# Midland Energy Hub Growth Forecast

## Low Carbon Environmental Goods and Services Growth Forecast for Net Zero 2030 and 2050

**Final Report March 2021**

kMatrix Data Services Ltd

kMatrix

MIDLANDS ENERGY HUB

sustainability west midlands

# Disclaimer

### kMatrix

This information is provided to help the client identify opportunities in current and future Low Carbon Environmental Goods and Services (LCEGS) markets.

It does not constitute advice to the client as to what they should do, when, where or with whom.

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### Midlands Energy Hub

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# Project Overview

The Low Carbon and Environmental Goods and Services sector study was commissioned by Nottingham City Council on behalf of the Midlands Energy Hub, sponsored by the Department of Business, Energy and Industrial Strategy (BEIS), and its stakeholders across the Midlands including the Local Enterprise Partnerships (LEPs) and Local Authorities.

The study was commissioned in November 2020 and awarded to kMatrix Data Services Ltd and Sustainability West Midlands, with the aim of understanding the current state of the sector, where support is needed to help grow the sector across the Midlands from a Local Authority level to a regional level and the role the sector can play to drive a low-carbon recovery from Covid-19.

The UK has a clear commitment to clean growth, where the economy continues to grow while reducing greenhouse gas emissions. The commitments are set out in the Industrial Strategy and the Clean Growth Strategy. The UK has a strong record of clean growth, cutting carbon emissions by 42% between 1990 and 2015, while experiencing a 67% increase in GDP during the same period, in contrast to the G7 emissions reduction of 3% and GDP increase of 61%[1]. This has been achieved through a variety of strategies including improved energy efficiency, increased recycling of waste products and improved automobile engine technology, with the largest contribution in reduction of emissions from the decarbonisation of power. The UK now has the largest installed offshore wind capacity in the world[2].

Although the UK is arguably a world leader in clean growth, there is an ongoing need for further development across multiple sectors to deliver on the low carbon economy commitments both local and central government are pursuing. LEPs in the Midlands are fully cognizant of the need to support and further develop the green economy, as set out in their Energy Strategies and Local Industrial Strategies.

The study is grounded in evidenced data provided by the kMatrix big data analytical tool, which has been used to inform the nature of the sector across the Midlands region, in a number of sub-sectors. The data has been used alongside desk research, documentation review, stakeholder engagement and collaboration with partners and the awarding authority to produce a series of reports constituting an evidence base of both quantitative and qualitative evidence. This evidence not only informs policy recommendations as an integral part of the study, but also acts as a baseline from which progress can be measured post Covid-19 and into the future.

The study involved the production of a quantitative evidence base led by kMatrix and a qualitative evidence-base led by Sustainability West Midlands with findings from each workstream enriching the evidence of the other. By full collaboration between partners, the project steering group and stakeholders, the evidence base produced by the project delivers a comprehensive overview of the LCEGS market, with detailed information at the LEP and Local Authority levels. The wider relevance to the green recovery and national commitment to net zero by 2050 have been considered throughout the work and are integral to the policy recommendations and growth forecasts made during the study.

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[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf

[2] https://gwec.net/global-figures/global-offshore/

# Report Introduction

This report draws upon data produced in the ten Market Snapshot evidenced-data reports produced for the Midlands Energy Hub (MEH) region as a whole and for the nine constituent Local Enterprise Partnerships (LEPs). The data in the Market Snapshot report, collated here, are produced using the kMatrix Big Data Analytical Tool, with full methodology paper delivered to the MEH.

The purpose of this report is to provide the specific forecasting and other relevant data such as scalability of sub-sectors in a single report, covering the MEH and the nine LEPs in one document.

The Market Snapshot reports are partly split by LEP to mitigate against double counting of data (due to some Local Authorities being present in more than one LEP) and partly to allow LEP-specific information to be easily accessible by each LEP. Some comparative data for the LEPs has been provided within the MEH report, heavily caveated regarding the double counting of some Local Authorities. While this approach has allowed the LEPs access to their data in reasonably manageable reports in terms of length, for this forecast growth report, both MEH and LEP data are discussed, to allow all growth-related data to be accessible in one place.

All data within this report are also present within the Market Snapshot reports, indeed there are additional data in evidence behind the figures and tables used within this report, in the Snapshot reports.

The report is presented in sections, with each section relating to either the MEH or a specific LEP. Within each section are sub-sections relating to different forms of analysis, such as scalability, potential $CO_2$ reduction of sub-sectors etc. For clarity, short descriptions regarding why the analysis was performed, the assumptions and metric-relevant information regarding calculations are provided within each section.

In summary, this report forms a summary of the findings and evidence from the Market Snapshot reports from the wider study, providing those data relevant to the growth forecasts. Due to double counting of local authorities, it is not appropriate to count the LEP figures to obtain the MEH total, rather the MEH data should be considered the overview of the region, comprising data from all 65 local authorities, while the LEP data comprises the Local Authority data relevant to the LEP.

# Wider Study Reports

The wider study includes ten data in evidence reports, one for the Midlands Energy Hub region as a whole and a further nine reports providing LEP-specific data.

Alongside the data evidence-base is a qualitative evidence base including literature review and stakeholder engagement with 1-2-1 interviews and workshops. Both the data produced by kMatrix and the qualitative findings of Sustainability West Midlands have fed into the research and production of all reports.

Final reports include this Growth Forecast and a report of Recommendations.

The full list of reports available through this project include:

- Midlands Region Low Carbon Environmental Goods and Services Market Snapshot
- Black Country Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Coventry and Warwick Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- D2N2 Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Greater Birmingham and Solihull Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Greater Lincolnshire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Leicester and Leicestershire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Marches Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Stoke and Staffordshire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Worcestershire Local Enterprise Partnership Low Carbon Environmental Goods and Services Market Snapshot
- Midlands Energy Hub Low Carbon Environmental Goods and Services Covid Impact Report
- Literature review & excel spreadsheet
- Stakeholder report
- Low Carbon Environmental Goods and Services Recommendations Report
- Midlands Energy Growth Forecast, Low Carbon Environmental Goods and Services Growth Forecast for Net Zero 2030 and 2050 (this report)

# Local Authorities within the MEH Region

This report includes local authority-level data, to allow deep disaggregation within the LEP area. For clarity of data visualization, the names of many local authorities have been shortened. The formal names and shortened labels of the local authorities within MEH Region are listed below:

| Formal name | Shortened label |
|---|---|
| Amber Valley DC | Amber Valley |
| Ashfield DC | Ashfield |
| Bassetlaw DC | Bassetlaw |
| Birmingham City C | Birmingham |
| Blaby DC | Blaby |
| Bolsover DC | Bolsover |
| Boston BC | Boston |
| Bromsgrove DC | Bromsgrove |
| Broxtowe DC | Broxtowe |
| Cannock Chase DC | Cannock Chase |
| Charnwood BC | Charnwood |
| Chesterfield DC | Chesterfield |
| City of Wolverhampton Council | Wolverhampton |
| Coventry City Council | Coventry |
| Derby City Council | Derby |
| Derbyshire Dales DC | Derbyshire Dales |
| Dudley MBC | Dudley |
| East Lindsey DC | East Lindsey |
| East Staffordshire BC | East Staffordshire |
| Erewash BC | Erewash |
| Gedling DC | Gedling |
| Harborough DC | Harborough |
| Herefordshire County C | Herefordshire |
| High Peak BC | High Peak |
| Hinckley & Bosworth BC | Hinckley & Bosworth |
| Leicester City C | Leicester |
| Lichfield DC | Lichfield |
| Lincoln City C | Lincoln |
| Malvern Hills DC | Malvern Hills |
| Mansfield DC | Mansfield |
| Melton BC | Melton |
| Newark & Sherwood DC | Newark & Sherwood |
| Newcastle-under-Lyme DC | Newcastle-under-Lyme |
| North East Derbyshire DC | North East Derbyshire |
| North East Lincolnshire C | North East Lincs |
| North Kesteven DC | North Kesteven |
| North Lincolnshire C | North Lincs |

| | |
|---|---|
| North Warwickshire BC | North Warwickshire |
| North West Leicestershire DC | North West Leicestershire |
| Nottingham City Council | Nottingham |
| Nuneaton & Bedworth BC | Nuneaton & Bedworth |
| Oadby & Wigston DC | Oadby & Wigston |
| Redditch BC | Redditch |
| Rugby BC | Rugby |
| Rushcliffe BC | Rushcliffe |
| Rutland CC | Rutland |
| Sandwell MBC | Sandwell |
| Shropshire C | Shropshire |
| Solihull BC | Solihull |
| South Derbyshire DC | South Derbyshire |
| South Holland DC | South Holland |
| South Kesteven DC | South Kesteven |
| South Staffordshire C | South Staffordshire |
| Stafford BC | Stafford |
| Staffordshire Moorlands DC | Staffordshire Moorlands |
| Stoke-on-Trent City C | Stoke-on-Trent |
| Stratford-on-Avon DC | Stratford-on-Avon |
| Tamworth BC | Tamworth |
| Telford & Wrekin C | Telford & Wrekin |
| Walsall MBC | Walsall |
| Warwick DC | Warwick |
| West Lindsey DC | West Lindsey |
| Worcester City C | Worcester |
| Wychavon DC | Wychavon |
| Wyre Forest DC | Wyre Forest |

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# Executive Summary

### Introduction

This Executive Summary is presented in sections, which correspond to the sections within the analysis. Due to Local Authorities being present in more than one LEP, it is recommended that each section (the MEH region and nine LEPs) be viewed separately.

## 1. Midlands Energy Hub Executive Summary

The Low Carbon Environmental Goods and Services sector across the Midlands Energy Hub region was worth £26.6bn to the MEH's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 10,500 businesses that employed over 195,000 people in the sector in 2019/20[3].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£4.4bn) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the MEH region and is not easily scalable (this is not the case for individual LEPs). Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.3% skills shortage compared with the regional average of 8.7%, has good training capacity and average potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Building Technologies (sales of £4.0bn) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates a medium capacity for scalability. Notably, it has good training capacity and strong upskilling potential with a high estimated $CO_2$ reduction potential. It also only has a 5.0% skills shortage.

Alternative fuels (sales of £3.8bn) is a highly scalable sub-sector, although at present it is growing in line with the UK and holds a share of the UK market in line with the regional average for the sector. The sub-sector has a 15.6% skills shortage (MEH average is 8.7%) and although it has an extremely high upskilling potential, it has a below average training capacity. For a sub-sector that has a large market and high estimated $CO_2$ reduction potential, this is a significant area for improvement.

[3] kMatrix Midlands Energy Hub Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

Photovoltaic (sales of £2.8bn) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (24.9% vs 12.1% MEH average). It does not score highly for scalability, has good but not exceptional potential for upskilling the workforce, but does have extremely good training capacity and is a large market with average $CO_2$ reduction potential. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.3%, compared with the regional average of 8.7%.

Water & Waste Water Treatment (sales of £2.0bn) has a slower growth than the UK average, but significantly larger UK market share than the regional average and has average scalability. Current training capacity is good and upskilling potential is high and is a large sub-sector offering average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.1%.

Waste Management (sales of £1.8bn) is a notable sub-sector, being a large market, with slower growth than the UK average, but being significantly above average market size (24.0% vs 12.1% MEH average). It is not particularly scalable and is not high in terms of $CO_2$ reduction potential but has good training capacity and good upskilling potential and only has a skills shortage of 5.9%.

Energy Management (sales of £0.6bn) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (14.2% vs 12.1% MEH average). It has medium scalability, reasonable training capacity and low upskilling of the workforce potential and medium $CO_2$ reduction potential. Although growing strongly, it displays an 18.5% skills shortage compared with the regional average of 8.7%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £1.2bn) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (5.9% vs 12.1% MEH average). It is only slightly below average for scalability, has very good current training capacity, but a low potential for upskilling the workforce and an average $CO_2$ reduction potential and has a 17.1% skills shortage compared with the regional average of 8.7%.

## Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size.
- Waste Management has weaker growth than the UK, but significantly above average market size.
- Photovoltaic has weaker growth than the UK, but significantly above average market size.
- Water & Waste Water Treatment has weaker growth than the UK, but significantly above average market size.
- Biomass has weaker growth than the UK, but above average market size.
- Building Technologies has weaker growth than the UK, but above average market size.
- Contaminated Land has a stronger growth than the UK average, but below average market size.
- Hydro has a stronger growth than the UK average, but below average market size.
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size.
- Air Pollution has a stronger growth than the UK average, but below average market size.

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size.
- Wave & Tidal has weaker growth than the UK and below average market size.

- Carbon Finance has weaker growth than the UK and below average market size.

### Scalability of sub-sectors

Scalability of the sub-sectors within the MEH is variable and when combined with GVA, strengths include:

- Alternative Fuels with high GVA and high Scalability
- Renewable Energy General Consultancy with high Scalability but small GVA
- Environmental Monitoring with high Scalability but small GVA
- Water & Waste Water Treatment with good GVA and medium Scalability
- Building Technologies with very good GVA and medium Scalability

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the MEH region being 8.7%.

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 35.7%
- Power Distribution Engineers 29.8%
- Technicians 22.2%

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1%
- Maintenance Engineer 6.3%
- Specialist or Consultant 3.3%
- Administrative Workers 2.1%

*Level 1 shortages*

Skills shortages within the MEH region at Level 1:

- Low Carbon 10.5%
- Renewable Energy 7.0%
- Environmental 10.3%

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:
- Low Carbon 43.7%
- Renewable Energy 27.9%
- Environmental 34.9%

Power Distribution Engineers:
- Low Carbon 33.7%
- Renewable Energy 27.1%
- Environmental 32.6%

Technicians:
- Low Carbon 27.9%
- Renewable Energy 17.3%
- Environmental 22.9%

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the MEH region to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.3%
- Best-case scenario for the UK economy is 57.9%

Estimated growth in employees for the MEH region to reach zero by 2050:

- Worst-case scenario for the UK economy is 86.0%
- Best-case scenario for the UK economy is 342.4%

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:

- Low Carbon 17.0%
- Renewable Energy 34.5%
- Environmental 27.0%

Power Distribution Engineers:

- Low Carbon 28.1%
- Renewable Energy 35.1%
- Environmental 29.3%

Technicians:

- Low Carbon 34.2%
- Renewable Energy 45.9%
- Environmental 39.6%

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the MEH region include:

- Building Technologies with good training capacity and strong upskilling potential
- Water and Waste Water Treatment with good training capacity and high upskilling potential
- Noise & Vibration Control with good training capacity and high upskilling potential
- Carbon Finance with extremely good training capacity and good upskilling potential
- Recovery and Recycling with good training capacity and good upskilling potential
- Environmental Consultancy with good training capacity and good upskilling potential
- Biomass with good training capacity and good upskilling potential
- Waste Management with good training capacity and good upskilling potential
- Renewable Energy General Consultancy with average training capacity and very high upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the MEH region include:

- Alternative Fuels with below average training capacity but extremely high upskilling potential
- Carbon Capture and Storage with low training capacity but extremely high upskilling potential
- Additional Energy Sources with very low training capacity but extremely high upskilling potential

**Potential of Level 2 sub-sectors to impact on $CO_2$ reduction.**
Sub-sectors with a high estimated CO2 reduction impact include:

- Wind with the largest market size and highest estimated potential impact
- Alternative Fuels with large market and high estimated potential impact
- Building Technologies with large market and high estimated potential impact
- Recovery and Recycling with large market and high estimated potential impact
- Renewable Energy General Consultancy with a small market but high estimated potential impact
- Carbon Finance with a small market but high estimated potential impact

Sub-sectors with a low estimated CO2 reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market
- Nuclear with low estimated potential impact and small market
- Biomass with low estimated potential impact but good market

## 2. Black Country LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Black Country LEP was worth £2.3bn to the Black Country LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 900 businesses that employed over 17,000 people in the sector in 2019/20[4].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£378m) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the Black Country LEP and is not easily scalable. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.3% skills shortage compared with the LEP average of 8.7%, has low training capacity but low potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Building Technologies (sales of £353m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates a low capacity for scalability. Notably, it has average training capacity but strong upskilling potential, but relatively low estimated $CO_2$ reduction potential. It also only has a 4.9% skills shortage.

[4] kMatrix Black Country LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

Alternative fuels (sales of £338m) is a highly scalable sub-sector, although at present it is growing in line with the UK and holds a share of the UK market in line with the LEP average for the sector. The sub-sector has a 15.6% skills shortage (LEP average is 8.7%) and although it has an extremely high upskilling potential, it has a below average training capacity. For a sub-sector that has a large market and high estimated $CO_2$ reduction potential, this is a significant area for improvement.

Photovoltaic (sales of £231m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (2.1% vs 1.1% LEP average). It scores reasonably highly for scalability, has very high potential for upskilling the workforce and good training capacity, additionally it is a large market with very high $CO_2$ reduction potential within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.4%, compared with the LEP average of 8.7%.

Water & Waste Water Treatment (sales of £187m) has a slower growth than the UK average, but significantly larger UK market share than the LEP average and has above average scalability. Current training capacity is good and upskilling potential is average and is a large sub-sector offering average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.2%.

Waste Management (sales of £160m) is a notable sub-sector, being a large market, with slower growth than the UK average, but being significantly above average market size (2.2% vs 1.1% LEP average). It is not particularly scalable but is above average in terms of $CO_2$ reduction potential. Although it has good upskilling potential, it has below average training capacity and only has a skills shortage of 6.0%.

Energy Management (sales of £47m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (1.2% vs 1.1% LEP average). It has slightly above average scalability, slightly below average training capacity, but above average upskilling of the workforce potential and above average $CO_2$ reduction potential. Although growing strongly, it displays an 18.9% skills shortage compared with the LEP average of 8.7%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £104m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (0.5% vs 1.1% LEP average). It is only above average for scalability, has below average current training capacity, but above average potential for upskilling the workforce and an above average $CO_2$ reduction potential and has a 16.6% skills shortage compared with the LEP average of 8.7%.

## Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size
- Waste Management has weaker growth than the UK, but significantly above average market size
- Photovoltaic has weaker growth than the UK, but significantly above average market size
- Water & Waste Water Treatment has weaker growth than the UK, but significantly above average market size.
- Biomass has weaker growth than the UK, but significantly above average market size
- Building Technologies has weaker growth than the UK, but significantly above average market size

- Contaminated Land has a stronger growth than the UK average, but below average market size
- Hydro has a stronger growth than the UK average, but below average market size
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size
- Air Pollution has a stronger growth than the UK average, but below average market size

Sub-Sector weaknesses include:
- Geothermal has weaker growth than the UK and below average market size
- Wave & Tidal has weaker growth than the UK and below average market size

### Scalability of sub-sectors
Scalability of the sub-sectors within the Black Country LEP is variable and when combined with GVA, strengths include:
- Alternative Fuels with high GVA and high Scalability (stronger position than the MEH average)
- Biomass with good Scalability and good GVA (stronger position than the MEH average)
- Recovery and Recycling with good Scalability and good GVA (stronger position than the MEH average)
- Photovoltaic with good Scalability and good GVA (stronger position than the MEH average)
- Geothermal with good Scalability and good GVA (stronger position than the MEH average)
- Water and Waste Water Treatment with good Scalability and good GVA
- Contaminated Land Reclamation and Remediation with high Scalability but small GVA
- Hydro with high Scalability but small GVA (stronger position than the MEH average)
- Carbon Capture and Storage with high Scalability but small GVA (stronger position than the MEH average)
- Energy Management with reasonable GVA and good Scalability (stronger position than the MEH average)

### Skills Shortages
The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Black Country LEP being 8.7% (MEH 8.7%).

Significant skills gaps are present within some SOC’s with large numbers of employees:
- Production Engineers 34.5% (MEH 35.7%)
- Power Distribution Engineers 30.0% (MEH 29.8%)
- Technicians 22.6% (MEH 22.2%)

Insignificant skills gaps are present within some SOC’s with large numbers of employees:
- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.4% (MEH 6.3%)
- Specialist or Consultant 3.2% (MEH 3.3%)
- Administrative Workers 2.2% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Black Country LEP at Level 1:

- Low Carbon 10.4% (MEH 10.5%)
- Renewable Energy 7.2% (MEH 7.0%)
- Environmental 10.3% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:
  - Low Carbon 43.7% (MEH 47.3%)
  - Renewable Energy 27.6% (MEH 27.9%)
  - Environmental 34.8% (MEH 34.9%)

Power Distribution Engineers:
  - Low Carbon 32.6% (MEH 33.7%)
  - Renewable Energy 28.2% (MEH 27.1%)
  - Environmental 31.7% (MEH 32.6%)

Technicians:
  - Low Carbon 28.3% (MEH 27.9%)
  - Renewable Energy 17.9% (MEH 17.3%)
  - Environmental 22.9% (22.9%)

## Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Black Country LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.3% (MEH 20.3%)
- Best-case scenario for the UK economy is 57.8% (MEH 57.9%)

Estimated growth in employees for the Black Country LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 85.6% (MEH 86.0%)
- Best-case scenario for the UK economy is 341.8% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:
  - Low Carbon 23.2% (MEH 17.0%)
  - Renewable Energy 34.6% (MEH 34.5%)
  - Environmental 27.1% (MEH 27.0%)

Power Distribution Engineers:
  - Low Carbon 29.1% (MEH 28.1%)
  - Renewable Energy 35.1% (MEH 35.1%)
  - Environmental 29.0% (MEH 29.3%)

Technicians:
  - Low Carbon 33.2% (MEH 34.2%)
  - Renewable Energy 45.7% (MEH 45.9%)
  - Environmental 39.2% (MEH 39.6%)

## Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Black Country LEP include:

- Renewable Energy General Consultancy with good training capacity and strong potential for upskilling
- Air Pollution with good training capacity and strong potential for upskilling
- Environmental Consultancy with good training capacity and strong potential for upskilling
- Photovoltaic with good training capacity and strong potential for upskilling
- Alternative Fuels Vehicle with good training capacity and average upskilling potential
- Alternative Fuels with average training capacity and good upskilling potential
- Building Technologies with average training capacity and good upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Black Country LEP include:

- Recovery and Recycling with good upskilling potential but poor training capacity
- Biomass with good upskilling potential but poor training capacity
- Waste Management with good upskilling potential but poor training capacity

**Potential of Level 2 sub-sectors to impact on $CO_2$ reduction**

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and high estimated potential impact
- Alternative Fuels with large market and high estimated potential impact
- Photovoltaic with high estimated potential impact and smaller market
- Building Technologies with large market and low estimated potential impact

Sub-sectors with a low estimated $CO_2$ reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market
- Additional Energy Sources with low estimated potential impact and small market

## 3. Coventry and Warwickshire LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Coventry and Warwickshire LEP was worth £3.5bn to the Coventry and Warwickshire LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 1,200 businesses that employed over 28,000 people in the sector in 2019/20[5].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£564m) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the Coventry and Warwickshire LEP and is just above average in terms of scalability. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.3% skills shortage compared with the LEP average of 8.7%, has good training capacity and extremely high potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector

[5] kMatrix Coventry and Warwickshire LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Building Technologies (sales of £528m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates a low capacity for scalability. It has good training capacity and below average upskilling potential and average estimated $CO_2$ reduction potential. It also only has a 4.9% skills shortage.

Alternative fuels (sales of £483m) is a highly scalable sub-sector, although at present it is growing in line with the UK and holds a share of the UK market in line with the LEP average for the sector. The sub-sector has a 15.0% skills shortage (LEP average is 8.7%) and scores low for both training capacity and upskilling potential. For a sub-sector that has a large market and high estimated $CO_2$ reduction potential, this is a significant area for improvement.

Photovoltaic (sales of £368m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (3.3% vs 1.6% LEP average). It scores blow average for scalability, has a medium potential for upskilling the workforce and average training capacity, with medium $CO_2$ reduction potential within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.3%, compared with the LEP average of 8.7%.

Water & Waste Water Treatment (sales of £274m) has a slower growth than the UK average, but significantly larger UK market share than the LEP average and has above average scalability. Current training capacity is very good and upskilling potential is average, is a large sub-sector with below average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.2%.

Waste Management (sales of £243m) is a notable sub-sector, being a large market, with slower growth than the UK average, but being significantly above average market size (3.3% vs 1.6% LEP average). It is low for scalability and average in terms of $CO_2$ reduction potential. It has good upskilling potential and average training capacity and only has a skills shortage of 5.9%.

Energy Management (sales of £74m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (1.9% vs 1.6% LEP average). It has average scalability, average training capacity, but very low upskilling of the workforce potential and above average $CO_2$ reduction potential. Although growing strongly, it displays an 18.7% skills shortage compared with the LEP average of 8.7%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £153m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (0.8% vs 1.6% LEP average). It is average for scalability, has below average current training capacity and very low potential for upskilling the workforce. Conversely, it has an above average $CO_2$ reduction potential and has a 17.2% skills shortage compared with the LEP average of 8.7%.

# Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size.
- Waste Management has weaker growth than the UK, but significantly above average market size.
- Photovoltaic has weaker growth than the UK, but significantly above average market size.
- Water & Waste Water Treatment has weaker growth than the UK, but significantly above average market size.
- Biomass has weaker growth than the UK, but significantly above average market size.
- Building Technologies has weaker growth than the UK, but significantly above average market size.
- Contaminated Land has a stronger growth than the UK average, but below average market size.
- Hydro has a stronger growth than the UK average, but below average market size.
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size.
- Air Pollution has a stronger growth than the UK average, but below average market size.

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size.
- Wave & Tidal has weaker growth than the UK and below average market size.

### Scalability of sub-sectors

Scalability of the sub-sectors within the Coventry and Warwickshire LEP is variable and when combined with GVA, strengths include:

- Alternative Fuels with high GVA and high Scalability (stronger position than the MEH average)
- Wind with high GVA and high Scalability (stronger position than the MEH average)
- Environmental Monitoring, Instrumentation and Analysis with high Scalability but small GVA (stronger position than the MEH average)
- Renewable Energy General Consultancy with high Scalability but small GVA
- Alternative Fuel Vehicle with reasonable GVA and good Scalability (stronger position than the MEH average)

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Coventry and Warwickshire LEP being 8.7% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 34.4% (MEH 35.7%)
- Power Distribution Engineers 29.6% (MEH 29.8%)
- Technicians 22.1% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.3% (MEH 6.3%)
- Specialist or Consultant 3.1% (MEH 3.3%)
- Administrative Workers 2.1% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Coventry and Warwickshire LEP at Level 1:
- Low Carbon 10.2% (MEH 10.5%)
- Renewable Energy 7.1% (MEH 7.0%)
- Environmental 10.0% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:
- Low Carbon 43.9% (MEH 47.3%)
- Renewable Energy 27.8% (MEH 27.9%)
- Environmental 34.4% (MEH 34.9%)

Power Distribution Engineers:
- Low Carbon 32.9% (MEH 33.7%)
- Renewable Energy 27.2% (MEH 27.1%)
- Environmental 32.2% (MEH 32.6%)

Technicians:
- Low Carbon 28.0% (MEH 27.9%)
- Renewable Energy 17.3% (MEH 17.3%)
- Environmental 22.5% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Coventry and Warwickshire LEP to reach zero by 2030:
- Worst-case scenario for the UK economy is 20.5% (MEH 20.3%)
- Best-case scenario for the UK economy is 58.0% (MEH 57.9%)

Estimated growth in employees for the Coventry and Warwickshire LEP to reach zero by 2050:
- Worst-case scenario for the UK economy is 86.2% (MEH 86.0%)
- Best-case scenario for the UK economy is 342.5% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:
- Low Carbon 19.7% (MEH 17.0%)
- Renewable Energy 34.2% (MEH 34.5%)
- Environmental 27.8% (MEH 27.0%)

Power Distribution Engineers:
- Low Carbon 27.9% (MEH 28.1%)
- Renewable Energy 34.6% (MEH 35.1%)
- Environmental 29.9% (MEH 29.3%)

Technicians:
- Low Carbon 34.3% (MEH 34.2%)

- Renewable Energy 45.8% (MEH 45.9%)
- Environmental 39.9% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Coventry and Warwickshire LEP include:

- Wind with good training capacity and strong potential for upskilling
- Renewable Energy General Consultancy with strong training capacity and good upskilling potential
- Waste Management with good training capacity and average upskilling potential with good upskilling potential
- Water & Waste Water Treatment with good training capacity and average upskilling potential
- Building Technologies with good training capacity
- Recovery and Recycling with good training capacity

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Coventry and Warwickshire LEP include:

- Wave & Tidal with good upskilling potential but poor training capacity

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction.

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and high estimated potential impact
- Alternative Fuels with large market and high estimated potential impact
- Building Technologies with large market and above average estimated potential impact
- Photovoltaic with average estimated potential impact and good market size
- Geothermal with good market size and high estimated potential impact

Sub-sectors with a low estimated $CO_2$ reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market

## 4. D2N2 LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the D2N2 LEP was worth £5.3bn to the D2N2 LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 1,800 businesses that employed over 35,000 people in the sector in 2019/20[6].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£874m) but has not grown above the UK average growth rate but holds a larger share of the UK market than would be expected for the D2N2 LEP and is highly scalable. Although it is not an area of high growth within the region, the Wind sub-

[6] kMatrix D2N2 LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

sector is on track regarding jobs, having only a 5.3% skills shortage compared with the LEP average of 8.7%, has medium training capacity but below average potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential.

Building Technologies (sales of £776m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates a below average capacity for scalability. Notably, it has below average training capacity but above average upskilling potential and average estimated $CO_2$ reduction potential. It also only has a 5.0% skills shortage.

Alternative fuels (sales of £770m) is a highly scalable sub-sector, although at present it is growing slower than the UK but holds a larger share of the UK market than the LEP average for the sector. The sub-sector has a 15.5% skills shortage (LEP average is 8.7%) and although it has an average upskilling potential, it has a low training capacity. For a sub-sector that has a large market medium estimated $CO_2$ reduction potential, this is a significant area for improvement.

Photovoltaic (sales of £551m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (4.9% vs 2.4% LEP average). It is average for scalability, has good training capacity but low potential for upskilling the workforce, additionally it is a large market with average $CO_2$ reduction potential within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.4%, compared with the LEP average of 8.7%.

Water & Waste Water Treatment (sales of £411m) has a slower growth than the UK average, but significantly larger UK market share than the LEP average and has above average scalability. Current training capacity is below average, upskilling potential is average and is a large sub-sector offering average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.0%.

Waste Management (sales of £348m) is a notable sub-sector, being a large market, with slower growth than the UK average, but being significantly above average market size (4.7% vs 2.4% LEP average). It has good scalability and is average in terms of $CO_2$ reduction potential. Although it has good upskilling potential, it has below average training capacity and only has a skills shortage of 5.9%.

Energy Management (sales of £113m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (2.9% vs 2.4% LEP average). It has slightly above average scalability, slightly below average training capacity, but very low upskilling of the workforce potential, with average $CO_2$ reduction potential. Although growing strongly, it displays an 18.2% skills shortage compared with the regional average of 8.7%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £232m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (1.2% vs 2.4% LEP average). It is very low for scalability, has above average current training capacity, but low potential for upskilling the workforce, average $CO_2$ reduction potential and has a 17.1% skills shortage compared with the LEP average of 8.7%.

## Summary Findings

### Sub-sector Strengths and Weaknesses
Sub-sector strengths include:
- Energy Management has stronger growth than the UK and above average market size.
- Alternative Fuel Vehicle has a stronger growth than the UK average and above average market size.
- Contaminated Land has a stronger growth than the UK average and above average market size.
- Hydro has a stronger growth than the UK average and above average market size.
- Waste Management has weaker growth than the UK, but significantly above average market size.
- Photovoltaic has weaker growth than the UK, but significantly above average market size.
- Water & Waste Water Treatment has weaker growth than the UK, but significantly above average market size.
- Biomass has weaker growth than the UK, but significantly above average market size.
- Building Technologies has weaker growth than the UK, but significantly above average market size.
- Wind has weaker growth than the UK, but significantly above average market size.
- Alternative Fuels has weaker growth than the UK, but significantly above average market size.
- Nuclear has a stronger growth than the UK average, but below average market size.
- Air Pollution has a stronger growth than the UK average, but below average market size.

Sub-Sector weaknesses include:
- Wave & Tidal has weaker growth than the UK and below average market size.

### Scalability of sub-sectors
Scalability of the sub-sectors within the D2N2 LEP is variable and when combined with GVA, strengths include:
- Alternative Fuels with high GVA and high Scalability (stronger position than the MEH average)
- Wind with high GVA and high Scalability (stronger position than the MEH average)
- Renewable Energy General Consultancy with high Scalability but small GVA
- Waste Management with good Scalability and good GVA (stronger position than the MEH average)
- Energy Management with reasonable GVA and good Scalability (stronger position than the MEH average)

### Skills Shortages
The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the D2N2 LEP being 8.7% (MEH .87%).

Significant skills gaps are present within some SOC's with large numbers of employees:
- Production Engineers 35.7% (MEH 35.7%)
- Power Distribution Engineers 30.0% (MEH 29.8%)
- Technicians 22.2% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.3% (MEH 6.3%)
- Specialist or Consultant 3.1% (MEH 3.3%)
- Administrative Workers 2.1% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the D2N2 LEP at Level 1:

- Low Carbon 10.7% (MEH 10.5%)
- Renewable Energy 7.2% (MEH 7.0%)
- Environmental 10.2% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:

- Low Carbon 46.4% (MEH 47.3%)
- Renewable Energy 27.6% (MEH 27.9%)
- Environmental 34.5% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 34.2% (MEH 33.7%)
- Renewable Energy 28.7% (MEH 27.1%)
- Environmental 31.7% (MEH 32.6%)

Technicians:

- Low Carbon 27.9% (MEH 27.9%)
- Renewable Energy 17.4% (MEH 17.3%)
- Environmental 22.5% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the D2N2 LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.5% (MEH 20.3%)
- Best-case scenario for the UK economy is 58.0% (MEH 57.9%)

Estimated growth in employees for the D2N2LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 86.2% (MEH 86.0%)
- Best-case scenario for the UK economy is 342.5% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:

- Low Carbon 16.6% (MEH 17.0%)
- Renewable Energy 33.3% (MEH 34.5%)
- Environmental 27.4% (MEH 27.0%)

Power Distribution Engineers:

- Low Carbon 27.4% (MEH 28.1%)
- Renewable Energy 34.7% (MEH 35.1%)
- Environmental 30.0% (MEH 29.3%)

Technicians:
- Low Carbon 33.7% (MEH 34.2%)
- Renewable Energy 45.8% (MEH 45.9%)
- Environmental 39.6% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the D2N2 LEP include:

- Contaminated Land has good training capacity and strong upskilling potential.
- Environmental Monitoring has very good training capacity, but lower upskilling potential
- Photovoltaic with good training capacity and lower potential for upskilling
- Geothermal with good training capacity and lower potential for upskilling
- Biomass with good training capacity and lower potential for upskilling
- Alternative Fuels Vehicle with below average training capacity but high upskilling potential
- Building Technologies with reasonable training capacity and good upskilling potential
- Recovery and Recycling with reasonable training capacity and good upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the D2N2 LEP include:

- Alternative Fuels with very low training capacity but good upskilling potential

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction.

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and high estimated potential impact
- Building Technologies with large market and good estimated potential impact
- Alternative Fuels with large market and good estimated potential impact
- Recovery and Recycling with high estimated potential impact and smaller market

Sub-sectors with a low estimated $CO_2$ reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market

## 5. Greater Birmingham and Solihull LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Greater Birmingham and Solihull LEP was worth £6.3bn to the Greater Birmingham and Solihull LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 2,800 businesses that employed over 48,000 people in the sector in 2019/20[7].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£1.0bn) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for

[7] kMatrix Greater Birmingham and Solihull LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

the Greater Birmingham and Solihull LEP and is not easily scalable. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.0% skills shortage compared with the LEP average of 8.6%, has below average training capacity but also below average potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Building Technologies (sales of £947m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a similar rate to the UK, it has an above average market size compared with the regional average and demonstrates a low capacity for scalability. Notably, it has good training capacity and strong upskilling potential, and good estimated $CO_2$ reduction potential. It also only has a 5.1% skills shortage.

Alternative fuels (sales of £856m) is average in terms of scalability, is growing in line with the UK and holds a share of the UK market in line with the regional average for the sector. The sub-sector has a 15.1% skills shortage (LEP average is 8.6%) average training capacity and low upskilling potential. For a sub-sector that has a large market and high estimated $CO_2$ reduction potential, this is a significant area for improvement.

Photovoltaic (sales of £655m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (5.9% vs 2.8% LEP average). It scores reasonably highly for scalability, has average potential for upskilling the workforce and good training capacity, but lower $CO_2$ reduction potential within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.3%, compared with the LEP average of 8.6%.

Water & Waste Water Treatment (sales of £455m) has a slightly stronger growth than the UK average and significantly larger UK market share than the LEP average and average scalability. Current training capacity is good and upskilling potential is high and is a large sub-sector offering good $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.1%.

Waste Management (sales of £403m) is a notable sub-sector, being a large market, with stronger growth than the UK average and significantly above average market size (5.5% vs 2.8% LEP average). It has average scalability and is above average in terms of $CO_2$ reduction potential. It has very good training capability but relatively low upskilling potential and only has a skills shortage of 6.1%.

Energy Management (sales of £131m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (3.3% vs 2.8% LEP average). It has average scalability, average training capacity, but below average upskilling of the workforce potential and below average $CO_2$ reduction potential. Although growing strongly, it displays an 18.4% skills shortage compared with the regional average of 8.6%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £271m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (1.4% vs 2.8% LEP average). It is average for scalability, has above average current training capacity, average potential for upskilling the workforce and average $CO_2$ reduction potential and has a 17.1% skills shortage compared with the LEP average of 8.6%.

# Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size
- Waste Management has stronger growth than the UK and significantly above average market size
- Water & Waste Water Treatment has slightly strong growth than the UK and significantly above average market size
- Building Technologies has similar growth to the UK and above average market size
- Photovoltaic has weaker growth than the UK, but significantly above average market size
- Biomass has weaker growth than the UK, but significantly above average market size
- Contaminated Land has a stronger growth than the UK average, but below average market size
- Hydro has a stronger growth than the UK average, but below average market size
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size
- Air Pollution has a stronger growth than the UK average, but below average market size

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size
- Wave & Tidal has weaker growth than the UK and below average market size

Additional Note

- Carbon Finance has weaker growth than the UK and below average market size but is the only LEP to contain Carbon Finance within the MEH region. Carbon Finance is dominated by London and should not be considered a weakness.

### Scalability of sub-sectors

Scalability of the sub-sectors within the Greater Birmingham and Solihull LEP is variable and when combined with GVA, strengths include:

- Carbon Finance with reasonable GVA and extremely good Scalability (stronger position than the MEH average)
- Photovoltaic good Scalability and good GVA (stronger position than the MEH average)
- Water and waste Water Treatments with good GVA and medium Scalability
- Renewable Energy General Consultancy with good Scalability but small GVA
- Waste Management with medium Scalability and good GVA (stronger position than the MEH average)
- Energy Management with reasonable GVA and medium Scalability (stronger position than the MEH average)

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Greater Birmingham and Solihull LEP being 8.6% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 36.0% (MEH 35.7%)
- Power Distribution Engineers 29.2% (MEH 29.8%)
- Technicians 22.0% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.3% (MEH 6.3%)
- Specialist or Consultant 3.5% (MEH 3.3%)
- Administrative Workers 2.2% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Greater Birmingham and Solihull LEP at Level 1:

- Low Carbon 10.3% (MEH 10.5%)
- Renewable Energy 6.9% (MEH 7.0%)
- Environmental 10.5% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:
- Low Carbon 48.5% (MEH 47.3%)
- Renewable Energy 27.7% (MEH 27.9%)
- Environmental 35.4% (MEH 34.9%)

Power Distribution Engineers:
- Low Carbon 33.9% (MEH 33.7%)
- Renewable Energy 25.3% (MEH 27.1%)
- Environmental 34.1% (MEH 32.6%)

Technicians:
- Low Carbon 27.5% (MEH 27.9%)
- Renewable Energy 16.9% (MEH 17.3%)
- Environmental 23.2% (22.9%)

## Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Greater Birmingham and Solihull LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.4% (MEH 20.3%)
- Best-case scenario for the UK economy is 58.1% (MEH 57.9%)

Estimated growth in employees for the Greater Birmingham and Solihull LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 86.2% (MEH 86.0%)
- Best-case scenario for the UK economy is 343.3% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:
- Low Carbon 15.8% (MEH 17.0%)
- Renewable Energy 35.2% (MEH 34.5%)
- Environmental 26.7% (MEH 27.0%)

Power Distribution Engineers:
- Low Carbon 28.2% (MEH 28.1%)
- Renewable Energy 36.7% (MEH 35.1%)
- Environmental 28.2% (MEH 29.3%)

Technicians:

- Low Carbon 36.5% (MEH 34.2%)
- Renewable Energy 46.1% (MEH 45.9%)
- Environmental 39.6% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Greater Birmingham and Solihull LEP include:

- Building Technologies with good training capacity and upskilling potential
- Water & Waste Water Treatment with good training capacity and upskilling potential
- Recovery and Recycling with good training capacity and reasonable upskilling potential
- Alternative Fuel Vehicle with good training capacity and average upskilling potential
- Photovoltaic with good training capacity and strong potential for upskilling
- Waste Management with very high training capacity but low upskilling potential
- Alternative Fuels with good training potential but low upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Greater Birmingham and Solihull LEP include:

- Wave and Tidal has slightly below average upskilling potential but very low training capacity
- Environmental Monitoring has slightly below average upskilling potential but very low training capacity

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and high estimated potential impact
- Building Technologies with large market and good estimated potential impact
- Alternative Fuels with large market and high estimated potential impact
- Water & Waste Water Treatment with moderate market size and potential impact
- Photovoltaic with lower estimated potential impact and smaller market

Sub-sectors with a low estimated $CO_2$ reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market

# 6. Greater Lincolnshire LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Greater Lincolnshire LEP was worth £2.4bn to the Greater Lincolnshire LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 1,000 businesses that employed almost 17,000 people in the sector in 2019/20[8].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the

[8] kMatrix Greater Lincolnshire LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£399m) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the Greater Lincolnshire LEP and is not easily scalable. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.2% skills shortage compared with the LEP average of 8.7%, has good training capacity and average potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Building Technologies (sales of £366m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates a below average capacity for scalability. Notably, it has average training capacity but above average upskilling potential, but relatively low estimated $CO_2$ reduction potential. It also only has a 5.1% skills shortage.

Alternative fuels (sales of £348m) is a highly scalable sub-sector, although at present it is growing slower than the UK and holds a share of the UK market in line with the regional average for the sector. The sub-sector has a 16.2% skills shortage (LEP average is 8.7%) and although it has an extremely high upskilling potential, it has very low training capacity. For a sub-sector that has a large market and good estimated $CO_2$ reduction potential, this is a significant area for improvement.

Photovoltaic (sales of £249m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (2.2% vs 1.1% LEP average). It is average for scalability, has low potential for upskilling the workforce and below average training capacity, however it is a large market with high $CO_2$ reduction potential within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.5%, compared with the LEP average of 8.7%.

Water & Waste Water Treatment (sales of £179m) has a slower growth than the UK average, but significantly larger UK market share than the LEP average and has average scalability. Current training capacity is good and upskilling potential is very high and is a large sub-sector offering average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.1%.

Biomass (sales of £181m) has a slower growth than the UK average, but significantly larger UK market share than the LEP average and has average scalability. Current training capacity is below average, while upskilling potential is high, it is a large sub-sector but with below average $CO_2$ reduction potential. The skills gap is in line with sector average at 8.7%.

Waste Management (sales of £169m) is a notable sub-sector, being a large market, with slower growth than the UK average, but being significantly above average market size (2.3% vs 1.1% LEP average). It has good scalability and average $CO_2$ reduction potential. It has average training capacity, but below average upskilling potential and only has a skills shortage of 5.9%.

Energy Management (sales of £50m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (1.3% vs 1.1% LEP average). It has slightly above average scalability, slightly below average training capacity, below average upskilling of the workforce potential and low average $CO_2$ reduction potential. Although growing strongly, it displays an 18.4% skills shortage compared with the regional average of 8.7%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £107m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (0.5% vs 1.1% LEP average). It is average for scalability, has very high current training capacity, but extremely low potential for upskilling the workforce, but an above average $CO_2$ reduction potential and has a 16.4% skills shortage compared with the LEP average of 8.7%.

## Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size.
- Contaminated Land has a stronger growth than the UK average, but slightly below average market size.
- Hydro has a stronger growth than the UK average and average market size.
- Waste Management has weaker growth than the UK, but significantly above average market size.
- Photovoltaic has weaker growth than the UK, but significantly above average market size.
- Water & Waste Water Treatment has weaker growth than the UK, but significantly above average market size.
- Biomass has weaker growth than the UK, but significantly above average market size.
- Building Technologies has weaker growth than the UK, but above average market size.
- Air Pollution has a stronger growth than the UK average, but slightly below average market size.
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size.

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size.
- Wave & Tidal has weaker growth than the UK and below average market size.

### Scalability of sub-sectors

Scalability of the sub-sectors within the Greater Lincolnshire LEP is variable and when combined with GVA, strengths include:

- Alternative Fuels with high GVA and high Scalability
- Waste Management with high GVA and high Scalability (stronger position than the MEH average)
- Additional Energy Sources with high Scalability but small GVA (stronger position than the MEH average)
- Renewable Energy General Consultancy with high Scalability but small GVA
- Alternative Fuel Vehicle with good Scalability and good GVA (stronger position than the MEH average)
- Photovoltaic with good Scalability and good GVA (stronger position than the MEH average)
- Biomass with good Scalability and good GVA (stronger position than the MEH average)

- Energy Management with reasonable GVA and good Scalability (stronger position than the MEH average)

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Greater Lincolnshire LEP being 8.7% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 36.4% (MEH 35.7%)
- Power Distribution Engineers 29.9% (MEH 29.8%)
- Technicians 22.1% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.3% (MEH 6.3%)
- Specialist or Consultant 3.2% (MEH 3.3%)
- Administrative Workers 2.1% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Greater Lincolnshire LEP at Level 1:

- Low Carbon 10.6% (MEH 10.5%)
- Renewable Energy 7.0% (MEH 7.0%)
- Environmental 10.5% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:

- Low Carbon 50.3% (MEH 47.3%)
- Renewable Energy 27.4% (MEH 27.9%)
- Environmental 35.2% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 33.7% (MEH 33.7%)
- Renewable Energy 27.2% (MEH 27.1%)
- Environmental 32.9% (MEH 32.6%)

Technicians:

- Low Carbon 27.1% (MEH 27.9%)
- Renewable Energy 17.5% (MEH 17.3%)
- Environmental 23.1% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Greater Lincolnshire LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.2% (MEH 20.3%)
- Best-case scenario for the UK economy is 57.7% (MEH 57.9%)

Estimated growth in employees for the Greater Lincolnshire LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 86.1% (MEH 86.0%)
- Best-case scenario for the UK economy is 341.8% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:
- Low Carbon 14.9% (MEH 17.0%)
- Renewable Energy 34.5% (MEH 34.5%)
- Environmental 26.9% (MEH 27.0%)

Power Distribution Engineers:
- Low Carbon 28.9% (MEH 28.1%)
- Renewable Energy 34.5% (MEH 35.1%)
- Environmental 29.7% (MEH 29.3%)

Technicians:
- Low Carbon 34.0% (MEH 34.2%)
- Renewable Energy 46.5% (MEH 45.9%)
- Environmental 39.8% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Greater Lincolnshire LEP include:
- Renewable Energy General Consultancy has very strong training capacity and potential for upskilling
- Hydro with good training capacity and strong potential for upskilling
- Wind with good training capacity and average upskilling potential
- Building Technologies with above average training capacity and upskilling potential
- Water and Waste Water Treatment with above average training capacity and good upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Greater Lincolnshire LEP include:
- Alternative Fuels with poor training capacity and but very high potential for upskilling
- Noise & Vibration Control with poor training capacity and but very high potential for upskilling

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction.

Sub-sectors with a high estimated $CO_2$ reduction impact include:
- Wind with large market and high estimated potential impact
- Photovoltaic with high estimated potential impact and good-sized market
- Alternative Fuels with large market and average estimated potential impact
- Building Technologies with large market and average estimated potential impact

Sub-sectors with a low estimated $CO_2$ reduction impact include:
- Environmental Consultancy with low estimated potential impact and small market

# 7. Leicester and Leicestershire LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Leicester and Leicestershire LEP was worth £2.8bn to the Leicester and Leicestershire LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 1,000 businesses that employed over 21,000 people in the sector in 2019/20[9].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£474m) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the Leicester and Leicestershire LEP, however it is highly scalable. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.4% skills shortage compared with the LEP average of 8.6%, has average training capacity and good potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential.

Building Technologies (sales of £394m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates an exceptionally high capacity for scalability. It has above average training capacity but average upskilling potential and average estimated $CO_2$ reduction potential. It also only has a 5.0% skills shortage.

Alternative fuels (sales of £384m) is a highly scalable sub-sector, although at present it is growing slower than the UK and holds a share of the UK market in line with the LEP average for the sector. The sub-sector has a 15.6% skills shortage (LEP average is 8.6%) and although it has an extremely high upskilling potential, it has a below average training capacity. For a sub-sector that has a large market and an average estimated $CO_2$ reduction potential, this is a significant area for improvement.

Photovoltaic (sales of £296m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (2.7% vs 1.3% LEP average). It scores reasonably highly for scalability, has very high potential for upskilling the workforce but low training capacity, additionally it is a large market with high $CO_2$ reduction potential within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.3%, compared with the LEP average of 8.6%.

Water & Waste Water Treatment (sales of £212) has a slower growth than the UK average, but significantly larger UK market share than the LEP average and average scalability. Current training capacity is very good, but upskilling potential is below average, it is a large sub-sector offering average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.2%.

[9] kMatrix Leicester and Leicestershire LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

Waste Management (sales of £188m) is a notable sub-sector, being a large market, with slower growth than the UK average, but being significantly above average market size (2.5% vs 1.3% LEP average). It is average for scalability but is above average in terms of $CO_2$ reduction potential. Although it has very good upskilling potential, it has low average training capacity, but a skills shortage of only 5.7%.

Energy Management (sales of £61m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (1.5% vs 1.3% LEP average). It has slightly below average scalability, slightly below average training capacity, below average upskilling of the workforce potential and average $CO_2$ reduction potential. Although growing strongly, it displays an 18.8% skills shortage compared with the regional average of 8.6%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £122m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (0.6% vs 1.3% LEP average). It has good scalability, below average current training capacity, very low potential for upskilling the workforce, below above average $CO_2$ reduction potential and has a 17.0% skills shortage compared with the LEP average of 8.6%.

## Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size.
- Contaminated Land has a significantly stronger growth than the UK average, but below average market size.
- Hydro has a significantly stronger growth than the UK average, but below average market size.
- Waste Management has weaker growth than the UK, but significantly above average market size.
- Photovoltaic has weaker growth than the UK, but significantly above average market size.
- Water & Waste Water Treatment has weaker growth than the UK, but significantly above average market size.
- Biomass has weaker growth than the UK, but significantly above average market size.
- Building Technologies has weaker growth than the UK, but slightly above average market size.
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size.
- Air Pollution has a stronger growth than the UK average, but slightly below average market size.

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size.
- Wave & Tidal has weaker growth than the UK and below average market size.

### Scalability of sub-sectors

Scalability of the sub-sectors within the Leicester and Leicestershire LEP is variable and when combined with GVA, strengths include:

- Building Technologies with very high Scalability and very high GVA (stronger position than the MEH average)

- Wind with high GVA and High Scalability (stronger position than the MEH average)
- Alternative Fuels with high GVA and High Scalability
- Photovoltaic with high GVA and high Scalability (stronger position than the MEH average)
- Renewable Energy General Consultancy with high Scalability but small GVA
- Environmental Monitoring, Instrumentation and Analysis high Scalability but small GVA (stronger position than the MEH average)
- Biomass with good GVA and good Scalability (stronger position than the MEH average)
- Geothermal with good GVA and good Scalability (stronger position than the MEH average)

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Leicester and Leicestershire LEP being 8.6% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 34.5% (MEH 35.7%)
- Power Distribution Engineers 30.1% (MEH 29.8%)
- Technicians 22.0% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.2% (MEH 6.3%)
- Specialist or Consultant 3.2% (MEH 3.3%)
- Administrative Workers 2.1% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Leicester and Leicestershire LEP at Level 1:

- Low Carbon 10.6% (MEH 10.5%)
- Renewable Energy 6.9% (MEH 7.0%)
- Environmental 10.3% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:

- Low Carbon 45.2% (MEH 47.3%)
- Renewable Energy 27.6% (MEH 27.9%)
- Environmental 34.2% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 34.9% (MEH 33.7%)
- Renewable Energy 27.4% (MEH 27.1%)
- Environmental 32.6% (MEH 32.6%)

Technicians:

- Low Carbon 27.9% (MEH 27.9%)
- Renewable Energy 17.3% (MEH 17.3%)
- Environmental 22.8% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Leicester and Leicestershire LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.5% (MEH 20.3%)
- Best-case scenario for the UK economy is 58.1% (MEH 57.9%)

Estimated growth in employees for the Leicester and Leicestershire LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 86.0% (MEH 86.0%)
- Best-case scenario for the UK economy is 342.7% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:

- Low Carbon 19.0% (MEH 17.0%)
- Renewable Energy 34.9% (MEH 34.5%)
- Environmental 27.5% (MEH 27.0%)

Power Distribution Engineers:

- Low Carbon 26.6% (MEH 28.1%)
- Renewable Energy 35.4% (MEH 35.1%)
- Environmental 29.2% (MEH 29.3%)

Technicians:

- Low Carbon 33.2% (MEH 34.2%)
- Renewable Energy 45.4% (MEH 45.9%)
- Environmental 39.5% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Leicester and Leicestershire LEP include:

- Noise & Vibration Control with very good training capacity and strong potential for upskilling
- Building Technologies with good training capacity and upskilling potential
- Water and Waste Water Treatment with good training capacity

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Leicester and Leicestershire LEP include:

- Alternative Fuels with very high upskilling potential but lower training capacity
- Photovoltaic with strong potential for upskilling but poor training capacity
- Waste Management strong potential for upskilling but poor training capacity

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction.

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and high estimated potential impact
- Building Technologies with large market and average estimated potential impact
- Alternative Fuels with large market and average estimated potential impact
- Photovoltaic with above average estimated potential impact and good market

Sub-sectors with a low estimated $CO_2$ reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market

# 8. Marches LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Marches LEP was worth £1.8bn to the Marches LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 700 businesses that employed over 12,500 people in the sector in 2019/20[10].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Building Technologies is the largest sub-sector in terms of value of sales (£286m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It grew at a slower rate than the UK but has a slightly above average market size compared with the regional average and demonstrates a below average capacity for scalability. It has below average training capacity but average upskilling potential, but extremely high estimated $CO_2$ reduction potential, as high as Wind. It also only has a 5.0% skills shortage, compared with an average for the sector of 8.8%.

Wind (£286m) is the second largest sub-sector but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the Marches LEP and is not easily scalable. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.3% skills shortage compared with the LEP average of 8.8%, has high training capacity but low potential for upskilling the workforce. Significantly, it is the joint-highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Alternative fuels (sales of £260m) has reasonable scalability, although at present it is growing in line with the UK and holds a share of the UK market below the LEP average for the sector. The sub-sector has a 17.4% skills shortage (LEP average is 8.8%) and has both an extremely high upskilling potential and training capacity. It also represents a large market and high estimated $CO_2$ reduction potential.

Photovoltaic (sales of £191m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (1.7% vs 0.8% LEP average). It scores below average for scalability but has very high potential for upskilling the workforce and good training capacity, although the $CO_2$ reduction potential is below average within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.1%, compared with the LEP average of 8.8%.

Biomass (sales of £136m) has a slower growth than the UK average, but larger UK market share than the LEP average and has average scalability. Current training capacity is average, upskilling potential

[10] kMatrix Marches LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

is average, it is a large sub-sector offering above average $CO_2$ reduction potential. At 8.2%, the skills gap is slightly lower than the 8.8% LEP average.

Water & Waste Water Treatment (sales of £134m) has a slower growth than the UK average, but larger UK market share than the LEP average and has average scalability. Current training capacity is slightly above average, but upskilling potential is extremely high, it is a large sub-sector offering average $CO_2$ reduction potential. As with most of the other large sub-sectors, the skills gap is low, at only 4.1%.

Waste Management (sales of £113) is a notable sub-sector, being a large market, with growth similar to the UK average, but being significantly above average market size (1.5% vs 0.8% LEP average). It has average scalability and average $CO_2$ reduction potential. Although it has good upskilling potential, it has slightly below average training capacity and only has a skills shortage of 5.8%.

Energy Management (sales of £37m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (0.9% vs 0.8% LEP average). It has slightly below average scalability, average training capacity, average upskilling of the workforce potential and below average $CO_2$ reduction potential. Although growing strongly, it displays an 18.5% skills shortage compared with the regional average of 8.8%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £76m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (0.4% vs 0.8% LEP average). It is above average for scalability, average potential for upskilling the workforce but very low current training capacity, and an above average $CO_2$ reduction potential and has a 17.5% skills shortage compared with the LEP average of 8.7%.

## Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Renewable Energy General Consultancy has slightly stronger growth than the UK average and slightly larger than average market size
- Contaminated Land has a stronger growth than the UK average, but below average market size.
- Hydro has a stronger growth than the UK average, but below average market size.
- Energy Management has stronger growth than the UK average and slightly above average market size.
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size.
- Air Pollution has a stronger growth than the UK average, but below average market size.
- Waste Management has similar growth to the UK, but above average market size
  Photovoltaic has weaker growth than the UK, but significantly above average market size.
- Water & Waste Water Treatment has weaker growth than the UK, but slightly above average market size.
- Biomass has weaker growth than the UK, but slightly above average market size.

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size.
- Wave & Tidal has weaker growth than the UK and below average market size.

## Scalability of sub-sectors

Scalability of the sub-sectors within the Marches LEP is variable and when combined with GVA, strengths include:

- Environmental Monitoring with small GVA but very high scalability (stronger position than the MEH average)
- Marine Pollution Control with small GVA but very high scalability (stronger position than the MEH average)
- Geothermal with good GVA and high Scalability (stronger position than the MEH average)
- Biomass with good GVA and medium Scalability (stronger position than the MEH average)
- Waste Management with good GVA and medium Scalability (stronger position than the MEH average)

## Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Marches LEP being 8.8% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 39.0% (MEH 35.7%)
- Power Distribution Engineers 30.0% (MEH 29.8%)
- Technicians 23.3% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.3% (MEH 6.3%)
- Specialist or Consultant 3.2% (MEH 3.3%)
- Administrative Workers 2.2% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Marches LEP at Level 1:

- Low Carbon 10.8% (MEH 10.5%)
- Renewable Energy 6.9% (MEH 7.0%)
- Environmental 10.5% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:

- Low Carbon 55.9% (MEH 47.3%)
- Renewable Energy 28.1% (MEH 27.9%)
- Environmental 35.5% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 34.0% (MEH 33.7%)
- Renewable Energy 27.2% (MEH 27.1%)
- Environmental 32.8% (MEH 32.6%)

Technicians:

- Low Carbon 31.1% (MEH 27.9%)
- Renewable Energy 16.9% (MEH 17.3%)
- Environmental 23.1% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Marches LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.1% (MEH 20.3%)
- Best-case scenario for the UK economy is 57.5% (MEH 57.9%)

Estimated growth in employees for the Marches LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 85.7% (MEH 86.0%)
- Best-case scenario for the UK economy is 342.1% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:

- Low Carbon 9.3% (MEH 17.0%)
- Renewable Energy 34.9% (MEH 34.5%)
- Environmental 25.9% (MEH 27.0%)

Power Distribution Engineers:

- Low Carbon 28.6% (MEH 28.1%)
- Renewable Energy 35.3% (MEH 35.1%)
- Environmental 28.1% (MEH 29.3%)

Technicians:

- Low Carbon 29.2% (MEH 34.2%)
- Renewable Energy 46.5% (MEH 45.9%)
- Environmental 40.0% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Marches LEP include:

- Alternative Fuels with good training capacity and strong potential for upskilling
- Photovoltaic with good training capacity and strong potential for upskilling
- Hydro with good training capacity and strong potential for upskilling
- Water and Waste Water Treatment with average training capacity but good upskilling potential
- Marine Pollution Control with good training capacity and strong potential for upskilling

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Marches LEP include:

- Alternative Fuel Vehicle with below average training capacity but good potential for upskilling
- Geothermal with very low training capacity but average upskilling potential

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction.

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and very high estimated potential impact
- Building Technologies with large market and very high estimated potential impact
- Alternative Fuels with large market and high estimated potential impact
- Photovoltaic with high estimated potential impact and smaller market

Sub-sectors with a low estimated $CO_2$ reduction impact include:

- Environmental Consultancy with low estimated potential impact and small market
- Additional Energy Sources with low estimated potential impact and small market

# 9. Stoke and Staffordshire LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Stoke and Staffordshire LEP was worth £2.7bn to the Stoke and Staffordshire LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 900 businesses that employed over 18,500 people in the sector in 2019/20[11].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£441m) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the Stoke and Staffordshire LEP and is not easily scalable. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.4% skills shortage compared with the LEP average of 8.6%, has average training capacity but high potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Building Technologies (sales of £417m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates a high capacity for scalability. It has average training capacity, average upskilling potential, but relatively high estimated $CO_2$ reduction potential. It also only has a 4.9% skills shortage.

Alternative fuels (sales of £381m) has low scalability and is growing in line with the UK and holds a share of the UK market in line with the regional average for the sector. The sub-sector has a 15.8% skills shortage (LEP average is 8.6%), good high upskilling potential supported by good training capacity. It is a sub-sector that has a large market and high estimated $CO_2$ reduction potential.

Photovoltaic (sales of £284m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (2.5% vs 1.2% LEP average). It scores reasonably highly for scalability, has very high potential for upskilling the workforce and good training capacity, it is a large market, but with relatively low $CO_2$ reduction potential within this LEP. Where it is outstanding, is the lack of skills gaps, with a shortage of only 3.4%, compared with the LEP average of 8.6%.

[11] kMatrix Stoke and Staffordshire LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

Water & Waste Water Treatment (sales of £203m) has a similar growth to the UK average, but significantly larger UK market share than the LEP average and extremely high scalability. Current training capacity is very low, yet the upskilling potential is average, with average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.1%.

Waste Management (sales of £177m) is a notable sub-sector, being a large market, with similar growth to the UK average, but being significantly above average market size (2.4% vs 1.2% LEP average). It has average scalability and is below average in terms of $CO_2$ reduction potential. It has good training capacity and low upskilling potential and only has a skills shortage of 5.9%.

Energy Management (sales of £55m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (1.4% vs 1.2% LEP average). It has below average scalability, slightly above average training capacity, but above average upskilling of the workforce potential and average $CO_2$ reduction potential. Although growing strongly, it displays an 18.0% skills shortage compared with the regional average of 8.6%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £119m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (0.6% vs 1.2% LEP average). It has good scalability, good current training capacity, good potential for upskilling the workforce, but slightly below average $CO_2$ reduction potential and has a 17.3% skills shortage compared with the LEP average of 8.6%.

## Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size
- Renewable Energy General Consultancy has a slightly higher growth than the UK average, and above average market size
- Contaminated Land has a significantly stronger growth than the UK average, but below average market size
- Hydro has a significantly stronger growth than the UK average, but below average market size
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size
- Air Pollution has a stronger growth than the UK average, but below average market size
- Waste Management has a similar growth to the UK, but significantly above average market size
- Photovoltaic has weaker growth than the UK, but significantly above average market size
- Water & Waste Water Treatment has a similar growth to the UK, but significantly above average market size.
- Building Technologies has a similar growth to the UK, but significantly above average market size
- Biomass has weaker growth than the UK, but significantly above average market size

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size
- Wave & Tidal has weaker growth than the UK and below average market size

### Scalability of sub-sectors

Scalability of the sub-sectors within the Stoke and Staffordshire LEP is variable and when combined with GVA, strengths include:

- Water and Waste Water Treatment with good GVA and high Scalability (stronger position than the MEH average)
- Building Technologies with high GVA and high Scalability (stronger position than the MEH average)
- Photovoltaic with high GVA and high Scalability (stronger position than the MEH average)
- Geothermal with good GVA and good Scalability (stronger position than the MEH average)
- Alternative Fuel Vehicle with good GVA and good Scalability (stronger position than the MEH average)
- Waste Management with good GVA and good Scalability (stronger position than the MEH average)
- Recovery and Recycling with reasonable GVA and good Scalability (stronger position than the MEH average)

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Stoke and Staffordshire LEP being 8.6% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 35.3% (MEH 35.7%)
- Power Distribution Engineers 30.3% (MEH 29.8%)
- Technicians 22.1% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.3% (MEH 6.3%)
- Specialist or Consultant 3.2% (MEH 3.3%)
- Administrative Workers 2.1% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Stoke and Staffordshire LEP at Level 1:

- Low Carbon 10.2% (MEH 10.5%)
- Renewable Energy 7.1% (MEH 7.0%)
- Environmental 10.1% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:

- Low Carbon 45.3% (MEH 47.3%)
- Renewable Energy 28.6% (MEH 27.9%)
- Environmental 34.8% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 33.4% (MEH 33.7%)
- Renewable Energy 28.4% (MEH 27.1%)
- Environmental 31.8% (MEH 32.6%)

Technicians:

- Low Carbon 27.2% (MEH 27.9%)
- Renewable Energy 17.6% (MEH 17.3%)
- Environmental 22.9% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Stoke and Staffordshire LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.5% (MEH 20.3%)
- Best-case scenario for the UK economy is 57.9% (MEH 57.9%)

Estimated growth in employees for the Stoke and Staffordshire LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 85.9% (MEH 86.0%)
- Best-case scenario for the UK economy is 341.9% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:

- Low Carbon 19.2% (MEH 17.0%)
- Renewable Energy 34.2% (MEH 34.5%)
- Environmental 26.6% (MEH 27.0%)

Power Distribution Engineers:

- Low Carbon 28.9% (MEH 28.1%)
- Renewable Energy 33.2% (MEH 35.1%)
- Environmental 30.0% (MEH 29.3%)

Technicians:

- Low Carbon 34.6% (MEH 34.2%)
- Renewable Energy 45.4% (MEH 45.9%)
- Environmental 39.1% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Stoke and Staffordshire LEP include:

- Geothermal with good training capacity and strong potential for upskilling
- Recovery and Recycling with very good training capacity and good upskilling potential
- Alternative Fuels with good training capacity and good upskilling potential
- Alternative Fuels Vehicle with good training capacity and average upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Stoke and Staffordshire LEP include:

- Water and Waste Water Treatment with poor training capacity but average potential for upskilling
- Additional Energy Sources with poor training capacity but average potential for upskilling

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction

Sub-sectors with a high estimated $CO_2$ reduction impact include:

- Wind with large market and very high estimated potential impact
- Building Technologies with large market and high estimated potential impact
- Alternative Fuels with large market and high estimated potential impact

Sub-sectors with a low estimated $CO_2$ reduction impact include:
- Environmental Consultancy with low estimated potential impact and small market

## 10. Worcestershire LEP Executive Summary

The Low Carbon Environmental Goods and Services sector across the Worcestershire LEP was worth £1.5bn to the Worcestershire LEP's economy in 2019/20, as indicated by the value of sales in the sector. These sales were generated by over 700 businesses that employed over 11,000 people in the sector in 2019/20[12].

By combining multiple metrics, including the size of sub-sectors, both in terms of value of sales and as a percentage of the UK total; growth compared with the UK average; relative ease of scalability; skills shortages present in 2019/20; the current training capacity and potential for upskilling of the workforce and the potential of each sub-sector to impact on $CO_2$ reduction, the ingredients needed for strong sector growth can be assessed.

Wind is the largest sub-sector in terms of value of sales (£251m) but has not grown above the UK average growth rate and does not hold a larger share of the UK market than would be expected for the Worcestershire LEP, however, it is highly scalable. Although it is not an area of high growth within the region, the Wind sub-sector is on track regarding jobs, having only a 5.3% skills shortage compared with the LEP average of 8.8%, has low training capacity but low potential for upskilling the workforce. Significantly, it is the highest scoring sub-sector in terms of both Sales and estimated $CO_2$ reduction potential. Although the Wind sub-sector does not feature heavily in the summary findings within the Executive Summary, generally not being at one extreme or the other for most metrics (with the exception of value of sales and $CO_2$ reduction potential), it is steadily progressing and considered to be getting things right.

Building Technologies (sales of £225m) is an important sub-sector, particularly considering circa 30% of UK carbon emissions are due to domestic heating, the insulative aspects of the sub-sector have the potential to play an important role. It is the second largest sub-sector and although it grew at a slower rate than the UK, it has an above average market size compared with the regional average and demonstrates a high capacity for scalability. It has a below average training capacity, average upskilling potential and reasonably good, estimated $CO_2$ reduction potential. It also only has a 5.2% skills shortage.

Alternative fuels (sales of £219m) is a highly scalable sub-sector, although at present it is growing slightly slower than the UK and holds a share of the UK market in line with the regional average for the sector. The sub-sector has a 15.3% skills shortage (LEP average is 8.8%) and although it has an average upskilling potential, it has a below average training capacity. It has a large market and reasonably good estimated $CO_2$ reduction potential.

Photovoltaic (sales of £152m) is a sub-sector with slower growth than the UK average, but significantly larger UK market share than the regional average (1.4% vs 0.7% LEP average). It scores below average for scalability, has very high potential for upskilling the workforce and but below average training capacity, it is a large market with but below average $CO_2$ reduction potential within this LEP. It has a lower shortage of only 3.5% when compared with the LEP average of 8.8%.

[12] kMatrix Worcestershire LEP Low Carbon Environmental Goods and Services Sector Market Snapshot, 2021

Water & Waste Water Treatment (sales of £114m) has a slightly slower growth than the UK average, but significantly larger UK market share than the LEP average and average scalability. Current training capacity is average, while upskilling potential is good and offers average $CO_2$ reduction potential. As with the other large sub-sectors, the skills gap is low, at only 4.1%.

Waste Management (sales of £103m) is a notable sub-sector, being a large market, with a similar growth to the UK average, but being significantly above average market size (1.4% vs 0.7% LEP average). It is not particularly scalable and is below average in terms of $CO_2$ reduction potential. Although it has good upskilling potential, it has below average training capacity and only has a skills shortage of 5.9%.

Energy Management (sales of £32m) has both a stronger growth rate than the UK average and a larger UK market share than would be expected (0.8% vs 0.7% LEP average). It has average scalability, below average training capacity, but also below average upskilling of the workforce potential and below average $CO_2$ reduction potential. Although growing strongly, it displays an 18.3% skills shortage compared with the regional average of 8.8%.

Geothermal is one of the top 11 sub-sectors within the MEH region (sales of £67m) but has both weaker growth than the UK average and a significantly smaller share of the UK market than expected (0.3% vs 0.7% LEP average). It is average for scalability, has average current training capacity, average potential for upskilling the workforce, but high $CO_2$ reduction potential and has a 16.9% skills shortage compared with the LEP average of 8.8%.

## Summary Findings

### Sub-sector Strengths and Weaknesses

Sub-sector strengths include:

- Energy Management has stronger growth than the UK and above average market size
- Renewable Energy General Consultancy has a slightly strong growth than the UK average and above average market size
- Waste Management has slightly weaker growth than the UK, but significantly above average market size
- Photovoltaic has weaker growth than the UK, but significantly above average market size
- Water & Waste Water Treatment has slightly weaker growth than the UK, but significantly above average market size
- Biomass has weaker growth than the UK, but significantly above average market size
- Building Technologies has weaker growth than the UK, but above average market size
- Contaminated Land has a stronger growth than the UK average, but below average market size
- Hydro has a stronger growth than the UK average, but below average market size
- Alternative Fuel Vehicle has a stronger growth than the UK average, but below average market size
- Air Pollution has a stronger growth than the UK average, but slightly below average market size

Sub-Sector weaknesses include:

- Geothermal has weaker growth than the UK and below average market size
- Wave & Tidal has weaker growth than the UK and below average market size

### Scalability of sub-sectors

Scalability of the sub-sectors within the Worcestershire LEP is variable and when combined with GVA, strengths include:

- Building Technologies with high GVA and high Scalability (stronger position than the MEH average)
- Wind with high GVA and high Scalability (stronger position than the MEH average)
- Alternative Fuels with high GVA and high Scalability
- Marine Pollution Control with high Scalability but small GVA (stronger position than the MEH average)

### Skills Shortages

The skills and employment estimates are based on the Standard Occupational Classification (SOC).

*Sector shortages*

The skills shortage for the LCEGS sector for the Worcestershire LEP being 8.8% (MEH 8.7%).

Significant skills gaps are present within some SOC's with large numbers of employees:

- Production Engineers 34.4% (MEH 35.7%)
- Power Distribution Engineers 29.8% (MEH 29.8%)
- Technicians 21.9% (MEH 22.2%)

Insignificant skills gaps are present within some SOC's with large numbers of employees:

- General Semi-skilled Worker 2.1% (MEH 2.1%)
- Maintenance Engineer 6.2% (MEH 6.3%)
- Specialist or Consultant 3.2% (MEH 3.3%)
- Administrative Workers 2.1% (MEH 2.1%)

*Level 1 shortages*

Skills shortages within the Worcestershire LEP at Level 1:

- Low Carbon 10.5% (MEH 10.5%)
- Renewable Energy 7.3% (MEH 7.0%)
- Environmental 10.4% (MEH 10.3%)

Skills gaps vary between SOC's for different Level 1 and Level 2 sub-sectors, for example:

Production Engineers:

- Low Carbon 43.2% (MEH 47.3%)
- Renewable Energy 28.3% (MEH 27.9%)
- Environmental 34.3% (MEH 34.9%)

Power Distribution Engineers:

- Low Carbon 32.8% (MEH 33.7%)
- Renewable Energy 27.7% (MEH 27.1%)
- Environmental 31.9% (MEH 32.6%)

Technicians:

- Low Carbon 27.2% (MEH 27.9%)
- Renewable Energy 17.4% (MEH 17.3%)
- Environmental 22.5% (22.9%)

### Estimated Employment Requirements to Reach Net Zero by 2030 and 2050

Estimated growth in employees for the Worcestershire LEP to reach zero by 2030:

- Worst-case scenario for the UK economy is 20.1% (MEH 20.3%)
- Best-case scenario for the UK economy is 57.6% (MEH 57.9%)

Estimated growth in employees for the Worcestershire LEP to reach zero by 2050:

- Worst-case scenario for the UK economy is 85.7% (MEH 86.0%)
- Best-case scenario for the UK economy is 341.5% (MEH 342.4%)

Growth requirements for SOC's vary between Level 1 and Level 2 subsectors, for example the estimated growth requirement to reach net zero, best-case scenario for the UK economy:

Production Engineers:

- Low Carbon 20.1% (MEH 17.0%)
- Renewable Energy 34.1% (MEH 34.5%)
- Environmental 28.0% (MEH 27.0%)

Power Distribution Engineers:

- Low Carbon 29.1% (MEH 28.1%)
- Renewable Energy 33.1% (MEH 35.1%)
- Environmental 30.2% (MEH 29.3%)

Technicians:

- Low Carbon 34.1% (MEH 34.2%)
- Renewable Energy 46.2% (MEH 45.9%)
- Environmental 40.0% (MEH 39.6%)

### Current Training Provision and Potential for Upskilling the Workforce

Strengths in the current training provision compared with the potential upskilling of the workforce in the Worcestershire LEP include:

- Renewable Energy General Consultancy has good training capacity and strong upskilling potential
- Noise & Vibration Control has very good training capacity and average upskilling potential
- Photovoltaic with good training capacity and average potential for upskilling
- Water and Waste Water Treatment with average good training capacity and good upskilling potential

Weaknesses in the current training provision compared with the potential upskilling of the workforce in the Worcestershire LEP include:

- Marine Pollution Control with poor training capacity and but good potential for upskilling
- Carbon Capture and Storage with poor training capacity and but good potential for upskilling
- Waste Management with below average training capacity but good potential for upskilling

### Potential of Level 2 sub-sectors to impact on $CO_2$ reduction

Sub-sectors with a high estimated CO2 reduction impact include:

- Wind with large market and high estimated potential impact
- Building Technologies with large market and good estimated potential impact
- Alternative Fuels with large market and good estimated potential impact
- Photovoltaic with good estimated potential impact and good market

Sub-sectors with a low estimated CO2 reduction impact include:

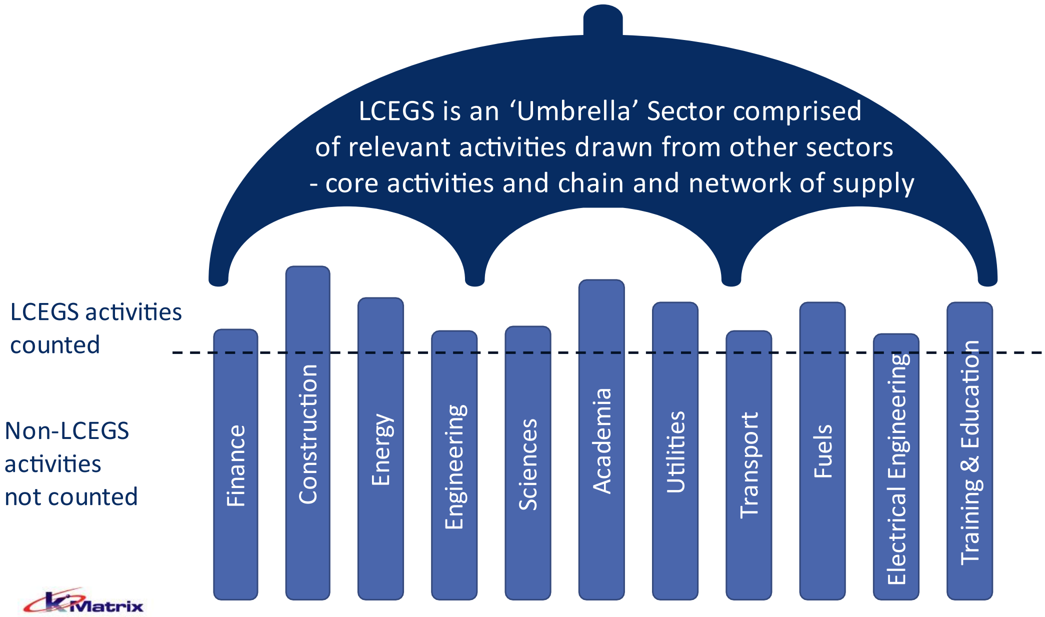
- Environmental Consultancy with low estimated potential impact and small market
- Recovery and Recycling with low estimated potential impact, but good market
- Energy Management with low estimated potential impact and reasonable market

# Introduction to the Low Carbon and Environmental Goods and Services Sector

This section includes a summary definition of the Low Carbon Environmental Goods Services sector, followed by a detailed description of the dataset that sits behind the data analysis and detail regarding the types of activities measured.

## Summary Sector Definition

The Low Carbon Environmental Goods and Services sector comprises products and services from across the economy, which actively enable a shift towards a green economy. The LCEGS sector is considered an 'umbrella' or horizontal sector, crossing many other traditional sectors, counting products and services from those sectors which can reduce carbon emissions and improve the environment:



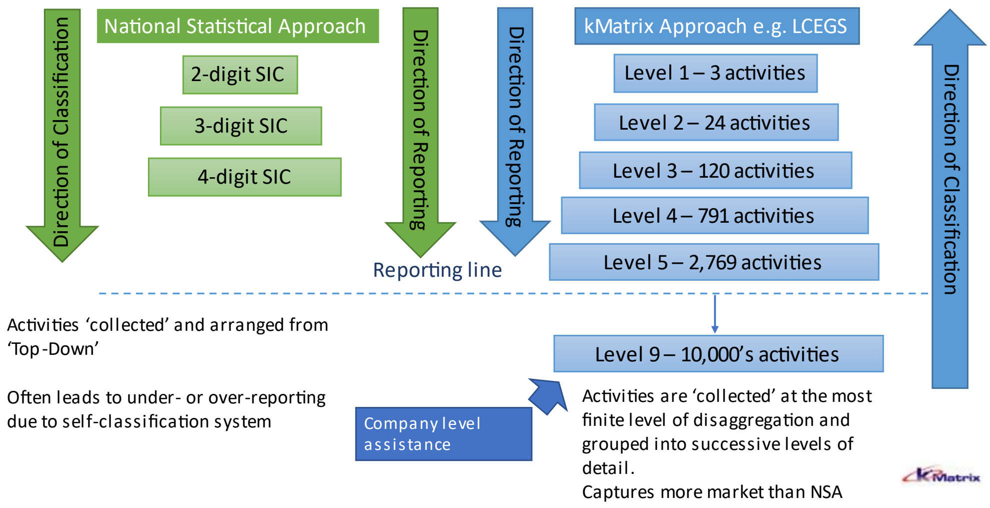

The sector is comprised of both core elements and those in the chain and network of supply, without whom the sector could not function.

## Brief Methodology

kMatrix uses a unique data triangulation methodology, developed with Professor R. Jaikumar of Harvard University over 35 years ago.

The process was originally developed to look at individual companies, providing evidenced data for development. As such, sectors are classified from the 'bottom up', collecting activities from the most finite level of granulation and grouping them into successive levels of detail.

### Example of bottom-up approach to classification – LCEGS Taxonomy




This is quite different to the National Statistical Approach, which classifies from the 'top down', with a company choosing their 2-digit code, then successive codes down through the classification system. The SIC system is very good as a national accounting system, but it struggles with hard to measure sectors such LCEGS. Here, the kMatrix system of data collection, which triangulates transactional data from many sources, up to 70,000 for this study, provides the flexibility of a definition tailored to the sector being studied. Although the sector is classified from the bottom up, the sector taxonomy is reported from the sector level down, through a series of levels of complexity.

This process has measured the LCEGS sector for the Greater London Authority and the UK for over a decade. kMatrix also collaborate with academic colleagues in several fields, co-authoring academic papers, which are peer-reviewed and published in academic journals including Nature, Climate Services and the Lancet.

Example sectors the process has been applied to, where evidence is available in the public domain via clients publishing reports or published peer-reviewed academic journals include:

- Cyber Security: https://www.eunity-project.eu/m/filer_public/4b/62/4b6262dc-3bca-4145-a84b-b514049156ce/1_lsec_japan_eunity_ecso_wg2_cima_seldeslachts_ulrich_20190124881.pdf
- Low carbon environmental goods and services sector: https://www.london.gov.uk/sites/default/files/london_low_carbon_market_snapshot_-_2019.pdf and https://www.enterprisem3.org.uk/sites/default/files/2020-02/Hampshire-LCEGS-Market-Report-2015-16-to-2017-18-2nd-Draft_0.pdf
- The green Economy: https://rgs-ibg.onlinelibrary.wiley.com/doi/pdf/10.1002/geo2.36 and https://www.nature.com/articles/s41599-019-0329-3
- Adaptation economy: https://www.nature.com/articles/nclimate2944
- Carbon Finance: https://www.nature.com/articles/nclimate1492?draft=marketing
- Weather and Climate: https://advances.sciencemag.org/content/3/5/e1602632.full
- Climate Services: https://www.sciencedirect.com/science/article/pii/S2405880719300494?via%3Dihub

# The LCEGS Dataset

The data used in this report is based upon the work and methodology used by kMatrix to provide datasets on the UK's Low Carbon Environmental Goods and Services (LCEGS) sector for UK Government reported annually by the Department for Business, Innovation and Skills (BIS) from 2008/09 to 2011/12 and further reported every 3 years for the UK and London by the Greater London Authority to 2017/18, representing a continuous annual timeseries of the LCEGS sector for over a decade.

The LCEGS sector has been defined using 24 sub-sectors (or Level 2 markets) grouped into three broad categories (or Level 1 markets) - Environmental, Renewable Energy and Low Carbon. The addition of the Renewable Energy and Low Carbon groupings illustrates the evolution of the current LCEGS sector definition from its original Environmental roots and reflects developments in the market as sectors across the economy evolve to address the environmental challenges that they and the world is facing.

The dataset measures the core activities of the sector along with those in the supply chain, without whom the LCEGS sector could not operate. For example, the Wind sector includes those companies which develop the systems integration software enabling the power generated though turbines to be integrated into the National Grid, but it also includes those companies installing and maintaining the system integration software itself. Another example would be the collection of household waste, where the collection, processing and recycling of the waste is included, along with those companies who design, manufacture and supply the waste collection equipment itself.

The time series provides 11 years of sales, companies and employment data and 10 years of growth rates for the LCEGS sector as a whole. The data is then broken down into three Level 1 sub-sectors (Low Carbon, Environmental and Renewable Energy) and then those three sub-sectors are split into further Level 2 sub-sectors to provide greater resolution and insights for analysing the data.

The kMatrix methodology is based around the production of a taxonomy, similar to that used for biological taxonomic ranking, with similar products and services being grouped together. As an illustration (provided below), the LCEGS sector is broken down into three Level 1 sub-sectors, one of which is Renewable Energy, which is in turn broken down into seven Level 2 sub-sectors, one of which is Wind that is then broken down into a further three Level 3 sub-sectors and so on:

**Sector**

Low Carbon and Environmental Goods and Services

**Level 1 sub-sectors**

Low Carbon

Environmental

Renewable Energy

**Level 2 sub-sectors**

Low Carbon:

- Additional Energy Sources
- Alternative Fuel Vehicle
- Alternative Fuels
- Building Technologies
- Carbon Capture & Storage
- Carbon Finance
- Energy Management
- Nuclear Power

Environmental:

- Air Pollution
- Contaminated Land Reclamation & Remediation
- Environmental Consultancy & Related Services
- Environmental Monitoring Instrumentation & Analysis
- Marine Pollution Control
- Noise & Vibration Control
- Recovery & Recycling
- Waste Management
- Water & Waste Water Treatment

Renewable Energy:

- Wind
- Geothermal
- Photovoltaic
- Biomass
- Hydro (Hydroelectric)
- Renewable consultancy
- Wave & Tidal

Although the taxonomy is reported and organised 'top down' as it goes from the sector to Level 1, to Level 2 etc., the data is gathered and organised from the 'bottom up'. The data is collected at the most finite disaggregation and then 'rolled up' to form the different levels. The current LCEGS sector definition, used in this report, includes 2,800 product and service activities at level 5 that are derived from sector supply chain activities (componentry & assemblies) and value chain activities (R&D, Supply & Training).

A glossary of economic activities included for each sub-sector of LCEGS is included as Appendix 1, a brief explanation of the LCEGS methodology as Appendix 2 and then a high-level comparison of data and methodologies between the Office of National Statistics (ONS) Environmental Goods and Services sector and LCEGS is presented in Appendix 3.

# What is actually measured?

The dataset measures the core activities of the sector along with enabling activities in the supply chain, without whom the LCEGS sector could not operate. For example, the Wind sector includes those companies which develop the systems integration software enabling the power generated though turbines to be integrated into the National Grid, but it also includes those companies installing and maintaining the system integration software itself. Another example would be the collection of household waste, where the collection, processing and recycling of the waste is included, along with those companies who design, manufacture and supply the waste collection equipment itself.

The purpose of the LCEGS dataset in its original form, is to provide a standardized measure of the complete LCEGS sector. The whole dataset includes those 'core' activities, which would immediately come to mind such as the manufacture of a wind turbine blade, but also the less obvious 'non-core' activities, such as the manufacture of the bearings for the turbine. Non-Core activities can be considered "enablers" for the Core sector and are often companies who have diversified from existing strengths into new sector activities. Non-core activities also include mid-stream activities, R&D, finance, training and other activities which cross multiple other sectors, but without which the LCEGS sector could not function.

**Total LCEGS Market** = **Core LCEGS Market** + **Non-Core Enabling LCEGS Market**

The definition of a sector is almost always open to debate, in terms of what is, or is not, considered to be part of the sector in question. The kMatrix methodology includes all aspects that can realistically be considered part of the LCEGS sector. The taxonomy is built and interrogated by assembling activities and services which are then grouped together under different headings. From the example taxonomy in figure 1, seven level 2 activities are grouped together to form the Renewable Energy Level 1 heading. There are five levels in total, comprising approximately 2,800 activities.

The following picture illustrates the two distinctive sides of the LCEGS market, the smaller Core market and the much larger Non-Core market, provided by enablers within the LCEGS sector. Examples give a simplistic overview of the types and differences between activities, with the Core side including activities such as manufacture of wind turbines and building insulation materials. The enablers providing Non-Core activities are offering components that are non-sector specific, such as valves, gaskets, drive chains etc., alongside financial, legal and administration activities.

In essence, Core activities are those products and services which are generally LCEGS specific, whereas the Non-Core activities, provided by enablers are products and services which are not LCEGS specific and can generally be found in other sectors. Core activities are considered vertical in nature, being sector specific, whereas Non-Core activities are horizontal, crossing other sectors. Both sides of the market are required for the sector to function.

**Core LCEGS Activities (example activities)**

- Wind Turbine & Tower Manufacture & Supply
- Design and Installation of Large Geothermal Systems
- Manufacture of Building Insulation Materials
- Production & Supply of Methane
- Production & Supply of Auto Gas (aka LPG, LP Gas, Propane)
- All Other Core Activities

**Total LCEGS Market = Core + Non-Core / Enabling Activities**

**Non-Core/Enabling LCEGS Activities (example activities)**

- Manufacture and Supply of Non-Sector Specific Components (e.g. Standard Valves, Drive Chains etc)
- Financial, Legal and Administration Services
- Training Services
- Design and Supply of Precision Engineering Machine Control Software
- Production and Supply of Operations Journals, Information Packs etc
- All Other
- Non-Core/Enabling Activities

The economic values provided are Sales values, which are transactions made within the sector, which have an economic footprint that can be measured. For companies which service multiple sectors, for example in finance, the sales value is the value of sales that company has in the LCEGS market, it does not include finance sales into other sectors.

## The complexity of determining the potential contribution to net zero

Understanding the potential contribution of each sub-sector to net zero targets (2030 & 2050) is important in identifying where priority markets lie for reaching those goals. Although the LCEGS sector entails low carbon and renewable energy technologies, they are not all equal in terms of their own carbon footprints or their ability to impact on net zero targets.

When assessing the potential for each Level 2 sub-sector to contribute to net-zero, there are a number of factors to consider, including:

- The embodied carbon of the product, is the carbon footprint to make the product, increasing throughout the supply chain and across geographies
- The carbon emissions during transportation, installation and commissioning of a product
- The emissions produced during operational lifetime of a product
- The emissions produced during decommissioning, dismantling and recovery of materials
- The localisation and format of the chain and network of supply

Academia varies with regards to estimating the carbon footprint of products, for example, photovoltaic systems produce almost zero carbon emissions when in operation, however carbon emissions are produced during the manufacturing process. Life cycle analysis of renewable energy systems, quantifying the carbon emissions of photovoltaic systems, report a wide range of carbon emissions factors. This is partly due to different methodologies and associated assumptions or design considerations[13].

There are also variations in carbon emissions within industries, for example, the life cycle carbon emissions from both on- and off-shore wind are very low at 15 and 12 $gCO_2eq/kWh$[14]. The carbon emissions reduction of wind power cannot be solely estimated as being the value of carbon emissions displaced from coal- or gas-fired generation. Wind power is not carbon-zero, because greenhouse gases are emitted during installation, maintenance and decommissioning and wind power will not replace all forms of conventional generation equally and will depend on the operation of the whole grid. Variations in cost and carbon emissions estimates are affected by assumptions made in the calculation itself and the differences in wind turbine designs, manufacturing and installations locations, maintenance and disposal.

When the embodied emissions for each material involved in manufacture, transport to site and installation are quantified, higher rated turbines had greater embodied carbon emissions, with a 3 MW turbine incorporating 1046 tCO2eq, compared with only 58 tCO2eq for an 80 kW turbine. However, the greater electricity output from the larger turbines offset these emissions more quickly, with a recovery of 6 days for a 3.4 MW turbine, compared with 354 days for a 100kW one.[15] Renewable energy generation is clean when compared with conventional energy generation methods, however the cost, payback time, size of power generation, construction time, resource capacity, characteristics of resource, external funding and other factors have affected how quickly different technologies have been adopted and the subsequent relative sizes of each market. The size of each market, corresponding to the carbon emissions displaced from conventional energy generation methods differs, as does the lifecycle carbon footprint of each renewable energy sub-sector.

Building Technologies are hugely important in terms of decarbonisation potential. An estimated 37% of UK emissions are attributable to heat[16], so building technologies such as roof and wall insulation, insulative glazing and other technologies designed to prevent the loss of heat can indirectly lead to reduction in energy usage and carbon emissions. As for the renewable energy sub-sector, the reductions in carbon emissions through a decrease in energy consumption, must offset

[13] Nian, V (2016) Impacts of changing design considerations on the life cycle carbon emissions of solar photovoltaic systems. J. Applied Energy 183 (2016) 1471-1487 https://doi.org/10.1016/j.apenergy.2016.08.176

[14] https://www.climatexchange.org.uk/media/1459/life_cycle_wind_-_executive_summary_.pdf

[15] Smoucha EA, Fitzpatrick K, Buckingham S, Knox OGG (2016) Life Cycle Analysis of the Embodied Carbon Emissions from 14 Wind Turbines with Rated Powers between 50 Kw and 3.4 Mw. J Fundam Renewable Energy Appl 6: 211. doi:10.4172/20904541.1000211

[16] Clean Growth – Transforming Heating, Overview of Current Evidence, Department for Business, Energy and Industrial Strategy, December 2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766109/decarbonising-heating.pdf

any embodied carbon and those emissions associated with transportation, installation, those produced during usage, maintenance and ‘end-of-life’ recovery of materials.

In terms of sub-sectors within the Environmental Level 1 sub-sector, the carbon footprint of Water and Waste Water Treatment may be decreased dramatically by the usage of forward osmosis membrane-technology during the next generation of waste water treatment[17].

Within Waste Management, the collection, re-use and recycling of the 2 Mt of waste electrical and electronic equipment (WEEE) produced in the UK each year has become a foremost environmental issue in the UK[18], where efforts are undergoing to increase the levels and efficiency of recycling. Each sub-sector within the LCEGS sector has the potential to play their part in the move towards net zero, but as indicated above, the relative impact they may have varies both between sub-sectors and between academics attempting to quantify current levels.

For this study, the level 2 sub-sectors have been allocated a relative impact score of “Low”, “Medium” and “High”, based upon estimates including the activities present in the area being studied, the localization of chains and networks and supply and the technologies both being used and produced.

[17] Environ. Sci.: Water Res. Technol., 2020, 6, 153

[18] Clarke C, Williams I, Turner D, (2019) Evaluating the carbon footprint of WEE management in the UK. J Resources, Conservation & Recycling 141 (2019) 465-473

# Clusters in the Midlands Energy Hub Region

## Clusters Overview

Cluster theory was first introduced by Professor Michael Porter of Harvard University in 1990[19] and since then has been the focus of government programs around the world. The theory was rooted in the idea that similar companies within a close geographical area could affect competition by increasing the productivity of the companies in the cluster, drive the direction and pace of innovation and stimulate the formation of new businesses, strengthening the cluster. Close proximity allowed significant business-to-business interaction in a time before broadband, virtual meetings and smart planning systems. Businesses who were physically close together, forming the critical mass needed for a cluster, could develop more rapidly together. In some cases, centralization of research and development could assist in knowledge transfer.

The original cluster theory was overhauled by Professor Porter in 1998[20], as the internet progressed, global markets were increasingly open and increased the speed of transportation and communications. Despite this evolution in business that should theoretically dimmish locational advantage, clusters were still found to be important, such as electronics in Japan or automotive around Birmingham.

As per Porter's definition, clusters are geographic concentrations of interconnected companies and institutions in a particular field. They can include linked industries and incorporate companies within the chains and networks of supply, who provide components, machinery, services and specialized infrastructure. They can also extend downstream to channels and customers and laterally to manufacturers of complementary products and further to companies in industries related by skills, technologies and common inputs. They may also include governmental and other institutions including universities, think tanks, vocational training providers, trade associations, standards-setting agencies and any other organisations that provide training, education, information, research and technical support.

The purpose of a cluster is to provide both competition and cooperation, with rivals competing for customers and cooperating with vertical companies involved in related industries and local institutions. Competition and cooperation within a cluster occur on different dimensions, between different entities. Competition is vital for a cluster to succeed.

A cluster of independent and informally linked companies (and institutions) offers an organizational form of a value chain with the advantages of efficiency, effectiveness and flexibility.

Competition depends on productivity, which rests on how companies compete, based on the methods used, use of advanced technology and unique products and services on offer. All industries have the capacity to develop and use advanced technology and all can be knowledge intensive.

Twenty years later, clusters are still visible and useful, despite the increase in global markets, leaps forward in broadband, access to information and communications development, however there is a

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[19] Porter, M.E. (1990). *The Competitive Advantage of Nations*. New York: The Free Press. 1–857 pgs

[20] Porter, M.E. (1998). *Clusters and the New Economincs of Competition*. Harvard Business Review, Magaxine November-December 1998

need to distinguish between physical and virtual clusters. Inter-company planning systems such as Distribution Requirements Planning (DRP) and adaptive manufacturing processes mean that physical location has become less important.

Technology compression has further reduced the need for clustering across all sectors and services. Using the manufacturing process of desktop PC's as an example, where twenty years ago there were up to 35 value-added suppliers in the chain of supply, today there are approximately 6, with this number still reducing as more value-added steps in the manufacturing process take place at a single point. Therefore proximity of chains and networks of supply have less influence on the manufacturing process and less need for clustering.

Many clusters are now virtual, especially within the Cyber Security sector, where clusters are international. Other high-tech or R&D-based industries also have well established virtual clusters.

Within manufacturing, the benefits of physical clusters tend to be regarding the cost of logistics in terms of reduced miles travelled. With regard to this study, arguably the reduction in the miles that components for a product travel can reduce the embodied carbon within that final product. Clustering of companies within the chain and network of supply ***can*** potentially reduce the embodied carbon of products, but the potential for this should be viewed along with the constraints of the overall embodied carbon: a low mileage chain of supply will not negate a carbon-intensive production process or the use of high-carbon components.

There are clear benefits to clusters, however some clusters are the legacy of traditional regional strengths, as opposed to offering ***significant*** commercial advantage today. Bandwidth of communications, enabling smart planning systems provide high levels of business coordination, reducing dependency on physical clusters. Social aspects of clusters cannot be underestimated, like finds like and clustered companies gain value in face-to-face contact and personal relationships. However, the industrial adoption of social media has accelerated the development of business-to-business relationships and although in its early days, has shown significant increase in senior level inter-relationships on a B2B basis, offering new routes to business development. Social media is to some degree offering the potential to build relationships away from the need for face-to-face interaction, contributing to the overall business efficiency, reducing cold-calling and offering a convenient way to make connections. However, it also important to acknowledge that the changing business environment means that a focus solely on physical clusters does not necessarily provide the highest return on investment and the virtual clusters that run in parallel are just as important.

Overall, clusters remain important for driving a sector and provide an efficient method for applying interventions that can offer a high return, however not all clusters are equal in terms of benefit. Competition within a location is strongly influenced by the quality of the local business environment, with 18 ingredients identified likely to increase the success of the cluster including the research and teaching available, specialisms within the locality, start-up accelerators, population density and others[21].

For the purpose of this study, we provide details of clusters who offer significant impact to the sector and are present in the Midlands Energy Hub region and LEPs.Although all of the LEPs within the Midlands Energy Hub region have companies involved in all sub-sectors (with the exceptions of Nuclear and Carbon Finance), there are clusters to some degree in all LEPs. Here we provide details of the high performing physical clusters that may be supported by virtual ones within each LEP.

[21] Bright, A (2017). *Ingredients for Climate Innovation Clusters: The UK Case*. Climate Innovation Insights, Series 1.4, Accelerating the Evolution of Climate Innovation Clusters

## Black Country LEP

The Black Country LEP is logistically well positioned for both end of chain and mid chain provision of components and products.

There are strong clusters in advanced manufacturing, low carbon building technologies, transport technologies and environmental technologies. These specialisms are particularly relevant to the Building Technologies, Alternative Fuels, Alternative Fuel Vehicles and Water and Waste Water Treatment, Level 2 sub-sectors.

The Black Country has one of the highest densities of automotive businesses, which supply 20% of the UK's Aerospace output and is very strong in construction. These three sectors are heavily intertwined with LCEGS sub-sectors including Wind, Alternative Fuels and Building Technologies.

## Coventry and Warwickshire LEP

Coventry is very strong in advanced manufacturing, centred around automotive, rail, aerospace and motorsport, with a particular strength in R&D, electric vehicles and hybrid powertrain technology, light-weighting of materials and products and software.

Clusters are present in energy and low carbon technologies, including clean air technologies, energy storage and sustainable building technologies.

Coventry and Warwickshire LEP also have a cluster for low carbon powertrain and hosts multiple R&D sites for Jaguar Land Rover, alongside Aston Martin, BMW and others. Locally there is a strong and growing supply chain cluster of powertrain design and engineering services, within the Alternative Fuel Vehicle and Alternative Fuels sub-sectors.

There is also a strong cluster surround zero emissions vehicles, heavily invested by Geely London Taxis, focussed on manufacturing and engineering a range of zero emissions vehicles.

Clusters are supported by innovation and R&D facilities such as the Manufacturing Technology Centre and the two Universities, Coventry University and the University of Warwick.

## D2N2 LEP

The D2N2 LEP has strong clusters involved in the aerospace, automotive and rail sectors, with strong local chains and networks of supply supporting large companies including Toyota, Rolls Royce and Bombardier near Derby.

There is strong innovation and manufacturing cluster contributing to the Alternative Fuel Vehicles sub-sector, specifically electric vehicles and alternative fuel systems. These capabilities are also potentially relevant to other sub-sectors.

There is also an additional cluster that specialises in digital smart control systems relevant to Energy Management and another specialising in drive chain systems for offshore wind turbines within the Wind Level 2 sub-sector.

These clusters are supported by three universities (Nottingham, Nottingham Trent and Derby), six science parks and approximately fifteen innovation centers/incubators.

## Greater Birmingham and Solihull LEP

Birmingham has a major advantage for the development and maintenance of clusters, having a large number of university graduates who stay in the LEP after graduation, to take advantage of the affordable cost of living, opportunities and thriving digital tech economy.
There is a large Automotive cluster across Birmingham, partly through historic manufacturing and partly due to the fertile business environment encouraging the cluster to succeed.

In terms of LCEGS clusters, they include intelligent buildings, relevant to Energy Management, wind energy drive control componentry, relevant to Wind and artificial intelligence for energy management.

Clusters are supported by the three universities, University of Birmingham, Birmingham City University and Aston University.

## Greater Lincolnshire LEP

The South Humber Bank has two major oil refineries, part of the chemicals sector, the mid-chain elements of which are relevant to Alternative Fuels, Hydrogen systems and potentially Biomass processes. This forms a cluster with other companies in a number of sectors, which includes petrochemicals refining, pigments and colours, chemicals, paint and coatings and surface treatments with the University of Hull having a particular interest and specialism in the chemicals sector. Relevant capabilities here are within the Alternative Fuels Level 2 sub-sector.

The Greater Lincolnshire LEP does contain clusters around the agricultural and food processing and manufacturing sectors, along the eastern ports, which have the potential to diversify into Biomass, but as yet do not offer significant input into the Biomass sub-sector.

The Humber Estuary has clusters for both engineering and manufacturing. Advanced engineering companies within the engineering cluster are relevant to hydrogen systems, currently working at the componentry level. Steel and advanced materials companies offer Low Carbon materials in Scunthorpe. Glass manufacturing in Goole is relevant to the Building Technologies sub-sector.

In addition, Hull's Engineering Centre and the team Humber Marine Alliance, support companies in off-shore marine engineering, including some aspects of Wind.

There is a further offshore wind and renewables cluster in the Humber, with particular offshore renewables strength in terms of localised networks of supply and localised support.

## Leicester and Leicestershire LEP

Leicester is well known as being the heart of the Textiles industry and although most of the textile cluster in Leicester is for traditional textiles, there are some advanced fabrics being developed for building technologies.

The emerging digital start-up cluster is involved with componentry and digital control systems for Energy Management and Hydrogen (and other gasses) systems.

## Marches LEP

Clusters within the Marches LEP are predominately in the Automotive, Aerospace, Defence, Rail and Agricultural sectors. These clusters provide some mid-chain componentry for LCEGS Level 2 sub-sectors including Alternative Fuel Vehicles (electric vehicle componentry) and Biomass (systems components).
There is an established advanced manufacturing and engineering cluster within the Marches LEP, with new companies specialising in producing and servicing next generation componentry with the use of high-tech, energy efficient materials and processes. Engineering clusters within the Marches LEP tend to be more virtual than in other LEP's within the Midlands Energy Hub region.

Localised clusters within the Marches LEP are experiencing deep shifts in manufacturing, caused by automation of manufacturing processes, increased use of artificial intelligence and increased decarbonisation.

Recruitment is an ongoing issue across the Marches, especially in digital and technical skills, partly attributable to the high cost of living.

## Stoke and Staffordshire LEP

Across the LEP there is a 250-year history in ceramics and advanced materials, more recently a strong applied materials cluster of approximately 300 companies, which apply to the Low Carbon sub-sector.

Clusters are present in the advanced engineering and advanced manufacturing sectors, with a bias towards automotive and aerospace, supporting large companies such as Jaguar Land Rover, JCB and Michelin.

Energy generation forms a significant cluster in the Stoke and Staffordshire LEP. Although traditionally coal-based, small clusters have moved towards geothermal, anaerobic digestion, biomass and energy from waste, with the potential for growth in these areas, complimented by the strong agricultural economy within the Stoke and Staffordshire LEP. There is also evidence of a small cluster involved in wind power systems.

## Worcester and Worcestershire LEP

The strong Cyber Security cluster in the Worcester and Worcestershire LEP can trace its roots back to 1942, when Winston Churchill ordered fledgling telecommunications research to move to the relative safety of the Malvern Hills.

Many cyber security and other digital tech companies within the cluster are spinouts from the privatised arm of the Defence Evaluation and Research Agency, QinetiQ. Although clusters within the LEP are predominantly in the digital tech sector, they do include advanced systems and control for the Energy Management Level 2 sub-sector.

Due to the nature of the clusters in the Worcester and Worcestershire LEP, there are also strong virtual clusters, some of which are international.

# 1. Growth Forecast for Net Zero in 2030 and 2050 for the Midlands Energy Hub's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Midlands Energy Hub Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 1.1 MEH's LCEGS Strengths and Weaknesses

In this section of the report MEH's LCEGS performance is compared with the UK as a whole. The MEH LCEGS sector was worth £26.6bn in 2019/20 and accounts for 12.1% of the UK total.

Figure 1 shows how the MEH Region compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the MEH/UK sales proportionality factor, which was calculated for each sub-sector by dividing the MEH sales a percentage of the UK, by 12.1 %. This proportionality factor demonstrates where the MEH holds a larger or smaller share of the UK market than would be expected, where 1 = 12.1% of the UK market; above 1 = larger than 12.1% share and below 1 = smaller than 12.1% share.

The y-axis represents the growth rate of the MEH's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the MEH by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 1 clearly illustrates the strong growth of the three relatively small sub-sectors, Contaminated Land and Reclamation, Nuclear Power and Hydroelectric. The growth rate for nuclear is exceptionally high at 29%, compared with the UK average of 2.9%, this is due to recent unusual activity within the sub-sector and is not expected to be continue through future years. Contaminated Land and Reclamation and Hydroelectric should be considered strengths, because they are close to the expected size of market (11.3% for Contaminated Land and 10.6% for Hydro), but are growing significantly stronger than the UK average.

**Figure 1: MEH/UK Sales proportionality factor vs. MEH/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

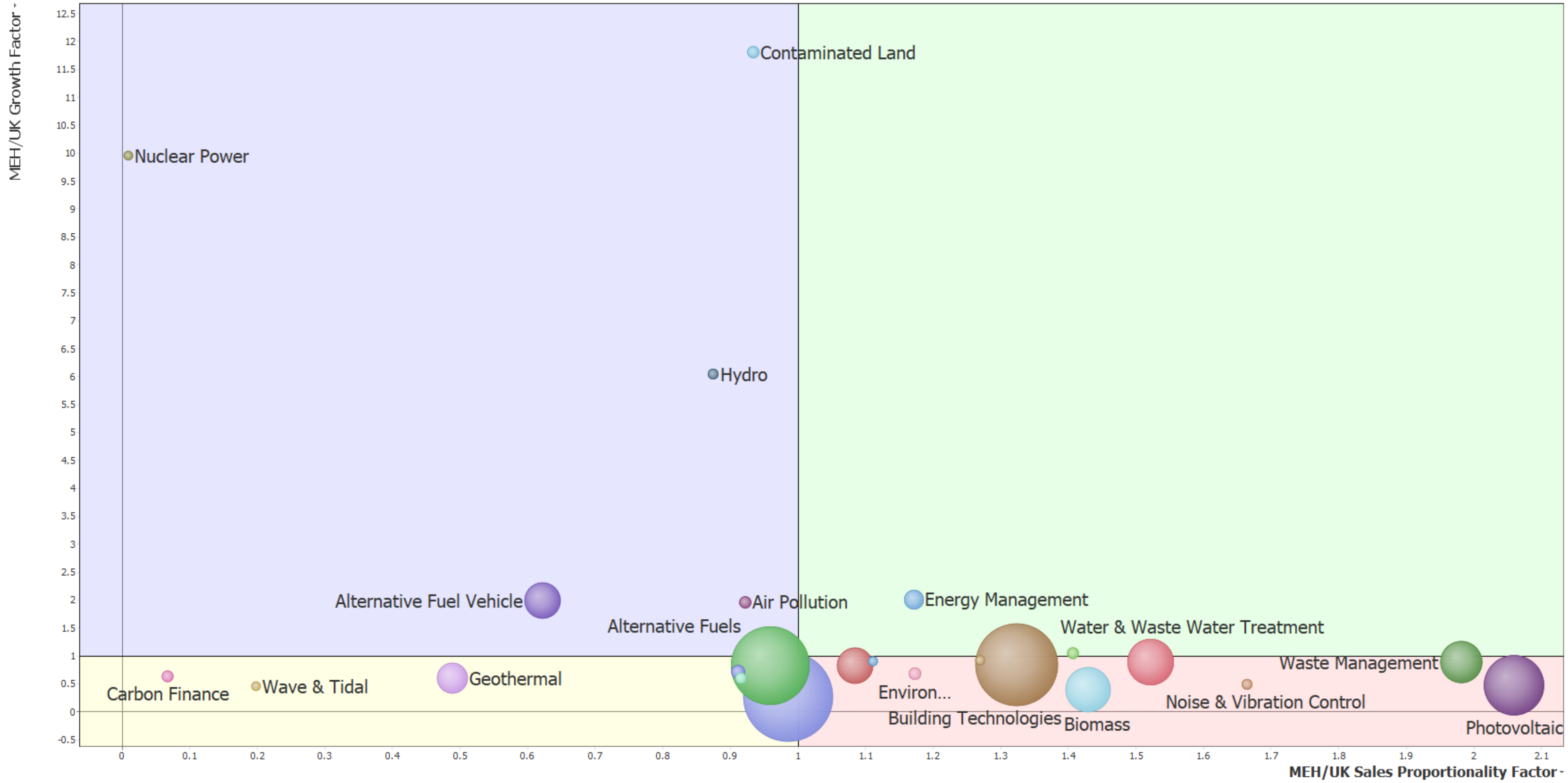
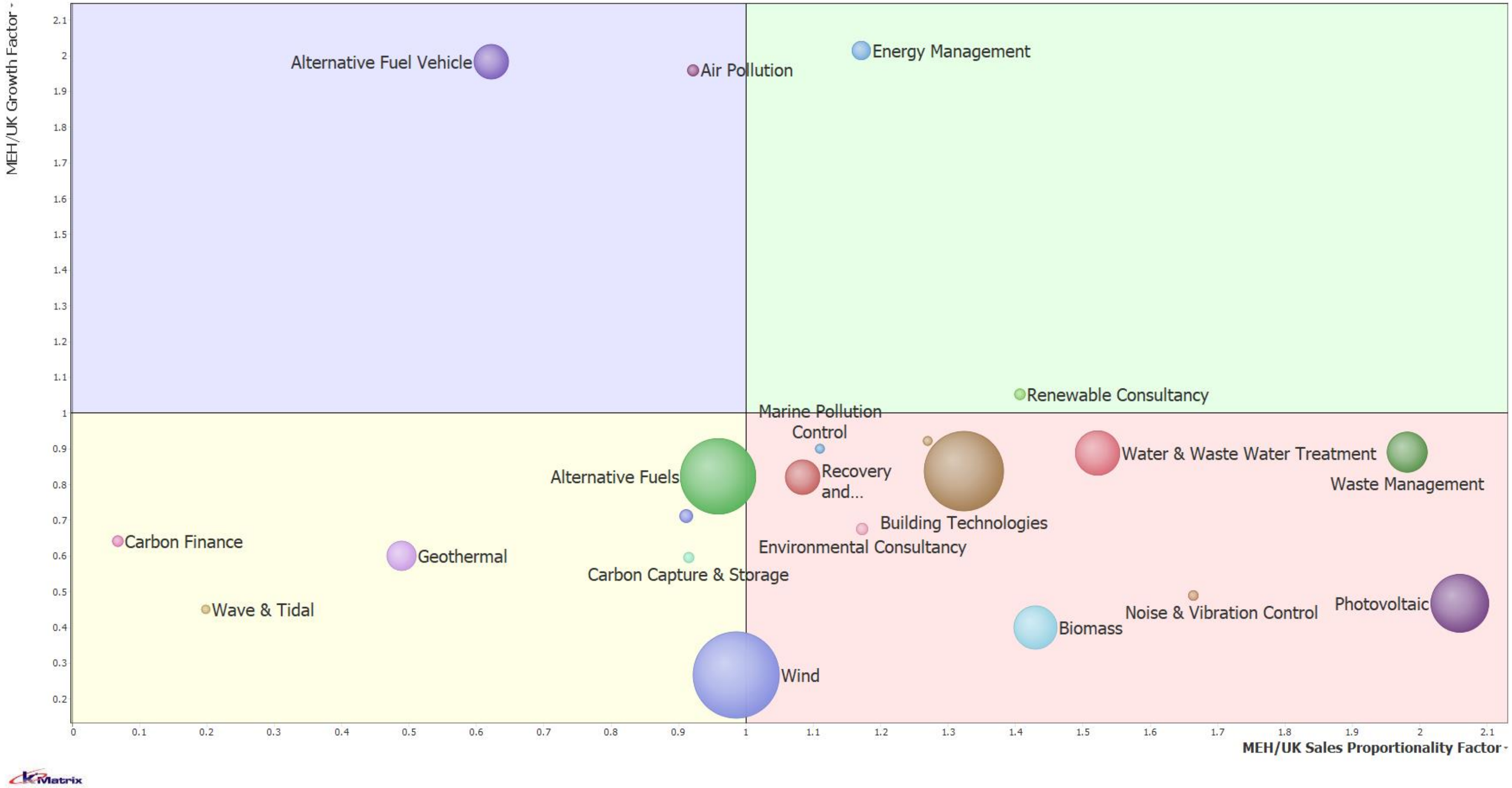


Figure 2 provides the same information as figure 1, but with Contaminated Land, Nuclear and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management and Renewable Consultancy have the ideal characteristics of above UK average growth and above MEH average size. Those in the lower right hand quadrant (red) hold a larger UK share than the average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Water & Waste Water Treatment, Waste Management and Biomass set these sub-sector apart as being strengths. Those in the lower left (yellow) quadrant such as Geothermal, Wave & tidal and Carbon Finance can be considered relative weaknesses.

**Figure 2: MEH/UK Sales proportionality factor vs. MEH/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m – Excluding Contaminated Land, Nuclear and Hydro**



## 1.2 Scalability of MEH's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 3 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the MEH, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Alternative Fuels sub-sector has a good combination of size and scalability, while Renewable Energy General Consultancy may be small in terms of market but is highly scalable. Biomass is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Midlands Energy Market Snapshot report.

**Figure 3: MEH Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

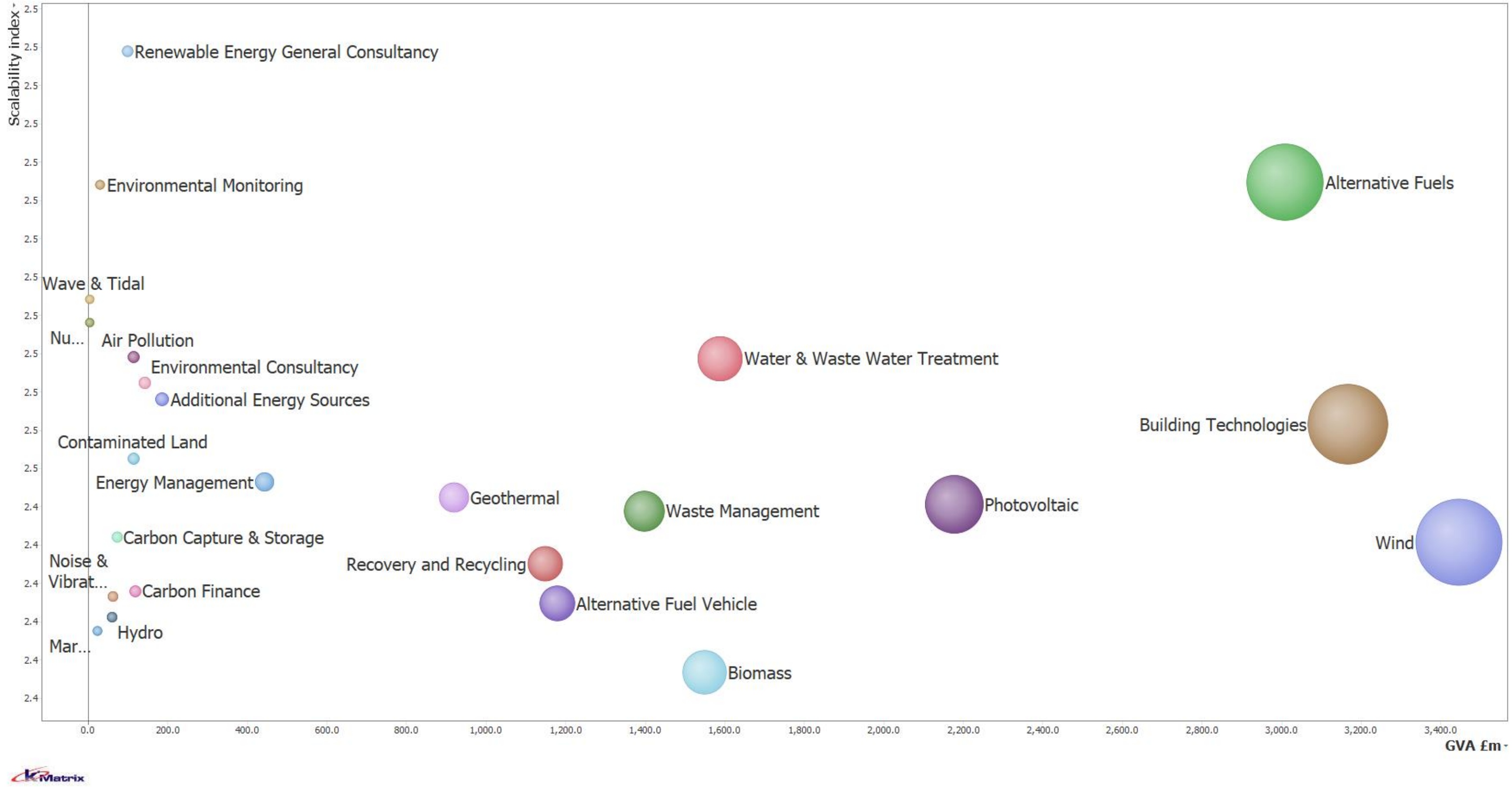
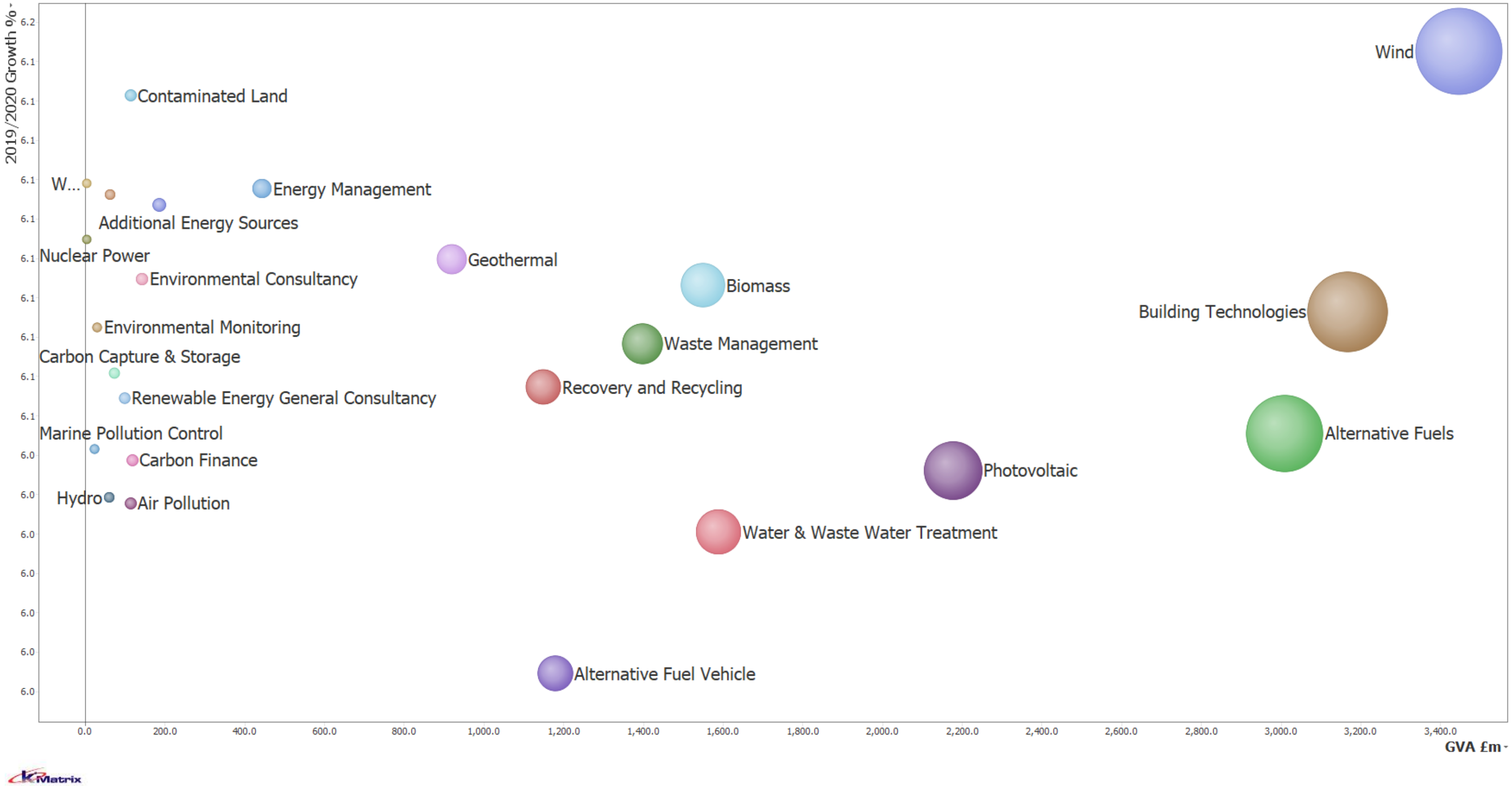


Figure 4 shows the same principle as Figure 3, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies the most favourable position of large size and high growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 4: MEH 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

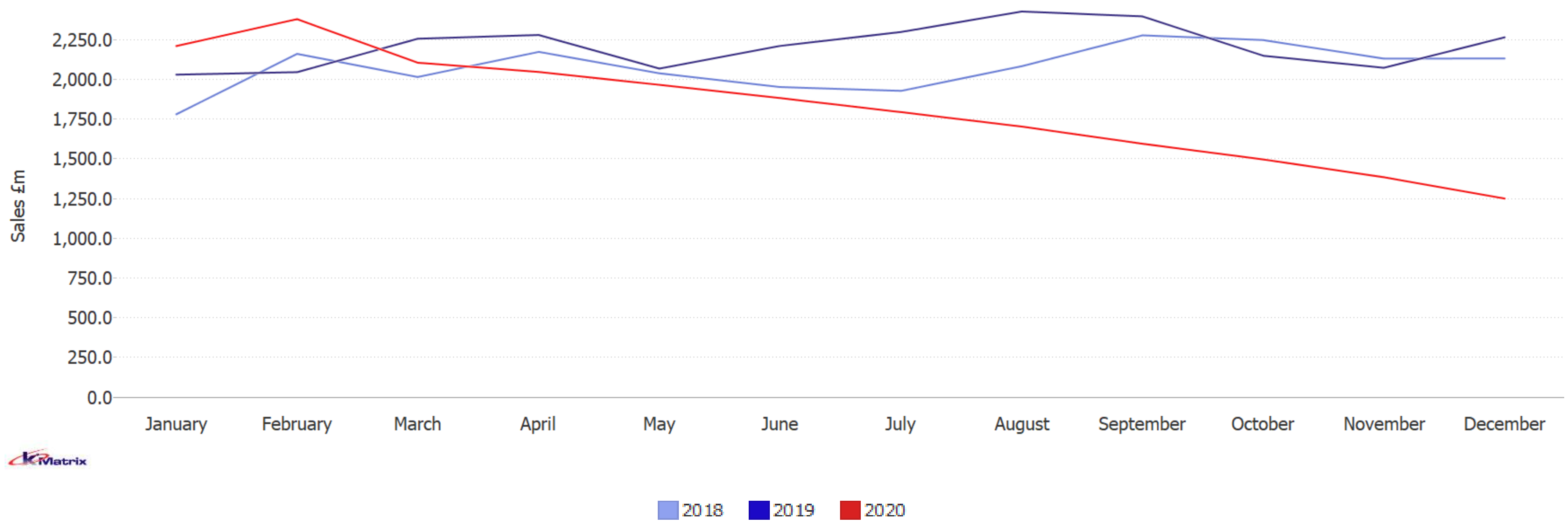


## 1.3 MEH's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 5, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the MEH region. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 5: MEH LCEGS Sales, by month 2018, 2019 and 2020**

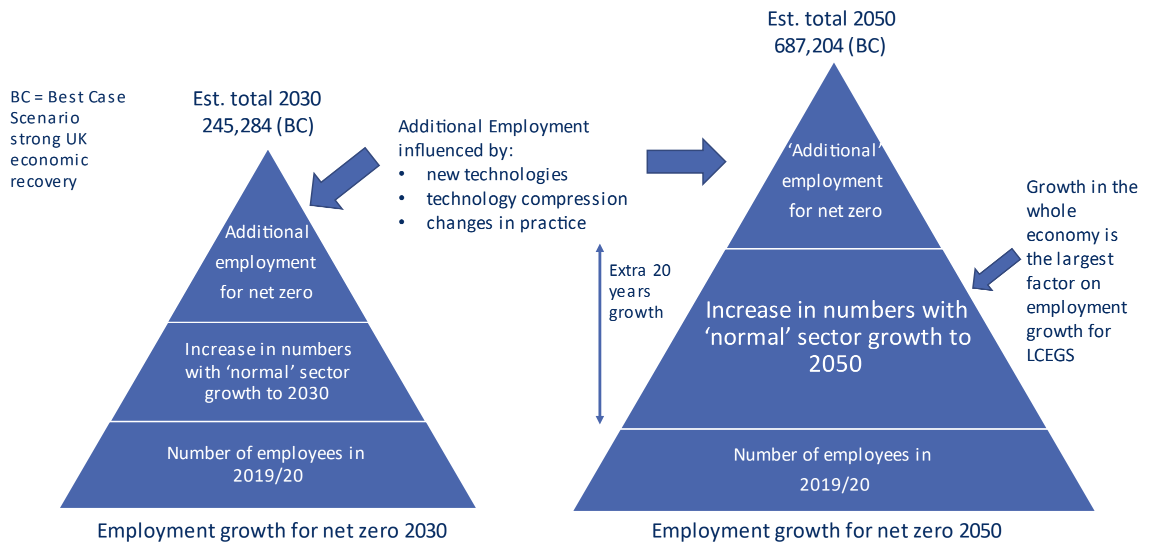


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| ***Timeline for Net Zero*** | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 1 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the MEH.

Shortage of employees refers to the employees that are 'imported' from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not 'fit'. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as "Other Employees" because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to 'heads equivalent', so although for example, there are 37 Educators listed, with a shortage of 12, making a total of 49 in the region, this will equate to over 400 people providing 'pockets' of time, to equate to 49 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 1: MEH LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 4,707 | 1,045 | 22.2% | 5,753 | 6,149 | 6.9% | 8,070 | 40.3% | 9,526 | 65.6% | 22,613 | 293.1% |
| **Snr Management SME** | 11,148 | 1,124 | 10.1% | 12,272 | 14,583 | 18.8% | 19,115 | 55.8% | 22,548 | 83.7% | 53,480 | 335.8% |
| **Supervisory** | 11,640 | 1,199 | 10.3% | 12,839 | 15,190 | 18.3% | 19,999 | 55.8% | 23,544 | 83.4% | 56,022 | 336.3% |
| **Middle / Junior Management** | 11,260 | 1,157 | 10.3% | 12,416 | 14,713 | 18.5% | 19,309 | 55.5% | 22,706 | 82.9% | 54,155 | 336.2% |
| **Designer / Developer** | 1,620 | 426 | 26.3% | 2,046 | 2,116 | 3.4% | 2,779 | 35.8% | 3,268 | 59.7% | 7,787 | 280.6% |
| **Clerical** | 5,875 | 12 | 0.2% | 5,887 | 7,696 | 30.7% | 10,083 | 71.3% | 11,882 | 101.8% | 28,180 | 378.7% |
| **Self Employed** | 1,578 | 204 | 12.9% | 1,782 | 2,062 | 15.8% | 2,707 | 51.9% | 3,182 | 78.6% | 7,582 | 325.5% |
| **Advisor or Agent** | 1,084 | 180 | 16.6% | 1,264 | 1,420 | 12.4% | 1,862 | 47.4% | 2,188 | 73.2% | 5,210 | 312.4% |
| **Educator** | 37 | 12 | 31.2% | 49 | 49 | 0.1% | 64 | 31.3% | 75 | 54.1% | 180 | 266.9% |
| **Specialist or Consultant** | 6,279 | 207 | 3.3% | 6,485 | 8,223 | 26.8% | 10,760 | 65.9% | 12,693 | 95.7% | 30,162 | 365.1% |
| **Editor** | 184 | 7 | 3.8% | 191 | 240 | 26.0% | 315 | 65.4% | 371 | 94.8% | 881 | 362.2% |
| **Industrial Researchers** | 1,800 | 140 | 7.8% | 1,940 | 2,348 | 21.0% | 3,089 | 59.3% | 3,644 | 87.8% | 8,658 | 346.3% |
| **Scientist** | 818 | 274 | 33.5% | 1,091 | 1,067 | -2.3% | 1,403 | 28.5% | 1,649 | 51.1% | 3,927 | 259.8% |
| **Maintenance Engineer** | 12,916 | 815 | 6.3% | 13,731 | 16,877 | 22.9% | 22,182 | 61.6% | 26,150 | 90.4% | 62,049 | 351.9% |
| **Civil Engineer** | 898 | 240 | 26.8% | 1,138 | 1,173 | 3.1% | 1,539 | 35.2% | 1,817 | 59.6% | 4,317 | 279.3% |
| **Production Engineer** | 2,330 | 831 | 35.7% | 3,161 | 3,041 | -3.8% | 4,006 | 26.7% | 4,703 | 48.8% | 11,210 | 254.6% |
| **Power distribution Engineer** | 5,906 | 1,758 | 29.8% | 7,664 | 7,728 | 0.8% | 10,129 | 32.2% | 11,955 | 56.0% | 28,393 | 270.5% |
| **Construction Engineer** | 1,347 | 229 | 17.0% | 1,577 | 1,764 | 11.9% | 2,313 | 46.7% | 2,723 | 72.7% | 6,481 | 311.0% |
| **Sales Exec** | 6,013 | 687 | 11.4% | 6,700 | 7,865 | 17.4% | 10,310 | 53.9% | 12,154 | 81.4% | 28,920 | 331.6% |
| **Marketing Personnel** | 6,028 | 673 | 11.2% | 6,702 | 7,882 | 17.6% | 10,362 | 54.6% | 12,165 | 81.5% | 28,997 | 332.7% |
| **General Semi Skilled Worker** | 12,514 | 262 | 2.1% | 12,776 | 16,346 | 27.9% | 21,504 | 68.3% | 25,301 | 98.0% | 60,171 | 371.0% |
| **General Labour** | 15,123 | 0 | 0.0% | 15,123 | 19,790 | 30.9% | 25,965 | 71.7% | 30,545 | 102.0% | 72,748 | 381.0% |
| **Other Employees** | 15,218 | 770 | 5.1% | 15,988 | 19,889 | 24.4% | 26,063 | 63.0% | 30,768 | 92.4% | 73,234 | 358.1% |
| **Administrative workers** | 6,621 | 142 | 2.1% | 6,763 | 8,657 | 28.0% | 11,353 | 67.9% | 13,347 | 97.4% | 31,849 | 370.9% |
| **Total** | **142,943** | **12,394** | **8.7%** | **155,338** | **186,868** | **20.3%** | **245,284** | **57.9%** | **288,903** | **86.0%** | **687,204** | **342.4%** |

Table 1 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 35.5%, Power Distribution Engineer 29.8% and Technicians 22.2%. Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 0%, Maintenance Engineer 6.3%, Specialist or Consultant 3.3% and Administrative Workers 2.1%.

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.3%
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 57.9%
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 86.0%
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 342.4%

Tables 2, 3 and 4 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.5%
Renewable Energy – 7.0%
Environmental – 10.3%

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 47.3%; Renewable Energy 27.9% and Environmental 34.9%
Power Distribution Engineers: Low Carbon 33.7%; Renewable Energy 27.1% and Environmental 32.6%
Technicians: Low Carbon 27.9%; Renewable Energy 17.3% and Environmental 22.9%

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 68.8%, but only 13.4% in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 17.0%; Renewable Energy 34.5% and Environmental 27.0%
Power Distribution Engineers of: Low Carbon 28.1%; Renewable Energy 35.1% and Environmental 29.3%
Technicians of: Low Carbon 34.2%; Renewable Energy 45.9% and Environmental 39.6%

**Table 2: MEH LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 1,493 | 417 | 27.9% | 1,911 | 1,944 | 1.8% | 2,563 | 34.2% | 3,027 | 58.5% | 7,165 | 275.0% |
| **Snr Management SME** | 2,665 | 318 | 11.9% | 2,983 | 3,475 | 16.5% | 4,571 | 53.2% | 5,401 | 81.0% | 12,811 | 329.4% |
| **Supervisory** | 2,917 | 370 | 12.7% | 3,287 | 3,816 | 16.1% | 5,010 | 52.4% | 5,902 | 79.6% | 13,994 | 325.7% |
| **Middle / Junior Management** | 2,805 | 356 | 12.7% | 3,161 | 3,672 | 16.2% | 4,810 | 52.2% | 5,655 | 78.9% | 13,550 | 328.7% |
| **Designer / Developer** | 411 | 117 | 28.4% | 527 | 535 | 1.4% | 702 | 33.3% | 828 | 57.0% | 1,976 | 274.8% |
| **Clerical** | 1,509 | 4 | 0.3% | 1,513 | 1,980 | 30.9% | 2,586 | 70.9% | 3,051 | 101.6% | 7,220 | 377.2% |
| **Self Employed** | 566 | 91 | 16.2% | 657 | 741 | 12.8% | 970 | 47.6% | 1,139 | 73.3% | 2,720 | 313.9% |
| **Advisor or Agent** | 540 | 88 | 16.3% | 628 | 708 | 12.7% | 927 | 47.7% | 1,092 | 73.9% | 2,594 | 313.2% |
| **Educator** | 2 | 0 | 22.6% | 2 | 2 | 6.4% | 3 | 40.2% | 4 | 62.7% | 9 | 288.7% |
| **Specialist or Consultant** | 1,824 | 71 | 3.9% | 1,895 | 2,391 | 26.2% | 3,140 | 65.7% | 3,683 | 94.4% | 8,742 | 361.4% |
| **Editor** | 40 | 2 | 4.0% | 42 | 53 | 25.9% | 69 | 64.9% | 82 | 94.8% | 194 | 362.0% |
| **Industrial Researchers** | 1,018 | 80 | 7.9% | 1,098 | 1,326 | 20.8% | 1,745 | 59.0% | 2,063 | 87.9% | 4,899 | 346.3% |
| **Scientist** | 542 | 181 | 33.5% | 723 | 706 | -2.4% | 929 | 28.5% | 1,093 | 51.0% | 2,602 | 259.7% |
| **Maintenance Engineer** | 3,172 | 254 | 8.0% | 3,427 | 4,137 | 20.7% | 5,444 | 58.9% | 6,433 | 87.7% | 15,238 | 344.7% |
| **Civil Engineer** | 209 | 64 | 30.5% | 272 | 273 | 0.1% | 358 | 31.3% | 423 | 55.1% | 1,003 | 268.2% |
| **Production Engineer** | 703 | 333 | 47.3% | 1,036 | 913 | -11.9% | 1,212 | 17.0% | 1,414 | 36.5% | 3,382 | 226.4% |
| **Power distribution Engineer** | 1,250 | 421 | 33.7% | 1,671 | 1,632 | -2.3% | 2,140 | 28.1% | 2,533 | 51.6% | 6,012 | 259.8% |
| **Construction Engineer** | 284 | 58 | 20.5% | 342 | 371 | 8.6% | 487 | 42.5% | 572 | 67.3% | 1,366 | 299.5% |
| **Sales Exec** | 1,797 | 261 | 14.5% | 2,057 | 2,348 | 14.2% | 3,080 | 49.7% | 3,632 | 76.6% | 8,617 | 318.9% |
| **Marketing Personnel** | 1,823 | 260 | 14.2% | 2,083 | 2,388 | 14.7% | 3,138 | 50.7% | 3,693 | 77.3% | 8,781 | 321.6% |
| **General Semi Skilled Worker** | 3,142 | 80 | 2.6% | 3,223 | 4,105 | 27.4% | 5,404 | 67.7% | 6,356 | 97.2% | 15,072 | 367.7% |
| **General Labour** | 5,087 | 0 | 0.0% | 5,087 | 6,660 | 30.9% | 8,732 | 71.6% | 10,283 | 102.1% | 24,464 | 380.9% |
| **Other Employees** | 3,513 | 219 | 6.2% | 3,731 | 4,589 | 23.0% | 6,039 | 61.8% | 7,112 | 90.6% | 16,890 | 352.7% |
| **Administrative workers** | 1,805 | 48 | 2.7% | 1,853 | 2,367 | 27.7% | 3,096 | 67.0% | 3,635 | 96.1% | 8,680 | 368.3% |
| **Total** | **39,116** | **4,094** | **10.5%** | **43,210** | **51,133** | **18.3%** | **67,156** | **55.4%** | **79,104** | **83.1%** | **187,982** | **335.0%** |

**Table 3: MEH LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 1,915 | 331 | 17.3% | 2,246 | 2,507 | 11.6% | 3,278 | 45.9% | 3,874 | 72.5% | 9,207 | 309.9% |
| Snr Management SME | 6,418 | 593 | 9.2% | 7,011 | 8,407 | 19.9% | 10,993 | 56.8% | 12,978 | 85.1% | 30,736 | 338.4% |
| Supervisory | 6,493 | 593 | 9.1% | 7,085 | 8,466 | 19.5% | 11,161 | 57.5% | 13,138 | 85.4% | 31,315 | 342.0% |
| Middle / Junior Management | 6,300 | 572 | 9.1% | 6,872 | 8,229 | 19.8% | 10,806 | 57.2% | 12,694 | 84.7% | 30,255 | 340.3% |
| Designer / Developer | 488 | 106 | 21.6% | 594 | 639 | 7.6% | 838 | 41.1% | 987 | 66.1% | 2,347 | 295.2% |
| Clerical | 3,235 | 6 | 0.2% | 3,241 | 4,237 | 30.7% | 5,551 | 71.3% | 6,547 | 102.0% | 15,539 | 379.5% |
| Self Employed | 421 | 39 | 9.4% | 460 | 550 | 19.6% | 722 | 57.0% | 847 | 84.1% | 2,018 | 338.7% |
| Advisor or Agent | 137 | 23 | 17.0% | 160 | 178 | 11.6% | 235 | 47.1% | 276 | 72.8% | 656 | 310.9% |
| Educator | 0 | 0 | 11.4% | 0 | 0 | 17.5% | 0 | 54.0% | 0 | 87.7% | 0 | 327.6% |
| Specialist or Consultant | 3,108 | 89 | 2.9% | 3,197 | 4,071 | 27.3% | 5,316 | 66.3% | 6,290 | 96.7% | 14,938 | 367.2% |
| Editor | 44 | 1 | 3.3% | 46 | 58 | 26.5% | 77 | 66.6% | 90 | 95.9% | 213 | 363.7% |
| Industrial Researchers | 209 | 15 | 7.0% | 224 | 273 | 22.1% | 360 | 60.9% | 423 | 88.9% | 1,005 | 348.8% |
| Scientist | 79 | 24 | 29.8% | 103 | 104 | 1.2% | 136 | 32.6% | 160 | 55.7% | 379 | 268.7% |
| Maintenance Engineer | 6,911 | 382 | 5.5% | 7,293 | 9,040 | 23.9% | 11,877 | 62.9% | 13,989 | 91.8% | 33,202 | 355.2% |
| Civil Engineer | 210 | 44 | 21.2% | 254 | 274 | 7.9% | 359 | 41.3% | 425 | 67.0% | 1,010 | 297.4% |
| Production Engineer | 989 | 276 | 27.9% | 1,266 | 1,296 | 2.4% | 1,702 | 34.5% | 2,001 | 58.1% | 4,760 | 276.1% |
| Power distribution Engineer | 3,272 | 886 | 27.1% | 4,158 | 4,284 | 3.0% | 5,617 | 35.1% | 6,625 | 59.4% | 15,725 | 278.2% |
| Construction Engineer | 455 | 57 | 12.5% | 511 | 596 | 16.6% | 779 | 52.4% | 921 | 80.2% | 2,189 | 328.0% |
| Sales Exec | 3,020 | 280 | 9.3% | 3,300 | 3,946 | 19.6% | 5,176 | 56.9% | 6,111 | 85.2% | 14,539 | 340.6% |
| Marketing Personnel | 3,095 | 284 | 9.2% | 3,380 | 4,038 | 19.5% | 5,317 | 57.3% | 6,231 | 84.4% | 14,881 | 340.3% |
| General Semi Skilled Worker | 6,615 | 120 | 1.8% | 6,735 | 8,634 | 28.2% | 11,366 | 68.8% | 13,379 | 98.6% | 31,851 | 372.9% |
| General Labour | 8,039 | 0 | 0.0% | 8,039 | 10,519 | 30.9% | 13,808 | 71.8% | 16,228 | 101.9% | 38,687 | 381.3% |
| Other Employees | 8,725 | 397 | 4.5% | 9,121 | 11,407 | 25.1% | 14,926 | 63.6% | 17,620 | 93.2% | 42,011 | 360.6% |
| Administrative workers | 3,392 | 61 | 1.8% | 3,454 | 4,432 | 28.3% | 5,815 | 68.4% | 6,839 | 98.0% | 16,325 | 372.7% |
| **Total** | **73,571** | **5,179** | **7.0%** | **78,750** | **96,186** | **22.1%** | **126,216** | **60.3%** | **148,672** | **88.8%** | **353,789** | **349.3%** |

**Table 4: MEH LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 1,299 | 297 | 22.9% | 1,596 | 1,698 | 6.4% | 2,229 | 39.6% | 2,625 | 64.5% | 6,241 | 291.0% |
| Snr Management SME | 2,064 | 213 | 10.3% | 2,277 | 2,701 | 18.6% | 3,551 | 55.9% | 4,169 | 83.1% | 9,933 | 336.1% |
| Supervisory | 2,230 | 237 | 10.6% | 2,467 | 2,908 | 17.9% | 3,828 | 55.2% | 4,504 | 82.6% | 10,713 | 334.2% |
| Middle / Junior Management | 2,155 | 228 | 10.6% | 2,383 | 2,812 | 18.0% | 3,694 | 55.0% | 4,357 | 82.8% | 10,349 | 334.2% |
| Designer / Developer | 721 | 204 | 28.3% | 925 | 943 | 1.9% | 1,239 | 33.9% | 1,453 | 57.1% | 3,464 | 274.4% |
| Clerical | 1,130 | 2 | 0.2% | 1,133 | 1,479 | 30.6% | 1,946 | 71.8% | 2,283 | 101.6% | 5,421 | 378.5% |
| Self Employed | 591 | 73 | 12.4% | 664 | 771 | 16.0% | 1,015 | 52.8% | 1,196 | 80.0% | 2,844 | 328.0% |
| Advisor or Agent | 408 | 68 | 16.7% | 476 | 534 | 12.2% | 700 | 47.0% | 820 | 72.4% | 1,960 | 311.7% |
| Educator | 35 | 11 | 31.6% | 47 | 47 | -0.2% | 61 | 30.8% | 72 | 53.6% | 171 | 265.8% |
| Specialist or Consultant | 1,347 | 47 | 3.5% | 1,394 | 1,761 | 26.3% | 2,304 | 65.3% | 2,720 | 95.2% | 6,482 | 365.1% |
| Editor | 99 | 4 | 4.0% | 103 | 129 | 25.9% | 170 | 65.1% | 199 | 94.3% | 474 | 361.6% |
| Industrial Researchers | 573 | 45 | 7.8% | 618 | 749 | 21.1% | 984 | 59.2% | 1,158 | 87.3% | 2,753 | 345.3% |
| Scientist | 196 | 69 | 35.0% | 265 | 257 | -3.2% | 337 | 27.1% | 397 | 49.5% | 946 | 256.6% |
| Maintenance Engineer | 2,832 | 178 | 6.3% | 3,010 | 3,700 | 22.9% | 4,861 | 61.5% | 5,728 | 90.3% | 13,609 | 352.1% |
| Civil Engineer | 479 | 132 | 27.5% | 612 | 626 | 2.4% | 822 | 34.5% | 969 | 58.5% | 2,304 | 276.7% |
| Production Engineer | 637 | 222 | 34.9% | 859 | 832 | -3.2% | 1,092 | 27.0% | 1,288 | 49.9% | 3,067 | 256.9% |
| Power distribution Engineer | 1,385 | 451 | 32.6% | 1,836 | 1,812 | -1.3% | 2,373 | 29.3% | 2,797 | 52.4% | 6,656 | 262.6% |
| Construction Engineer | 609 | 114 | 18.7% | 723 | 796 | 10.1% | 1,047 | 44.7% | 1,230 | 70.0% | 2,926 | 304.5% |
| Sales Exec | 1,196 | 147 | 12.3% | 1,343 | 1,570 | 16.9% | 2,054 | 52.9% | 2,410 | 79.4% | 5,764 | 329.1% |
| Marketing Personnel | 1,110 | 129 | 11.6% | 1,239 | 1,457 | 17.6% | 1,906 | 53.8% | 2,241 | 80.9% | 5,335 | 330.6% |
| General Semi Skilled Worker | 2,757 | 62 | 2.2% | 2,818 | 3,607 | 28.0% | 4,734 | 68.0% | 5,565 | 97.5% | 13,248 | 370.0% |
| General Labour | 1,997 | 0 | 0.0% | 1,997 | 2,611 | 30.7% | 3,426 | 71.5% | 4,034 | 102.0% | 9,597 | 380.6% |
| Other Employees | 2,981 | 155 | 5.2% | 3,135 | 3,892 | 24.1% | 5,099 | 62.6% | 6,036 | 92.5% | 14,332 | 357.1% |
| Administrative workers | 1,424 | 32 | 2.3% | 1,456 | 1,858 | 27.7% | 2,442 | 67.7% | 2,873 | 97.4% | 6,844 | 370.2% |
| **Total** | **30,257** | **3,121** | **10.3%** | **33,378** | **39,549** | **18.5%** | **51,912** | **55.5%** | **61,127** | **83.1%** | **145,433** | **335.7%** |

## 1.4 MEH's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the MEH region and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill-sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 6 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the MEH region, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the MEH region. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 6: MEH LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

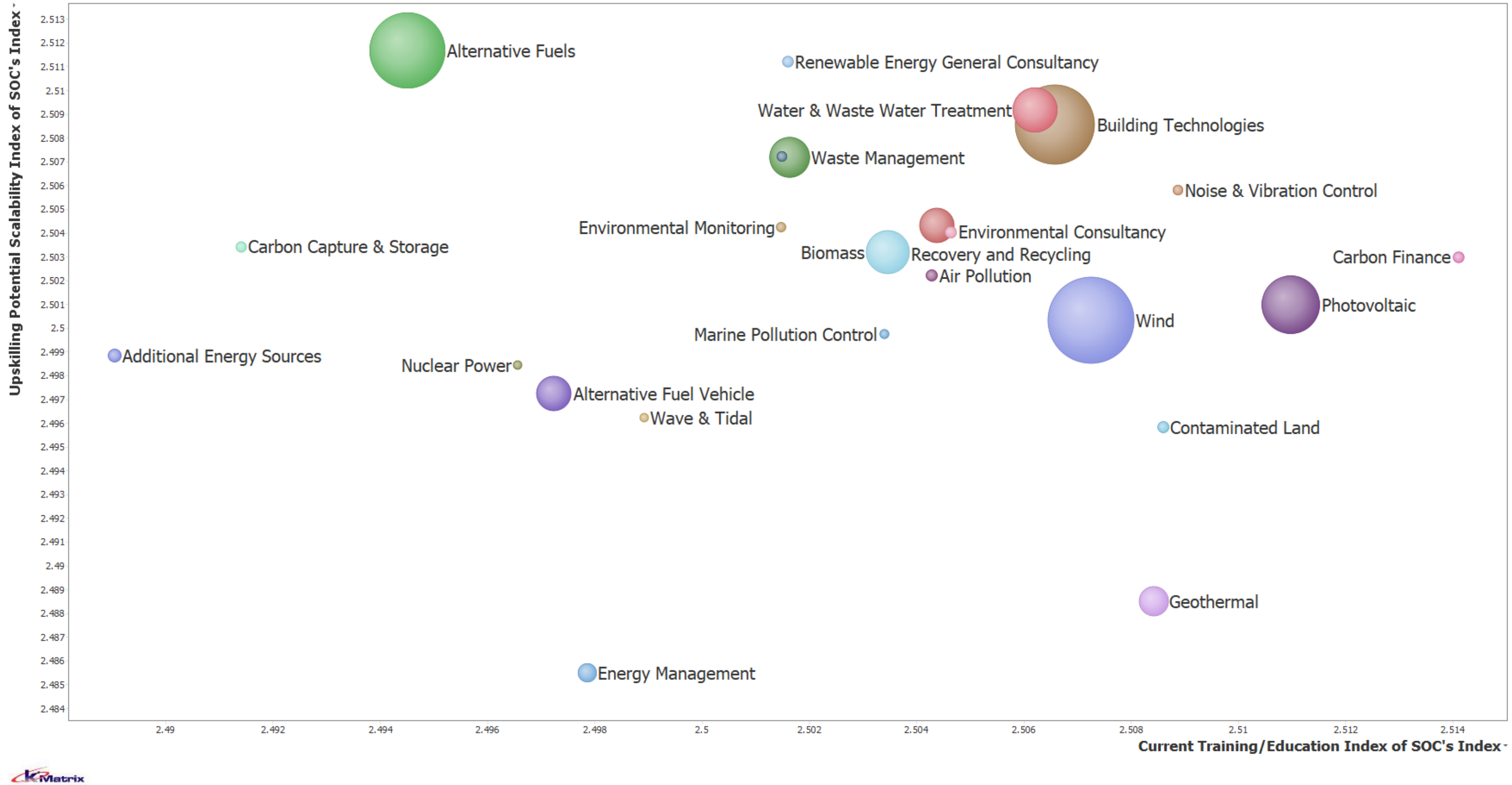



Figure 6 shows that Building Technologies holds a strong position, with good current training capacity combined with a strong potential for upskilling. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.

## 1.5 MEH's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the MEH region. As outlined in the introduction on page 18 of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3)+(4x2)+(4x1)}{17}=1.9$$

Figures 7 and 8 show the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales.

Figure 7 illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential in the region, compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector.

Figure 8 provides the same information, but with Wind and Environmental Consultancy removed, to assess the relative impact of the other sub-sectors. The data in figure 8 provide a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors in the graph (excluding Wind and Environmental Consultancy). Alternative Fuels and Building Technologies have a strong position, with large market and high $CO_2$ reduction potential.

**Figure 7: MEH LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**

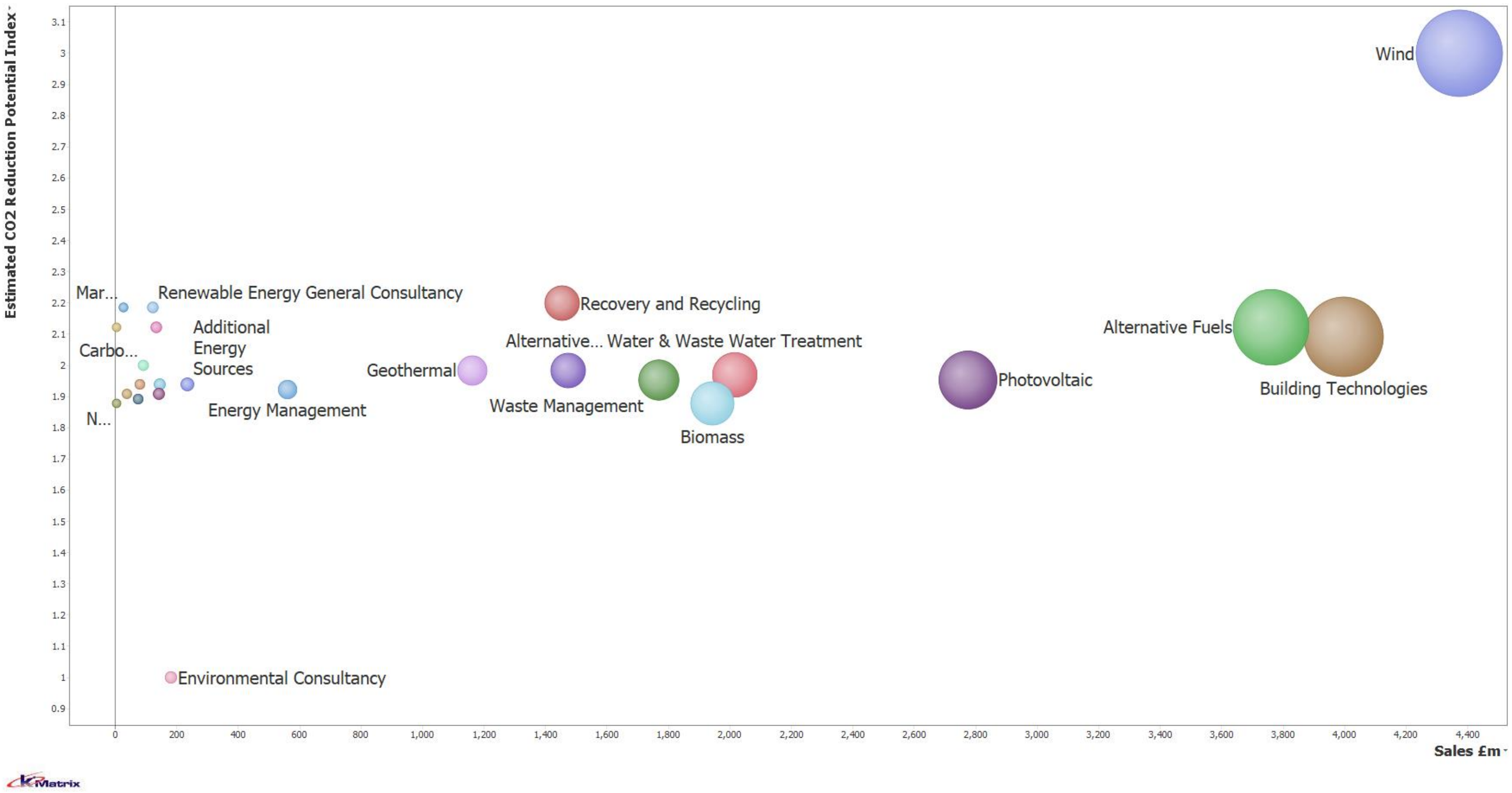
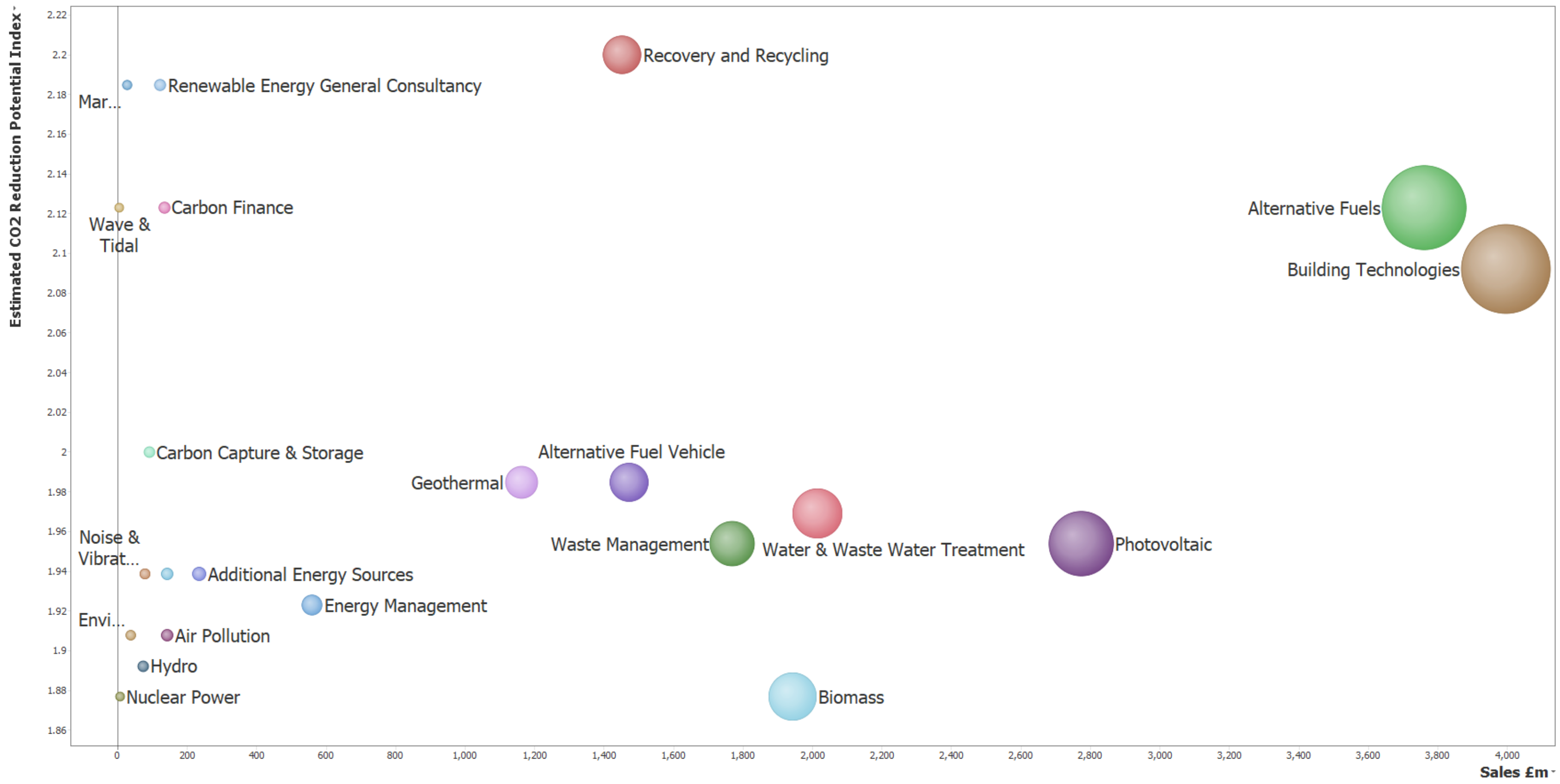


**Figure 8: MEH LCEGS Estimated Potential CO2 Reduction against Sales (£m) by Level 2 Sub-sector – Wind and Environmental Removed**



# 2. Growth Forecast for Net Zero in 2030 and 2050 for the Black Country LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Black Country LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 2.1 Black Country LEP's LCEGS Strengths and Weaknesses

In this section of the report Black Country LEP's LCEGS performance is compared with the UK as a whole. The Black Country LEP's LCEGS sector was worth £2.3bn in 2019/20 and accounts for 1.1% of the UK total.

Figure 1 shows how the Black Country LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 1.1 %. This proportionality factor demonstrates where the Black Country LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 1.1% of the UK market; above 1 = larger than 1.1% share and below 1 = smaller than 1.1% share.

The y-axis represents the growth rate of the Black Country LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 9 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric should be considered strengths, because they are close to the expected size of market (1.0 for Contaminated Land and 0.9 for Hydro), but are growing significantly stronger than the UK average (12.1% LEP vs 1.0% UK for Contaminated Land and 11.7% vs. 1.8%Uk for Hydro).

**Figure 9: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

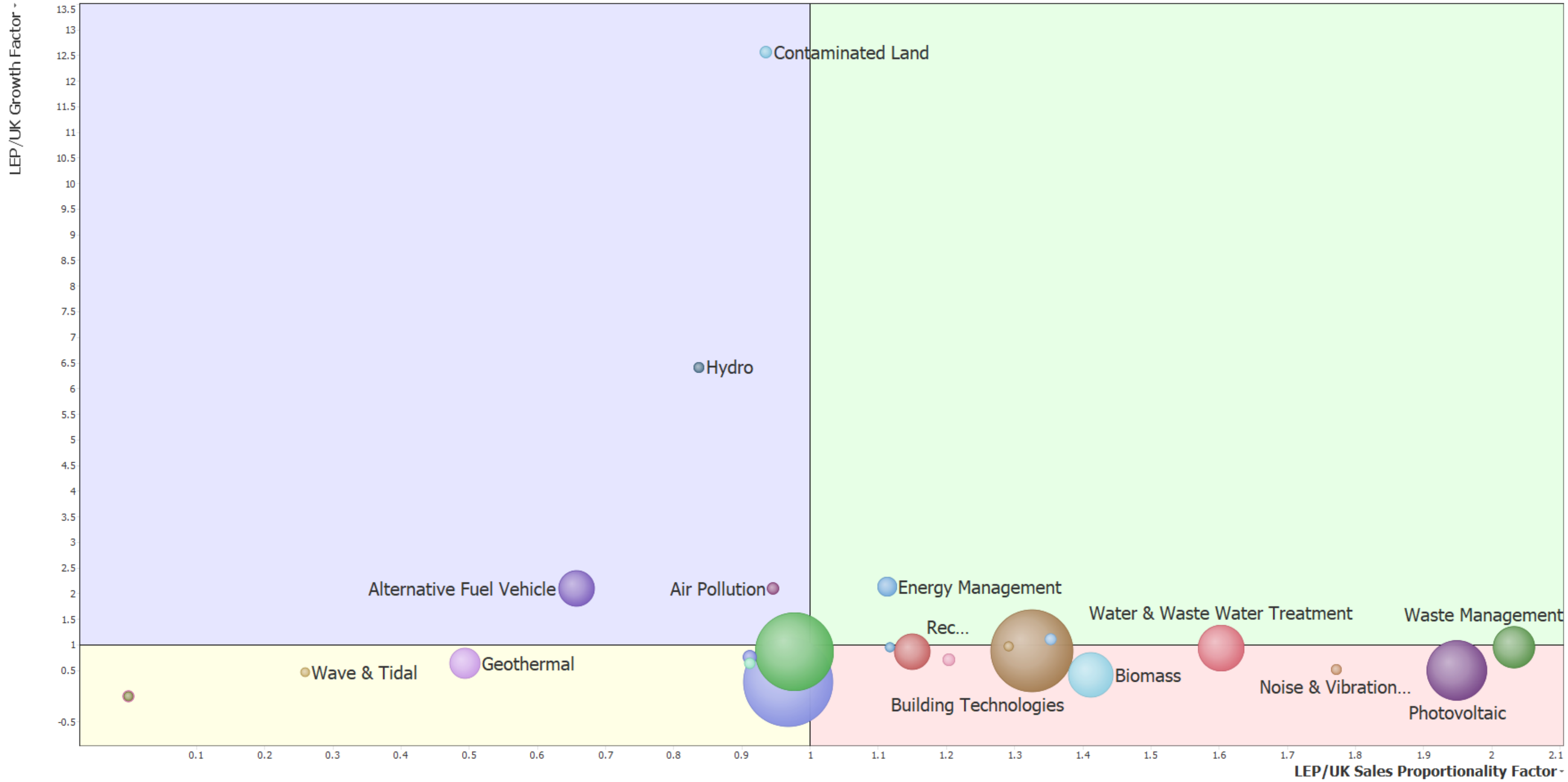
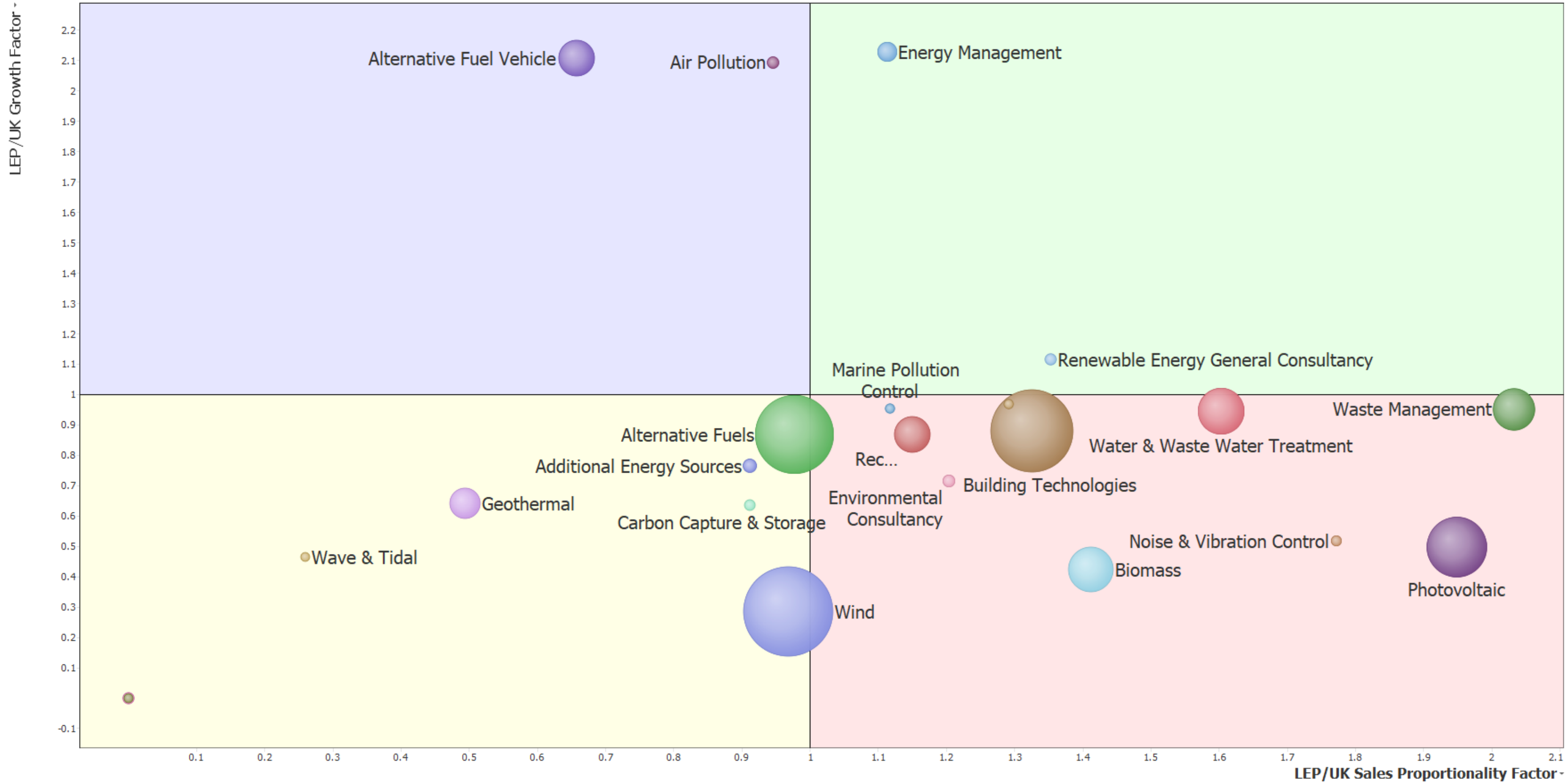


Figure 10 provides the same information as figure 34, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management has the ideal characteristics of above UK average growth and above LEP average size. Those in the bottom right quadrant (red) hold a larger UK share than the LEP's average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Waste Management, Biomass and Water & Waste Water Treatment set these sub-sector apart as being strengths. Those in the lower left (yellow) quadrant i.e. Wave & tidal, Geothermal, Wind and Alternative Fuels can be considered relative weaknesses.

**Figure 10: LEP/UK Sales proportionality factor vs LEP/UK Growth factor of Level 2 Sub-sectors, Bubbles Sized by Sales £m, Excluding Contaminated Land and Hydro**



## 2.2 Scalability of Black Country LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 11 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Black Country LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right hand corner of the graph, with high GVA and high Scalability. We can see that the Alternative Fuels sub-sector has a good combination of size and scalability, while Contaminated Land Reclamation and Remediation may be small in terms of market, but is highly scalable. Building Technologies is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Black Country LEP Market Snapshot report.

**Figure 11: Black Country LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

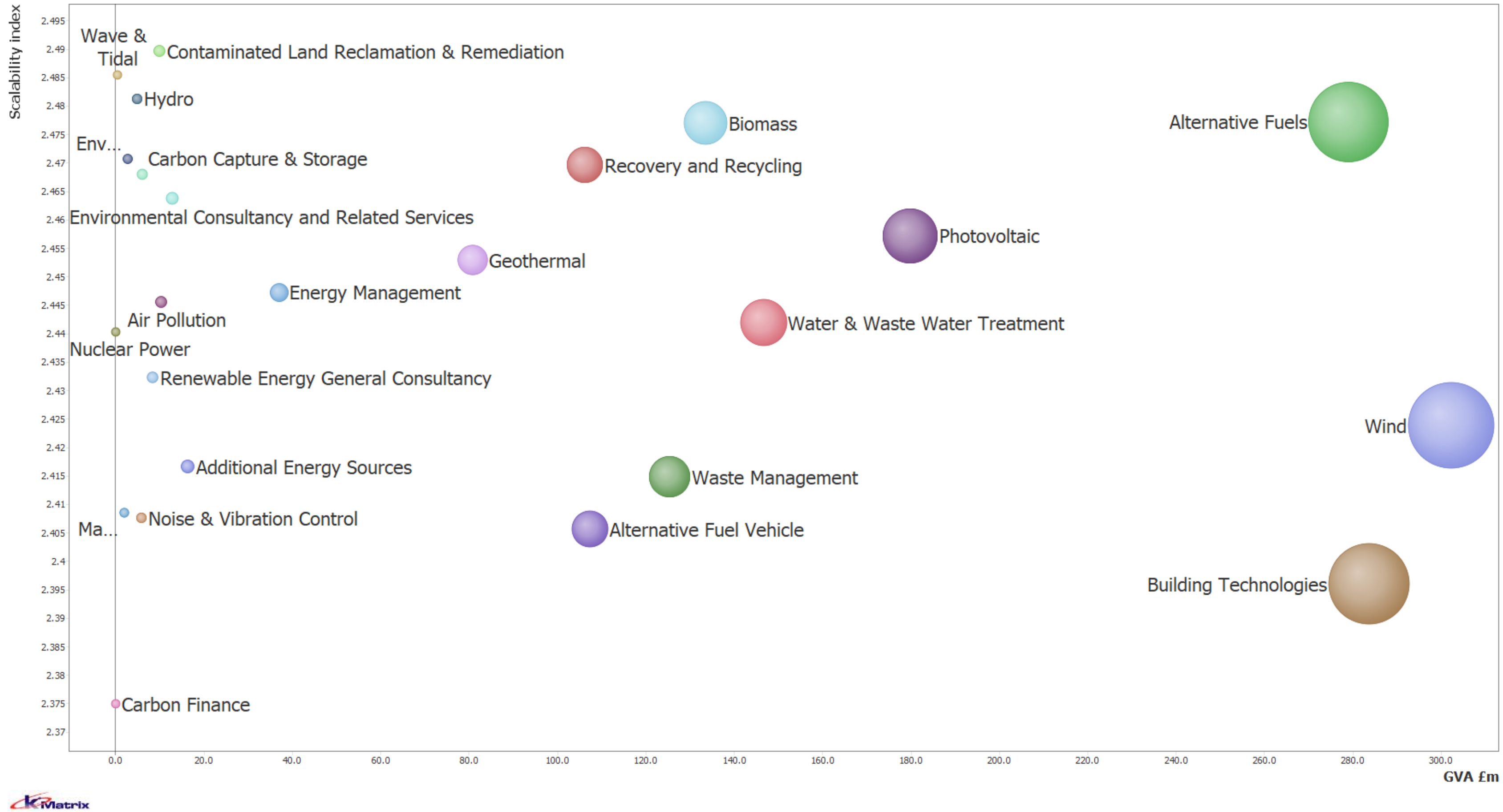
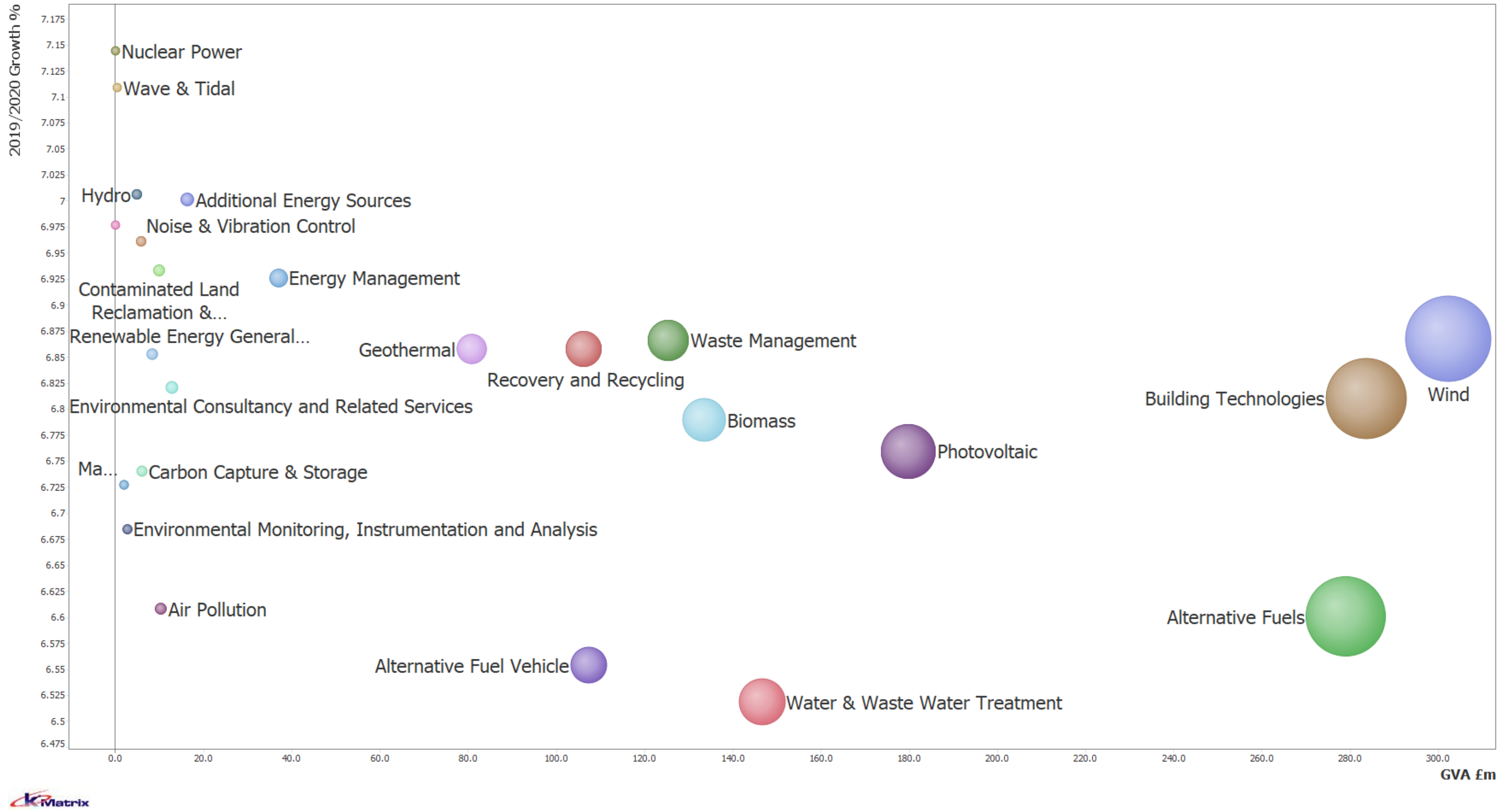


Figure 12 shows the same principle as Figure 11, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies the most favourable position of large size and high growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 12: Black Country LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

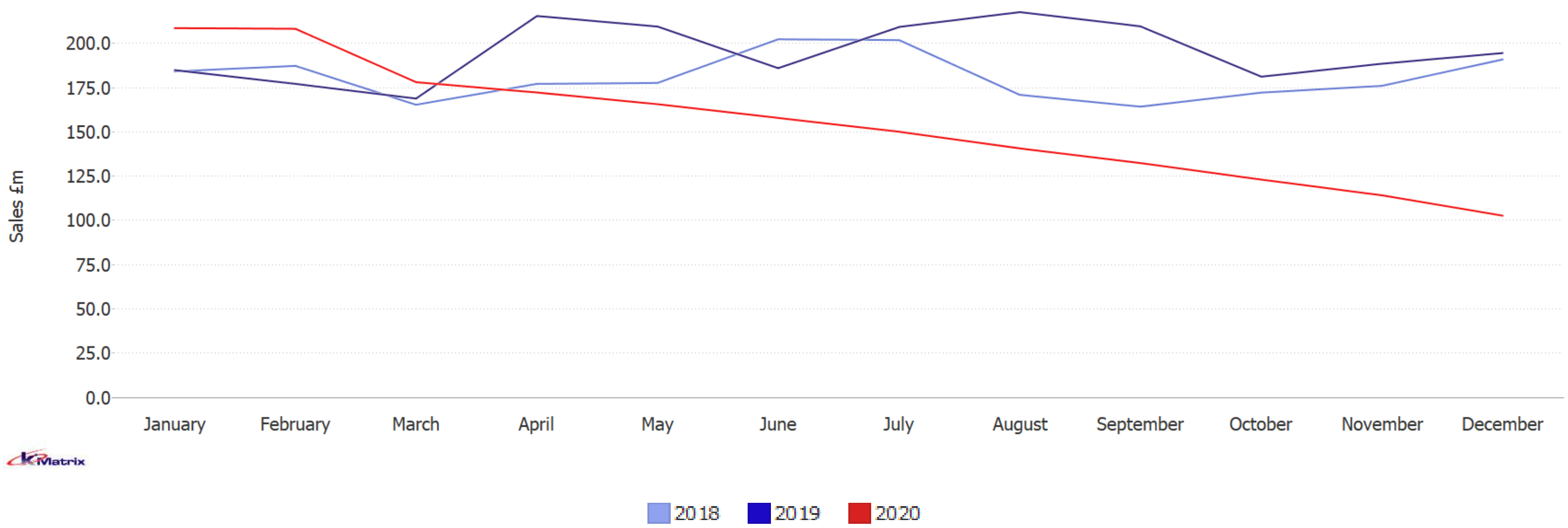


## 2.3 Black Country LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 13, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Black Country LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

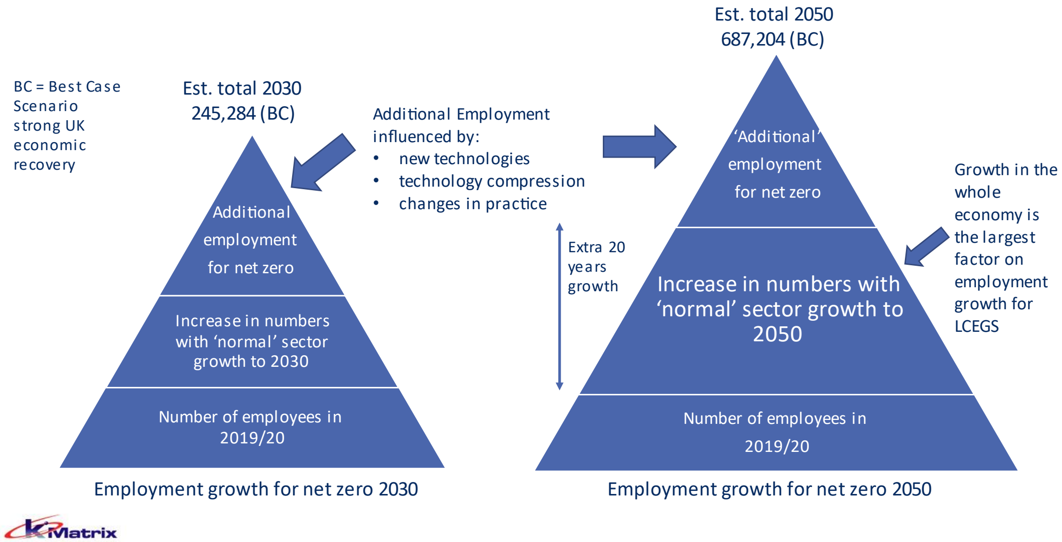
**Figure 13: Black Country LEP LCEGS Sales, by month 2018, 2019 and 2020**



Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| ***Timeline for Net Zero*** | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.




The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.

On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 5 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Black Country LEP.

Shortage of employees refers to the employees that are ‘imported’ from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not ‘fit’. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as “Other Employees” because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to ‘heads equivalent’, so although for example, there are 3 Educators listed, with a shortage of 1, making a total of 4 in the region, this will equate to over 40 people providing ‘pockets’ of time, to equate to 4 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 5: Black Country LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 422 | 95 | 22.6% | 517 | 550 | 6.3% | 723 | 39.7% | 848 | 64.1% | 2,022 | 290.9% |
| **Snr Management SME** | 899 | 91 | 10.2% | 990 | 1,178 | 19.0% | 1,538 | 55.3% | 1,809 | 82.7% | 4,330 | 337.5% |
| **Supervisory** | 868 | 91 | 10.4% | 959 | 1,138 | 18.7% | 1,498 | 56.2% | 1,754 | 82.9% | 4,183 | 336.2% |
| **Middle / Junior Management** | 946 | 98 | 10.4% | 1,044 | 1,240 | 18.8% | 1,622 | 55.4% | 1,907 | 82.7% | 4,547 | 335.6% |
| **Designer / Developer** | 128 | 34 | 26.7% | 162 | 168 | 3.7% | 220 | 35.5% | 259 | 59.4% | 617 | 279.8% |
| **Clerical** | 475 | 1 | 0.2% | 476 | 623 | 30.8% | 814 | 70.9% | 961 | 101.7% | 2,283 | 379.2% |
| **Self Employed** | 125 | 16 | 13.0% | 142 | 164 | 15.8% | 216 | 52.3% | 253 | 78.4% | 605 | 327.2% |
| **Advisor or Agent** | 88 | 14 | 16.4% | 102 | 115 | 12.7% | 151 | 47.9% | 179 | 74.7% | 424 | 314.2% |
| **Educator** | 3 | 1 | 32.4% | 4 | 4 | -0.2% | 6 | 31.8% | 7 | 51.6% | 16 | 264.8% |
| **Specialist or Consultant** | 507 | 16 | 3.2% | 523 | 664 | 26.8% | 858 | 63.9% | 1,022 | 95.2% | 2,444 | 367.0% |
| **Editor** | 17 | 1 | 3.9% | 17 | 22 | 26.4% | 28 | 65.2% | 33 | 93.8% | 80 | 363.9% |
| **Industrial Researchers** | 162 | 13 | 8.0% | 175 | 211 | 20.3% | 280 | 60.0% | 328 | 87.1% | 778 | 343.9% |
| **Scientist** | 76 | 24 | 32.0% | 100 | 100 | -0.5% | 132 | 31.0% | 153 | 52.6% | 361 | 259.6% |
| **Maintenance Engineer** | 1,085 | 69 | 6.4% | 1,154 | 1,422 | 23.2% | 1,864 | 61.5% | 2,194 | 90.1% | 5,216 | 351.8% |
| **Civil Engineer** | 88 | 24 | 27.0% | 112 | 114 | 2.4% | 151 | 35.2% | 178 | 58.8% | 422 | 277.4% |
| **Production Engineer** | 186 | 64 | 34.5% | 251 | 243 | -3.0% | 323 | 28.8% | 374 | 49.0% | 885 | 253.0% |
| **Power distribution Engineer** | 539 | 162 | 30.0% | 701 | 708 | 1.0% | 927 | 32.3% | 1,092 | 55.8% | 2,588 | 269.3% |
| **Construction Engineer** | 114 | 19 | 17.0% | 133 | 148 | 11.3% | 195 | 46.4% | 229 | 71.9% | 546 | 310.2% |
| **Sales Exec** | 530 | 61 | 11.4% | 590 | 692 | 17.2% | 910 | 54.2% | 1,072 | 81.5% | 2,539 | 330.1% |
| **Marketing Personnel** | 518 | 59 | 11.4% | 577 | 676 | 17.2% | 888 | 53.9% | 1,041 | 80.3% | 2,494 | 332.3% |
| **General Semi Skilled Worker** | 1,066 | 23 | 2.1% | 1,089 | 1,387 | 27.4% | 1,829 | 68.0% | 2,154 | 97.8% | 5,100 | 368.4% |
| **General Labour** | 1,396 | 0 | 0.0% | 1,396 | 1,825 | 30.8% | 2,394 | 71.5% | 2,818 | 101.9% | 6,709 | 380.6% |
| **Other Employees** | 1,201 | 60 | 5.0% | 1,261 | 1,569 | 24.4% | 2,062 | 63.5% | 2,426 | 92.3% | 5,786 | 358.7% |
| **Administrative workers** | 550 | 12 | 2.2% | 562 | 718 | 27.8% | 945 | 68.1% | 1,111 | 97.7% | 2,640 | 369.8% |
| **Total** | **11,990** | **1,049** | **8.7%** | **13,039** | **15,680** | **20.3%** | **20,573** | **57.8%** | **24,199** | **85.6%** | **57,614** | **341.8%** |

Table 5 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 34.5% (MEH 35.7%), Power Distribution Engineer 30.0% (MEH 29.8%) and Technicians 22.6% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%), Maintenance Engineer 6.4% (MEH 6.3%), Specialist or Consultant 3.2% (MEH 3.3%) and Administrative Workers 2.2% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.3% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 57.8% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 85.6% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 341.8% (MEH 342.4%)

Tables 6, 7 and 8 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.4% (MEH 10.5%)
Renewable Energy – 7.2% (MEH 7.0%)
Environmental – 10.3% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 43.7% (MEH 47.3%); Renewable Energy 27.6% (MEH 27.9%) and Environmental 34.8% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 32.6% (MEH 33.7%); Renewable Energy 28.2% (MEH 27.1%) and Environmental 31.7% (MEH 32.6%)
Technicians: Low Carbon 28.3% (MEH 27.9%); Renewable Energy 17.9% (MEH 17.3%) and Environmental 22.9% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 65.7% (MEH 68.8%), but only 12.7% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 23.2% (MEH 17.0%); Renewable Energy 34.6% (MEH 34.5%) and Environmental 27.1% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 29.1% (MEH 28.1%); Renewable Energy 35.1% (MEH 35.1%) and Environmental 29.0% (MEH 29.3%)
Technicians of: Low Carbon 33.2% (MEH 34.2%); Renewable Energy 45.7% (MEH 45.9%) and Environmental 39.2% (MEH 39.6%)

**Table 6: Black Country LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 133 | 38 | 28.3% | 170 | 173 | 1.8% | 227 | 33.2% | 267 | 56.5% | 637 | 273.6% |
| **Snr Management SME** | 213 | 26 | 12.1% | 239 | 279 | 16.7% | 368 | 54.1% | 435 | 81.8% | 1,026 | 329.0% |
| **Supervisory** | 211 | 27 | 12.6% | 238 | 277 | 16.5% | 364 | 53.3% | 427 | 79.6% | 1,018 | 328.8% |
| **Middle / Junior Management** | 232 | 29 | 12.6% | 261 | 306 | 17.1% | 396 | 51.7% | 471 | 80.2% | 1,113 | 326.0% |
| **Designer / Developer** | 31 | 9 | 28.8% | 41 | 41 | 1.2% | 54 | 32.2% | 64 | 57.9% | 151 | 272.0% |
| **Clerical** | 119 | 0 | 0.3% | 119 | 155 | 30.1% | 203 | 70.0% | 240 | 101.1% | 568 | 376.2% |
| **Self Employed** | 44 | 7 | 16.3% | 52 | 58 | 12.4% | 77 | 48.3% | 90 | 74.0% | 214 | 314.2% |
| **Advisor or Agent** | 43 | 7 | 15.7% | 49 | 56 | 14.0% | 74 | 48.9% | 87 | 76.3% | 206 | 316.6% |
| **Educator** | 0 | 0 | 24.0% | 0 | 0 | 7.1% | 0 | 35.3% | 0 | 61.2% | 1 | 287.6% |
| **Specialist or Consultant** | 133 | 5 | 3.8% | 138 | 173 | 25.9% | 225 | 63.2% | 267 | 93.6% | 645 | 367.7% |
| **Editor** | 3 | 0 | 3.8% | 4 | 5 | 27.4% | 6 | 64.9% | 7 | 94.1% | 16 | 362.9% |
| **Industrial Researchers** | 92 | 7 | 8.1% | 99 | 119 | 19.9% | 159 | 60.1% | 186 | 87.1% | 439 | 341.1% |
| **Scientist** | 50 | 16 | 31.4% | 66 | 66 | -0.1% | 87 | 32.1% | 101 | 53.5% | 236 | 258.9% |
| **Maintenance Engineer** | 268 | 22 | 8.3% | 290 | 348 | 20.0% | 458 | 57.8% | 542 | 86.8% | 1,296 | 346.4% |
| **Civil Engineer** | 20 | 6 | 29.8% | 26 | 26 | -0.1% | 34 | 32.8% | 40 | 56.3% | 95 | 267.0% |
| **Production Engineer** | 56 | 24 | 43.7% | 80 | 73 | -9.3% | 99 | 23.2% | 110 | 37.6% | 260 | 224.1% |
| **Power distribution Engineer** | 114 | 37 | 32.6% | 151 | 148 | -2.1% | 195 | 29.1% | 232 | 53.7% | 541 | 258.9% |
| **Construction Engineer** | 24 | 5 | 20.4% | 28 | 30 | 6.9% | 40 | 42.5% | 47 | 67.1% | 113 | 299.8% |
| **Sales Exec** | 158 | 23 | 14.8% | 181 | 207 | 14.1% | 271 | 49.5% | 322 | 77.3% | 757 | 317.6% |
| **Marketing Personnel** | 157 | 23 | 14.7% | 180 | 205 | 13.9% | 270 | 50.1% | 315 | 74.9% | 753 | 318.6% |
| **General Semi Skilled Worker** | 267 | 7 | 2.6% | 274 | 347 | 26.6% | 458 | 67.1% | 536 | 95.6% | 1,264 | 361.6% |
| **General Labour** | 475 | 0 | 0.0% | 475 | 624 | 31.5% | 818 | 72.3% | 958 | 101.8% | 2,286 | 381.7% |
| **Other Employees** | 261 | 16 | 6.0% | 277 | 338 | 21.8% | 447 | 61.5% | 530 | 91.1% | 1,247 | 350.2% |
| **Administrative workers** | 146 | 4 | 2.7% | 150 | 191 | 27.4% | 253 | 68.1% | 296 | 97.1% | 696 | 363.2% |
| **Total** | **3,250** | **338** | **10.4%** | **3,589** | **4,245** | **18.3%** | **5,582** | **55.6%** | **6,568** | **83.0%** | **15,579** | **334.1%** |

**Table 7: Black Country LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 168 | 30 | 17.9% | 198 | 218 | 10.3% | 288 | 45.7% | 338 | 70.9% | 804 | 306.5% |
| **Snr Management SME** | 512 | 48 | 9.3% | 560 | 674 | 20.4% | 874 | 56.1% | 1,024 | 82.9% | 2,470 | 341.2% |
| **Supervisory** | 480 | 45 | 9.5% | 526 | 629 | 19.6% | 833 | 58.3% | 968 | 84.1% | 2,317 | 340.6% |
| **Middle / Junior Management** | 522 | 48 | 9.3% | 570 | 685 | 20.1% | 896 | 57.2% | 1,048 | 84.0% | 2,511 | 340.7% |
| **Designer / Developer** | 38 | 8 | 22.6% | 46 | 50 | 7.8% | 64 | 40.1% | 76 | 64.5% | 180 | 291.5% |
| **Clerical** | 259 | 0 | 0.2% | 260 | 340 | 31.0% | 444 | 70.8% | 524 | 101.4% | 1,251 | 381.4% |
| **Self Employed** | 32 | 3 | 9.6% | 35 | 42 | 19.9% | 55 | 57.4% | 65 | 83.1% | 156 | 342.8% |
| **Advisor or Agent** | 11 | 2 | 16.8% | 13 | 14 | 11.5% | 19 | 46.9% | 22 | 73.8% | 52 | 309.9% |
| **Educator** | 0 | 0 | 12.5% | 0 | 0 | 20.0% | 0 | 56.3% | 0 | 81.0% | 0 | 301.5% |
| **Specialist or Consultant** | 257 | 7 | 2.9% | 264 | 338 | 28.0% | 433 | 64.0% | 519 | 96.4% | 1,237 | 368.5% |
| **Editor** | 4 | 0 | 3.5% | 4 | 5 | 27.3% | 7 | 66.3% | 8 | 95.5% | 19 | 366.0% |
| **Industrial Researchers** | 18 | 1 | 7.1% | 19 | 23 | 22.3% | 31 | 61.0% | 36 | 87.4% | 86 | 348.2% |
| **Scientist** | 7 | 2 | 29.3% | 9 | 9 | 1.9% | 12 | 32.9% | 14 | 54.3% | 34 | 267.7% |
| **Maintenance Engineer** | 569 | 31 | 5.5% | 601 | 751 | 24.9% | 980 | 63.1% | 1,150 | 91.5% | 2,728 | 354.2% |
| **Civil Engineer** | 20 | 4 | 21.7% | 24 | 25 | 6.6% | 34 | 41.8% | 40 | 66.6% | 94 | 294.4% |
| **Production Engineer** | 77 | 21 | 27.6% | 99 | 101 | 2.4% | 133 | 34.6% | 155 | 57.0% | 370 | 274.8% |
| **Power distribution Engineer** | 293 | 83 | 28.2% | 375 | 386 | 2.8% | 507 | 35.1% | 589 | 57.0% | 1,411 | 275.8% |
| **Construction Engineer** | 37 | 5 | 12.6% | 41 | 48 | 16.2% | 63 | 52.7% | 74 | 78.9% | 175 | 325.7% |
| **Sales Exec** | 263 | 24 | 9.0% | 287 | 341 | 19.1% | 451 | 57.4% | 531 | 85.5% | 1,263 | 340.8% |
| **Marketing Personnel** | 261 | 24 | 9.3% | 286 | 341 | 19.3% | 447 | 56.4% | 526 | 84.1% | 1,259 | 340.4% |
| **General Semi Skilled Worker** | 551 | 10 | 1.8% | 561 | 714 | 27.3% | 945 | 68.4% | 1,118 | 99.3% | 2,646 | 371.5% |
| **General Labour** | 727 | 0 | 0.0% | 727 | 950 | 30.6% | 1,245 | 71.1% | 1,467 | 101.7% | 3,490 | 379.8% |
| **Other Employees** | 690 | 32 | 4.6% | 722 | 904 | 25.3% | 1,186 | 64.3% | 1,397 | 93.6% | 3,337 | 362.4% |
| **Administrative workers** | 278 | 5 | 1.9% | 283 | 363 | 28.3% | 475 | 67.6% | 560 | 97.7% | 1,345 | 375.1% |
| **Total** | **6,074** | **436** | **7.2%** | **6,509** | **7,953** | **22.2%** | **10,420** | **60.1%** | **12,249** | **88.2%** | **29,236** | **349.2%** |

**Table 8: Black Country LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 121 | 28 | 22.9% | 149 | 158 | 6.2% | 207 | 39.2% | 244 | 63.7% | 581 | 290.1% |
| Snr Management SME | 173 | 18 | 10.2% | 191 | 225 | 17.7% | 295 | 54.7% | 350 | 83.4% | 834 | 336.9% |
| Supervisory | 177 | 19 | 10.6% | 196 | 232 | 18.7% | 301 | 54.0% | 359 | 83.5% | 848 | 333.4% |
| Middle / Junior Management | 192 | 20 | 10.6% | 213 | 250 | 17.5% | 330 | 55.2% | 387 | 82.3% | 922 | 334.0% |
| Designer / Developer | 59 | 17 | 28.1% | 76 | 78 | 2.5% | 102 | 34.5% | 119 | 57.1% | 286 | 276.8% |
| Clerical | 97 | 0 | 0.2% | 97 | 128 | 31.4% | 167 | 72.2% | 197 | 103.0% | 464 | 377.1% |
| Self Employed | 49 | 6 | 12.2% | 55 | 64 | 16.4% | 83 | 52.8% | 98 | 79.6% | 234 | 329.4% |
| Advisor or Agent | 34 | 6 | 17.0% | 40 | 45 | 11.5% | 59 | 46.9% | 69 | 72.9% | 166 | 312.6% |
| Educator | 3 | 1 | 32.8% | 4 | 4 | -0.5% | 5 | 31.7% | 6 | 51.1% | 15 | 263.7% |
| Specialist or Consultant | 117 | 4 | 3.5% | 121 | 152 | 25.4% | 200 | 64.3% | 236 | 94.5% | 562 | 363.1% |
| Editor | 9 | 0 | 4.1% | 10 | 12 | 25.6% | 16 | 64.8% | 19 | 93.0% | 44 | 363.4% |
| Industrial Researchers | 52 | 4 | 8.0% | 57 | 68 | 20.4% | 90 | 59.6% | 106 | 87.0% | 253 | 347.4% |
| Scientist | 19 | 7 | 34.7% | 25 | 25 | -2.4% | 32 | 27.5% | 38 | 49.6% | 91 | 258.5% |
| Maintenance Engineer | 248 | 16 | 6.3% | 263 | 323 | 22.8% | 426 | 61.7% | 502 | 90.5% | 1,191 | 352.1% |
| Civil Engineer | 49 | 14 | 28.1% | 62 | 63 | 1.8% | 83 | 33.6% | 97 | 56.9% | 233 | 275.3% |
| Production Engineer | 53 | 19 | 34.8% | 72 | 69 | -3.4% | 91 | 27.1% | 109 | 50.9% | 256 | 255.4% |
| Power distribution Engineer | 133 | 42 | 31.7% | 175 | 174 | -0.4% | 225 | 29.0% | 271 | 55.1% | 637 | 264.3% |
| Construction Engineer | 54 | 10 | 18.6% | 64 | 70 | 10.1% | 92 | 44.1% | 108 | 69.6% | 257 | 304.8% |
| Sales Exec | 109 | 14 | 12.5% | 123 | 144 | 17.2% | 188 | 53.4% | 219 | 78.3% | 519 | 323.5% |
| Marketing Personnel | 100 | 11 | 11.5% | 111 | 130 | 17.3% | 171 | 53.5% | 200 | 79.5% | 482 | 333.3% |
| General Semi Skilled Worker | 248 | 6 | 2.3% | 254 | 326 | 28.6% | 427 | 68.2% | 499 | 96.8% | 1,190 | 368.8% |
| General Labour | 194 | 0 | 0.0% | 194 | 252 | 29.7% | 332 | 70.9% | 393 | 102.7% | 933 | 380.9% |
| Other Employees | 250 | 12 | 4.9% | 263 | 326 | 24.4% | 429 | 63.2% | 499 | 90.2% | 1,201 | 357.6% |
| Administrative workers | 126 | 3 | 2.2% | 129 | 163 | 26.9% | 217 | 69.1% | 255 | 98.4% | 599 | 365.6% |
| **Total** | **2,667** | **275** | **10.3%** | **2,942** | **3,482** | **18.4%** | **4,570** | **55.4%** | **5,381** | **82.9%** | **12,799** | **335.1%** |

## 2.4 Black Country LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Black Country LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 14 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Black Country LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Black Country LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 14: Black Country LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

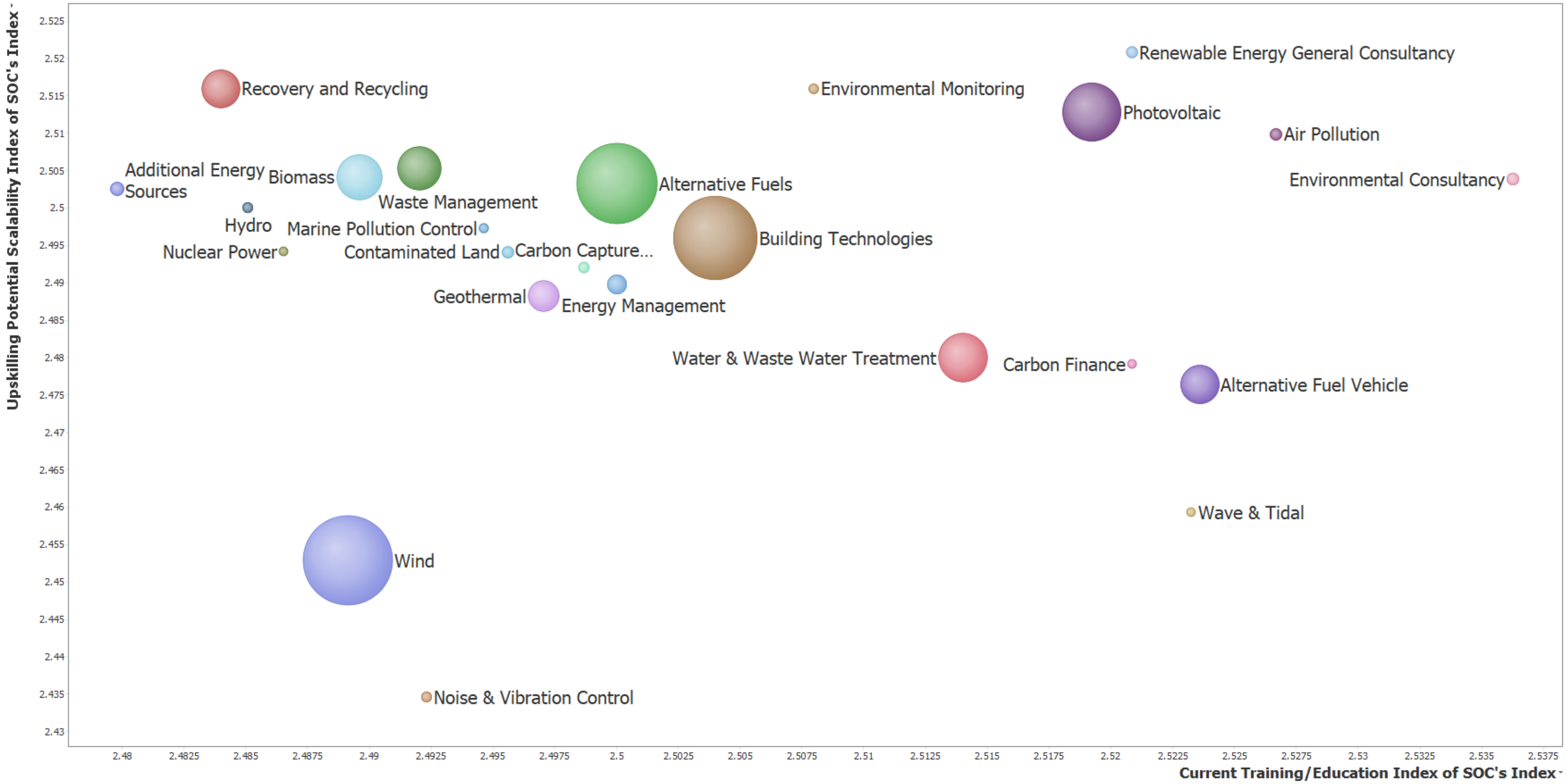



Figure 14 shows that Photovoltaic holds a strong position, with good current training capacity combined with a strong potential for upskilling. Alternative Fuel Vehicle is also strong, along with Building Technologies. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.

## 2.5 Black Country LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Black Country LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

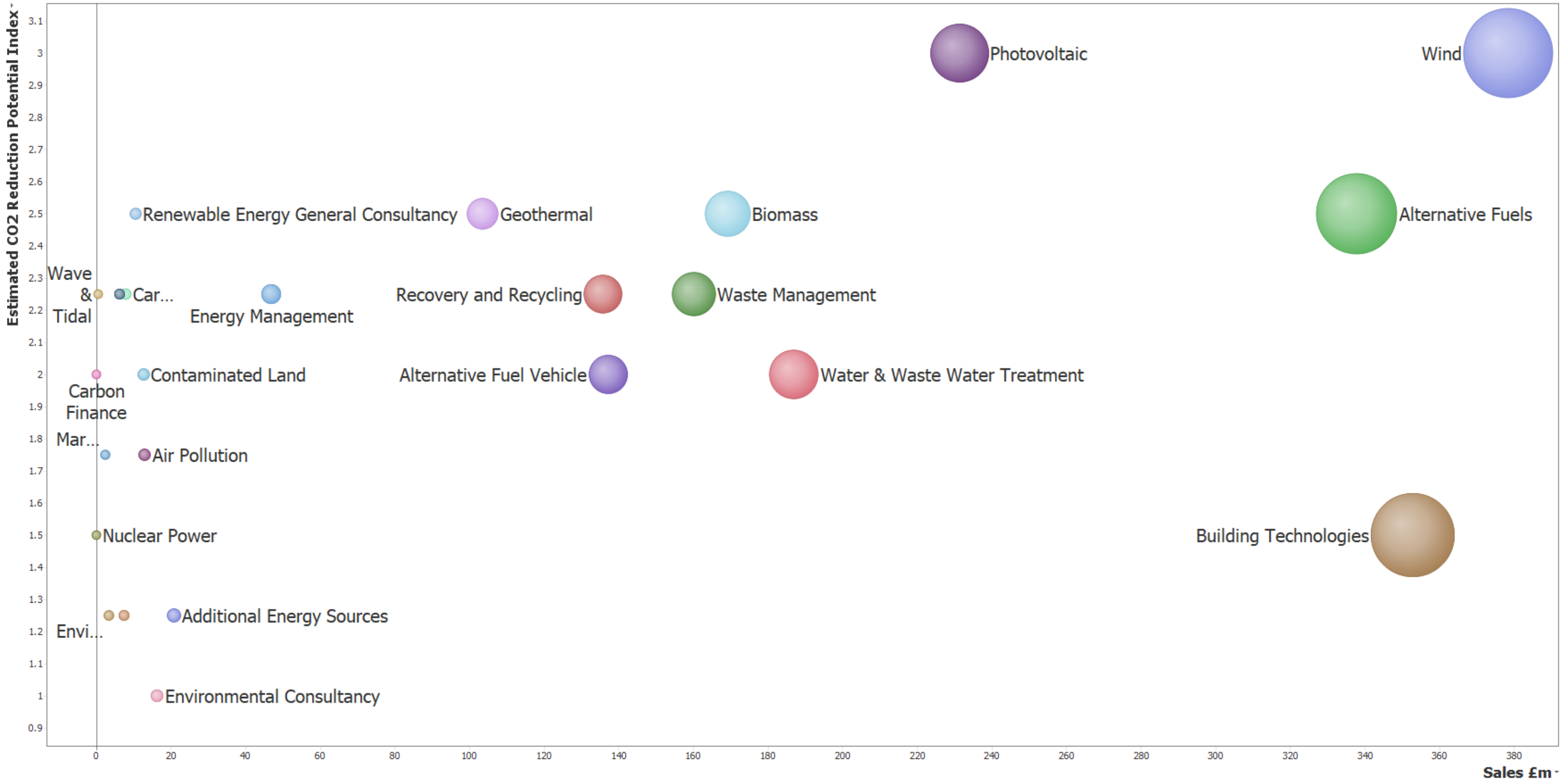
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 15 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors in the graph. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Alternative Fuels having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 15: Black Country LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 3. Growth Forecast for Net Zero in 2030 and 2050 for the Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Coventry and Warwickshire LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 3.1 Coventry and Warwickshire LEP's LCEGS Strengths and Weaknesses

In this section of the report Coventry and Warwickshire LEP's LCEGS performance is compared with the UK as a whole. The Coventry and Warwickshire LEP's LCEGS sector was worth £3.5bn in 2019/20 and accounts for 1.6% of the UK total.

Figure 16 shows how the Coventry and Warwickshire LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 1.6 %. This proportionality factor demonstrates where the Coventry and Warwickshire LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 1.6% of the UK market; above 1 = larger than 1.6% share and below 1 = smaller than 1.6% share.

The y-axis represents the growth rate of the Coventry and Warwickshire LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 16 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric are strengths, because they are close to the expected size of market (1.5 for Contaminated Land and 1.4 for Hydro) and are growing significantly stronger than the UK average (11.5% LEP vs 1.0% UK for Contaminated Land and 11.3% vs. 1.8%Uk for Hydro)

**Figure 16: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

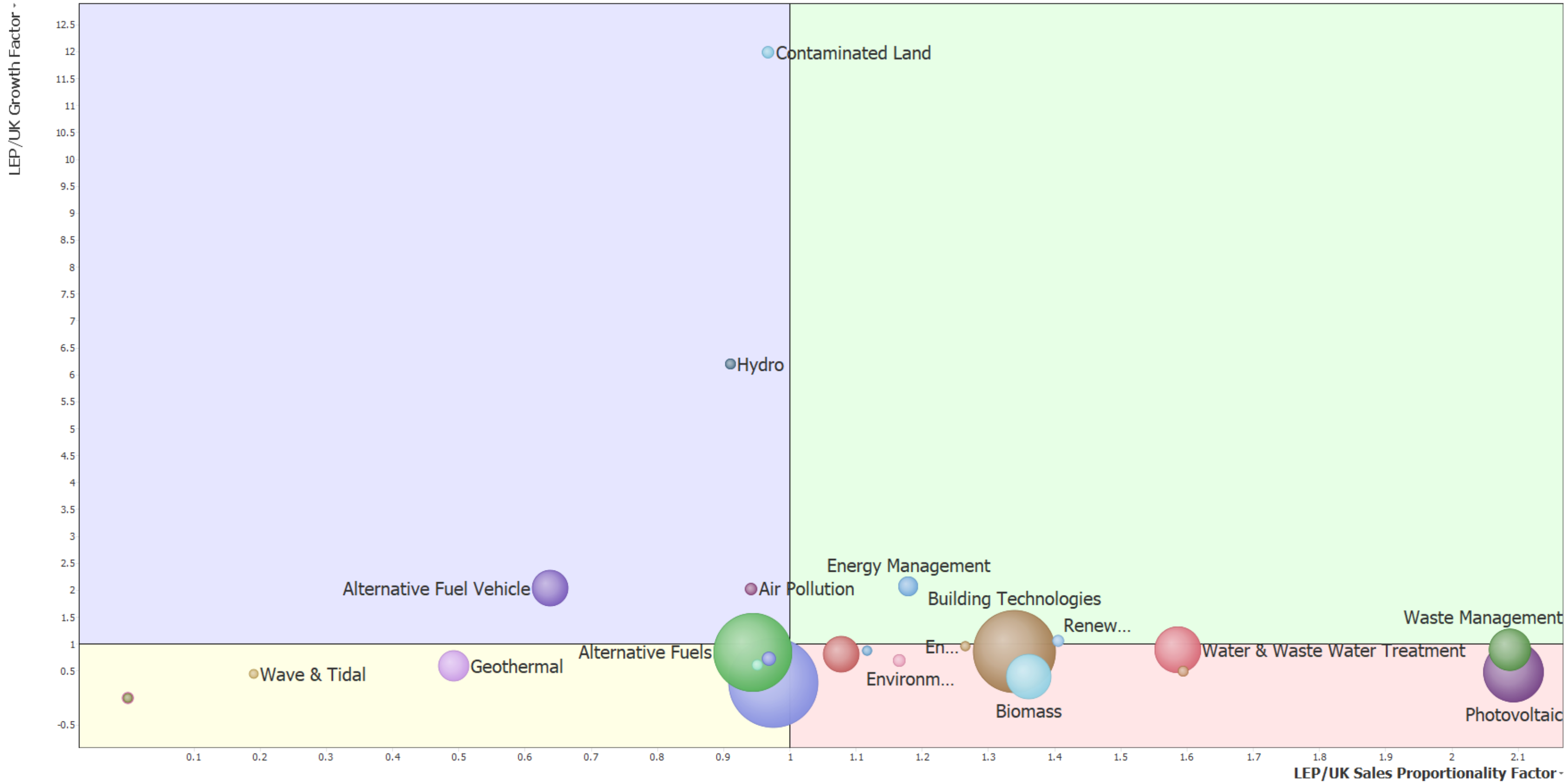
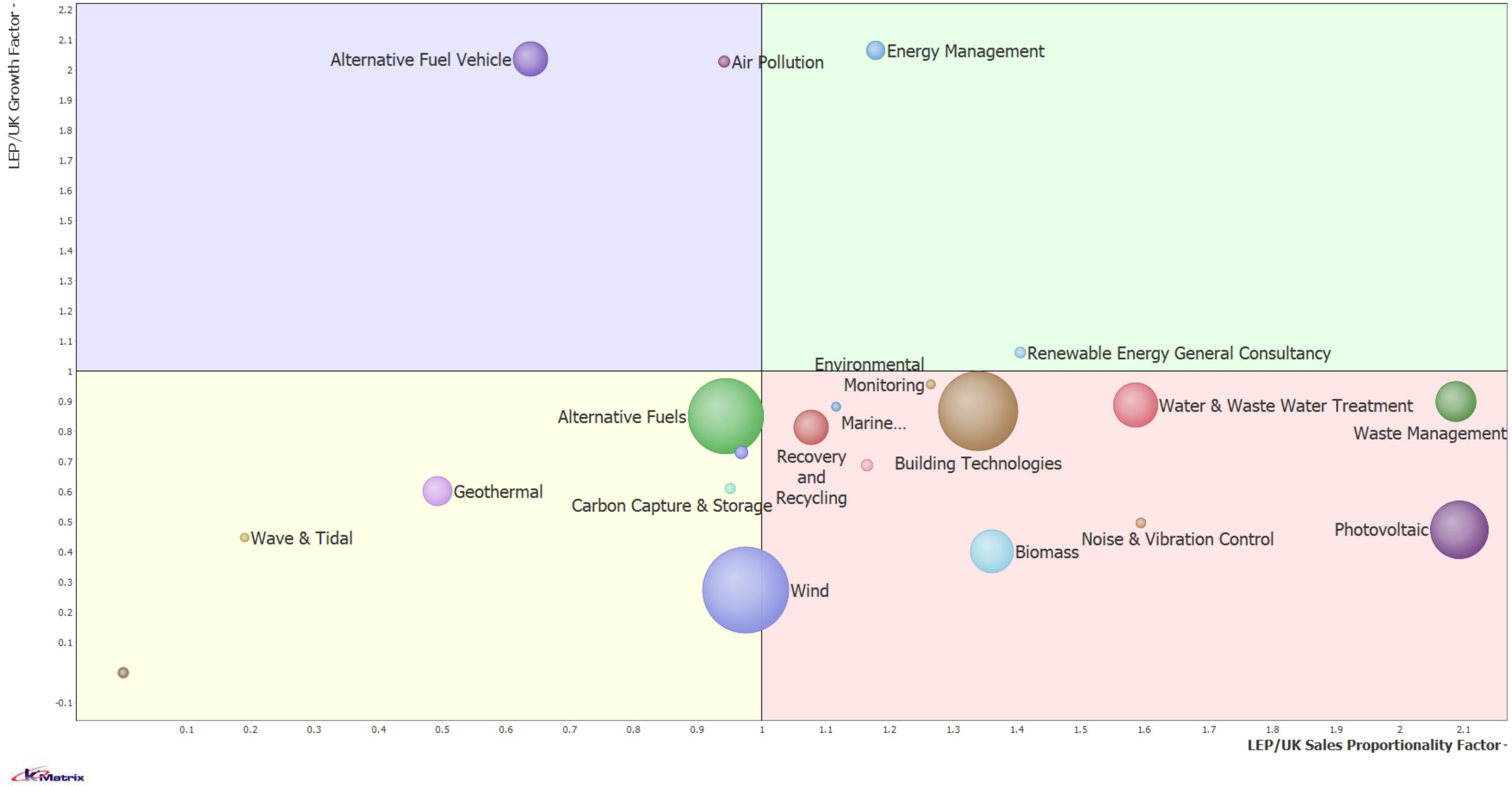


Figure 17 provides the same information as figure 34, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management and Air Pollution have the ideal characteristics of above UK average growth and above LEP average size. Those in the bottom right quadrant (red) hold a larger UK share than the LEP's average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Waste Management, Biomass, Water & Waste Water Treatment and Wind set these sub-sector apart as being strengths. Those in the lower left (yellow) quadrant i.e. Wave & Tidal and Geothermal can be considered relative weaknesses.

**Figure 17: LEP/UK Sales proportionality factor vs LEP/UK Growth factor of Level 2 Sub-sectors, Bubbles Sized by Sales £m, Excluding Contaminated Land and Hydro**



## 3.2 Scalability of Coventry and Warwickshire LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 18 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Coventry and Warwickshire LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Alternative Fuels sub-sector has a good combination of size and scalability, while Environmental Monitoring, Instrumentation and Analysis may be small in terms of market but is highly scalable. Biomass is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Coventry & Warwickshire LEP Market Snapshot report.

**Figure 18: Coventry and Warwickshire LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

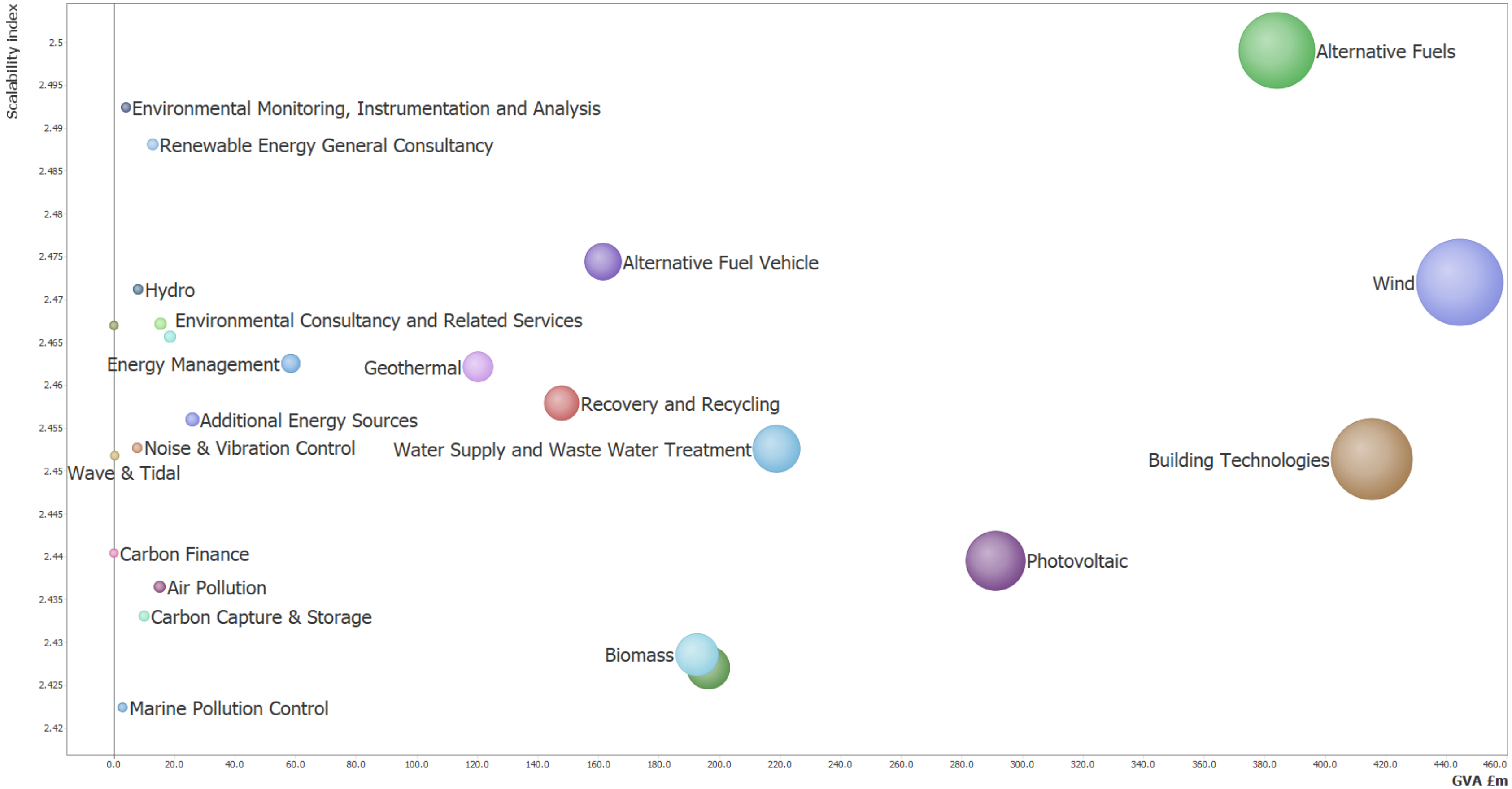
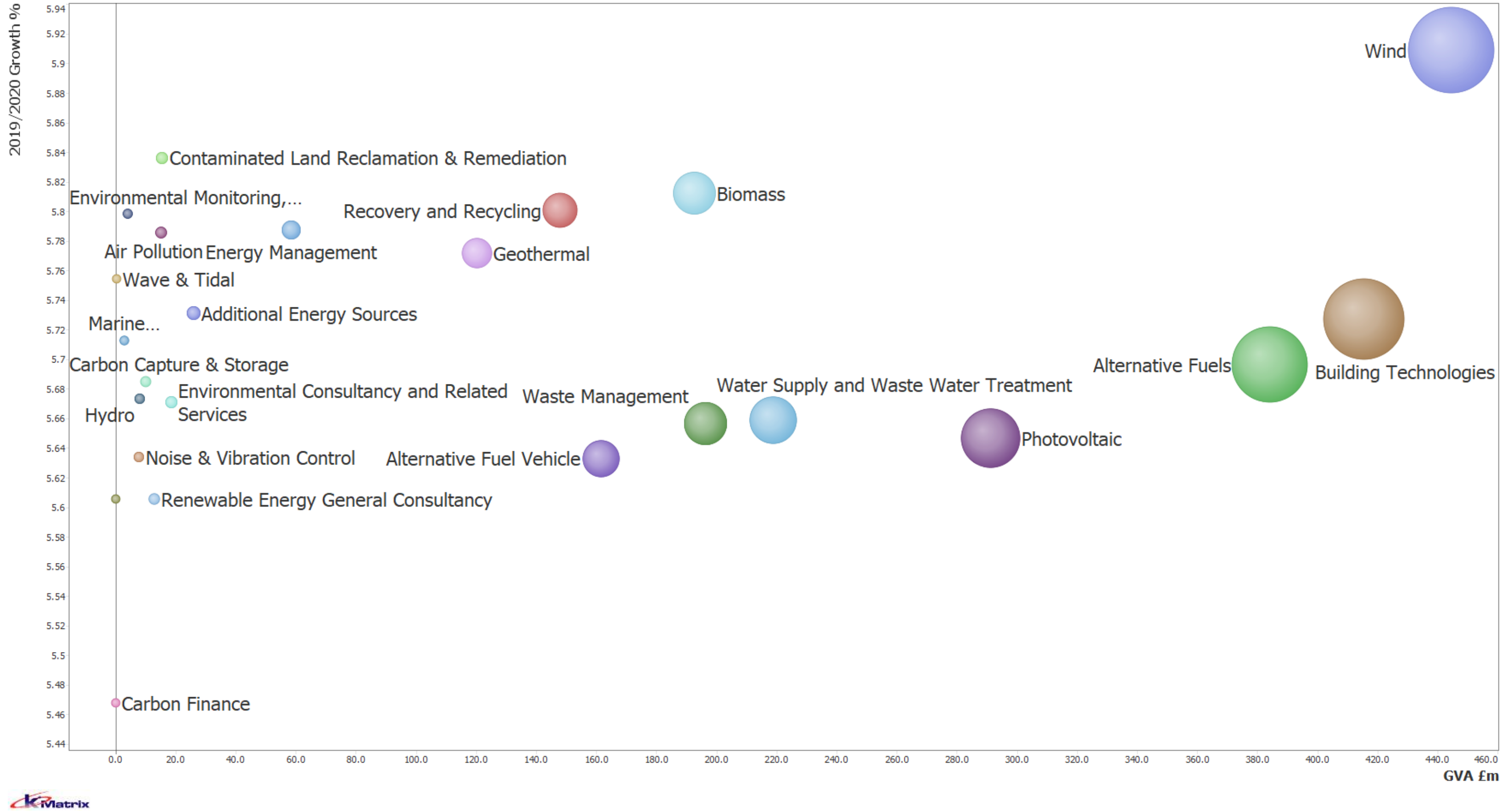


Figure 19 shows the same principle as Figure 18, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies the most favourable position of large size and high growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 19: Coventry and Warwickshire LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

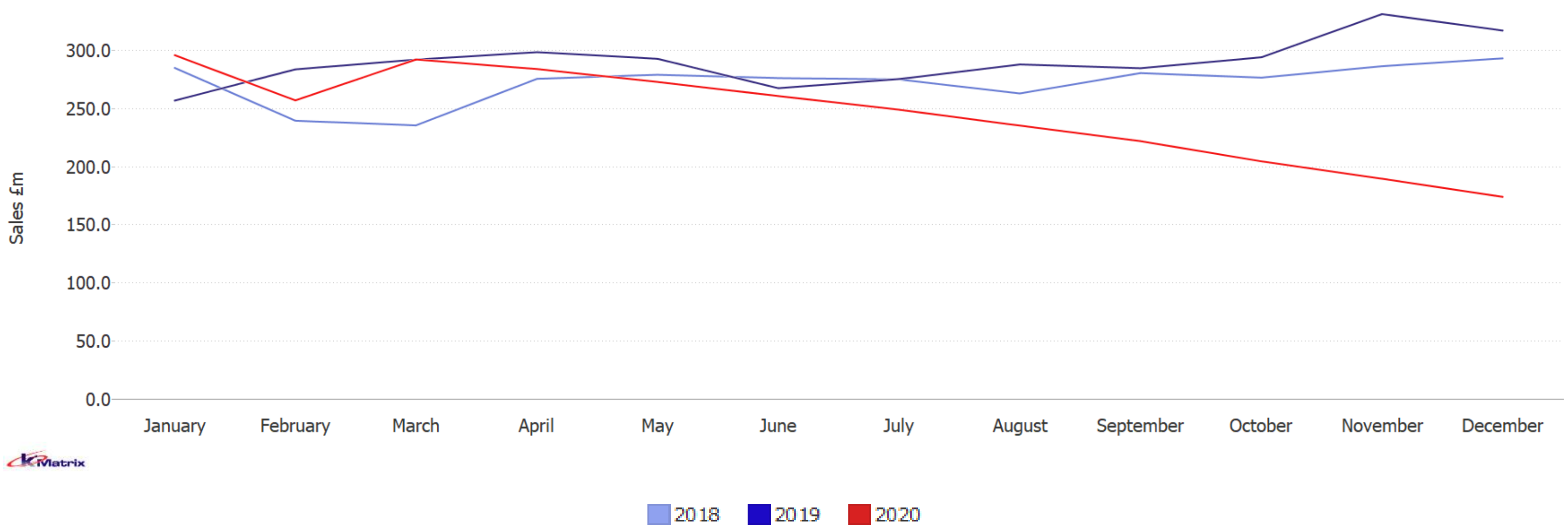


## 3.3 Coventry and Warwickshire LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 20, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Coventry and Warwickshire LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 20: Coventry and Warwickshire LEP LCEGS Sales, by month 2018, 2019 and 2020**

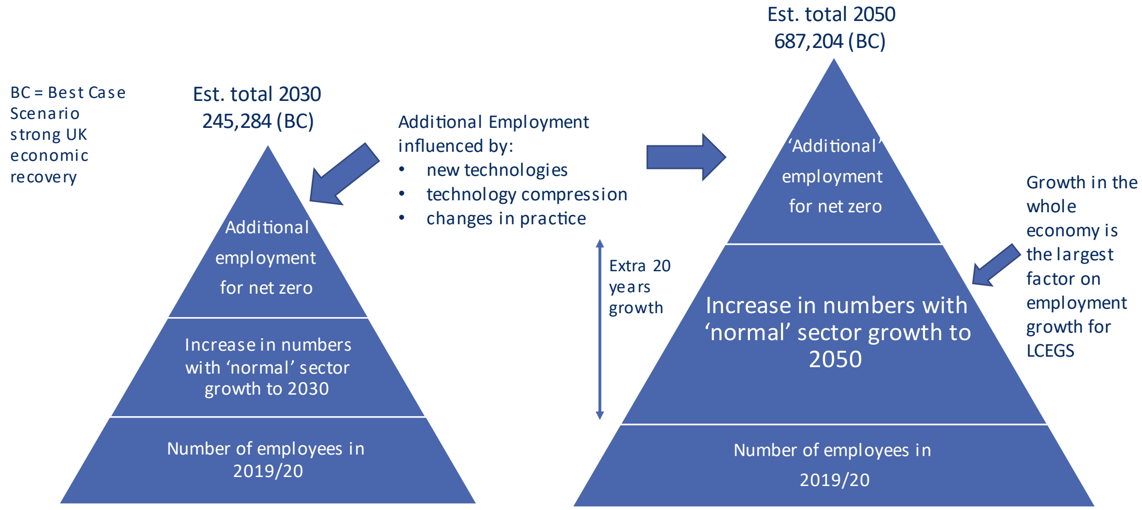


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| ***Timeline for Net Zero*** | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




Employment growth for net zero 2030 — Employment growth for net zero 2050

On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 9 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Coventry and Warwickshire LEP.

Shortage of employees refers to the employees that are ‘imported’ from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not ‘fit’. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as “Other Employees” because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to ‘heads equivalent’, so although for example, there are 6 Educators listed, with a shortage of 2, making a total of 7 in the region, this will equate to over 70 people providing ‘pockets’ of time, to equate to 7 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 9: Coventry and Warwickshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 596 | 132 | 22.1% | 727 | 777 | 6.9% | 1,021 | 40.4% | 1,208 | 66.1% | 2,856 | 292.8% |
| **Snr Management SME** | 1,648 | 165 | 10.0% | 1,813 | 2,151 | 18.6% | 2,826 | 55.8% | 3,345 | 84.5% | 7,918 | 336.7% |
| **Supervisory** | 1,596 | 164 | 10.3% | 1,760 | 2,096 | 19.1% | 2,738 | 55.6% | 3,226 | 83.3% | 7,666 | 335.6% |
| **Middle / Junior Management** | 1,514 | 154 | 10.2% | 1,669 | 1,977 | 18.4% | 2,599 | 55.8% | 3,061 | 83.4% | 7,309 | 338.0% |
| **Designer / Developer** | 202 | 53 | 26.3% | 255 | 264 | 3.6% | 345 | 35.6% | 407 | 60.1% | 966 | 279.5% |
| **Clerical** | 779 | 2 | 0.2% | 781 | 1,018 | 30.3% | 1,332 | 70.5% | 1,580 | 102.3% | 3,732 | 377.9% |
| **Self Employed** | 212 | 27 | 12.8% | 239 | 277 | 16.2% | 363 | 52.1% | 429 | 79.6% | 1,018 | 326.4% |
| **Advisor or Agent** | 145 | 24 | 16.5% | 168 | 189 | 12.4% | 248 | 47.5% | 291 | 72.8% | 692 | 310.7% |
| **Educator** | 6 | 2 | 30.7% | 7 | 7 | 2.4% | 10 | 33.1% | 11 | 55.9% | 27 | 268.0% |
| **Specialist or Consultant** | 807 | 25 | 3.1% | 833 | 1,058 | 27.0% | 1,388 | 66.7% | 1,631 | 95.9% | 3,876 | 365.4% |
| **Editor** | 26 | 1 | 3.9% | 27 | 34 | 25.9% | 45 | 66.4% | 53 | 94.1% | 125 | 363.6% |
| **Industrial Researchers** | 253 | 19 | 7.6% | 273 | 331 | 21.4% | 432 | 58.6% | 512 | 87.9% | 1,215 | 345.8% |
| **Scientist** | 99 | 34 | 34.6% | 133 | 128 | -3.7% | 169 | 27.1% | 200 | 50.4% | 478 | 258.7% |
| **Maintenance Engineer** | 1,807 | 114 | 6.3% | 1,921 | 2,361 | 22.9% | 3,099 | 61.4% | 3,647 | 89.8% | 8,644 | 350.0% |
| **Civil Engineer** | 133 | 35 | 26.4% | 168 | 175 | 3.7% | 229 | 35.8% | 269 | 60.0% | 638 | 279.3% |
| **Production Engineer** | 291 | 100 | 34.4% | 391 | 382 | -2.3% | 499 | 27.8% | 591 | 51.2% | 1,394 | 257.0% |
| **Power distribution Engineer** | 849 | 252 | 29.6% | 1,101 | 1,109 | 0.7% | 1,454 | 32.0% | 1,721 | 56.3% | 4,070 | 269.7% |
| **Construction Engineer** | 182 | 31 | 17.0% | 213 | 237 | 11.7% | 312 | 46.7% | 367 | 72.7% | 871 | 309.8% |
| **Sales Exec** | 815 | 93 | 11.4% | 907 | 1,068 | 17.7% | 1,390 | 53.3% | 1,646 | 81.4% | 3,911 | 331.1% |
| **Marketing Personnel** | 756 | 86 | 11.3% | 841 | 988 | 17.5% | 1,298 | 54.3% | 1,525 | 81.3% | 3,635 | 332.1% |
| **General Semi Skilled Worker** | 1,892 | 40 | 2.1% | 1,932 | 2,478 | 28.3% | 3,249 | 68.2% | 3,813 | 97.4% | 9,083 | 370.2% |
| **General Labour** | 2,079 | 0 | 0.0% | 2,079 | 2,717 | 30.7% | 3,567 | 71.5% | 4,206 | 102.3% | 10,020 | 381.9% |
| **Other Employees** | 1,895 | 96 | 5.1% | 1,991 | 2,474 | 24.3% | 3,246 | 63.0% | 3,819 | 91.8% | 9,113 | 357.7% |
| **Administrative workers** | 875 | 18 | 2.1% | 893 | 1,146 | 28.3% | 1,506 | 68.6% | 1,767 | 97.8% | 4,202 | 370.4% |
| **Total** | **19,455** | **1,667** | **8.6%** | **21,122** | **25,445** | **20.5%** | **33,366** | **58.0%** | **39,326** | **86.2%** | **93,460** | **342.5%** |

Table 9 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 34.4% (MEH 35.7%), Power Distribution Engineer 29.6% (MEH 29.8%) and Technicians 22.1% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.3% (MEH 6.3%), Specialist or Consultant 3.1% (MEH 3.3%) and Administrative Workers 2.1% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.5% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 58.0% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 86.2% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 342.5% (MEH 342.4%)

Tables 10, 11 and 12 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.2% (MEH 10.5%)
Renewable Energy – 7.1% (MEH 7.0%)
Environmental – 10.0% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 43.9% (MEH 47.3%); Renewable Energy 27.8% (MEH 27.9%) and Environmental 34.4% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 32.9% (MEH 33.7%); Renewable Energy 27.2% (MEH 27.1%) and Environmental 32.2% (MEH 32.6%)
Technicians: Low Carbon 28.0% (MEH 27.9%); Renewable Energy 17.3% (MEH 17.3%) and Environmental 22.5% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 69.6% (MEH 68.8%), but only 13.1% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 19.7% (MEH 17.0%); Renewable Energy 34.2% (MEH 34.5%) and Environmental 27.8% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 27.9% (MEH 28.1%); Renewable Energy 34.6% (MEH 35.1%) and Environmental 29.9% (MEH 29.3%)
Technicians of: Low Carbon 34.3% (MEH 34.2%); Renewable Energy 45.8% (MEH 45.9%) and Environmental 39.9% (MEH 39.6%)

**Table 10: Coventry and Warwickshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 185 | 52 | 28.0% | 237 | 242 | 1.8% | 319 | 34.3% | 377 | 59.1% | 884 | 272.6% |
| **Snr Management SME** | 388 | 46 | 11.9% | 434 | 507 | 16.8% | 663 | 52.8% | 794 | 82.8% | 1,867 | 330.2% |
| **Supervisory** | 390 | 48 | 12.3% | 438 | 514 | 17.4% | 669 | 52.9% | 787 | 79.8% | 1,873 | 328.0% |
| **Middle / Junior Management** | 370 | 46 | 12.5% | 417 | 485 | 16.3% | 633 | 51.9% | 750 | 80.1% | 1,783 | 328.0% |
| **Designer / Developer** | 50 | 15 | 28.9% | 65 | 66 | 1.1% | 86 | 32.2% | 102 | 56.7% | 241 | 272.2% |
| **Clerical** | 193 | 0 | 0.2% | 194 | 253 | 30.5% | 330 | 70.6% | 393 | 102.9% | 929 | 380.1% |
| **Self Employed** | 75 | 12 | 16.3% | 87 | 99 | 13.7% | 128 | 47.3% | 151 | 73.9% | 360 | 314.4% |
| **Advisor or Agent** | 71 | 12 | 16.4% | 82 | 93 | 12.7% | 122 | 48.2% | 143 | 73.4% | 338 | 310.4% |
| **Educator** | 0 | 0 | 22.7% | 0 | 0 | 9.6% | 0 | 41.7% | 1 | 65.1% | 1 | 282.8% |
| **Specialist or Consultant** | 212 | 8 | 3.6% | 219 | 279 | 27.4% | 365 | 66.6% | 427 | 95.0% | 1,014 | 362.7% |
| **Editor** | 6 | 0 | 4.0% | 6 | 7 | 24.4% | 10 | 66.6% | 11 | 93.4% | 28 | 369.0% |
| **Industrial Researchers** | 142 | 11 | 7.7% | 153 | 186 | 21.4% | 243 | 58.6% | 288 | 87.7% | 684 | 345.9% |
| **Scientist** | 65 | 23 | 35.1% | 88 | 84 | -4.3% | 111 | 26.3% | 132 | 50.5% | 314 | 257.3% |
| **Maintenance Engineer** | 438 | 35 | 7.9% | 473 | 576 | 21.9% | 748 | 58.3% | 883 | 86.8% | 2,089 | 342.0% |
| **Civil Engineer** | 31 | 9 | 30.0% | 40 | 40 | 0.9% | 53 | 31.6% | 62 | 55.5% | 148 | 270.0% |
| **Production Engineer** | 85 | 38 | 43.9% | 123 | 112 | -8.7% | 147 | 19.7% | 175 | 42.5% | 409 | 232.9% |
| **Power distribution Engineer** | 177 | 58 | 32.9% | 235 | 233 | -1.1% | 301 | 27.9% | 358 | 52.3% | 858 | 264.6% |
| **Construction Engineer** | 38 | 8 | 20.4% | 45 | 50 | 9.6% | 65 | 42.7% | 76 | 68.5% | 181 | 297.8% |
| **Sales Exec** | 240 | 34 | 14.2% | 274 | 313 | 13.9% | 409 | 49.2% | 488 | 77.7% | 1,156 | 321.1% |
| **Marketing Personnel** | 228 | 34 | 14.9% | 262 | 298 | 13.7% | 391 | 49.3% | 461 | 75.8% | 1,099 | 319.7% |
| **General Semi Skilled Worker** | 473 | 12 | 2.5% | 485 | 619 | 27.8% | 814 | 68.0% | 950 | 96.0% | 2,276 | 369.7% |
| **General Labour** | 702 | 0 | 0.0% | 702 | 920 | 31.0% | 1,196 | 70.4% | 1,428 | 103.4% | 3,373 | 380.5% |
| **Other Employees** | 448 | 28 | 6.2% | 476 | 583 | 22.5% | 771 | 62.0% | 916 | 92.3% | 2,155 | 352.8% |
| **Administrative workers** | 231 | 6 | 2.6% | 237 | 303 | 27.7% | 395 | 66.8% | 468 | 97.4% | 1,105 | 366.5% |
| **Total** | **5,238** | **534** | **10.2%** | **5,772** | **6,859** | **18.8%** | **8,970** | **55.4%** | **10,620** | **84.0%** | **25,166** | **336.0%** |

**Table 11: Coventry and Warwickshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 241 | 42 | 17.3% | 283 | 314 | 11.3% | 412 | 45.8% | 488 | 72.6% | 1,159 | 310.3% |
| Snr Management SME | 942 | 86 | 9.2% | 1,028 | 1,227 | 19.4% | 1,615 | 57.1% | 1,907 | 85.5% | 4,504 | 338.1% |
| Supervisory | 888 | 83 | 9.4% | 972 | 1,166 | 20.0% | 1,522 | 56.7% | 1,800 | 85.2% | 4,270 | 339.5% |
| Middle / Junior Management | 842 | 76 | 9.1% | 918 | 1,099 | 19.6% | 1,450 | 57.8% | 1,698 | 84.8% | 4,068 | 342.9% |
| Designer / Developer | 60 | 13 | 21.7% | 73 | 78 | 7.7% | 102 | 40.4% | 121 | 66.4% | 286 | 292.9% |
| Clerical | 429 | 1 | 0.2% | 430 | 560 | 30.4% | 733 | 70.5% | 871 | 102.5% | 2,045 | 375.8% |
| Self Employed | 55 | 5 | 9.3% | 61 | 73 | 19.9% | 95 | 56.3% | 112 | 84.9% | 266 | 338.7% |
| Advisor or Agent | 18 | 3 | 17.9% | 21 | 24 | 10.3% | 31 | 45.7% | 36 | 70.9% | 86 | 305.2% |
| Educator | 0 | 0 | 11.0% | 0 | 0 | 15.3% | 0 | 58.2% | 0 | 91.6% | 0 | 320.8% |
| Specialist or Consultant | 412 | 12 | 2.8% | 423 | 537 | 26.9% | 709 | 67.4% | 832 | 96.4% | 1,978 | 367.1% |
| Editor | 6 | 0 | 3.4% | 6 | 8 | 26.2% | 11 | 67.1% | 12 | 96.0% | 29 | 366.8% |
| Industrial Researchers | 29 | 2 | 7.1% | 31 | 38 | 22.1% | 50 | 59.6% | 59 | 88.6% | 140 | 349.9% |
| Scientist | 10 | 3 | 29.9% | 12 | 12 | 0.0% | 16 | 32.0% | 19 | 53.4% | 46 | 274.1% |
| Maintenance Engineer | 960 | 54 | 5.6% | 1,015 | 1,253 | 23.5% | 1,651 | 62.7% | 1,935 | 90.7% | 4,594 | 352.9% |
| Civil Engineer | 31 | 7 | 21.1% | 37 | 41 | 8.9% | 53 | 41.9% | 62 | 67.3% | 147 | 295.2% |
| Production Engineer | 123 | 34 | 27.8% | 157 | 162 | 2.8% | 211 | 34.2% | 250 | 58.6% | 592 | 276.2% |
| Power distribution Engineer | 467 | 127 | 27.2% | 595 | 609 | 2.4% | 801 | 34.6% | 947 | 59.3% | 2,227 | 274.4% |
| Construction Engineer | 61 | 8 | 12.9% | 68 | 78 | 14.8% | 104 | 51.7% | 122 | 79.0% | 290 | 324.3% |
| Sales Exec | 407 | 38 | 9.4% | 446 | 537 | 20.4% | 696 | 56.3% | 823 | 84.7% | 1,957 | 339.1% |
| Marketing Personnel | 383 | 35 | 9.2% | 419 | 501 | 19.8% | 658 | 57.2% | 775 | 85.0% | 1,844 | 340.4% |
| General Semi Skilled Worker | 991 | 19 | 1.9% | 1,009 | 1,299 | 28.7% | 1,702 | 68.7% | 2,002 | 98.3% | 4,772 | 372.9% |
| General Labour | 1,097 | 0 | 0.0% | 1,097 | 1,430 | 30.4% | 1,888 | 72.1% | 2,211 | 101.6% | 5,297 | 382.9% |
| Other Employees | 1,053 | 48 | 4.6% | 1,101 | 1,378 | 25.2% | 1,800 | 63.5% | 2,107 | 91.4% | 5,057 | 359.3% |
| Administrative workers | 448 | 8 | 1.8% | 456 | 587 | 28.6% | 773 | 69.5% | 904 | 98.3% | 2,151 | 371.7% |
| **Total** | **9,953** | **705** | **7.1%** | **10,658** | **13,012** | **22.1%** | **17,081** | **60.3%** | **20,092** | **88.5%** | **47,806** | **348.5%** |

**Table 12: Coventry and Warwickshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 169 | 38 | 22.5% | 208 | 221 | 6.6% | 290 | 39.9% | 343 | 65.2% | 813 | 291.9% |
| Snr Management SME | 319 | 33 | 10.2% | 351 | 417 | 18.9% | 548 | 55.9% | 645 | 83.6% | 1,547 | 340.4% |
| Supervisory | 318 | 32 | 10.2% | 351 | 416 | 18.8% | 546 | 55.7% | 640 | 82.5% | 1,523 | 334.5% |
| Middle / Junior Management | 302 | 32 | 10.5% | 334 | 393 | 17.8% | 517 | 54.8% | 613 | 83.7% | 1,458 | 336.9% |
| Designer / Developer | 92 | 25 | 27.8% | 117 | 120 | 2.5% | 157 | 34.5% | 185 | 58.0% | 439 | 275.2% |
| Clerical | 157 | 0 | 0.2% | 157 | 205 | 30.0% | 269 | 70.6% | 316 | 101.0% | 757 | 381.0% |
| Self Employed | 81 | 10 | 12.0% | 91 | 106 | 16.2% | 140 | 53.9% | 165 | 81.5% | 392 | 329.6% |
| Advisor or Agent | 56 | 9 | 16.2% | 65 | 73 | 12.7% | 95 | 47.1% | 112 | 72.7% | 268 | 312.9% |
| Educator | 5 | 2 | 31.1% | 7 | 7 | 2.0% | 9 | 32.7% | 11 | 55.5% | 25 | 267.3% |
| Specialist or Consultant | 184 | 6 | 3.4% | 190 | 242 | 26.9% | 315 | 65.4% | 372 | 95.7% | 884 | 364.6% |
| Editor | 14 | 1 | 4.0% | 15 | 19 | 26.3% | 25 | 66.0% | 29 | 93.6% | 68 | 360.1% |
| Industrial Researchers | 82 | 6 | 7.5% | 88 | 107 | 21.2% | 139 | 58.3% | 165 | 87.8% | 391 | 344.3% |
| Scientist | 24 | 9 | 35.0% | 33 | 32 | -3.5% | 42 | 27.1% | 49 | 49.2% | 118 | 256.7% |
| Maintenance Engineer | 408 | 25 | 6.2% | 434 | 533 | 22.9% | 701 | 61.6% | 828 | 91.1% | 1,961 | 352.3% |
| Civil Engineer | 72 | 19 | 27.2% | 91 | 94 | 2.9% | 123 | 35.1% | 145 | 59.0% | 343 | 276.8% |
| Production Engineer | 82 | 28 | 34.4% | 110 | 108 | -2.4% | 141 | 27.8% | 166 | 50.3% | 393 | 256.6% |
| Power distribution Engineer | 205 | 66 | 32.2% | 271 | 267 | -1.4% | 352 | 29.9% | 416 | 53.3% | 985 | 263.6% |
| Construction Engineer | 83 | 15 | 18.4% | 99 | 109 | 10.4% | 143 | 45.0% | 168 | 70.2% | 400 | 305.2% |
| Sales Exec | 167 | 20 | 12.0% | 187 | 219 | 16.9% | 284 | 52.1% | 335 | 79.2% | 799 | 326.9% |
| Marketing Personnel | 144 | 17 | 11.5% | 161 | 189 | 17.9% | 249 | 55.0% | 290 | 80.5% | 691 | 330.4% |
| General Semi Skilled Worker | 429 | 10 | 2.2% | 438 | 560 | 27.9% | 733 | 67.2% | 862 | 96.6% | 2,035 | 364.6% |
| General Labour | 281 | 0 | 0.0% | 281 | 367 | 30.9% | 482 | 71.9% | 568 | 102.2% | 1,351 | 381.3% |
| Other Employees | 394 | 20 | 5.1% | 414 | 513 | 24.0% | 676 | 63.2% | 797 | 92.4% | 1,901 | 359.1% |
| Administrative workers | 196 | 4 | 2.2% | 200 | 257 | 28.3% | 338 | 68.9% | 395 | 97.4% | 945 | 372.1% |
| **Total** | **4,265** | **428** | **10.0%** | **4,692** | **5,574** | **18.8%** | **7,314** | **55.9%** | **8,615** | **83.6%** | **20,489** | **336.7%** |

## 3.4 Coventry and Warwickshire LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Coventry and Warwickshire LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 21 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Coventry and Warwickshire LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Coventry and Warwickshire LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 21: Coventry and Warwickshire LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

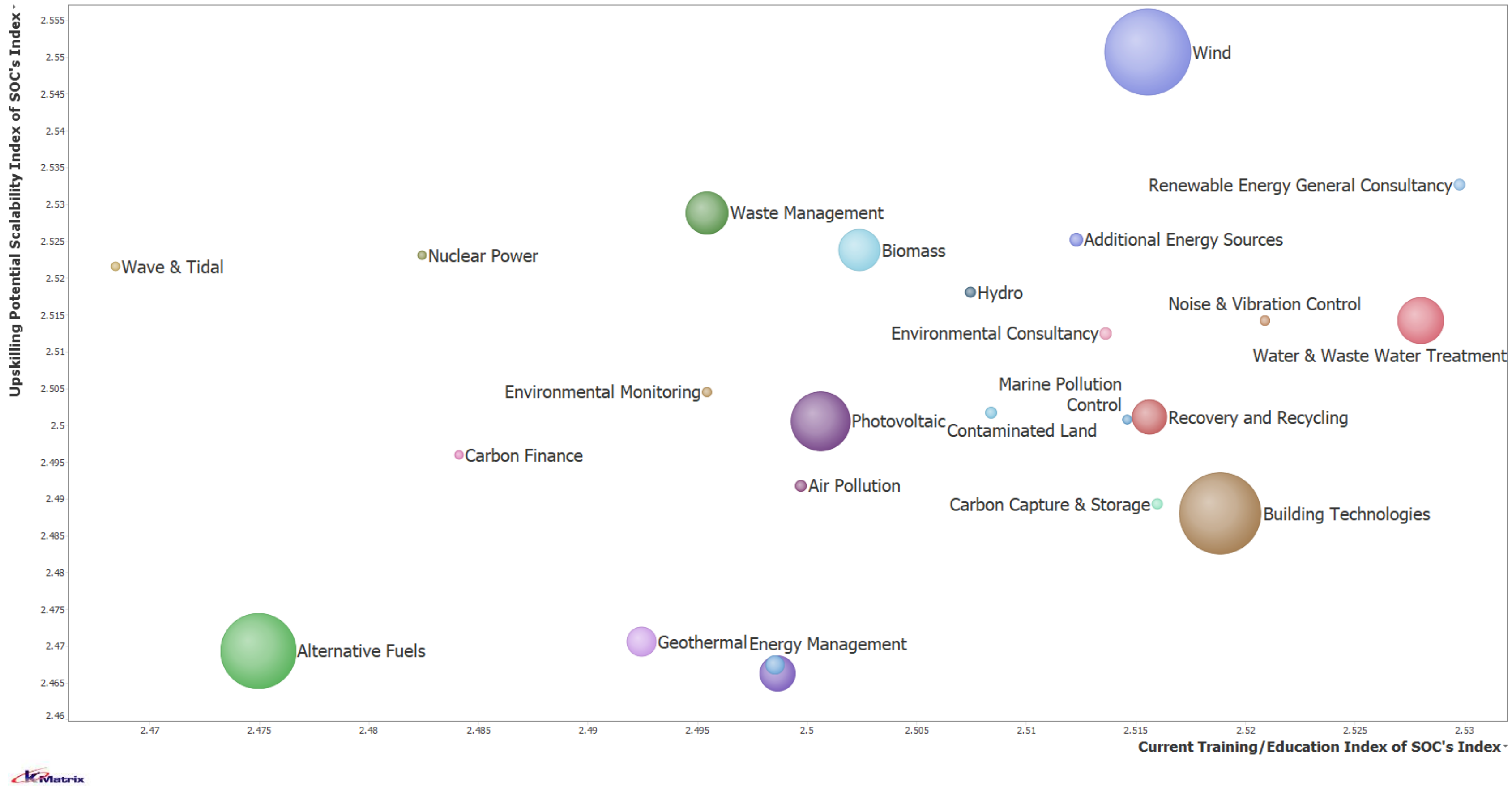



Figure 21 shows that Wind holds a strong position, with good current training capacity combined with a strong potential for upskilling. Water and Waste Water Treatment also holds a strong position with high training capacity and good upskilling potential. Alternative Fuels holds the least favourable position.

## 3.5 Coventry and Warwickshire LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Coventry and Warwickshire LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

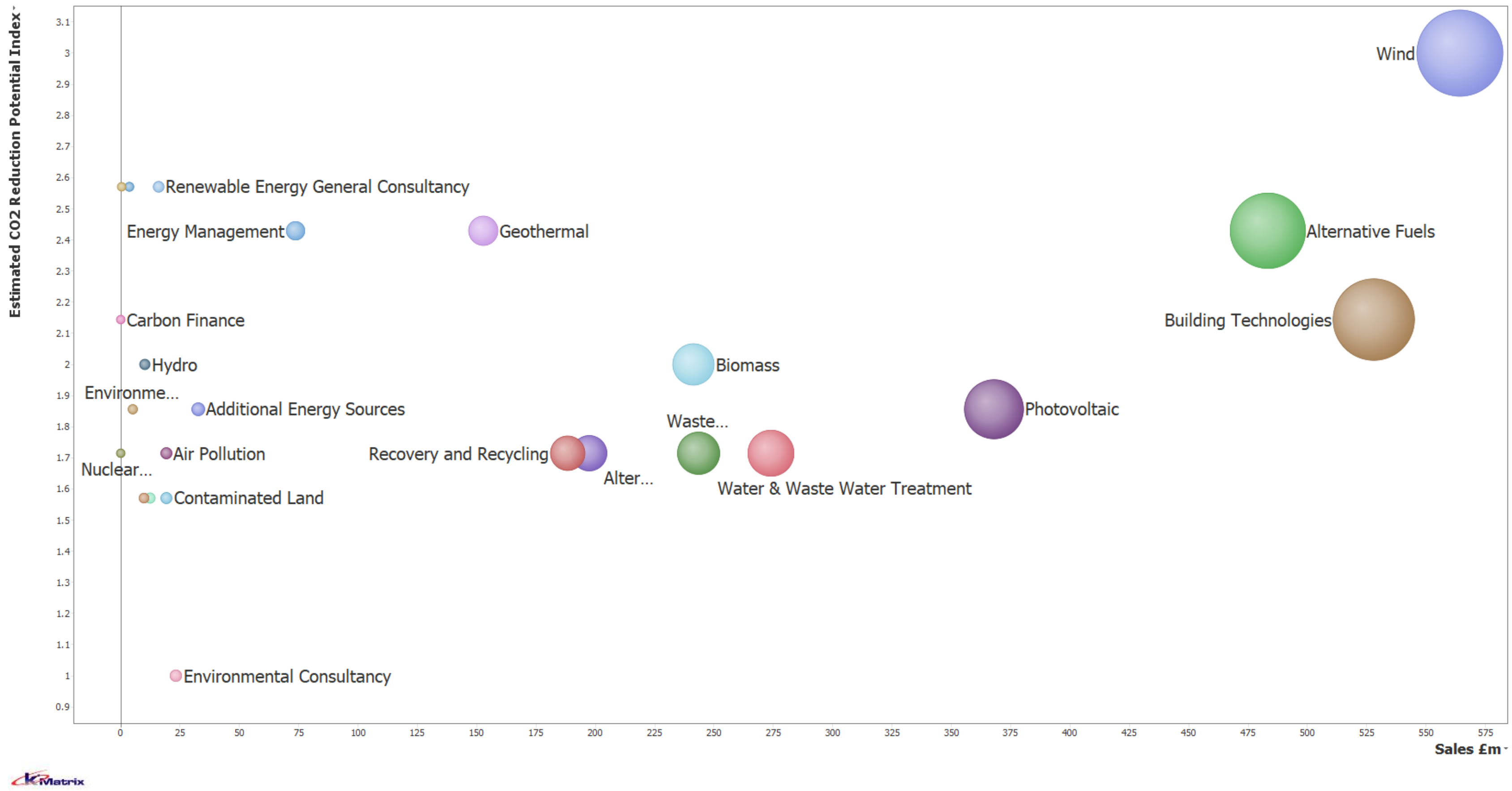
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 22 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Alternative Fuels having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 22: Coventry and Warwickshire LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 4. Growth Forecast for Net Zero in 2030 and 2050 for the D2N2 LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the D2N2 LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 4.1 D2N2 LEP's LCEGS Strengths and Weaknesses

In this section of the report D2N2 LEP's LCEGS performance is compared with the UK as a whole. The D2N2 LEP's LCEGS sector was worth £5.3bn in 2019/20 and accounts for 2.4% of the UK total.

Figure 23 shows how the D2N2 LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 2.4%. This proportionality factor demonstrates where the D2N2 LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 2.4% of the UK market; above 1 = larger than 2.4% share and below 1 = smaller than 2.4% share.

The y-axis represents the growth rate of the D2N2 LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 23 clearly illustrates the strong growth of the three relatively small sub-sectors, Nuclear, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric are strengths, because they are both above the expected size of market (2.2 for Contaminated Land and 2.4 for Hydro) and are growing significantly stronger than the UK average (11.5% LEP vs. 1.0% UK for Contaminated Land and 11.3% vs. 1.8% UK for Hydro)

**Figure 23: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

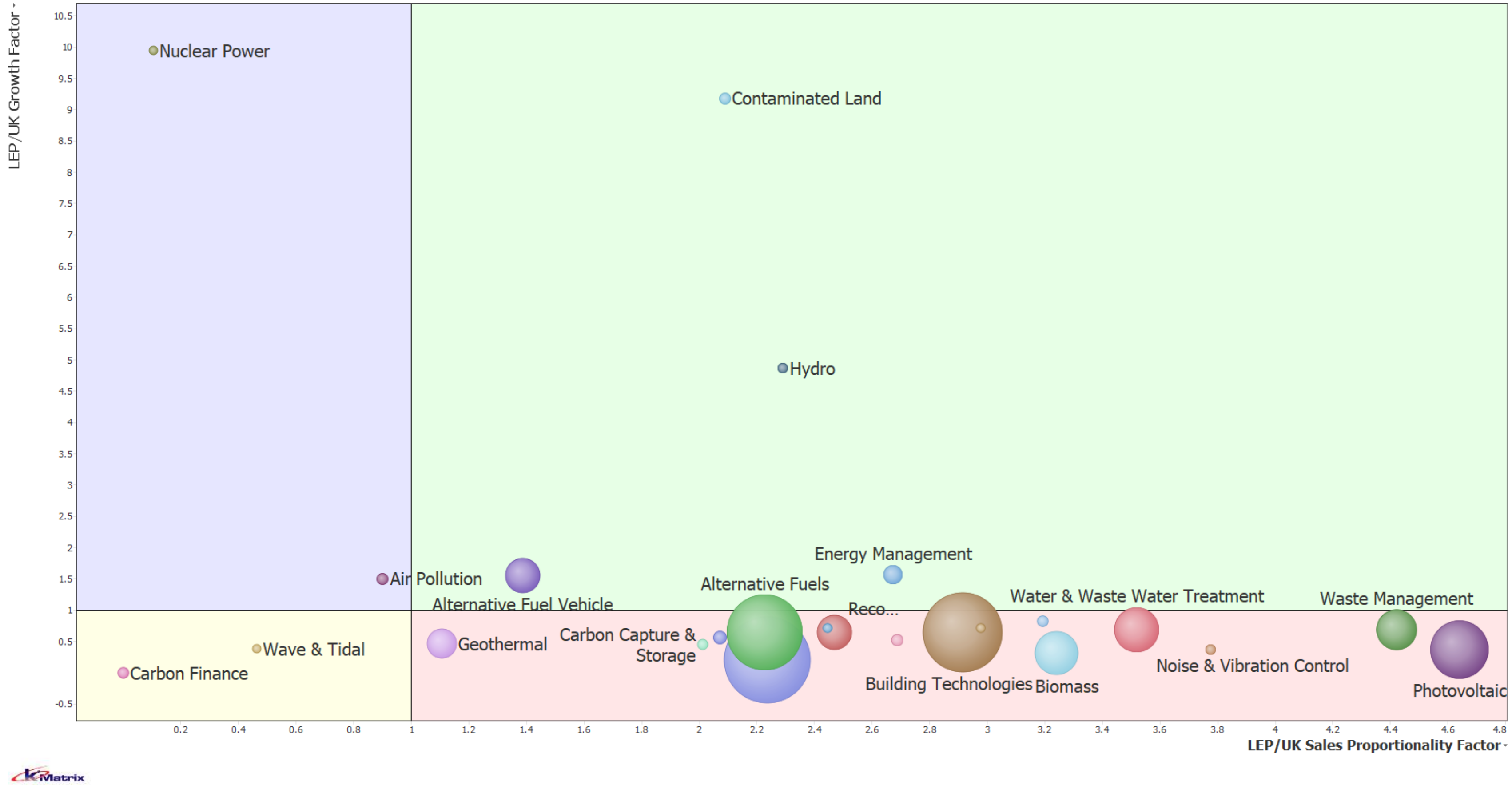
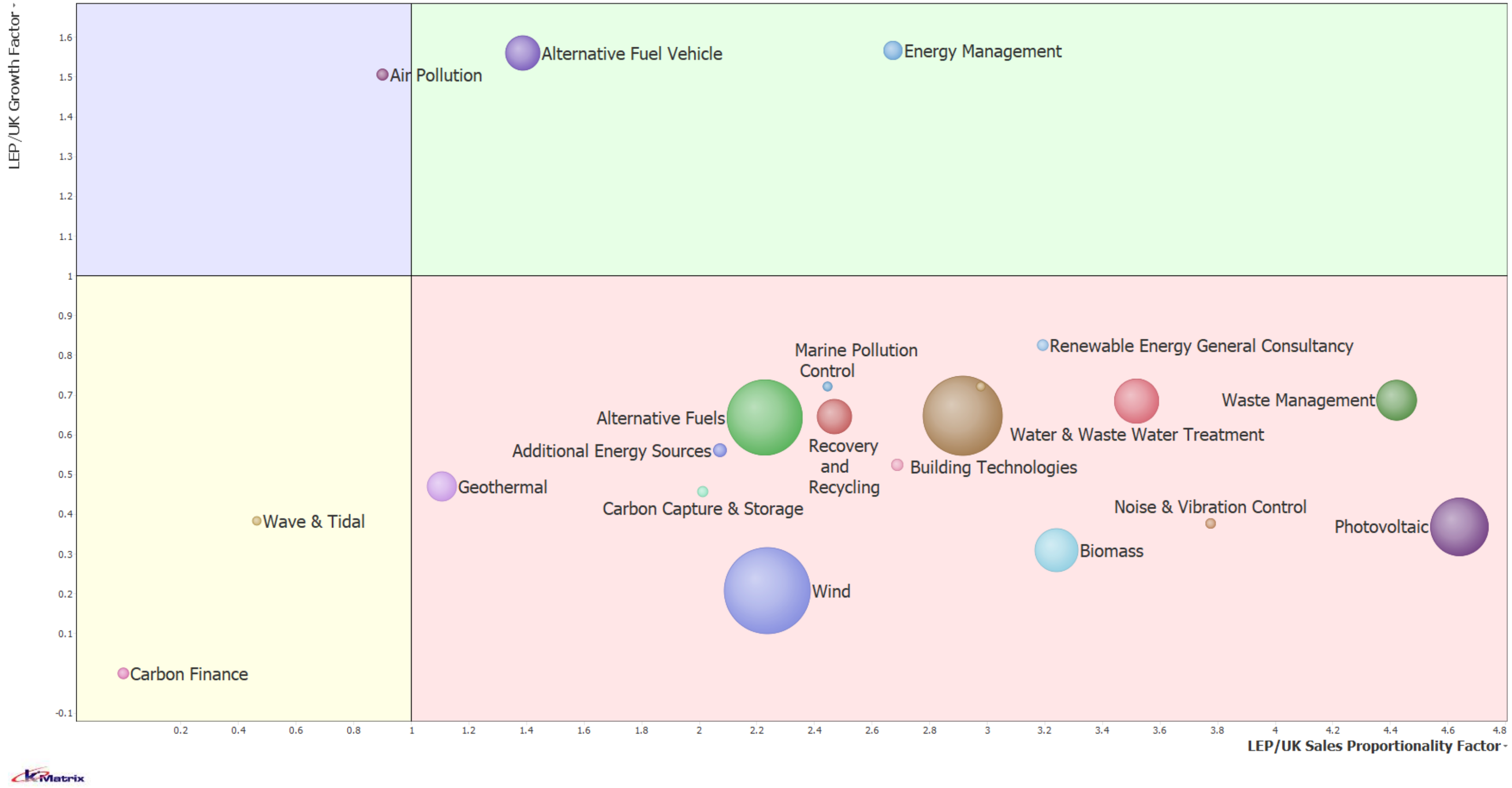


Figure 24 provides the same information as figure 23, but with Contaminated Land, Nuclear and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management and Alternative Fuel Vehicle have the ideal characteristics of above UK average growth and above LEP average size. Those in the bottom right quadrant (red) hold a larger UK share than the LEP's average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Alternative Fuels, Waste Management, Biomass and Wind set these sub-sector apart as being strengths. Those in the lower left (yellow) quadrant i.e. Wave & tidal and Carbon Finance can be considered relative weaknesses.

**Figure 24: LEP/UK Sales proportionality factor vs LEP/UK Growth factor of Level 2 Sub-sectors, Bubbles Sized by Sales £m, Excluding Contaminated Land, Nuclear and Hydro**



## 4.2 Scalability of D2N2 LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 25 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the D2N2 LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Alternative Fuels sub-sector has a good combination of size and scalability, while Renewable Energy General Consultancy may be small in terms of market but is highly scalable. Biomass is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the D2N2 Market Snapshot report. Wind, Waste Management, Energy Management and Alternative Fuel Vehicles are in a stronger position than the regional average.

**Figure 25: D2N2 LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

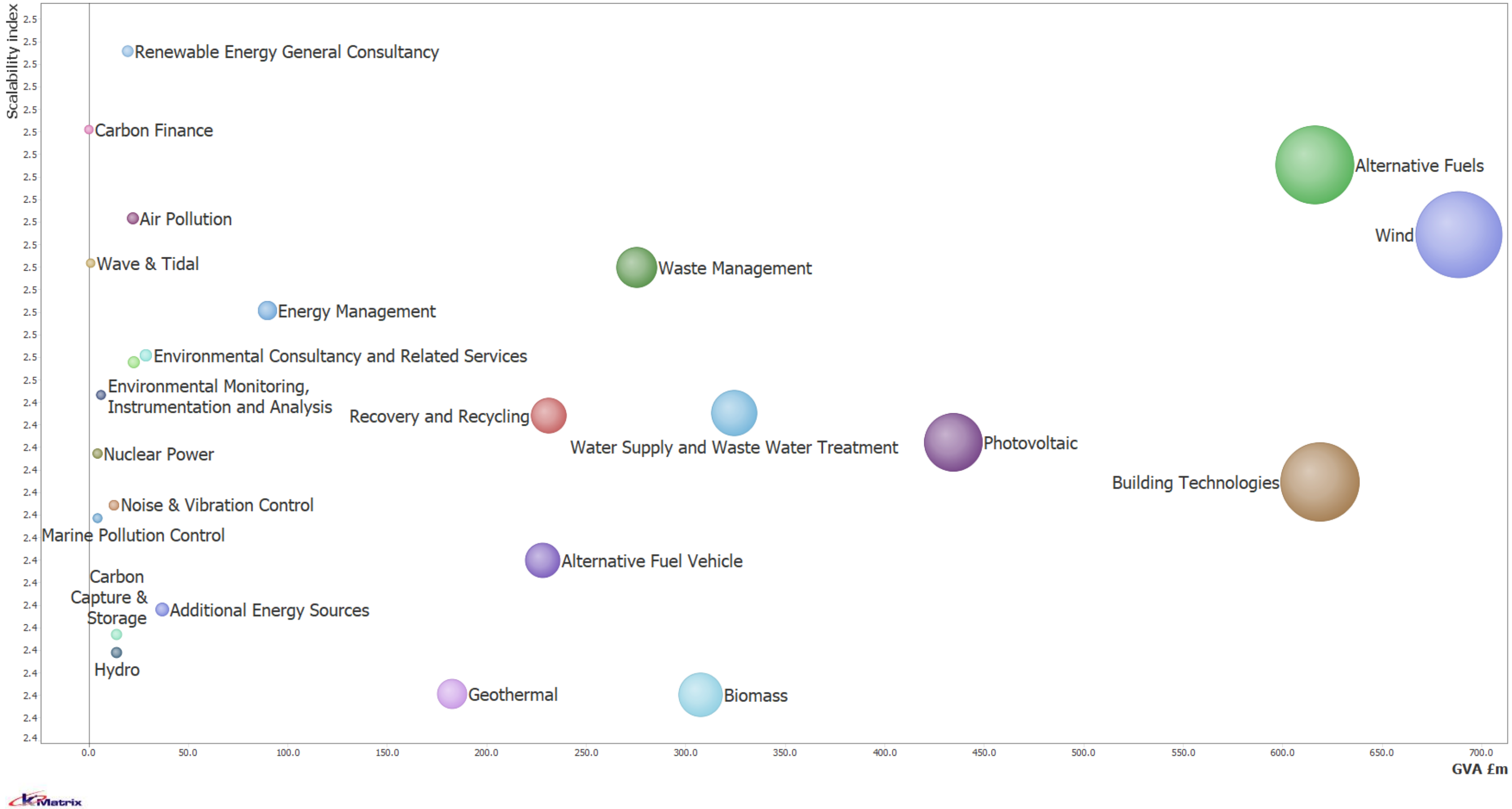
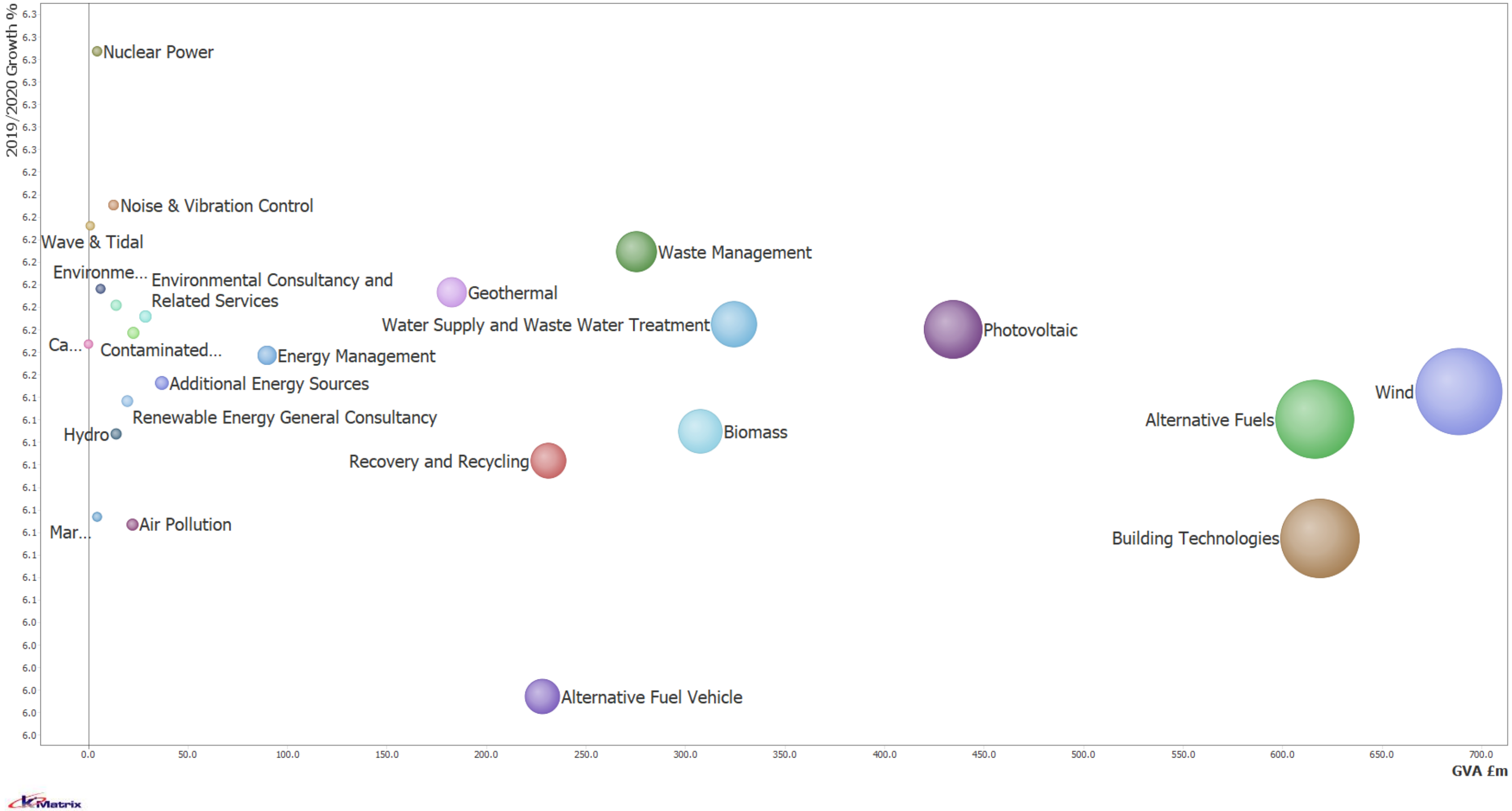


Figure 26 shows the same principle as Figure 25, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies the most favourable position of large size and high growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 26: D2N2 LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**



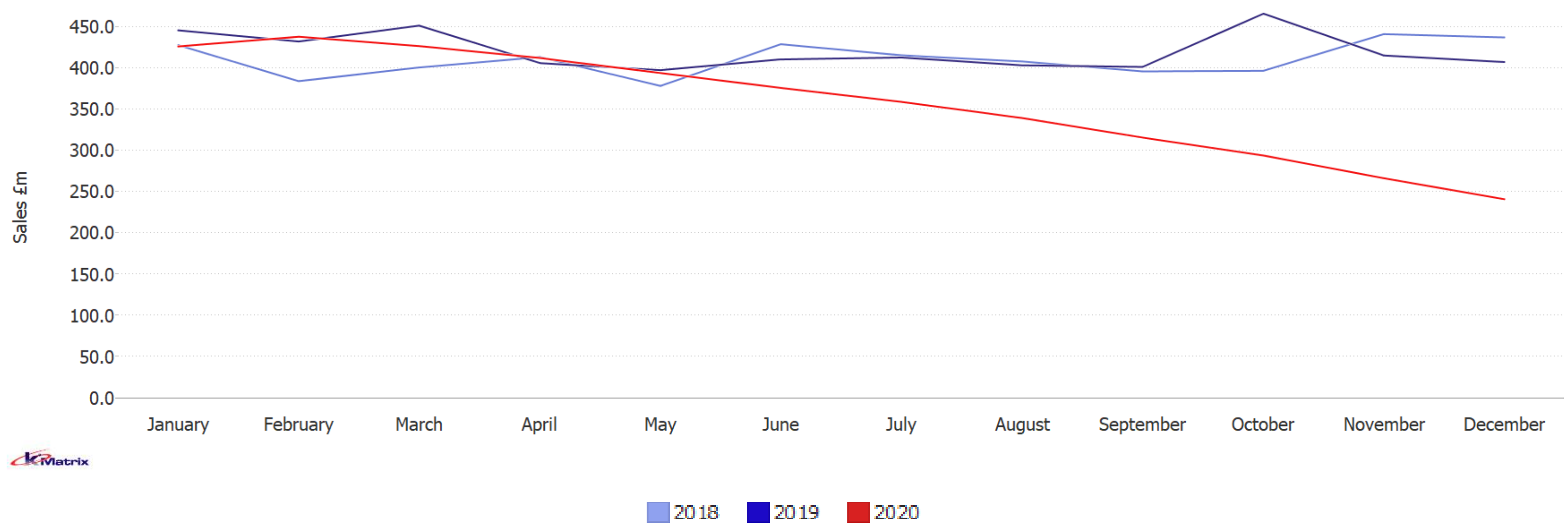

Note: the growth rate for Nuclear is lower than reported elsewhere due to the average taken of Local Authorities across the LEP, the growth in GVA for Nuclear is 13%

## 4.3 D2N2 LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 27, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the D2N2 LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 27: D2N2LEP LCEGS Sales, by month 2018, 2019 and 2020**

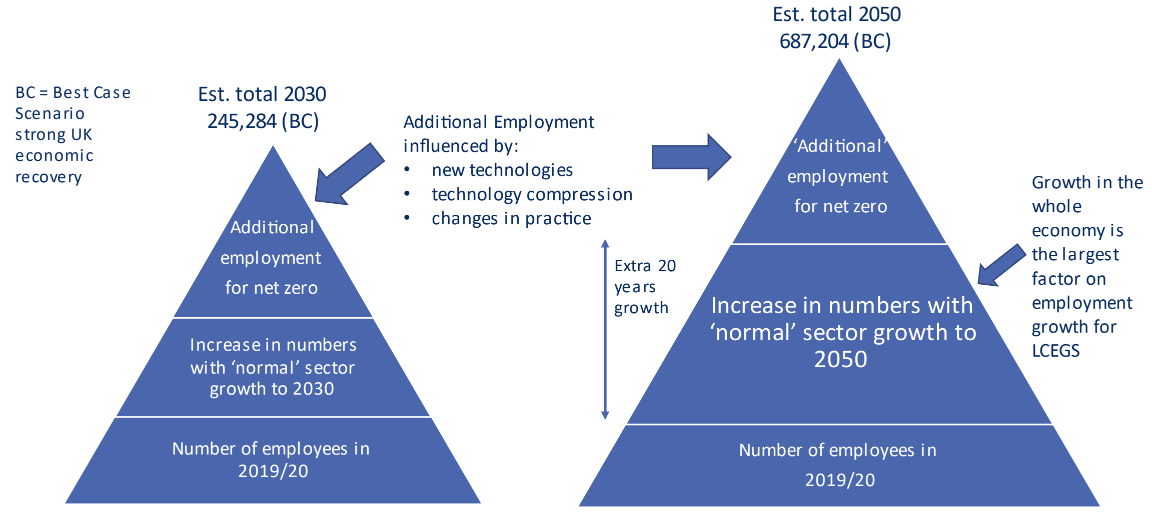


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| ***Timeline for Net Zero*** | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy ‘bounces’ back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




Employment growth for net zero 2030

Employment growth for net zero 2050

On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 13 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the D2N2 LEP.

Shortage of employees refers to the employees that are 'imported' from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not 'fit'. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as "Other Employees" because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to 'heads equivalent', so although for example, there are 7 Educators listed, with a shortage of 2, making a total of 9 in the region, this will equate to over 90 people providing 'pockets' of time, to equate to 9 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 13: D2N2LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 878 | 195 | 22.2% | 1,073 | 1,149 | 7.1% | 1,503 | 40.0% | 1,769 | 64.9% | 4,218 | 293.1% |
| **Snr Management SME** | 2,254 | 228 | 10.1% | 2,483 | 2,950 | 18.8% | 3,871 | 55.9% | 4,557 | 83.6% | 10,836 | 336.5% |
| **Supervisory** | 2,208 | 229 | 10.4% | 2,437 | 2,878 | 18.1% | 3,803 | 56.1% | 4,467 | 83.3% | 10,624 | 336.0% |
| **Middle / Junior Management** | 2,141 | 221 | 10.3% | 2,362 | 2,795 | 18.3% | 3,684 | 56.0% | 4,320 | 82.9% | 10,288 | 335.6% |
| **Designer / Developer** | 326 | 86 | 26.5% | 412 | 425 | 3.1% | 559 | 35.8% | 657 | 59.6% | 1,566 | 280.0% |
| **Clerical** | 1,066 | 2 | 0.2% | 1,069 | 1,396 | 30.6% | 1,832 | 71.4% | 2,153 | 101.5% | 5,110 | 378.2% |
| **Self Employed** | 303 | 39 | 13.0% | 343 | 396 | 15.6% | 522 | 52.3% | 612 | 78.6% | 1,460 | 325.7% |
| **Advisor or Agent** | 194 | 32 | 16.5% | 226 | 252 | 11.7% | 333 | 47.6% | 391 | 73.2% | 934 | 314.2% |
| **Educator** | 7 | 2 | 30.3% | 9 | 10 | 0.4% | 13 | 32.7% | 15 | 54.9% | 35 | 269.6% |
| **Specialist or Consultant** | 1,087 | 35 | 3.2% | 1,122 | 1,420 | 26.6% | 1,864 | 66.2% | 2,206 | 96.7% | 5,231 | 366.4% |
| **Editor** | 35 | 1 | 3.9% | 36 | 46 | 26.2% | 60 | 65.4% | 71 | 95.0% | 169 | 362.4% |
| **Industrial Researchers** | 355 | 27 | 7.7% | 382 | 465 | 21.5% | 608 | 59.1% | 719 | 88.1% | 1,713 | 348.2% |
| **Scientist** | 165 | 54 | 32.9% | 219 | 216 | -1.4% | 286 | 30.2% | 333 | 51.9% | 794 | 262.2% |
| **Maintenance Engineer** | 2,516 | 159 | 6.3% | 2,675 | 3,290 | 23.0% | 4,327 | 61.8% | 5,099 | 90.6% | 12,090 | 352.0% |
| **Civil Engineer** | 171 | 46 | 27.1% | 217 | 224 | 3.1% | 293 | 34.9% | 346 | 59.2% | 824 | 279.5% |
| **Production Engineer** | 444 | 158 | 35.7% | 602 | 579 | -3.8% | 760 | 26.2% | 893 | 48.4% | 2,150 | 257.3% |
| **Power distribution Engineer** | 1,141 | 342 | 30.0% | 1,483 | 1,494 | 0.7% | 1,958 | 32.0% | 2,316 | 56.1% | 5,498 | 270.6% |
| **Construction Engineer** | 248 | 42 | 17.0% | 290 | 324 | 11.9% | 425 | 46.6% | 499 | 72.1% | 1,190 | 310.6% |
| **Sales Exec** | 1,116 | 129 | 11.6% | 1,245 | 1,462 | 17.4% | 1,912 | 53.5% | 2,259 | 81.4% | 5,387 | 332.5% |
| **Marketing Personnel** | 1,090 | 122 | 11.2% | 1,212 | 1,427 | 17.8% | 1,875 | 54.7% | 2,198 | 81.4% | 5,239 | 332.3% |
| **General Semi Skilled Worker** | 2,291 | 48 | 2.1% | 2,339 | 2,984 | 27.6% | 3,940 | 68.5% | 4,636 | 98.2% | 10,985 | 369.6% |
| **General Labour** | 2,759 | 0 | 0.0% | 2,759 | 3,602 | 30.6% | 4,726 | 71.3% | 5,577 | 102.2% | 13,277 | 381.3% |
| **Other Employees** | 2,885 | 146 | 5.1% | 3,031 | 3,759 | 24.0% | 4,935 | 62.8% | 5,842 | 92.8% | 13,895 | 358.5% |
| **Administrative workers** | 1,299 | 28 | 2.1% | 1,327 | 1,696 | 27.8% | 2,236 | 68.5% | 2,625 | 97.8% | 6,249 | 370.9% |
| **Total** | **26,977** | **2,374** | **8.8%** | **29,352** | **35,238** | **20.1%** | **46,324** | **57.8%** | **54,562** | **85.9%** | **129,761** | **342.1%** |

Table 13 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 35.7% (MEH 35.7%), Power Distribution Engineer 30.0% (MEH 29.8%) and Technicians 22.2% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.3% (MEH 6.3%), Specialist or Consultant 3.1% (MEH 3.3%) and Administrative Workers 2.1% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.5% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 58.0% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 86.2% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 342.5% (MEH 342.4%)

Tables 14, 15 and 16 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.7% (MEH 10.5%)
Renewable Energy – 7.2% (MEH 7.0%)
Environmental – 10.2% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 46.4% (MEH 47.3%); Renewable Energy 27.6% (MEH 27.9%) and Environmental 34.5% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 34.2% (MEH 33.7%); Renewable Energy 28.7% (MEH 27.1%) and Environmental 31.7% (MEH 32.6%)
Technicians: Low Carbon 27.9% (MEH 27.9%); Renewable Energy 17.4% (MEH 17.3%) and Environmental 22.5% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 69.9% (MEH 68.8%), but only 13.5% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 16.6% (MEH 17.0%); Renewable Energy 33.3% (MEH 34.5%) and Environmental 27.4% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 27.4% (MEH 28.1%); Renewable Energy 34.7% (MEH 35.1%) and Environmental 30.0% (MEH 29.3%)
Technicians of: Low Carbon 33.7% (MEH 34.2%); Renewable Energy 45.8% (MEH 45.9%) and Environmental 39.6% (MEH 39.6%)

**Table 14: D2N2LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 281 | 79 | 27.9% | 360 | 367 | 1.9% | 481 | 33.7% | 565 | 57.0% | 1,347 | 274.1% |
| **Snr Management SME** | 540 | 65 | 12.1% | 605 | 705 | 16.6% | 923 | 52.7% | 1,092 | 80.5% | 2,597 | 329.5% |
| **Supervisory** | 546 | 69 | 12.7% | 615 | 711 | 15.5% | 938 | 52.3% | 1,107 | 79.9% | 2,614 | 324.7% |
| **Middle / Junior Management** | 530 | 69 | 13.0% | 599 | 692 | 15.6% | 908 | 51.7% | 1,071 | 78.8% | 2,550 | 325.8% |
| **Designer / Developer** | 85 | 25 | 29.4% | 109 | 110 | 1.0% | 145 | 32.6% | 171 | 56.2% | 408 | 272.7% |
| **Clerical** | 270 | 1 | 0.3% | 271 | 354 | 30.6% | 465 | 71.6% | 549 | 102.7% | 1,285 | 374.1% |
| **Self Employed** | 111 | 18 | 16.1% | 129 | 145 | 12.5% | 192 | 48.8% | 225 | 73.8% | 537 | 315.6% |
| **Advisor or Agent** | 95 | 15 | 16.3% | 111 | 124 | 11.6% | 164 | 48.1% | 192 | 73.6% | 459 | 314.8% |
| **Educator** | 0 | 0 | 22.1% | 0 | 0 | 7.9% | 1 | 38.7% | 1 | 64.0% | 2 | 292.8% |
| **Specialist or Consultant** | 284 | 10 | 3.7% | 294 | 369 | 25.3% | 485 | 64.6% | 576 | 95.8% | 1,370 | 365.2% |
| **Editor** | 9 | 0 | 4.2% | 9 | 11 | 24.8% | 15 | 63.1% | 17 | 95.8% | 41 | 361.2% |
| **Industrial Researchers** | 201 | 16 | 7.9% | 216 | 262 | 21.2% | 343 | 58.7% | 407 | 88.1% | 971 | 348.8% |
| **Scientist** | 110 | 36 | 32.4% | 146 | 144 | -0.9% | 191 | 31.3% | 222 | 52.6% | 532 | 264.8% |
| **Maintenance Engineer** | 625 | 51 | 8.1% | 676 | 813 | 20.3% | 1,074 | 58.9% | 1,268 | 87.6% | 3,012 | 345.8% |
| **Civil Engineer** | 41 | 13 | 31.8% | 55 | 54 | -0.7% | 71 | 29.7% | 84 | 53.2% | 200 | 266.9% |
| **Production Engineer** | 136 | 63 | 46.4% | 199 | 177 | -10.9% | 232 | 16.6% | 273 | 37.2% | 670 | 236.8% |
| **Power distribution Engineer** | 243 | 83 | 34.2% | 326 | 315 | -3.2% | 415 | 27.4% | 492 | 51.2% | 1,167 | 258.3% |
| **Construction Engineer** | 53 | 11 | 21.3% | 65 | 70 | 8.0% | 91 | 41.3% | 107 | 66.0% | 257 | 297.6% |
| **Sales Exec** | 339 | 51 | 15.0% | 390 | 442 | 13.3% | 580 | 48.9% | 686 | 76.1% | 1,628 | 317.6% |
| **Marketing Personnel** | 335 | 48 | 14.3% | 383 | 440 | 14.8% | 580 | 51.3% | 676 | 76.4% | 1,614 | 321.1% |
| **General Semi Skilled Worker** | 580 | 15 | 2.6% | 596 | 759 | 27.4% | 1,000 | 67.9% | 1,175 | 97.3% | 2,798 | 369.8% |
| **General Labour** | 924 | 0 | 0.0% | 924 | 1,207 | 30.6% | 1,583 | 71.3% | 1,873 | 102.7% | 4,454 | 382.0% |
| **Other Employees** | 679 | 43 | 6.3% | 722 | 888 | 23.0% | 1,167 | 61.6% | 1,381 | 91.4% | 3,280 | 354.3% |
| **Administrative workers** | 346 | 9 | 2.7% | 355 | 453 | 27.5% | 594 | 67.4% | 695 | 95.6% | 1,665 | 369.0% |
| **Total** | **7,365** | **790** | **10.7%** | **8,155** | **9,613** | **17.9%** | **12,639** | **55.0%** | **14,907** | **82.8%** | **35,458** | **334.8%** |

**Table 15: D2N2LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 355 | 62 | 17.4% | 418 | 467 | 11.9% | 609 | 45.8% | 716 | 71.5% | 1,709 | 309.4% |
| **Snr Management SME** | 1,294 | 121 | 9.3% | 1,414 | 1,694 | 19.8% | 2,223 | 57.2% | 2,612 | 84.7% | 6,210 | 339.1% |
| **Supervisory** | 1,232 | 115 | 9.3% | 1,346 | 1,606 | 19.3% | 2,129 | 58.1% | 2,493 | 85.2% | 5,942 | 341.4% |
| **Middle / Junior Management** | 1,196 | 109 | 9.1% | 1,305 | 1,562 | 19.7% | 2,064 | 58.1% | 2,409 | 84.5% | 5,756 | 340.9% |
| **Designer / Developer** | 97 | 21 | 21.5% | 118 | 127 | 7.4% | 167 | 41.4% | 196 | 66.5% | 464 | 293.7% |
| **Clerical** | 588 | 1 | 0.2% | 589 | 769 | 30.5% | 1,009 | 71.3% | 1,185 | 101.0% | 2,827 | 379.7% |
| **Self Employed** | 80 | 8 | 9.6% | 88 | 105 | 19.0% | 137 | 56.5% | 161 | 83.5% | 385 | 338.3% |
| **Advisor or Agent** | 25 | 4 | 17.2% | 29 | 32 | 11.4% | 42 | 46.4% | 50 | 72.1% | 120 | 313.7% |
| **Educator** | 0 | 0 | 11.6% | 0 | 0 | 21.3% | 0 | 52.5% | 0 | 83.6% | 0 | 326.1% |
| **Specialist or Consultant** | 562 | 16 | 2.9% | 579 | 736 | 27.3% | 967 | 67.2% | 1,144 | 97.7% | 2,708 | 368.0% |
| **Editor** | 8 | 0 | 3.3% | 9 | 11 | 26.7% | 14 | 65.4% | 17 | 95.1% | 40 | 367.3% |
| **Industrial Researchers** | 41 | 3 | 7.1% | 44 | 54 | 21.8% | 71 | 60.4% | 84 | 88.6% | 199 | 347.6% |
| **Scientist** | 16 | 5 | 30.5% | 21 | 21 | 0.6% | 27 | 31.1% | 32 | 54.8% | 76 | 263.9% |
| **Maintenance Engineer** | 1,338 | 74 | 5.5% | 1,412 | 1,752 | 24.1% | 2,304 | 63.2% | 2,716 | 92.4% | 6,410 | 354.0% |
| **Civil Engineer** | 40 | 8 | 21.1% | 48 | 52 | 8.1% | 68 | 41.8% | 80 | 66.5% | 191 | 298.3% |
| **Production Engineer** | 186 | 53 | 28.7% | 240 | 244 | 1.7% | 320 | 33.3% | 376 | 56.7% | 898 | 274.6% |
| **Power distribution Engineer** | 631 | 174 | 27.6% | 805 | 829 | 3.0% | 1,085 | 34.7% | 1,285 | 59.6% | 3,038 | 277.4% |
| **Construction Engineer** | 83 | 10 | 12.3% | 93 | 109 | 16.8% | 143 | 52.6% | 167 | 79.2% | 400 | 327.9% |
| **Sales Exec** | 556 | 51 | 9.2% | 608 | 730 | 20.2% | 954 | 57.0% | 1,126 | 85.3% | 2,696 | 343.7% |
| **Marketing Personnel** | 553 | 51 | 9.2% | 604 | 725 | 20.1% | 950 | 57.4% | 1,116 | 84.9% | 2,655 | 339.8% |
| **General Semi Skilled Worker** | 1,204 | 22 | 1.8% | 1,226 | 1,566 | 27.7% | 2,070 | 68.9% | 2,438 | 98.9% | 5,754 | 369.3% |
| **General Labour** | 1,469 | 0 | 0.0% | 1,469 | 1,918 | 30.6% | 2,517 | 71.3% | 2,968 | 102.0% | 7,069 | 381.1% |
| **Other Employees** | 1,641 | 75 | 4.5% | 1,715 | 2,132 | 24.3% | 2,803 | 63.4% | 3,314 | 93.2% | 7,909 | 361.0% |
| **Administrative workers** | 670 | 12 | 1.8% | 682 | 873 | 27.9% | 1,156 | 69.4% | 1,357 | 98.9% | 3,220 | 372.0% |
| **Total** | **13,867** | **996** | **7.2%** | **14,862** | **18,115** | **21.9%** | **23,828** | **60.3%** | **28,041** | **88.7%** | **66,676** | **348.6%** |

**Table 16: D2N2 LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 241 | 54 | 22.5% | 296 | 315 | 6.6% | 413 | 39.6% | 488 | 65.3% | 1,162 | 293.0% |
| Snr Management SME | 421 | 43 | 10.1% | 464 | 551 | 18.8% | 725 | 56.3% | 854 | 84.1% | 2,029 | 337.5% |
| Supervisory | 430 | 45 | 10.5% | 475 | 560 | 18.0% | 737 | 55.2% | 866 | 82.4% | 2,068 | 335.5% |
| Middle / Junior Management | 414 | 43 | 10.4% | 457 | 541 | 18.2% | 712 | 55.6% | 840 | 83.6% | 1,982 | 333.3% |
| Designer / Developer | 144 | 41 | 28.2% | 185 | 188 | 1.7% | 248 | 34.1% | 290 | 57.1% | 694 | 275.7% |
| Clerical | 208 | 0 | 0.2% | 208 | 272 | 30.8% | 357 | 71.5% | 419 | 101.3% | 998 | 379.1% |
| Self Employed | 112 | 14 | 12.3% | 126 | 146 | 16.5% | 192 | 53.1% | 226 | 80.0% | 537 | 327.3% |
| Advisor or Agent | 74 | 12 | 16.5% | 86 | 96 | 11.9% | 126 | 47.3% | 148 | 72.9% | 355 | 313.7% |
| Educator | 7 | 2 | 30.7% | 9 | 9 | 0.0% | 12 | 32.4% | 14 | 54.5% | 33 | 268.5% |
| Specialist or Consultant | 240 | 8 | 3.4% | 249 | 314 | 26.4% | 412 | 65.8% | 486 | 95.7% | 1,154 | 364.3% |
| Editor | 18 | 1 | 4.0% | 19 | 24 | 26.7% | 32 | 66.4% | 37 | 94.6% | 88 | 360.8% |
| Industrial Researchers | 113 | 9 | 7.8% | 121 | 148 | 22.1% | 194 | 59.5% | 228 | 87.9% | 543 | 347.5% |
| Scientist | 39 | 14 | 35.3% | 53 | 51 | -3.5% | 67 | 26.9% | 78 | 48.8% | 187 | 254.3% |
| Maintenance Engineer | 553 | 34 | 6.2% | 587 | 724 | 23.4% | 950 | 61.7% | 1,115 | 89.9% | 2,667 | 354.2% |
| Civil Engineer | 90 | 25 | 27.5% | 115 | 118 | 2.7% | 154 | 34.5% | 182 | 59.0% | 433 | 277.5% |
| Production Engineer | 121 | 42 | 34.5% | 163 | 158 | -3.1% | 208 | 27.4% | 245 | 49.9% | 582 | 256.7% |
| Power distribution Engineer | 268 | 85 | 31.7% | 353 | 350 | -0.7% | 459 | 30.0% | 538 | 52.7% | 1,293 | 266.5% |
| Construction Engineer | 111 | 21 | 18.5% | 132 | 145 | 10.3% | 191 | 44.8% | 224 | 70.1% | 533 | 304.7% |
| Sales Exec | 221 | 27 | 12.3% | 248 | 290 | 16.8% | 378 | 52.4% | 447 | 80.1% | 1,063 | 328.6% |
| Marketing Personnel | 202 | 23 | 11.5% | 225 | 262 | 16.8% | 344 | 53.3% | 406 | 80.5% | 969 | 331.4% |
| General Semi Skilled Worker | 506 | 11 | 2.2% | 517 | 660 | 27.5% | 870 | 68.1% | 1,023 | 97.7% | 2,434 | 370.3% |
| General Labour | 365 | 0 | 0.0% | 365 | 477 | 30.6% | 625 | 71.3% | 736 | 101.7% | 1,754 | 380.5% |
| Other Employees | 564 | 29 | 5.1% | 593 | 739 | 24.5% | 966 | 62.8% | 1,147 | 93.4% | 2,706 | 356.0% |
| Administrative workers | 284 | 6 | 2.2% | 290 | 371 | 27.9% | 486 | 67.5% | 574 | 97.9% | 1,364 | 370.5% |
| **Total** | **5,746** | **589** | **10.2%** | **6,335** | **7,510** | **18.6%** | **9,856** | **55.6%** | **11,613** | **83.3%** | **27,628** | **336.1%** |

## 4.4 D2N2 LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the D2N2 LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 28 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the D2N2 LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the D2N2 LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 28: D2N2 LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

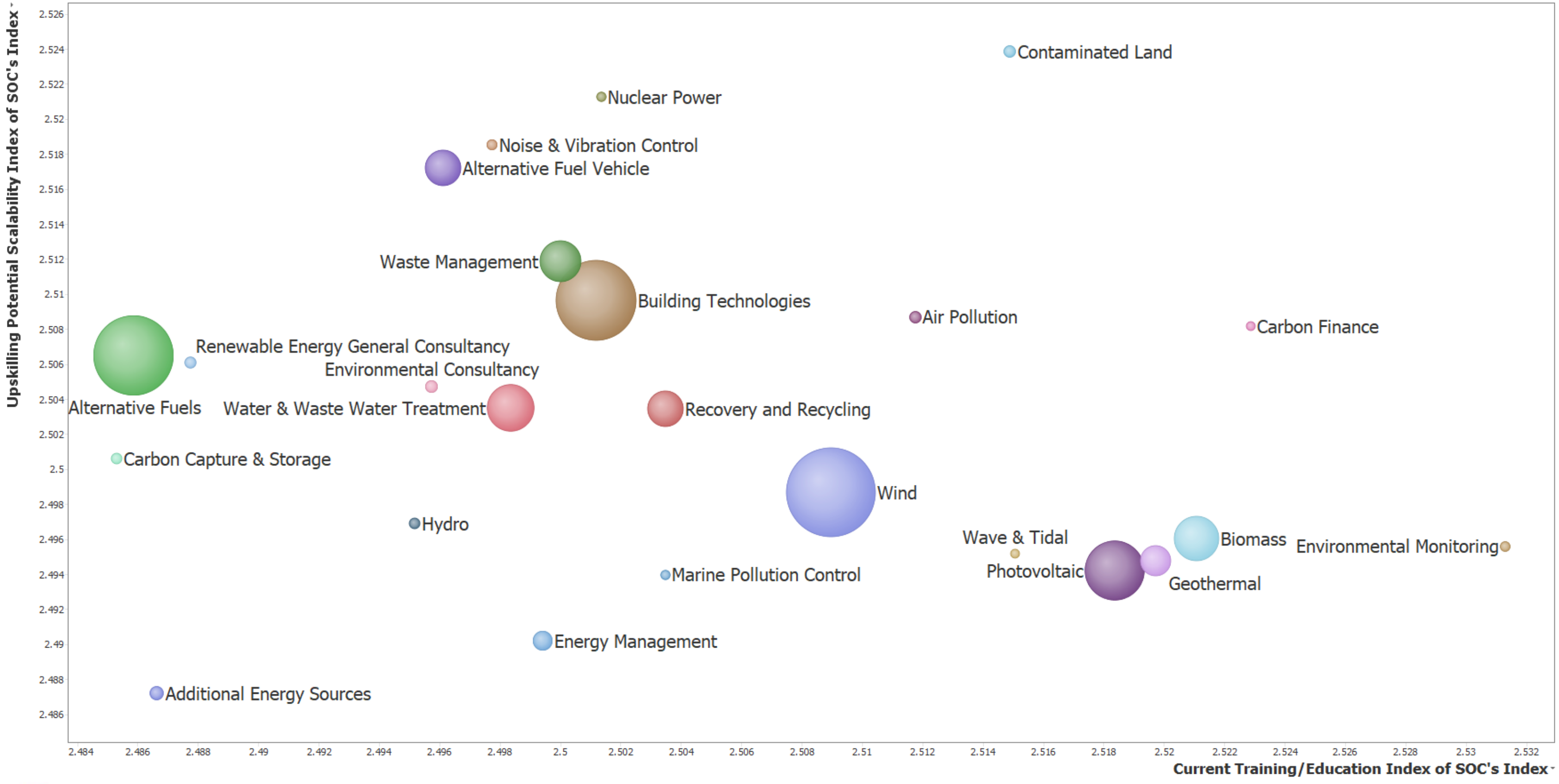



Figure 28 shows that the smaller sub-sector of Contaminated Land and Environmental Monitoring are relatively stronger in Upskilling Potential and current training capacity respectively. This has pushed the other, larger sub-sectors to one side, but Biomass, Photovoltaic and Wind have good current training capacity, while Building Technologies is well placed if the outliers are excluded. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.

## 4.5 D2N2 LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the D2N2 LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

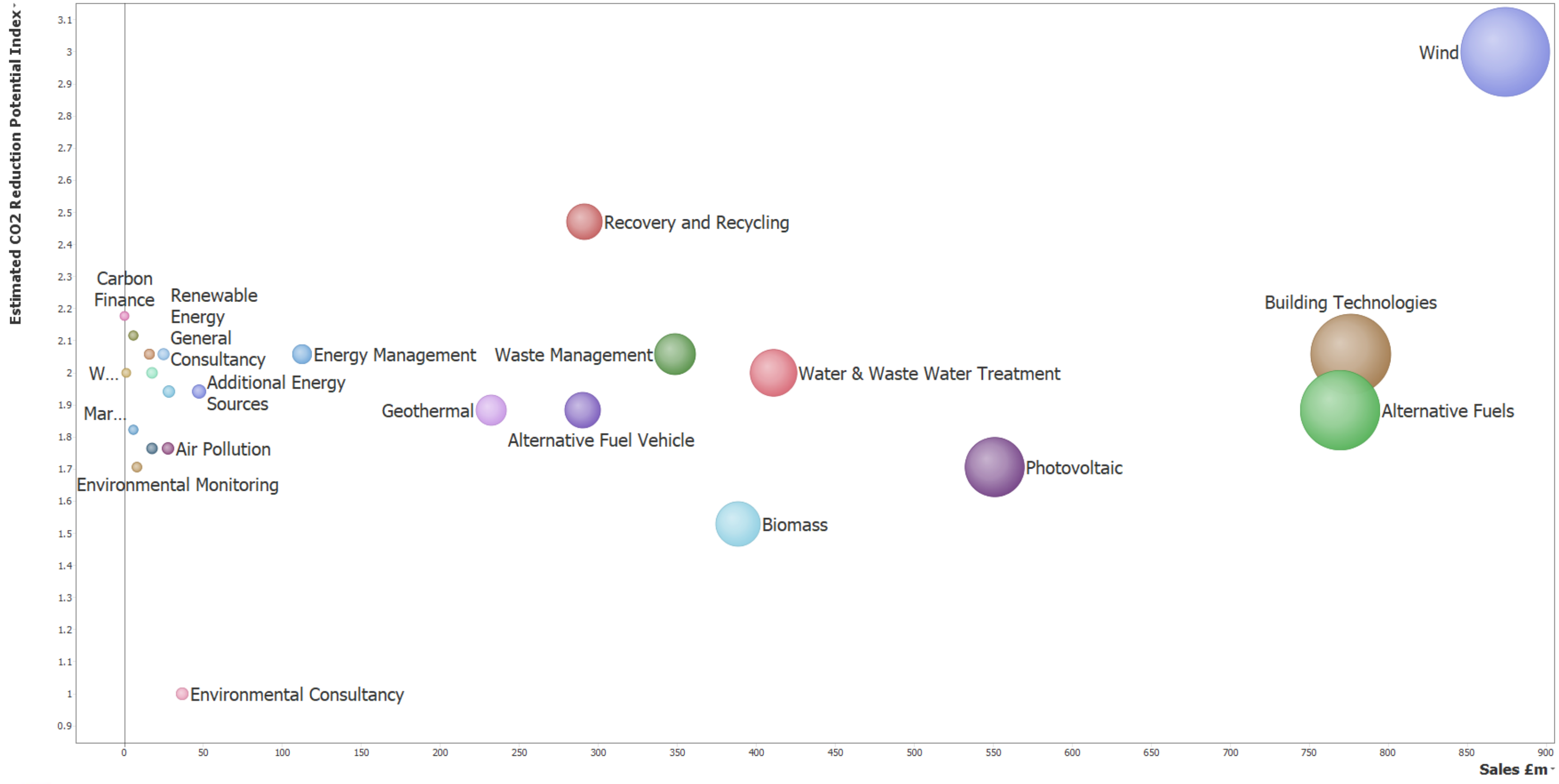
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 29 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Building Technologies having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 29: D2N2 LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 5. Growth Forecast for Net Zero in 2030 and 2050 for the Greater Birmingham and Solihull LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Greater Birmingham and Solihull LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 5.1 Greater Birmingham and Solihull LEP's LCEGS Strengths and Weaknesses

In this section of the report Greater Birmingham and Solihull LEP's LCEGS performance is compared with the UK as a whole. Greater Birmingham and Solihull LEP's LCEGS sector was worth £6.3bn in 2019/20 and accounts for 2.8% of the UK total.

Figure 30 shows how the Greater Birmingham and Solihull LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 2.8%. This proportionality factor demonstrates where the Greater Birmingham and Solihull LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 2.8% of the UK market; above 1 = larger than 2.8% share and below 1 = smaller than 2.8% share.

The y-axis represents the growth rate of the Greater Birmingham and Solihull LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 30 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric should be considered strengths, because although they are both below the expected size of market (2.7 for Contaminated Land and 2.2 for Hydro), they are growing significantly stronger than the UK average (14.6% LEP vs 1.0% UK for Contaminated Land and 13.8% vs. 1.8%Uk for Hydro)

**Figure 30: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

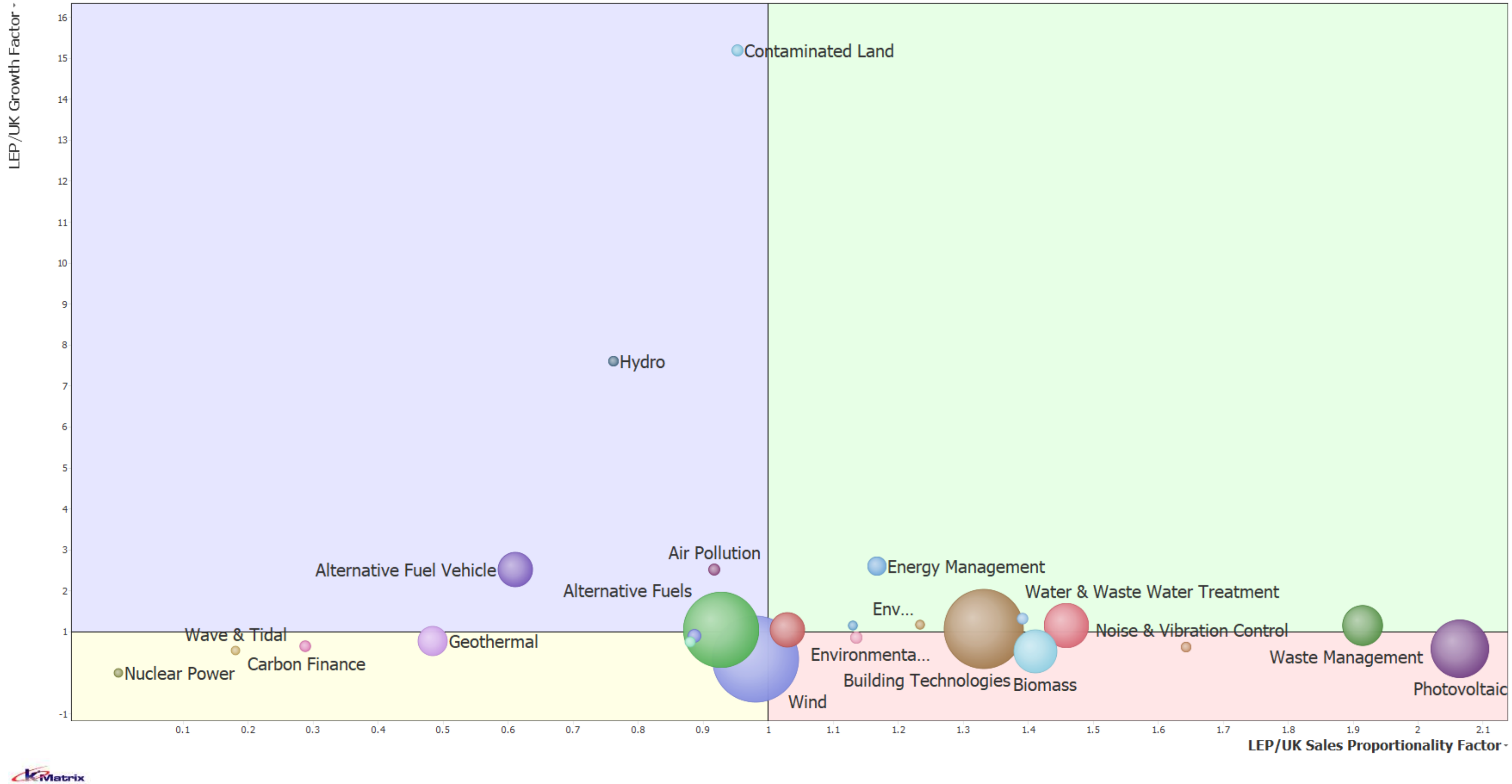
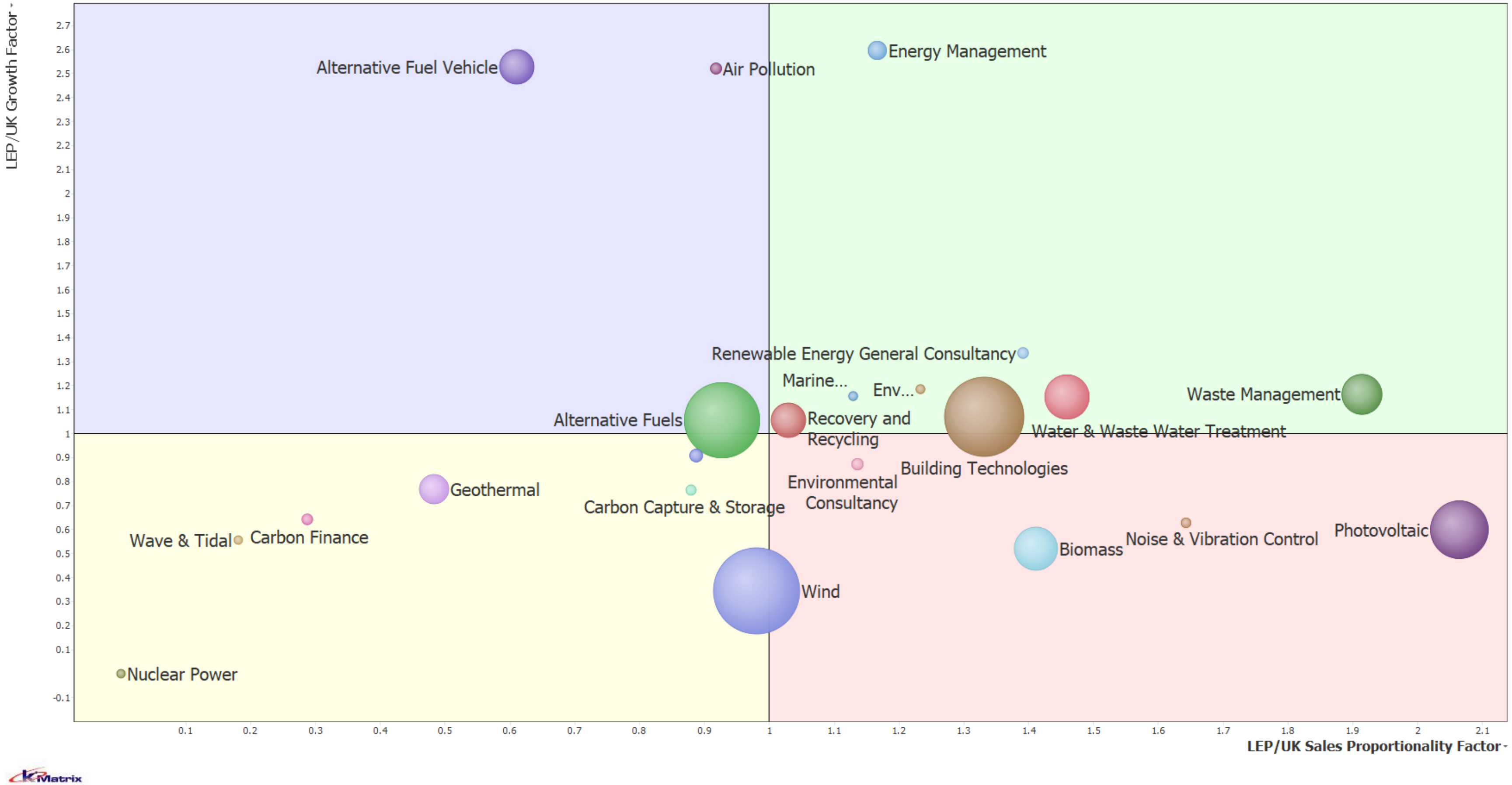


Figure 31 provides the same information as figure 34, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management Waste Management have the ideal characteristics of above UK average growth and above LEP average size. Those on the boundary of and within, the bottom right quadrant (red) also hold a larger UK share than the LEP's average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Biomass and to a lesser extent Wind, set these sub-sector apart as being strengths, despite lower growth. Alternative Fuel Vehicle can be considered a strength, because although it has a smaller size than would be expected, it has significantly stronger growth than the UK average. Those in the lower left (yellow) quadrant i.e. Wave & tidal and Carbon Finance can be considered relative weaknesses.

**Figure 31: LEP/UK Sales proportionality factor vs LEP/UK Growth factor of Level 2 Sub-sectors, Bubbles Sized by Sales £m, Excluding Contaminated Land and Hydro**



## 5.2 Scalability of Greater Birmingham and Solihull LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3)+(15x2)+(4x1)}{30}=2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 32 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Greater Birmingham and Solihull LEP's, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Photovoltaic sub-sector has a reasonable combination of size and scalability, while Carbon Finance may be smaller in terms of market but is highly scalable. Biomass is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Greater Birmingham and Solihull Market Snapshot report.

**Figure 32: Greater Birmingham and Solihull LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

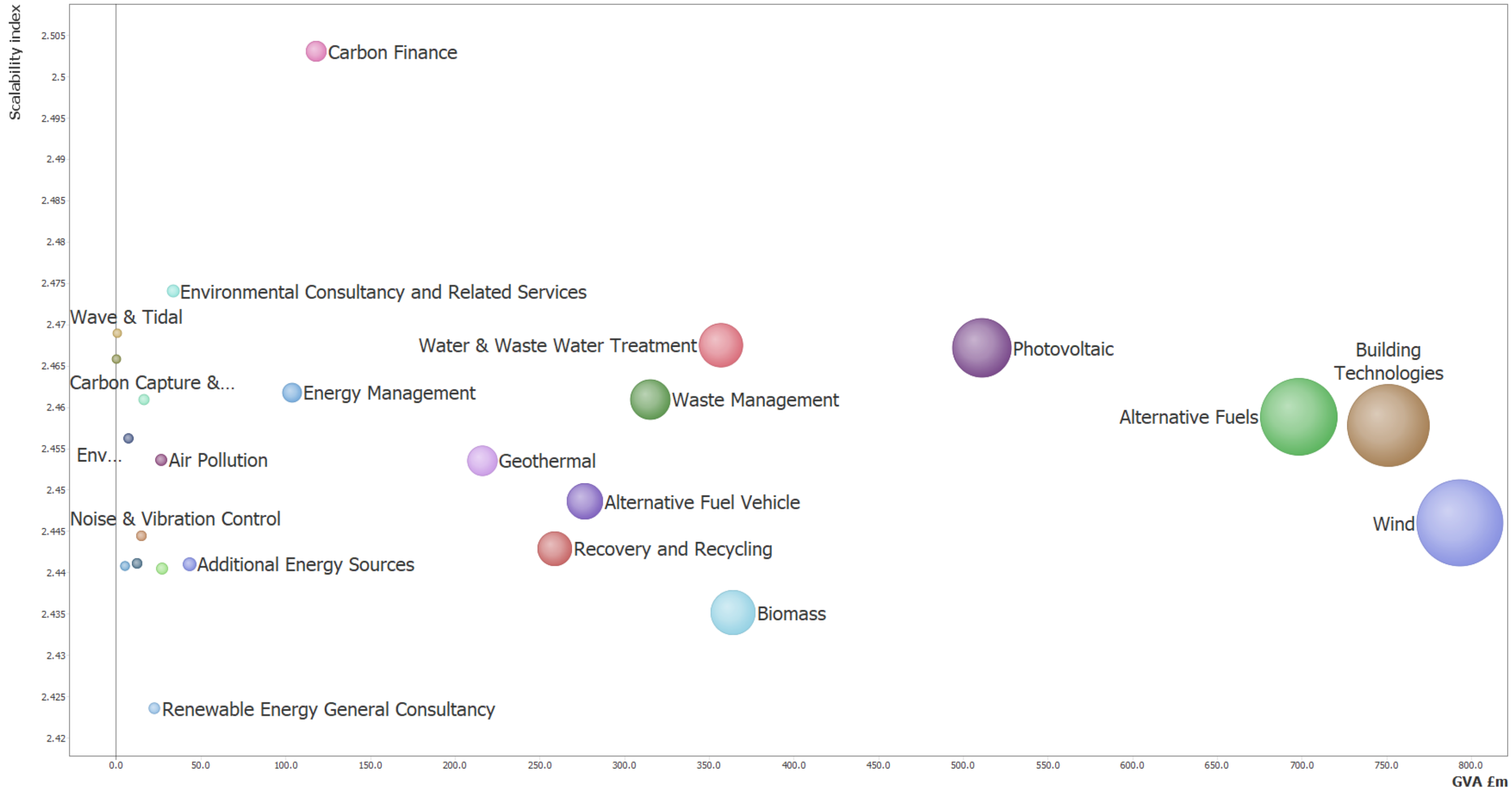
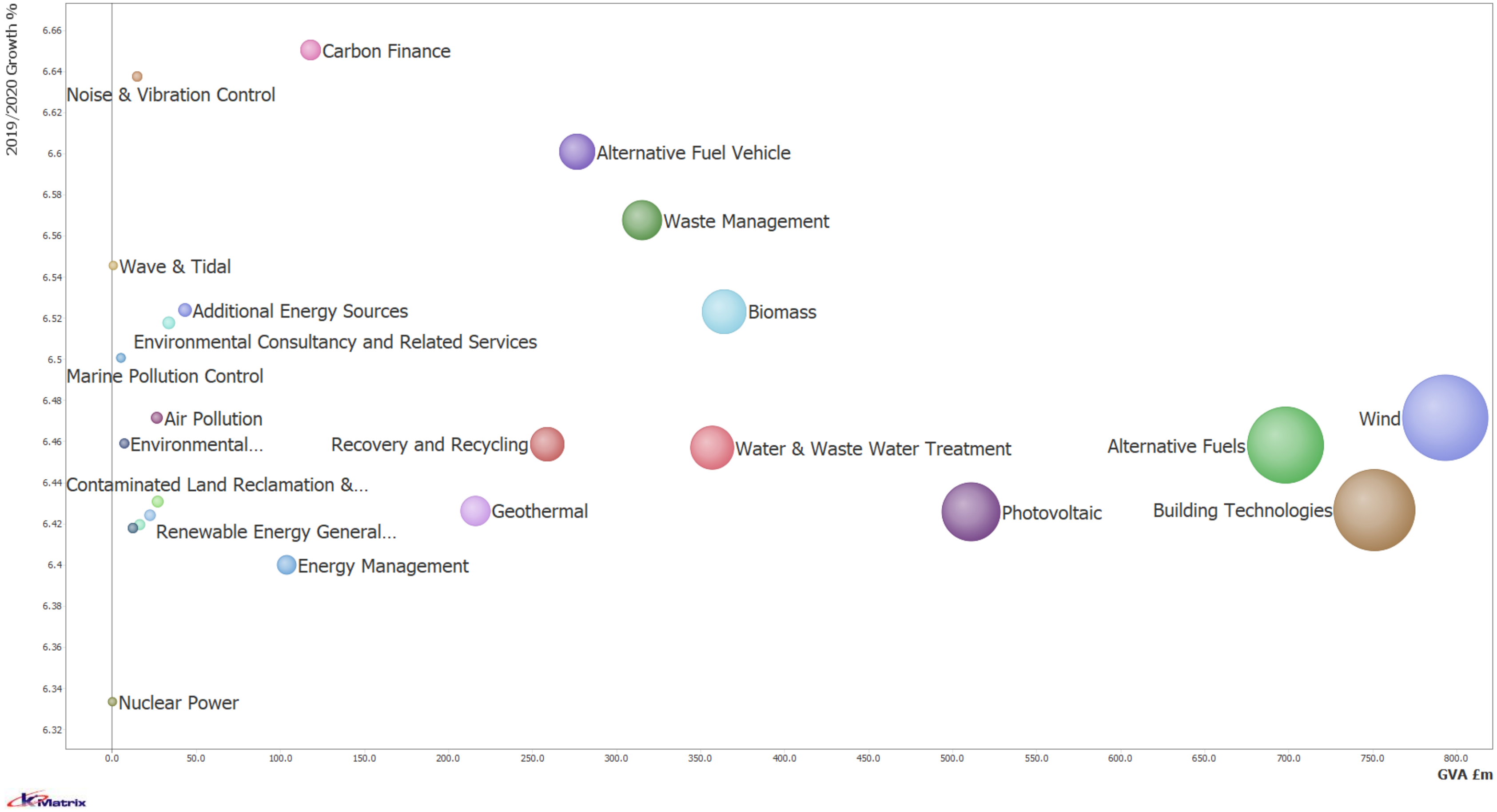


Figure 33 shows the same principle as Figure 32, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies a more favourable position of large size and high growth compared with the other two large subsectors. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 33: Greater Birmingham and Solihull LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

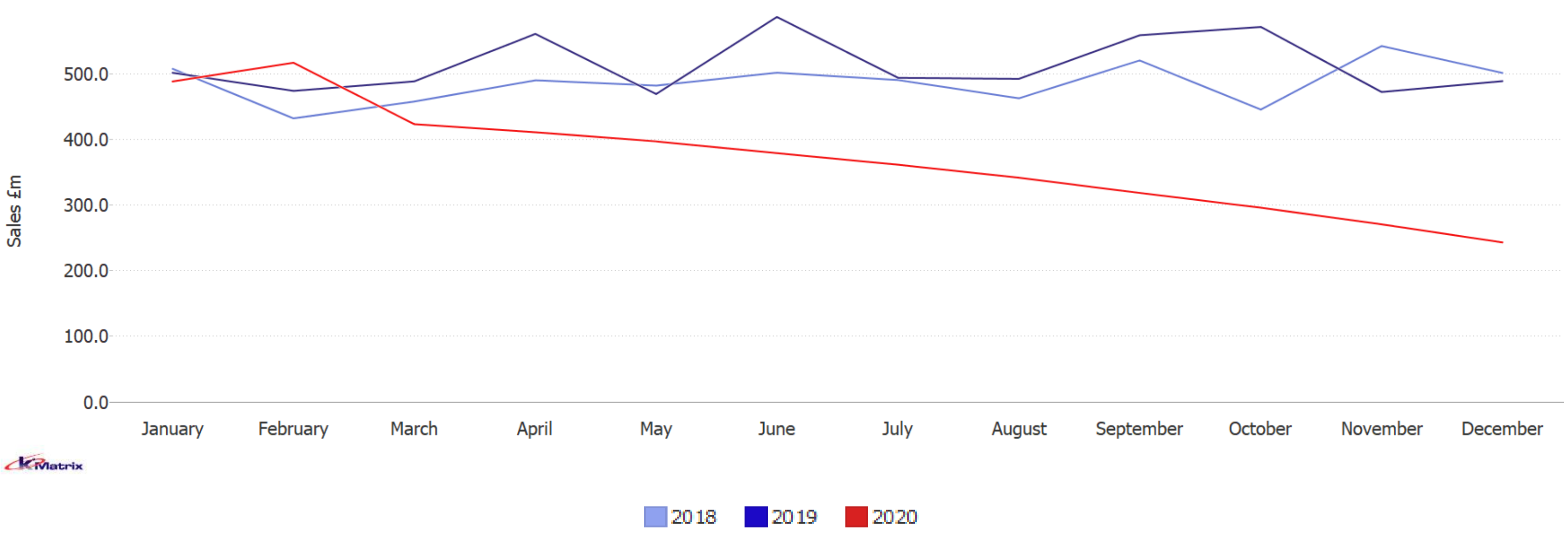


## 5.3 Greater Birmingham and Solihull LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 34, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Greater Birmingham an Solihull LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 34: Greater Birmingham and Solihull LEP LCEGS Sales, by month 2018, 2019 and 2020**

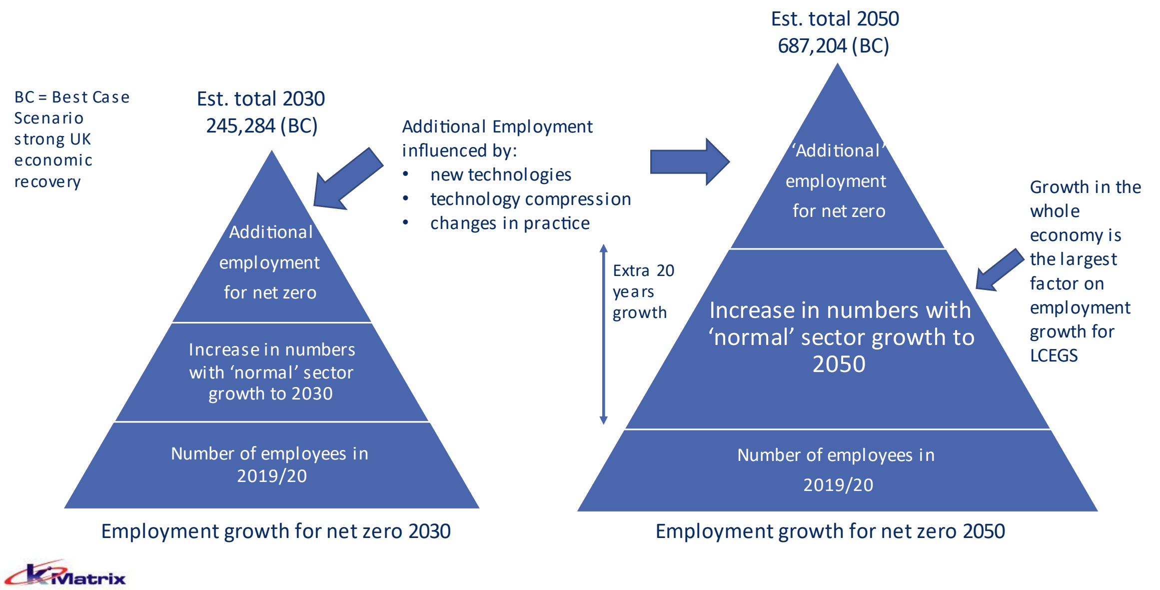


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| *Timeline for Net Zero* | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 17 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Greater Birmingham and Solihill LEP.

Shortage of employees refers to the employees that are 'imported' from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not 'fit'. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as "Other Employees" because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to 'heads equivalent', so although for example, there are 9 Educators listed, with a shortage of 3, making a total of 11 in the region, this will equate to over 110 people providing 'pockets' of time, to equate to 11 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 17: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 1,124 | 247 | 22.0% | 1,371 | 1,463 | 6.7% | 1,935 | 41.1% | 2,288 | 66.9% | 5,424 | 295.7% |
| Snr Management SME | 2,508 | 255 | 10.1% | 2,762 | 3,278 | 18.7% | 4,332 | 56.8% | 5,089 | 84.2% | 11,979 | 333.7% |
| Supervisory | 2,917 | 300 | 10.3% | 3,216 | 3,783 | 17.6% | 4,987 | 55.1% | 5,913 | 83.8% | 14,106 | 338.6% |
| Middle / Junior Management | 2,828 | 292 | 10.3% | 3,120 | 3,695 | 18.4% | 4,839 | 55.1% | 5,680 | 82.1% | 13,609 | 336.2% |
| Designer / Developer | 391 | 103 | 26.3% | 494 | 511 | 3.4% | 671 | 35.9% | 787 | 59.3% | 1,881 | 280.7% |
| Clerical | 1,471 | 3 | 0.2% | 1,474 | 1,937 | 31.4% | 2,531 | 71.7% | 2,973 | 101.7% | 7,045 | 377.9% |
| Self Employed | 408 | 53 | 13.0% | 461 | 532 | 15.5% | 699 | 51.7% | 820 | 77.9% | 1,958 | 324.6% |
| Advisor or Agent | 287 | 49 | 17.1% | 336 | 379 | 12.7% | 493 | 46.8% | 578 | 72.1% | 1,380 | 310.6% |
| Educator | 9 | 3 | 32.5% | 11 | 11 | -1.3% | 15 | 28.8% | 17 | 53.5% | 41 | 260.2% |
| Specialist or Consultant | 1,778 | 62 | 3.5% | 1,841 | 2,338 | 27.0% | 3,048 | 65.6% | 3,572 | 94.1% | 8,505 | 362.0% |
| Editor | 42 | 2 | 3.9% | 44 | 56 | 25.9% | 73 | 65.0% | 86 | 95.9% | 203 | 360.7% |
| Industrial Researchers | 398 | 31 | 7.9% | 430 | 518 | 20.7% | 684 | 59.3% | 805 | 87.5% | 1,917 | 346.3% |
| Scientist | 180 | 59 | 33.0% | 239 | 234 | -2.2% | 307 | 28.3% | 369 | 54.5% | 867 | 262.9% |
| Maintenance Engineer | 3,041 | 193 | 6.3% | 3,234 | 3,965 | 22.6% | 5,226 | 61.6% | 6,179 | 91.0% | 14,648 | 352.9% |
| Civil Engineer | 198 | 53 | 26.9% | 251 | 258 | 2.7% | 338 | 34.9% | 402 | 60.3% | 953 | 279.8% |
| Production Engineer | 557 | 201 | 36.0% | 758 | 724 | -4.5% | 959 | 26.6% | 1,124 | 48.4% | 2,686 | 254.4% |
| Power distribution Engineer | 1,356 | 395 | 29.2% | 1,751 | 1,777 | 1.5% | 2,326 | 32.8% | 2,743 | 56.6% | 6,539 | 273.4% |
| Construction Engineer | 327 | 56 | 17.0% | 383 | 430 | 12.2% | 563 | 46.8% | 664 | 73.3% | 1,579 | 312.3% |
| Sales Exec | 1,390 | 159 | 11.4% | 1,548 | 1,819 | 17.5% | 2,388 | 54.2% | 2,811 | 81.6% | 6,665 | 330.5% |
| Marketing Personnel | 1,475 | 163 | 11.1% | 1,638 | 1,919 | 17.1% | 2,547 | 55.5% | 2,984 | 82.1% | 7,098 | 333.3% |
| General Semi Skilled Worker | 2,983 | 62 | 2.1% | 3,045 | 3,895 | 27.9% | 5,136 | 68.7% | 6,034 | 98.2% | 14,429 | 373.9% |
| General Labour | 3,458 | 0 | 0.0% | 3,458 | 4,544 | 31.4% | 5,956 | 72.2% | 6,981 | 101.9% | 16,628 | 380.9% |
| Other Employees | 4,006 | 208 | 5.2% | 4,214 | 5,238 | 24.3% | 6,856 | 62.7% | 8,104 | 92.3% | 19,334 | 358.8% |
| Administrative workers | 1,679 | 37 | 2.2% | 1,716 | 2,193 | 27.8% | 2,864 | 66.9% | 3,377 | 96.8% | 8,089 | 371.4% |
| **Total** | **34,811** | **2,984** | **8.6%** | **37,796** | **45,496** | **20.4%** | **59,774** | **58.1%** | **70,382** | **86.2%** | **167,562** | **343.3%** |

Table 17 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 36.0% (MEH 35.7%), Power Distribution Engineer 29.2% (MEH 29.8%) and Technicians 22.0% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.3% (MEH 6.3%), Specialist or Consultant 3.5% (MEH 3.3%) and Administrative Workers 2.2% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.4% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 58.1% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 86.2% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 343.3% (MEH 342.4%)

Tables 18, 19 and 20 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.3% (MEH 10.5%)
Renewable Energy – 6.9% (MEH 7.0%)
Environmental – 10.5% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 48.5% (MEH 47.3%); Renewable Energy 27.7% (MEH 27.9%) and Environmental 35.4% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 33.9% (MEH 33.7%); Renewable Energy 25.3% (MEH 27.1%) and Environmental 34.1% (MEH 32.6%)
Technicians: Low Carbon 27.5% (MEH 27.9%); Renewable Energy 16.9% (MEH 17.3%) and Environmental 23.2% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 64.4% (MEH 68.8%), but only 13.9% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 15.8% (MEH 17.0%); Renewable Energy 35.2% (MEH 34.5%) and Environmental 26.7% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 28.2% (MEH 28.1%); Renewable Energy 36.7% (MEH 35.1%) and Environmental 28.2% (MEH 29.3%)
Technicians of: Low Carbon 36.5% (MEH 34.2%); Renewable Energy 46.1% (MEH 45.9%) and Environmental 39.6% (MEH 39.6%)

**Table 18: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 359 | 99 | 27.5% | 458 | 463 | 1.0% | 625 | 36.5% | 735 | 60.4% | 1,741 | 280.2% |
| Snr Management SME | 612 | 72 | 11.8% | 684 | 795 | 16.2% | 1,061 | 55.1% | 1,231 | 80.0% | 2,946 | 330.7% |
| Supervisory | 784 | 100 | 12.8% | 885 | 1,029 | 16.3% | 1,355 | 53.2% | 1,584 | 79.0% | 3,759 | 324.9% |
| Middle / Junior Management | 735 | 94 | 12.9% | 829 | 963 | 16.1% | 1,263 | 52.3% | 1,469 | 77.1% | 3,573 | 331.0% |
| Designer / Developer | 99 | 28 | 28.4% | 127 | 128 | 0.9% | 169 | 33.4% | 199 | 56.6% | 478 | 276.5% |
| Clerical | 412 | 1 | 0.3% | 413 | 543 | 31.4% | 706 | 70.9% | 833 | 101.5% | 1,975 | 378.0% |
| Self Employed | 146 | 24 | 16.3% | 170 | 192 | 13.2% | 249 | 46.9% | 292 | 72.4% | 697 | 311.3% |
| Advisor or Agent | 150 | 26 | 17.0% | 176 | 198 | 12.9% | 257 | 46.5% | 304 | 73.0% | 721 | 310.7% |
| Educator | 0 | 0 | 22.4% | 1 | 1 | 4.7% | 1 | 42.5% | 1 | 57.9% | 2 | 289.8% |
| Specialist or Consultant | 648 | 27 | 4.2% | 675 | 852 | 26.2% | 1,122 | 66.2% | 1,298 | 92.2% | 3,090 | 357.6% |
| Editor | 9 | 0 | 3.9% | 10 | 12 | 27.2% | 16 | 65.3% | 19 | 96.1% | 43 | 355.2% |
| Industrial Researchers | 224 | 18 | 8.0% | 242 | 292 | 20.6% | 385 | 58.9% | 455 | 88.1% | 1,089 | 350.1% |
| Scientist | 119 | 39 | 32.6% | 157 | 154 | -2.2% | 201 | 28.0% | 245 | 55.8% | 574 | 264.7% |
| Maintenance Engineer | 751 | 60 | 8.0% | 812 | 980 | 20.7% | 1,294 | 59.4% | 1,532 | 88.7% | 3,614 | 345.3% |
| Civil Engineer | 46 | 14 | 30.8% | 60 | 60 | -0.2% | 78 | 30.3% | 94 | 56.3% | 220 | 267.2% |
| Production Engineer | 168 | 82 | 48.5% | 250 | 214 | -14.5% | 289 | 15.8% | 336 | 34.5% | 810 | 224.3% |
| Power distribution Engineer | 291 | 99 | 33.9% | 390 | 381 | -2.3% | 500 | 28.2% | 589 | 51.1% | 1,401 | 259.5% |
| Construction Engineer | 69 | 14 | 20.3% | 84 | 91 | 9.2% | 120 | 43.7% | 139 | 66.2% | 334 | 299.7% |
| Sales Exec | 416 | 60 | 14.5% | 476 | 548 | 15.0% | 717 | 50.6% | 842 | 76.8% | 1,973 | 314.3% |
| Marketing Personnel | 443 | 60 | 13.6% | 503 | 582 | 15.7% | 768 | 52.6% | 907 | 80.1% | 2,147 | 326.7% |
| General Semi Skilled Worker | 751 | 19 | 2.5% | 770 | 976 | 26.8% | 1,294 | 68.1% | 1,523 | 98.0% | 3,586 | 365.9% |
| General Labour | 1,165 | 0 | 0.0% | 1,165 | 1,531 | 31.4% | 2,007 | 72.2% | 2,352 | 101.9% | 5,573 | 378.3% |
| Other Employees | 957 | 63 | 6.5% | 1,020 | 1,253 | 22.9% | 1,653 | 62.1% | 1,925 | 88.7% | 4,603 | 351.4% |
| Administrative workers | 498 | 14 | 2.8% | 512 | 654 | 27.7% | 855 | 67.0% | 998 | 95.1% | 2,409 | 370.9% |
| **Total** | **9,853** | **1,013** | **10.3%** | **10,866** | **12,889** | **18.6%** | **16,985** | **56.3%** | **19,900** | **83.1%** | **47,360** | **335.9%** |

**Table 19: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 461 | 78 | 16.9% | 539 | 605 | 12.2% | 788 | 46.1% | 939 | 74.1% | 2,225 | 312.5% |
| Snr Management SME | 1,453 | 135 | 9.3% | 1,588 | 1,902 | 19.8% | 2,504 | 57.7% | 2,963 | 86.5% | 6,910 | 335.1% |
| Supervisory | 1,602 | 142 | 8.9% | 1,745 | 2,070 | 18.6% | 2,720 | 55.9% | 3,258 | 86.7% | 7,795 | 346.9% |
| Middle / Junior Management | 1,579 | 142 | 9.0% | 1,721 | 2,063 | 19.9% | 2,690 | 56.3% | 3,171 | 84.3% | 7,568 | 339.8% |
| Designer / Developer | 120 | 26 | 21.7% | 146 | 158 | 7.7% | 207 | 41.4% | 244 | 66.3% | 579 | 295.3% |
| Clerical | 794 | 1 | 0.2% | 795 | 1,050 | 32.0% | 1,366 | 71.8% | 1,604 | 101.7% | 3,811 | 379.2% |
| Self Employed | 111 | 10 | 9.2% | 121 | 145 | 19.6% | 191 | 57.7% | 222 | 83.4% | 532 | 338.8% |
| Advisor or Agent | 35 | 6 | 16.5% | 41 | 46 | 12.2% | 61 | 49.1% | 70 | 73.0% | 169 | 313.8% |
| Educator | 0 | 0 | 12.0% | 0 | 0 | 19.0% | 0 | 48.6% | 0 | 94.9% | 0 | 335.4% |
| Specialist or Consultant | 787 | 23 | 2.9% | 810 | 1,036 | 28.0% | 1,342 | 65.7% | 1,581 | 95.2% | 3,761 | 364.4% |
| Editor | 10 | 0 | 3.4% | 11 | 14 | 26.3% | 18 | 67.3% | 21 | 97.6% | 50 | 360.6% |
| Industrial Researchers | 48 | 3 | 6.8% | 51 | 62 | 21.8% | 82 | 61.5% | 96 | 88.6% | 228 | 347.1% |
| Scientist | 17 | 5 | 29.9% | 23 | 23 | 1.1% | 30 | 33.5% | 36 | 57.7% | 83 | 266.5% |
| Maintenance Engineer | 1,642 | 91 | 5.5% | 1,733 | 2,141 | 23.5% | 2,816 | 62.5% | 3,337 | 92.6% | 7,923 | 357.2% |
| Civil Engineer | 47 | 10 | 21.0% | 57 | 61 | 8.1% | 80 | 40.5% | 96 | 68.2% | 227 | 300.1% |
| Production Engineer | 240 | 66 | 27.7% | 306 | 315 | 2.9% | 414 | 35.2% | 487 | 59.1% | 1,154 | 276.9% |
| Power distribution Engineer | 758 | 192 | 25.3% | 950 | 992 | 4.4% | 1,298 | 36.7% | 1,532 | 61.3% | 3,668 | 286.3% |
| Construction Engineer | 112 | 14 | 12.3% | 126 | 148 | 17.6% | 191 | 51.7% | 230 | 82.5% | 546 | 332.9% |
| Sales Exec | 705 | 65 | 9.2% | 770 | 916 | 19.1% | 1,205 | 56.6% | 1,428 | 85.5% | 3,387 | 340.1% |
| Marketing Personnel | 769 | 71 | 9.3% | 841 | 991 | 17.9% | 1,327 | 57.9% | 1,545 | 83.7% | 3,695 | 339.4% |
| General Semi Skilled Worker | 1,594 | 28 | 1.8% | 1,622 | 2,080 | 28.2% | 2,736 | 68.7% | 3,215 | 98.1% | 7,755 | 378.0% |
| General Labour | 1,849 | 0 | 0.0% | 1,849 | 2,432 | 31.6% | 3,187 | 72.4% | 3,732 | 101.9% | 8,923 | 382.7% |
| Other Employees | 2,307 | 105 | 4.5% | 2,412 | 3,021 | 25.3% | 3,940 | 63.4% | 4,673 | 93.8% | 11,153 | 362.5% |
| Administrative workers | 845 | 15 | 1.8% | 860 | 1,103 | 28.3% | 1,437 | 67.1% | 1,701 | 97.9% | 4,064 | 372.6% |
| **Total** | **17,886** | **1,230** | **6.9%** | **19,116** | **23,375** | **22.3%** | **30,633** | **60.3%** | **36,180** | **89.3%** | **86,206** | **351.0%** |

**Table 20: Greater Birmingham and Solihull LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 303 | 70 | 23.2% | 373 | 395 | 5.9% | 521 | 39.6% | 614 | 64.5% | 1,458 | 290.5% |
| **Snr Management SME** | 443 | 47 | 10.6% | 490 | 581 | 18.5% | 767 | 56.5% | 895 | 82.6% | 2,124 | 333.1% |
| **Supervisory** | 530 | 57 | 10.8% | 587 | 685 | 16.6% | 913 | 55.4% | 1,071 | 82.4% | 2,551 | 334.5% |
| **Middle / Junior Management** | 515 | 55 | 10.8% | 570 | 669 | 17.4% | 886 | 55.4% | 1,040 | 82.5% | 2,467 | 332.9% |
| **Designer / Developer** | 172 | 49 | 28.2% | 221 | 225 | 2.1% | 295 | 33.7% | 345 | 56.3% | 824 | 273.3% |
| **Clerical** | 265 | 1 | 0.2% | 266 | 344 | 29.7% | 459 | 72.7% | 536 | 101.8% | 1,258 | 373.9% |
| **Self Employed** | 151 | 19 | 12.6% | 170 | 196 | 14.9% | 259 | 52.2% | 306 | 79.4% | 729 | 327.7% |
| **Advisor or Agent** | 102 | 18 | 17.3% | 120 | 135 | 12.5% | 175 | 46.5% | 204 | 70.5% | 490 | 309.4% |
| **Educator** | 8 | 3 | 33.1% | 11 | 11 | -1.6% | 14 | 28.1% | 17 | 53.3% | 39 | 258.6% |
| **Specialist or Consultant** | 343 | 12 | 3.6% | 356 | 449 | 26.3% | 584 | 64.2% | 694 | 95.0% | 1,654 | 365.1% |
| **Editor** | 23 | 1 | 4.1% | 24 | 30 | 25.1% | 39 | 63.7% | 46 | 95.1% | 110 | 363.1% |
| **Industrial Researchers** | 126 | 10 | 8.0% | 137 | 164 | 20.4% | 217 | 59.0% | 254 | 85.9% | 600 | 339.3% |
| **Scientist** | 44 | 15 | 35.4% | 59 | 57 | -3.4% | 75 | 27.1% | 88 | 49.7% | 210 | 256.6% |
| **Maintenance Engineer** | 648 | 42 | 6.5% | 690 | 844 | 22.3% | 1,116 | 61.8% | 1,310 | 89.9% | 3,111 | 350.9% |
| **Civil Engineer** | 105 | 29 | 27.8% | 134 | 136 | 1.6% | 180 | 34.5% | 213 | 58.8% | 505 | 276.8% |
| **Production Engineer** | 149 | 53 | 35.4% | 202 | 195 | -3.5% | 255 | 26.7% | 301 | 49.4% | 721 | 257.6% |
| **Power distribution Engineer** | 307 | 105 | 34.1% | 412 | 404 | -1.8% | 528 | 28.2% | 622 | 51.0% | 1,470 | 256.9% |
| **Construction Engineer** | 146 | 28 | 19.1% | 173 | 190 | 9.7% | 251 | 44.9% | 295 | 70.0% | 699 | 303.3% |
| **Sales Exec** | 269 | 33 | 12.4% | 302 | 355 | 17.3% | 465 | 53.7% | 542 | 79.1% | 1,305 | 331.5% |
| **Marketing Personnel** | 262 | 32 | 12.2% | 294 | 345 | 17.5% | 452 | 53.6% | 532 | 80.9% | 1,257 | 327.2% |
| **General Semi Skilled Worker** | 638 | 15 | 2.3% | 653 | 839 | 28.5% | 1,106 | 69.4% | 1,296 | 98.5% | 3,088 | 373.0% |
| **General Labour** | 444 | 0 | 0.0% | 444 | 581 | 30.9% | 762 | 71.6% | 897 | 102.0% | 2,132 | 380.2% |
| **Other Employees** | 742 | 40 | 5.5% | 783 | 964 | 23.1% | 1,263 | 61.4% | 1,507 | 92.4% | 3,578 | 357.0% |
| **Administrative workers** | 337 | 8 | 2.3% | 344 | 437 | 26.9% | 573 | 66.3% | 678 | 96.8% | 1,616 | 369.1% |
| **Total** | **7,072** | **742** | **10.5%** | **7,814** | **9,232** | **18.1%** | **12,156** | **55.6%** | **14,302** | **83.0%** | **33,996** | **335.0%** |

## 5.4 Greater Birmingham and Solihull LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Greater Birmingham an Solihull LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 35 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Greater Birmingham an Solihull LEP, with the bubbles sized by sales £m.  This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Greater Birmingham an Solihull LEP.  Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 35: Greater Birmingham and Solihull LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

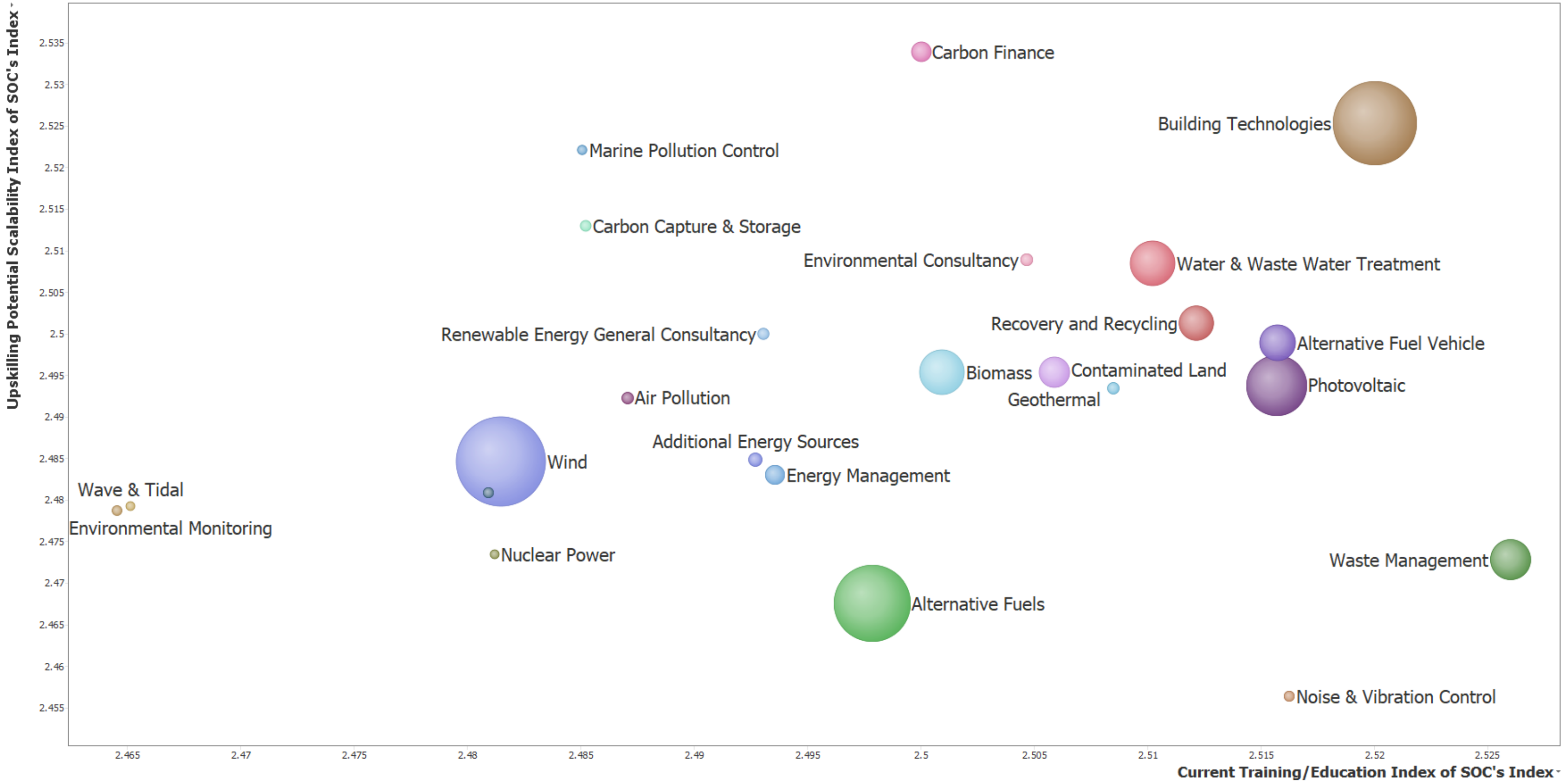



Figure 35 shows that Building Technologies holds the most desirable position, with good current training capacity combined with a strong potential for upskilling.  With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.  Alternative Fuel Vehicle, Photovoltaic and Water and Waste Water Treatment are also strong.

## 5.5 Greater Birmingham and Solihull LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Greater Birmingham an Solihull LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

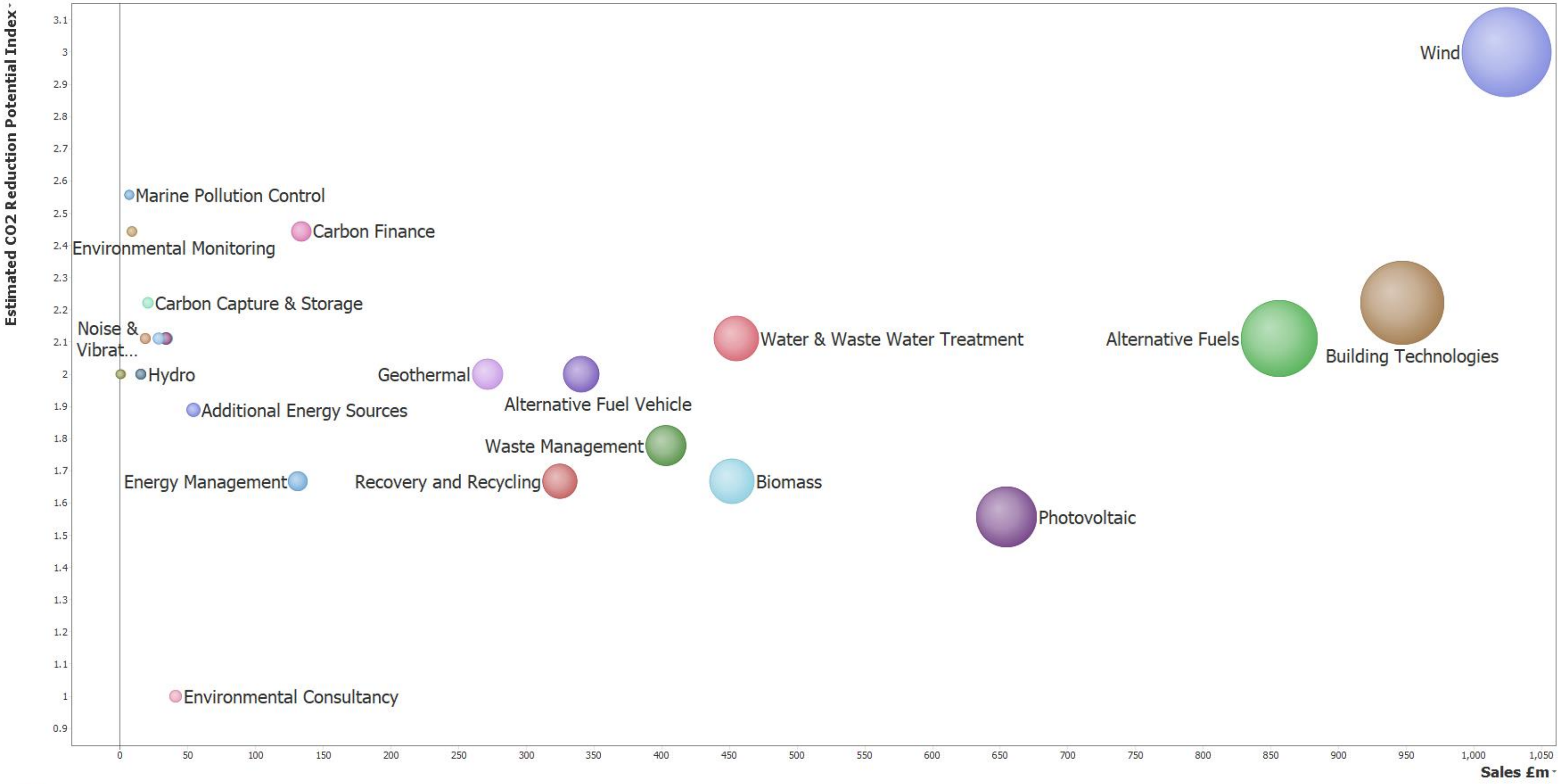
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 36 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Building Technologies having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 36: Greater Birmingham and Solihull LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 6. Growth Forecast for Net Zero in 2030 and 2050 for the Greater Lincolnshire LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Greater Lincolnshire LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 6.1 Greater Lincolnshire LEP's LCEGS Strengths and Weaknesses

In this section of the report Greater Lincolnshire LEP's LCEGS performance is compared with the UK as a whole. The Greater Lincolnshire LEP's LCEGS sector was worth £2.4bn in 2019/20 and accounts for 1.1% of the UK total.

Figure 37 shows how the Greater Lincolnshire LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 1.1%. This proportionality factor demonstrates where the Greater Lincolnshire LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 1.1% of the UK market; above 1 = larger than 1.1% share and below 1 = smaller than 1.1% share.

The y-axis represents the growth rate of the Greater Lincolnshire LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 37 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric are strengths, because they are close to or match the expected size of market (1.1 for Contaminated Land and 1.1 for Hydro) and are growing significantly stronger than the UK average (8.1% LEP vs 1.0% UK for Contaminated Land and 8.4% vs. 1.8%Uk for Hydro)

**Figure 37: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

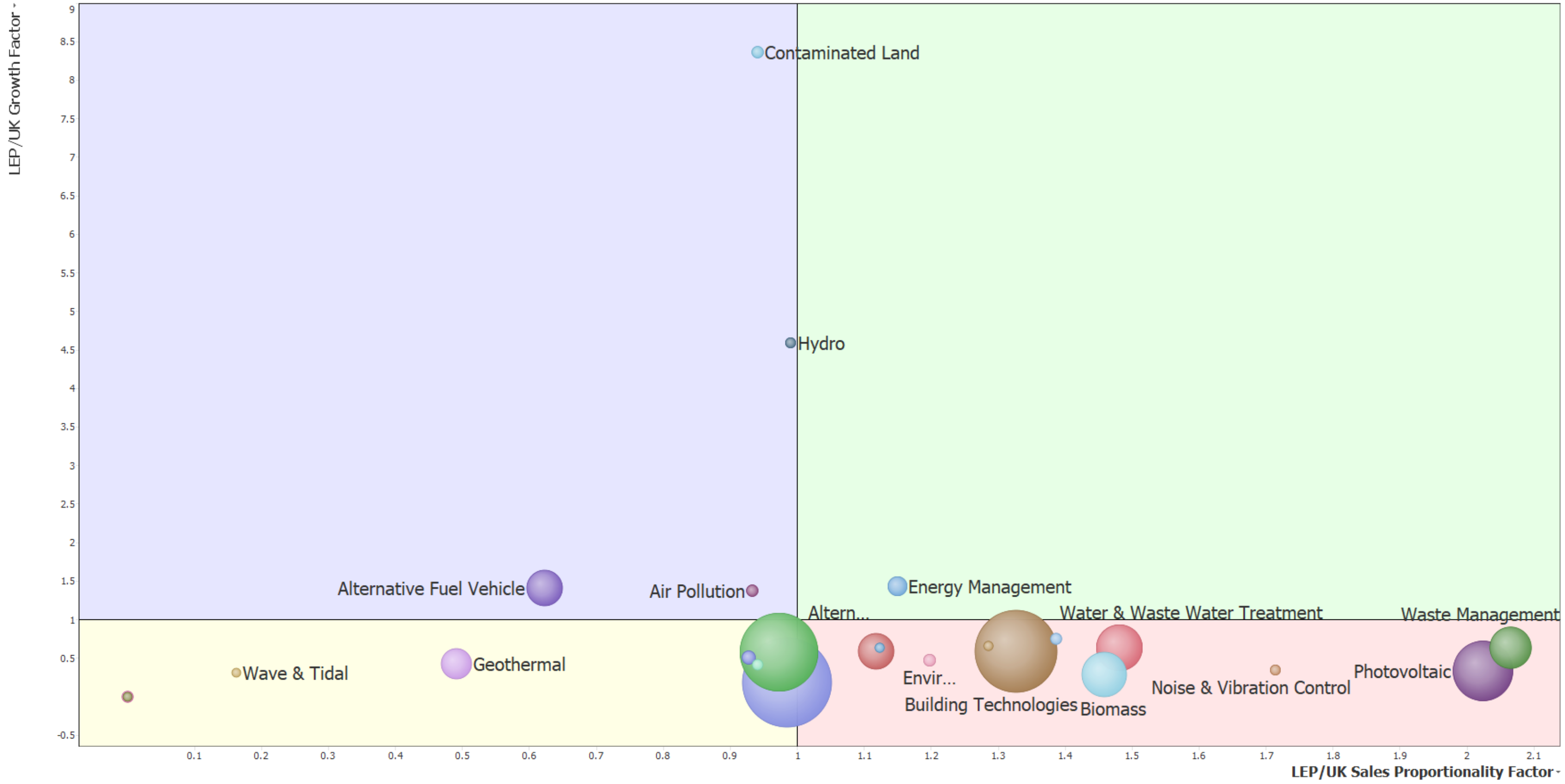
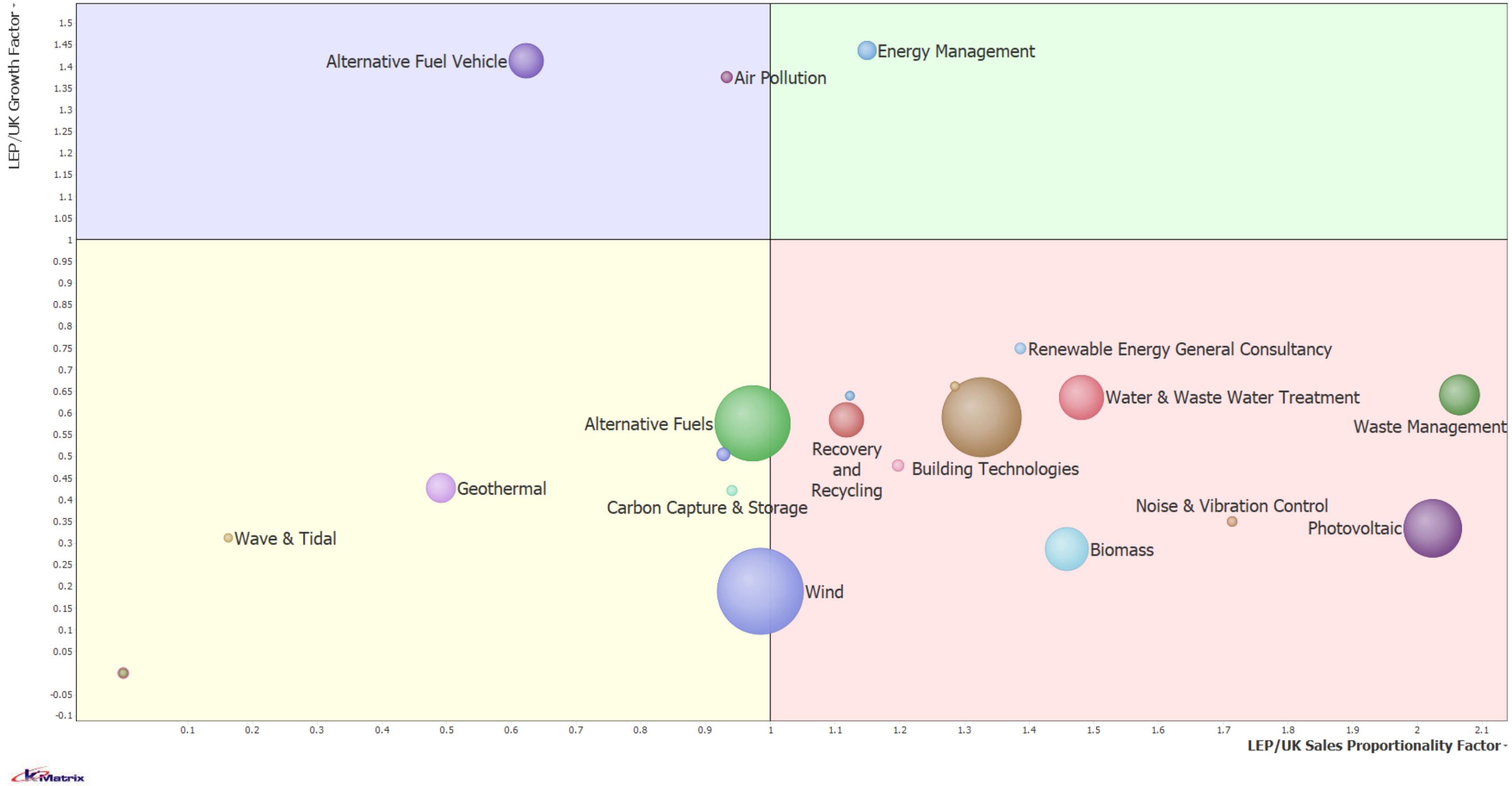


Figure 38 provides the same information as figure 34, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management has the ideal characteristics of above UK average growth and above LEP average size. Those in the bottom right quadrant (red) hold a larger UK share than the LEP's average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Waste Management and Biomass set these sub-sector apart as being strengths. Alternative Fuel Vehicle holds a smaller share of the UK market than the LEP average but has stronger growth. Those in the lower left (yellow) quadrant i.e. Wave & tidal and Geothermal can be considered relative weaknesses.

**Figure 38: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m – Excluding Contaminated Land, Nuclear and Hydro**



## 6.2 Scalability of Greater Lincolnshire LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:
- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 39 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Greater Lincolnshire LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Alternative Fuels sub-sector has a good combination of size and scalability, while Additional Energy Sources may be small in terms of market but is highly scalable. Wind is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Greater Lincolnshire LEP Market Snapshot report.

**Figure 39: Greater Lincolnshire LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

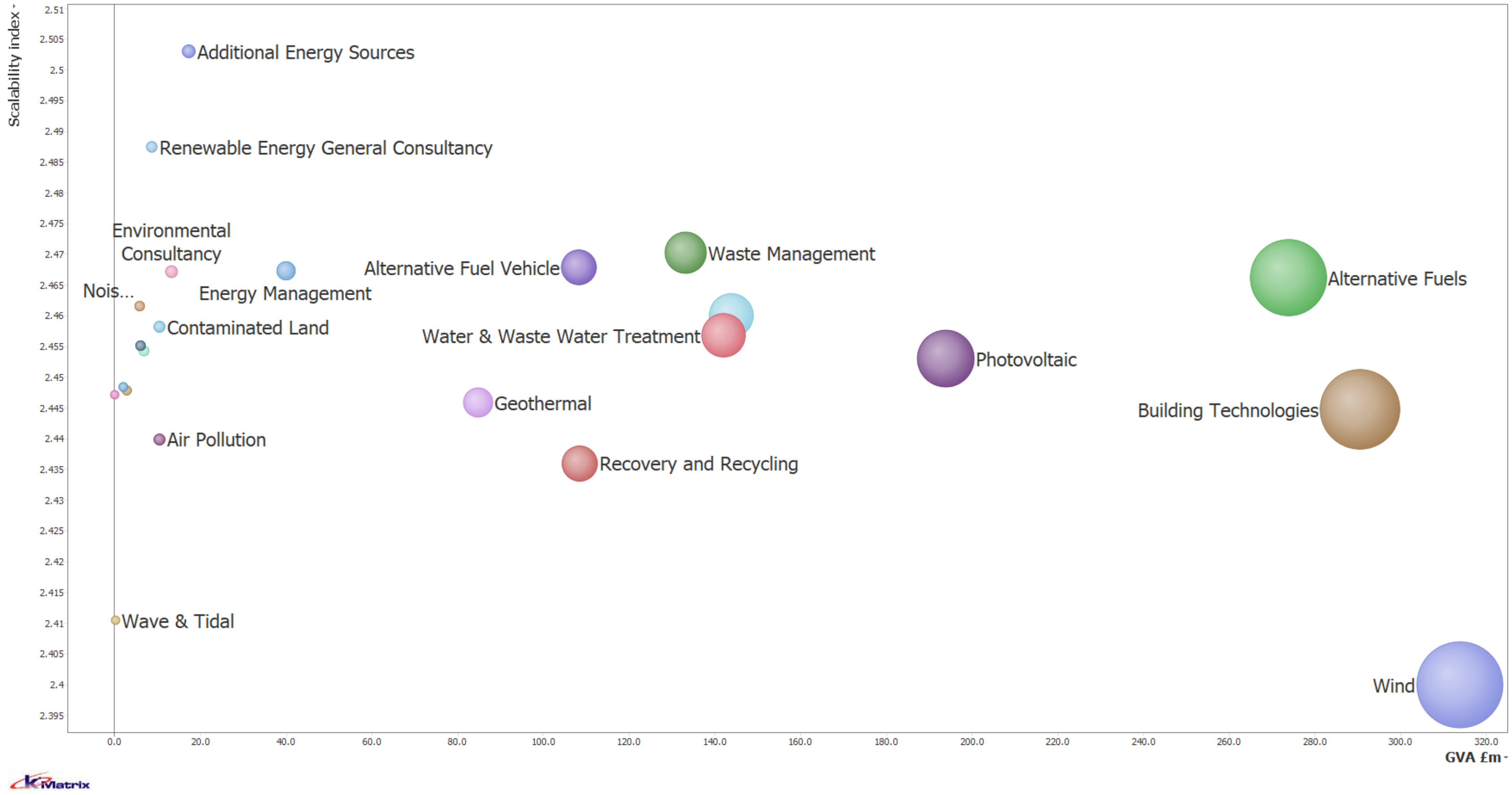
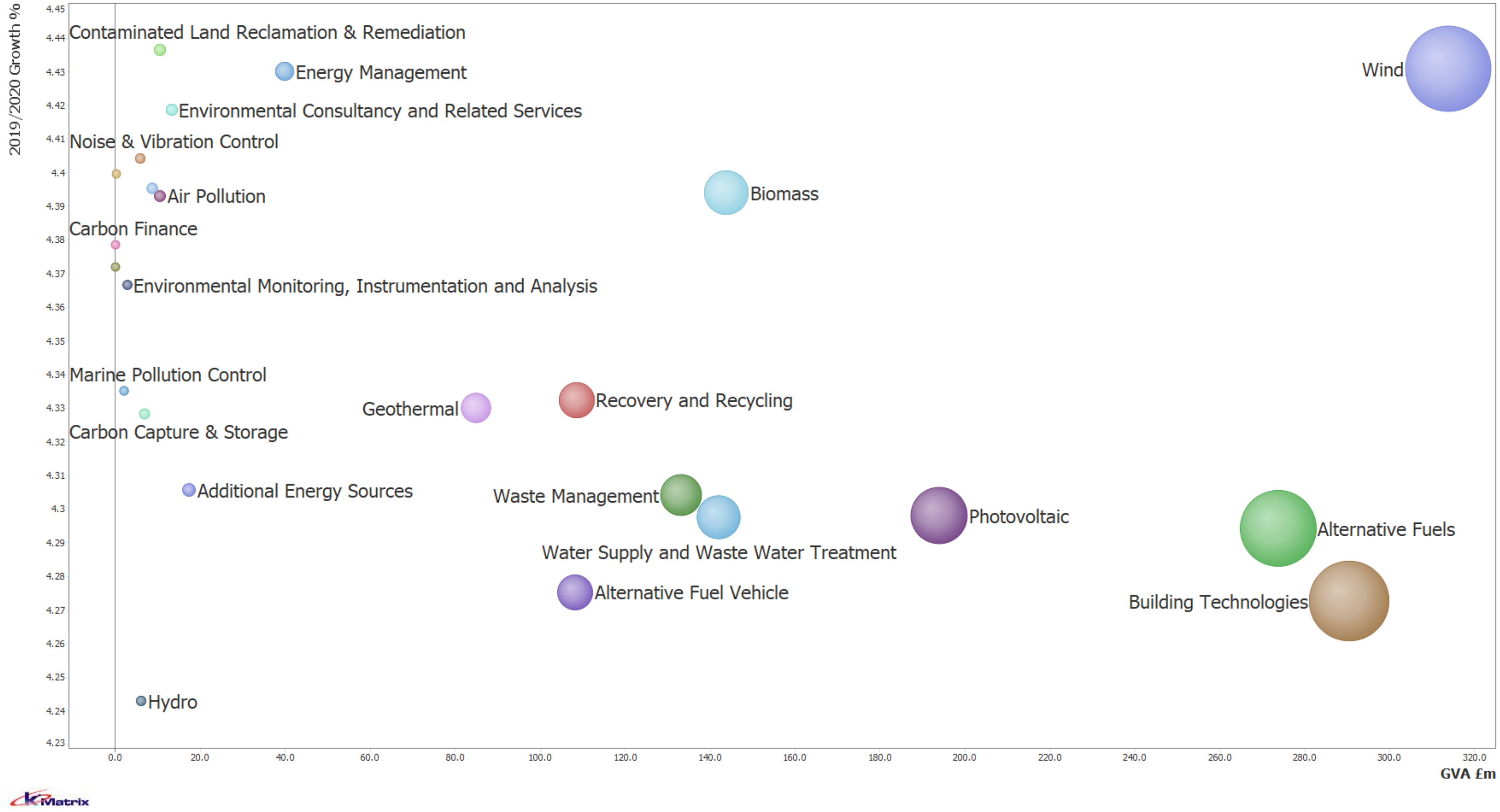


Figure 40 shows the same principle as Figure 40, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies the most favourable position of large size and high growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 40: Greater Lincolnshire LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

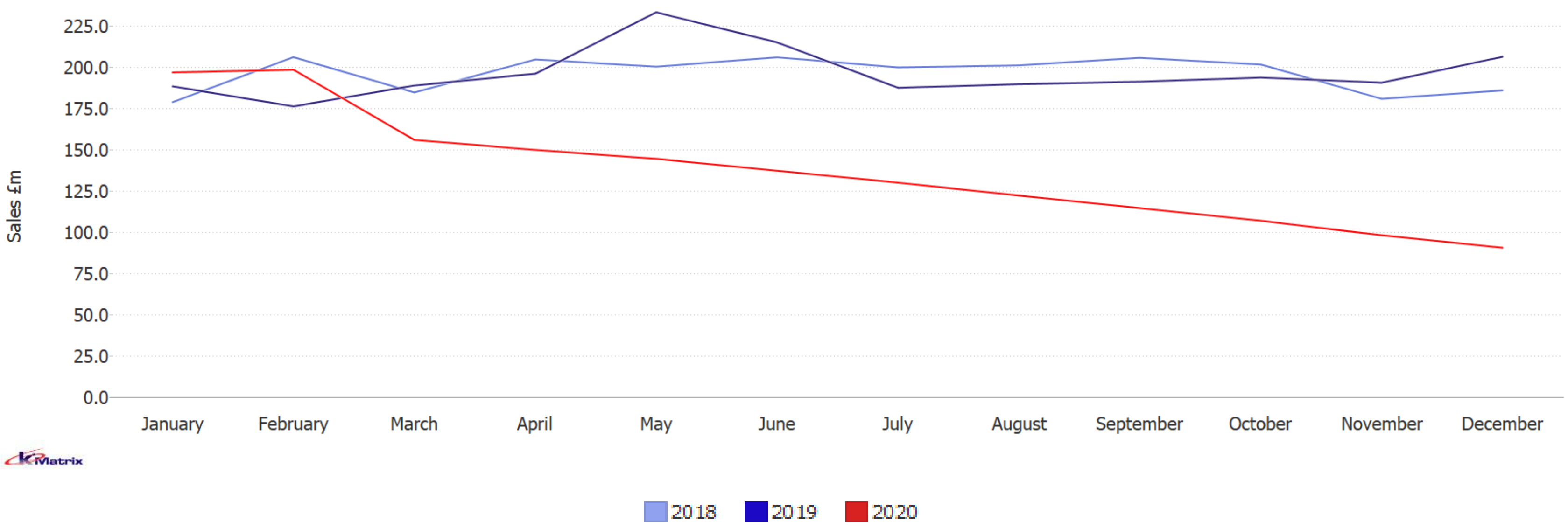


## 6.3 Greater Lincolnshire LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 41, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Greater Lincolnshire LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 41: Greater Lincolnshire LEP LCEGS Sales, by month 2018, 2019 and 2020**

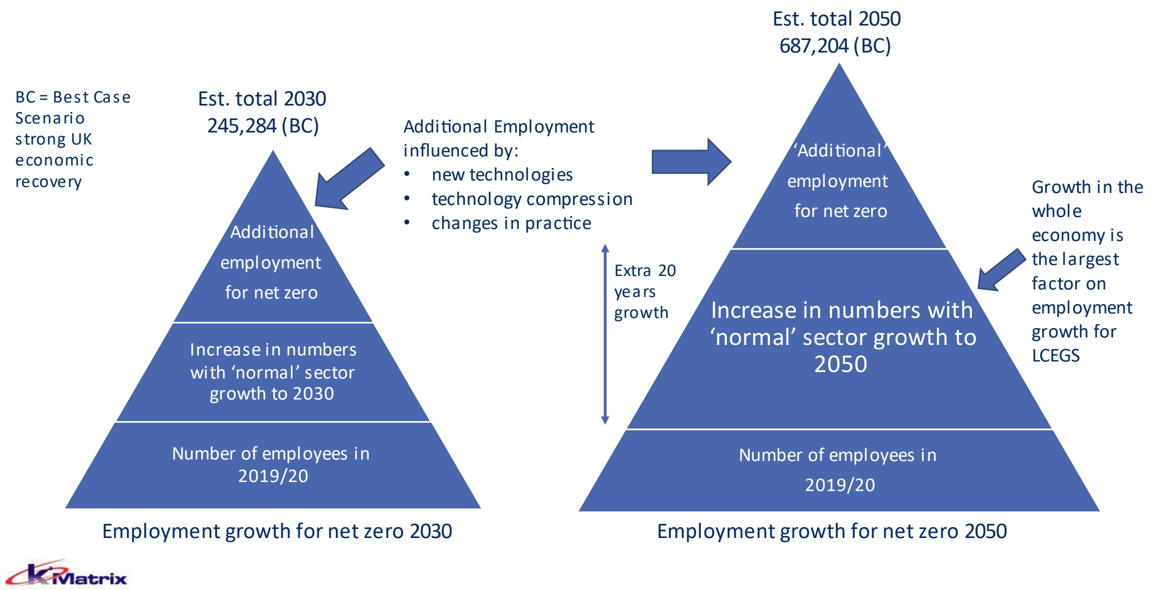


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| ***Timeline for Net Zero*** | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 21 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Greater Lincolnshire LEP.

Shortage of employees refers to the employees that are 'imported' from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not 'fit'. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as "Other Employees" because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to 'heads equivalent', so although for example, there are 3 Educators listed, with a shortage of 1, making a total of 4 in the region, this will equate to over 40 people providing 'pockets' of time, to equate to 4 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 21: Greater Lincolnshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 409 | 90 | 22.1% | 499 | 536 | 7.4% | 701 | 40.5% | 826 | 65.4% | 1,969 | 294.5% |
| **Snr Management SME** | 961 | 96 | 10.0% | 1,057 | 1,257 | 18.8% | 1,637 | 54.8% | 1,949 | 84.3% | 4,609 | 335.9% |
| **Supervisory** | 1,000 | 102 | 10.2% | 1,103 | 1,304 | 18.2% | 1,719 | 55.9% | 2,019 | 83.1% | 4,811 | 336.3% |
| **Middle / Junior Management** | 950 | 97 | 10.2% | 1,047 | 1,241 | 18.5% | 1,625 | 55.2% | 1,927 | 84.0% | 4,584 | 337.8% |
| **Designer / Developer** | 141 | 37 | 26.6% | 178 | 184 | 3.3% | 241 | 35.3% | 283 | 59.3% | 676 | 280.0% |
| **Clerical** | 507 | 1 | 0.2% | 508 | 662 | 30.3% | 873 | 71.8% | 1,026 | 102.0% | 2,433 | 378.9% |
| **Self Employed** | 128 | 16 | 12.9% | 144 | 167 | 15.8% | 219 | 52.0% | 257 | 78.3% | 612 | 325.0% |
| **Advisor or Agent** | 97 | 16 | 16.3% | 113 | 127 | 11.7% | 168 | 47.9% | 197 | 74.1% | 466 | 310.9% |
| **Educator** | 3 | 1 | 31.1% | 4 | 4 | -0.4% | 5 | 30.6% | 6 | 53.7% | 15 | 265.2% |
| **Specialist or Consultant** | 477 | 15 | 3.2% | 492 | 624 | 26.8% | 820 | 66.6% | 966 | 96.3% | 2,289 | 365.1% |
| **Editor** | 15 | 1 | 3.7% | 16 | 20 | 26.1% | 26 | 65.0% | 30 | 94.2% | 72 | 362.9% |
| **Industrial Researchers** | 147 | 11 | 7.8% | 158 | 193 | 21.7% | 252 | 59.2% | 298 | 87.8% | 705 | 344.8% |
| **Scientist** | 73 | 25 | 33.4% | 98 | 95 | -2.5% | 126 | 28.6% | 147 | 49.9% | 354 | 262.2% |
| **Maintenance Engineer** | 1,086 | 68 | 6.3% | 1,155 | 1,414 | 22.4% | 1,864 | 61.4% | 2,201 | 90.6% | 5,202 | 350.5% |
| **Civil Engineer** | 80 | 21 | 26.7% | 101 | 104 | 3.1% | 137 | 35.5% | 161 | 59.2% | 384 | 279.9% |
| **Production Engineer** | 207 | 75 | 36.4% | 282 | 270 | -4.3% | 355 | 26.0% | 420 | 49.0% | 998 | 253.9% |
| **Power distribution Engineer** | 497 | 149 | 29.9% | 646 | 649 | 0.6% | 853 | 32.1% | 1,006 | 55.7% | 2,385 | 269.3% |
| **Construction Engineer** | 111 | 19 | 17.3% | 130 | 145 | 11.7% | 191 | 46.7% | 225 | 72.9% | 535 | 311.1% |
| **Sales Exec** | 502 | 58 | 11.5% | 560 | 658 | 17.5% | 859 | 53.4% | 1,014 | 81.0% | 2,419 | 332.0% |
| **Marketing Personnel** | 527 | 58 | 11.1% | 586 | 690 | 17.8% | 905 | 54.5% | 1,067 | 82.1% | 2,533 | 332.3% |
| **General Semi Skilled Worker** | 1,082 | 22 | 2.1% | 1,104 | 1,420 | 28.6% | 1,852 | 67.8% | 2,190 | 98.4% | 5,183 | 369.4% |
| **General Labour** | 1,321 | 0 | 0.0% | 1,321 | 1,724 | 30.5% | 2,263 | 71.3% | 2,672 | 102.3% | 6,354 | 381.0% |
| **Other Employees** | 1,266 | 64 | 5.1% | 1,330 | 1,657 | 24.5% | 2,169 | 63.0% | 2,562 | 92.6% | 6,064 | 355.9% |
| **Administrative workers** | 525 | 11 | 2.1% | 536 | 688 | 28.4% | 900 | 67.8% | 1,058 | 97.2% | 2,525 | 370.8% |
| **Total** | **12,113** | **1,056** | **8.7%** | **13,169** | **15,832** | **20.2%** | **20,761** | **57.7%** | **24,507** | **86.1%** | **58,177** | **341.8%** |

Table 21 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 36.4% (MEH 35.7%), Power Distribution Engineer 29.9% (MEH 29.8%) and Technicians 22.1% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.3% (MEH 6.3%), Specialist or Consultant 3.2% (MEH 3.3%) and Administrative Workers 2.1% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.2% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 57.7% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 86.1% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 341.8% (MEH 342.4%)

Tables 22, 23 and 24 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.6% (MEH 10.5%)
Renewable Energy – 7.0% (MEH 7.0%)
Environmental – 10.5% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 50.3% (MEH 47.3%); Renewable Energy 27.4% (MEH 27.9%) and Environmental 35.2% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 33.7% (MEH 33.7%); Renewable Energy 27.2% (MEH 27.1%) and Environmental 32.9% (MEH 32.6%)
Technicians: Low Carbon 27.1% (MEH 27.9%); Renewable Energy 17.5% (MEH 17.3%) and Environmental 23.1% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 64.6% (MEH 68.8%), but only 13.7% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 14.9% (MEH 17.0%); Renewable Energy 34.5% (MEH 34.5%) and Environmental 26.9% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 28.9% (MEH 28.1%); Renewable Energy 34.5% (MEH 35.1%) and Environmental 29.7% (MEH 29.3%)
Technicians of: Low Carbon 34.0% (MEH 34.2%); Renewable Energy 46.5% (MEH 45.9%) and Environmental 39.8% (MEH 39.6%)

**Table 22: Greater Lincolnshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 129 | 35 | 27.1% | 165 | 170 | 3.1% | 220 | 34.0% | 261 | 58.4% | 626 | 280.3% |
| Snr Management SME | 231 | 28 | 12.0% | 259 | 301 | 16.1% | 394 | 52.0% | 467 | 80.5% | 1,106 | 327.3% |
| Supervisory | 246 | 31 | 12.6% | 277 | 324 | 16.7% | 421 | 51.7% | 500 | 80.3% | 1,185 | 327.2% |
| Middle / Junior Management | 233 | 29 | 12.4% | 262 | 305 | 16.1% | 399 | 52.1% | 474 | 80.8% | 1,124 | 328.7% |
| Designer / Developer | 36 | 10 | 28.4% | 46 | 47 | 2.0% | 61 | 32.9% | 71 | 56.4% | 170 | 272.0% |
| Clerical | 127 | 0 | 0.2% | 127 | 166 | 30.9% | 218 | 71.4% | 256 | 101.7% | 609 | 379.0% |
| Self Employed | 45 | 7 | 16.0% | 53 | 60 | 12.9% | 78 | 48.0% | 91 | 73.2% | 218 | 314.4% |
| Advisor or Agent | 47 | 8 | 16.2% | 55 | 61 | 11.2% | 81 | 48.5% | 95 | 73.6% | 225 | 311.0% |
| Educator | 0 | 0 | 22.5% | 0 | 0 | 5.6% | 0 | 39.1% | 0 | 64.3% | 1 | 286.7% |
| Specialist or Consultant | 120 | 5 | 3.9% | 125 | 158 | 26.5% | 208 | 66.1% | 245 | 95.9% | 578 | 361.7% |
| Editor | 3 | 0 | 3.7% | 3 | 4 | 26.6% | 5 | 64.7% | 6 | 95.4% | 15 | 364.1% |
| Industrial Researchers | 83 | 7 | 7.9% | 89 | 108 | 21.6% | 141 | 58.7% | 167 | 87.6% | 394 | 341.7% |
| Scientist | 48 | 16 | 33.8% | 65 | 63 | -2.9% | 83 | 28.2% | 96 | 48.9% | 234 | 262.6% |
| Maintenance Engineer | 266 | 21 | 8.0% | 288 | 348 | 21.0% | 458 | 59.2% | 539 | 87.5% | 1,276 | 343.7% |
| Civil Engineer | 18 | 5 | 29.8% | 24 | 24 | 0.7% | 31 | 32.6% | 37 | 55.4% | 88 | 270.7% |
| Production Engineer | 62 | 31 | 50.3% | 93 | 81 | -13.4% | 107 | 14.9% | 126 | 35.6% | 301 | 223.0% |
| Power distribution Engineer | 105 | 36 | 33.7% | 141 | 139 | -1.6% | 182 | 28.9% | 216 | 53.2% | 506 | 259.5% |
| Construction Engineer | 23 | 5 | 20.4% | 28 | 30 | 8.7% | 40 | 42.6% | 47 | 68.7% | 111 | 301.3% |
| Sales Exec | 151 | 22 | 14.6% | 173 | 198 | 14.5% | 257 | 48.7% | 306 | 77.3% | 724 | 319.5% |
| Marketing Personnel | 160 | 23 | 14.2% | 183 | 208 | 14.1% | 276 | 50.9% | 322 | 76.3% | 769 | 320.9% |
| General Semi Skilled Worker | 273 | 7 | 2.6% | 280 | 359 | 28.2% | 466 | 66.6% | 554 | 98.0% | 1,303 | 365.6% |
| General Labour | 439 | 0 | 0.0% | 439 | 572 | 30.4% | 752 | 71.4% | 886 | 102.0% | 2,109 | 380.6% |
| Other Employees | 290 | 18 | 6.3% | 309 | 380 | 23.1% | 501 | 62.5% | 585 | 89.5% | 1,390 | 350.6% |
| Administrative workers | 140 | 4 | 2.6% | 143 | 182 | 27.3% | 240 | 67.2% | 281 | 96.4% | 671 | 368.3% |
| **Total** | **3,277** | **348** | **10.6%** | **3,624** | **4,286** | **18.2%** | **5,618** | **55.0%** | **6,631** | **83.0%** | **15,733** | **334.1%** |

**Table 23: Greater Lincolnshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 166 | 29 | 17.5% | 195 | 218 | 11.9% | 286 | 46.5% | 336 | 72.2% | 798 | 309.2% |
| Snr Management SME | 551 | 50 | 9.1% | 601 | 724 | 20.4% | 939 | 56.3% | 1,120 | 86.3% | 2,645 | 340.1% |
| Supervisory | 558 | 50 | 9.0% | 609 | 725 | 19.1% | 965 | 58.5% | 1,124 | 84.7% | 2,684 | 341.0% |
| Middle / Junior Management | 533 | 48 | 9.1% | 581 | 694 | 19.5% | 912 | 56.9% | 1,080 | 85.8% | 2,572 | 342.5% |
| Designer / Developer | 42 | 9 | 21.4% | 51 | 55 | 7.7% | 72 | 41.0% | 85 | 65.8% | 205 | 298.5% |
| Clerical | 281 | 1 | 0.2% | 281 | 365 | 29.7% | 484 | 71.9% | 569 | 102.2% | 1,347 | 378.7% |
| Self Employed | 34 | 3 | 9.4% | 37 | 44 | 18.9% | 59 | 57.3% | 69 | 84.1% | 163 | 337.3% |
| Advisor or Agent | 12 | 2 | 16.6% | 14 | 16 | 12.1% | 21 | 46.6% | 25 | 74.0% | 60 | 311.4% |
| Educator | 0 | 0 | 12.1% | 0 | 0 | 17.6% | 0 | 54.5% | 0 | 87.2% | 0 | 309.9% |
| Specialist or Consultant | 249 | 7 | 2.8% | 256 | 326 | 27.1% | 428 | 67.0% | 505 | 97.1% | 1,197 | 367.0% |
| Editor | 4 | 0 | 3.3% | 4 | 5 | 27.5% | 6 | 66.5% | 7 | 96.0% | 18 | 364.6% |
| Industrial Researchers | 17 | 1 | 6.9% | 18 | 22 | 22.6% | 29 | 61.2% | 34 | 90.4% | 81 | 348.4% |
| Scientist | 7 | 2 | 29.0% | 9 | 9 | 1.2% | 13 | 33.8% | 15 | 56.1% | 34 | 269.0% |
| Maintenance Engineer | 579 | 31 | 5.4% | 611 | 752 | 23.1% | 993 | 62.5% | 1,177 | 92.7% | 2,772 | 353.8% |
| Civil Engineer | 19 | 4 | 20.9% | 23 | 25 | 8.1% | 32 | 41.9% | 38 | 66.6% | 90 | 298.7% |
| Production Engineer | 88 | 24 | 27.4% | 112 | 115 | 2.9% | 151 | 34.5% | 179 | 59.6% | 423 | 277.8% |
| Power distribution Engineer | 275 | 75 | 27.2% | 349 | 358 | 2.4% | 470 | 34.5% | 554 | 58.5% | 1,317 | 276.9% |
| Construction Engineer | 37 | 5 | 12.8% | 42 | 49 | 16.2% | 65 | 53.4% | 76 | 80.2% | 180 | 327.6% |
| Sales Exec | 251 | 23 | 9.3% | 274 | 328 | 19.8% | 430 | 57.1% | 504 | 84.1% | 1,206 | 340.7% |
| Marketing Personnel | 269 | 24 | 9.0% | 294 | 352 | 19.9% | 461 | 56.9% | 545 | 85.5% | 1,294 | 340.4% |
| General Semi Skilled Worker | 570 | 10 | 1.8% | 580 | 749 | 29.1% | 978 | 68.6% | 1,154 | 98.9% | 2,726 | 369.8% |
| General Labour | 706 | 0 | 0.0% | 706 | 922 | 30.6% | 1,209 | 71.2% | 1,430 | 102.6% | 3,398 | 381.3% |
| Other Employees | 722 | 32 | 4.5% | 755 | 944 | 25.1% | 1,234 | 63.5% | 1,461 | 93.6% | 3,462 | 358.7% |
| Administrative workers | 270 | 5 | 1.8% | 275 | 356 | 29.4% | 463 | 68.2% | 544 | 97.7% | 1,299 | 372.6% |
| **Total** | **6,241** | **437** | **7.0%** | **6,678** | **8,153** | **22.1%** | **10,698** | **60.2%** | **12,631** | **89.1%** | **29,970** | **348.8%** |

**Table 24: Greater Lincolnshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 113 | 26 | 23.1% | 140 | 148 | 6.1% | 195 | 39.8% | 229 | 64.2% | 545 | 290.8% |
| **Snr Management SME** | 179 | 19 | 10.3% | 198 | 232 | 17.7% | 304 | 53.9% | 362 | 83.2% | 858 | 334.3% |
| **Supervisory** | 196 | 21 | 10.6% | 217 | 255 | 17.9% | 334 | 54.2% | 395 | 82.2% | 942 | 334.9% |
| **Middle / Junior Management** | 184 | 20 | 10.6% | 204 | 242 | 18.7% | 315 | 54.6% | 373 | 82.9% | 888 | 336.1% |
| **Designer / Developer** | 63 | 18 | 29.0% | 81 | 82 | 1.2% | 108 | 33.1% | 127 | 56.8% | 301 | 272.8% |
| **Clerical** | 99 | 0 | 0.2% | 100 | 131 | 31.5% | 172 | 72.1% | 201 | 101.6% | 478 | 379.2% |
| **Self Employed** | 48 | 6 | 12.6% | 54 | 63 | 16.6% | 82 | 52.3% | 97 | 79.3% | 230 | 327.0% |
| **Advisor or Agent** | 38 | 6 | 16.3% | 44 | 50 | 12.2% | 65 | 47.7% | 77 | 74.7% | 182 | 310.7% |
| **Educator** | 3 | 1 | 31.6% | 4 | 4 | -0.6% | 5 | 30.2% | 6 | 53.2% | 14 | 264.1% |
| **Specialist or Consultant** | 107 | 4 | 3.5% | 111 | 140 | 26.6% | 184 | 66.2% | 216 | 94.9% | 515 | 364.8% |
| **Editor** | 8 | 0 | 3.9% | 8 | 11 | 25.3% | 14 | 64.5% | 16 | 92.8% | 39 | 361.7% |
| **Industrial Researchers** | 48 | 4 | 7.8% | 51 | 62 | 21.7% | 82 | 59.3% | 96 | 87.3% | 230 | 348.7% |
| **Scientist** | 18 | 6 | 34.3% | 24 | 23 | -2.9% | 31 | 27.7% | 36 | 50.2% | 86 | 258.3% |
| **Maintenance Engineer** | 241 | 15 | 6.4% | 256 | 314 | 22.4% | 413 | 61.3% | 484 | 89.0% | 1,155 | 350.5% |
| **Civil Engineer** | 43 | 12 | 27.9% | 55 | 56 | 2.1% | 73 | 34.0% | 86 | 57.8% | 206 | 276.1% |
| **Production Engineer** | 57 | 20 | 35.2% | 77 | 74 | -3.9% | 98 | 26.9% | 115 | 49.9% | 274 | 256.5% |
| **Power distribution Engineer** | 117 | 39 | 32.9% | 156 | 153 | -1.6% | 202 | 29.7% | 236 | 51.7% | 562 | 260.9% |
| **Construction Engineer** | 51 | 10 | 19.1% | 60 | 66 | 9.9% | 87 | 43.8% | 102 | 69.7% | 243 | 304.1% |
| **Sales Exec** | 101 | 13 | 12.5% | 114 | 133 | 16.7% | 172 | 51.6% | 204 | 79.3% | 489 | 330.2% |
| **Marketing Personnel** | 98 | 11 | 11.6% | 110 | 129 | 18.0% | 169 | 54.4% | 200 | 82.3% | 470 | 329.4% |
| **General Semi Skilled Worker** | 239 | 5 | 2.3% | 244 | 312 | 27.9% | 408 | 67.1% | 482 | 97.6% | 1,153 | 372.5% |
| **General Labour** | 176 | 0 | 0.0% | 176 | 230 | 30.7% | 302 | 71.4% | 356 | 102.3% | 847 | 381.0% |
| **Other Employees** | 254 | 13 | 5.3% | 267 | 333 | 24.6% | 434 | 62.4% | 516 | 93.2% | 1,212 | 353.8% |
| **Administrative workers** | 115 | 3 | 2.3% | 118 | 150 | 27.2% | 198 | 67.6% | 232 | 97.1% | 554 | 370.0% |
| **Total** | **2,595** | **272** | **10.5%** | **2,867** | **3,393** | **18.4%** | **4,445** | **55.1%** | **5,245** | **83.0%** | **12,474** | **335.2%** |

## 6.4 Greater Lincolnshire LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Greater Lincolnshire LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 42 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Greater Lincolnshire LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Greater Lincolnshire LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 42: Greater Lincolnshire LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

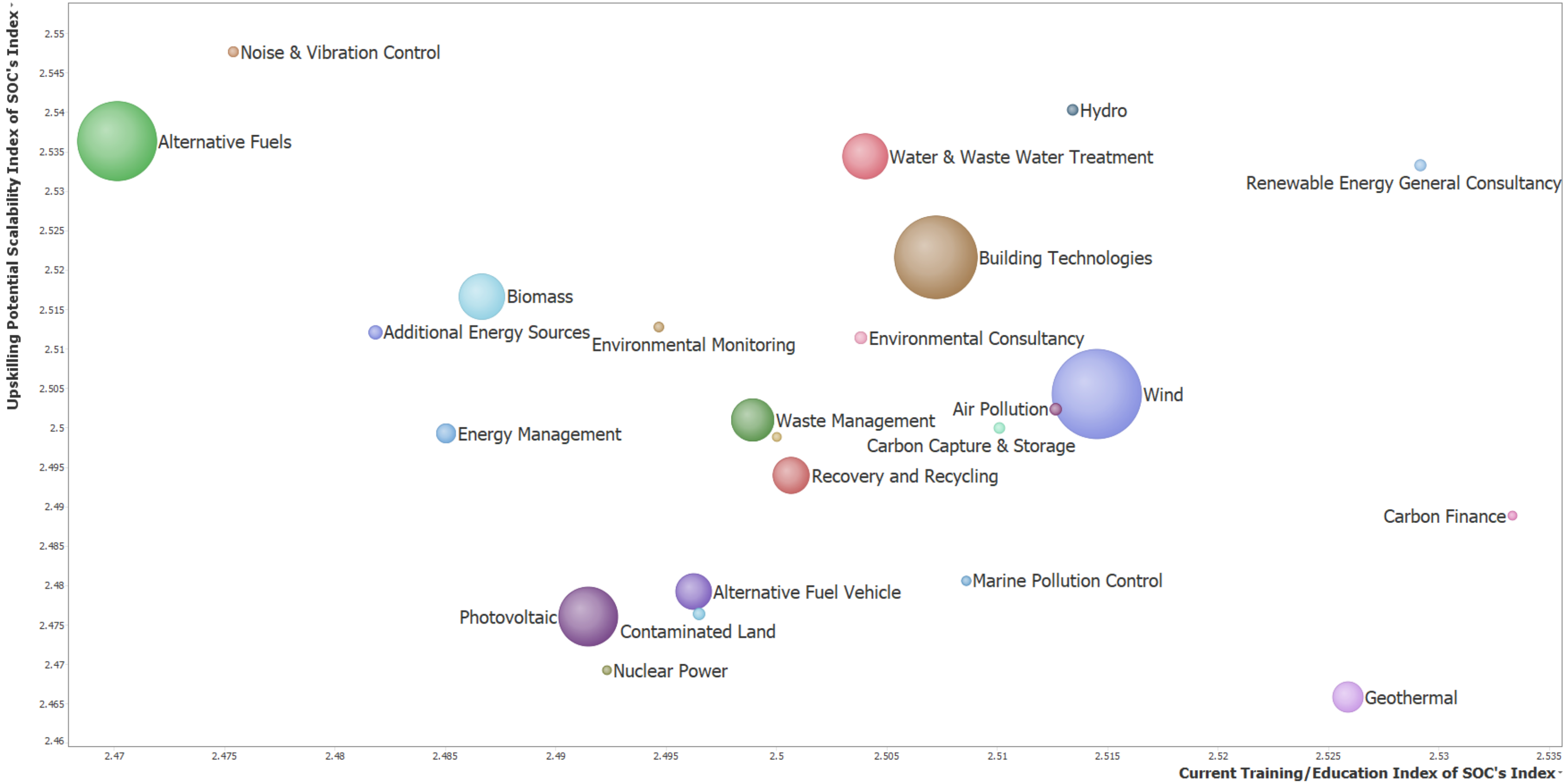



Figure 42 shows that the smaller sub-sector of Renewable Energy General Consultancy holds the most favourable position has pushed the other, larger sub-sectors to one side, but Wind, Building Technologies and Water and Waste Water Treatment also hold strong positions. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.

## 6.5 Greater Lincolnshire LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Greater Lincolnshire LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

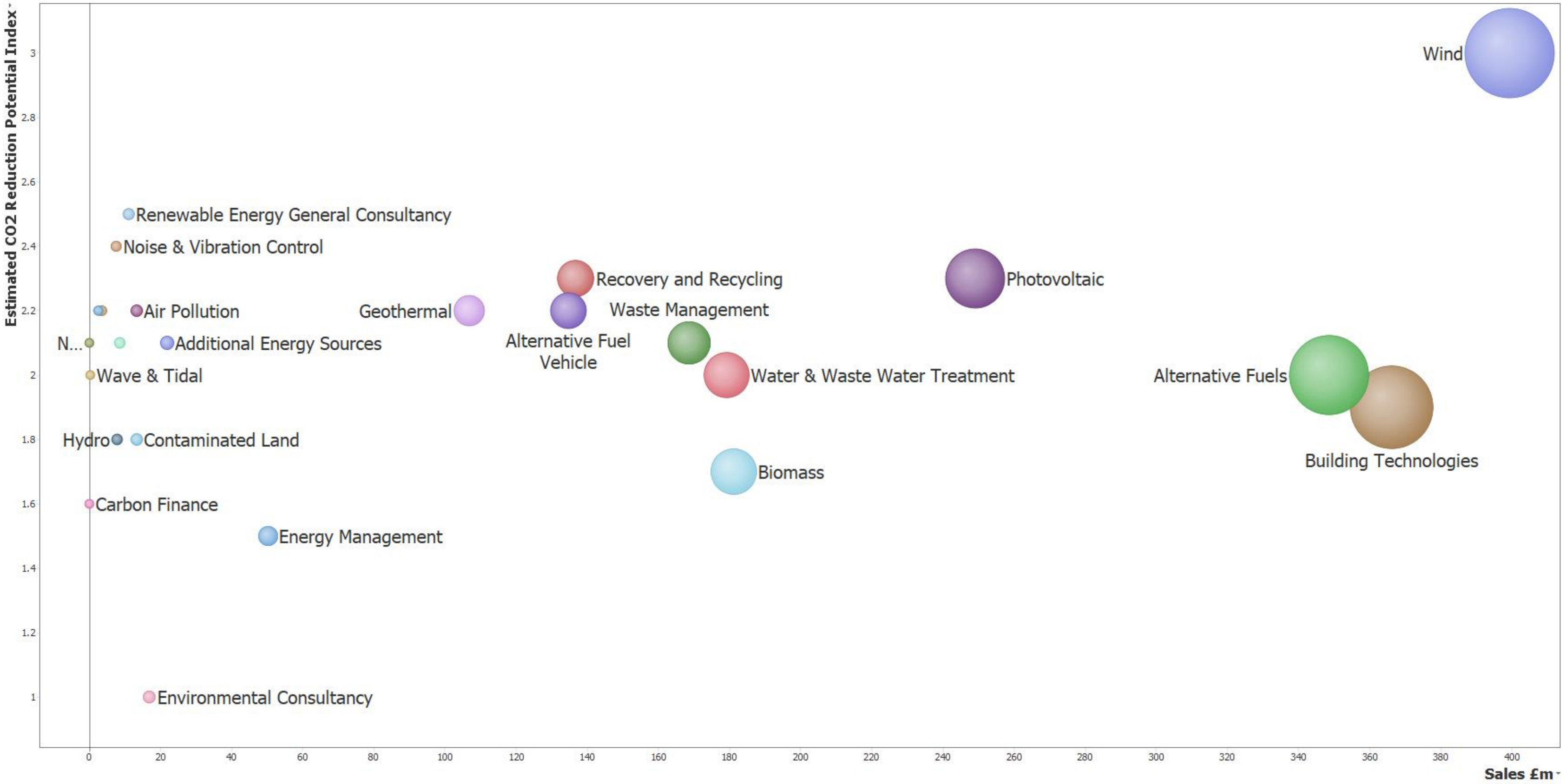
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 43 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Alternative Fuels having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 43: Greater Lincolnshire LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 7. Growth Forecast for Net Zero in 2030 and 2050 for the Leicester and Leicestershire LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Leicester and Leicestershire LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 7.1 Leicester and Leicestershire LEP's LCEGS Strengths and Weaknesses

In this section of the report Leicester and Leicestershire LEP's LCEGS performance is compared with the UK as a whole. The Leicester and Leicestershire LEP's LCEGS sector was worth £2.8bn in 2019/20 and accounts for 1.3% of the UK total.

Figure 44 shows how the Leicester and Leicestershire LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 1.3%. This proportionality factor demonstrates where the Leicester and Leicestershire LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 1.3% of the UK market; above 1 = larger than 1.3% share and below 1 = smaller than 1.3% share.

The y-axis represents the growth rate of the Leicester and Leicestershire LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 44 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric are strengths, because they are both above the expected size of market (1.1 for Contaminated Land and 1.1 for Hydro) and are growing significantly stronger than the UK average (9.0% LEP vs 1.0% UK for Contaminated Land and 9.1% vs. 1.8%Uk for Hydro)

**Figure 44: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

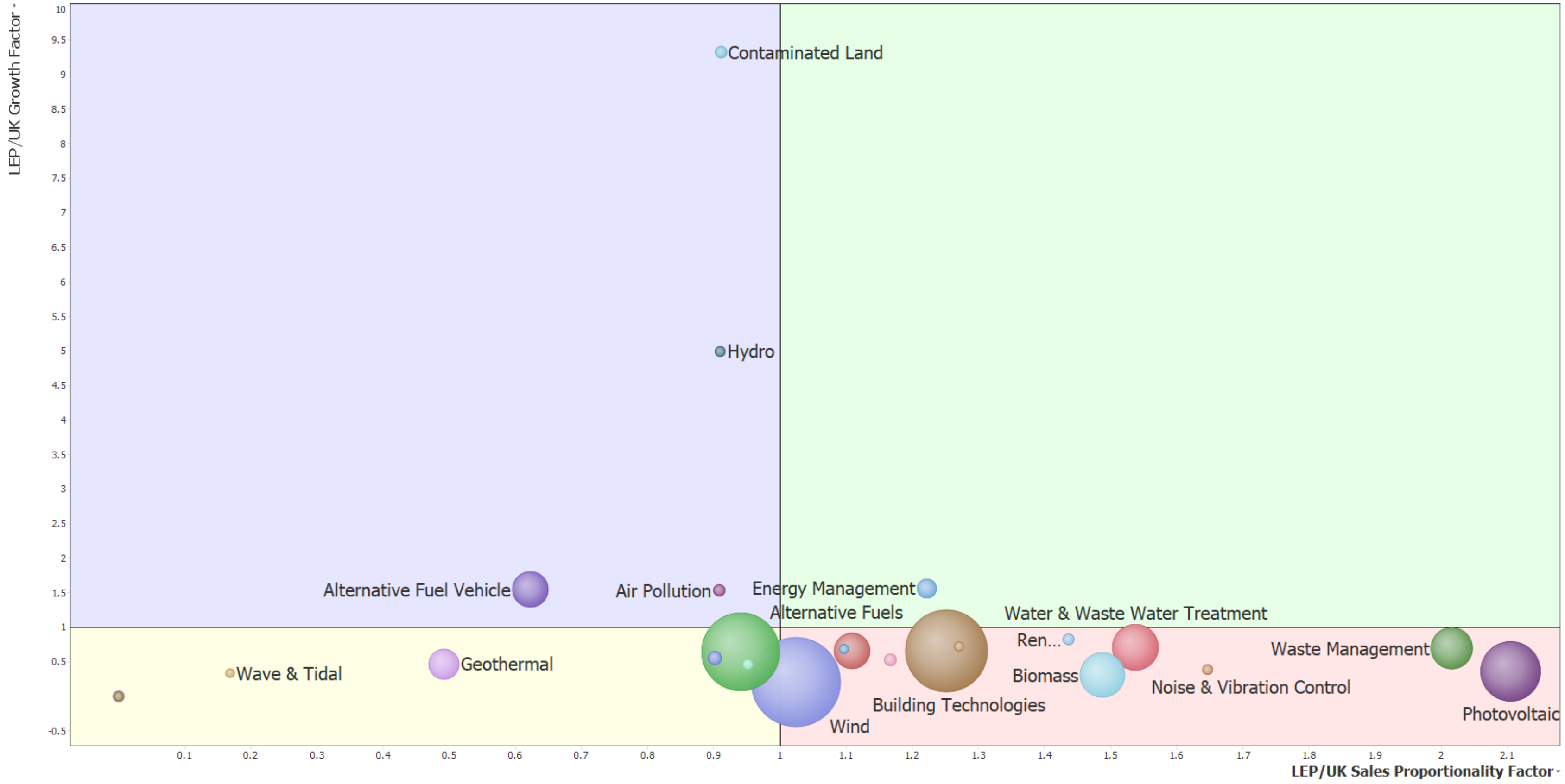
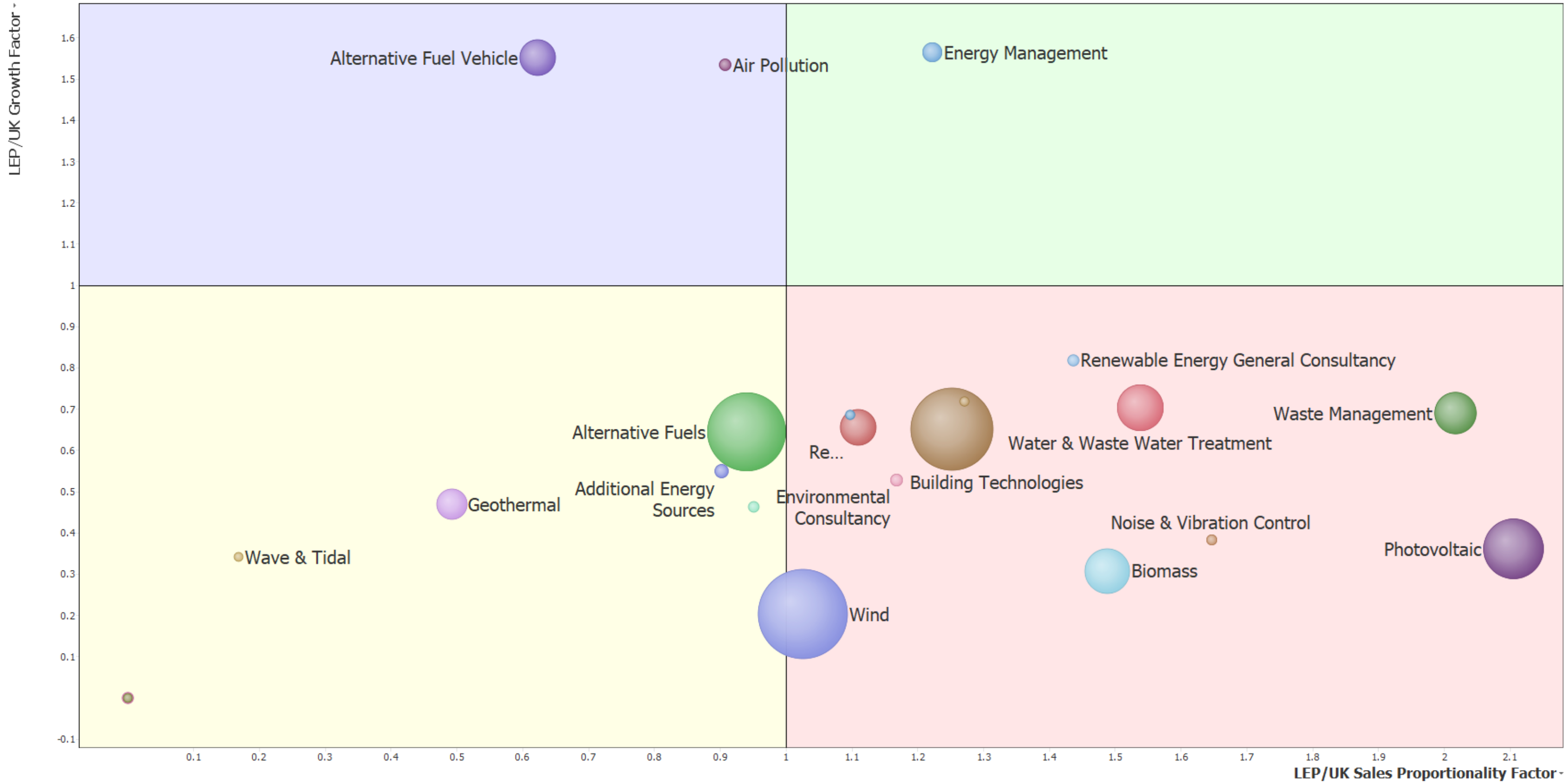


Figure 45 provides the same information as figure 1, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management has the ideal characteristics of above UK average growth and above LEP average size. Those in the lower right hand quadrant (red) hold a larger UK share than the average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Water & Waste Water Treatment, Waste Management and Biomass set these sub-sector apart as being strengths. Alternative Fuel Vehicle has a smaller market share than expected, but stronger growth than the UK average. Those in the lower left (yellow) quadrant such as Geothermal and Wave & tidal can be considered relative weaknesses.

**Figure 45: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m – Excluding Contaminated Land, Nuclear and Hydro**



## 7.2 Scalability of Leicester and Leicestershire LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 46 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Leicester and Leicestershire LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Building Technologies and Wind sub-sectors have a good combination of size and scalability, while Renewable Energy General Consultancy may be small in terms of market but is highly scalable. Biomass is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Leicester and Leicestershire LEP Market Snapshot report.

**Figure 46: Leicester and Leicestershire LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

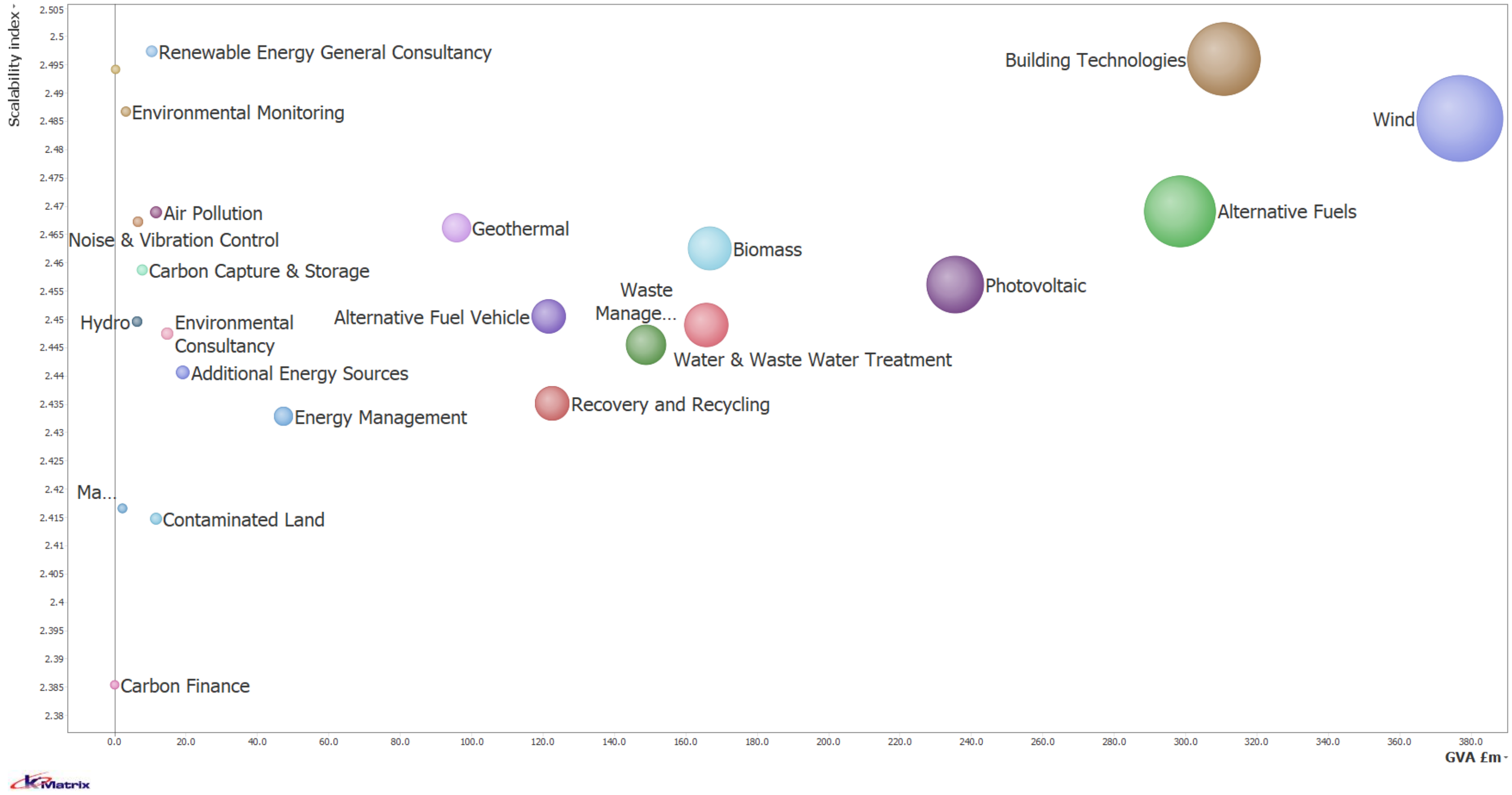
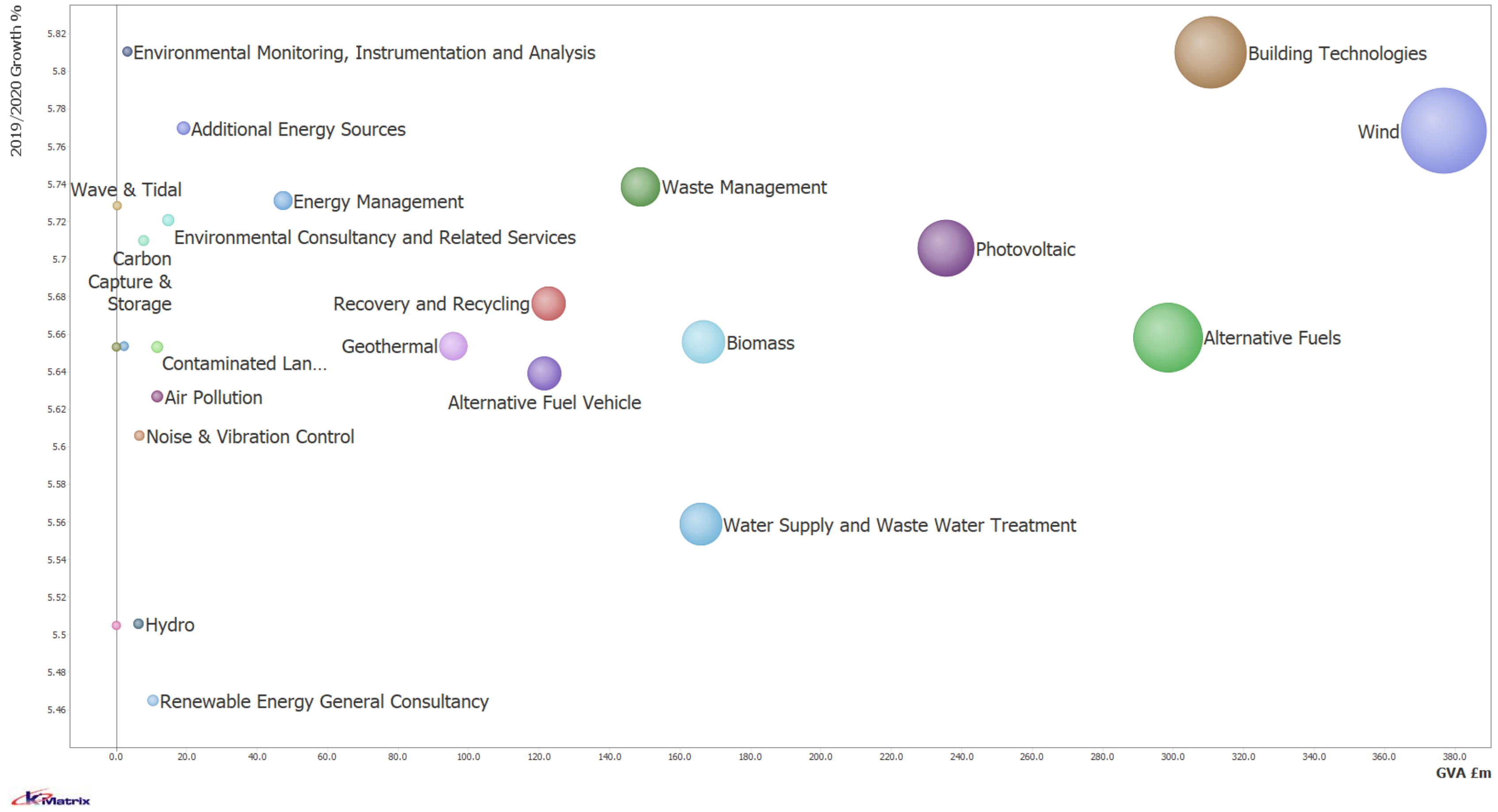


Figure 47 shows the same principle as Figure 46, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth it would be easy to miss the opportunity in Renewable Energy General Consultancy, with such a low growth rate. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 47: Leicester and Leicestershire LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

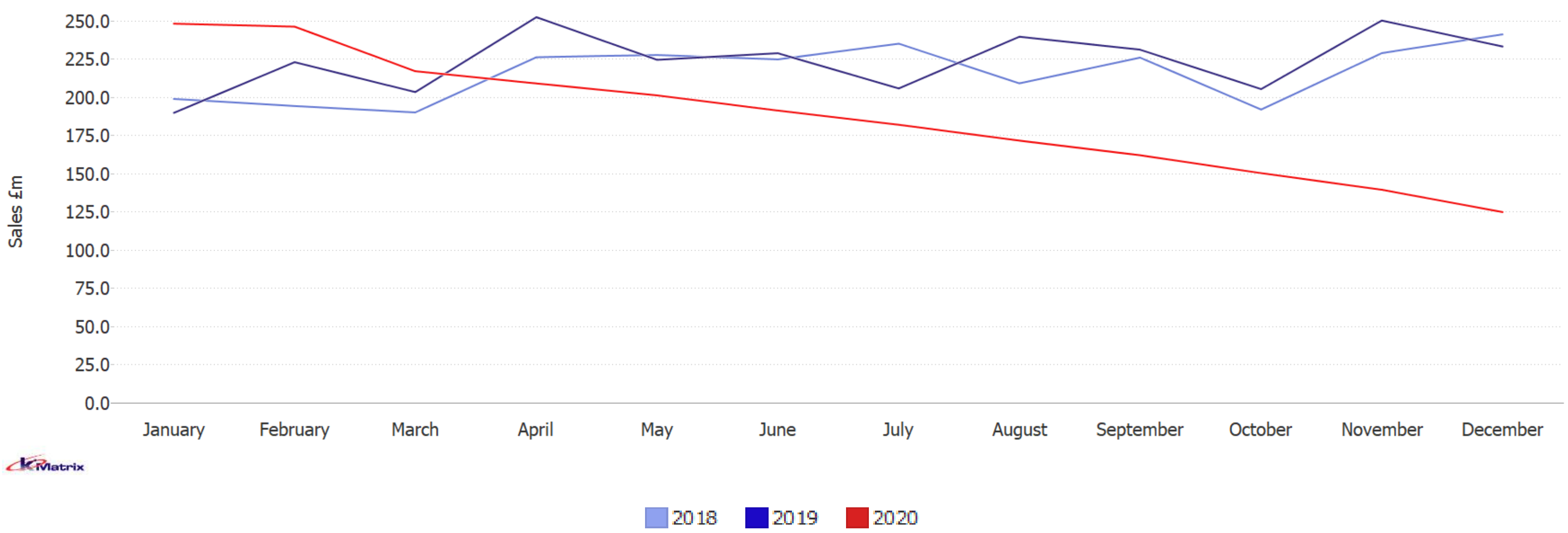


## 7.3 Leicester and Leicestershire LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 48, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Leicester and Leicestershire LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 48: Leicester and Leicestershire LEP LCEGS Sales, by month 2018, 2019 and 2020**

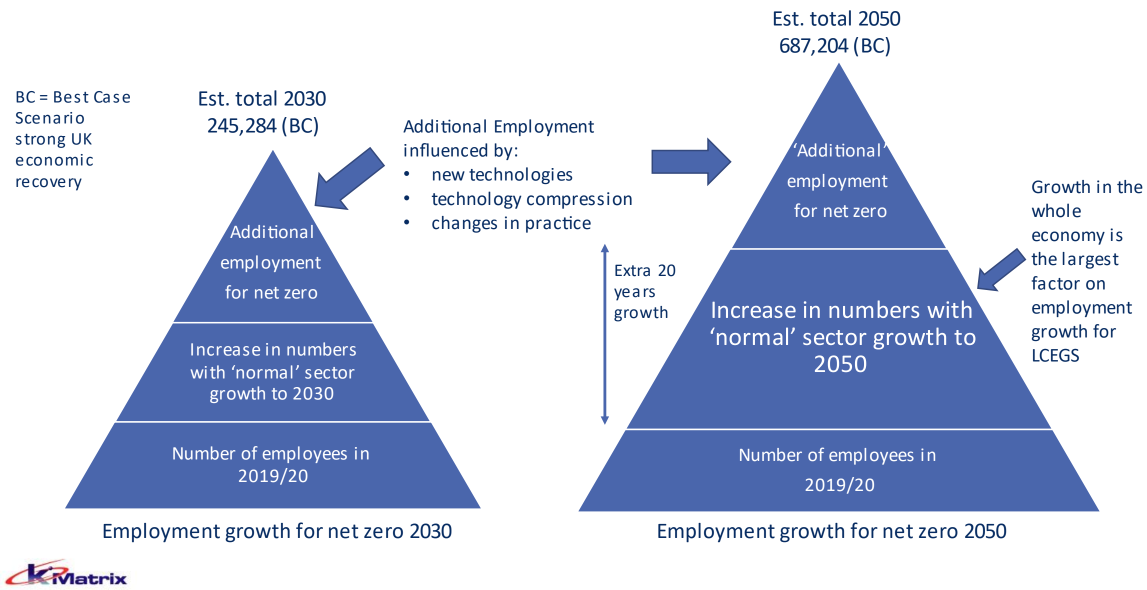


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| *Timeline for Net Zero* | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 25 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Leicester and Leicestershire LEP.

Shortage of employees refers to the employees that are 'imported' from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not 'fit'. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as "Other Employees" because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to 'heads equivalent', so although for example, there are 4 Educators listed, with a shortage of 1, making a total of 6 (5.57 rounded to 6) in the region, this will equate to over 60 people providing 'pockets' of time, to equate to 6 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 25: Leicester and Leicestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 543 | 120 | 22.0% | 663 | 709 | 7.0% | 927 | 39.9% | 1,098 | 65.8% | 2,625 | 296.1% |
| **Snr Management SME** | 1,150 | 115 | 10.0% | 1,265 | 1,510 | 19.4% | 1,967 | 55.5% | 2,315 | 83.0% | 5,550 | 338.8% |
| **Supervisory** | 1,355 | 140 | 10.4% | 1,495 | 1,777 | 18.8% | 2,338 | 56.3% | 2,743 | 83.4% | 6,510 | 335.3% |
| **Middle / Junior Management** | 1,221 | 125 | 10.3% | 1,346 | 1,593 | 18.3% | 2,088 | 55.1% | 2,469 | 83.4% | 5,839 | 333.7% |
| **Designer / Developer** | 178 | 46 | 26.0% | 224 | 233 | 3.9% | 306 | 36.6% | 359 | 60.3% | 857 | 282.6% |
| **Clerical** | 666 | 1 | 0.2% | 667 | 868 | 30.1% | 1,144 | 71.4% | 1,349 | 102.2% | 3,212 | 381.2% |
| **Self Employed** | 176 | 23 | 12.8% | 199 | 230 | 15.5% | 302 | 51.9% | 356 | 78.8% | 847 | 325.9% |
| **Advisor or Agent** | 116 | 19 | 16.3% | 135 | 152 | 12.6% | 199 | 47.8% | 234 | 74.0% | 558 | 314.7% |
| **Educator** | 4 | 1 | 30.3% | 6 | 6 | 0.5% | 7 | 32.8% | 9 | 52.7% | 20 | 267.7% |
| **Specialist or Consultant** | 679 | 22 | 3.2% | 701 | 889 | 26.8% | 1,172 | 67.2% | 1,377 | 96.4% | 3,277 | 367.4% |
| **Editor** | 21 | 1 | 3.8% | 21 | 27 | 25.8% | 36 | 66.9% | 42 | 94.6% | 99 | 363.1% |
| **Industrial Researchers** | 195 | 15 | 7.7% | 210 | 253 | 20.5% | 336 | 59.8% | 396 | 88.2% | 935 | 344.7% |
| **Scientist** | 91 | 31 | 34.6% | 123 | 118 | -3.6% | 154 | 25.2% | 185 | 50.9% | 432 | 252.3% |
| **Maintenance Engineer** | 1,360 | 84 | 6.2% | 1,444 | 1,782 | 23.4% | 2,342 | 62.2% | 2,737 | 89.5% | 6,531 | 352.2% |
| **Civil Engineer** | 100 | 27 | 26.7% | 126 | 131 | 3.4% | 171 | 35.3% | 201 | 59.1% | 478 | 279.1% |
| **Production Engineer** | 273 | 94 | 34.5% | 368 | 356 | -3.0% | 470 | 27.9% | 550 | 49.7% | 1,305 | 255.1% |
| **Power distribution Engineer** | 640 | 193 | 30.1% | 834 | 838 | 0.6% | 1,101 | 32.1% | 1,292 | 55.1% | 3,068 | 268.1% |
| **Construction Engineer** | 157 | 27 | 17.0% | 184 | 205 | 11.6% | 268 | 46.2% | 316 | 72.0% | 754 | 310.7% |
| **Sales Exec** | 700 | 79 | 11.3% | 779 | 910 | 16.9% | 1,197 | 53.6% | 1,410 | 81.1% | 3,357 | 331.0% |
| **Marketing Personnel** | 729 | 80 | 11.0% | 809 | 952 | 17.7% | 1,247 | 54.2% | 1,475 | 82.3% | 3,510 | 333.9% |
| **General Semi Skilled Worker** | 1,335 | 28 | 2.1% | 1,363 | 1,740 | 27.7% | 2,289 | 68.0% | 2,695 | 97.8% | 6,434 | 372.2% |
| **General Labour** | 1,716 | 0 | 0.0% | 1,716 | 2,251 | 31.2% | 2,953 | 72.1% | 3,465 | 101.9% | 8,268 | 381.8% |
| **Other Employees** | 1,849 | 90 | 4.9% | 1,939 | 2,426 | 25.1% | 3,173 | 63.6% | 3,735 | 92.6% | 8,879 | 357.8% |
| **Administrative workers** | 747 | 15 | 2.1% | 762 | 978 | 28.4% | 1,280 | 68.0% | 1,508 | 97.9% | 3,590 | 371.0% |
| **Total** | **16,001** | **1,377** | **8.6%** | **17,379** | **20,935** | **20.5%** | **27,468** | **58.1%** | **32,316** | **86.0%** | **76,937** | **342.7%** |

Table 25 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 34.5% (MEH 35.7%), Power Distribution Engineer 30.1% (MEH 29.8%) and Technicians 22.0% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.2% (MEH 6.3%), Specialist or Consultant 3.2% (MEH 3.3%) and Administrative Workers 2.1% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.5% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 58.1% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 86.0% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 342.7% (MEH 342.4%)

Tables 26, 27 and 28 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.6% (MEH 10.5%)
Renewable Energy – 6.9% (MEH 7.0%)
Environmental – 10.3% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 45.2% (MEH 47.3%); Renewable Energy 27.6% (MEH 27.9%) and Environmental 34.2% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 34.9% (MEH 33.7%); Renewable Energy 27.4% (MEH 27.1%) and Environmental 32.6% (MEH 32.6%)
Technicians: Low Carbon 27.9% (MEH 27.9%); Renewable Energy 17.3% (MEH 17.3%) and Environmental 22.8% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 68.7% (MEH 68.8%), but only 13.9% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 19.0% (MEH 17.0%); Renewable Energy 34.9% (MEH 34.5%) and Environmental 27.5% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 26.6% (MEH 28.1%); Renewable Energy 35.4% (MEH 35.1%) and Environmental 29.2% (MEH 29.3%)
Technicians of: Low Carbon 33.2% (MEH 34.2%); Renewable Energy 45.4% (MEH 45.9%) and Environmental 39.5% (MEH 39.6%)

**Table 26: Leicester and Leicestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 164 | 46 | 27.9% | 210 | 215 | 2.1% | 280 | 33.2% | 335 | 59.1% | 793 | 277.1% |
| **Snr Management SME** | 260 | 32 | 12.1% | 291 | 340 | 16.7% | 442 | 51.9% | 523 | 79.3% | 1,257 | 331.3% |
| **Supervisory** | 312 | 41 | 13.2% | 353 | 406 | 15.0% | 532 | 50.6% | 635 | 79.8% | 1,510 | 327.5% |
| **Middle / Junior Management** | 286 | 38 | 13.2% | 323 | 373 | 15.4% | 486 | 50.4% | 578 | 78.6% | 1,375 | 325.1% |
| **Designer / Developer** | 43 | 12 | 27.7% | 55 | 56 | 2.2% | 74 | 34.7% | 87 | 57.8% | 209 | 278.4% |
| **Clerical** | 157 | 0 | 0.3% | 157 | 205 | 30.7% | 270 | 71.8% | 315 | 100.9% | 750 | 377.8% |
| **Self Employed** | 61 | 10 | 16.0% | 71 | 80 | 11.7% | 105 | 47.4% | 123 | 72.6% | 296 | 314.7% |
| **Advisor or Agent** | 56 | 9 | 15.9% | 65 | 74 | 13.6% | 97 | 48.6% | 114 | 75.1% | 271 | 317.6% |
| **Educator** | 0 | 0 | 19.8% | 0 | 0 | 6.4% | 0 | 44.5% | 0 | 67.3% | 1 | 293.3% |
| **Specialist or Consultant** | 171 | 7 | 3.9% | 178 | 223 | 25.6% | 295 | 66.2% | 348 | 96.0% | 823 | 363.5% |
| **Editor** | 4 | 0 | 4.1% | 5 | 6 | 25.4% | 8 | 66.9% | 9 | 93.3% | 22 | 363.6% |
| **Industrial Researchers** | 109 | 9 | 7.8% | 118 | 141 | 19.9% | 188 | 60.0% | 220 | 87.6% | 519 | 341.7% |
| **Scientist** | 59 | 21 | 35.1% | 80 | 77 | -4.4% | 99 | 23.5% | 121 | 50.8% | 279 | 248.1% |
| **Maintenance Engineer** | 316 | 25 | 8.0% | 341 | 411 | 20.5% | 541 | 58.7% | 638 | 86.9% | 1,520 | 345.7% |
| **Civil Engineer** | 22 | 7 | 31.6% | 29 | 29 | -0.7% | 38 | 30.2% | 45 | 51.8% | 107 | 263.4% |
| **Production Engineer** | 79 | 36 | 45.2% | 115 | 103 | -10.2% | 136 | 19.0% | 158 | 37.9% | 372 | 224.4% |
| **Power distribution Engineer** | 128 | 45 | 34.9% | 172 | 166 | -3.5% | 218 | 26.6% | 258 | 49.5% | 613 | 255.4% |
| **Construction Engineer** | 32 | 7 | 20.8% | 38 | 41 | 7.7% | 54 | 40.9% | 64 | 67.2% | 152 | 298.0% |
| **Sales Exec** | 201 | 29 | 14.2% | 229 | 259 | 13.0% | 345 | 50.4% | 402 | 75.2% | 967 | 321.7% |
| **Marketing Personnel** | 212 | 31 | 14.5% | 242 | 277 | 14.2% | 359 | 48.2% | 429 | 76.9% | 1,018 | 320.1% |
| **General Semi Skilled Worker** | 317 | 8 | 2.6% | 326 | 416 | 27.7% | 544 | 67.2% | 642 | 97.1% | 1,524 | 368.2% |
| **General Labour** | 555 | 0 | 0.0% | 555 | 730 | 31.5% | 957 | 72.4% | 1,117 | 101.1% | 2,678 | 382.4% |
| **Other Employees** | 396 | 24 | 6.0% | 420 | 517 | 23.2% | 676 | 61.1% | 802 | 91.0% | 1,911 | 355.3% |
| **Administrative workers** | 187 | 5 | 2.6% | 192 | 245 | 27.5% | 318 | 65.9% | 379 | 97.3% | 894 | 365.7% |
| **Total** | **4,128** | **439** | **10.6%** | **4,567** | **5,391** | **18.0%** | **7,065** | **54.7%** | **8,339** | **82.6%** | **19,861** | **334.9%** |

**Table 27: Leicester and Leicestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 227 | 39 | 17.3% | 266 | 295 | 10.9% | 386 | 45.4% | 459 | 72.7% | 1,099 | 313.7% |
| **Snr Management SME** | 676 | 60 | 8.9% | 737 | 888 | 20.5% | 1,158 | 57.1% | 1,362 | 84.9% | 3,263 | 342.9% |
| **Supervisory** | 782 | 71 | 9.1% | 853 | 1,029 | 20.6% | 1,358 | 59.2% | 1,582 | 85.4% | 3,752 | 339.6% |
| **Middle / Junior Management** | 699 | 62 | 8.9% | 761 | 910 | 19.5% | 1,198 | 57.4% | 1,413 | 85.7% | 3,329 | 337.4% |
| **Designer / Developer** | 54 | 11 | 21.0% | 66 | 71 | 8.1% | 94 | 42.2% | 110 | 66.1% | 263 | 298.4% |
| **Clerical** | 380 | 1 | 0.2% | 380 | 494 | 29.8% | 651 | 71.1% | 772 | 102.9% | 1,836 | 382.5% |
| **Self Employed** | 48 | 5 | 9.4% | 53 | 63 | 19.6% | 83 | 56.6% | 97 | 84.2% | 231 | 338.4% |
| **Advisor or Agent** | 15 | 3 | 17.5% | 18 | 20 | 10.6% | 26 | 46.5% | 31 | 72.8% | 73 | 307.2% |
| **Educator** | 0 | 0 | 12.5% | 0 | 0 | 11.1% | 0 | 54.6% | 0 | 81.6% | 0 | 324.6% |
| **Specialist or Consultant** | 358 | 10 | 2.8% | 368 | 469 | 27.4% | 619 | 68.1% | 728 | 97.8% | 1,728 | 369.5% |
| **Editor** | 5 | 0 | 3.3% | 5 | 7 | 26.0% | 9 | 67.9% | 10 | 95.1% | 25 | 364.9% |
| **Industrial Researchers** | 23 | 2 | 7.0% | 25 | 30 | 22.2% | 40 | 60.4% | 47 | 88.5% | 112 | 352.5% |
| **Scientist** | 9 | 3 | 30.3% | 12 | 12 | 0.7% | 16 | 31.4% | 19 | 53.4% | 45 | 271.4% |
| **Maintenance Engineer** | 746 | 41 | 5.4% | 786 | 980 | 24.6% | 1,291 | 64.2% | 1,497 | 90.4% | 3,578 | 354.9% |
| **Civil Engineer** | 24 | 5 | 21.6% | 29 | 31 | 7.3% | 41 | 40.8% | 48 | 66.1% | 114 | 295.8% |
| **Production Engineer** | 119 | 33 | 27.6% | 152 | 155 | 2.2% | 205 | 34.9% | 240 | 57.9% | 572 | 276.8% |
| **Power distribution Engineer** | 362 | 99 | 27.4% | 461 | 475 | 3.1% | 624 | 35.4% | 731 | 58.5% | 1,727 | 274.6% |
| **Construction Engineer** | 54 | 7 | 12.9% | 61 | 71 | 15.6% | 93 | 51.7% | 109 | 77.9% | 260 | 325.5% |
| **Sales Exec** | 359 | 33 | 9.2% | 392 | 468 | 19.2% | 612 | 56.0% | 727 | 85.1% | 1,716 | 337.3% |
| **Marketing Personnel** | 382 | 34 | 8.9% | 416 | 498 | 19.7% | 657 | 57.8% | 773 | 85.6% | 1,840 | 342.1% |
| **General Semi Skilled Worker** | 725 | 13 | 1.8% | 738 | 944 | 27.9% | 1,245 | 68.7% | 1,463 | 98.2% | 3,507 | 375.3% |
| **General Labour** | 931 | 0 | 0.0% | 931 | 1,219 | 31.0% | 1,599 | 71.8% | 1,882 | 102.3% | 4,482 | 381.6% |
| **Other Employees** | 1,085 | 48 | 4.4% | 1,133 | 1,426 | 25.8% | 1,862 | 64.3% | 2,193 | 93.5% | 5,197 | 358.6% |
| **Administrative workers** | 396 | 7 | 1.7% | 403 | 519 | 28.8% | 681 | 69.1% | 800 | 98.6% | 1,908 | 373.8% |
| **Total** | **8,459** | **587** | **6.9%** | **9,046** | **11,073** | **22.4%** | **14,545** | **60.8%** | **17,090** | **88.9%** | **40,657** | **349.4%** |

**Table 28: Leicester and Leicestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 152 | 35 | 22.8% | 187 | 200 | 7.0% | 260 | 39.5% | 305 | 63.5% | 733 | 292.6% |
| **Snr Management SME** | 214 | 23 | 10.6% | 237 | 282 | 19.0% | 367 | 54.9% | 431 | 81.8% | 1,030 | 335.0% |
| **Supervisory** | 261 | 28 | 10.8% | 289 | 341 | 18.1% | 447 | 54.9% | 526 | 82.1% | 1,248 | 332.3% |
| **Middle / Junior Management** | 237 | 25 | 10.7% | 262 | 310 | 18.3% | 404 | 54.2% | 478 | 82.5% | 1,135 | 333.6% |
| **Designer / Developer** | 80 | 23 | 28.3% | 103 | 105 | 2.2% | 138 | 34.0% | 162 | 57.9% | 385 | 274.8% |
| **Clerical** | 130 | 0 | 0.2% | 130 | 170 | 30.5% | 223 | 71.7% | 262 | 101.5% | 626 | 381.6% |
| **Self Employed** | 67 | 8 | 12.3% | 75 | 87 | 16.3% | 114 | 53.0% | 135 | 80.9% | 320 | 327.7% |
| **Advisor or Agent** | 45 | 7 | 16.4% | 52 | 58 | 12.1% | 76 | 47.2% | 90 | 73.1% | 215 | 313.8% |
| **Educator** | 4 | 1 | 30.8% | 5 | 5 | 0.2% | 7 | 32.3% | 8 | 52.0% | 19 | 266.4% |
| **Specialist or Consultant** | 150 | 5 | 3.5% | 156 | 197 | 26.8% | 258 | 65.9% | 302 | 93.8% | 726 | 366.8% |
| **Editor** | 11 | 0 | 4.0% | 11 | 14 | 25.9% | 19 | 66.5% | 22 | 94.9% | 53 | 362.0% |
| **Industrial Researchers** | 63 | 5 | 7.7% | 68 | 82 | 20.8% | 108 | 59.2% | 128 | 89.1% | 304 | 347.2% |
| **Scientist** | 22 | 8 | 34.8% | 30 | 29 | -3.1% | 39 | 27.4% | 45 | 50.0% | 108 | 255.9% |
| **Maintenance Engineer** | 298 | 19 | 6.2% | 317 | 391 | 23.5% | 510 | 61.0% | 603 | 90.3% | 1,433 | 352.5% |
| **Civil Engineer** | 54 | 14 | 27.0% | 68 | 70 | 3.6% | 92 | 35.1% | 108 | 59.3% | 257 | 278.7% |
| **Production Engineer** | 75 | 26 | 34.2% | 101 | 98 | -2.8% | 129 | 27.5% | 153 | 50.9% | 361 | 257.2% |
| **Power distribution Engineer** | 151 | 49 | 32.6% | 200 | 197 | -1.8% | 259 | 29.2% | 304 | 51.8% | 728 | 263.9% |
| **Construction Engineer** | 71 | 13 | 18.4% | 84 | 93 | 10.4% | 122 | 44.7% | 143 | 70.0% | 342 | 305.7% |
| **Sales Exec** | 140 | 17 | 12.2% | 157 | 183 | 16.8% | 240 | 52.5% | 282 | 79.7% | 673 | 328.8% |
| **Marketing Personnel** | 135 | 15 | 11.4% | 150 | 177 | 17.9% | 232 | 54.0% | 273 | 81.8% | 652 | 333.5% |
| **General Semi Skilled Worker** | 293 | 6 | 2.2% | 299 | 381 | 27.2% | 500 | 67.2% | 590 | 97.3% | 1,403 | 368.9% |
| **General Labour** | 230 | 0 | 0.0% | 230 | 302 | 31.1% | 397 | 72.3% | 465 | 101.9% | 1,108 | 380.7% |
| **Other Employees** | 368 | 18 | 5.0% | 386 | 483 | 25.0% | 636 | 64.5% | 741 | 91.7% | 1,771 | 358.3% |
| **Administrative workers** | 164 | 4 | 2.2% | 168 | 215 | 28.1% | 281 | 67.9% | 330 | 96.8% | 788 | 370.5% |
| **Total** | **3,415** | **351** | **10.3%** | **3,765** | **4,471** | **18.8%** | **5,857** | **55.6%** | **6,886** | **82.9%** | **16,419** | **336.1%** |

## 7.4 Leicester and Leicestershire LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Leicester and Leicestershire LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 49 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Leicester and Leicestershire LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Leicester and Leicestershire LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 49: Leicester and Leicestershire LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

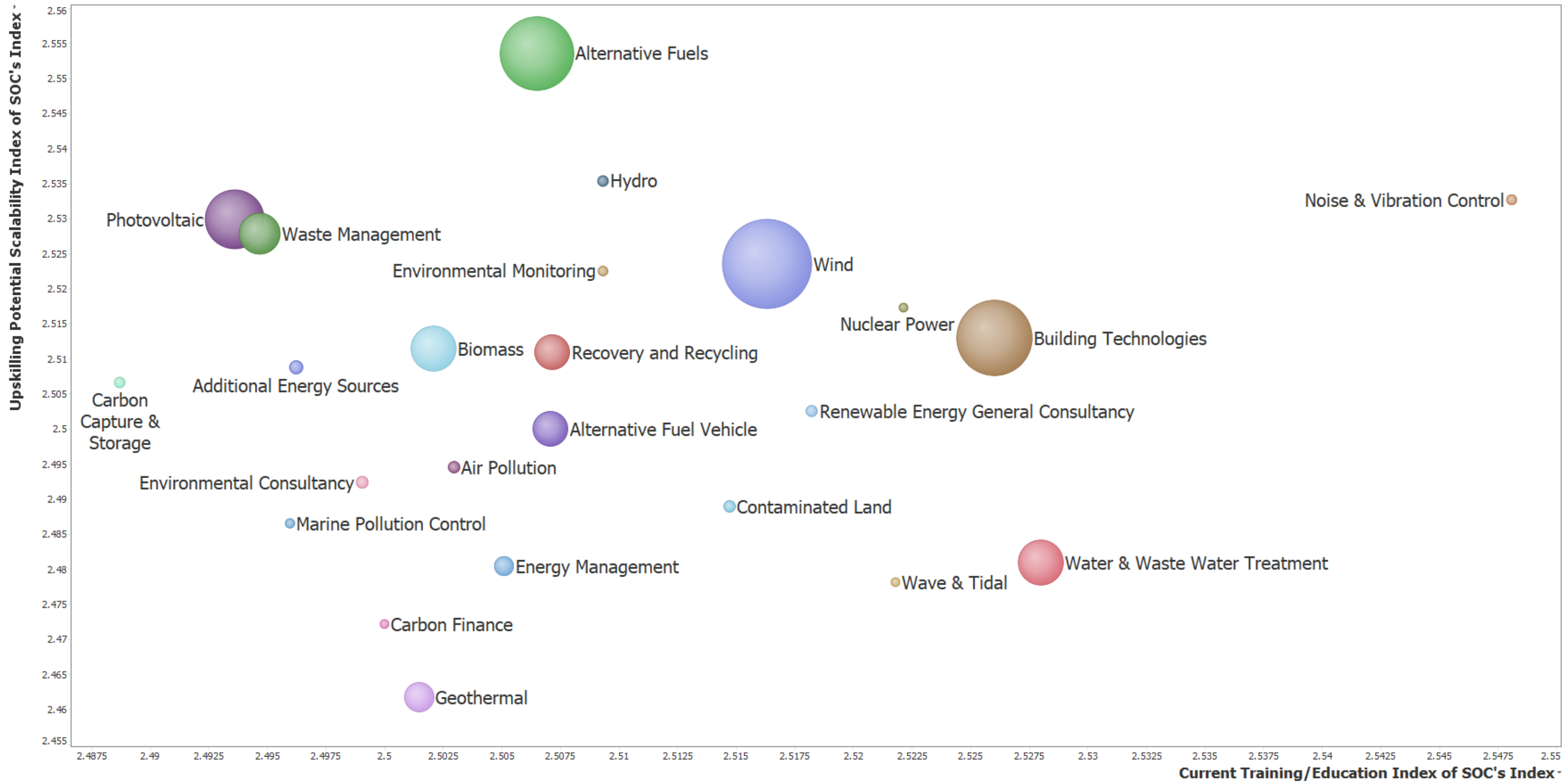



Figure 49 shows that Noise and Vibration Control holds the strongest position, with good current training capacity combined with a strong potential for upskilling. Building Technologies is also strong, along with Wind. Alternative Fuels has strong upskilling potential, but scores lower for current training capacity. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.

## 7.5 Leicester and Leicestershire LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Leicester and Leicestershire LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

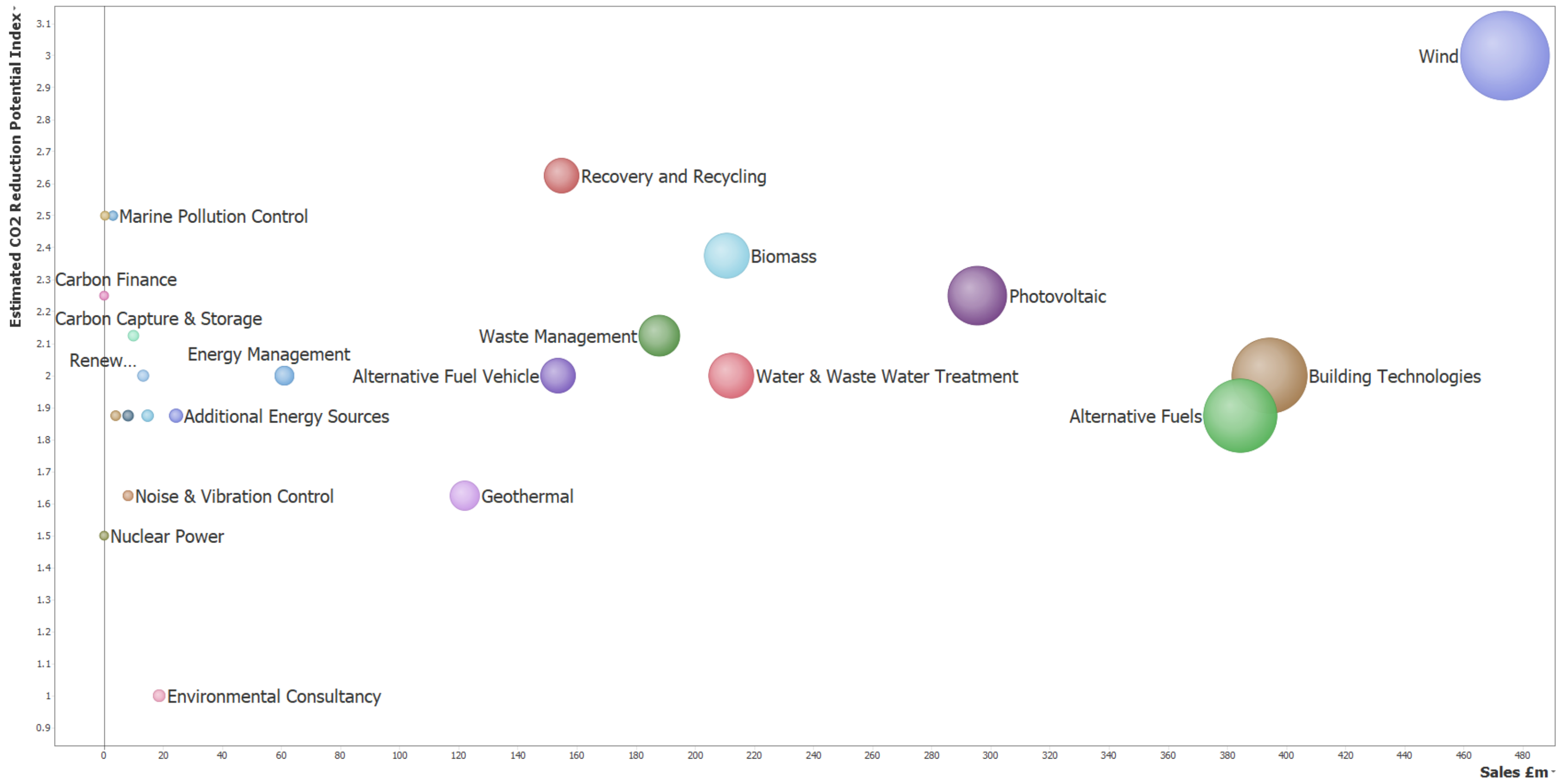
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3)+(4x2)+(4x1)}{17} = 1.9$$

Figures 50 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and 50 provide a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Building Technologies having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 50: Leicester and Leicestershire LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 8. Growth Forecast for Net Zero in 2030 and 2050 for the Marches LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Marches LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 8.1 Marches LEP's LCEGS Strengths and Weaknesses

In this section of the report Marches LEP's LCEGS performance is compared with the UK as a whole. The Marches LEP's LCEGS sector was worth £1.8bn in 2019/20 and accounts for 0.8% of the UK total.

Figure 51 shows how the Marches LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 0.8%. This proportionality factor demonstrates where the Marches LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 0.8% of the UK market; above 1 = larger than 0.8% share and below 1 = smaller than 0.8% share.

The y-axis represents the growth rate of the Marches LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 51 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric are strengths, because they are both close to the expected size of market (0.7 for Contaminated Land and 0.7 for Hydro) and are growing significantly stronger than the UK average (13.0% LEP vs 1.0% UK for Contaminated Land and 13.3% vs. 1.8%Uk for Hydro)

**Figure 51: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

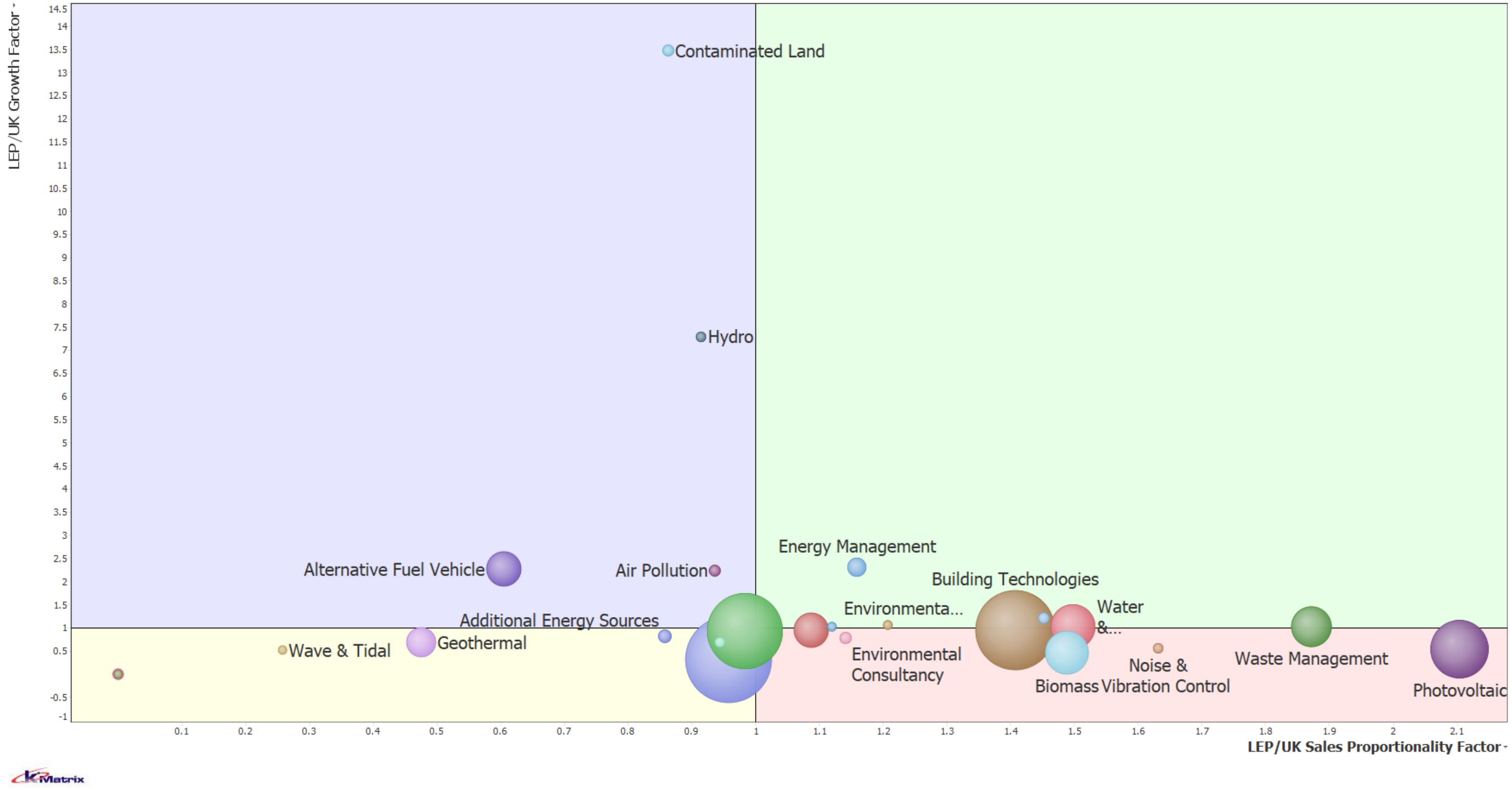
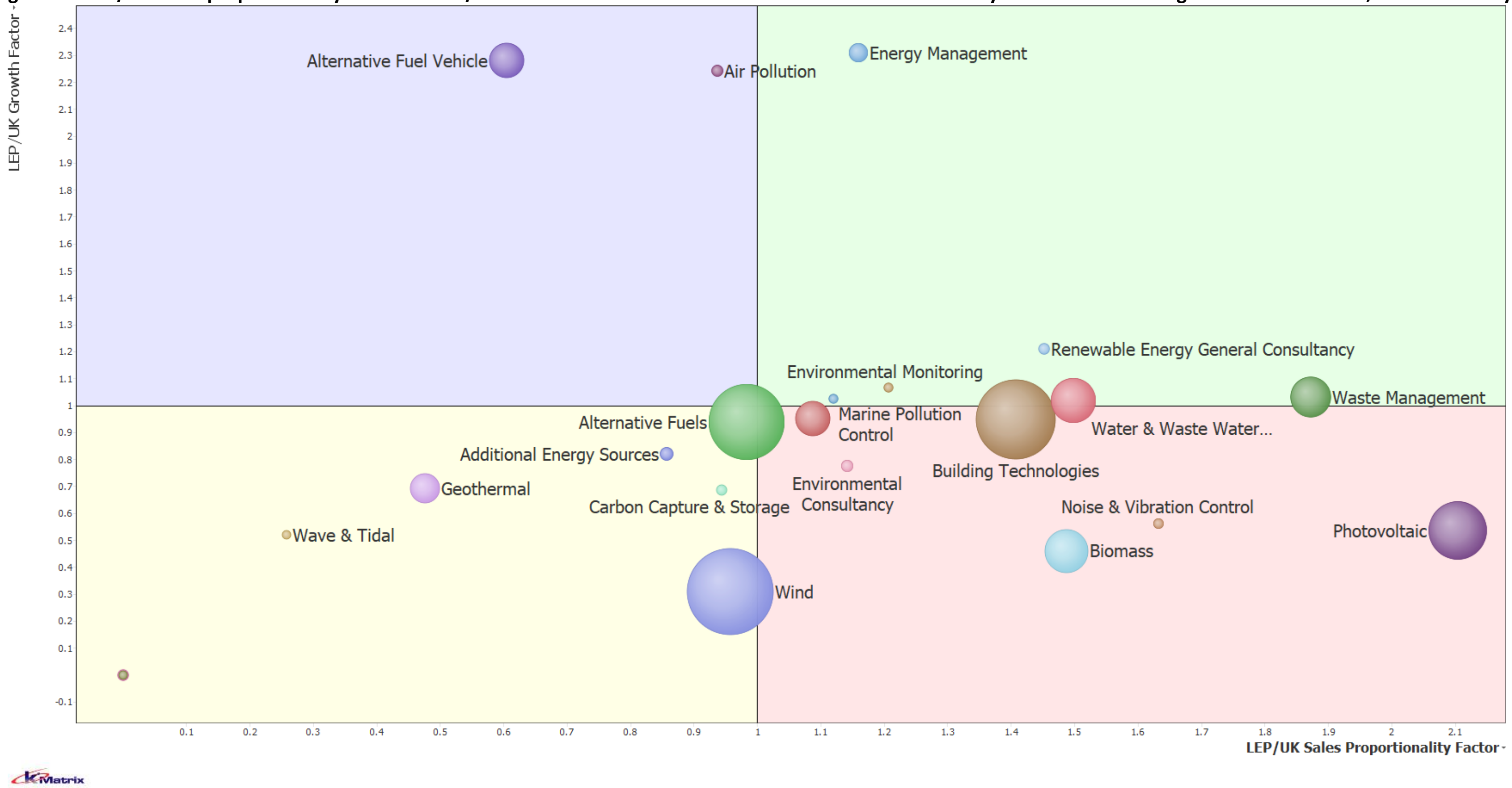


Figure 52 provides the same information as figure 1, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management has the ideal characteristics of above UK average growth and above LEP average size. Those in the lower right hand quadrant (red) hold a larger UK share than the average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Water & Waste Water Treatment, Waste Management and Biomass set these sub-sector apart as being strengths. Alternative Fuel Vehicle has a smaller market share than expected, but stronger growth than the UK average. Those in the lower left (yellow) quadrant such as Geothermal and Wave & tidal can be considered relative weaknesses.

**Figure 52: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m – Excluding Contaminated Land, Nuclear and Hydro**



## 8.2 Scalability of Marches LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 53 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Marches LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Alternative Fuels sub-sector has the best combination of size and scalability, while Environmental Monitoring may be small in terms of market but is highly scalable. Alternative Fuel Vehicle is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Marches LEP Market Snapshot report. Environmental Monitoring and Marine Pollution Control are small, but significantly more scalable than the regional average.

**Figure 53: Marches LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

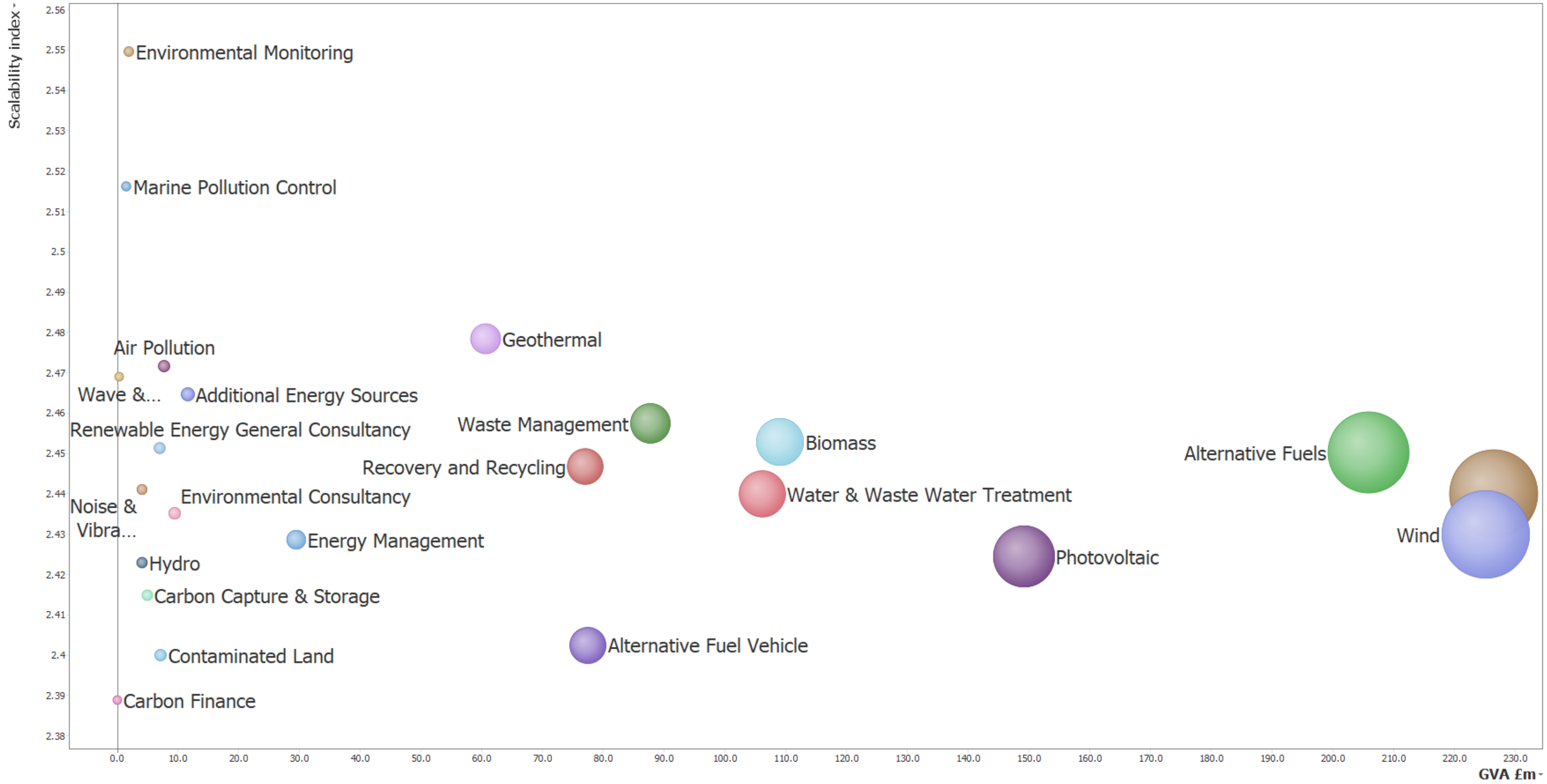
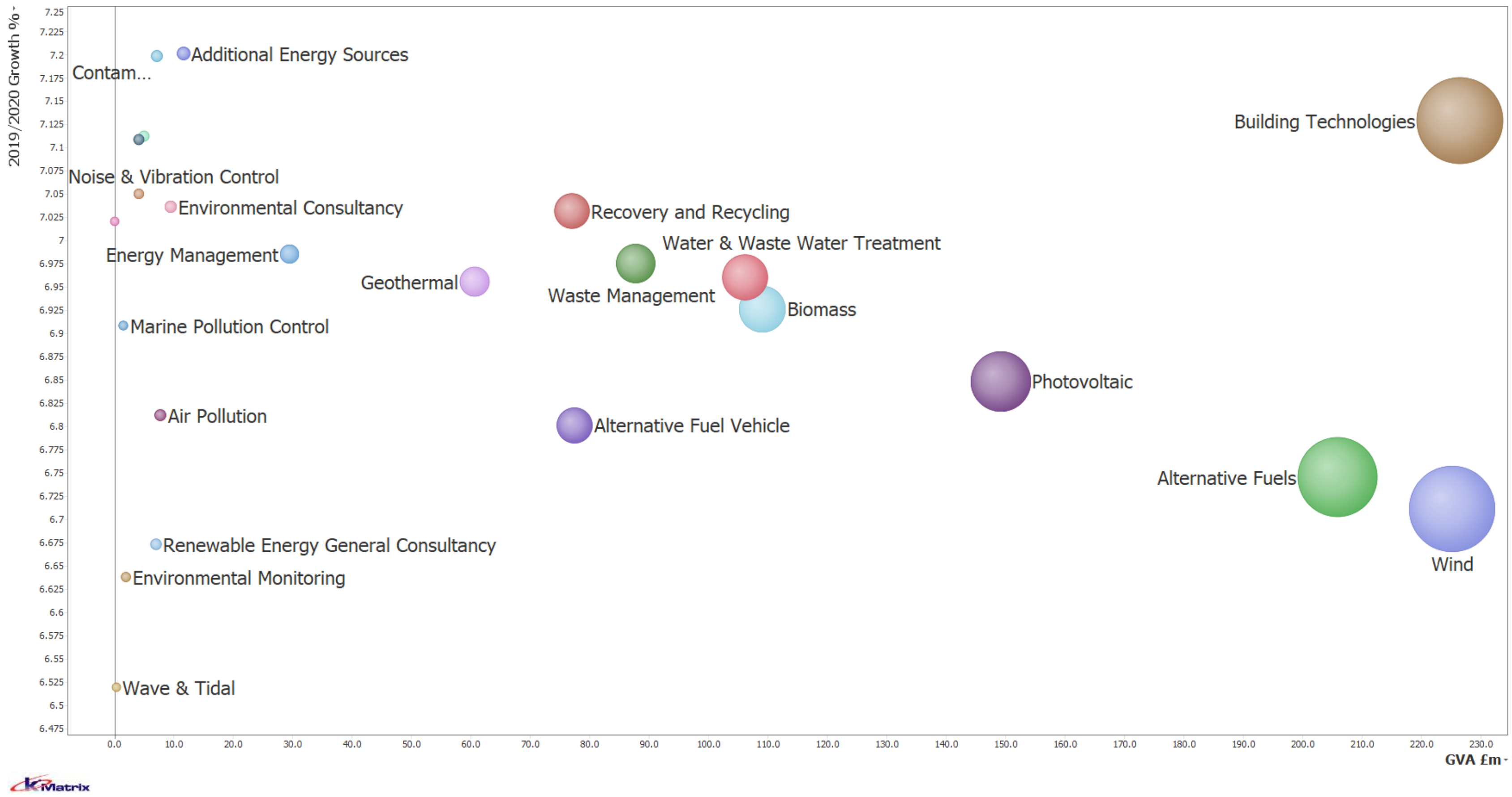


Figure 54 shows the same principle as Figure 53, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Building Technologies sub-sector occupies the most favourable position of large size and high growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 54: Marches LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

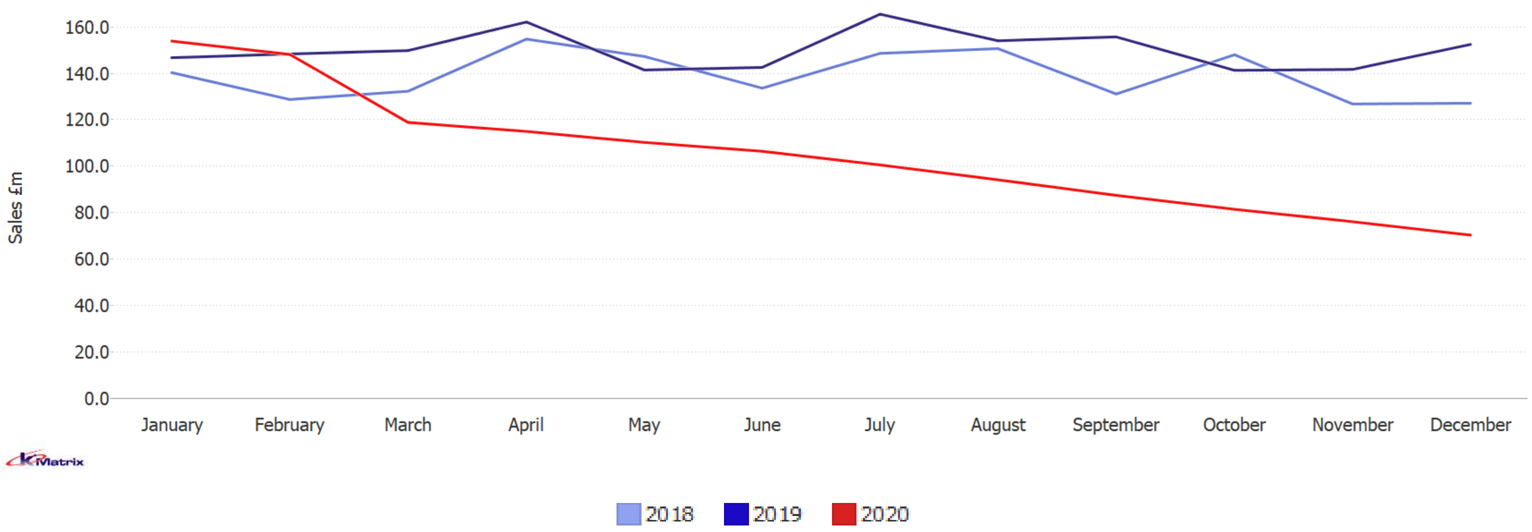


## 8.3 Marches LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 55, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Marches LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 55: Marches LEP LCEGS Sales, by month 2018, 2019 and 2020**



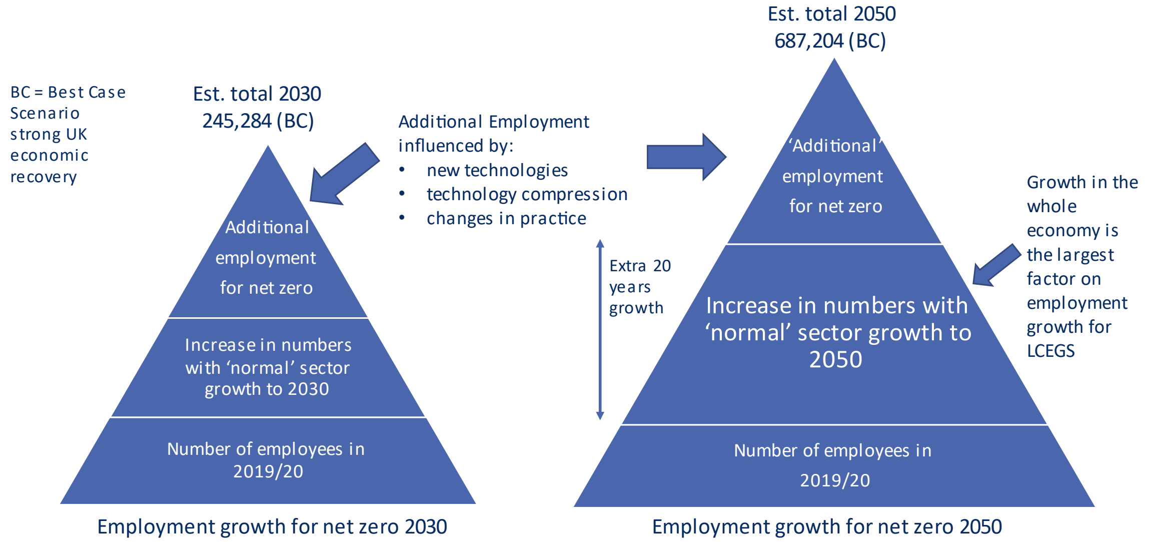

Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

*Timeline for Net Zero* Implications of Covid-19 and Brexit

| | |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 29 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Marches LEP.

Shortage of employees refers to the employees that are 'imported' from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not 'fit'. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as "Other Employees" because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to 'heads equivalent', so although for example, there are 2 Educators listed, with a shortage of 1, making a total of 3 in the region, this will equate to over 30 people providing 'pockets' of time, to equate to 3 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth

- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 29: Marches LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 328 | 76 | 23.3% | 404 | 429 | 6.1% | 560 | 38.6% | 663 | 63.9% | 1,555 | 284.5% |
| **Snr Management SME** | 827 | 82 | 9.9% | 909 | 1,079 | 18.7% | 1,412 | 55.3% | 1,662 | 82.9% | 3,955 | 335.0% |
| **Supervisory** | 784 | 81 | 10.4% | 865 | 1,020 | 17.9% | 1,349 | 55.9% | 1,581 | 82.7% | 3,772 | 335.8% |
| **Middle / Junior Management** | 733 | 74 | 10.1% | 807 | 958 | 18.8% | 1,259 | 56.1% | 1,478 | 83.2% | 3,508 | 334.8% |
| **Designer / Developer** | 118 | 31 | 26.4% | 150 | 154 | 2.8% | 203 | 35.3% | 238 | 59.2% | 571 | 281.3% |
| **Clerical** | 423 | 1 | 0.2% | 424 | 555 | 30.8% | 723 | 70.5% | 853 | 101.1% | 2,031 | 379.0% |
| **Self Employed** | 108 | 14 | 12.9% | 122 | 142 | 16.5% | 185 | 51.6% | 219 | 79.0% | 519 | 325.0% |
| **Advisor or Agent** | 72 | 12 | 16.7% | 85 | 95 | 12.6% | 124 | 46.3% | 145 | 71.9% | 349 | 312.5% |
| **Educator** | 2 | 1 | 32.0% | 3 | 3 | 0.2% | 4 | 26.9% | 4 | 51.9% | 11 | 273.8% |
| **Specialist or Consultant** | 466 | 15 | 3.2% | 481 | 606 | 26.2% | 793 | 65.1% | 947 | 97.1% | 2,246 | 367.2% |
| **Editor** | 13 | 0 | 3.8% | 13 | 17 | 25.6% | 22 | 65.1% | 26 | 94.5% | 62 | 359.2% |
| **Industrial Researchers** | 137 | 11 | 8.1% | 148 | 178 | 20.5% | 234 | 57.9% | 278 | 87.8% | 665 | 349.2% |
| **Scientist** | 59 | 21 | 36.2% | 80 | 78 | -2.3% | 100 | 24.9% | 115 | 44.5% | 282 | 253.1% |
| **Maintenance Engineer** | 990 | 62 | 6.3% | 1,052 | 1,294 | 23.0% | 1,694 | 61.1% | 2,019 | 92.0% | 4,756 | 352.3% |
| **Civil Engineer** | 58 | 15 | 26.6% | 74 | 76 | 3.5% | 99 | 35.0% | 117 | 59.6% | 279 | 279.0% |
| **Production Engineer** | 179 | 70 | 39.0% | 249 | 234 | -5.8% | 306 | 23.3% | 360 | 45.1% | 863 | 247.3% |
| **Power distribution Engineer** | 383 | 115 | 30.0% | 498 | 499 | 0.1% | 658 | 32.1% | 775 | 55.5% | 1,844 | 270.1% |
| **Construction Engineer** | 97 | 16 | 16.9% | 113 | 127 | 12.0% | 166 | 47.0% | 196 | 73.6% | 464 | 310.6% |
| **Sales Exec** | 438 | 50 | 11.5% | 488 | 569 | 16.7% | 755 | 54.8% | 884 | 81.1% | 2,122 | 334.9% |
| **Marketing Personnel** | 459 | 52 | 11.2% | 510 | 605 | 18.6% | 786 | 54.1% | 916 | 79.6% | 2,214 | 334.1% |
| **General Semi Skilled Worker** | 876 | 19 | 2.1% | 895 | 1,146 | 28.1% | 1,509 | 68.7% | 1,781 | 99.1% | 4,201 | 369.5% |
| **General Labour** | 1,123 | 0 | 0.0% | 1,123 | 1,463 | 30.3% | 1,923 | 71.3% | 2,257 | 101.1% | 5,401 | 381.0% |
| **Other Employees** | 853 | 42 | 4.9% | 894 | 1,115 | 24.7% | 1,452 | 62.3% | 1,726 | 93.0% | 4,125 | 361.2% |
| **Administrative workers** | 398 | 9 | 2.2% | 406 | 520 | 28.0% | 685 | 68.6% | 796 | 96.0% | 1,917 | 371.7% |
| **Total** | **9,922** | **870** | **8.8%** | **10,792** | **12,962** | **20.1%** | **17,002** | **57.5%** | **20,039** | **85.7%** | **47,709** | **342.1%** |

Table 29 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 39.0% (MEH 35.7%), Power Distribution Engineer 30.0% (MEH 29.8%) and Technicians 23.3% (MEH 22.2%).

Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.3% (MEH 6.3%), Specialist or Consultant 3.2% (MEH 3.3%) and Administrative Workers 2.2% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.1% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 57.5% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 85.7% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 342.1% (MEH 342.4%)

Tables 30, 31 and 32 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.8% (MEH 10.5%)
Renewable Energy – 6.9% (MEH 7.0%)
Environmental – 10.5% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 55.9% (MEH 47.3%); Renewable Energy 28.1% (MEH 27.9%) and Environmental 35.5% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 34.0% (MEH 33.7%); Renewable Energy 27.2% (MEH 27.1%) and Environmental 32.8% (MEH 32.6%)
Technicians: Low Carbon 31.1% (MEH 27.9%); Renewable Energy 16.9% (MEH 17.3%) and Environmental 23.1% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 70.6% (MEH 68.8%), but only 12.4% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 9.3% (MEH 17.0%); Renewable Energy 34.9% (MEH 34.5%) and Environmental 25.9% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 28.6% (MEH 28.1%); Renewable Energy 35.3% (MEH 35.1%) and Environmental 28.1% (MEH 29.3%)
Technicians of: Low Carbon 29.2% (MEH 34.2%); Renewable Energy 46.5% (MEH 45.9%) and Environmental 40.0% (MEH 39.6%)

**Table 30: Marches LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 109 | 34 | 31.1% | 143 | 143 | -0.2% | 185 | 29.2% | 220 | 53.8% | 513 | 258.2% |
| **Snr Management SME** | 206 | 23 | 11.4% | 229 | 267 | 16.6% | 353 | 54.3% | 418 | 82.5% | 988 | 331.1% |
| **Supervisory** | 199 | 25 | 12.8% | 225 | 260 | 15.5% | 339 | 50.9% | 403 | 79.1% | 951 | 322.8% |
| **Middle / Junior Management** | 188 | 23 | 12.1% | 210 | 246 | 17.0% | 326 | 55.0% | 377 | 78.9% | 907 | 331.1% |
| **Designer / Developer** | 31 | 9 | 28.0% | 40 | 41 | 1.5% | 53 | 32.5% | 63 | 56.8% | 150 | 274.1% |
| **Clerical** | 110 | 0 | 0.2% | 110 | 144 | 31.2% | 185 | 68.1% | 220 | 100.6% | 520 | 374.0% |
| **Self Employed** | 40 | 6 | 15.8% | 46 | 52 | 13.4% | 68 | 46.7% | 80 | 73.9% | 194 | 318.6% |
| **Advisor or Agent** | 36 | 6 | 16.7% | 42 | 47 | 12.5% | 61 | 46.3% | 72 | 72.5% | 174 | 314.7% |
| **Educator** | 0 | 0 | 26.5% | 0 | 0 | 3.5% | 0 | 30.8% | 0 | 59.6% | 1 | 282.2% |
| **Specialist or Consultant** | 130 | 5 | 3.8% | 135 | 171 | 26.2% | 224 | 65.5% | 268 | 97.6% | 630 | 365.6% |
| **Editor** | 3 | 0 | 4.0% | 3 | 4 | 26.5% | 5 | 63.7% | 6 | 93.1% | 14 | 365.1% |
| **Industrial Researchers** | 80 | 7 | 8.4% | 86 | 104 | 20.0% | 135 | 56.6% | 162 | 87.5% | 387 | 348.2% |
| **Scientist** | 40 | 15 | 37.4% | 56 | 54 | -3.0% | 69 | 23.6% | 78 | 40.8% | 195 | 250.3% |
| **Maintenance Engineer** | 252 | 20 | 8.0% | 273 | 327 | 20.0% | 435 | 59.6% | 516 | 89.1% | 1,201 | 340.6% |
| **Civil Engineer** | 14 | 4 | 30.0% | 18 | 18 | 0.5% | 24 | 32.7% | 28 | 56.9% | 66 | 271.6% |
| **Production Engineer** | 58 | 32 | 55.9% | 90 | 76 | -15.3% | 98 | 9.3% | 116 | 29.3% | 278 | 208.7% |
| **Power distribution Engineer** | 85 | 29 | 34.0% | 114 | 111 | -3.0% | 147 | 28.6% | 172 | 50.8% | 411 | 260.1% |
| **Construction Engineer** | 21 | 4 | 20.5% | 25 | 27 | 8.3% | 36 | 41.3% | 43 | 68.7% | 101 | 300.2% |
| **Sales Exec** | 134 | 19 | 14.5% | 153 | 175 | 14.4% | 229 | 49.8% | 268 | 75.2% | 644 | 320.4% |
| **Marketing Personnel** | 143 | 21 | 14.5% | 163 | 188 | 15.1% | 245 | 50.0% | 289 | 77.3% | 686 | 320.5% |
| **General Semi Skilled Worker** | 228 | 6 | 2.6% | 234 | 301 | 28.5% | 392 | 67.4% | 465 | 99.0% | 1,108 | 373.6% |
| **General Labour** | 392 | 0 | 0.0% | 392 | 510 | 30.1% | 671 | 71.0% | 787 | 100.6% | 1,916 | 388.2% |
| **Other Employees** | 189 | 11 | 5.7% | 199 | 247 | 24.0% | 320 | 60.3% | 389 | 95.2% | 912 | 357.4% |
| **Administrative workers** | 110 | 3 | 2.8% | 113 | 146 | 29.1% | 189 | 66.7% | 220 | 94.1% | 530 | 367.4% |
| **Total** | **2,798** | **304** | **10.8%** | **3,102** | **3,660** | **18.0%** | **4,789** | **54.4%** | **5,662** | **82.5%** | **13,476** | **334.5%** |

**Table 31: Marches LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 131 | 22 | 16.9% | 153 | 171 | 11.7% | 224 | 46.5% | 265 | 73.0% | 624 | 307.4% |
| **Snr Management SME** | 471 | 43 | 9.1% | 514 | 616 | 19.9% | 798 | 55.2% | 942 | 83.3% | 2,246 | 337.0% |
| **Supervisory** | 440 | 40 | 9.0% | 480 | 571 | 19.1% | 760 | 58.4% | 883 | 84.2% | 2,130 | 344.1% |
| **Middle / Junior Management** | 409 | 37 | 9.1% | 446 | 534 | 19.7% | 704 | 57.7% | 829 | 85.8% | 1,956 | 338.2% |
| **Designer / Developer** | 35 | 8 | 21.4% | 43 | 46 | 6.9% | 61 | 40.5% | 71 | 65.5% | 172 | 300.3% |
| **Clerical** | 233 | 0 | 0.2% | 234 | 304 | 30.2% | 399 | 70.8% | 470 | 101.1% | 1,118 | 378.8% |
| **Self Employed** | 28 | 3 | 9.3% | 31 | 37 | 20.7% | 49 | 57.3% | 57 | 85.7% | 133 | 332.3% |
| **Advisor or Agent** | 9 | 2 | 16.7% | 11 | 12 | 12.4% | 16 | 46.2% | 19 | 74.1% | 45 | 309.7% |
| **Educator** | 0 | 0 | 9.5% | 0 | 0 | 12.6% | 0 | 56.8% | 0 | 82.5% | 0 | 372.7% |
| **Specialist or Consultant** | 236 | 7 | 2.8% | 243 | 307 | 26.4% | 399 | 64.4% | 481 | 97.9% | 1,136 | 367.8% |
| **Editor** | 3 | 0 | 3.3% | 3 | 4 | 26.5% | 6 | 67.4% | 7 | 94.9% | 15 | 355.5% |
| **Industrial Researchers** | 16 | 1 | 7.3% | 17 | 21 | 23.0% | 27 | 62.6% | 32 | 89.4% | 76 | 352.0% |
| **Scientist** | 5 | 2 | 28.6% | 7 | 7 | 5.3% | 9 | 32.7% | 11 | 60.2% | 26 | 270.9% |
| **Maintenance Engineer** | 525 | 28 | 5.4% | 554 | 690 | 24.5% | 901 | 62.7% | 1,071 | 93.4% | 2,538 | 358.2% |
| **Civil Engineer** | 13 | 3 | 21.3% | 16 | 18 | 8.6% | 23 | 41.3% | 27 | 65.8% | 65 | 296.6% |
| **Production Engineer** | 74 | 21 | 28.1% | 95 | 96 | 1.5% | 128 | 34.9% | 149 | 57.5% | 357 | 276.7% |
| **Power distribution Engineer** | 210 | 57 | 27.2% | 267 | 273 | 2.1% | 362 | 35.3% | 427 | 59.8% | 1,012 | 278.2% |
| **Construction Engineer** | 32 | 4 | 12.3% | 36 | 42 | 17.2% | 55 | 53.2% | 65 | 80.9% | 153 | 325.0% |
| **Sales Exec** | 218 | 20 | 9.2% | 238 | 281 | 18.0% | 378 | 58.5% | 441 | 85.3% | 1,059 | 344.7% |
| **Marketing Personnel** | 234 | 21 | 9.2% | 255 | 308 | 20.6% | 401 | 56.8% | 462 | 80.7% | 1,129 | 342.2% |
| **General Semi Skilled Worker** | 461 | 8 | 1.8% | 469 | 599 | 27.6% | 799 | 70.2% | 939 | 100.1% | 2,191 | 366.7% |
| **General Labour** | 587 | 0 | 0.0% | 587 | 764 | 30.2% | 1,008 | 71.6% | 1,182 | 101.3% | 2,799 | 376.8% |
| **Other Employees** | 503 | 23 | 4.5% | 526 | 658 | 25.1% | 857 | 63.0% | 1,006 | 91.4% | 2,432 | 362.5% |
| **Administrative workers** | 203 | 4 | 1.8% | 207 | 263 | 27.2% | 350 | 69.2% | 407 | 96.7% | 982 | 374.2% |
| **Total** | **5,080** | **353** | **6.9%** | **5,433** | **6,624** | **21.9%** | **8,712** | **60.4%** | **10,244** | **88.6%** | **24,394** | **349.0%** |

**Table 32: Marches LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 88 | 20 | 23.1% | 108 | 115 | 6.6% | 151 | 40.0% | 177 | 64.2% | 418 | 287.0% |
| Snr Management SME | 150 | 16 | 10.6% | 166 | 196 | 17.9% | 260 | 56.9% | 302 | 81.9% | 721 | 334.3% |
| Supervisory | 145 | 16 | 11.1% | 161 | 189 | 17.6% | 250 | 55.4% | 295 | 83.0% | 691 | 329.2% |
| Middle / Junior Management | 136 | 15 | 10.8% | 150 | 178 | 18.7% | 229 | 52.9% | 272 | 81.5% | 645 | 329.7% |
| Designer / Developer | 52 | 15 | 28.7% | 67 | 67 | 1.0% | 89 | 33.7% | 104 | 56.6% | 249 | 273.4% |
| Clerical | 81 | 0 | 0.2% | 81 | 106 | 31.8% | 139 | 72.7% | 163 | 102.0% | 393 | 386.4% |
| Self Employed | 40 | 5 | 12.4% | 45 | 53 | 16.7% | 69 | 52.6% | 81 | 79.6% | 192 | 326.5% |
| Advisor or Agent | 27 | 5 | 16.7% | 32 | 36 | 12.9% | 46 | 46.4% | 54 | 70.4% | 130 | 310.5% |
| Educator | 2 | 1 | 32.3% | 3 | 3 | 0.0% | 3 | 26.7% | 4 | 51.4% | 10 | 273.3% |
| Specialist or Consultant | 99 | 3 | 3.5% | 102 | 128 | 25.4% | 170 | 66.1% | 199 | 94.5% | 479 | 368.0% |
| Editor | 7 | 0 | 4.0% | 7 | 9 | 24.8% | 12 | 64.5% | 14 | 94.9% | 33 | 358.6% |
| Industrial Researchers | 42 | 3 | 7.8% | 45 | 54 | 20.4% | 71 | 58.5% | 84 | 87.8% | 202 | 350.1% |
| Scientist | 13 | 5 | 35.5% | 17 | 17 | -3.3% | 22 | 26.3% | 26 | 49.8% | 61 | 255.2% |
| Maintenance Engineer | 212 | 14 | 6.4% | 225 | 277 | 23.1% | 358 | 59.1% | 432 | 92.0% | 1,017 | 351.8% |
| Civil Engineer | 31 | 8 | 27.3% | 39 | 40 | 2.8% | 52 | 33.5% | 62 | 58.2% | 147 | 275.1% |
| Production Engineer | 47 | 17 | 35.5% | 64 | 62 | -3.3% | 80 | 25.9% | 95 | 48.8% | 228 | 258.0% |
| Power distribution Engineer | 88 | 29 | 32.8% | 117 | 115 | -1.5% | 150 | 28.1% | 176 | 50.4% | 422 | 261.3% |
| Construction Engineer | 44 | 8 | 18.6% | 52 | 57 | 10.2% | 75 | 45.6% | 88 | 70.9% | 210 | 305.8% |
| Sales Exec | 86 | 11 | 12.5% | 96 | 113 | 17.1% | 148 | 53.4% | 174 | 80.3% | 418 | 333.9% |
| Marketing Personnel | 82 | 9 | 11.5% | 91 | 109 | 19.0% | 141 | 53.7% | 165 | 80.5% | 399 | 335.7% |
| General Semi Skilled Worker | 187 | 4 | 2.2% | 191 | 246 | 28.7% | 319 | 66.7% | 377 | 96.9% | 902 | 371.4% |
| General Labour | 143 | 0 | 0.0% | 143 | 188 | 31.2% | 244 | 70.7% | 288 | 101.4% | 686 | 379.0% |
| Other Employees | 161 | 8 | 5.2% | 169 | 210 | 24.1% | 275 | 62.5% | 331 | 95.6% | 781 | 361.4% |
| Administrative workers | 84 | 2 | 2.3% | 86 | 111 | 28.7% | 146 | 69.4% | 169 | 96.6% | 405 | 371.5% |
| **Total** | **2,044** | **214** | **10.5%** | **2,258** | **2,679** | **18.7%** | **3,501** | **55.1%** | **4,133** | **83.1%** | **9,839** | **335.8%** |

## 8.4 Marches LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Marches LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 56 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Marches LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Marches LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 56: Marches LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

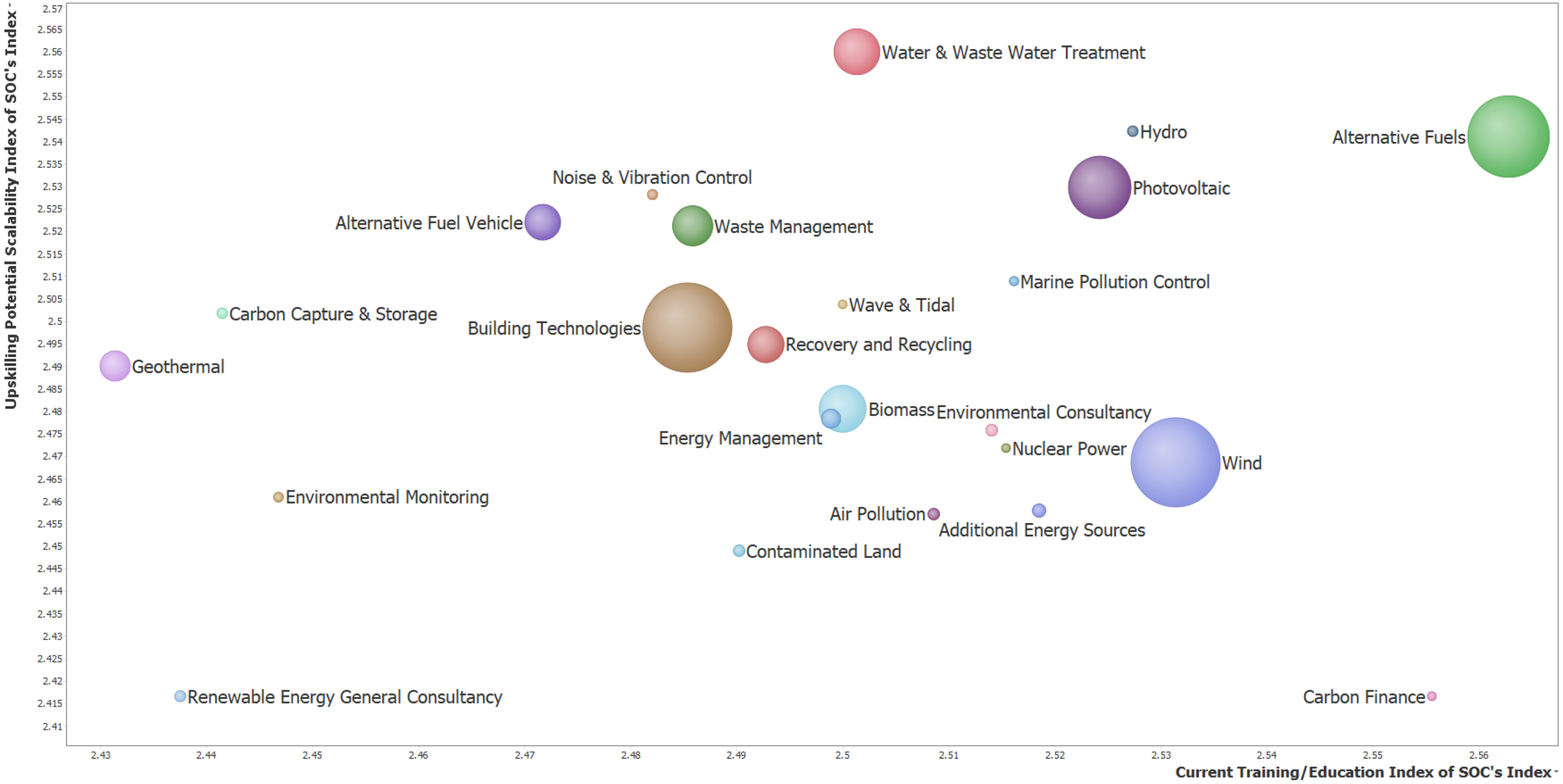



Figure 56 shows that Alternative Fuel Vehicle holds the most desirable position, with good current training capacity combined with a strong potential for upskilling. Photovoltaic is also strong, along with Water and Waste Water Treatment.

## 8.5 Marches LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Marches LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

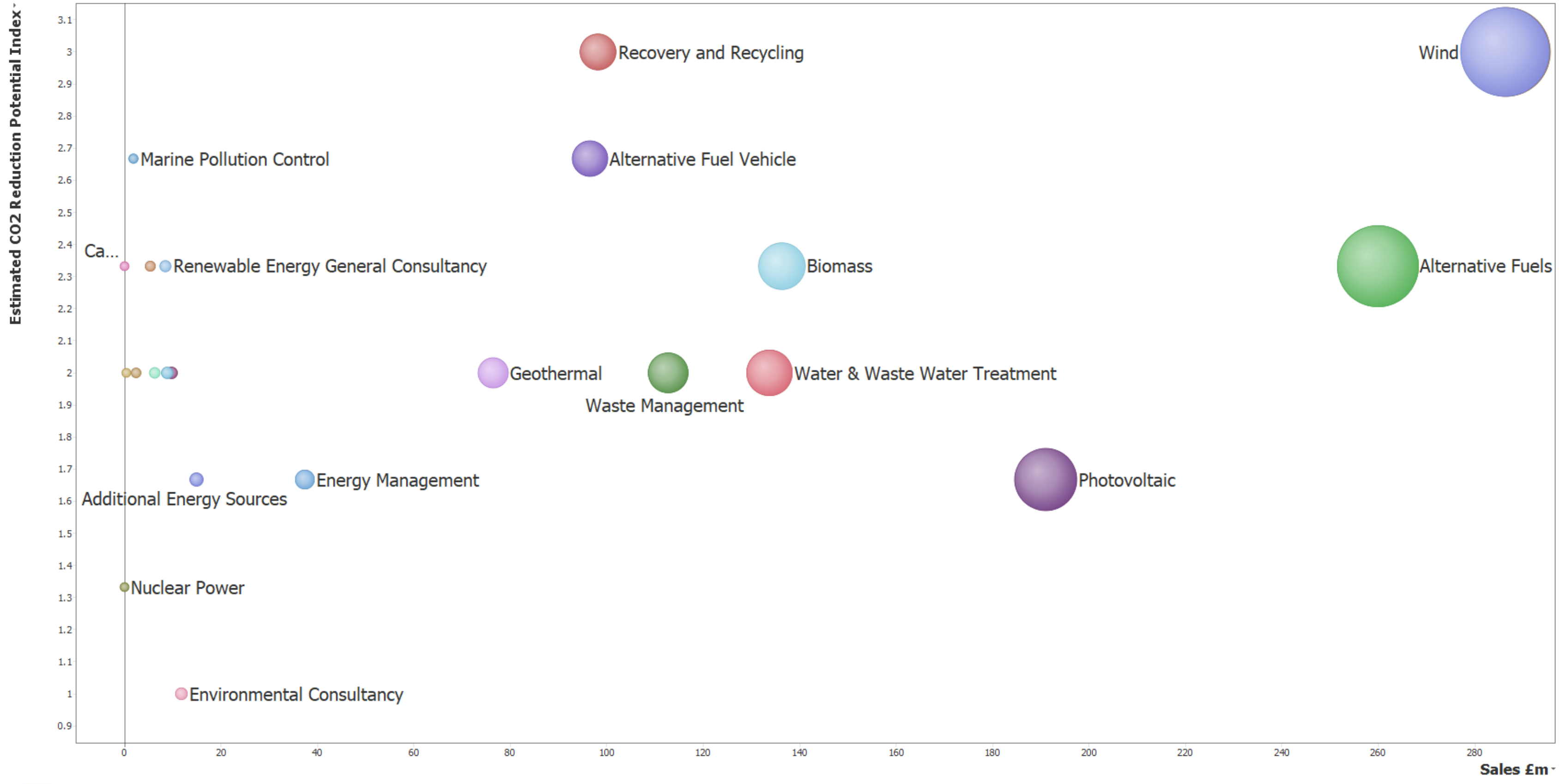
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 57 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the both the Building Technologies and Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Building technologies sits directly behind Wind on the graph. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels has a strong position in terms of large size of market and a high $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 57: Marches LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 9. Growth Forecast for Net Zero in 2030 and 2050 for the Stoke and Staffordshire LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Stoke and Staffordshire LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 9.1 Stoke and Staffordshire LEP's LCEGS Strengths and Weaknesses

In this section of the report Stoke and Staffordshire LEP's LCEGS performance is compared with the UK as a whole. The Stoke and Staffordshire LEP's LCEGS sector was worth £2.7bn in 2019/20 and accounts for 1.2% of the UK total.

Figure 58 shows how the Stoke and Staffordshire LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 1.2%. This proportionality factor demonstrates where the Stoke and Staffordshire LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 1.2% of the UK market; above 1 = larger than 1.2% share and below 1 = smaller than 1.2% share.

The y-axis represents the growth rate of the Stoke and Staffordshire LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 58 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric are strengths, because they are both close to the expected size of market (1.1 for Contaminated Land and 1.0 for Hydro) and are growing significantly stronger than the UK average (11.5% LEP vs 1.0% UK for Contaminated Land and 11.3% vs. 1.8% UK for Hydro)

**Figure 58: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

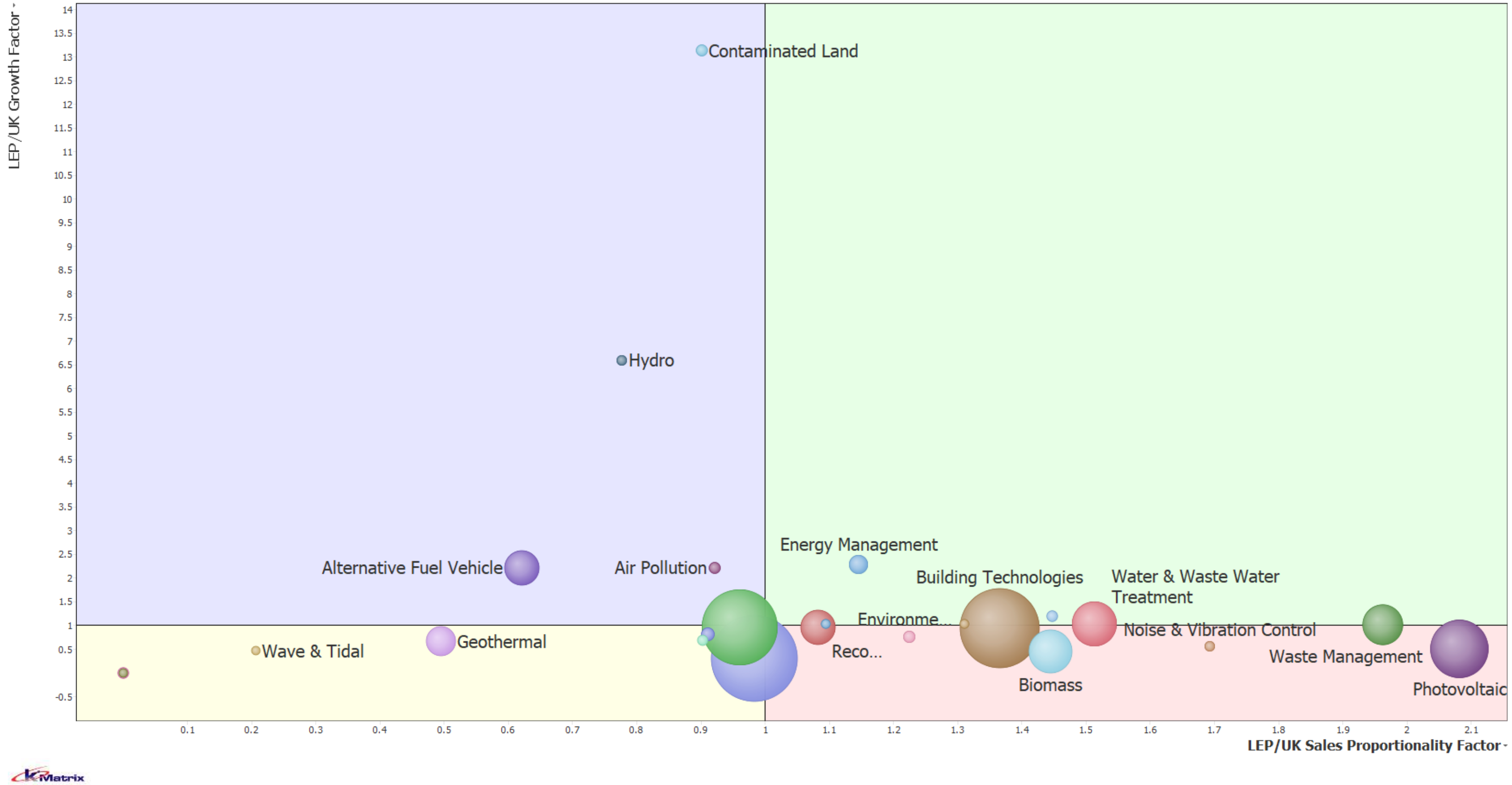
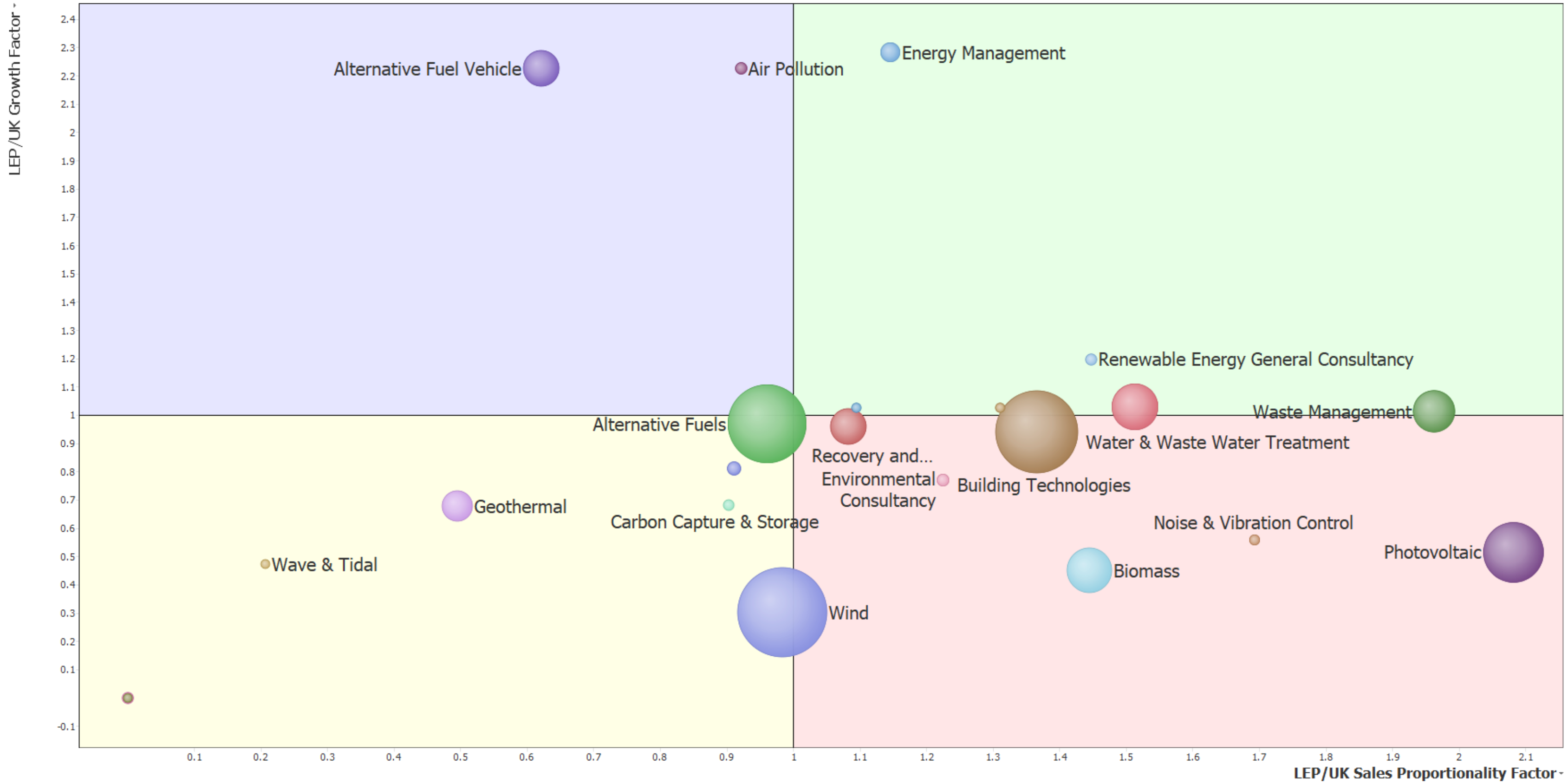


Figure 59 provides the same information as figure 1, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management and Renewable Consultancy have the ideal characteristics of above UK average growth and above LEP average size. Those in the lower right hand quadrant (red) hold a larger UK share than the average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Water & Waste Water Treatment, Waste Management and Biomass set these sub-sector apart as being strengths. Those in the lower left (yellow) quadrant such as Geothermal and Wave & tidal can be considered relative weaknesses.

**Figure 59: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m – Excluding Contaminated Land, Nuclear and Hydro**



## 9.2 Scalability of Stoke and Staffordshire LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:
- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 60 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Stoke and Staffordshire LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right corner of the graph, with high GVA and high Scalability. We can see that the Building Technologies sub-sector has a good combination of size and scalability, while Water & Waste Water Treatment may be smaller in terms of market, but is highly scalable. Wind is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Stoke and Staffordshire LEP Market Snapshot report.

**Figure 60: Stoke and Staffordshire LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

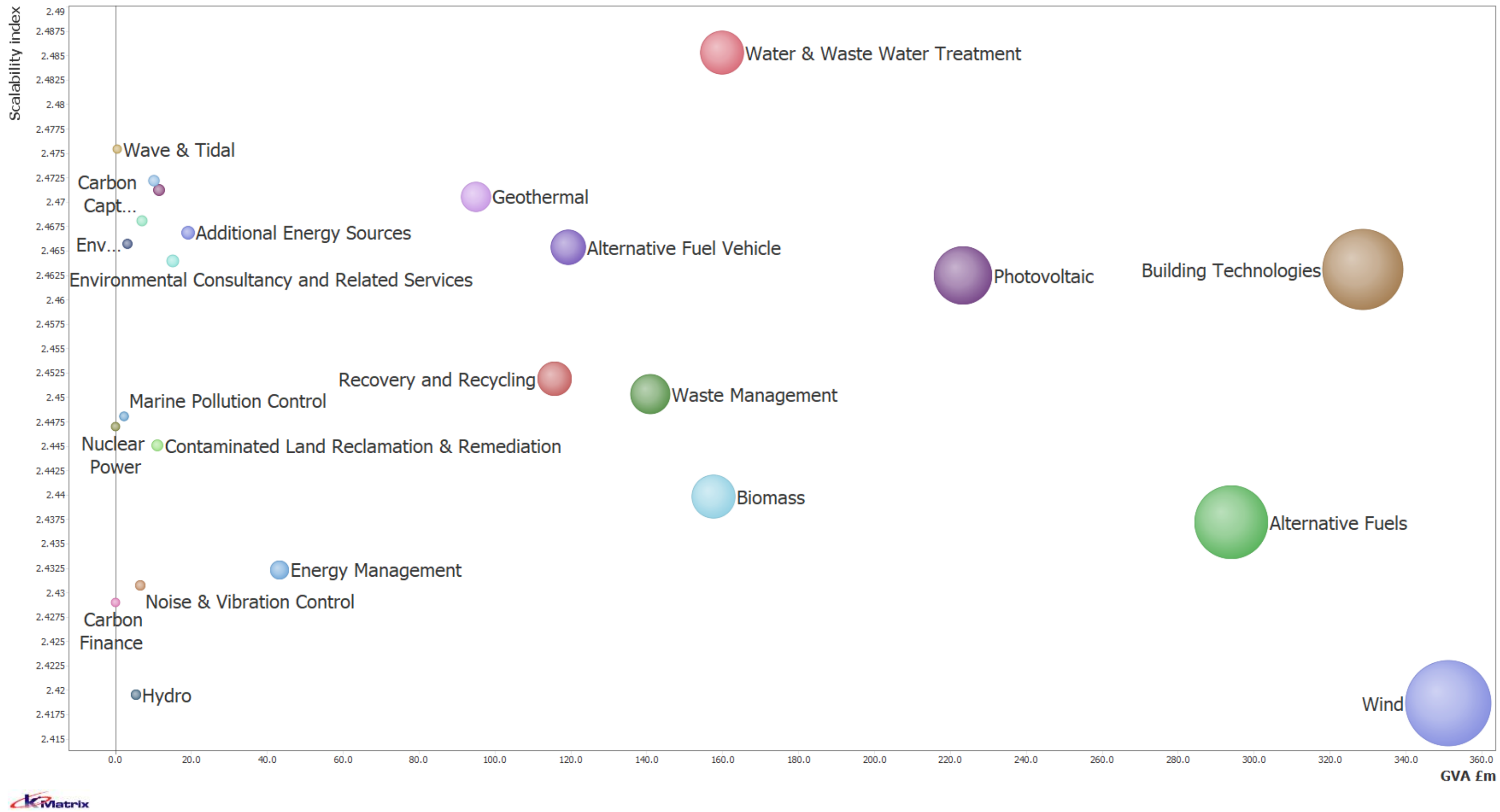
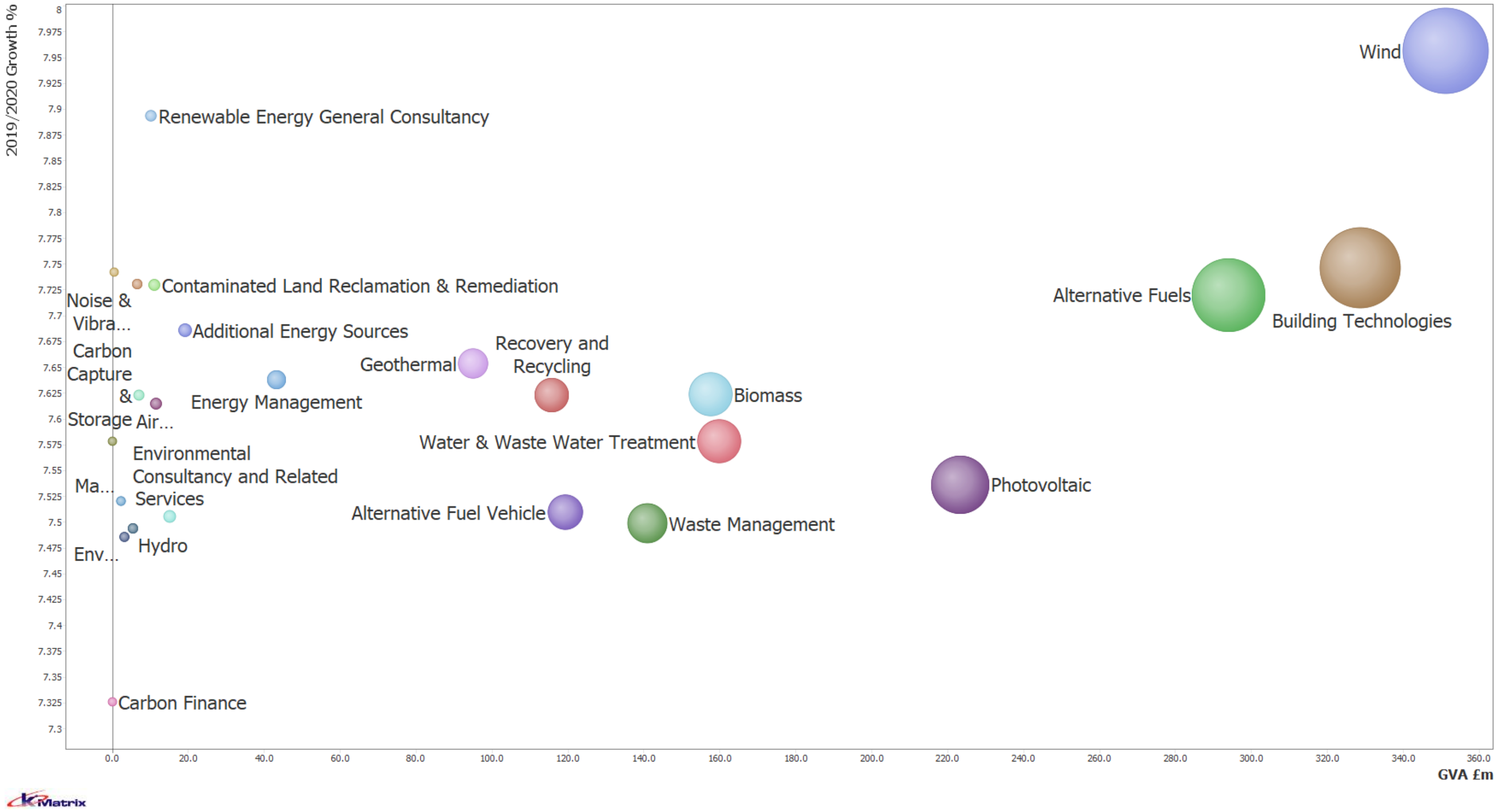


Figure 61 shows the same principle as Figure 60, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies the most favourable position of large size and high growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc. In terms of Wind, technology is advancing which impacts on scalability. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 61: Stoke and Staffordshire LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

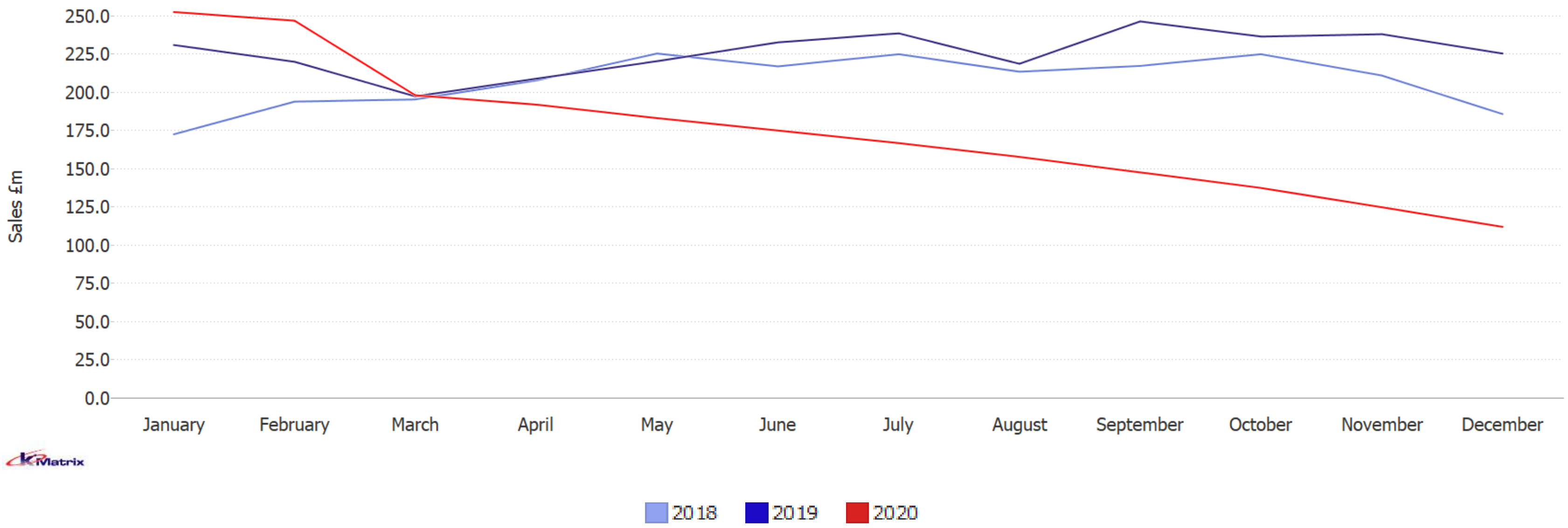


## 9.3 Stoke and Staffordshire LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 62, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Stoke and Staffordshire LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 62: Stoke and Staffordshire LEP LCEGS Sales, by month 2018, 2019 and 2020**

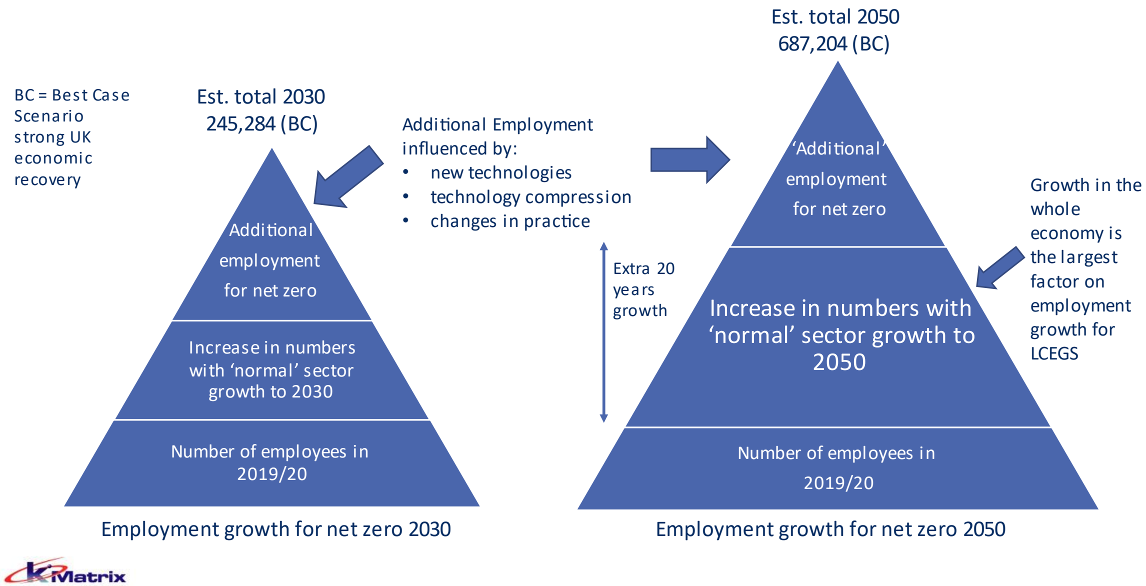


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| *Timeline for Net Zero* | **Implications of Covid-19 and Brexit** |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.




On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 33 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Stoke and Staffordshire LEP.

Shortage of employees refers to the employees that are ‘imported’ from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not ‘fit’. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as “Other Employees” because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to ‘heads equivalent’, so although for example, there are 4 Educators listed, with a shortage of 1, making a total of 5 in the region, this will equate to over 50 people providing ‘pockets’ of time, to equate to 5 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 33: Stoke and Staffordshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 492 | 109 | 22.1% | 600 | 643 | 7.1% | 841 | 40.1% | 994 | 65.5% | 2,349 | 291.3% |
| **Snr Management SME** | 1,104 | 111 | 10.1% | 1,215 | 1,449 | 19.2% | 1,890 | 55.5% | 2,228 | 83.3% | 5,287 | 335.0% |
| **Supervisory** | 1,099 | 111 | 10.1% | 1,210 | 1,439 | 18.9% | 1,885 | 55.7% | 2,218 | 83.2% | 5,266 | 335.1% |
| **Middle / Junior Management** | 1,124 | 115 | 10.2% | 1,239 | 1,471 | 18.7% | 1,928 | 55.6% | 2,271 | 83.3% | 5,412 | 336.9% |
| **Designer / Developer** | 166 | 43 | 25.9% | 208 | 216 | 3.7% | 284 | 36.1% | 335 | 60.8% | 795 | 281.5% |
| **Clerical** | 576 | 1 | 0.2% | 577 | 754 | 30.6% | 990 | 71.5% | 1,168 | 102.4% | 2,767 | 379.5% |
| **Self Employed** | 142 | 18 | 13.0% | 160 | 185 | 15.6% | 242 | 51.0% | 287 | 79.5% | 683 | 326.1% |
| **Advisor or Agent** | 99 | 16 | 16.1% | 114 | 129 | 12.8% | 169 | 47.4% | 200 | 74.7% | 472 | 312.8% |
| **Educator** | 4 | 1 | 29.9% | 5 | 5 | -0.4% | 7 | 32.5% | 8 | 54.8% | 19 | 271.4% |
| **Specialist or Consultant** | 552 | 18 | 3.2% | 570 | 721 | 26.5% | 947 | 66.2% | 1,120 | 96.6% | 2,651 | 365.1% |
| **Editor** | 19 | 1 | 3.8% | 19 | 24 | 25.9% | 32 | 65.0% | 38 | 94.7% | 90 | 364.0% |
| **Industrial Researchers** | 191 | 15 | 7.6% | 205 | 249 | 21.4% | 329 | 60.2% | 386 | 88.0% | 915 | 346.0% |
| **Scientist** | 87 | 30 | 35.1% | 117 | 113 | -3.4% | 150 | 27.7% | 172 | 46.5% | 415 | 253.7% |
| **Maintenance Engineer** | 1,226 | 77 | 6.3% | 1,303 | 1,613 | 23.8% | 2,101 | 61.2% | 2,469 | 89.5% | 5,886 | 351.7% |
| **Civil Engineer** | 90 | 24 | 26.5% | 113 | 117 | 3.2% | 154 | 35.7% | 181 | 59.8% | 429 | 278.3% |
| **Production Engineer** | 238 | 84 | 35.3% | 322 | 312 | -3.4% | 410 | 27.3% | 480 | 48.9% | 1,141 | 254.0% |
| **Power distribution Engineer** | 558 | 169 | 30.3% | 726 | 730 | 0.4% | 955 | 31.5% | 1,127 | 55.2% | 2,674 | 268.1% |
| **Construction Engineer** | 134 | 23 | 16.8% | 156 | 175 | 12.3% | 230 | 47.1% | 270 | 72.8% | 643 | 311.5% |
| **Sales Exec** | 637 | 73 | 11.5% | 711 | 835 | 17.5% | 1,098 | 54.5% | 1,287 | 81.1% | 3,059 | 330.4% |
| **Marketing Personnel** | 601 | 68 | 11.3% | 669 | 789 | 17.8% | 1,032 | 54.1% | 1,219 | 82.1% | 2,884 | 330.8% |
| **General Semi Skilled Worker** | 1,263 | 27 | 2.1% | 1,290 | 1,649 | 27.8% | 2,166 | 67.9% | 2,549 | 97.6% | 6,072 | 370.8% |
| **General Labour** | 1,609 | 0 | 0.0% | 1,609 | 2,107 | 30.9% | 2,765 | 71.8% | 3,248 | 101.8% | 7,736 | 380.7% |
| **Other Employees** | 1,662 | 85 | 5.1% | 1,747 | 2,173 | 24.4% | 2,851 | 63.2% | 3,353 | 91.9% | 7,966 | 356.0% |
| **Administrative workers** | 636 | 13 | 2.1% | 649 | 830 | 28.0% | 1,088 | 67.7% | 1,281 | 97.3% | 3,058 | 371.2% |
| **Total** | **14,308** | **1,232** | **8.6%** | **15,539** | **18,728** | **20.5%** | **24,543** | **57.9%** | **28,890** | **85.9%** | **68,672** | **341.9%** |

Table 33 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 35.3% (MEH 35.7%), Power Distribution Engineer 30.3% (MEH 29.8%) and Technicians 22.1% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.3% (MEH 6.3%), Specialist or Consultant 3.2% (MEH 3.3%) and Administrative Workers 2.1% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.5% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 57.9% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 85.9% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 341.9% (MEH 342.4%)

Tables 34, 35 and 36 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.2% (MEH 10.5%)
Renewable Energy – 7.1% (MEH 7.0%)
Environmental – 10.1% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 45.3% (MEH 47.3%); Renewable Energy 28.6% (MEH 27.9%) and Environmental 34.8% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 33.4% (MEH 33.7%); Renewable Energy 28.4% (MEH 27.1%) and Environmental 31.8% (MEH 32.6%)
Technicians: Low Carbon 27.2% (MEH 27.9%); Renewable Energy 17.6% (MEH 17.3%) and Environmental 22.9% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 69.9% (MEH 68.8%), but only 13.3% (MEH 13.4%) in Photovoltaic. Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 19.2% (MEH 17.0%); Renewable Energy 34.2% (MEH 34.5%) and Environmental 26.6% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 28.9% (MEH 28.1%); Renewable Energy 33.2% (MEH 35.1%) and Environmental 30.0% (MEH 29.3%)
Technicians of: Low Carbon 34.6% (MEH 34.2%); Renewable Energy 45.4% (MEH 45.9%) and Environmental 39.1% (MEH 39.6%)

**Table 34: Stoke and Staffordshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 157 | 43 | 27.2% | 200 | 206 | 3.1% | 269 | 34.6% | 318 | 59.0% | 748 | 273.9% |
| **Snr Management SME** | 264 | 31 | 11.8% | 295 | 343 | 16.3% | 451 | 52.9% | 534 | 80.8% | 1,261 | 327.0% |
| **Supervisory** | 273 | 33 | 12.2% | 306 | 353 | 15.5% | 468 | 53.0% | 550 | 80.0% | 1,306 | 326.8% |
| **Middle / Junior Management** | 278 | 35 | 12.4% | 313 | 364 | 16.4% | 477 | 52.6% | 561 | 79.5% | 1,347 | 330.9% |
| **Designer / Developer** | 42 | 11 | 26.3% | 53 | 55 | 2.9% | 72 | 35.9% | 85 | 60.2% | 203 | 280.6% |
| **Clerical** | 145 | 0 | 0.3% | 145 | 190 | 31.0% | 248 | 71.4% | 291 | 101.0% | 696 | 380.0% |
| **Self Employed** | 51 | 8 | 16.3% | 59 | 66 | 11.8% | 87 | 46.8% | 103 | 74.5% | 245 | 314.4% |
| **Advisor or Agent** | 48 | 7 | 15.4% | 56 | 63 | 13.4% | 82 | 47.6% | 98 | 76.6% | 231 | 314.5% |
| **Educator** | 0 | 0 | 23.2% | 0 | 0 | 4.8% | 0 | 41.0% | 0 | 65.1% | 1 | 290.3% |
| **Specialist or Consultant** | 143 | 5 | 3.7% | 149 | 187 | 25.9% | 246 | 65.4% | 291 | 95.5% | 681 | 358.2% |
| **Editor** | 4 | 0 | 3.8% | 4 | 5 | 25.1% | 7 | 64.3% | 8 | 95.0% | 19 | 365.8% |
| **Industrial Researchers** | 109 | 8 | 7.6% | 117 | 142 | 21.6% | 188 | 61.0% | 220 | 88.5% | 520 | 345.0% |
| **Scientist** | 58 | 21 | 36.0% | 79 | 75 | -4.4% | 100 | 27.1% | 114 | 44.1% | 276 | 249.8% |
| **Maintenance Engineer** | 302 | 23 | 7.8% | 326 | 396 | 21.7% | 516 | 58.4% | 610 | 87.3% | 1,453 | 346.1% |
| **Civil Engineer** | 21 | 6 | 28.7% | 27 | 27 | 1.8% | 36 | 33.5% | 42 | 56.9% | 99 | 269.8% |
| **Production Engineer** | 72 | 33 | 45.3% | 105 | 94 | -10.4% | 125 | 19.2% | 146 | 39.1% | 343 | 227.4% |
| **Power distribution Engineer** | 119 | 40 | 33.4% | 159 | 156 | -2.3% | 205 | 28.9% | 241 | 51.1% | 573 | 260.0% |
| **Construction Engineer** | 28 | 6 | 19.6% | 34 | 37 | 9.8% | 49 | 44.5% | 57 | 68.1% | 137 | 301.8% |
| **Sales Exec** | 191 | 27 | 14.3% | 218 | 250 | 14.4% | 329 | 50.9% | 385 | 76.5% | 926 | 324.0% |
| **Marketing Personnel** | 183 | 26 | 14.4% | 209 | 240 | 15.0% | 312 | 49.4% | 371 | 77.8% | 877 | 319.7% |
| **General Semi Skilled Worker** | 321 | 8 | 2.5% | 329 | 416 | 26.4% | 553 | 68.1% | 647 | 96.9% | 1,537 | 367.5% |
| **General Labour** | 548 | 0 | 0.0% | 548 | 715 | 30.6% | 941 | 71.8% | 1,104 | 101.6% | 2,632 | 380.5% |
| **Other Employees** | 378 | 23 | 6.0% | 401 | 499 | 24.2% | 654 | 62.9% | 759 | 89.0% | 1,820 | 353.4% |
| **Administrative workers** | 170 | 4 | 2.5% | 174 | 223 | 28.0% | 292 | 67.7% | 343 | 97.1% | 815 | 368.3% |
| **Total** | **3,905** | **400** | **10.2%** | **4,305** | **5,103** | **18.5%** | **6,708** | **55.8%** | **7,881** | **83.1%** | **18,744** | **335.4%** |

**Table 35: Stoke and Staffordshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 200 | 35 | 17.6% | 235 | 261 | 11.2% | 341 | 45.4% | 403 | 71.7% | 956 | 307.0% |
| Snr Management SME | 638 | 60 | 9.4% | 697 | 839 | 20.3% | 1,091 | 56.5% | 1,287 | 84.5% | 3,050 | 337.5% |
| Supervisory | 616 | 56 | 9.0% | 671 | 810 | 20.7% | 1,055 | 57.2% | 1,242 | 85.0% | 2,945 | 338.7% |
| Middle / Junior Management | 632 | 58 | 9.2% | 690 | 827 | 19.8% | 1,083 | 57.0% | 1,280 | 85.4% | 3,035 | 339.8% |
| Designer / Developer | 50 | 11 | 22.1% | 61 | 65 | 6.6% | 86 | 40.7% | 102 | 66.1% | 241 | 293.7% |
| Clerical | 320 | 1 | 0.2% | 321 | 419 | 30.5% | 550 | 71.6% | 653 | 103.7% | 1,538 | 379.7% |
| Self Employed | 38 | 4 | 9.5% | 41 | 50 | 20.1% | 64 | 55.7% | 77 | 85.3% | 182 | 339.5% |
| Advisor or Agent | 13 | 2 | 17.0% | 15 | 17 | 11.6% | 22 | 47.2% | 26 | 72.5% | 61 | 311.4% |
| Educator | 0 | 0 | 10.8% | 0 | 0 | 17.1% | 0 | 59.7% | 0 | 91.1% | 0 | 333.5% |
| Specialist or Consultant | 287 | 8 | 2.9% | 295 | 375 | 27.0% | 492 | 66.8% | 582 | 97.3% | 1,379 | 367.8% |
| Editor | 5 | 0 | 3.4% | 5 | 6 | 25.5% | 8 | 64.6% | 9 | 95.4% | 22 | 363.7% |
| Industrial Researchers | 22 | 2 | 7.1% | 24 | 29 | 21.3% | 38 | 60.1% | 45 | 90.2% | 106 | 348.2% |
| Scientist | 8 | 3 | 30.1% | 11 | 11 | 0.9% | 15 | 33.0% | 17 | 55.6% | 40 | 269.0% |
| Maintenance Engineer | 656 | 37 | 5.7% | 693 | 867 | 25.1% | 1,126 | 62.4% | 1,319 | 90.2% | 3,149 | 354.1% |
| Civil Engineer | 21 | 5 | 21.8% | 26 | 28 | 7.3% | 36 | 40.5% | 43 | 66.5% | 102 | 294.5% |
| Production Engineer | 101 | 29 | 28.6% | 130 | 133 | 2.2% | 175 | 34.2% | 204 | 56.7% | 487 | 273.1% |
| Power distribution Engineer | 308 | 87 | 28.4% | 395 | 403 | 2.1% | 527 | 33.2% | 623 | 57.6% | 1,475 | 273.2% |
| Construction Engineer | 45 | 6 | 12.6% | 51 | 59 | 17.3% | 77 | 52.8% | 91 | 80.1% | 216 | 326.9% |
| Sales Exec | 321 | 31 | 9.6% | 352 | 421 | 19.8% | 552 | 56.9% | 647 | 84.1% | 1,529 | 334.9% |
| Marketing Personnel | 309 | 29 | 9.5% | 338 | 405 | 19.9% | 530 | 56.8% | 625 | 85.1% | 1,480 | 338.2% |
| General Semi Skilled Worker | 666 | 12 | 1.8% | 678 | 872 | 28.6% | 1,139 | 68.1% | 1,346 | 98.5% | 3,203 | 372.5% |
| General Labour | 852 | 0 | 0.0% | 852 | 1,118 | 31.2% | 1,465 | 71.8% | 1,721 | 101.9% | 4,096 | 380.5% |
| Other Employees | 949 | 45 | 4.7% | 994 | 1,236 | 24.3% | 1,624 | 63.4% | 1,922 | 93.3% | 4,544 | 357.1% |
| Administrative workers | 328 | 6 | 1.9% | 334 | 428 | 28.0% | 561 | 67.7% | 660 | 97.3% | 1,580 | 372.6% |
| **Total** | **7,383** | **525** | **7.1%** | **7,909** | **9,678** | **22.4%** | **12,656** | **60.0%** | **14,921** | **88.7%** | **35,414** | **347.8%** |

**Table 36: Stoke and Staffordshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 135 | 31 | 22.9% | 166 | 176 | 6.2% | 230 | 39.1% | 273 | 64.6% | 646 | 289.9% |
| Snr Management SME | 203 | 20 | 10.1% | 223 | 267 | 19.6% | 347 | 55.8% | 408 | 82.8% | 976 | 337.9% |
| Supervisory | 211 | 22 | 10.5% | 233 | 276 | 18.1% | 362 | 55.2% | 426 | 82.6% | 1,016 | 335.4% |
| Middle / Junior Management | 214 | 22 | 10.3% | 236 | 280 | 18.7% | 367 | 55.5% | 430 | 82.1% | 1,030 | 336.3% |
| Designer / Developer | 73 | 21 | 28.2% | 94 | 96 | 2.2% | 125 | 33.2% | 148 | 57.7% | 351 | 274.1% |
| Clerical | 111 | 0 | 0.2% | 112 | 145 | 30.2% | 191 | 71.6% | 224 | 100.7% | 533 | 378.2% |
| Self Employed | 53 | 7 | 12.3% | 60 | 70 | 16.3% | 91 | 51.8% | 108 | 80.3% | 256 | 328.4% |
| Advisor or Agent | 38 | 6 | 16.6% | 44 | 49 | 12.4% | 65 | 47.2% | 76 | 72.9% | 180 | 311.2% |
| Educator | 4 | 1 | 30.2% | 5 | 5 | -0.6% | 6 | 32.1% | 7 | 54.3% | 18 | 270.5% |
| Specialist or Consultant | 122 | 4 | 3.5% | 126 | 159 | 25.8% | 210 | 65.8% | 248 | 96.2% | 590 | 366.7% |
| Editor | 10 | 0 | 3.9% | 11 | 13 | 26.4% | 17 | 65.4% | 20 | 94.2% | 49 | 363.4% |
| Industrial Researchers | 60 | 5 | 7.9% | 65 | 79 | 21.2% | 103 | 58.8% | 121 | 86.3% | 290 | 347.1% |
| Scientist | 21 | 7 | 34.4% | 28 | 27 | -2.3% | 35 | 27.2% | 41 | 49.5% | 99 | 258.7% |
| Maintenance Engineer | 267 | 17 | 6.2% | 284 | 349 | 23.0% | 459 | 61.7% | 540 | 90.1% | 1,284 | 352.2% |
| Civil Engineer | 48 | 13 | 27.7% | 61 | 62 | 2.0% | 82 | 34.6% | 97 | 58.3% | 229 | 275.1% |
| Production Engineer | 65 | 23 | 34.8% | 87 | 84 | -3.3% | 110 | 26.6% | 130 | 49.2% | 312 | 257.3% |
| Power distribution Engineer | 130 | 42 | 31.8% | 172 | 171 | -0.8% | 223 | 30.0% | 264 | 53.6% | 626 | 263.9% |
| Construction Engineer | 60 | 11 | 18.7% | 72 | 79 | 9.9% | 104 | 44.4% | 122 | 69.8% | 291 | 305.2% |
| Sales Exec | 126 | 15 | 12.1% | 141 | 165 | 16.8% | 217 | 53.8% | 255 | 80.6% | 605 | 329.0% |
| Marketing Personnel | 110 | 13 | 11.4% | 123 | 144 | 17.0% | 190 | 54.5% | 223 | 81.4% | 527 | 329.5% |
| General Semi Skilled Worker | 277 | 6 | 2.3% | 283 | 362 | 27.7% | 475 | 67.6% | 556 | 96.3% | 1,333 | 370.5% |
| General Labour | 209 | 0 | 0.0% | 209 | 273 | 30.6% | 360 | 71.9% | 423 | 102.2% | 1,008 | 382.0% |
| Other Employees | 334 | 17 | 5.1% | 352 | 438 | 24.6% | 573 | 63.1% | 672 | 91.3% | 1,603 | 355.9% |
| Administrative workers | 137 | 3 | 2.2% | 140 | 179 | 27.7% | 235 | 67.4% | 278 | 97.8% | 662 | 371.5% |
| **Total** | **3,019** | **306** | **10.1%** | **3,325** | **3,947** | **18.7%** | **5,178** | **55.7%** | **6,089** | **83.1%** | **14,514** | **336.5%** |

## 9.4 Stoke and Staffordshire LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Stoke and Staffordshire LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 63 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Stoke and Staffordshire LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Stoke and Staffordshire LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 63: Stoke and Staffordshire LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

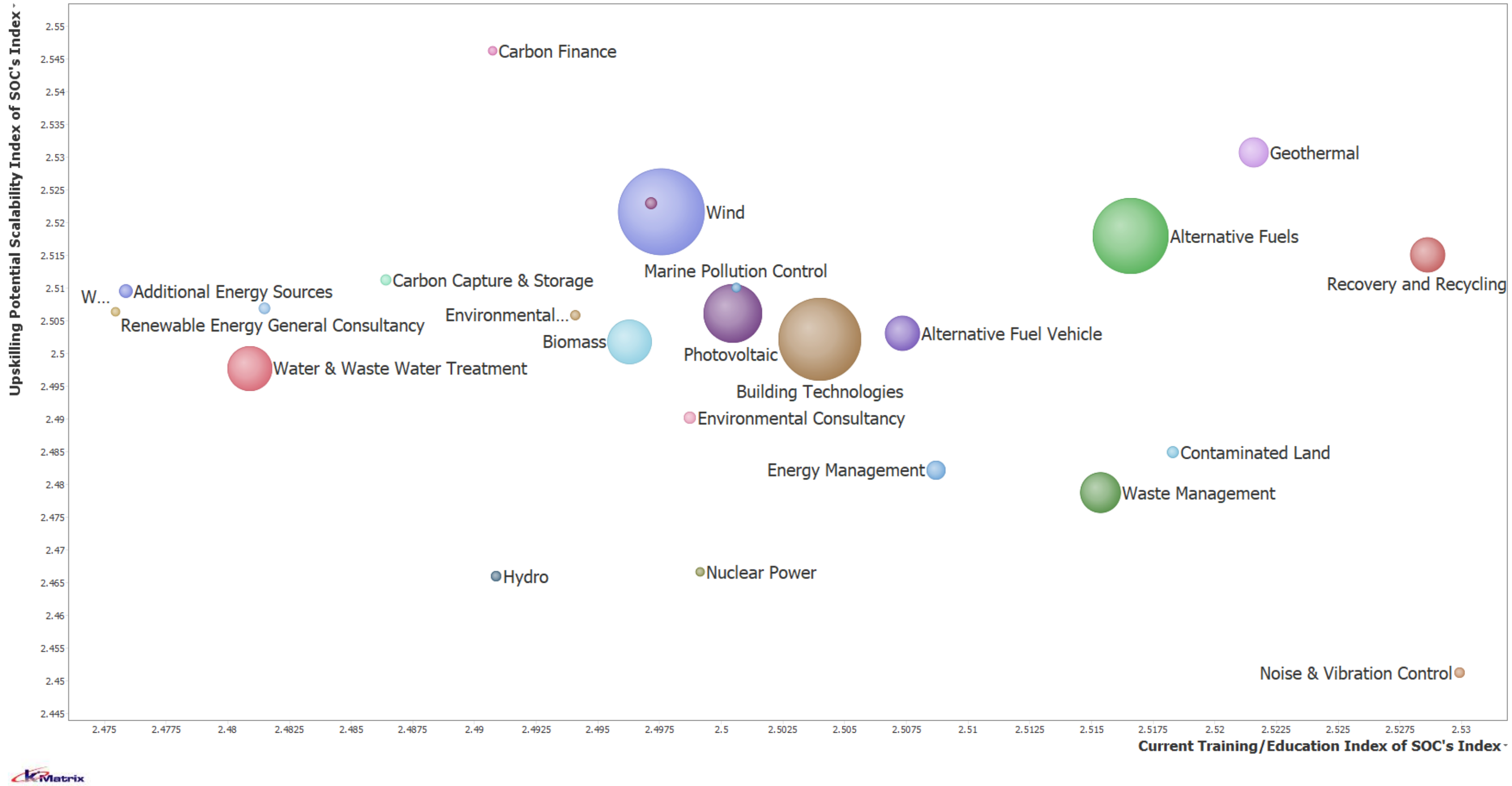



Figure 14 shows that Geothermal holds a strong position, with good current training capacity combined with a strong potential for upskilling. Alternative Fuels and Recovery and Recycling are also strong. Building Technologies holds a middle position. With 30% of UK carbon emissions being emitted from domestic heating, insulating windows and other building technologies have the potential to impact significantly on CO2 reduction.

## 9.5 Stoke and Staffordshire LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Stoke and Staffordshire LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

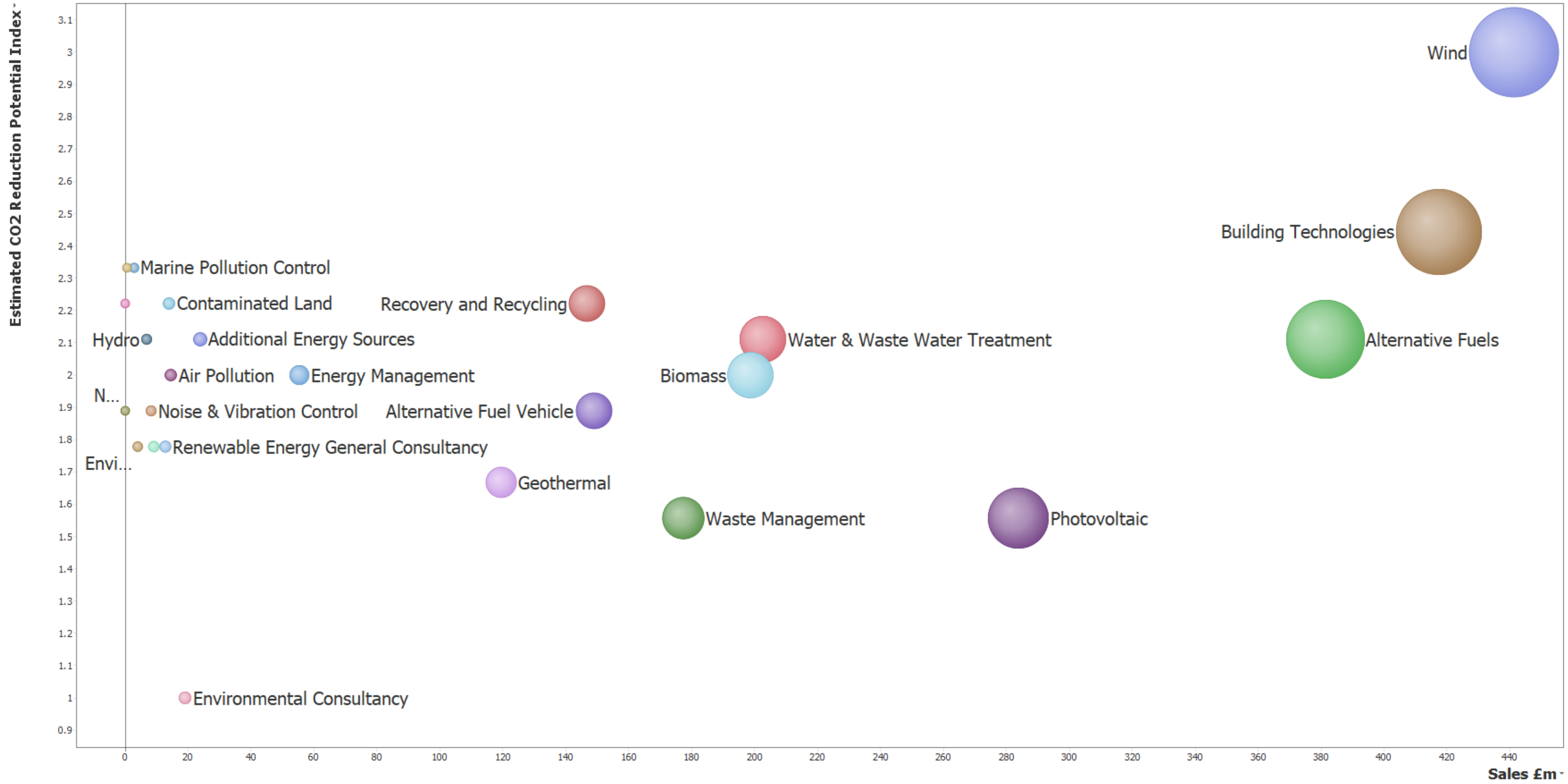
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 64 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, with Building technologies having a higher $CO_2$ reduction potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 64: Stoke and Staffordshire LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# 10. Growth Forecast for Net Zero in 2030 and 2050 for the Worcestershire LEP's Low Carbon and Environmental Goods and Services (LCEGS)

This section of the report includes data from the Worcestershire LEP's Low Carbon Environmental Goods and Services Market Snapshot report, produced as part of this study. Here the relevant data from the evidenced snapshot report is presented to provide concise growth-related aspects of the wider study. Analysis includes:

- Strengths and weaknesses of the region
- Scalability of sub-sectors
- Current employment, skills gaps and forecast needs for net zero 2030 and 2050 scenarios
- Current training capacity and how that relates to the upskilling potential of the workforce
- Estimated potential $CO_2$ reduction of sub-sectors

## 10.1 Worcestershire LEP's LCEGS Strengths and Weaknesses

In this section of the report Worcestershire LEP's LCEGS performance is compared with the UK as a whole. Worcestershire LEP's LCEGS sector was worth £1.5bn in 2019/20 and accounts for 0.7% of the UK total.

Figure 65 shows how the Worcestershire LEP compares with the UK for the 24 Level 2 sub-sectors, with regards to size of market and growth across the three-year study period 2017/18 to 2019/20.

The x-axis represents the LEP/UK sales proportionality factor, which was calculated for each sub-sector by dividing the LEP sales a percentage of the UK, by 0.7%. This proportionality factor demonstrates where the Worcestershire LEP holds a larger or smaller share of the UK market than would be expected, where 1 = 0.7% of the UK market; above 1 = larger than 0.7% share and below 1 = smaller than 0.7% share.

The y-axis represents the growth rate of the Worcestershire LEP's Level 2 sub-sectors compared with the UK. This was calculated by dividing the 3-year growth rate of the LEP by the average UK growth rate. This growth rate factor demonstrates which sub-sectors have a stronger or slower growth rate than the UK, where 1 = the UK growth rate, above 1 = stronger than the UK average growth and below 1 = weaker than UK growth.

The graph is split into four quadrants along 1 on each axis, with sub-sectors in each demonstrating:

- Top right = larger market share than expected and stronger growth than the UK average
- Bottom Right = larger market share than expected, but weaker growth than the UK average
- Top left = smaller market share than expected, but stronger growth than the UK average
- Bottom left = smaller market share than expected and weaker growth than the UK average

The bubbles represent the 24 Level 2 sub-sectors and are sized by the 2019/20 sales £m, illustrating the relative sizes of each sub-sector.

Figure 65 clearly illustrates the strong growth of the two relatively small sub-sectors, Contaminated Land & Reclamation and Hydroelectric. Contaminated Land & Reclamation and Hydroelectric are strengths, because they are close to expected size of market (0.6 for Contaminated Land and 0.5 for Hydro) and are growing significantly stronger than the UK average (11.3% LEP vs 1.0% UK for Contaminated Land and 14.4% vs. 1.8% UK for Hydro)

**Figure 65: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m**

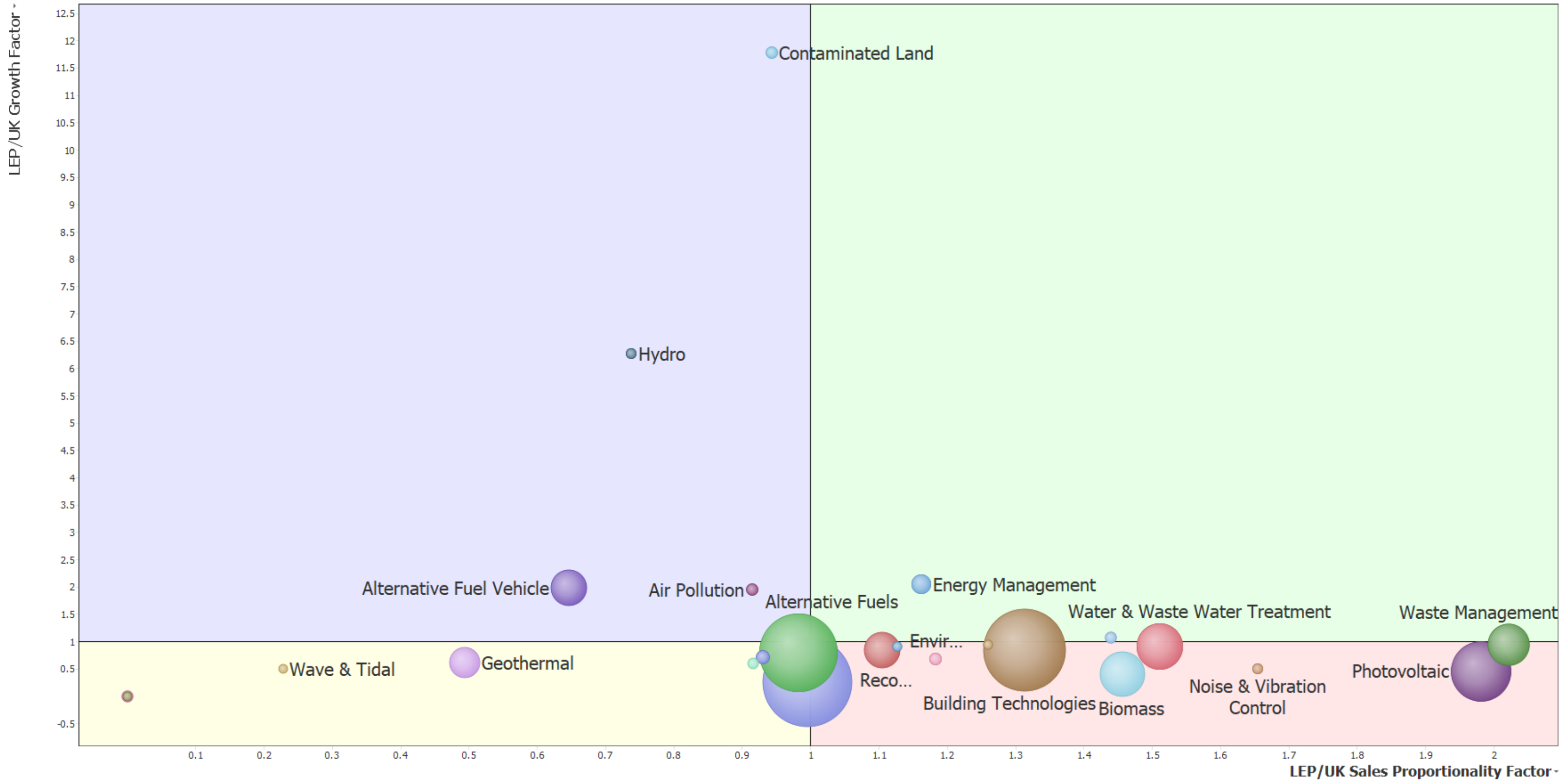
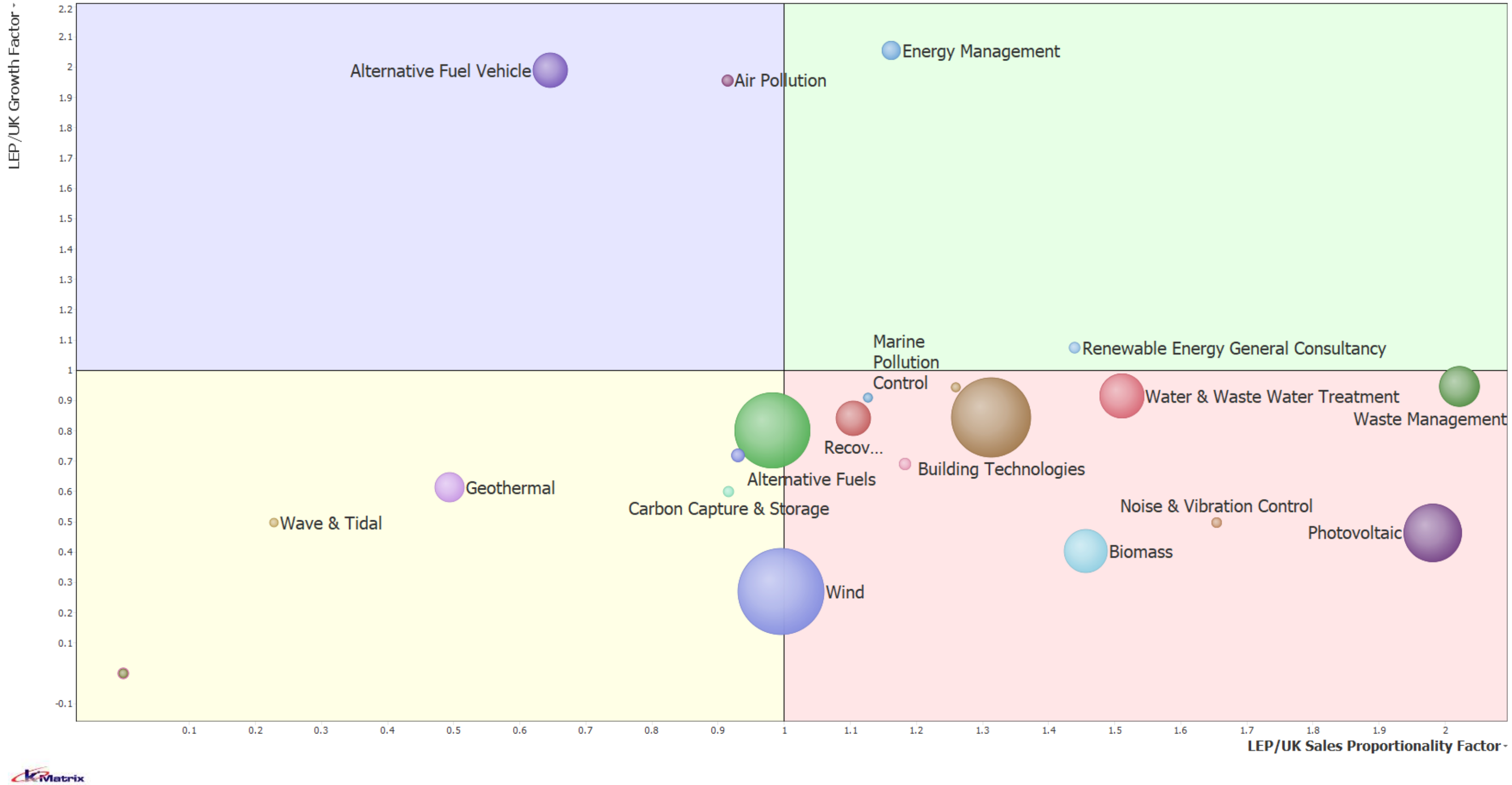


Figure 66 provides the same information as figure 1, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management has the ideal characteristics of above UK average growth and above LEP average size. Those in the lower right hand quadrant (red) hold a larger UK share than the average LCEGS UK market share. The large size of sub-sectors such as Photovoltaic, Building Technologies, Water & Waste Water Treatment, Waste Management and Biomass set these sub-sector apart as being strengths. Those in the lower left (yellow) quadrant such as Geothermal and Wave & tidal can be considered relative weaknesses.

**Figure 66: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m – Excluding Contaminated Land, Nuclear and Hydro**



## 10.2 Scalability of Worcestershire LEP's LCEGS Sub-sectors

In this section we explain the concept of scalability, what influences it, how it can be combined with GVA to explore opportunities and finally why it is different to using only growth.

Scalability refers to the combination of:

- Existence of appropriate available market
- The scalability of technology within a company, area or market
- Affordability of technology
- Availability of appropriate skill sets in the locality
- Historic growth
- Accessibility of networks and chains of supply

All of these factors are taken into consideration when grading scalability.

The scalability of the sector has been calculated by attributing a scalability factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index of scalability.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a scalability factor:
11 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
4 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(11x3) + (15x2) + (4x1)}{30} = 2.23$$

The scalability index has been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot the potential for scalability against the GVA of the sector at Level 2.

Figure 67 shows the GVA plotted against the scalability index of the 24 Level 2 sub-sectors for the Worcestershire LEP, with each bubble sized by the GVA of that sub-sector. The most desirable position would be the top right hand corner of the graph, with high GVA and high Scalability. We can see that the Building Technologies sub-sector has a good combination of size and scalability, while Marine Pollution Control and Renewable Energy General Consultancy may be small in terms of market but are highly scalable. Alternative Fuel Vehicles is a good example of a sub-sector which is has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4 of the Worcestershire LEP Market Snapshot report.

**Figure 67: Worcestershire LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

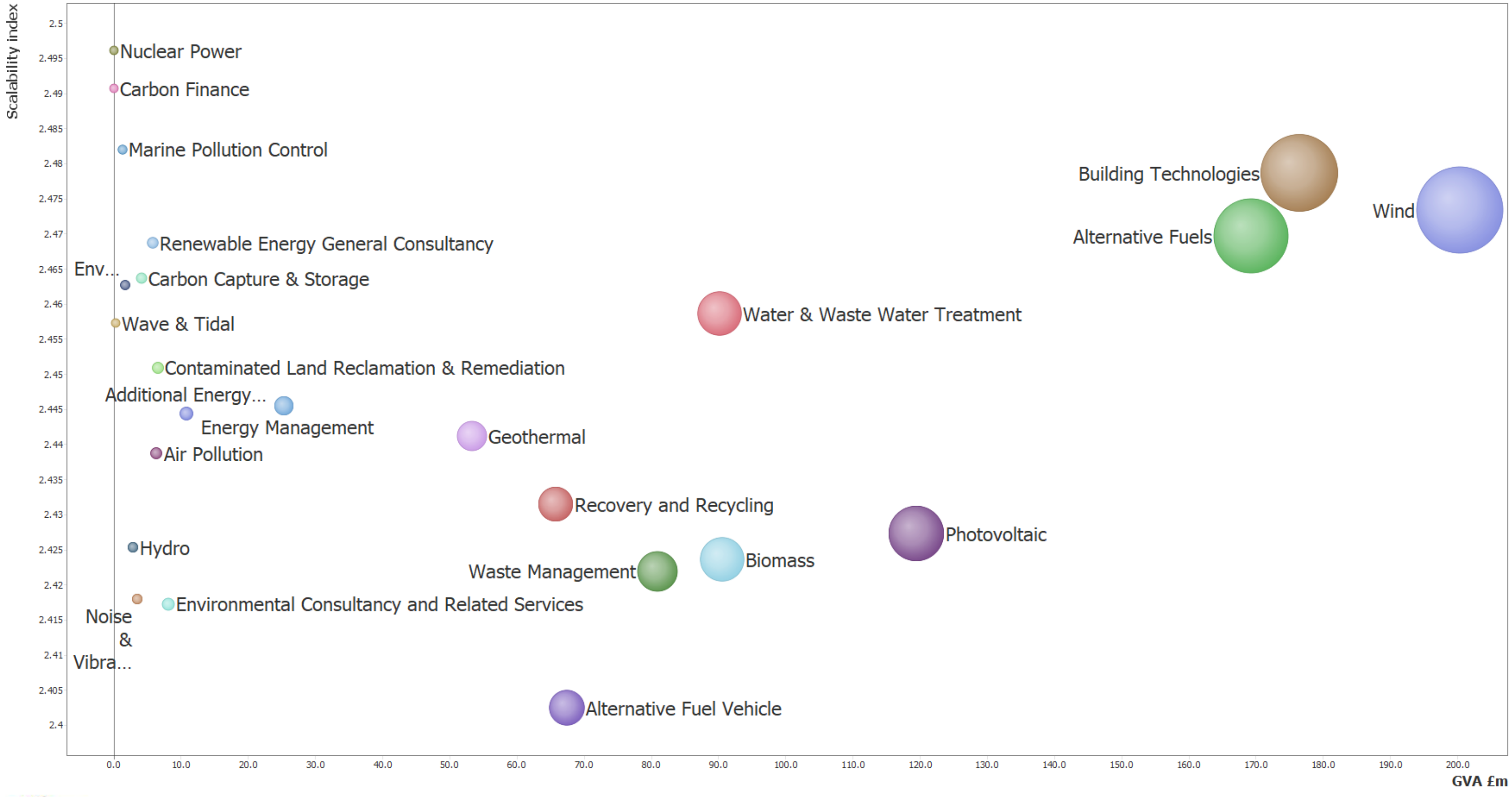
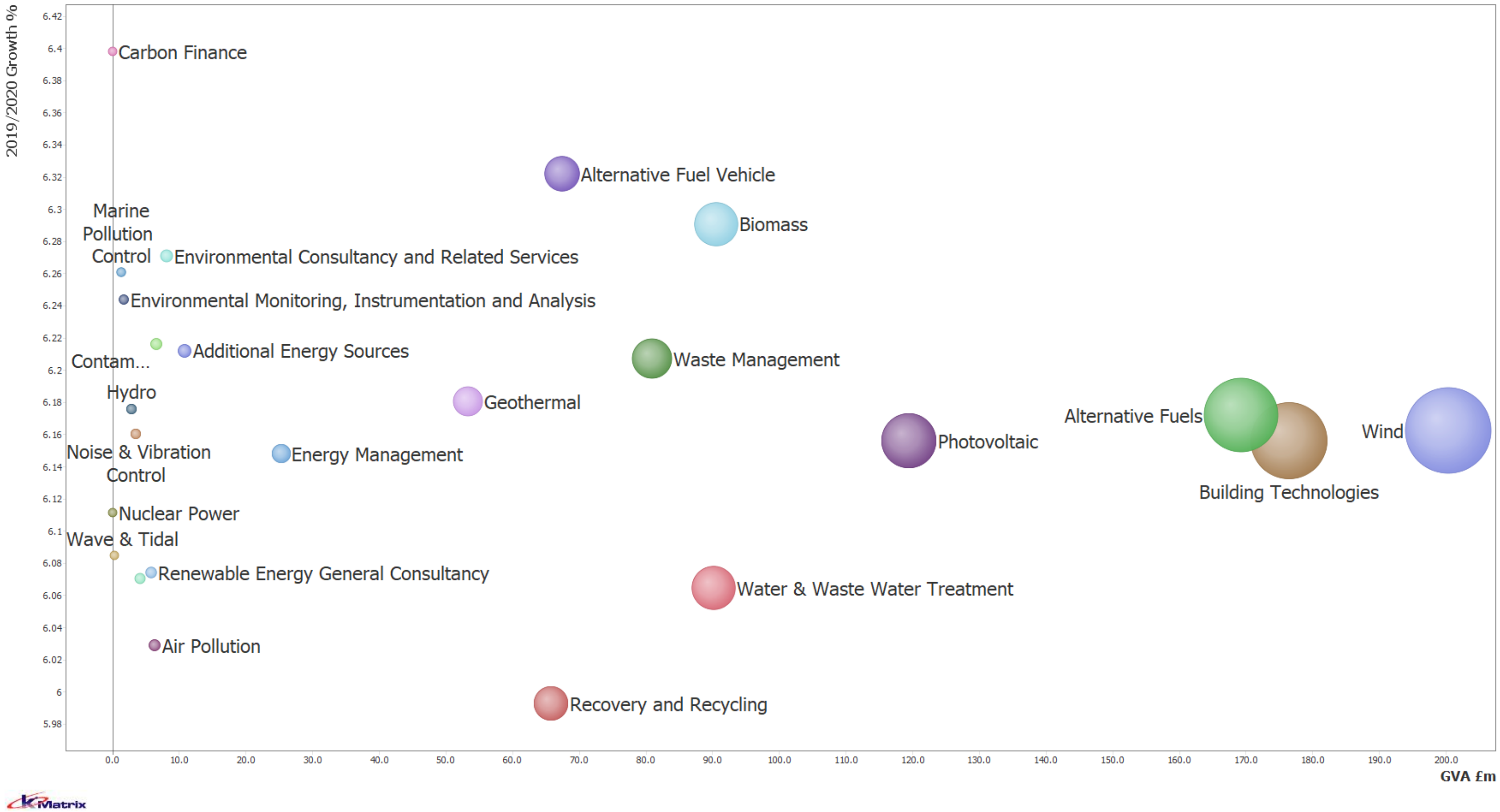


Figure 68 shows the same principle as Figure 67, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind, Building Technologies and Alternative Fuels sub-sectors are large size, but have only medium growth. But in terms of scalability, other factors which can form barriers to scalability, such as restrictions in the supply chain or network of supply or the availability of skills etc which can limit scalability in other LEPs are not present in these sub-sectors in the Worcestershire LEP. For this reason, scalability is a more useful measure than previous growth when looking at opportunities.

**Figure 68: Worcestershire LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA**

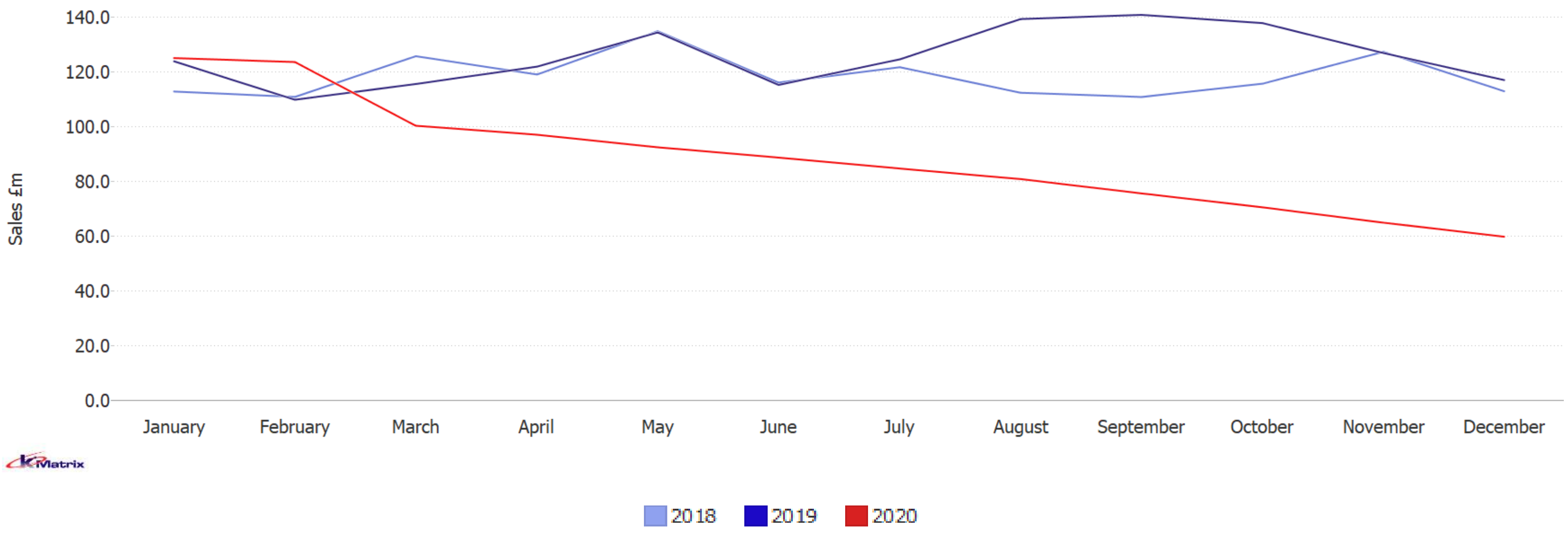


## 10.3 Worcestershire LEP's LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying sills gaps that are present in the sector and sub-sectors and then estimate the skills requirements needed to achieve net zero targets for 2030 and 2050.

It is difficult to untangle the impact of Covid and the impact of Brexit on the LCEGS sector and for the purposes of this study, we have not attempted to do so. A sister document produced during this study, which maps the monthly LCEGS sector for the MEH region and the nine LEPs, to Level 2 sub-sector detail provides the evidence of the significant impact on the sector since March 2020. The impact during 2020 is illustrated in figure 69, which shows the LCEGS sales, by month for 2018, 2019 and 2020 for the Worcestershire LEP. Although there has been support for business during the pandemic, many people and businesses have postponed work. There is a large section of the LCEGS sector that will always function, for example waste will be collected, water purified, electricity produced etc. Unfortunately, much of the activity in the sector can and has been postponed until there is more certainty in the market. It is anticipated that the sector will bounce back as restrictions are lifted, particularly with not just the political will, but more so the social emphasis on net zero.

**Figure 69: Worcestershire LEP LCEGS Sales, by month 2018, 2019 and 2020**

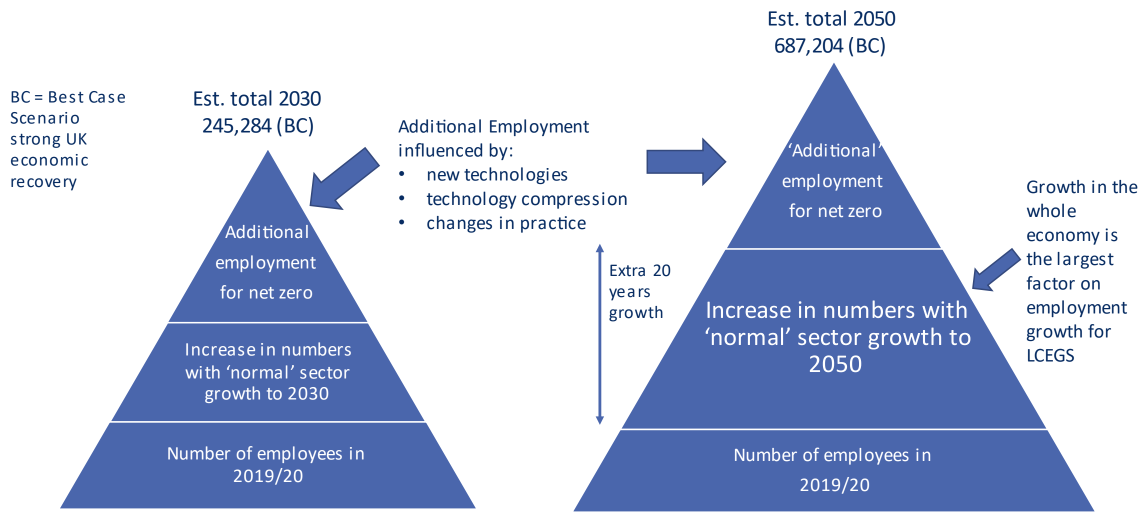


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

| *Timeline for Net Zero* | Implications of Covid-19 and Brexit |
|---|---|
| *Net Zero 2030* | Best-Case Scenario |
| | Worst-Case Scenario |
| *Net Zero 2050* | Best-Case Scenario |
| | Worst-Case Scenario |

Worst-case scenario refers to a situation with the economy being slow to recover, with slow growth and therefore slow recovery of the LCEGS sector. Best-case scenario refers to a situation where the economy 'bounces' back, with strong growth and rapid recovery of the LCEGS sector. In theory, the need to decarbonize will increase with the expansion of the whole economy, therefore the number of employees required to reach net zero will be larger in a best-case scenario than in a worst-case scenario.

The growth forecasts for both 2030 and 2050 begin with the same baseline employment figures for 2019/20, illustrated by the wide base of the triangles in the diagram.



Employment growth for net zero 2030

Employment growth for net zero 2050

On top of that, the normal growth in the sector that will increase between 2020 and 2030 or 2050 sits on top of that base and has the greatest effect on the growth of the employment numbers. The effect of normal sector growth is more significant for the 2050 target than the 2030 target due to an additional 20 years of normal growth. The extent of growth is determined by whether the UK economy as a whole bounces back from 2020 or takes more time.

On top of that growth is the additional employment required to achieve net zero. In this diagram, the additional employment section is sized the same for both targets. This is to emphasise that to reach net zero by 2030 would require ***relatively*** more people with less technology, whereas by 2050, streamlined processes, new technologies, technology compression and changes in practice are likely to lead to a situation requiring ***relatively*** fewer people, but improved technology.

In essence, most of the employment growth is likely to be normal sector growth, resulting in a higher number of employees in 2050 than 2030, regardless of net zero targets. The LCEGS sector will not stand still during decarbonisation, new technologies and processes will be developed, and the wider economy will still grow. Decarbonisation will not be linear, the quicker it is achieved, the more people are likely to be needed, however, the longer it takes, the more opportunity for technology to impact. In reality, the additional employment component of growth is more nuanced and varies between sub-sectors and geographical area.

Table 37 shows the current 2019/20 employment figures and the estimated employment required to achieve net zero by 2030 and 2050, best- and worst-case scenarios for the LCEGS sector for the Worcestershire LEP.

Shortage of employees refers to the employees that are ‘imported’ from outside the area, representing a skills gap and the estimated employment requirement and growth assumes those skills gaps are filled.

Employment Total in this analysis is lower than elsewhere in the study. The total employment count in other areas of the study are triangulated from the output and are the number of people required to produce the output recorded, bearing in mind the skills, technology and nature of the sector and sub-sectors in each location. When this data is then overlaid with the data on the SOC classification, there are some jobs that do not ‘fit’. Not all jobs can be split into the SOC classification system, because there are new sectors whose job descriptions are not an exact match. It is not appropriate to allocate them as “Other Employees” because they are often combinations of the SOC classifications, also in start-ups and micro companies the same person can be performing several roles with different SOCs for a few days at a time. In a sector comprised of predominately micro and SMEs, this lack of transparency has a higher impact than other sectors comprised of fewer, larger companies.

The employment count refers to ‘heads equivalent’, so although for example, there are 2 Educators listed, with a shortage of 1, making a total of 2 in the region, this will equate to over 30 people providing ‘pockets’ of time, to equate to 3 full time jobs.

A limitation of the SOC system is in terms of measuring the number of people involved in installation, distribution, multi-engineering, monitoring or other job descriptions, which could be informative and perhaps future projects could look at breaking the total employment numbers into classifications of job descriptions using the industries own language and tailored to each sub-sector.

The purpose of the data is to indicate skills gaps of those jobs we ***can*** measure within this project, in order to inform training needs etc. As such, we have based the forecasts on those job descriptions we can measure and forecast on those. In order to reach net zero, the estimation of employment requirement not only takes into account the number of people required to achieve it, within the network and chain of supply, but also forecasts change of practice, e.g. improved manufacturing processes.

In summary, the estimation of employment requirements represents the number of employees likely to be employed in 2030 or 2050, having achieved net zero and can be considered the target numbers of employees per SOC. In terms of changes in number of employees, there are three factors in play:

- The usual increase in employment numbers through normal sector growth
- The additional increase in employment numbers needed to achieve net zero
- These two growths are moderated by the introduction of new technologies, technology compression and changes in practice over time

**Table 37: Worcestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data**

| | | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 288 | 63 | 21.9% | 351 | 377 | 7.5% | 493 | 40.4% | 582 | 65.7% | 1,384 | 294.0% |
| **Snr Management SME** | 688 | 70 | 10.1% | 758 | 896 | 18.3% | 1,178 | 55.5% | 1,397 | 84.3% | 3,293 | 334.7% |
| **Supervisory** | 656 | 67 | 10.2% | 723 | 858 | 18.7% | 1,119 | 54.8% | 1,331 | 84.1% | 3,136 | 334.0% |
| **Middle / Junior Management** | 622 | 64 | 10.2% | 686 | 815 | 18.8% | 1,067 | 55.5% | 1,257 | 83.2% | 3,002 | 337.6% |
| **Designer / Developer** | 91 | 23 | 25.6% | 115 | 120 | 4.4% | 157 | 36.9% | 184 | 60.7% | 438 | 282.6% |
| **Clerical** | 326 | 1 | 0.2% | 327 | 426 | 30.3% | 560 | 71.3% | 659 | 101.6% | 1,570 | 380.1% |
| **Self Employed** | 91 | 12 | 13.1% | 103 | 119 | 16.1% | 156 | 51.9% | 183 | 78.6% | 436 | 324.5% |
| **Advisor or Agent** | 68 | 11 | 16.4% | 79 | 88 | 12.0% | 116 | 46.7% | 137 | 73.7% | 326 | 314.4% |
| **Educator** | 2 | 1 | 31.7% | 3 | 3 | -1.6% | 4 | 29.1% | 4 | 52.9% | 10 | 270.3% |
| **Specialist or Consultant** | 352 | 11 | 3.2% | 363 | 461 | 26.9% | 603 | 66.2% | 712 | 96.0% | 1,689 | 365.1% |
| **Editor** | 11 | 0 | 3.8% | 11 | 14 | 25.6% | 18 | 64.5% | 22 | 94.3% | 51 | 360.6% |
| **Industrial Researchers** | 110 | 8 | 7.5% | 118 | 143 | 20.8% | 189 | 60.4% | 223 | 88.4% | 530 | 348.6% |
| **Scientist** | 50 | 17 | 33.5% | 67 | 65 | -2.7% | 87 | 29.3% | 100 | 49.6% | 241 | 260.3% |
| **Maintenance Engineer** | 723 | 45 | 6.2% | 768 | 944 | 22.8% | 1,243 | 61.7% | 1,461 | 90.2% | 3,480 | 352.9% |
| **Civil Engineer** | 56 | 15 | 26.7% | 71 | 73 | 3.0% | 96 | 35.3% | 113 | 59.7% | 270 | 279.6% |
| **Production Engineer** | 140 | 48 | 34.4% | 187 | 182 | -3.0% | 240 | 28.0% | 281 | 50.1% | 673 | 258.8% |
| **Power distribution Engineer** | 351 | 105 | 29.8% | 456 | 459 | 0.7% | 600 | 31.6% | 709 | 55.4% | 1,691 | 270.9% |
| **Construction Engineer** | 82 | 14 | 17.0% | 95 | 107 | 12.1% | 140 | 47.2% | 165 | 72.8% | 393 | 312.2% |
| **Sales Exec** | 367 | 42 | 11.4% | 409 | 480 | 17.4% | 628 | 53.4% | 743 | 81.6% | 1,773 | 333.1% |
| **Marketing Personnel** | 362 | 41 | 11.2% | 403 | 472 | 17.2% | 621 | 54.3% | 731 | 81.6% | 1,737 | 331.5% |
| **General Semi Skilled Worker** | 650 | 13 | 2.1% | 663 | 854 | 28.8% | 1,116 | 68.2% | 1,312 | 97.7% | 3,131 | 372.0% |
| **General Labour** | 850 | 0 | 0.0% | 850 | 1,109 | 30.5% | 1,458 | 71.6% | 1,716 | 102.0% | 4,072 | 379.3% |
| **Other Employees** | 823 | 41 | 4.9% | 863 | 1,078 | 24.9% | 1,416 | 64.1% | 1,659 | 92.1% | 3,949 | 357.5% |
| **Administrative workers** | 375 | 8 | 2.1% | 383 | 490 | 28.1% | 642 | 67.7% | 756 | 97.6% | 1,800 | 370.6% |
| **Total** | **8,134** | **718** | **8.8%** | **8,852** | **10,634** | **20.1%** | **13,947** | **57.6%** | **16,437** | **85.7%** | **39,078** | **341.5%** |

Table 37 shows that the skills gap throughout the sector varies considerably between SOCs within the sector, with significant gap's within large occupational groupings for Production Engineers 34.4% (MEH 35.7%), Power Distribution Engineer 29.8% (MEH 29.8%) and Technicians 21.9% (MEH 22.2%). Conversely, there are low skills gap's within large occupational grouping such as General Semi-skilled Worker 2.1% (MEH 2.1%) Maintenance Engineer 6.2% (MEH 6.3%), Specialist or Consultant 3.2% (MEH 3.3%) and Administrative Workers 2.1% (MEH 2.1%).

Key points at a sector-level:

- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2030 is 20.1% (MEH 20.3%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2030 is 57.6% (MEH 57.9%)
- Estimated growth in employees to reach net zero under worst-case scenario economic growth conditions by 2050 is 85.7% (MEH 86.0%)
- Estimated growth in employees to reach net zero under best-case scenario economic growth conditions by 2050 is 341.5% (MEH 342.4%)

Tables 38, 39 and 40 provide the estimated employment growth for the three Level 1 sub-sectors.

The Level 1 sub-sectors have different shortages of employees, representing skills gaps:
Low Carbon – 10.5% (MEH 10.5%)
Renewable Energy – 7.3% (MEH 7.0%)
Environmental – 10.4% (MEH 10.3%)

Skill gaps between SOC's also varies between Level 1 sub-sectors:
Production Engineers: Low Carbon 43.2% (MEH 47.3%); Renewable Energy 28.3% (MEH 27.9%) and Environmental 34.3% (MEH 34.9%)
Power Distribution Engineers: Low Carbon 32.8% (MEH 33.7%); Renewable Energy 27.7% (MEH 27.1%) and Environmental 31.9% (MEH 32.6%)
Technicians: Low Carbon 27.2% (MEH 27.9%); Renewable Energy 17.4% (MEH 17.3%) and Environmental 22.5% (22.9%)

Shortages also vary between Level 2 sub-sectors, for example the shortage in Production Engineers for Geothermal is 66.8% (MEH 68.8%), but only 13.9% (MEH 13.4%) in Photovoltaic.  Level 2 tables are located in Appendix 4.

Growth requirements are similar at the sub-sector level of analysis, but demonstrates more variation in SOC's between sub-sectors, for example to reach net zero by 2030, best case scenario would require growth in:
Production Engineers of: Low Carbon 20.1% (MEH 17.0%); Renewable Energy 34.1% (MEH 34.5%) and Environmental 28.0% (MEH 27.0%)
Power Distribution Engineers of: Low Carbon 29.1% (MEH 28.1%); Renewable Energy 33.1% (MEH 35.1%) and Environmental 30.2% (MEH 29.3%)
Technicians of: Low Carbon 34.1% (MEH 34.2%); Renewable Energy 46.2% (MEH 45.9%) and Environmental 40.0% (MEH 39.6%)

**Table 38: Worcestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Low Carbon**

| | Low Carbon Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 91 | 25 | 27.2% | 115 | 118 | 2.3% | 154 | 34.1% | 184 | 59.5% | 434 | 277.2% |
| **Snr Management SME** | 164 | 20 | 12.0% | 183 | 213 | 16.1% | 280 | 52.6% | 336 | 83.0% | 782 | 326.4% |
| **Supervisory** | 162 | 20 | 12.3% | 182 | 212 | 16.5% | 275 | 51.4% | 329 | 80.8% | 772 | 324.7% |
| **Middle / Junior Management** | 153 | 19 | 12.1% | 171 | 200 | 16.6% | 262 | 53.2% | 310 | 80.8% | 742 | 333.2% |
| **Designer / Developer** | 23 | 6 | 26.9% | 29 | 30 | 3.8% | 39 | 35.1% | 46 | 58.6% | 110 | 278.7% |
| **Clerical** | 82 | 0 | 0.2% | 82 | 107 | 31.4% | 140 | 70.7% | 163 | 99.5% | 392 | 378.7% |
| **Self Employed** | 33 | 5 | 16.7% | 38 | 43 | 12.6% | 56 | 47.2% | 66 | 72.9% | 156 | 309.1% |
| **Advisor or Agent** | 33 | 5 | 16.3% | 39 | 43 | 12.5% | 57 | 46.9% | 67 | 73.3% | 161 | 315.7% |
| **Educator** | 0 | 0 | 26.1% | 0 | 0 | 3.3% | 0 | 37.6% | 0 | 60.3% | 0 | 282.0% |
| **Specialist or Consultant** | 88 | 3 | 3.6% | 91 | 116 | 26.8% | 152 | 67.2% | 178 | 95.1% | 419 | 359.1% |
| **Editor** | 2 | 0 | 3.9% | 2 | 3 | 23.8% | 4 | 65.5% | 5 | 95.9% | 11 | 356.5% |
| **Industrial Researchers** | 62 | 5 | 7.4% | 67 | 80 | 20.4% | 107 | 59.9% | 125 | 88.1% | 301 | 350.9% |
| **Scientist** | 33 | 11 | 33.6% | 44 | 43 | -3.3% | 57 | 29.7% | 65 | 48.4% | 158 | 258.8% |
| **Maintenance Engineer** | 177 | 14 | 7.9% | 191 | 232 | 21.3% | 305 | 59.5% | 359 | 87.7% | 851 | 344.7% |
| **Civil Engineer** | 13 | 4 | 30.9% | 17 | 17 | -0.2% | 22 | 31.0% | 26 | 55.0% | 62 | 268.3% |
| **Production Engineer** | 41 | 18 | 43.2% | 59 | 53 | -10.0% | 71 | 20.1% | 83 | 39.6% | 199 | 236.9% |
| **Power distribution Engineer** | 74 | 24 | 32.8% | 98 | 97 | -1.0% | 126 | 29.1% | 148 | 51.2% | 353 | 260.8% |
| **Construction Engineer** | 17 | 3 | 20.5% | 21 | 22 | 8.1% | 29 | 42.6% | 34 | 67.9% | 82 | 299.6% |
| **Sales Exec** | 111 | 16 | 14.5% | 127 | 146 | 15.3% | 190 | 49.8% | 224 | 77.1% | 531 | 319.3% |
| **Marketing Personnel** | 110 | 16 | 14.1% | 126 | 143 | 14.2% | 189 | 50.8% | 221 | 76.3% | 526 | 318.9% |
| **General Semi Skilled Worker** | 164 | 4 | 2.5% | 168 | 217 | 29.0% | 281 | 66.8% | 329 | 95.5% | 791 | 370.1% |
| **General Labour** | 285 | 0 | 0.0% | 285 | 370 | 29.8% | 489 | 71.6% | 576 | 102.0% | 1,358 | 376.3% |
| **Other Employees** | 184 | 11 | 6.1% | 195 | 241 | 23.4% | 317 | 62.1% | 370 | 89.7% | 877 | 349.3% |
| **Administrative workers** | 99 | 3 | 2.6% | 102 | 130 | 27.6% | 170 | 67.3% | 199 | 96.0% | 475 | 368.3% |
| **Total** | **2,200** | **232** | **10.5%** | **2,432** | **2,876** | **18.3%** | **3,773** | **55.2%** | **4,444** | **82.7%** | **10,544** | **333.6%** |

**Table 39: Worcestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy**

| | Renewable Energy Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 116 | 20 | 17.4% | 137 | 153 | 12.2% | 200 | 46.2% | 234 | 71.5% | 559 | 309.0% |
| Snr Management SME | 396 | 37 | 9.4% | 434 | 516 | 18.9% | 678 | 56.3% | 803 | 85.1% | 1,900 | 338.2% |
| Supervisory | 366 | 34 | 9.2% | 400 | 477 | 19.4% | 624 | 56.2% | 743 | 86.0% | 1,753 | 338.4% |
| Middle / Junior Management | 349 | 33 | 9.4% | 381 | 457 | 19.9% | 596 | 56.3% | 703 | 84.3% | 1,674 | 339.1% |
| Designer / Developer | 27 | 6 | 21.0% | 33 | 36 | 8.3% | 47 | 41.9% | 55 | 66.6% | 132 | 298.2% |
| Clerical | 181 | 0 | 0.2% | 181 | 235 | 29.7% | 312 | 71.7% | 368 | 102.9% | 873 | 381.1% |
| Self Employed | 24 | 2 | 9.3% | 26 | 31 | 20.7% | 41 | 57.4% | 48 | 84.4% | 114 | 338.9% |
| Advisor or Agent | 9 | 1 | 16.7% | 10 | 11 | 12.6% | 15 | 46.9% | 17 | 73.8% | 41 | 314.7% |
| Educator | 0 | 0 | 11.4% | 0 | 0 | 17.5% | 0 | 47.0% | 0 | 81.2% | 0 | 324.5% |
| Specialist or Consultant | 185 | 5 | 2.9% | 191 | 243 | 27.4% | 315 | 65.5% | 375 | 96.6% | 893 | 368.8% |
| Editor | 3 | 0 | 3.4% | 3 | 3 | 25.4% | 4 | 64.8% | 5 | 94.3% | 13 | 359.8% |
| Industrial Researchers | 13 | 1 | 7.0% | 14 | 17 | 21.6% | 22 | 61.4% | 26 | 90.3% | 61 | 352.6% |
| Scientist | 5 | 1 | 30.2% | 6 | 6 | 0.5% | 8 | 32.0% | 10 | 54.2% | 24 | 270.0% |
| Maintenance Engineer | 386 | 21 | 5.4% | 407 | 502 | 23.2% | 661 | 62.4% | 778 | 91.1% | 1,863 | 357.4% |
| Civil Engineer | 13 | 3 | 21.3% | 16 | 17 | 7.3% | 22 | 40.3% | 26 | 67.7% | 63 | 296.4% |
| Production Engineer | 59 | 17 | 28.3% | 76 | 78 | 2.3% | 102 | 34.1% | 120 | 58.2% | 285 | 274.9% |
| Power distribution Engineer | 195 | 54 | 27.7% | 249 | 253 | 1.9% | 331 | 33.1% | 393 | 58.2% | 938 | 277.5% |
| Construction Engineer | 27 | 3 | 11.9% | 30 | 36 | 17.5% | 47 | 53.9% | 55 | 80.5% | 132 | 333.9% |
| Sales Exec | 183 | 17 | 9.3% | 200 | 238 | 19.2% | 311 | 55.8% | 370 | 85.3% | 887 | 344.1% |
| Marketing Personnel | 185 | 17 | 9.3% | 202 | 240 | 18.9% | 317 | 56.9% | 373 | 84.7% | 890 | 340.9% |
| General Semi Skilled Worker | 341 | 6 | 1.8% | 347 | 448 | 29.1% | 586 | 68.8% | 690 | 98.8% | 1,646 | 374.0% |
| General Labour | 451 | 0 | 0.0% | 451 | 590 | 30.9% | 774 | 71.6% | 912 | 102.2% | 2,168 | 380.9% |
| Other Employees | 482 | 21 | 4.4% | 503 | 632 | 25.6% | 832 | 65.4% | 970 | 92.8% | 2,319 | 361.1% |
| Administrative workers | 193 | 4 | 1.9% | 197 | 253 | 28.4% | 331 | 68.2% | 390 | 98.2% | 929 | 371.4% |
| **Total** | **4,189** | **304** | **7.3%** | **4,493** | **5,474** | **21.8%** | **7,177** | **59.7%** | **8,466** | **88.4%** | **20,158** | **348.6%** |

**Table 40: Worcestershire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental**

| | Environmental | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 81 | 18 | 22.5% | 99 | 106 | 6.9% | 139 | 40.0% | 164 | 64.9% | 390 | 292.8% |
| Snr Management SME | 128 | 13 | 9.8% | 141 | 167 | 19.2% | 221 | 56.9% | 258 | 83.8% | 611 | 334.6% |
| Supervisory | 128 | 13 | 10.5% | 141 | 169 | 19.6% | 219 | 55.4% | 259 | 83.2% | 612 | 333.5% |
| Middle / Junior Management | 121 | 12 | 10.2% | 134 | 158 | 18.6% | 208 | 56.0% | 245 | 83.2% | 586 | 339.1% |
| Designer / Developer | 41 | 11 | 27.9% | 52 | 53 | 2.2% | 70 | 34.7% | 83 | 58.2% | 196 | 274.9% |
| Clerical | 64 | 0 | 0.2% | 64 | 83 | 30.4% | 109 | 71.0% | 128 | 100.6% | 305 | 379.0% |
| Self Employed | 34 | 4 | 12.3% | 39 | 45 | 16.5% | 59 | 52.8% | 70 | 80.3% | 166 | 330.0% |
| Advisor or Agent | 26 | 4 | 16.6% | 30 | 34 | 11.3% | 44 | 46.4% | 52 | 74.3% | 124 | 312.6% |
| Educator | 2 | 1 | 32.0% | 3 | 3 | -1.8% | 3 | 28.7% | 4 | 52.5% | 10 | 269.8% |
| Specialist or Consultant | 79 | 3 | 3.4% | 81 | 103 | 26.0% | 136 | 66.5% | 159 | 95.5% | 377 | 363.1% |
| Editor | 6 | 0 | 4.0% | 6 | 8 | 26.4% | 10 | 64.0% | 12 | 93.7% | 28 | 362.5% |
| Industrial Researchers | 35 | 3 | 7.7% | 38 | 46 | 21.3% | 61 | 60.9% | 71 | 88.3% | 167 | 342.9% |
| Scientist | 12 | 4 | 34.3% | 16 | 16 | -2.4% | 21 | 27.4% | 25 | 51.2% | 59 | 260.2% |
| Maintenance Engineer | 160 | 10 | 6.2% | 170 | 210 | 23.8% | 276 | 62.7% | 324 | 90.8% | 765 | 351.4% |
| Civil Engineer | 30 | 8 | 27.3% | 38 | 39 | 2.7% | 52 | 35.2% | 61 | 58.5% | 145 | 277.6% |
| Production Engineer | 39 | 13 | 34.3% | 52 | 51 | -2.8% | 67 | 28.0% | 79 | 50.1% | 189 | 260.3% |
| Power distribution Engineer | 83 | 26 | 31.9% | 109 | 109 | -0.4% | 143 | 30.2% | 167 | 53.0% | 400 | 265.2% |
| Construction Engineer | 37 | 7 | 19.1% | 44 | 49 | 10.3% | 64 | 44.7% | 75 | 69.8% | 179 | 303.2% |
| Sales Exec | 74 | 9 | 12.0% | 83 | 96 | 16.2% | 127 | 53.0% | 149 | 79.7% | 354 | 327.8% |
| Marketing Personnel | 67 | 8 | 11.7% | 75 | 88 | 17.5% | 115 | 53.1% | 137 | 82.2% | 321 | 327.1% |
| General Semi Skilled Worker | 145 | 3 | 2.2% | 148 | 189 | 27.8% | 249 | 68.4% | 293 | 97.8% | 695 | 369.7% |
| General Labour | 114 | 0 | 0.0% | 114 | 148 | 30.5% | 195 | 71.6% | 229 | 101.5% | 546 | 380.3% |
| Other Employees | 157 | 8 | 5.1% | 165 | 205 | 24.4% | 268 | 62.3% | 319 | 93.0% | 753 | 356.1% |
| Administrative workers | 82 | 2 | 2.2% | 84 | 107 | 28.0% | 140 | 67.2% | 167 | 98.3% | 396 | 371.4% |
| **Total** | **1,745** | **182** | **10.4%** | **1,927** | **2,284** | **18.5%** | **2,997** | **55.5%** | **3,528** | **83.1%** | **8,376** | **334.7%** |

## 10.4 Worcestershire LEP's LCEGS Current Training Capacity and Potential for Upskilling the Workforce

In this section we explore both the current training capacity within the Worcestershire LEP and the potential for upskilling of the workforce.

Current training capacity takes into account the current offerings from local training providers for each sub-sector and is an estimate of the provision of services compared with a national average. It takes into account those training services provided through both the traditional education system and training companies. It does not include training provided in-house by other company employees.

The potential for upskilling the workforce refers to the potential for each sub-sector to either upskill their current workforce and/or upskill workers from other sectors to easily move into the sub-sector being measured. It refers to the rate of upskilling potential compared with the rate of increase in demand, combined with the ability of the skill sets to upgrade in line with the rate of increase in demand and the rate of new technology and methods introduction.

Both the current training capacity and the potential for upskilling the workforce of the sector have been calculated by attributing a factor of 'Low', 'Medium' or 'High' per product or service at the Local Authority level, which has been given the corresponding value of 1 = Low; 2 = Medium and 3 = High. We have then taken the average of those values for the products and services grouped together for the Levels to produce an index for both factors.

For example, there are 30 products and services within the Level 3 sub-sector of Windows, within the Building technologies (Low Carbon) sub-sector. For each Local Authority (using Amber Valley as an example), each product and service was allocated a current training capacity factor:
21 products and services listed as 'High' with a score of 3
9 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1
Calculation:

$$\frac{(21x3) + (9x2) + (0x1)}{30} = 2.7$$

The same process was applied with regards to the potential for upskilling the workforce, with the same example of Amber Valley scoring:
15 products and services listed as 'High' with a score of 3
15 products and services listed as 'Medium' with a score of 2
0 products and services listed a 'Low' with a score of 1

Calculation:

$$\frac{(15x3) + (15x2) + (0x1)}{30} = 2.5$$

Both the current training capacity and upskilling potential indexes have been calculated for the 2769 products and services at Level 5 of the dataset, for each Local Authority, with the average being used to plot graphs comparing the two factors at Level 2 for the MEH region and the nine LEPs. This allows us to examine which sub-sectors have a current workforce which has a potential for upskilling combined with good current training capacity and which sub-sectors could benefit from additional training capacity.

Figure 70 illustrates the current training capacity compared with the upskilling potential of Level 2 sub-sectors of the Worcestershire LEP, with the bubbles sized by sales £m. This graph shows how the Level 2 sub-sectors perform ***relative to each other*** within the Worcestershire LEP. Each LEP has its own graph, with different patterns, for example, Photovoltaics upskilling potential is very high in the Black Country, but low in Greater Lincolnshire and conversely, Water and Waste Water Treatment upskilling potential is higher in Greater Lincolnshire than the Black Country.

**Figure 70: Worcestershire LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector**

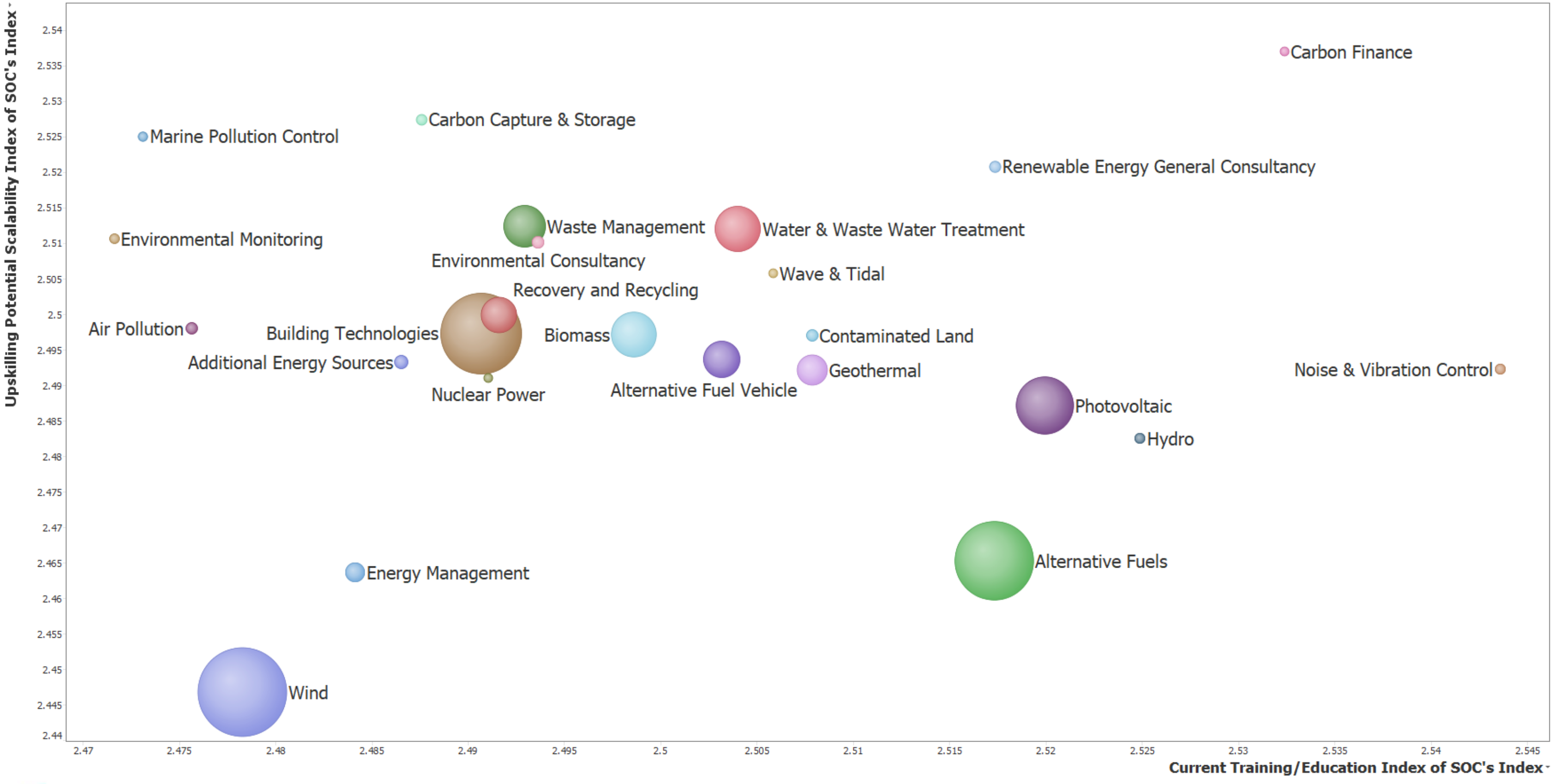



Figure 70 shows that Carbon Finance, Renewable Energy General Consultancy and Noise & Vibration control are outliers. Of the larger sub-sectors, Water & Waste Water Treatment, Waste Management and Photovoltaic holds the strongest positions. Water & Waste Water Treatment, Waste Management have relatively high upskilling potential but less current training capacity, while the opposite is true for Photovoltaic.

## 10.5 Worcestershire LEP's LCEGS Estimated $CO_2$ Reduction Potential of Sub-sectors

In this section we estimate $CO_2$ reduction potential for Level 2 sub-sectors within the Worcestershire LEP. As outlined in the introduction to the Low Carbon Environmental Goods and Services sector of this report, there is a wide range of variance within academia regarding how to accurately measure the $CO_2$ reduction potential of products and services. As such, the potential reduction in $CO_2$ has been estimated, considering the activities within each area, the localization of chains and networks of supply and the technologies in use or being produced.

The $CO_2$ reduction potential has been determined for each Level 2 Sub-sector in each Local Authority, by estimating 'High', 'Medium' and 'Low'.

The 'Low', 'Medium' and 'High' categories have also been allocated a scale of Low = 1, Medium = 2 and High = 3, with the averages across the Local Authorities within each LEP being used to provide a visual representation of levels of $CO_2$ reduction potential within the MEH region and each LEP.

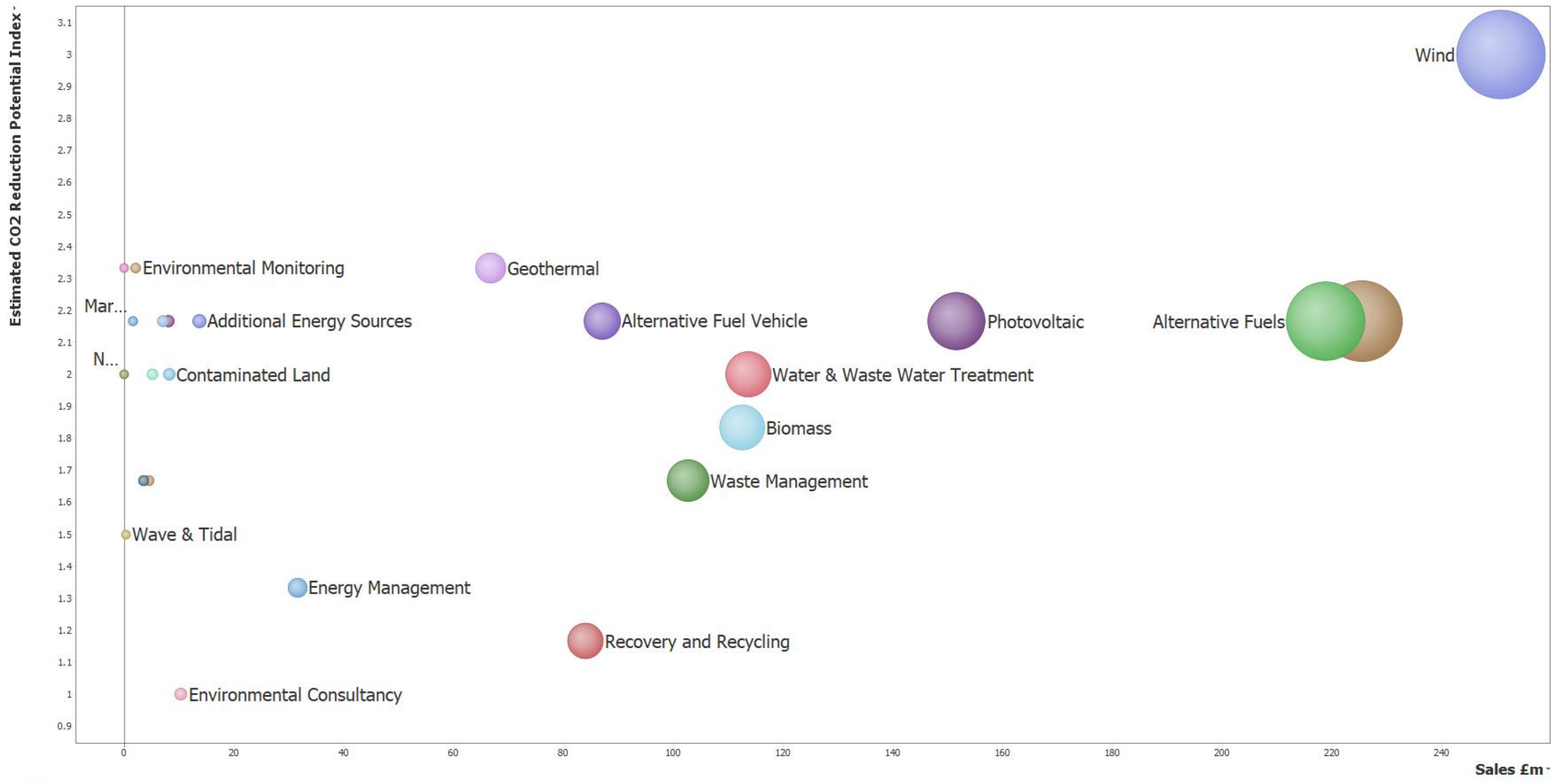
A worked example for Waste Management in the D2N2 LEP, with 17 Local Authorities:
7 Local Authorities estimated as 'High' with a score of 3
4 Local Authorities estimated as 'Medium' with a score of 2
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7x3) + (4x2) + (4x1)}{17} = 1.9$$

Figures 71 shows the estimated $CO_2$ reduction potential against the sales (£m) for each Level 2 sub-sector, with the bubbles sized for sales and provides a visualization of the relative market sizes and $CO_2$ reduction potential of the sub-sectors relative to the other sub-sectors. It illustrates the dominance of the Wind Sub-sector, in terms of both sales and $CO_2$ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and $CO_2$ reduction potential of the Environmental Consultancy Sub-sector. Alternative Fuels and Building Technologies have a strong position in terms of size of market, being equal for Estimated CO2 Reduction Potential. Photovoltaic is also in a favourable position, with high $CO_2$ reduction potential and reasonably large market.

**Figure 71: Worcestershire LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector**



# Appendix 1

## LCEGS Sector Definition

The **Low Carbon and Environmental Goods and Services** (LCEGS) is divided into three Level 1 sub-sectors - Environmental, Renewable Energy and Low Carbon. These are in turn divided into 24 Level 2 sub-sectors:

- The Environmental sub-sector is made up of the following: Air Pollution Control, Contaminated Land Reclamation & Remediation, Environmental Consultancy, Environmental Monitoring, Marine Pollution Control, Noise & Vibration Control, Recovery & Recycling, Waste Management and Water Supply & Waste Water Treatment.

- The Renewable Energy sub-sector is made up of the following: Biomass, Geothermal, Hydro, Photovoltaic, Renewable Energy Consultancy, Wave & Tidal and Wind.

- The Low Carbon sub-sector is made up of the following: Additional Energy Sources, Alternative Fuels & Vehicles, Alternative Fuels, Building Technologies, Carbon Capture & Storage, Carbon Finance, Energy Management and Nuclear Power.

**Environmental** activities include 9 Level 2 sub-sectors, divided into 47 Level 3 activity groupings:

- Air Pollution includes indoor and industrial air quality and emissions control.
- Contaminated Land Reclamation/Remediation includes Decommissioning of Nuclear Sites.
- Environmental Consulting includes consulting, training & other services.
- Environmental Monitoring includes analysis, monitoring and instrumentation.
- Marine Pollution and Noise & Vibration Control both include abatement, consulting and R&D.
- Recovery & Recycling includes Waste Collection and various recycling processes
- Waste Management includes Waste Treatment Facilities & Equipment, consulting and R&D
- Water Supply and Waste Water Treatment includes treatment, distribution, consulting and R&D.

**Low Carbon** includes 8 Level 2 sub-sectors, divided into 49 Level 3 activity groupings:

- Carbon Finance includes Credits Finance, Fund Management, Trading and Research
- Carbon Capture & Storage includes Capture, Pipeline, Storage and Engineering.
- Energy Management includes Lighting, Heating & Ventilation and Engineering.
- Nuclear Power includes Construction, Commissioning, Operations, Engineering and Testing Services.
- Additional Energy Sources include Energy Storage Research, Fuel Cells & Hydrogen.
- Alternative Fuels & Vehicles includes main stream and other vehicle fuels.
- Alternative Fuels includes Main Stream and other Bio Fuels, Batteries and Other Fuels.
- Building Technologies includes Doors, Windows, Monitoring & Control Systems and Insulation/Heat Retention Materials.

**Renewable Energy** includes 7 Level 2 sub-sectors, divided into 30 Level 3 activity groupings:

- Wind includes Large Turbines, Small Turbines and Wind Farm Systems.
- Wave & Tidal includes Ebb & Flood, Pumps & Equipment, Turbine & Generation etc.
- Photovoltaic includes Systems & Equipment, Cells and Chemicals.
- Hydro includes Turbines, Pumps, Electricity Supply and Dams.
- Geothermal includes Whole Systems, Specialist Equipment, Consulting and R&D.
- Biomass includes Energy, Furnace, Boilers and Related Systems.
- Renewable Energy consulting includes specialist consulting and legal advice.

## Further detail on the Level 2 sub-sectors are provided below in their Level 1 groupings:

### Environmental

**Air Pollution Control** sub-sector includes a wide range of manufacturing, operations, consulting and engineering functions that relate to improving and maintaining air quality. It includes:

- Emission Control sensing and monitoring systems and technologies.
- Indoor Air Quality Control (domestic and industrial) through ventilation, cooling and purification systems.
- Dust & Particulate control through installed technologies like filters, towers, scrubbers, cyclones and eliminators.
- Process Engineering for odour control and other cleaner technologies.
- Industrial Emission Control technologies and equipment (manufacture, installation, operations and maintenance).
- Emission Control through manufacture, installation and operation of sampling, control and evaluation systems.

**Contaminated Land Reclamation and Remediation** sub-sector includes all activities that bring land back into agricultural, industrial, community or commercial use. This includes longer term activities like the decommissioning of nuclear sites.

Remediation and land reclamation include land forming, bunds, geotextiles, storage & containment, oil interceptors, drainage systems, monitoring systems, proprietary treatment processes, sampling & analysis, site investigation, specialist cleaning services, cleaner technology R&D, surface & ground water services, organic waste composting and other services.

Decommissioning includes equipment, consulting, project management, safety critical assessment, pollution control, enviro risk analysis & impact assessment, recycling & compaction, waste collection & containment, waste water treatment, site assessment, excavation, sampling & analysis and monitoring.

**Environmental Consulting and Services** sub-sector includes consulting, training and management services that are specific to the environmental sector. It includes:

- Specialist consulting - habitat assessment, regulations, compliance and management systems, audits and impact assessment, eco design, eco-investment, climate change modelling, insurance and bio-diversity advice & assessment.

- Manpower and executive recruitment, temporary and permanent recruitment, contracted and interim management services.
- Management services - general consulting, financial, IT, software and marketing services.
- Training and education - publications, online publications, teaching aids, newsletters and courses for waste management, waste water treatment etc.

**Environmental Monitoring, Instrumentation and Analysis** sub-sector includes activities that measure water, soil and air quality and that support wider pollution control activities in other land, water, marine or air- based environmental sub-sectors. It includes:

- Environmental monitoring- development of cleaner monitoring processes and technologies, vehicle testing, oil spill detection, food testing, nitrate levels, meteorological, water/soil/air quality testing and monitoring.
- Instrumentation equipment & control manufacture, supply, maintenance and development of instrumentation, laboratory equipment and software for environmental/ air/ water/ land/ marine analysis.
- Environmental analysis - laboratory testing, data logging & recording, quality reporting, collection & collation of samples, auto sampling systems, in-field measurement and reporting and R&D in water, soil and emissions analysis.

**Marine Pollution Control** sub-sector includes responses to pollution hazards at sea and also discharged from land-based sources. It includes the following products and services for deep sea, coastal waters and inland waterways. It includes:

- Marine pollution abatement - manufacture, supply and maintenance of booms, chemical discharge treatment equipment, solid & liquid waste/radioactive containment and treatment equipment and monitoring services, spillage clean-up services, shoreline & shallow water remediation and maintenance services and collection & containment services.
- R&D - cleaner processes and technologies, monitoring systems, oil absorbents, boom and containment systems, water containment and treatment technologies.
- Specialist consulting and training - chemical discharge prevention, education, policy & planning, training, publications, sewerage discharge management, radioactive waste management and solid and liquid waste management.

**Noise & Vibration Control** sub-sector includes all activities that prevent or control noise and vibration pollution. It includes:

- Noise abatement - manufacture, supply, installation and maintenance of barriers, acoustic management equipment, noise insulation, noise & vibration control and monitoring equipment, acoustic management equipment, noise insulation materials, monitoring services, large plant services and surface modifications.
- R&D - noise attenuation, noise sensing, vibration sensing, vibration control and noise & vibration abatement equipment and cleaner technologies and process by development.
- Consulting and training - consulting, publications, training and noise monitoring services.

**Recovery & Recycling** sub-sector includes all activities relating to the collection and processing of domestic and industrial waste products. It includes:

- Waste collection - manufacture, supply, installation and operation of equipment and services for collection of household, industrial and hazardous waste, treatment of waste prior to landfill and supply of pre-treated recyclates.

- Engineering & equipment - engineering services and process control for the complete range of recycling stock
- Consulting & training - collection and processing consultancy and training, publishing, legal & insurance advice.
- R&D - metals recovery, pyrolysis, bio-based systems, new recyclable materials, new collection & processing technologies.
- Recycling stock - recovery, recycling, processing, sorting, supply and packaging of rubber, plastics, paper, oil, electrical, electronics, glass, composting, construction & demolition, automotive, wood and textiles stocks.

**Waste Management** sub-sector includes the treatment/management of domestic and industrial waste that cannot otherwise be recycled. It includes:

- Construction & operation of waste treatment facilities for anaerobic digestion, composting, incineration, landfill, waste to energy conversion and the supporting engineering services.
- Equipment for Waste treatment, manufacture, supply, installation and maintenance of bio filters, bio reactors, collection equipment, grease traps, oil interceptors, materials processing equipment, monitoring & control equipment and nightsoil & landfill leachate treatment.
- R&D - incineration technologies, energy from waste systems, cleaner processing & treatment technologies, disposal of hazardous waste and other materials processing technologies.
- Consultancy and training - books, periodicals & publications, specialist consulting and training for asbestos, hazardous materials and other waste management systems.

**Water Supply and Waste Water Treatment** sub-sector includes activities relating to the treatment of pollutants in the water supply. It includes:

- Water treatment and distribution, manufacture, supply, installation and maintenance of systems for activated sludge, aerobic & anaerobic treatment, biological odour & corrosion control, demand management & leakage reduction, effluent treatment, filters, microbial treatment, screens, sequencing batch reactors, water disinfection and storm/grey water treatment.
- Engineering - field engineering, pipe & valve maintenance, fitting & construction, fabrication & welding and engineering design.
- R&D - water purification, water management, black/grey water treatment, biocides, bio reactors and aerobic/anaerobic treatment technologies.
- Consulting and training - engineering and water management training, publishing and specialist consulting for water systems treatment, management and engineering.

## Renewable Energy

**Biomass Energy** sub-sector includes all activities that convert biomass into energy but excludes biomass materials (see Alternative Fuels). It includes:

- Biomass furnace systems - manufacture, supply, consulting, design, installation, engineering and other services for domestic, industrial and community applications.
- Biomass energy systems - manufacture, supply, consulting, design, installation, engineering and other services for domestic, industrial and community applications.
- Manufacture of biomass boilers and systems including boilers, cogeneration, heat exchange and packaged power systems for domestic, industrial and community applications.

- Biomass boilers and related systems including supply, consulting, design, engineering, installation and other services for boilers, cogeneration, heat exchange and packaged power systems for domestic, industrial and community applications.
- Technical and operational consulting.

**Geothermal Energy** sub-sector includes all activities relating to the extraction and use of heat generated from the earth. It includes:

- Manufacture and supply of specialist thermally enhanced equipment - grout, heat pumps, pipes, flow control valves, drilling equipment, installation rigs and ancillary equipment.
- Whole systems manufacture and supply for industrial, residential and community geothermal energy applications.
- Component design and research - design services, component research and component recycling.
- Consulting & related services - architectural, construction, systems design, consulting, engineering, installation and project development services.

**Hydroelectric Energy** sub-sector includes activities that help to extract energy from river and other water sources held in dams (as opposed to wave or tidal energy) that is used to drive turbines and generators. Large scale civil engineering/construction activities associated with dam building have not been included in this analysis. It includes:

- Turbines - manufacture, supply, installation and maintenance of turbine generators, control systems, spares and structural supports and fittings.
- Dams & structures - manufacture, supply, installation and maintenance of dam operational systems, control systems, maintenance services and sluice gates and actuators.
- Pumping & lubrication - manufacture, supply, installation and maintenance of pumps, spares, storage and lubrication systems and spares.
- Electricity supply - manufacture, supply, installation and maintenance of power factor, power distribution and grid connections and supporting structures.

**Nuclear Power** sub-sector includes all activities that relate to the generation of nuclear power, excluding decommissioning of nuclear sites. It includes:

- Nuclear safety engineering services, regulatory compliance, reactor management, fail-to-safety engineering.
- Nuclear power plant operations management, engineering and PR.
- Nuclear cooling equipment - manufacture, installation and maintenance.
- Construction of plant and equipment - site development, reactor and buildings and power plant/equipment construction.
- Commissioning engineering services - cooling & thermal control, engineering maintenance, instrumentation, power distribution, reactor & plant commissioning.
- Sampling & testing services - thermal control testing, remote monitoring, back-up plant monitoring and effluent discharge testing.
- Nuclear scientific services - research, laboratory testing and fuel management.

**Photovoltaic Energy** sub-sector includes all activities that help to convert solar radiation into useable energy. It includes:

- Chemicals - production and supply of solar chemicals and solar pond salt.

- Systems & equipment - manufacture, supply, installation and maintenance of active and batch systems, clerestory windows, light shelves and tubes, solar box cookers, solar combi-systems and solar lighting design.
- R&D - solar power and solar car research.
- Photovoltaic cells - manufacture, supply, installation and maintenance of photovoltaic modules, mounting systems, ancillary components, cells and cell materials.
- Other equipment & chemicals - manufacture, supply, installation and maintenance of glass houses, convection towers, heliostats, parabolic collectors, turbines, trough collectors, towers and solar trackers.

**Renewable Energy Consulting** sub-sector includes consulting and legal services specific to Renewables i.e. not included in general or specific environmental consulting. It includes:

- Legal services - wind farm location and other renewable energies.
- Consulting - turbines, solar and photovoltaic applications, public sector and corporate Renewables policies, nuclear energy, insulation technologies and alternative fuel technologies.

**Wave & Tidal Energy** sub-sector includes all activities that help to convert the energy from waves and tides into usable power (also known as marine renewable energy). It includes:

- Turbines & generators - the manufacture, supply, installation and maintenance of tidal turbines, structural supports and fittings, spares and turbine control systems.
- Pumps & equipment - the manufacture, supply, installation and maintenance of pumps and pump spares.
- Two basin schemes - provision of structural engineering and field maintenance services.
- Ebb & flow systems - manufacture, supply, installation and maintenance of ebb and flood generation systems.
- Assessment & Measurement - waves, water levels, turbidity, tidal energy, sediment, salinity pollutants, fish stocks monitoring and local/ global environmental impact assessment.
- Other general services - financial planning, operational and maintenance services.

**Wind Energy** sub-sector includes all activities that convert wind power into usable energy. This includes wind farm systems, large and small wind turbines. The sub-sector is divided by size of turbine rather than location (onshore and offshore) because it is easier to differentiate and map supply chain activities in this way. It includes:

- Wind farm systems - manufacture, supply, installation, operation and maintenance of integration, power plant, power control, grid entry equipment and systems and electrical and mechanical componentry.
- Small wind turbines - manufacture, supply, installation, operation and maintenance of small turbine systems (blades, towers, fixing structures, cowlings, enclosures, gear boxes and drive trains), componentry and research.
- Large Wind Turbines - manufacture, supply, installation, operation and maintenance of large turbine systems (blades, towers, fixing structures, cowlings, enclosures, gear boxes and drive trains), componentry and research.

## Low Carbon

**Additional Energy Sources** sub-sector groups together R&D, Design and Prototyping activities relating to a range of new Low Carbon energy sources.

These energy sources include: Fuel Cells, Hydraulic Accumulators, Hydrogen, Molten Salt, Thermal Mass, Compressed Air, Superconducting Magnets and more general energy storage research.

This is a small sub-sector (in value and impact) because only energy sources that have a current economic footprint (i.e. trading) are included. This excludes a number of promising energy sources that are still in development and for which economic evidence is not yet available.

**Alternative Fuel and Vehicles** sub-sector includes Low Carbon Fuel and technology activities that relate to (predominantly) automotive transport. It is divided into Alternative Fuels (main stream) and Other Fuels and Vehicles. This sub-sector does not include bio diesel (see Alternative Fuels). It includes:

- Alternative Fuels includes the production, supply and distribution of Natural Gas (Compressed or Liquefied), Synthetic Fuel and Auto Gas (LPG, LP Gas or Propane).
- Other Fuels and Vehicles includes vehicle technologies and fuel sources that are still at an early stage.
- Research, Design, Development and Prototyping activities are included for: Hydrogen fuel cells and hydrogen internal combustion, Electric, Hybrid Electric, Steam powered, Organic waste fuel, Wood gas, Solar powered and Air, Spring & Wind powered vehicles.

**Alternative Fuels** sub-sector includes a wide range of Low(er) carbon fuel sources that are not included under Renewable Energy. It includes the manufacture, production, supply and distribution of:

- Batteries - chemicals, chargers, controllers, cables, connectors, containers, suppliers and testing equipment.
- Bio fuels for Vehicles - bio diesel, butanol, ethanol and vegetable oils.
- Mainstream Bio fuel applications (non-transport) - bio diesel, butanol and ethanol.
- Other Bio fuels - biomass, methane, peanut oil, vegetable oil, wood and woodgas.
- Other fuels - Hydrogen.

**Building Technologies** sub-sector includes main stream building materials and systems that contribute to reduced energy use and to lowering the carbon footprint of buildings. It includes:

- Windows - the manufacture, supply, distribution, installation and development of double glazed, electro chromatic, insulated alloy, honeycomb and triple glazed units.
- Doors - the manufacture, supply, distribution, installation and development of insulated alloy and plastic doors.
- Insulation and heat retention materials - the manufacture, supply, distribution, installation and development of insulation materials, heat retention surfaces & ceramics, electronic control systems and controlled venting and ducting systems.
- Monitoring and control systems - the manufacture, supply, distribution, installation and development of energy and distributed energy control, monitoring, management and analysis systems.

**Carbon Capture & Storage** sub-sector includes activities that store carbon emissions - from locations like power plants and prevent them entering the atmosphere. It includes manufacturing, supply, distribution, installation, maintenance, development and design of:

- Pre combustion capture systems
- Post combustion capture systems
- Oxy-Fuel combustion systems
- Pipeline systems and services
- Ship storage and discharge systems
- Ocean storage equipment and services
- Mineral storage equipment and services
- Geological storage equipment and services
- Engineering, project management and consulting services.

**Carbon Finance** sub-sector includes investment activities and financial instruments for emission reduction projects and carbon trading. This includes:

- Carbon credits finance and fund management - land, project or general trading services from finance houses and investment funds.
- Carbon credits trading - development and supply of trading systems, land/project/general trading houses and transactions.
- Carbon market intelligence - carbon markets analysis & reporting and carbon trading by forecasting and reporting from journals, online, data providers or other publishing sources.
- Projects and verification - data collection, verification, legal, project development, capacity development and carbon declaration services.
- Press and journalism - financial press and periodicals, other journals, data providers and online services.

**Energy Management** sub-sector includes energy saving and power management activities for industrial and domestic use. It includes:

- R&D into high efficiency lighting, heating & ventilation, power, lighting, equipment & pumps and advance management systems.
- Gas Supply - monitoring, meterage, leak detection & maintenance, gas supply control and manufacture of high efficiency consumer equipment and devices.
- Lighting - manufacture, supply, distribution and installation of energy saving light bulbs & tubes, lighting and control systems.
- Heating & Ventilation - manufacture, supply, distribution and installation of energy saving equipment and systems.
- Electrical - manufacture, supply and installation of energy saving power control, building control, power consumption control & monitoring systems.
- Consulting and other services - advice & consultancy, publication, training and design of management systems.

# Appendix 2

# The kMatrix Methodology

## 2.1 Introduction

This sector (until 2015) has not been well documented by government statistics, so the methodology works beyond standard industrial and market classifications and looks for multiple sources of industrial-based evidence to quantify market values. kMatrix is unique in how it identifies, assembles, evaluates, monitors and develops rules for the use of those sources to quantify 'difficult-to-measure' markets.

Market activities are only included when there are multiple data sources. These sources are screened to remove duplicate references to any single source and then shortlisted by removing outliers and unreliable sources. This shortlist is then screened again until some consistency in value is achieved.

Market values created in this way are then "reality tested" by comparing these values within and across sectors, against known national/regional industrial specialism, across nations, against known trade flows and recognised industry benchmarks.

This methodology is quantitative and data intensive. Its uniqueness resides in the ability to manage and select reliable sources that are specific to each market activity. The data sources are global in nature and derive from government, private sector, institutional, industrial, trade, advertising, HR, financial, investor, academic and other (unpublished) sources. Up to 900 sources are used to compile the national LCEGS data set.

Sources are carefully managed. kMatrix measure and rate their sources' accuracy and reliability over time and exclude sources that are outdated or without a measurable track record. They use no less than seven qualified sources showing some consistency in results for deriving any values that they print. They create a mean value from these selected values and then assign a confidence level (generally of about 85%) based upon the spread of selected values around the mean

In contrast to most research or consulting reports kMatrix do not identify, copy and then acknowledge single data sources for specific tables or analytical comments. This is impossible for them to do because they multi-source every aspect of their data and then "transform" it into a new value. This makes single source attribution meaningless.

## 2.2 Measures

Throughout this dataset the focus is on a small number of key measures. To summarise, these are:

- **Sales** – This is the estimate (in £m) of economic activity by identified companies in a defined region within the supply/value chain for market products and services. The estimate is based upon where sales activity takes place rather than where it is reported.

- **Companies** – This is a measure of the total number of companies in a defined region that match, or fit within, the market activity headings.

- **Employment** – This is a measure of the estimated employment numbers across all aspects of the supply/value chain. National, regional and other economic data sources have been used to estimate current employment levels for each area of market activity.

- **Growth** – This is a multi-year measure that includes historical AND forecast growth. The growth measure is derived from live, rapidly changing and multi-sourced data links and is specifically based upon growth in Sales. Growth is generally a measure of increased market opportunity and can be used for trend analysis, comparison across different markets or as a moving indicator of market confidence (growth time series).

- **Exports** – This is a measure of products and services sold overseas and is calculated using in-country/out-of-country data and additional data from the logistics and freight forwarding industry.

## 2.3 kMatrix's Methodology

The methodology for sector analysis is definition and source-driven. The definition determines WHAT gets measured and the source model determines HOW it gets measured.

All of the data measures are multi-sourced and the process starts by defining the financial value of the sector (based upon our inclusive definition) from a wide variety of sources.

When kMatrix create a sector definition they always check that multiple sources of economic data exist for each included activity. This financial value is checked against existing sector values and also against the value of other economic sectors.

This is an iterative process that continues until they arrive at robust values and comparisons for all activities within the sector (comparative values of Wind vs. Photovoltaic vs. Biomass) that can then be meaningfully compared across global economies (UK vs. US vs. China etc.) and across different sectors (environmental consultancy vs. other specialist consulting activities). It is important that the methodology triangulates economic values in this way so that they:

a) Can exclude the research bias that often occurs from focusing on a single sector in a single country and
b) Ensure that they are effectively monitoring a sector that is still evolving by absorbing activities often included in other sectors.

**Sales**
The key measure that is used for financial value is Sales i.e., the value of sector products and services sold either to other businesses or directly to consumers from the geographically located company base, whether it be national, regional, sub-regional or Local Authority.  This means that the analysis only includes activities where there is a measurable economic footprint. It does not include publicly-funded research or pre-commercial consumption of funds, except where those activities result in the purchase of product and services from third parties

As they derive the financial value for the sector they also assemble and assess the UK company base that is contributing to this value. In the first case they identify all "significant" or "specialist" companies, these are companies where LCEGS account for over 80% of company sales, and then the supply/value chain companies where LCEGS sales is an important and measurable component of their overall sales - (over 20%). These percentages are indicative and vary for different LCEGS activities.

**Companies**

The company count acts as a further reality check on the financial value of the sector by comparing company turnover values in this and other sectors and also assists in the geographical analysis of where LCEGS value is created. For company counts and company listings we use standard data sources (FAME, Companies House etc), international sources, industry/trade sources, the advertising industry (YELL etc.) and, with caution, company-published information.

One important fact about the methodology is that in a typical SIC approach to sector analysis, a company is counted once and the value of its activities are very often assigned to a single category (which may or may not reflect what a company actually sells now), within a single sector and from a single geographical location.

This approach is to identify and assign value to different activities within a company that may fall within the same sector and to exclude values associated with different sectors. Where possible, they also break the reported activity down within larger multi-site companies so that only the value created within a region/LA is reported for that region/LA.

By analysing a sector in this way, they are able to capture the economic value generated by all “specialist” and supply/value chain companies, without any double counting of value. However, the methodology does mean that a single company may contribute value to multiple activities and we have to be careful not to double-count companies. To avoid this we assign a company, for counting purposes, to the activity that accounts for most of its sector sales. This does mean that on some occasions some of the smaller activities in our analysis may have a financial value in the sales column but a zero in the company column.

**Employment**

When financial values and company numbers have been calculated the methodology then looks at the employment base for the sector. The analysis of employment includes HR/Recruitment industry data, trade/industry data, government statistics, company reported employment levels and a variety of industry benchmarks that show employee input ratios into different products and processes. They do not survey companies directly for this information.

From these different sources we calculate employment numbers for LCEGS sector activities, taking into account how staff can operate processes that produce products for different markets. We, therefore, measure our employment numbers in Whole Time Equivalents (WTE).

**Growth**

Sales Growth is both an historical and a forecast measure and the methodology applies the same multi-source rigour to assessing growth that has already occurred as to growth that may occur. Growth forecasting shows the importance of both multi sourcing AND tracking the historical reliability/accuracy of sources used. It is based upon continuous monitoring of forecast “opinions” that are constantly being updated and re-evaluated, as a result “in-year” measurements of predicted growth can vary depending on when the sample is taken and change as sources respond to events like recession.

For this reason, we measure annual growth as a) a value frozen at a point in time and b) a time series (monthly or quarterly) measured throughout the year. In this file we include only the single (frozen) forecast. Separate files with detailed time series forecasts and trend analysis for the LCEGS sector are available.

Annual growth figures are useful in calculating and comparing the future contribution of sector activities beyond the current baseline. The percentage growth shows the RATE of change, the application of growth rates to the current sales baseline shows the IMPACT of change. Measuring the impact of change in financial terms shows how the ranking and importance of existing activities to the region/local authority may change over time and suggests when and where action may need to be taken to accommodate changes in the employment and company base.

The quoted growth rates in this dataset apply specifically to sales value. A growth in sales is indicative of changes in company numbers/employment but 5% sales growth does not necessarily equate to 5% employment growth. Companies can achieve growth in different ways and the recession has shown that companies will consume any “slack” before creating new jobs.

**Geography**
The methodology is designed to locate and measure economic activity at various geographical levels. The smallest unit of measurement is the Local Authority, but it can analyse data at county, sub-regional, LEP, regional and UK level.

When the methodology calculates and measures economic activity at the local authority level it takes into account existing local government boundaries, local GDP calculations and demographics, the postcode location of companies in the sector and any other local data that is available and relevant to the sector. When we measure sales and employment, therefore, our numbers are based upon where the business is located, rather than where people live.

There are some limits to what economic measures can be meaningfully or accurately applied at the local level. This is due to the range and specificity of data sources. Most of the economic development measures within this dataset can be accurately represented at a local level. Growth is an exception because rates cannot meaningfully be differentiated at a local level, therefore we apply regional growth rates throughout.

# Appendix 3

## LCEGS and Office of National Statistics Environmental Goods and Services Sector Comparison

The purpose of this appendix is to provide a brief description of some of the differences between the Office of National Statistics (ONS) Environmental Goods and Services Sector (EGSS) data and the LCEGS data provided by kMatrix. The two methodologies differ in the way data is collected, their methodologies, and in terms of their sector definitions.

kMatrix is a data house that specialises in providing evidential data for business modelling and analysis on a multi-sectoral basis. We provide back room services to the likes of Deloitte and PWC amongst others in the UK, New Zealand, Australia, US and the EU for sectoral analysis and due diligence for sectoral development and investment. We also provide our business and technology profiling services through these channels to market, as well as direct to universities for technology spinouts and individual businesses for development purposes. Further customers include government departments such as BEIS, Home Office and various local and regional government departments.

The ONS EGSS data is produced primarily for the purpose of national accounting. It is sector-specific, using narrow sector definitions and takes no account of the value or supply chains in a sector. In contrast, the kMatrix methodology was originally designed to help companies by measuring technologies or activities using small taxonomies, to assist with investment and developmental planning. This capability was expanded to provide market data for a number of economic sectors, by creating larger taxonomies to capture as much of the market as possible, including the supply and value chains. Each taxonomy for a sector will draw relevant activities from many other sectors, to fully capture all activity. In this way, the LCEGS taxonomy captures activities across multiple sectors and down the value and supply chains. This difference in *what* is being measured is the fundamental reason why the definitions used by ONS and LCEGS do not align.

The kMatrix methodology uses a unique process of ‘triangulation’ to measure metrics such as employment and other characteristics of a sector at varying levels of detail. This process has been developed over 30 years and has been adopted by various governments, universities and major corporates to provide economic industry data for hard to measure sectors. It is similar in concept to the triangulation of satellites to work GPS satellite navigation systems. The methodology uses multiple data points which can be economic or non-economic in origin, from a number of different sources to ‘triangulate’ the value of a product or service in question.

This process is different to the methodology used by the ONS to produce the EGSS data, predominantly because the ONS data relies on self-certification of companies into SIC codes, whereas the kMatrix methodology calculates values based on multiple sources of data. The ONS data is based on where companies choose to classify themselves. kMatrix data looks at the activities of companies and attributes those activities to different sub-sectors. In effect, the ONS system is limited to the ability or willingness of companies to list which sectors their products or services are used in, this method is likely to produce both over and underestimates of market size as companies will attribute more or less of their activities to relevant SIC codes. The kMatrix methodology does not rely on company cooperation but looks at their activities and breaks them down into the levels or sub-sectors they are relevant to.

The kMatrix process operates on a ‘bottom up’ basis, meaning we look at products and services delivered, rather than company classifications and turnover, which is classed as ‘top down’ (SIC system). The bottom up process was developed to assist individual companies based on sectoral analysis findings and provide evidential data and advice. By looking at the sector from the bottom up (by each activity, product or service), the sector can be determined in accordance with the relevant sector definition, whilst allowing the flexibility to ‘add in’ or ‘opt out’ of various activities depending on the purpose of the reporting. ONS data itself is not used to produce kMatrix figures, but the kMatrix values can be reported out through the ONS classification system if required.

Table 1 shows a comparison between employment analysis for the London region using the SIC classification methodology and the kMatrix methodology for the Manufacturing sector and the Construction sector.

**Table 1: Comparison of 2011 - 2016 Employment Data for SIC and kMatrix in London**

| **Methodology** | **Sector** | **2011 Jobs** | **2012 Jobs** | **2013 Jobs** | **2014 Jobs** | **2015 Jobs** | **2016 Jobs** |
|---|---|---|---|---|---|---|---|
| SIC based | Manufacturing | 106,750 | 108,250 | 106,750 | 112,000 | 108,000 | 105,250 |
| SIC based | Construction | 133,250 | 150,500 | 146,500 | 146,250 | 145,250 | 155,750 |
| kMatrix | Manufacturing | 137,351 | 135,943 | 138,951 | 141,873 | 140,308 | 131,230 |
| kMatrix | Construction | 166,629 | 195,334 | 177,915 | 184,022 | 184,317 | 199,038 |
| | | | | | | | |
| ***Indexed numbers for the rows above show that growth in the manufacturing and construction sectors is similar for both the SIC and kMatrix definitions*** | | 100 | 101.4 | 100.0 | 104.9 | 101.2 | 98.6 |
| | | 100 | 112.9 | 109.9 | 109.8 | 109.0 | 116.9 |
| | | 100 | 99.0 | 101.2 | 103.3 | 102.2 | 95.5 |
| | | 100 | 117.2 | 106.8 | 110.4 | 110.6 | 119.4 |

**Sector** - LCEGS is made up of elements from many different traditional sectors (including manufacturing, finance, construction, consulting and energy) therefore as a grouping it includes products and services from those sectors that together amount to the total value of the LCEGS grouping.

**Scale** - The ONS system only produces estimates of the sector size at the country level, whereas the LCEGS data can be provided by Country, Region, City, Local Authority etc.

Table 2 shows a summary of the main differences between the kMatrix data and the ONS EGSS data.

**Table 2: kMatrix and ONS – EGSS Comparison Summary Table**

| | kMatrix - LCEGS | ONS - EGSS |
|---|---|---|
| **Sector definition** | The LCEGS sector includes the EGSS definition but expands it to include all activities that contribute and enable growth in the sector. Those elements which are excluded from EGSS which are produced for purposes that, while beneficial to the environment, primarily satisfy technical, human and economic needs or that are requirements for health and safety are included in LCEGS if they contribute to the sector. For more information please see Appendix 3 and Appendix 4 of this report. | The environmental goods and services sector is made up of areas of the economy engaged in producing goods and services for environmental protection purposes, as well as those engaged in conserving and maintaining natural resources. Excluded from the scope of EGSS are goods and services produced for purposes that, while beneficial to the environment, primarily satisfy technical, human and economic needs or that are requirements for health and safety. |
| **Sector size measurement** | Triangulation of data from multiple sources | Company surveys via company self-certification |
| **Sector sales coverage** | Full value of sales for the sector, including supply and value chain | Only sector sales, not including supply or value chains |
| **Geographic range of coverage** | Global, Country, Regional, City & Local Authority | Country |
| **Available data includes** | Sales, number of employees, number of companies, exports, growth rates (historical and forecast) & 60+ more metrics | Output, GVA, employee count and exports |
| For further information and detail on the ONS – EGSS definition: https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2010to2015 | | |

# Appendix 4

## LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios for Top Level 2 Sub-sectors

### Midlands Energy Hub Region

#### Alternative Fuel Vehicle

| | Alternative Fuel Vehicle | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 80 | 36 | 45.5% | 117 | 105 | -10.2% | 138 | 18.3% | 163 | 40.1% | 386 | 231.1% |
| Snr Management SME | 144 | 33 | 22.8% | 177 | 187 | 5.7% | 246 | 39.5% | 292 | 65.7% | 696 | 294.1% |
| Supervisory | 184 | 41 | 22.2% | 225 | 240 | 6.4% | 316 | 40.2% | 372 | 65.0% | 887 | 293.3% |
| Middle / Junior Management | 180 | 41 | 23.0% | 222 | 237 | 6.9% | 309 | 39.1% | 366 | 65.1% | 862 | 288.5% |
| Designer / Developer | 19 | 9 | 45.5% | 28 | 25 | -9.9% | 33 | 18.8% | 39 | 39.9% | 92 | 230.7% |
| Clerical | 111 | 1 | 0.5% | 111 | 145 | 30.2% | 191 | 71.0% | 222 | 99.6% | 532 | 378.0% |
| Self Employed | 112 | 26 | 23.0% | 137 | 147 | 6.9% | 191 | 38.8% | 225 | 63.6% | 538 | 292.0% |
| Advisor or Agent | 188 | 43 | 23.1% | 232 | 246 | 5.9% | 324 | 39.5% | 380 | 64.0% | 906 | 290.5% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 45 | 3 | 6.2% | 48 | 59 | 24.2% | 76 | 60.3% | 91 | 91.8% | 221 | 365.6% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 296 | 34 | 11.5% | 329 | 389 | 18.1% | 507 | 53.8% | 600 | 82.0% | 1,426 | 332.8% |
| Scientist | 31 | 14 | 45.3% | 45 | 40 | -10.2% | 53 | 18.4% | 62 | 39.4% | 148 | 232.5% |
| Maintenance Engineer | 258 | 36 | 13.8% | 293 | 338 | 15.2% | 440 | 50.1% | 522 | 78.2% | 1,232 | 320.2% |
| Civil Engineer | 38 | 17 | 44.8% | 54 | 49 | -10.0% | 64 | 18.0% | 76 | 39.5% | 182 | 233.7% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 39 | 26 | 67.3% | 65 | 51 | -22.0% | 67 | 2.4% | 79 | 20.7% | 188 | 187.1% |
| Construction Engineer | 40 | 14 | 34.5% | 54 | 52 | -2.8% | 69 | 27.6% | 81 | 50.2% | 193 | 258.8% |
| Sales Exec | 206 | 46 | 22.5% | 253 | 272 | 7.5% | 356 | 41.0% | 417 | 64.9% | 1,000 | 295.8% |
| Marketing Personnel | 212 | 49 | 23.1% | 261 | 275 | 5.6% | 365 | 39.9% | 430 | 64.9% | 1,018 | 290.6% |
| General Semi Skilled Worker | 182 | 8 | 4.5% | 190 | 238 | 24.9% | 311 | 63.3% | 369 | 93.8% | 873 | 359.0% |
| General Labour | 292 | 0 | 0.0% | 292 | 383 | 31.2% | 500 | 71.4% | 591 | 102.7% | 1,405 | 381.6% |
| Other Employees | 205 | 23 | 11.4% | 229 | 269 | 17.8% | 352 | 54.0% | 415 | 81.7% | 988 | 332.3% |
| Administrative workers | 149 | 7 | 4.6% | 156 | 195 | 25.1% | 256 | 63.9% | 302 | 93.6% | 715 | 357.7% |
| **Total** | **3,010** | **507** | **16.8%** | **3,517** | **3,941** | **12.0%** | **5,162** | **46.8%** | **6,095** | **73.3%** | **14,488** | **311.9%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 589 | 211 | 35.8% | 800 | 767 | -4.1% | 1,015 | 26.8% | 1,204 | 50.5% | 2,828 | 253.5% |
| Snr Management SME | 513 | 93 | 18.1% | 606 | 670 | 10.5% | 883 | 45.6% | 1,036 | 70.8% | 2,473 | 307.9% |
| Supervisory | 640 | 116 | 18.2% | 756 | 829 | 9.7% | 1,094 | 44.7% | 1,287 | 70.3% | 3,068 | 305.8% |
| Middle / Junior Management | 621 | 111 | 17.9% | 733 | 811 | 10.7% | 1,070 | 46.0% | 1,261 | 72.1% | 3,010 | 310.8% |
| Designer / Developer | 108 | 38 | 35.2% | 146 | 140 | -4.4% | 186 | 26.9% | 218 | 48.6% | 525 | 258.2% |
| Clerical | 316 | 1 | 0.4% | 317 | 417 | 31.7% | 539 | 70.3% | 639 | 101.8% | 1,529 | 382.7% |
| Self Employed | 171 | 32 | 18.6% | 203 | 225 | 10.9% | 292 | 44.0% | 343 | 69.3% | 822 | 305.2% |
| Advisor or Agent | 14 | 3 | 18.9% | 17 | 19 | 10.5% | 24 | 43.6% | 28 | 69.1% | 68 | 306.5% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 494 | 25 | 5.1% | 519 | 639 | 23.1% | 845 | 62.6% | 1,005 | 93.5% | 2,370 | 356.2% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 219 | 20 | 9.3% | 240 | 282 | 17.7% | 375 | 56.6% | 445 | 86.0% | 1,060 | 342.7% |
| Scientist | 415 | 141 | 34.0% | 556 | 539 | -2.9% | 711 | 27.9% | 835 | 50.4% | 1,989 | 258.1% |
| Maintenance Engineer | 803 | 89 | 11.0% | 891 | 1,049 | 17.7% | 1,375 | 54.3% | 1,629 | 82.8% | 3,856 | 332.7% |
| Civil Engineer | 3 | 1 | 37.1% | 4 | 4 | -4.9% | 5 | 25.8% | 6 | 46.2% | 13 | 250.0% |
| Production Engineer | 420 | 236 | 56.0% | 656 | 543 | -17.1% | 725 | 10.5% | 840 | 28.1% | 2,016 | 207.3% |
| Power distribution Engineer | 144 | 74 | 51.4% | 217 | 187 | -14.1% | 245 | 12.6% | 290 | 33.2% | 685 | 215.1% |
| Construction Engineer | 3 | 1 | 27.9% | 4 | 4 | 1.2% | 5 | 34.0% | 6 | 57.7% | 14 | 273.7% |
| Sales Exec | 629 | 115 | 18.4% | 744 | 825 | 10.8% | 1,074 | 44.3% | 1,262 | 69.5% | 3,010 | 304.5% |
| Marketing Personnel | 641 | 113 | 17.6% | 754 | 837 | 11.1% | 1,104 | 46.5% | 1,292 | 71.4% | 3,104 | 311.8% |
| General Semi Skilled Worker | 837 | 30 | 3.5% | 866 | 1,099 | 26.8% | 1,437 | 65.9% | 1,697 | 96.0% | 4,034 | 365.7% |
| General Labour | 1,139 | 0 | 0.0% | 1,139 | 1,492 | 31.1% | 1,966 | 72.7% | 2,304 | 102.3% | 5,489 | 382.1% |
| Other Employees | 685 | 64 | 9.3% | 748 | 891 | 19.0% | 1,175 | 57.0% | 1,382 | 84.6% | 3,293 | 339.9% |
| Administrative workers | 418 | 15 | 3.6% | 433 | 546 | 26.2% | 713 | 64.9% | 839 | 93.9% | 2,012 | 365.1% |
| **Total** | **9,821** | **1,528** | **15.6%** | **11,349** | **12,815** | **12.9%** | **16,859** | **48.5%** | **19,849** | **74.9%** | **47,270** | **316.5%** |

## Biomass

| SOC | Biomass Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 338 | 78 | 23.0% | 416 | 444 | 6.8% | 580 | 39.4% | 685 | 64.7% | 1,635 | 293.1% |
| Snr Management SME | 1,422 | 165 | 11.6% | 1,587 | 1,856 | 16.9% | 2,437 | 53.6% | 2,875 | 81.2% | 6,827 | 330.3% |
| Supervisory | 1,437 | 164 | 11.4% | 1,601 | 1,877 | 17.2% | 2,478 | 54.8% | 2,903 | 81.3% | 6,948 | 333.9% |
| Middle / Junior Management | 1,380 | 157 | 11.4% | 1,537 | 1,804 | 17.4% | 2,369 | 54.1% | 2,794 | 81.8% | 6,600 | 329.4% |
| Designer / Developer | 159 | 37 | 23.2% | 195 | 207 | 5.7% | 274 | 40.2% | 320 | 63.8% | 763 | 290.4% |
| Clerical | 711 | 2 | 0.2% | 713 | 936 | 31.4% | 1,226 | 72.0% | 1,436 | 101.5% | 3,432 | 381.5% |
| Self Employed | 73 | 9 | 11.8% | 81 | 95 | 17.1% | 124 | 52.7% | 146 | 80.0% | 348 | 329.4% |
| Advisor or Agent | 22 | 2 | 11.3% | 24 | 29 | 17.6% | 38 | 54.6% | 44 | 81.1% | 106 | 332.8% |
| Educator | 0 | 0 | 11.4% | 0 | 0 | 17.5% | 0 | 54.0% | 0 | 87.7% | 0 | 327.6% |
| Specialist or Consultant | 769 | 27 | 3.5% | 796 | 1,011 | 27.0% | 1,317 | 65.5% | 1,549 | 94.7% | 3,717 | 367.1% |
| Editor | 21 | 0 | 2.3% | 22 | 28 | 27.1% | 37 | 68.3% | 43 | 97.7% | 102 | 369.5% |
| Industrial Researchers | 28 | 2 | 5.8% | 29 | 36 | 23.6% | 48 | 62.7% | 56 | 91.4% | 134 | 353.8% |
| Scientist | 43 | 10 | 22.2% | 53 | 57 | 7.7% | 75 | 40.8% | 87 | 65.2% | 206 | 288.8% |
| Maintenance Engineer | 1,424 | 100 | 7.0% | 1,524 | 1,862 | 22.2% | 2,458 | 61.3% | 2,875 | 88.7% | 6,864 | 350.4% |
| Civil Engineer | 22 | 5 | 23.0% | 27 | 29 | 5.8% | 38 | 39.6% | 45 | 64.1% | 107 | 291.1% |
| Production Engineer | 210 | 71 | 33.8% | 281 | 277 | -1.6% | 363 | 29.1% | 426 | 51.5% | 1,008 | 258.4% |
| Power distribution Engineer | 687 | 235 | 34.2% | 923 | 899 | -2.5% | 1,184 | 28.4% | 1,394 | 51.1% | 3,308 | 258.5% |
| Construction Engineer | 21 | 4 | 17.2% | 25 | 28 | 11.9% | 36 | 46.8% | 43 | 72.2% | 102 | 311.2% |
| Sales Exec | 675 | 77 | 11.4% | 753 | 887 | 17.8% | 1,155 | 53.5% | 1,366 | 81.6% | 3,256 | 332.6% |
| Marketing Personnel | 697 | 79 | 11.4% | 777 | 912 | 17.4% | 1,194 | 53.7% | 1,406 | 81.0% | 3,346 | 330.8% |
| General Semi Skilled Worker | 1,404 | 32 | 2.3% | 1,436 | 1,831 | 27.5% | 2,409 | 67.8% | 2,851 | 98.6% | 6,790 | 372.9% |
| General Labour | 1,472 | 0 | 0.0% | 1,472 | 1,921 | 30.5% | 2,528 | 71.8% | 2,968 | 101.7% | 7,093 | 382.0% |
| Other Employees | 1,878 | 109 | 5.8% | 1,987 | 2,457 | 23.6% | 3,209 | 61.5% | 3,812 | 91.8% | 9,049 | 355.4% |
| Administrative workers | 714 | 16 | 2.3% | 730 | 928 | 27.2% | 1,224 | 67.7% | 1,451 | 98.8% | 3,436 | 370.8% |
| **Total** | **15,608** | **1,381** | **8.8%** | **16,989** | **20,409** | **20.1%** | **26,801** | **57.8%** | **31,576** | **85.9%** | **75,177** | **342.5%** |

## Building Technologies

| | Building Technologies Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 646 | 88 | 13.6% | 734 | 840 | 14.4% | 1,104 | 50.4% | 1,300 | 77.1% | 3,096 | 321.7% |
| **Snr Management SME** | 1,647 | 111 | 6.7% | 1,757 | 2,147 | 22.2% | 2,821 | 60.5% | 3,340 | 90.1% | 7,906 | 349.9% |
| **Supervisory** | 1,641 | 112 | 6.8% | 1,753 | 2,156 | 23.0% | 2,825 | 61.1% | 3,328 | 89.8% | 7,872 | 349.0% |
| **Middle / Junior Management** | 1,589 | 109 | 6.8% | 1,698 | 2,083 | 22.7% | 2,721 | 60.3% | 3,191 | 87.9% | 7,689 | 352.9% |
| **Designer / Developer** | 187 | 26 | 13.7% | 213 | 244 | 14.6% | 320 | 50.4% | 377 | 77.0% | 896 | 321.3% |
| **Clerical** | 842 | 1 | 0.1% | 843 | 1,103 | 30.8% | 1,441 | 70.9% | 1,705 | 102.2% | 4,002 | 374.6% |
| **Self Employed** | 190 | 13 | 6.8% | 203 | 248 | 22.0% | 327 | 61.1% | 384 | 88.9% | 914 | 349.9% |
| **Advisor or Agent** | 217 | 15 | 6.9% | 232 | 287 | 23.4% | 374 | 61.1% | 440 | 89.6% | 1,047 | 350.9% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 972 | 20 | 2.1% | 992 | 1,282 | 29.2% | 1,681 | 69.5% | 1,960 | 97.5% | 4,645 | 368.2% |
| **Editor** | 7 | 0 | 1.4% | 7 | 9 | 28.6% | 12 | 69.5% | 14 | 99.0% | 33 | 374.2% |
| **Industrial Researchers** | 398 | 14 | 3.5% | 411 | 517 | 25.8% | 682 | 65.8% | 805 | 95.6% | 1,908 | 363.7% |
| **Scientist** | 56 | 8 | 13.9% | 63 | 73 | 14.8% | 95 | 50.7% | 112 | 76.4% | 268 | 322.7% |
| **Maintenance Engineer** | 1,664 | 68 | 4.1% | 1,732 | 2,164 | 24.9% | 2,860 | 65.1% | 3,377 | 94.9% | 7,998 | 361.7% |
| **Civil Engineer** | 97 | 13 | 13.9% | 110 | 127 | 14.9% | 166 | 50.3% | 196 | 78.0% | 466 | 322.9% |
| **Production Engineer** | 203 | 42 | 20.7% | 245 | 265 | 8.3% | 350 | 42.8% | 411 | 67.9% | 982 | 300.8% |
| **Power distribution Engineer** | 853 | 176 | 20.6% | 1,029 | 1,116 | 8.4% | 1,460 | 41.9% | 1,733 | 68.4% | 4,110 | 299.4% |
| **Construction Engineer** | 162 | 16 | 10.1% | 179 | 213 | 19.1% | 279 | 56.0% | 327 | 82.9% | 783 | 337.5% |
| **Sales Exec** | 749 | 51 | 6.8% | 799 | 975 | 21.9% | 1,285 | 60.8% | 1,524 | 90.7% | 3,583 | 348.3% |
| **Marketing Personnel** | 768 | 52 | 6.8% | 820 | 1,011 | 23.3% | 1,322 | 61.2% | 1,564 | 90.7% | 3,686 | 349.4% |
| **General Semi Skilled Worker** | 1,708 | 24 | 1.4% | 1,731 | 2,226 | 28.6% | 2,941 | 69.9% | 3,449 | 99.2% | 8,170 | 371.9% |
| **General Labour** | 3,162 | 0 | 0.0% | 3,162 | 4,136 | 30.8% | 5,418 | 71.3% | 6,390 | 102.1% | 15,196 | 380.5% |
| **Other Employees** | 2,103 | 72 | 3.4% | 2,175 | 2,749 | 26.4% | 3,618 | 66.3% | 4,265 | 96.1% | 10,101 | 364.3% |
| **Administrative workers** | 933 | 13 | 1.4% | 946 | 1,230 | 30.0% | 1,601 | 69.2% | 1,878 | 98.6% | 4,486 | 374.3% |
| **Total** | **20,794** | **1,044** | **5.0%** | **21,838** | **27,200** | **24.6%** | **35,706** | **63.5%** | **42,069** | **92.6%** | **99,837** | **357.2%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 106 | 48 | 45.7% | 154 | 139 | -10.1% | 182 | 17.8% | 214 | 38.5% | 509 | 229.7% |
| Snr Management SME | 203 | 46 | 22.5% | 248 | 264 | 6.3% | 347 | 39.7% | 411 | 65.7% | 975 | 292.8% |
| Supervisory | 218 | 49 | 22.5% | 267 | 286 | 7.0% | 372 | 39.1% | 440 | 64.7% | 1,048 | 292.4% |
| Middle / Junior Management | 211 | 48 | 22.8% | 259 | 275 | 6.3% | 362 | 40.0% | 426 | 64.6% | 1,015 | 292.1% |
| Designer / Developer | 55 | 25 | 46.1% | 80 | 72 | -10.4% | 93 | 16.3% | 111 | 38.5% | 264 | 230.2% |
| Clerical | 110 | 1 | 0.5% | 110 | 144 | 30.2% | 188 | 70.5% | 221 | 100.3% | 527 | 377.4% |
| Self Employed | 53 | 12 | 22.5% | 65 | 69 | 7.1% | 91 | 40.5% | 106 | 64.1% | 253 | 290.6% |
| Advisor or Agent | 45 | 10 | 22.7% | 56 | 60 | 6.9% | 78 | 39.9% | 91 | 64.0% | 218 | 291.0% |
| Educator | 1 | 0 | 22.4% | 2 | 2 | 6.7% | 2 | 40.5% | 3 | 62.5% | 7 | 288.7% |
| Specialist or Consultant | 124 | 8 | 6.7% | 133 | 164 | 23.3% | 214 | 61.0% | 250 | 88.2% | 601 | 353.0% |
| Editor | 20 | 1 | 4.4% | 21 | 26 | 25.5% | 35 | 64.1% | 41 | 93.7% | 97 | 359.6% |
| Industrial Researchers | 40 | 5 | 11.6% | 45 | 53 | 17.3% | 69 | 54.2% | 82 | 81.4% | 193 | 330.0% |
| Scientist | 22 | 10 | 46.5% | 33 | 29 | -10.9% | 39 | 17.7% | 46 | 38.6% | 107 | 225.3% |
| Maintenance Engineer | 264 | 36 | 13.7% | 300 | 346 | 15.1% | 453 | 50.9% | 533 | 77.6% | 1,269 | 322.6% |
| Civil Engineer | 39 | 18 | 45.3% | 57 | 51 | -10.1% | 68 | 18.5% | 80 | 39.5% | 187 | 227.4% |
| Production Engineer | 47 | 33 | 69.8% | 79 | 61 | -23.2% | 80 | 1.0% | 95 | 19.6% | 224 | 182.9% |
| Power distribution Engineer | 123 | 84 | 68.4% | 208 | 160 | -22.7% | 213 | 2.5% | 249 | 19.8% | 594 | 185.9% |
| Construction Engineer | 45 | 16 | 34.8% | 60 | 58 | -3.4% | 77 | 27.5% | 90 | 49.5% | 215 | 256.2% |
| Sales Exec | 126 | 29 | 22.7% | 155 | 165 | 6.3% | 217 | 40.2% | 255 | 64.8% | 608 | 292.2% |
| Marketing Personnel | 120 | 27 | 22.2% | 147 | 157 | 6.8% | 206 | 40.0% | 243 | 65.0% | 579 | 294.1% |
| General Semi Skilled Worker | 244 | 11 | 4.5% | 255 | 320 | 25.2% | 419 | 64.2% | 494 | 93.3% | 1,172 | 358.8% |
| General Labour | 373 | 0 | 0.0% | 373 | 490 | 31.3% | 640 | 71.3% | 754 | 101.9% | 1,793 | 380.0% |
| Other Employees | 290 | 33 | 11.5% | 324 | 380 | 17.3% | 500 | 54.5% | 584 | 80.6% | 1,401 | 332.9% |
| Administrative workers | 131 | 6 | 4.6% | 137 | 171 | 24.4% | 225 | 64.1% | 265 | 92.9% | 632 | 360.7% |
| **Total** | **3,013** | **556** | **18.5%** | **3,569** | **3,940** | **10.4%** | **5,169** | **44.8%** | **6,082** | **70.4%** | **14,486** | **305.9%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 169 | 77 | 45.3% | 245 | 221 | -10.1% | 289 | 17.9% | 340 | 38.8% | 810 | 230.2% |
| Snr Management SME | 678 | 156 | 23.0% | 834 | 888 | 6.4% | 1,161 | 39.2% | 1,367 | 63.9% | 3,259 | 290.7% |
| Supervisory | 674 | 153 | 22.7% | 827 | 877 | 6.1% | 1,156 | 39.8% | 1,358 | 64.2% | 3,243 | 292.3% |
| Middle / Junior Management | 656 | 149 | 22.8% | 805 | 856 | 6.3% | 1,120 | 39.1% | 1,328 | 64.9% | 3,149 | 291.1% |
| Designer / Developer | 74 | 34 | 45.4% | 108 | 97 | -10.0% | 127 | 17.7% | 150 | 38.8% | 356 | 229.6% |
| Clerical | 338 | 2 | 0.5% | 339 | 444 | 30.7% | 580 | 70.9% | 686 | 102.2% | 1,623 | 378.1% |
| Self Employed | 39 | 9 | 23.0% | 49 | 51 | 6.0% | 68 | 40.1% | 79 | 63.6% | 190 | 291.9% |
| Advisor or Agent | 35 | 8 | 22.8% | 44 | 47 | 7.0% | 61 | 39.8% | 71 | 64.0% | 170 | 290.5% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 343 | 24 | 6.9% | 367 | 449 | 22.2% | 590 | 60.5% | 692 | 88.4% | 1,661 | 352.4% |
| Editor | 18 | 1 | 4.5% | 19 | 24 | 25.6% | 31 | 64.3% | 37 | 93.6% | 88 | 358.4% |
| Industrial Researchers | 25 | 3 | 11.3% | 27 | 32 | 17.0% | 42 | 54.6% | 50 | 81.5% | 118 | 332.1% |
| Scientist | 19 | 9 | 45.0% | 28 | 25 | -10.0% | 33 | 18.6% | 39 | 40.0% | 93 | 231.6% |
| Maintenance Engineer | 704 | 97 | 13.8% | 802 | 920 | 14.8% | 1,198 | 49.4% | 1,419 | 77.0% | 3,386 | 322.3% |
| Civil Engineer | 33 | 15 | 45.6% | 48 | 43 | -10.3% | 57 | 17.4% | 67 | 38.9% | 159 | 230.0% |
| Production Engineer | 112 | 77 | 68.8% | 190 | 147 | -22.4% | 193 | 1.6% | 227 | 19.7% | 537 | 183.2% |
| Power distribution Engineer | 338 | 228 | 67.5% | 566 | 441 | -22.0% | 580 | 2.5% | 682 | 20.6% | 1,620 | 186.4% |
| Construction Engineer | 29 | 10 | 33.6% | 39 | 38 | -1.9% | 49 | 28.4% | 58 | 51.1% | 139 | 261.0% |
| Sales Exec | 346 | 79 | 22.8% | 425 | 453 | 6.6% | 592 | 39.1% | 698 | 64.1% | 1,675 | 293.7% |
| Marketing Personnel | 346 | 79 | 22.8% | 425 | 453 | 6.4% | 593 | 39.4% | 700 | 64.6% | 1,665 | 291.5% |
| General Semi Skilled Worker | 693 | 31 | 4.5% | 724 | 904 | 24.9% | 1,191 | 64.5% | 1,404 | 93.9% | 3,347 | 362.3% |
| General Labour | 1,031 | 0 | 0.0% | 1,031 | 1,350 | 31.0% | 1,767 | 71.5% | 2,076 | 101.5% | 4,970 | 382.3% |
| Other Employees | 888 | 100 | 11.2% | 988 | 1,158 | 17.2% | 1,522 | 54.0% | 1,794 | 81.6% | 4,240 | 329.2% |
| Administrative workers | 349 | 16 | 4.5% | 365 | 457 | 25.3% | 599 | 64.2% | 704 | 93.0% | 1,682 | 360.8% |
| **Total** | **7,939** | **1,355** | **17.1%** | **9,295** | **10,375** | **11.6%** | **13,598** | **46.3%** | **16,028** | **72.4%** | **38,181** | **310.8%** |

## Photovoltaic

| SOC | Photovoltaic Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 554 | 49 | 8.8% | 603 | 725 | 20.3% | 949 | 57.4% | 1,125 | 86.6% | 2,664 | 341.9% |
| **Snr Management SME** | 1,710 | 76 | 4.4% | 1,786 | 2,247 | 25.8% | 2,933 | 64.2% | 3,472 | 94.4% | 8,195 | 358.9% |
| **Supervisory** | 1,701 | 75 | 4.4% | 1,776 | 2,220 | 25.0% | 2,942 | 65.6% | 3,429 | 93.1% | 8,215 | 362.6% |
| **Middle / Junior Management** | 1,649 | 71 | 4.3% | 1,721 | 2,161 | 25.6% | 2,832 | 64.6% | 3,330 | 93.5% | 7,901 | 359.2% |
| **Designer / Developer** | 120 | 10 | 8.7% | 131 | 158 | 20.9% | 206 | 57.6% | 244 | 86.7% | 577 | 341.5% |
| **Clerical** | 846 | 1 | 0.1% | 847 | 1,102 | 30.2% | 1,446 | 70.8% | 1,711 | 102.1% | 4,043 | 377.6% |
| **Self Employed** | 91 | 4 | 4.5% | 95 | 118 | 24.2% | 155 | 63.8% | 183 | 93.3% | 436 | 359.9% |
| **Advisor or Agent** | 11 | 1 | 4.5% | 12 | 15 | 24.5% | 20 | 65.3% | 23 | 93.9% | 55 | 360.9% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 784 | 10 | 1.3% | 794 | 1,029 | 29.6% | 1,334 | 68.0% | 1,587 | 99.9% | 3,750 | 372.3% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 58 | 1 | 2.3% | 60 | 76 | 27.9% | 100 | 68.5% | 117 | 97.3% | 281 | 371.9% |
| **Scientist** | 2 | 0 | 9.1% | 2 | 2 | 19.8% | 3 | 58.6% | 4 | 84.4% | 9 | 343.2% |
| **Maintenance Engineer** | 1,722 | 46 | 2.7% | 1,768 | 2,257 | 27.7% | 2,969 | 67.9% | 3,490 | 97.4% | 8,268 | 367.7% |
| **Civil Engineer** | 43 | 4 | 8.9% | 47 | 57 | 19.9% | 74 | 57.3% | 88 | 86.7% | 210 | 343.6% |
| **Production Engineer** | 224 | 30 | 13.4% | 254 | 293 | 15.4% | 384 | 51.3% | 453 | 78.7% | 1,078 | 325.3% |
| **Power distribution Engineer** | 855 | 116 | 13.5% | 971 | 1,117 | 15.1% | 1,467 | 51.1% | 1,711 | 76.3% | 4,108 | 323.3% |
| **Construction Engineer** | 91 | 6 | 6.7% | 97 | 119 | 22.1% | 157 | 61.1% | 185 | 89.9% | 440 | 351.9% |
| **Sales Exec** | 806 | 35 | 4.4% | 841 | 1,051 | 25.0% | 1,380 | 64.2% | 1,631 | 94.0% | 3,861 | 359.2% |
| **Marketing Personnel** | 829 | 37 | 4.4% | 866 | 1,085 | 25.3% | 1,425 | 64.6% | 1,677 | 93.7% | 3,981 | 359.6% |
| **General Semi Skilled Worker** | 1,770 | 16 | 0.9% | 1,786 | 2,311 | 29.4% | 3,046 | 70.6% | 3,562 | 99.5% | 8,423 | 371.7% |
| **General Labour** | 2,284 | 0 | 0.0% | 2,284 | 2,980 | 30.5% | 3,925 | 71.9% | 4,626 | 102.5% | 10,969 | 380.3% |
| **Other Employees** | 2,190 | 48 | 2.2% | 2,238 | 2,874 | 28.4% | 3,716 | 66.1% | 4,409 | 97.0% | 10,532 | 370.7% |
| **Administrative workers** | 885 | 8 | 0.9% | 893 | 1,156 | 29.4% | 1,517 | 69.9% | 1,774 | 98.6% | 4,237 | 374.4% |
| **Total** | **19,226** | **642** | **3.3%** | **19,869** | **25,154** | **26.6%** | **32,981** | **66.0%** | **38,833** | **95.5%** | **92,234** | **364.2%** |

## Recovery and Recycling

| | Recovery and Recycling | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 389 | 144 | 36.9% | 533 | 508 | -4.6% | 667 | 25.3% | 788 | 48.0% | 1,869 | 251.0% |
| **Snr Management SME** | 455 | 84 | 18.5% | 539 | 594 | 10.2% | 777 | 44.1% | 915 | 69.6% | 2,185 | 305.2% |
| **Supervisory** | 485 | 91 | 18.8% | 576 | 634 | 10.1% | 834 | 44.8% | 975 | 69.4% | 2,326 | 303.9% |
| **Middle / Junior Management** | 469 | 89 | 19.0% | 558 | 610 | 9.3% | 804 | 44.0% | 949 | 70.0% | 2,260 | 304.6% |
| **Designer / Developer** | 334 | 123 | 36.8% | 457 | 437 | -4.3% | 574 | 25.5% | 672 | 47.0% | 1,606 | 251.3% |
| **Clerical** | 240 | 1 | 0.4% | 241 | 315 | 30.6% | 414 | 71.6% | 487 | 102.0% | 1,148 | 376.0% |
| **Self Employed** | 118 | 22 | 18.4% | 140 | 155 | 10.5% | 203 | 44.9% | 239 | 70.7% | 570 | 307.3% |
| **Advisor or Agent** | 42 | 8 | 18.8% | 50 | 54 | 9.8% | 72 | 44.3% | 84 | 69.1% | 199 | 301.7% |
| **Educator** | 2 | 0 | 18.5% | 2 | 2 | 10.8% | 3 | 43.3% | 3 | 70.3% | 8 | 302.2% |
| **Specialist or Consultant** | 390 | 22 | 5.7% | 412 | 507 | 22.9% | 666 | 61.5% | 789 | 91.4% | 1,882 | 356.4% |
| **Editor** | 19 | 1 | 3.7% | 19 | 24 | 26.1% | 32 | 64.9% | 38 | 96.1% | 89 | 361.9% |
| **Industrial Researchers** | 100 | 9 | 9.1% | 109 | 131 | 20.0% | 171 | 57.3% | 202 | 85.3% | 479 | 339.9% |
| **Scientist** | 90 | 33 | 37.0% | 123 | 118 | -4.4% | 154 | 25.3% | 181 | 47.3% | 433 | 251.5% |
| **Maintenance Engineer** | 607 | 67 | 11.0% | 674 | 795 | 18.0% | 1,041 | 54.5% | 1,229 | 82.4% | 2,919 | 333.2% |
| **Civil Engineer** | 173 | 63 | 36.5% | 236 | 226 | -4.1% | 296 | 25.7% | 349 | 48.3% | 829 | 251.9% |
| **Production Engineer** | 206 | 114 | 55.5% | 320 | 269 | -15.8% | 352 | 10.1% | 416 | 30.1% | 991 | 209.8% |
| **Power distribution Engineer** | 322 | 180 | 55.8% | 501 | 419 | -16.3% | 550 | 9.7% | 648 | 29.2% | 1,548 | 208.8% |
| **Construction Engineer** | 186 | 52 | 27.8% | 238 | 243 | 2.2% | 320 | 34.6% | 376 | 58.2% | 894 | 275.8% |
| **Sales Exec** | 389 | 72 | 18.4% | 461 | 509 | 10.3% | 669 | 45.1% | 784 | 70.0% | 1,869 | 305.2% |
| **Marketing Personnel** | 320 | 59 | 18.4% | 380 | 421 | 11.0% | 550 | 44.8% | 649 | 70.9% | 1,537 | 304.9% |
| **General Semi Skilled Worker** | 788 | 29 | 3.7% | 817 | 1,033 | 26.4% | 1,356 | 66.0% | 1,591 | 94.7% | 3,781 | 362.6% |
| **General Labour** | 807 | 0 | 0.0% | 807 | 1,053 | 30.4% | 1,387 | 71.8% | 1,630 | 101.9% | 3,881 | 380.8% |
| **Other Employees** | 579 | 53 | 9.1% | 632 | 756 | 19.6% | 997 | 57.7% | 1,176 | 86.1% | 2,788 | 340.9% |
| **Administrative workers** | 327 | 12 | 3.7% | 340 | 426 | 25.5% | 561 | 65.1% | 664 | 95.4% | 1,583 | 366.0% |
| **Total** | **7,838** | **1,327** | **16.9%** | **9,165** | **10,240** | **11.7%** | **13,449** | **46.7%** | **15,836** | **72.8%** | **37,673** | **311.0%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 329 | 44 | 13.5% | 373 | 430 | 15.1% | 563 | 50.8% | 666 | 78.3% | 1,584 | 324.1% |
| **Snr Management SME** | 603 | 42 | 7.0% | 645 | 787 | 22.0% | 1,039 | 61.1% | 1,223 | 89.5% | 2,903 | 349.8% |
| **Supervisory** | 675 | 47 | 7.0% | 722 | 884 | 22.5% | 1,159 | 60.5% | 1,364 | 88.9% | 3,239 | 348.6% |
| **Middle / Junior Management** | 658 | 45 | 6.8% | 704 | 860 | 22.2% | 1,129 | 60.5% | 1,328 | 88.8% | 3,164 | 349.8% |
| **Designer / Developer** | 137 | 18 | 13.4% | 155 | 178 | 14.8% | 235 | 51.7% | 276 | 78.1% | 654 | 322.8% |
| **Clerical** | 353 | 0 | 0.1% | 354 | 462 | 30.7% | 609 | 72.0% | 715 | 102.0% | 1,692 | 378.1% |
| **Self Employed** | 178 | 12 | 6.8% | 190 | 232 | 22.5% | 304 | 60.3% | 360 | 89.7% | 853 | 350.0% |
| **Advisor or Agent** | 231 | 16 | 6.7% | 246 | 303 | 22.9% | 396 | 60.8% | 463 | 88.1% | 1,110 | 351.1% |
| **Educator** | 14 | 1 | 6.5% | 15 | 19 | 23.7% | 24 | 62.5% | 29 | 90.4% | 68 | 351.6% |
| **Specialist or Consultant** | 363 | 8 | 2.1% | 371 | 474 | 27.9% | 622 | 67.9% | 734 | 98.1% | 1,739 | 369.0% |
| **Editor** | 37 | 0 | 1.3% | 38 | 49 | 29.7% | 64 | 70.8% | 75 | 98.4% | 179 | 374.6% |
| **Industrial Researchers** | 311 | 10 | 3.3% | 321 | 405 | 26.1% | 534 | 66.1% | 627 | 95.2% | 1,493 | 364.7% |
| **Scientist** | 60 | 8 | 13.4% | 67 | 78 | 15.0% | 102 | 51.6% | 120 | 77.8% | 287 | 325.4% |
| **Maintenance Engineer** | 829 | 34 | 4.1% | 863 | 1,084 | 25.7% | 1,421 | 64.7% | 1,672 | 93.8% | 3,985 | 362.0% |
| **Civil Engineer** | 123 | 17 | 13.6% | 140 | 161 | 14.7% | 211 | 50.5% | 249 | 77.6% | 593 | 323.4% |
| **Production Engineer** | 141 | 29 | 20.3% | 169 | 184 | 8.5% | 240 | 41.9% | 285 | 68.1% | 678 | 300.3% |
| **Power distribution Engineer** | 403 | 85 | 20.9% | 488 | 529 | 8.3% | 692 | 41.9% | 816 | 67.2% | 1,939 | 297.3% |
| **Construction Engineer** | 167 | 17 | 10.3% | 185 | 219 | 18.7% | 287 | 55.7% | 338 | 83.0% | 802 | 334.8% |
| **Sales Exec** | 325 | 22 | 6.8% | 347 | 428 | 23.3% | 556 | 60.1% | 655 | 88.9% | 1,567 | 351.5% |
| **Marketing Personnel** | 314 | 21 | 6.8% | 335 | 411 | 22.5% | 539 | 60.7% | 635 | 89.3% | 1,512 | 350.8% |
| **General Semi Skilled Worker** | 750 | 10 | 1.4% | 760 | 980 | 29.0% | 1,286 | 69.2% | 1,513 | 99.1% | 3,603 | 374.2% |
| **General Labour** | 466 | 0 | 0.0% | 466 | 609 | 30.8% | 798 | 71.3% | 941 | 102.2% | 2,238 | 380.7% |
| **Other Employees** | 949 | 33 | 3.5% | 982 | 1,236 | 25.9% | 1,627 | 65.7% | 1,918 | 95.3% | 4,561 | 364.6% |
| **Administrative workers** | 442 | 6 | 1.4% | 448 | 579 | 29.1% | 761 | 69.7% | 889 | 98.3% | 2,117 | 372.3% |
| **Total** | **8,858** | **526** | **5.9%** | **9,384** | **11,579** | **23.4%** | **15,198** | **62.0%** | **17,890** | **90.6%** | **42,562** | **353.6%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 485 | 45 | 9.2% | 530 | 635 | 19.8% | 835 | 57.4% | 978 | 84.5% | 2,328 | 339.2% |
| **Snr Management SME** | 824 | 38 | 4.6% | 862 | 1,082 | 25.5% | 1,423 | 65.0% | 1,664 | 93.0% | 3,972 | 360.6% |
| **Supervisory** | 859 | 38 | 4.5% | 898 | 1,114 | 24.1% | 1,473 | 64.1% | 1,738 | 93.5% | 4,136 | 360.7% |
| **Middle / Junior Management** | 826 | 36 | 4.4% | 862 | 1,078 | 25.2% | 1,414 | 64.1% | 1,672 | 94.1% | 3,955 | 359.0% |
| **Designer / Developer** | 192 | 18 | 9.3% | 210 | 252 | 19.9% | 330 | 57.2% | 388 | 84.8% | 924 | 339.9% |
| **Clerical** | 425 | 0 | 0.1% | 425 | 555 | 30.6% | 731 | 72.1% | 855 | 101.2% | 2,042 | 380.5% |
| **Self Employed** | 225 | 10 | 4.5% | 236 | 292 | 24.1% | 388 | 64.8% | 456 | 93.6% | 1,083 | 360.0% |
| **Advisor or Agent** | 30 | 1 | 4.6% | 32 | 40 | 25.1% | 52 | 63.6% | 61 | 92.2% | 145 | 358.1% |
| **Educator** | 1 | 0 | 4.6% | 1 | 1 | 24.6% | 2 | 64.7% | 2 | 92.9% | 4 | 361.4% |
| **Specialist or Consultant** | 473 | 6 | 1.4% | 480 | 622 | 29.8% | 811 | 69.0% | 954 | 99.0% | 2,285 | 376.3% |
| **Editor** | 15 | 0 | 0.9% | 15 | 19 | 29.4% | 25 | 69.2% | 30 | 100.4% | 70 | 372.8% |
| **Industrial Researchers** | 36 | 1 | 2.3% | 37 | 47 | 27.5% | 61 | 67.4% | 73 | 97.9% | 172 | 369.5% |
| **Scientist** | 16 | 1 | 9.4% | 17 | 20 | 19.0% | 27 | 56.1% | 32 | 85.7% | 75 | 337.5% |
| **Maintenance Engineer** | 1,145 | 31 | 2.7% | 1,176 | 1,492 | 26.9% | 1,967 | 67.3% | 2,319 | 97.2% | 5,491 | 367.0% |
| **Civil Engineer** | 135 | 12 | 9.2% | 148 | 176 | 19.4% | 232 | 57.3% | 273 | 85.1% | 649 | 339.5% |
| **Production Engineer** | 246 | 34 | 13.6% | 280 | 320 | 14.5% | 423 | 51.1% | 498 | 77.9% | 1,184 | 323.2% |
| **Power distribution Engineer** | 537 | 74 | 13.9% | 611 | 704 | 15.2% | 920 | 50.5% | 1,085 | 77.7% | 2,579 | 322.2% |
| **Construction Engineer** | 203 | 14 | 6.8% | 217 | 265 | 22.4% | 349 | 60.9% | 409 | 88.8% | 976 | 350.2% |
| **Sales Exec** | 365 | 17 | 4.6% | 382 | 482 | 25.9% | 630 | 64.9% | 736 | 92.4% | 1,767 | 362.2% |
| **Marketing Personnel** | 367 | 17 | 4.6% | 384 | 483 | 25.7% | 633 | 64.5% | 739 | 92.3% | 1,767 | 359.5% |
| **General Semi Skilled Worker** | 988 | 9 | 0.9% | 997 | 1,292 | 29.6% | 1,696 | 70.1% | 1,995 | 100.1% | 4,755 | 377.0% |
| **General Labour** | 513 | 0 | 0.0% | 513 | 673 | 31.1% | 879 | 71.3% | 1,035 | 101.8% | 2,464 | 380.3% |
| **Other Employees** | 1,162 | 26 | 2.3% | 1,188 | 1,520 | 27.9% | 1,978 | 66.4% | 2,352 | 97.9% | 5,585 | 370.0% |
| **Administrative workers** | 509 | 5 | 0.9% | 514 | 664 | 29.3% | 871 | 69.6% | 1,027 | 100.0% | 2,448 | 376.8% |
| **Total** | **10,578** | **435** | **4.1%** | **11,013** | **13,829** | **25.6%** | **18,149** | **64.8%** | **21,371** | **94.1%** | **50,856** | **361.8%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 829 | 111 | 13.4% | 940 | 1,084 | 15.3% | 1,417 | 50.8% | 1,673 | 78.0% | 3,978 | 323.2% |
| **Snr Management SME** | 2,566 | 179 | 7.0% | 2,746 | 3,363 | 22.5% | 4,391 | 59.9% | 5,180 | 88.7% | 12,257 | 346.4% |
| **Supervisory** | 2,630 | 181 | 6.9% | 2,811 | 3,425 | 21.9% | 4,498 | 60.0% | 5,345 | 90.2% | 12,664 | 350.5% |
| **Middle / Junior Management** | 2,565 | 175 | 6.8% | 2,740 | 3,342 | 22.0% | 4,399 | 60.6% | 5,142 | 87.7% | 12,368 | 351.4% |
| **Designer / Developer** | 123 | 17 | 13.8% | 140 | 162 | 15.2% | 211 | 50.1% | 249 | 77.2% | 595 | 323.5% |
| **Clerical** | 1,310 | 2 | 0.1% | 1,312 | 1,715 | 30.7% | 2,248 | 71.3% | 2,654 | 102.2% | 6,298 | 379.9% |
| **Self Employed** | 201 | 13 | 6.4% | 214 | 264 | 23.5% | 346 | 61.8% | 404 | 89.0% | 962 | 349.8% |
| **Advisor or Agent** | 22 | 1 | 6.8% | 23 | 28 | 21.0% | 38 | 61.9% | 44 | 89.5% | 106 | 352.9% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 1,179 | 24 | 2.1% | 1,203 | 1,539 | 27.9% | 2,017 | 67.7% | 2,394 | 99.0% | 5,646 | 369.4% |
| **Editor** | 3 | 0 | 1.3% | 3 | 4 | 29.9% | 5 | 72.8% | 6 | 99.5% | 14 | 365.2% |
| **Industrial Researchers** | 29 | 1 | 3.5% | 30 | 37 | 25.8% | 50 | 67.6% | 57 | 92.1% | 137 | 363.4% |
| **Scientist** | 6 | 1 | 13.5% | 7 | 8 | 17.2% | 10 | 51.9% | 12 | 76.6% | 28 | 332.8% |
| **Maintenance Engineer** | 3,003 | 125 | 4.2% | 3,128 | 3,924 | 25.4% | 5,153 | 64.7% | 6,088 | 94.6% | 14,406 | 360.5% |
| **Civil Engineer** | 97 | 13 | 13.3% | 110 | 128 | 15.8% | 166 | 51.0% | 197 | 78.4% | 468 | 324.7% |
| **Production Engineer** | 436 | 88 | 20.2% | 524 | 570 | 8.7% | 751 | 43.3% | 880 | 67.9% | 2,102 | 301.1% |
| **Power distribution Engineer** | 1,359 | 271 | 20.0% | 1,631 | 1,784 | 9.4% | 2,330 | 42.9% | 2,773 | 70.0% | 6,533 | 300.6% |
| **Construction Engineer** | 297 | 30 | 10.3% | 327 | 390 | 19.1% | 508 | 55.3% | 602 | 84.0% | 1,428 | 336.4% |
| **Sales Exec** | 1,171 | 79 | 6.8% | 1,250 | 1,527 | 22.2% | 2,010 | 60.8% | 2,371 | 89.7% | 5,641 | 351.3% |
| **Marketing Personnel** | 1,201 | 81 | 6.7% | 1,281 | 1,560 | 21.7% | 2,068 | 61.4% | 2,404 | 87.6% | 5,784 | 351.5% |
| **General Semi Skilled Worker** | 2,692 | 37 | 1.4% | 2,729 | 3,514 | 28.8% | 4,625 | 69.4% | 5,449 | 99.6% | 13,021 | 377.1% |
| **General Labour** | 3,185 | 0 | 0.0% | 3,185 | 4,180 | 31.2% | 5,472 | 71.8% | 6,422 | 101.6% | 15,330 | 381.3% |
| **Other Employees** | 3,695 | 126 | 3.4% | 3,821 | 4,823 | 26.2% | 6,353 | 66.3% | 7,457 | 95.2% | 17,836 | 366.8% |
| **Administrative workers** | 1,403 | 19 | 1.3% | 1,421 | 1,836 | 29.2% | 2,404 | 69.1% | 2,826 | 98.8% | 6,770 | 376.3% |
| **Total** | **30,001** | **1,575** | **5.3%** | **31,577** | **39,207** | **24.2%** | **51,470** | **63.0%** | **60,627** | **92.0%** | **144,371** | **357.2%** |

# Black Country LEP

## Alternative Fuel Vehicle

| | Alternative Fuel Vehicle | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 7 | 4 | 47.7% | 11 | 10 | -10.8% | 13 | 16.2% | 15 | 39.1% | 36 | 229.4% |
| **Snr Management SME** | 12 | 3 | 24.2% | 15 | 15 | 4.1% | 20 | 37.3% | 24 | 59.8% | 57 | 285.3% |
| **Supervisory** | 14 | 3 | 21.9% | 18 | 19 | 6.7% | 25 | 40.7% | 30 | 68.0% | 69 | 293.7% |
| **Middle / Junior Management** | 16 | 3 | 21.4% | 19 | 21 | 8.3% | 27 | 40.8% | 32 | 69.0% | 75 | 292.7% |
| **Designer / Developer** | 2 | 1 | 43.2% | 2 | 2 | -10.2% | 3 | 20.9% | 3 | 43.7% | 8 | 238.2% |
| **Clerical** | 9 | 0 | 0.5% | 10 | 12 | 29.3% | 16 | 72.1% | 19 | 98.2% | 45 | 374.6% |
| **Self Employed** | 9 | 2 | 23.3% | 11 | 12 | 3.8% | 15 | 36.8% | 18 | 63.6% | 43 | 285.7% |
| **Advisor or Agent** | 16 | 4 | 21.7% | 20 | 21 | 6.5% | 28 | 41.4% | 33 | 66.8% | 78 | 292.9% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 2 | 0 | 7.0% | 2 | 3 | 23.4% | 4 | 62.1% | 5 | 92.3% | 11 | 347.5% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 28 | 3 | 11.4% | 31 | 36 | 17.3% | 48 | 55.6% | 56 | 82.1% | 130 | 323.5% |
| **Scientist** | 3 | 1 | 44.2% | 4 | 4 | -9.2% | 5 | 21.3% | 6 | 39.4% | 14 | 233.0% |
| **Maintenance Engineer** | 22 | 3 | 14.9% | 25 | 29 | 15.1% | 38 | 48.2% | 46 | 79.4% | 108 | 324.1% |
| **Civil Engineer** | 4 | 2 | 45.6% | 5 | 5 | -12.9% | 6 | 15.4% | 8 | 38.1% | 18 | 226.9% |
| **Production Engineer** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Power distribution Engineer** | 4 | 3 | 69.8% | 6 | 5 | -23.2% | 6 | 1.3% | 8 | 20.6% | 18 | 185.5% |
| **Construction Engineer** | 3 | 1 | 36.9% | 5 | 4 | -5.9% | 6 | 26.2% | 7 | 49.8% | 17 | 251.3% |
| **Sales Exec** | 19 | 4 | 20.0% | 22 | 25 | 10.1% | 32 | 44.9% | 38 | 71.9% | 89 | 299.8% |
| **Marketing Personnel** | 19 | 4 | 22.2% | 23 | 24 | 4.8% | 31 | 38.8% | 37 | 63.2% | 89 | 294.3% |
| **General Semi Skilled Worker** | 16 | 1 | 4.2% | 16 | 21 | 24.8% | 27 | 66.4% | 32 | 95.8% | 77 | 368.0% |
| **General Labour** | 28 | 0 | 0.0% | 28 | 36 | 30.6% | 48 | 73.8% | 57 | 103.7% | 136 | 386.6% |
| **Other Employees** | 16 | 2 | 11.7% | 18 | 21 | 17.0% | 28 | 54.2% | 33 | 82.9% | 75 | 320.5% |
| **Administrative workers** | 13 | 1 | 4.3% | 14 | 17 | 25.7% | 23 | 64.8% | 27 | 95.6% | 63 | 356.9% |
| **Total** | **262** | **44** | **16.7%** | **306** | **342** | **11.7%** | **451** | **47.4%** | **533** | **74.3%** | **1,257** | **311.1%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 53 | 19 | 36.3% | 73 | 69 | -4.9% | 91 | 24.3% | 108 | 47.7% | 258 | 253.3% |
| Snr Management SME | 43 | 8 | 18.4% | 51 | 56 | 9.9% | 75 | 47.8% | 86 | 69.4% | 205 | 305.0% |
| Supervisory | 49 | 9 | 18.2% | 58 | 64 | 10.0% | 85 | 45.9% | 98 | 69.5% | 236 | 306.1% |
| Middle / Junior Management | 54 | 11 | 19.7% | 65 | 71 | 10.7% | 93 | 43.3% | 110 | 70.9% | 257 | 297.7% |
| Designer / Developer | 9 | 3 | 37.7% | 12 | 11 | -4.3% | 15 | 21.6% | 18 | 49.4% | 42 | 248.2% |
| Clerical | 27 | 0 | 0.4% | 27 | 35 | 31.3% | 45 | 69.3% | 54 | 101.8% | 128 | 378.2% |
| Self Employed | 14 | 3 | 18.5% | 16 | 18 | 12.0% | 24 | 47.8% | 28 | 72.1% | 67 | 312.1% |
| Advisor or Agent | 1 | 0 | 17.3% | 1 | 1 | 11.5% | 2 | 42.9% | 2 | 68.5% | 5 | 311.5% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 41 | 2 | 5.4% | 43 | 54 | 25.0% | 69 | 60.3% | 82 | 89.1% | 201 | 365.0% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 20 | 2 | 9.9% | 22 | 25 | 14.1% | 35 | 60.3% | 40 | 82.8% | 95 | 339.9% |
| Scientist | 38 | 12 | 31.6% | 51 | 50 | -0.2% | 67 | 32.2% | 78 | 53.5% | 180 | 256.9% |
| Maintenance Engineer | 70 | 8 | 11.5% | 78 | 93 | 18.5% | 120 | 53.4% | 142 | 81.6% | 333 | 325.9% |
| Civil Engineer | 0 | 0 | 36.6% | 0 | 0 | -6.9% | 0 | 26.2% | 1 | 47.9% | 1 | 254.0% |
| Production Engineer | 34 | 17 | 50.3% | 51 | 44 | -13.9% | 61 | 19.2% | 66 | 30.1% | 156 | 205.4% |
| Power distribution Engineer | 13 | 7 | 52.4% | 20 | 17 | -14.7% | 23 | 12.1% | 27 | 31.7% | 63 | 211.6% |
| Construction Engineer | 0 | 0 | 26.9% | 0 | 0 | 1.2% | 0 | 34.3% | 1 | 60.9% | 1 | 276.2% |
| Sales Exec | 56 | 11 | 20.0% | 67 | 73 | 9.3% | 94 | 39.8% | 112 | 67.2% | 265 | 294.0% |
| Marketing Personnel | 56 | 11 | 18.7% | 67 | 73 | 10.3% | 97 | 45.4% | 112 | 67.8% | 269 | 304.5% |
| General Semi Skilled Worker | 73 | 3 | 3.8% | 76 | 94 | 24.1% | 121 | 60.2% | 146 | 92.8% | 342 | 351.9% |
| General Labour | 110 | 0 | 0.0% | 110 | 147 | 34.1% | 189 | 72.5% | 220 | 101.1% | 517 | 372.2% |
| Other Employees | 49 | 4 | 8.9% | 53 | 63 | 18.9% | 83 | 57.2% | 99 | 87.6% | 232 | 337.2% |
| Administrative workers | 36 | 1 | 4.0% | 38 | 47 | 25.7% | 62 | 65.0% | 72 | 92.3% | 170 | 352.1% |
| **Total** | **846** | **132** | **15.6%** | **978** | **1,108** | **13.4%** | **1,450** | **48.3%** | **1,702** | **74.0%** | **4,024** | **311.5%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 30 | 7 | 22.7% | 37 | 39 | 6.7% | 51 | 38.3% | 61 | 64.5% | 146 | 295.3% |
| Snr Management SME | 115 | 13 | 11.8% | 128 | 151 | 17.7% | 196 | 53.2% | 231 | 80.4% | 551 | 330.5% |
| Supervisory | 106 | 13 | 12.3% | 119 | 138 | 16.3% | 183 | 54.0% | 213 | 79.4% | 516 | 333.6% |
| Middle / Junior Management | 116 | 13 | 11.4% | 130 | 152 | 17.4% | 198 | 52.8% | 231 | 78.4% | 557 | 329.4% |
| Designer / Developer | 12 | 3 | 25.8% | 15 | 16 | 5.5% | 21 | 37.1% | 25 | 60.6% | 59 | 283.1% |
| Clerical | 58 | 0 | 0.3% | 58 | 76 | 32.1% | 101 | 74.2% | 118 | 103.7% | 285 | 393.9% |
| Self Employed | 6 | 1 | 12.2% | 6 | 7 | 16.7% | 10 | 57.2% | 12 | 83.3% | 28 | 334.1% |
| Advisor or Agent | 2 | 0 | 10.9% | 2 | 2 | 17.2% | 3 | 54.4% | 4 | 82.5% | 8 | 329.8% |
| Educator | 0 | 0 | 12.5% | 0 | 0 | 20.0% | 0 | 56.3% | 0 | 81.0% | 0 | 301.5% |
| Specialist or Consultant | 64 | 2 | 3.7% | 67 | 85 | 27.1% | 109 | 63.7% | 128 | 92.1% | 312 | 367.0% |
| Editor | 2 | 0 | 2.4% | 2 | 2 | 27.7% | 3 | 68.8% | 4 | 98.9% | 9 | 373.3% |
| Industrial Researchers | 2 | 0 | 5.8% | 3 | 3 | 23.4% | 4 | 61.4% | 5 | 92.0% | 12 | 345.7% |
| Scientist | 4 | 1 | 20.9% | 5 | 5 | 9.2% | 7 | 41.3% | 8 | 63.0% | 18 | 287.5% |
| Maintenance Engineer | 117 | 8 | 7.0% | 126 | 153 | 21.4% | 202 | 60.3% | 238 | 89.3% | 557 | 343.3% |
| Civil Engineer | 2 | 1 | 23.4% | 3 | 3 | 5.0% | 4 | 38.6% | 4 | 62.7% | 10 | 289.1% |
| Production Engineer | 16 | 5 | 33.8% | 22 | 21 | -4.0% | 28 | 28.4% | 32 | 49.6% | 76 | 250.0% |
| Power distribution Engineer | 62 | 23 | 37.0% | 85 | 81 | -4.5% | 106 | 25.5% | 125 | 47.1% | 297 | 249.7% |
| Construction Engineer | 2 | 0 | 17.0% | 2 | 2 | 11.8% | 3 | 46.1% | 4 | 72.3% | 9 | 313.3% |
| Sales Exec | 58 | 7 | 11.2% | 65 | 77 | 18.6% | 99 | 52.2% | 117 | 80.4% | 284 | 338.3% |
| Marketing Personnel | 59 | 7 | 11.4% | 66 | 77 | 17.6% | 100 | 52.7% | 118 | 80.5% | 280 | 327.3% |
| General Semi Skilled Worker | 119 | 3 | 2.4% | 121 | 156 | 28.6% | 201 | 65.3% | 240 | 97.2% | 565 | 365.4% |
| General Labour | 135 | 0 | 0.0% | 135 | 176 | 30.7% | 232 | 71.8% | 268 | 99.0% | 644 | 377.1% |
| Other Employees | 151 | 9 | 6.3% | 160 | 199 | 24.3% | 261 | 63.0% | 301 | 88.0% | 721 | 350.6% |
| Administrative workers | 59 | 1 | 2.5% | 60 | 76 | 25.7% | 100 | 66.2% | 117 | 94.8% | 286 | 375.9% |
| **Total** | **1,296** | **118** | **9.1%** | **1,415** | **1,699** | **20.1%** | **2,221** | **57.0%** | **2,603** | **84.0%** | **6,230** | **340.3%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 57 | 8 | 13.5% | 65 | 75 | 15.6% | 98 | 51.6% | 114 | 75.4% | 271 | 318.5% |
| Snr Management SME | 133 | 9 | 6.9% | 142 | 174 | 22.8% | 229 | 61.0% | 272 | 91.8% | 638 | 349.7% |
| Supervisory | 121 | 8 | 6.8% | 129 | 160 | 23.5% | 209 | 61.8% | 245 | 89.6% | 587 | 354.5% |
| Middle / Junior Management | 134 | 9 | 6.7% | 143 | 176 | 23.5% | 228 | 59.6% | 271 | 89.6% | 645 | 351.6% |
| Designer / Developer | 14 | 2 | 13.5% | 16 | 19 | 13.8% | 25 | 50.9% | 29 | 78.8% | 69 | 323.6% |
| Clerical | 68 | 0 | 0.1% | 68 | 89 | 29.6% | 116 | 70.2% | 138 | 101.4% | 325 | 374.5% |
| Self Employed | 15 | 1 | 7.0% | 16 | 20 | 21.9% | 26 | 61.5% | 30 | 89.1% | 72 | 348.4% |
| Advisor or Agent | 18 | 1 | 6.9% | 19 | 24 | 25.5% | 31 | 61.7% | 36 | 91.9% | 86 | 354.0% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 73 | 2 | 2.1% | 75 | 95 | 27.3% | 124 | 65.4% | 148 | 97.7% | 356 | 374.5% |
| Editor | 1 | 0 | 1.4% | 1 | 1 | 29.4% | 1 | 70.5% | 1 | 94.9% | 3 | 372.4% |
| Industrial Researchers | 36 | 1 | 3.6% | 37 | 47 | 26.1% | 61 | 65.8% | 72 | 95.3% | 170 | 358.7% |
| Scientist | 5 | 1 | 14.1% | 6 | 7 | 14.5% | 9 | 50.8% | 10 | 75.4% | 25 | 317.6% |
| Maintenance Engineer | 140 | 6 | 4.2% | 146 | 180 | 23.2% | 240 | 63.8% | 283 | 93.5% | 688 | 369.9% |
| Civil Engineer | 10 | 1 | 13.1% | 11 | 12 | 15.2% | 17 | 53.7% | 19 | 80.0% | 45 | 322.1% |
| Production Engineer | 16 | 3 | 21.1% | 19 | 21 | 8.9% | 28 | 44.2% | 32 | 65.9% | 76 | 292.1% |
| Power distribution Engineer | 78 | 15 | 19.3% | 93 | 102 | 8.9% | 134 | 43.2% | 160 | 71.6% | 372 | 298.0% |
| Construction Engineer | 14 | 1 | 9.7% | 15 | 17 | 16.5% | 23 | 55.9% | 27 | 81.6% | 66 | 339.7% |
| Sales Exec | 66 | 4 | 6.6% | 70 | 86 | 22.3% | 115 | 63.4% | 135 | 92.7% | 318 | 353.3% |
| Marketing Personnel | 66 | 5 | 6.9% | 71 | 87 | 22.9% | 114 | 61.4% | 133 | 88.3% | 317 | 348.9% |
| General Semi Skilled Worker | 144 | 2 | 1.4% | 146 | 188 | 28.4% | 251 | 71.4% | 290 | 97.9% | 684 | 367.3% |
| General Labour | 294 | 0 | 0.0% | 294 | 384 | 30.7% | 506 | 72.0% | 593 | 101.6% | 1,428 | 385.5% |
| Other Employees | 160 | 5 | 3.3% | 165 | 206 | 24.6% | 273 | 64.8% | 324 | 95.8% | 764 | 361.6% |
| Administrative workers | 79 | 1 | 1.4% | 80 | 103 | 29.1% | 136 | 70.8% | 160 | 100.3% | 375 | 370.6% |
| **Total** | **1,742** | **86** | **4.9%** | **1,828** | **2,273** | **24.3%** | **2,993** | **63.7%** | **3,524** | **92.8%** | **8,380** | **358.3%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 9 | 4 | 46.5% | 13 | 12 | -11.0% | 15 | 16.5% | 18 | 38.4% | 43 | 229.4% |
| **Snr Management SME** | 16 | 4 | 22.9% | 19 | 20 | 6.7% | 27 | 40.6% | 32 | 68.2% | 76 | 295.8% |
| **Supervisory** | 15 | 4 | 24.4% | 19 | 20 | 4.6% | 27 | 39.3% | 31 | 62.2% | 74 | 285.2% |
| **Middle / Junior Management** | 17 | 4 | 22.6% | 20 | 22 | 7.1% | 28 | 39.3% | 33 | 63.3% | 80 | 292.3% |
| **Designer / Developer** | 4 | 2 | 46.4% | 6 | 5 | -10.7% | 7 | 17.2% | 8 | 36.4% | 19 | 221.1% |
| **Clerical** | 8 | 0 | 0.5% | 8 | 11 | 31.2% | 14 | 69.4% | 17 | 100.1% | 41 | 380.0% |
| **Self Employed** | 4 | 1 | 23.3% | 5 | 5 | 6.2% | 7 | 39.7% | 8 | 60.7% | 19 | 288.5% |
| **Advisor or Agent** | 4 | 1 | 24.1% | 4 | 5 | 6.4% | 6 | 39.1% | 7 | 66.9% | 17 | 290.2% |
| **Educator** | 0 | 0 | 24.2% | 0 | 0 | 7.7% | 0 | 34.1% | 0 | 60.8% | 1 | 286.8% |
| **Specialist or Consultant** | 10 | 1 | 6.9% | 10 | 12 | 21.8% | 16 | 59.4% | 19 | 85.9% | 46 | 352.4% |
| **Editor** | 2 | 0 | 4.2% | 2 | 2 | 28.1% | 3 | 63.2% | 4 | 95.8% | 8 | 360.5% |
| **Industrial Researchers** | 3 | 0 | 11.6% | 4 | 4 | 17.2% | 6 | 52.3% | 7 | 80.8% | 17 | 332.7% |
| **Scientist** | 2 | 1 | 44.7% | 3 | 3 | -9.3% | 3 | 18.4% | 4 | 39.3% | 9 | 232.1% |
| **Maintenance Engineer** | 21 | 3 | 14.2% | 24 | 28 | 14.5% | 36 | 50.5% | 43 | 77.5% | 100 | 314.8% |
| **Civil Engineer** | 4 | 2 | 46.5% | 5 | 5 | -11.0% | 6 | 18.4% | 7 | 39.1% | 17 | 221.5% |
| **Production Engineer** | 3 | 2 | 66.2% | 6 | 5 | -21.3% | 6 | 2.5% | 7 | 20.9% | 17 | 186.5% |
| **Power distribution Engineer** | 11 | 8 | 70.9% | 18 | 14 | -24.9% | 18 | 1.8% | 21 | 18.3% | 51 | 179.5% |
| **Construction Engineer** | 4 | 1 | 35.0% | 5 | 5 | -3.1% | 6 | 27.7% | 7 | 51.1% | 17 | 253.5% |
| **Sales Exec** | 11 | 2 | 23.5% | 13 | 14 | 7.1% | 18 | 39.8% | 21 | 64.7% | 51 | 295.3% |
| **Marketing Personnel** | 10 | 2 | 24.2% | 12 | 13 | 4.3% | 17 | 39.1% | 20 | 63.4% | 47 | 287.0% |
| **General Semi Skilled Worker** | 20 | 1 | 4.5% | 21 | 26 | 26.1% | 34 | 63.2% | 39 | 90.5% | 94 | 355.4% |
| **General Labour** | 33 | 0 | 0.0% | 33 | 43 | 30.7% | 56 | 72.2% | 67 | 103.8% | 155 | 374.0% |
| **Other Employees** | 21 | 2 | 11.7% | 23 | 27 | 16.5% | 36 | 55.0% | 41 | 78.0% | 100 | 335.5% |
| **Administrative workers** | 11 | 0 | 4.6% | 11 | 14 | 25.5% | 18 | 64.9% | 22 | 94.7% | 51 | 360.0% |
| **Total** | **239** | **45** | **18.9%** | **285** | **313** | **10.0%** | **412** | **44.6%** | **484** | **69.9%** | **1,149** | **303.3%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 15 | 7 | 45.7% | 22 | 20 | -9.3% | 26 | 16.8% | 30 | 37.9% | 73 | 233.6% |
| Snr Management SME | 55 | 13 | 22.7% | 67 | 71 | 5.6% | 94 | 38.8% | 111 | 64.5% | 266 | 293.6% |
| Supervisory | 52 | 12 | 22.8% | 63 | 67 | 6.5% | 88 | 38.3% | 104 | 65.0% | 250 | 294.6% |
| Middle / Junior Management | 56 | 12 | 21.8% | 68 | 74 | 9.5% | 95 | 40.4% | 113 | 66.8% | 269 | 296.1% |
| Designer / Developer | 6 | 3 | 45.1% | 8 | 8 | -9.0% | 10 | 17.9% | 12 | 41.0% | 28 | 232.5% |
| Clerical | 28 | 0 | 0.5% | 28 | 36 | 29.3% | 48 | 71.3% | 57 | 103.0% | 133 | 377.9% |
| Self Employed | 3 | 1 | 22.8% | 4 | 4 | 5.4% | 5 | 40.8% | 6 | 64.2% | 15 | 292.5% |
| Advisor or Agent | 3 | 1 | 24.0% | 4 | 4 | 5.4% | 5 | 40.3% | 6 | 63.0% | 14 | 284.7% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 29 | 2 | 6.8% | 31 | 39 | 23.3% | 50 | 58.7% | 60 | 89.8% | 142 | 352.3% |
| Editor | 2 | 0 | 4.6% | 2 | 2 | 26.3% | 3 | 62.3% | 3 | 91.2% | 8 | 359.4% |
| Industrial Researchers | 2 | 0 | 11.8% | 2 | 3 | 13.2% | 4 | 54.9% | 4 | 79.3% | 11 | 331.9% |
| Scientist | 2 | 1 | 45.5% | 3 | 2 | -9.5% | 3 | 20.6% | 4 | 40.7% | 8 | 228.8% |
| Maintenance Engineer | 60 | 8 | 13.6% | 68 | 79 | 16.2% | 101 | 49.9% | 120 | 77.7% | 282 | 317.2% |
| Civil Engineer | 3 | 1 | 44.5% | 5 | 4 | -10.0% | 6 | 20.7% | 6 | 40.6% | 15 | 230.8% |
| Production Engineer | 9 | 6 | 65.7% | 15 | 12 | -19.9% | 16 | 4.0% | 18 | 21.6% | 43 | 190.4% |
| Power distribution Engineer | 32 | 20 | 64.1% | 52 | 41 | -19.8% | 55 | 5.6% | 64 | 23.5% | 152 | 193.1% |
| Construction Engineer | 2 | 1 | 34.9% | 3 | 3 | -1.8% | 4 | 26.3% | 5 | 49.2% | 12 | 258.2% |
| Sales Exec | 31 | 7 | 21.3% | 38 | 40 | 6.6% | 53 | 41.9% | 63 | 67.0% | 150 | 299.9% |
| Marketing Personnel | 30 | 7 | 22.5% | 37 | 39 | 6.2% | 52 | 40.6% | 62 | 66.8% | 146 | 294.5% |
| General Semi Skilled Worker | 60 | 3 | 4.3% | 63 | 79 | 25.7% | 103 | 64.1% | 122 | 94.1% | 289 | 359.0% |
| General Labour | 97 | 0 | 0.0% | 97 | 127 | 31.6% | 166 | 71.7% | 195 | 101.9% | 457 | 373.8% |
| Other Employees | 71 | 8 | 11.0% | 78 | 92 | 16.8% | 122 | 55.2% | 145 | 85.3% | 342 | 335.5% |
| Administrative workers | 30 | 1 | 4.4% | 31 | 39 | 25.1% | 51 | 61.4% | 61 | 93.8% | 146 | 364.3% |
| **Total** | **676** | **112** | **16.6%** | **789** | **886** | **12.4%** | **1,158** | **46.8%** | **1,372** | **74.0%** | **3,251** | **312.2%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 47 | 4 | 9.1% | 51 | 61 | 19.8% | 81 | 58.9% | 94 | 84.7% | 223 | 336.6% |
| **Snr Management SME** | 133 | 6 | 4.3% | 139 | 174 | 25.2% | 227 | 64.1% | 268 | 93.7% | 640 | 361.8% |
| **Supervisory** | 122 | 5 | 4.4% | 128 | 162 | 27.1% | 212 | 65.9% | 244 | 91.3% | 587 | 360.0% |
| **Middle / Junior Management** | 132 | 6 | 4.4% | 137 | 174 | 26.6% | 227 | 64.9% | 264 | 92.1% | 636 | 362.5% |
| **Designer / Developer** | 9 | 1 | 8.8% | 10 | 12 | 21.0% | 15 | 56.9% | 18 | 85.5% | 42 | 335.6% |
| **Clerical** | 66 | 0 | 0.1% | 67 | 88 | 31.6% | 114 | 71.5% | 132 | 98.3% | 314 | 371.3% |
| **Self Employed** | 7 | 0 | 4.5% | 7 | 9 | 25.7% | 11 | 61.1% | 14 | 93.8% | 32 | 363.6% |
| **Advisor or Agent** | 1 | 0 | 4.6% | 1 | 1 | 28.2% | 1 | 60.6% | 2 | 93.5% | 4 | 359.9% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 63 | 1 | 1.3% | 64 | 82 | 28.2% | 105 | 65.2% | 126 | 98.5% | 304 | 377.4% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 5 | 0 | 2.3% | 5 | 6 | 27.9% | 8 | 69.6% | 9 | 95.1% | 23 | 378.7% |
| **Scientist** | 0 | 0 | 8.2% | 0 | 0 | 17.3% | 0 | 56.1% | 0 | 90.5% | 1 | 344.1% |
| **Maintenance Engineer** | 139 | 4 | 2.6% | 143 | 184 | 29.1% | 242 | 69.7% | 282 | 98.0% | 672 | 371.5% |
| **Civil Engineer** | 4 | 0 | 8.8% | 4 | 5 | 18.0% | 7 | 58.5% | 8 | 85.5% | 19 | 339.9% |
| **Production Engineer** | 17 | 2 | 12.7% | 19 | 22 | 15.3% | 30 | 55.0% | 34 | 77.3% | 82 | 325.9% |
| **Power distribution Engineer** | 75 | 10 | 13.5% | 85 | 99 | 16.1% | 130 | 52.6% | 149 | 75.7% | 366 | 330.7% |
| **Construction Engineer** | 7 | 0 | 7.0% | 8 | 9 | 23.5% | 12 | 61.2% | 15 | 92.3% | 34 | 346.0% |
| **Sales Exec** | 69 | 3 | 4.4% | 72 | 90 | 23.6% | 119 | 64.0% | 140 | 92.8% | 327 | 351.3% |
| **Marketing Personnel** | 68 | 3 | 4.6% | 71 | 90 | 26.5% | 115 | 62.8% | 136 | 91.6% | 328 | 362.0% |
| **General Semi Skilled Worker** | 143 | 1 | 0.9% | 144 | 184 | 27.5% | 245 | 69.6% | 290 | 101.2% | 689 | 377.2% |
| **General Labour** | 198 | 0 | 0.0% | 198 | 259 | 30.8% | 342 | 72.7% | 401 | 102.5% | 960 | 384.8% |
| **Other Employees** | 170 | 4 | 2.3% | 174 | 227 | 30.4% | 285 | 63.7% | 345 | 98.4% | 833 | 378.9% |
| **Administrative workers** | 71 | 1 | 0.9% | 71 | 93 | 29.9% | 121 | 69.5% | 143 | 99.6% | 340 | 376.0% |
| **Total** | **1,545** | **52** | **3.4%** | **1,597** | **2,030** | **27.1%** | **2,650** | **65.9%** | **3,115** | **95.0%** | **7,455** | **366.7%** |

## Recovery and Recycling

| | Recovery and Recycling | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 37 | 14 | 37.3% | 51 | 48 | -5.1% | 63 | 24.2% | 75 | 47.4% | 177 | 249.3% |
| **Snr Management SME** | 39 | 7 | 17.9% | 46 | 51 | 11.5% | 67 | 45.4% | 78 | 69.5% | 188 | 309.8% |
| **Supervisory** | 39 | 7 | 18.0% | 46 | 51 | 11.4% | 68 | 47.0% | 80 | 74.0% | 184 | 299.4% |
| **Middle / Junior Management** | 43 | 8 | 18.5% | 51 | 56 | 9.9% | 73 | 43.4% | 86 | 70.1% | 202 | 298.6% |
| **Designer / Developer** | 28 | 10 | 37.2% | 38 | 37 | -3.6% | 48 | 25.4% | 56 | 46.8% | 133 | 251.6% |
| **Clerical** | 21 | 0 | 0.4% | 21 | 28 | 31.6% | 36 | 70.4% | 43 | 101.1% | 100 | 372.8% |
| **Self Employed** | 10 | 2 | 19.0% | 12 | 13 | 9.7% | 17 | 44.3% | 20 | 68.7% | 47 | 304.1% |
| **Advisor or Agent** | 4 | 1 | 20.3% | 4 | 5 | 10.6% | 6 | 40.8% | 7 | 69.0% | 18 | 302.5% |
| **Educator** | 0 | 0 | 20.8% | 0 | 0 | 4.0% | 0 | 42.2% | 0 | 68.9% | 1 | 299.4% |
| **Specialist or Consultant** | 35 | 2 | 5.5% | 37 | 45 | 22.4% | 59 | 60.4% | 70 | 91.3% | 168 | 357.2% |
| **Editor** | 2 | 0 | 4.1% | 2 | 2 | 26.2% | 3 | 61.4% | 4 | 94.0% | 8 | 357.5% |
| **Industrial Researchers** | 9 | 1 | 8.9% | 10 | 12 | 19.0% | 16 | 59.1% | 19 | 85.4% | 45 | 338.9% |
| **Scientist** | 9 | 3 | 36.7% | 12 | 12 | -4.0% | 15 | 25.4% | 18 | 47.1% | 43 | 255.0% |
| **Maintenance Engineer** | 54 | 6 | 10.8% | 60 | 71 | 18.3% | 93 | 54.9% | 111 | 83.7% | 261 | 333.1% |
| **Civil Engineer** | 18 | 7 | 37.6% | 24 | 23 | -4.8% | 30 | 24.4% | 36 | 46.7% | 86 | 250.5% |
| **Production Engineer** | 17 | 9 | 54.2% | 27 | 23 | -15.1% | 30 | 10.9% | 35 | 31.8% | 83 | 210.1% |
| **Power distribution Engineer** | 32 | 17 | 53.1% | 48 | 41 | -14.7% | 54 | 11.2% | 64 | 32.2% | 151 | 212.7% |
| **Construction Engineer** | 17 | 4 | 26.9% | 21 | 22 | 3.6% | 28 | 34.5% | 33 | 58.1% | 80 | 278.2% |
| **Sales Exec** | 36 | 7 | 18.5% | 43 | 47 | 11.1% | 62 | 44.7% | 73 | 70.3% | 172 | 303.0% |
| **Marketing Personnel** | 29 | 5 | 18.0% | 34 | 38 | 10.8% | 49 | 43.1% | 59 | 70.3% | 142 | 311.6% |
| **General Semi Skilled Worker** | 72 | 3 | 3.6% | 74 | 94 | 27.1% | 123 | 65.8% | 145 | 95.6% | 342 | 360.5% |
| **General Labour** | 80 | 0 | 0.0% | 80 | 103 | 29.0% | 137 | 71.3% | 162 | 102.6% | 386 | 384.5% |
| **Other Employees** | 44 | 4 | 8.9% | 48 | 59 | 21.0% | 78 | 61.4% | 88 | 81.8% | 210 | 335.1% |
| **Administrative workers** | 29 | 1 | 3.6% | 30 | 38 | 25.8% | 50 | 66.0% | 60 | 98.0% | 141 | 364.6% |
| **Total** | **703** | **117** | **16.7%** | **820** | **919** | **12.1%** | **1,205** | **46.9%** | **1,420** | **73.2%** | **3,369** | **310.6%** |

## Waste Management

| | Waste Management Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 30 | 4 | 12.8% | 34 | 39 | 15.5% | 51 | 51.7% | 60 | 77.5% | 144 | 324.3% |
| **Snr Management SME** | 50 | 3 | 6.9% | 53 | 65 | 22.8% | 84 | 57.5% | 100 | 87.7% | 237 | 346.7% |
| **Supervisory** | 53 | 4 | 6.9% | 56 | 69 | 23.2% | 89 | 57.5% | 105 | 86.5% | 255 | 352.0% |
| **Middle / Junior Management** | 58 | 4 | 7.0% | 62 | 76 | 22.4% | 99 | 59.2% | 118 | 89.9% | 284 | 357.8% |
| **Designer / Developer** | 11 | 1 | 13.4% | 13 | 15 | 15.9% | 19 | 51.5% | 22 | 77.8% | 53 | 325.0% |
| **Clerical** | 30 | 0 | 0.1% | 30 | 40 | 33.7% | 52 | 73.2% | 61 | 104.4% | 140 | 368.3% |
| **Self Employed** | 15 | 1 | 6.5% | 16 | 19 | 23.3% | 25 | 60.6% | 29 | 88.5% | 70 | 352.8% |
| **Advisor or Agent** | 19 | 1 | 7.3% | 21 | 25 | 21.2% | 33 | 60.8% | 39 | 88.4% | 93 | 351.3% |
| **Educator** | 1 | 0 | 8.1% | 1 | 2 | 25.7% | 2 | 65.0% | 2 | 83.5% | 6 | 351.1% |
| **Specialist or Consultant** | 31 | 1 | 2.1% | 31 | 40 | 27.1% | 52 | 64.9% | 61 | 95.6% | 147 | 366.9% |
| **Editor** | 4 | 0 | 1.4% | 4 | 5 | 27.0% | 6 | 72.4% | 7 | 93.8% | 17 | 376.7% |
| **Industrial Researchers** | 28 | 1 | 3.7% | 29 | 36 | 25.3% | 48 | 66.1% | 57 | 94.6% | 136 | 368.7% |
| **Scientist** | 6 | 1 | 13.6% | 6 | 8 | 16.8% | 10 | 51.8% | 11 | 77.8% | 27 | 323.1% |
| **Maintenance Engineer** | 71 | 3 | 4.0% | 74 | 93 | 25.1% | 123 | 65.4% | 146 | 96.6% | 342 | 360.3% |
| **Civil Engineer** | 12 | 2 | 13.9% | 14 | 16 | 14.6% | 21 | 49.4% | 24 | 74.4% | 58 | 319.2% |
| **Production Engineer** | 12 | 2 | 21.4% | 14 | 15 | 7.7% | 20 | 40.8% | 24 | 70.0% | 56 | 296.2% |
| **Power distribution Engineer** | 38 | 8 | 21.2% | 46 | 50 | 8.0% | 65 | 40.4% | 77 | 67.9% | 184 | 299.5% |
| **Construction Engineer** | 15 | 1 | 10.0% | 16 | 19 | 18.5% | 25 | 54.6% | 29 | 83.2% | 70 | 335.0% |
| **Sales Exec** | 29 | 2 | 7.1% | 31 | 39 | 23.0% | 50 | 60.0% | 58 | 84.4% | 140 | 344.4% |
| **Marketing Personnel** | 28 | 2 | 6.9% | 30 | 37 | 22.3% | 49 | 61.6% | 57 | 88.5% | 137 | 355.0% |
| **General Semi Skilled Worker** | 67 | 1 | 1.4% | 68 | 88 | 30.5% | 115 | 70.9% | 134 | 97.6% | 318 | 370.4% |
| **General Labour** | 44 | 0 | 0.0% | 44 | 57 | 30.7% | 75 | 70.1% | 89 | 103.1% | 209 | 376.1% |
| **Other Employees** | 82 | 3 | 3.4% | 84 | 106 | 25.8% | 140 | 65.7% | 162 | 91.6% | 387 | 358.8% |
| **Administrative workers** | 38 | 1 | 1.4% | 39 | 50 | 28.7% | 66 | 70.5% | 77 | 97.3% | 182 | 368.8% |
| **Total** | **770** | **46** | **6.0%** | **816** | **1,008** | **23.5%** | **1,318** | **61.4%** | **1,549** | **89.8%** | **3,691** | **352.2%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 45 | 4 | 9.2% | 50 | 59 | 19.9% | 78 | 57.3% | 91 | 84.2% | 218 | 339.8% |
| Snr Management SME | 70 | 3 | 4.8% | 73 | 89 | 21.5% | 119 | 63.5% | 142 | 95.1% | 337 | 362.0% |
| Supervisory | 69 | 3 | 5.0% | 72 | 90 | 24.8% | 117 | 61.7% | 141 | 94.9% | 331 | 357.9% |
| Middle / Junior Management | 74 | 3 | 4.6% | 77 | 95 | 23.1% | 128 | 65.9% | 148 | 91.6% | 353 | 355.5% |
| Designer / Developer | 16 | 1 | 9.0% | 17 | 21 | 19.2% | 28 | 58.7% | 32 | 83.8% | 77 | 344.1% |
| Clerical | 37 | 0 | 0.1% | 37 | 48 | 29.7% | 63 | 72.7% | 74 | 103.3% | 179 | 387.3% |
| Self Employed | 19 | 1 | 4.6% | 19 | 24 | 24.4% | 32 | 64.4% | 38 | 93.6% | 90 | 361.8% |
| Advisor or Agent | 3 | 0 | 4.6% | 3 | 3 | 25.0% | 5 | 63.4% | 5 | 94.3% | 13 | 361.1% |
| Educator | 0 | 0 | 4.4% | 0 | 0 | 25.7% | 0 | 65.6% | 0 | 95.1% | 0 | 357.3% |
| Specialist or Consultant | 42 | 1 | 1.4% | 42 | 54 | 28.1% | 72 | 69.1% | 84 | 99.0% | 199 | 371.5% |
| Editor | 1 | 0 | 0.8% | 1 | 2 | 31.9% | 2 | 68.5% | 3 | 104.8% | 7 | 376.9% |
| Industrial Researchers | 3 | 0 | 2.2% | 3 | 4 | 26.7% | 6 | 68.1% | 7 | 96.2% | 16 | 363.9% |
| Scientist | 2 | 0 | 9.3% | 2 | 2 | 18.9% | 3 | 56.8% | 3 | 85.7% | 7 | 341.8% |
| Maintenance Engineer | 101 | 3 | 2.8% | 103 | 131 | 26.9% | 173 | 67.3% | 202 | 95.2% | 486 | 369.3% |
| Civil Engineer | 14 | 1 | 9.4% | 15 | 18 | 18.1% | 24 | 57.1% | 28 | 84.1% | 66 | 339.1% |
| Production Engineer | 21 | 3 | 13.9% | 24 | 27 | 13.5% | 36 | 51.1% | 42 | 77.4% | 99 | 319.9% |
| Power distribution Engineer | 52 | 7 | 13.2% | 58 | 68 | 16.4% | 87 | 49.5% | 106 | 82.4% | 246 | 321.1% |
| Construction Engineer | 18 | 1 | 7.0% | 19 | 23 | 21.3% | 31 | 60.4% | 36 | 87.9% | 86 | 349.8% |
| Sales Exec | 33 | 2 | 4.7% | 35 | 44 | 26.5% | 58 | 67.4% | 67 | 92.4% | 158 | 353.1% |
| Marketing Personnel | 33 | 1 | 4.4% | 34 | 43 | 25.2% | 57 | 64.1% | 65 | 89.1% | 158 | 358.7% |
| General Semi Skilled Worker | 90 | 1 | 0.9% | 91 | 118 | 29.7% | 154 | 69.6% | 180 | 98.7% | 433 | 378.0% |
| General Labour | 50 | 0 | 0.0% | 50 | 65 | 29.7% | 86 | 70.8% | 102 | 102.8% | 242 | 379.3% |
| Other Employees | 100 | 2 | 2.3% | 102 | 130 | 27.4% | 170 | 65.7% | 201 | 96.4% | 489 | 377.1% |
| Administrative workers | 46 | 0 | 0.9% | 46 | 59 | 27.5% | 79 | 72.3% | 93 | 102.2% | 215 | 368.3% |
| **Total** | **937** | **39** | **4.2%** | **976** | **1,218** | **24.8%** | **1,607** | **64.6%** | **1,892** | **93.9%** | **4,505** | **361.6%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 74 | 10 | 14.1% | 84 | 95 | 12.9% | 127 | 50.9% | 148 | 76.6% | 351 | 318.7% |
| Snr Management SME | 206 | 14 | 7.0% | 221 | 274 | 24.2% | 351 | 58.9% | 407 | 84.4% | 998 | 351.7% |
| Supervisory | 197 | 14 | 6.9% | 210 | 256 | 21.8% | 344 | 63.3% | 399 | 89.5% | 946 | 349.5% |
| Middle / Junior Management | 214 | 15 | 7.2% | 229 | 279 | 21.7% | 369 | 61.1% | 432 | 88.5% | 1,030 | 349.9% |
| Designer / Developer | 10 | 1 | 13.1% | 11 | 13 | 17.0% | 17 | 52.5% | 19 | 76.5% | 46 | 325.8% |
| Clerical | 105 | 0 | 0.1% | 105 | 137 | 30.4% | 177 | 68.3% | 212 | 101.8% | 507 | 381.9% |
| Self Employed | 15 | 1 | 6.4% | 16 | 20 | 24.0% | 27 | 62.5% | 30 | 85.9% | 75 | 357.1% |
| Advisor or Agent | 2 | 0 | 6.4% | 2 | 2 | 19.8% | 3 | 57.0% | 4 | 95.9% | 9 | 360.8% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 98 | 2 | 2.0% | 100 | 130 | 30.3% | 165 | 65.4% | 200 | 100.3% | 470 | 370.2% |
| Editor | 0 | 0 | 1.2% | 0 | 0 | 34.5% | 1 | 77.7% | 1 | 100.4% | 1 | 373.2% |
| Industrial Researchers | 3 | 0 | 3.8% | 3 | 3 | 28.2% | 5 | 71.3% | 5 | 90.1% | 12 | 364.5% |
| Scientist | 1 | 0 | 13.2% | 1 | 1 | 16.7% | 1 | 51.2% | 1 | 73.0% | 3 | 337.7% |
| Maintenance Engineer | 249 | 10 | 4.0% | 259 | 329 | 27.2% | 427 | 65.0% | 500 | 93.4% | 1,193 | 361.4% |
| Civil Engineer | 9 | 1 | 13.7% | 10 | 12 | 14.6% | 16 | 51.5% | 19 | 78.9% | 44 | 322.5% |
| Production Engineer | 34 | 7 | 19.9% | 41 | 45 | 9.6% | 59 | 41.9% | 69 | 67.1% | 166 | 301.2% |
| Power distribution Engineer | 122 | 26 | 21.2% | 148 | 161 | 9.3% | 211 | 43.4% | 246 | 66.4% | 583 | 295.0% |
| Construction Engineer | 24 | 2 | 9.9% | 26 | 31 | 18.6% | 41 | 56.5% | 48 | 82.1% | 115 | 336.3% |
| Sales Exec | 102 | 7 | 6.5% | 109 | 132 | 21.5% | 177 | 62.6% | 208 | 91.2% | 492 | 352.3% |
| Marketing Personnel | 103 | 7 | 6.7% | 110 | 132 | 20.7% | 176 | 60.7% | 207 | 88.5% | 496 | 352.8% |
| General Semi Skilled Worker | 224 | 3 | 1.3% | 227 | 289 | 27.0% | 388 | 70.7% | 457 | 101.0% | 1,080 | 375.3% |
| General Labour | 292 | 0 | 0.0% | 292 | 379 | 30.1% | 495 | 69.6% | 590 | 102.4% | 1,399 | 379.8% |
| Other Employees | 293 | 9 | 3.2% | 303 | 380 | 25.6% | 509 | 68.3% | 595 | 96.6% | 1,415 | 367.6% |
| Administrative workers | 115 | 2 | 1.4% | 117 | 151 | 29.9% | 197 | 69.2% | 232 | 99.3% | 557 | 377.9% |
| **Total** | **2,491** | **132** | **5.3%** | **2,623** | **3,253** | **24.1%** | **4,280** | **63.2%** | **5,028** | **91.7%** | **11,988** | **357.1%** |

# Coventry and Warwickshire LEP

## Alternative Fuel Vehicle

| | Alternative Fuel Vehicle | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 11 | 5 | 43.9% | 15 | 14 | -9.2% | 18 | 18.6% | 21 | 39.5% | 50 | 232.4% |
| Snr Management SME | 22 | 5 | 22.9% | 27 | 28 | 5.2% | 38 | 39.2% | 45 | 66.1% | 105 | 290.3% |
| Supervisory | 26 | 6 | 22.2% | 32 | 34 | 6.7% | 46 | 43.9% | 54 | 67.5% | 128 | 295.9% |
| Middle / Junior Management | 25 | 6 | 23.2% | 31 | 33 | 6.6% | 44 | 39.5% | 52 | 66.5% | 122 | 290.2% |
| Designer / Developer | 2 | 1 | 44.5% | 4 | 3 | -7.5% | 4 | 19.0% | 5 | 40.4% | 12 | 233.0% |
| Clerical | 15 | 0 | 0.5% | 15 | 20 | 30.1% | 26 | 71.6% | 31 | 100.4% | 72 | 373.6% |
| Self Employed | 15 | 3 | 22.7% | 19 | 20 | 7.7% | 26 | 39.3% | 31 | 67.8% | 73 | 293.1% |
| Advisor or Agent | 26 | 6 | 23.7% | 32 | 34 | 5.1% | 45 | 40.5% | 52 | 62.5% | 123 | 285.4% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 4 | 0 | 7.6% | 4 | 5 | 24.2% | 6 | 60.9% | 7 | 84.1% | 18 | 347.7% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 42 | 5 | 11.7% | 47 | 55 | 17.7% | 71 | 52.4% | 83 | 78.7% | 200 | 329.0% |
| Scientist | 4 | 2 | 45.6% | 6 | 5 | -10.4% | 7 | 19.0% | 8 | 38.9% | 18 | 232.0% |
| Maintenance Engineer | 36 | 5 | 13.3% | 41 | 48 | 16.3% | 62 | 49.7% | 73 | 76.6% | 175 | 325.5% |
| Civil Engineer | 6 | 3 | 44.2% | 8 | 7 | -9.2% | 10 | 18.9% | 12 | 40.2% | 28 | 237.0% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 6 | 4 | 66.6% | 10 | 8 | -20.8% | 10 | 2.4% | 12 | 21.3% | 27 | 186.3% |
| Construction Engineer | 5 | 2 | 34.9% | 7 | 7 | -3.3% | 9 | 27.7% | 11 | 50.7% | 26 | 260.8% |
| Sales Exec | 28 | 6 | 21.8% | 35 | 37 | 8.1% | 48 | 40.1% | 57 | 63.8% | 141 | 306.8% |
| Marketing Personnel | 27 | 7 | 24.4% | 34 | 35 | 5.3% | 46 | 35.4% | 54 | 62.0% | 133 | 295.6% |
| General Semi Skilled Worker | 28 | 1 | 4.5% | 30 | 37 | 24.2% | 48 | 62.7% | 58 | 95.5% | 134 | 353.7% |
| General Labour | 42 | 0 | 0.0% | 42 | 54 | 30.2% | 72 | 73.2% | 85 | 103.4% | 202 | 385.6% |
| Other Employees | 29 | 3 | 11.4% | 32 | 38 | 17.5% | 50 | 53.8% | 58 | 81.6% | 140 | 334.1% |
| Administrative workers | 21 | 1 | 4.7% | 22 | 28 | 26.9% | 36 | 63.4% | 42 | 94.0% | 100 | 358.2% |
| **Total** | **420** | **70** | **16.8%** | **491** | **551** | **12.2%** | **721** | **46.8%** | **850** | **73.2%** | **2,029** | **313.2%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 71 | 26 | 36.4% | 96 | 92 | -4.2% | 124 | 28.9% | 144 | 50.2% | 338 | 251.6% |
| Snr Management SME | 74 | 14 | 18.2% | 88 | 97 | 10.3% | 127 | 44.2% | 152 | 73.1% | 361 | 310.3% |
| Supervisory | 85 | 16 | 18.2% | 101 | 111 | 9.9% | 146 | 44.7% | 173 | 71.5% | 408 | 305.8% |
| Middle / Junior Management | 82 | 15 | 18.4% | 97 | 108 | 10.9% | 139 | 43.3% | 165 | 69.8% | 394 | 305.5% |
| Designer / Developer | 13 | 5 | 37.6% | 18 | 17 | -6.3% | 22 | 22.2% | 26 | 44.8% | 62 | 250.1% |
| Clerical | 42 | 0 | 0.3% | 42 | 55 | 32.8% | 71 | 69.7% | 85 | 103.0% | 203 | 387.4% |
| Self Employed | 22 | 4 | 19.5% | 26 | 30 | 12.9% | 37 | 42.8% | 44 | 67.9% | 106 | 303.3% |
| Advisor or Agent | 2 | 0 | 17.8% | 2 | 3 | 11.9% | 3 | 45.0% | 4 | 68.8% | 9 | 307.9% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 62 | 3 | 4.9% | 65 | 82 | 26.5% | 108 | 67.4% | 124 | 92.1% | 293 | 352.9% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 29 | 3 | 8.7% | 32 | 39 | 21.6% | 49 | 55.5% | 60 | 88.8% | 139 | 337.1% |
| Scientist | 49 | 18 | 36.1% | 67 | 63 | -5.4% | 84 | 25.1% | 100 | 49.5% | 238 | 254.9% |
| Maintenance Engineer | 109 | 12 | 10.7% | 121 | 144 | 19.4% | 184 | 52.5% | 220 | 82.4% | 526 | 335.4% |
| Civil Engineer | 0 | 0 | 38.2% | 1 | 1 | -5.3% | 1 | 26.3% | 1 | 42.5% | 2 | 251.2% |
| Production Engineer | 50 | 26 | 51.3% | 76 | 66 | -13.1% | 87 | 14.5% | 103 | 36.5% | 237 | 213.5% |
| Power distribution Engineer | 19 | 10 | 52.8% | 30 | 25 | -15.0% | 34 | 13.3% | 39 | 33.3% | 91 | 208.2% |
| Construction Engineer | 0 | 0 | 24.2% | 0 | 1 | 6.1% | 1 | 39.1% | 1 | 61.6% | 2 | 289.9% |
| Sales Exec | 83 | 15 | 17.9% | 97 | 106 | 9.3% | 140 | 43.9% | 169 | 73.6% | 388 | 297.7% |
| Marketing Personnel | 80 | 15 | 18.6% | 94 | 102 | 8.1% | 136 | 44.2% | 159 | 68.5% | 386 | 309.0% |
| General Semi Skilled Worker | 122 | 4 | 3.6% | 127 | 161 | 27.0% | 210 | 65.5% | 244 | 93.1% | 596 | 371.0% |
| General Labour | 153 | 0 | 0.0% | 153 | 199 | 30.5% | 263 | 72.2% | 316 | 107.2% | 737 | 382.4% |
| Other Employees | 95 | 9 | 9.0% | 103 | 123 | 19.4% | 162 | 56.6% | 189 | 82.7% | 459 | 343.9% |
| Administrative workers | 55 | 2 | 3.4% | 57 | 72 | 26.3% | 93 | 62.9% | 110 | 93.1% | 263 | 361.2% |
| **Total** | **1,297** | **195** | **15.0%** | **1,492** | **1,696** | **13.7%** | **2,220** | **48.8%** | **2,629** | **76.2%** | **6,237** | **318.1%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 41 | 9 | 22.2% | 50 | 53 | 5.9% | 70 | 40.6% | 83 | 66.6% | 197 | 295.2% |
| Snr Management SME | 198 | 23 | 11.6% | 221 | 260 | 17.4% | 339 | 53.2% | 401 | 81.5% | 954 | 331.4% |
| Supervisory | 187 | 22 | 11.8% | 209 | 246 | 17.9% | 321 | 53.7% | 382 | 82.6% | 896 | 328.9% |
| Middle / Junior Management | 174 | 20 | 11.6% | 194 | 223 | 14.9% | 300 | 54.4% | 353 | 81.7% | 834 | 329.2% |
| Designer / Developer | 19 | 4 | 22.4% | 23 | 24 | 7.7% | 32 | 39.3% | 38 | 66.7% | 89 | 292.0% |
| Clerical | 89 | 0 | 0.2% | 89 | 118 | 32.1% | 151 | 68.9% | 180 | 101.7% | 426 | 377.6% |
| Self Employed | 9 | 1 | 11.1% | 10 | 12 | 19.9% | 16 | 52.6% | 18 | 79.4% | 43 | 321.3% |
| Advisor or Agent | 3 | 0 | 11.5% | 3 | 4 | 17.7% | 5 | 54.6% | 6 | 80.0% | 13 | 330.8% |
| Educator | 0 | 0 | 11.0% | 0 | 0 | 15.3% | 0 | 58.2% | 0 | 91.6% | 0 | 320.8% |
| Specialist or Consultant | 98 | 3 | 3.6% | 102 | 129 | 26.5% | 169 | 66.6% | 199 | 95.8% | 471 | 363.7% |
| Editor | 3 | 0 | 2.2% | 3 | 4 | 27.1% | 5 | 67.8% | 6 | 97.3% | 14 | 378.5% |
| Industrial Researchers | 4 | 0 | 5.7% | 4 | 5 | 24.1% | 6 | 63.1% | 8 | 92.4% | 18 | 353.9% |
| Scientist | 5 | 1 | 21.2% | 6 | 7 | 7.5% | 9 | 41.2% | 10 | 63.0% | 25 | 301.8% |
| Maintenance Engineer | 186 | 14 | 7.5% | 200 | 244 | 21.9% | 322 | 60.8% | 371 | 85.6% | 889 | 344.4% |
| Civil Engineer | 3 | 1 | 23.2% | 4 | 4 | 6.9% | 5 | 39.0% | 6 | 63.9% | 15 | 292.3% |
| Production Engineer | 25 | 8 | 33.5% | 33 | 33 | -1.4% | 43 | 29.4% | 51 | 52.0% | 121 | 263.9% |
| Power distribution Engineer | 93 | 31 | 32.8% | 124 | 123 | -1.0% | 159 | 28.2% | 189 | 53.1% | 437 | 253.4% |
| Construction Engineer | 3 | 0 | 17.8% | 3 | 4 | 11.0% | 5 | 45.4% | 5 | 71.5% | 13 | 306.4% |
| Sales Exec | 87 | 11 | 12.1% | 98 | 115 | 17.4% | 149 | 53.0% | 176 | 80.0% | 414 | 324.6% |
| Marketing Personnel | 82 | 10 | 12.0% | 92 | 106 | 15.0% | 141 | 53.4% | 167 | 81.5% | 393 | 327.4% |
| General Semi Skilled Worker | 201 | 5 | 2.5% | 206 | 264 | 28.1% | 351 | 70.1% | 407 | 97.4% | 966 | 368.3% |
| General Labour | 192 | 0 | 0.0% | 192 | 253 | 31.6% | 330 | 71.6% | 388 | 102.0% | 931 | 384.3% |
| Other Employees | 217 | 13 | 5.9% | 230 | 283 | 23.1% | 372 | 61.5% | 437 | 90.1% | 1,049 | 355.8% |
| Administrative workers | 90 | 2 | 2.2% | 92 | 118 | 28.4% | 154 | 67.7% | 184 | 100.7% | 427 | 365.2% |
| **Total** | **2,009** | **179** | **8.9%** | **2,188** | **2,630** | **20.2%** | **3,452** | **57.8%** | **4,066** | **85.8%** | **9,637** | **340.4%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 82 | 11 | 13.9% | 93 | 106 | 14.1% | 138 | 48.3% | 167 | 78.8% | 388 | 316.3% |
| **Snr Management SME** | 241 | 16 | 6.7% | 258 | 316 | 22.7% | 413 | 60.3% | 496 | 92.4% | 1,161 | 350.5% |
| **Supervisory** | 227 | 15 | 6.8% | 242 | 302 | 24.8% | 389 | 60.9% | 455 | 88.1% | 1,090 | 350.6% |
| **Middle / Junior Management** | 214 | 14 | 6.5% | 228 | 280 | 22.5% | 366 | 60.5% | 435 | 90.4% | 1,034 | 353.2% |
| **Designer / Developer** | 23 | 3 | 13.8% | 26 | 30 | 14.6% | 40 | 50.6% | 47 | 77.9% | 110 | 319.1% |
| **Clerical** | 111 | 0 | 0.1% | 111 | 144 | 29.5% | 190 | 70.8% | 227 | 104.1% | 533 | 379.2% |
| **Self Employed** | 26 | 2 | 6.7% | 27 | 33 | 22.4% | 44 | 61.3% | 52 | 89.8% | 124 | 353.3% |
| **Advisor or Agent** | 29 | 2 | 6.8% | 31 | 39 | 23.6% | 51 | 61.6% | 60 | 89.9% | 141 | 346.7% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 119 | 2 | 1.9% | 121 | 157 | 29.4% | 203 | 67.8% | 241 | 98.4% | 571 | 371.2% |
| **Editor** | 1 | 0 | 1.3% | 1 | 1 | 27.4% | 2 | 70.1% | 2 | 99.0% | 5 | 377.6% |
| **Industrial Researchers** | 56 | 2 | 3.3% | 58 | 73 | 25.3% | 97 | 66.6% | 114 | 96.1% | 273 | 368.0% |
| **Scientist** | 7 | 1 | 13.8% | 8 | 9 | 15.2% | 12 | 51.5% | 14 | 77.8% | 34 | 326.7% |
| **Maintenance Engineer** | 230 | 10 | 4.2% | 239 | 301 | 25.8% | 394 | 64.4% | 463 | 93.4% | 1,084 | 352.7% |
| **Civil Engineer** | 14 | 2 | 13.1% | 16 | 19 | 16.5% | 24 | 50.5% | 29 | 79.0% | 69 | 324.1% |
| **Production Engineer** | 26 | 5 | 19.6% | 31 | 34 | 9.9% | 44 | 42.1% | 52 | 69.5% | 125 | 308.8% |
| **Power distribution Engineer** | 121 | 23 | 19.3% | 145 | 160 | 10.8% | 206 | 42.0% | 246 | 70.0% | 592 | 308.9% |
| **Construction Engineer** | 22 | 2 | 10.2% | 24 | 29 | 20.3% | 37 | 55.4% | 44 | 84.2% | 103 | 331.8% |
| **Sales Exec** | 100 | 6 | 6.4% | 107 | 131 | 22.7% | 171 | 60.5% | 203 | 90.3% | 488 | 357.6% |
| **Marketing Personnel** | 96 | 7 | 6.9% | 103 | 127 | 23.7% | 166 | 61.4% | 195 | 90.5% | 457 | 345.6% |
| **General Semi Skilled Worker** | 258 | 4 | 1.4% | 261 | 339 | 29.6% | 446 | 70.5% | 517 | 97.9% | 1,238 | 373.3% |
| **General Labour** | 440 | 0 | 0.0% | 440 | 577 | 31.3% | 745 | 69.5% | 890 | 102.4% | 2,108 | 379.3% |
| **Other Employees** | 261 | 9 | 3.3% | 269 | 339 | 25.9% | 449 | 66.9% | 538 | 99.8% | 1,250 | 364.1% |
| **Administrative workers** | 124 | 2 | 1.3% | 126 | 163 | 29.3% | 214 | 69.7% | 253 | 101.0% | 594 | 372.0% |
| **Total** | **2,828** | **138** | **4.9%** | **2,966** | **3,709** | **25.0%** | **4,841** | **63.2%** | **5,739** | **93.5%** | **13,571** | **357.5%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 14 | 6 | 47.5% | 20 | 18 | -11.6% | 23 | 16.3% | 27 | 35.8% | 65 | 224.2% |
| Snr Management SME | 30 | 7 | 23.3% | 37 | 39 | 6.0% | 52 | 38.8% | 61 | 63.1% | 146 | 292.2% |
| Supervisory | 30 | 7 | 22.6% | 37 | 39 | 5.4% | 51 | 38.1% | 62 | 67.0% | 145 | 292.3% |
| Middle / Junior Management | 29 | 7 | 23.6% | 35 | 37 | 5.9% | 50 | 40.7% | 58 | 64.6% | 137 | 286.7% |
| Designer / Developer | 7 | 3 | 47.0% | 10 | 9 | -10.7% | 12 | 15.7% | 14 | 39.1% | 34 | 229.6% |
| Clerical | 15 | 0 | 0.5% | 15 | 19 | 30.7% | 25 | 69.8% | 30 | 99.4% | 71 | 378.7% |
| Self Employed | 7 | 2 | 23.8% | 9 | 9 | 6.1% | 12 | 38.9% | 14 | 61.4% | 33 | 286.6% |
| Advisor or Agent | 6 | 1 | 23.6% | 8 | 8 | 7.3% | 10 | 37.6% | 12 | 62.0% | 29 | 288.2% |
| Educator | 0 | 0 | 23.1% | 0 | 0 | 9.9% | 0 | 42.1% | 0 | 65.2% | 1 | 279.1% |
| Specialist or Consultant | 16 | 1 | 7.0% | 18 | 21 | 21.0% | 28 | 60.0% | 33 | 89.6% | 79 | 348.9% |
| Editor | 3 | 0 | 4.6% | 3 | 4 | 23.2% | 5 | 67.2% | 6 | 90.9% | 14 | 372.6% |
| Industrial Researchers | 6 | 1 | 11.3% | 6 | 7 | 17.9% | 10 | 53.2% | 11 | 81.9% | 27 | 333.0% |
| Scientist | 3 | 1 | 48.5% | 4 | 4 | -12.0% | 5 | 14.5% | 6 | 37.1% | 13 | 215.7% |
| Maintenance Engineer | 37 | 5 | 14.0% | 42 | 49 | 15.9% | 64 | 52.3% | 75 | 76.5% | 180 | 326.3% |
| Civil Engineer | 6 | 3 | 46.5% | 9 | 8 | -10.8% | 10 | 18.1% | 12 | 37.6% | 28 | 226.0% |
| Production Engineer | 6 | 4 | 71.0% | 10 | 8 | -23.5% | 10 | 2.0% | 12 | 19.6% | 28 | 180.1% |
| Power distribution Engineer | 18 | 12 | 68.2% | 30 | 23 | -23.7% | 30 | 1.2% | 35 | 18.2% | 86 | 187.5% |
| Construction Engineer | 6 | 2 | 34.8% | 8 | 8 | -2.6% | 10 | 28.4% | 12 | 49.9% | 29 | 257.4% |
| Sales Exec | 17 | 4 | 23.9% | 22 | 23 | 4.9% | 29 | 36.7% | 35 | 63.1% | 84 | 287.9% |
| Marketing Personnel | 15 | 3 | 22.5% | 19 | 20 | 6.5% | 26 | 41.0% | 31 | 66.1% | 74 | 295.1% |
| General Semi Skilled Worker | 38 | 2 | 4.4% | 39 | 49 | 23.6% | 65 | 64.6% | 77 | 95.7% | 182 | 361.1% |
| General Labour | 51 | 0 | 0.0% | 51 | 67 | 30.9% | 88 | 70.7% | 104 | 101.8% | 247 | 381.6% |
| Other Employees | 37 | 4 | 11.5% | 42 | 48 | 16.1% | 65 | 55.4% | 76 | 83.3% | 180 | 332.0% |
| Administrative workers | 18 | 1 | 4.7% | 19 | 23 | 23.9% | 31 | 64.4% | 36 | 93.2% | 85 | 357.7% |
| **Total** | **415** | **78** | **18.7%** | **493** | **541** | **9.8%** | **712** | **44.7%** | **840** | **70.6%** | **1,998** | **305.7%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 22 | 10 | 44.1% | 31 | 28 | -9.9% | 37 | 19.2% | 44 | 40.4% | 103 | 230.9% |
| **Snr Management SME** | 102 | 23 | 22.1% | 125 | 134 | 7.3% | 176 | 40.3% | 206 | 64.9% | 491 | 292.7% |
| **Supervisory** | 95 | 23 | 23.9% | 117 | 124 | 6.1% | 161 | 37.4% | 193 | 65.0% | 451 | 284.9% |
| **Middle / Junior Management** | 90 | 20 | 22.9% | 110 | 116 | 5.0% | 155 | 40.4% | 180 | 63.2% | 434 | 294.0% |
| **Designer / Developer** | 9 | 4 | 45.7% | 14 | 12 | -10.5% | 16 | 18.0% | 19 | 38.1% | 44 | 227.5% |
| **Clerical** | 46 | 0 | 0.4% | 46 | 61 | 31.5% | 78 | 69.6% | 93 | 100.8% | 221 | 380.0% |
| **Self Employed** | 5 | 1 | 23.6% | 6 | 7 | 6.3% | 9 | 40.0% | 11 | 62.7% | 25 | 292.5% |
| **Advisor or Agent** | 5 | 1 | 23.6% | 6 | 6 | 5.9% | 8 | 39.6% | 9 | 62.8% | 22 | 286.7% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 47 | 3 | 6.6% | 50 | 61 | 22.0% | 81 | 60.9% | 95 | 89.2% | 227 | 351.6% |
| **Editor** | 3 | 0 | 4.6% | 3 | 3 | 25.7% | 4 | 65.8% | 5 | 94.4% | 12 | 357.3% |
| **Industrial Researchers** | 3 | 0 | 11.5% | 4 | 4 | 15.8% | 6 | 54.8% | 7 | 81.1% | 16 | 334.7% |
| **Scientist** | 2 | 1 | 45.0% | 3 | 3 | -11.1% | 4 | 18.2% | 5 | 39.9% | 12 | 232.6% |
| **Maintenance Engineer** | 100 | 14 | 13.9% | 114 | 129 | 13.4% | 172 | 51.7% | 201 | 77.2% | 479 | 321.8% |
| **Civil Engineer** | 5 | 2 | 44.5% | 7 | 6 | -8.9% | 8 | 19.0% | 10 | 39.4% | 23 | 232.6% |
| **Production Engineer** | 14 | 10 | 69.6% | 24 | 18 | -23.6% | 24 | 0.8% | 28 | 18.6% | 68 | 183.9% |
| **Power distribution Engineer** | 49 | 34 | 70.8% | 83 | 63 | -24.0% | 84 | 0.5% | 99 | 18.9% | 235 | 182.1% |
| **Construction Engineer** | 4 | 1 | 34.3% | 5 | 5 | -3.5% | 7 | 26.3% | 8 | 47.4% | 18 | 257.9% |
| **Sales Exec** | 48 | 11 | 23.0% | 59 | 62 | 5.2% | 82 | 39.6% | 96 | 63.1% | 233 | 293.7% |
| **Marketing Personnel** | 44 | 10 | 22.0% | 54 | 57 | 6.8% | 76 | 41.1% | 89 | 65.9% | 212 | 296.3% |
| **General Semi Skilled Worker** | 106 | 5 | 4.5% | 111 | 139 | 25.0% | 182 | 64.3% | 216 | 94.3% | 517 | 365.5% |
| **General Labour** | 142 | 0 | 0.0% | 142 | 186 | 31.0% | 245 | 72.5% | 284 | 100.5% | 684 | 382.8% |
| **Other Employees** | 110 | 12 | 11.3% | 122 | 144 | 17.9% | 189 | 54.6% | 223 | 82.4% | 528 | 331.9% |
| **Administrative workers** | 47 | 2 | 4.6% | 49 | 63 | 27.1% | 81 | 63.2% | 94 | 91.1% | 228 | 360.2% |
| **Total** | **1,097** | **188** | **17.2%** | **1,285** | **1,432** | **11.4%** | **1,884** | **46.6%** | **2,215** | **72.3%** | **5,284** | **311.1%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 71 | 6 | 8.8% | 77 | 93 | 20.1% | 122 | 58.0% | 144 | 86.7% | 341 | 342.0% |
| Snr Management SME | 261 | 12 | 4.6% | 273 | 341 | 24.9% | 445 | 63.1% | 531 | 94.4% | 1,255 | 359.6% |
| Supervisory | 241 | 10 | 4.2% | 251 | 316 | 25.9% | 414 | 64.6% | 484 | 92.5% | 1,161 | 361.7% |
| Middle / Junior Management | 232 | 10 | 4.3% | 242 | 305 | 26.1% | 397 | 64.1% | 466 | 92.3% | 1,118 | 361.7% |
| Designer / Developer | 15 | 1 | 9.1% | 17 | 20 | 20.3% | 26 | 55.5% | 31 | 86.1% | 74 | 340.8% |
| Clerical | 117 | 0 | 0.1% | 117 | 152 | 29.8% | 200 | 70.9% | 234 | 100.2% | 556 | 375.9% |
| Self Employed | 12 | 1 | 4.5% | 12 | 15 | 24.4% | 20 | 63.7% | 24 | 94.0% | 58 | 367.5% |
| Advisor or Agent | 2 | 0 | 4.5% | 2 | 2 | 25.6% | 3 | 66.2% | 3 | 94.3% | 7 | 357.3% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 109 | 1 | 1.3% | 111 | 141 | 27.6% | 186 | 68.4% | 220 | 99.3% | 526 | 375.6% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 8 | 0 | 2.3% | 8 | 11 | 27.5% | 14 | 67.8% | 17 | 99.5% | 39 | 369.6% |
| Scientist | 0 | 0 | 10.0% | 0 | 0 | 21.2% | 0 | 56.1% | 0 | 80.9% | 1 | 351.9% |
| Maintenance Engineer | 246 | 7 | 2.7% | 253 | 325 | 28.8% | 423 | 67.3% | 501 | 98.4% | 1,191 | 371.2% |
| Civil Engineer | 6 | 1 | 8.6% | 7 | 8 | 19.2% | 11 | 57.8% | 13 | 90.3% | 31 | 345.2% |
| Production Engineer | 29 | 4 | 13.1% | 33 | 38 | 15.7% | 49 | 49.7% | 59 | 78.2% | 139 | 323.0% |
| Power distribution Engineer | 128 | 17 | 13.7% | 145 | 166 | 14.4% | 218 | 50.0% | 258 | 77.8% | 615 | 324.1% |
| Construction Engineer | 12 | 1 | 6.4% | 13 | 16 | 21.8% | 21 | 61.1% | 25 | 90.1% | 59 | 355.8% |
| Sales Exec | 114 | 5 | 4.3% | 119 | 152 | 27.2% | 193 | 61.7% | 227 | 90.5% | 549 | 361.2% |
| Marketing Personnel | 108 | 5 | 4.2% | 112 | 141 | 25.0% | 183 | 62.6% | 219 | 94.5% | 515 | 357.9% |
| General Semi Skilled Worker | 277 | 2 | 0.9% | 280 | 365 | 30.6% | 474 | 69.6% | 563 | 101.4% | 1,328 | 375.1% |
| General Labour | 319 | 0 | 0.0% | 319 | 412 | 29.3% | 549 | 72.2% | 641 | 101.1% | 1,532 | 380.7% |
| Other Employees | 277 | 6 | 2.2% | 283 | 367 | 29.6% | 476 | 68.1% | 550 | 94.2% | 1,322 | 366.7% |
| Administrative workers | 122 | 1 | 0.8% | 123 | 159 | 28.7% | 211 | 71.4% | 246 | 99.6% | 589 | 377.8% |
| **Total** | **2,707** | **91** | **3.3%** | **2,797** | **3,545** | **26.7%** | **4,635** | **65.7%** | **5,456** | **95.0%** | **13,006** | **364.9%** |

## Recovery and Recycling

| | Recovery and Recycling | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 48 | 18 | 37.2% | 66 | 63 | -5.6% | 83 | 25.3% | 98 | 48.2% | 233 | 251.2% |
| Snr Management SME | 67 | 12 | 17.9% | 79 | 86 | 9.3% | 115 | 45.9% | 135 | 71.4% | 319 | 305.7% |
| Supervisory | 66 | 12 | 17.4% | 78 | 87 | 11.5% | 115 | 47.7% | 132 | 69.9% | 318 | 308.4% |
| Middle / Junior Management | 62 | 12 | 18.4% | 74 | 82 | 10.3% | 107 | 45.0% | 126 | 70.1% | 304 | 311.3% |
| Designer / Developer | 41 | 15 | 36.7% | 56 | 54 | -4.8% | 71 | 25.5% | 83 | 47.3% | 197 | 249.5% |
| Clerical | 32 | 0 | 0.4% | 32 | 41 | 28.6% | 54 | 70.3% | 63 | 100.3% | 152 | 381.2% |
| Self Employed | 16 | 3 | 18.1% | 18 | 20 | 11.4% | 27 | 45.4% | 31 | 71.1% | 74 | 305.8% |
| Advisor or Agent | 5 | 1 | 17.9% | 6 | 7 | 11.1% | 9 | 45.9% | 11 | 70.7% | 26 | 307.6% |
| Educator | 0 | 0 | 20.5% | 0 | 0 | 11.0% | 0 | 42.0% | 0 | 72.0% | 1 | 298.9% |
| Specialist or Consultant | 52 | 3 | 5.6% | 55 | 68 | 23.9% | 89 | 62.1% | 106 | 93.3% | 250 | 355.9% |
| Editor | 3 | 0 | 3.7% | 3 | 3 | 24.5% | 4 | 66.9% | 5 | 95.7% | 12 | 357.2% |
| Industrial Researchers | 14 | 1 | 9.2% | 15 | 18 | 19.7% | 24 | 57.3% | 28 | 85.2% | 66 | 340.6% |
| Scientist | 11 | 4 | 37.7% | 15 | 14 | -5.5% | 19 | 24.9% | 22 | 46.2% | 52 | 249.4% |
| Maintenance Engineer | 83 | 9 | 10.6% | 92 | 108 | 17.5% | 142 | 54.8% | 170 | 84.7% | 399 | 334.6% |
| Civil Engineer | 25 | 9 | 36.7% | 34 | 32 | -4.4% | 43 | 26.0% | 50 | 48.1% | 118 | 248.6% |
| Production Engineer | 25 | 14 | 56.5% | 40 | 33 | -15.9% | 44 | 10.1% | 51 | 28.8% | 122 | 207.5% |
| Power distribution Engineer | 45 | 25 | 56.0% | 70 | 59 | -16.8% | 78 | 10.9% | 90 | 28.3% | 217 | 207.5% |
| Construction Engineer | 24 | 7 | 28.2% | 31 | 32 | 1.7% | 42 | 34.1% | 49 | 57.8% | 117 | 274.6% |
| Sales Exec | 52 | 9 | 17.9% | 61 | 68 | 10.7% | 89 | 45.3% | 106 | 72.6% | 250 | 306.9% |
| Marketing Personnel | 40 | 7 | 18.2% | 47 | 53 | 12.1% | 69 | 46.0% | 79 | 68.5% | 191 | 305.4% |
| General Semi Skilled Worker | 118 | 4 | 3.8% | 122 | 154 | 26.3% | 201 | 64.2% | 238 | 94.6% | 561 | 358.6% |
| General Labour | 110 | 0 | 0.0% | 110 | 143 | 30.5% | 188 | 71.7% | 222 | 102.4% | 529 | 382.7% |
| Other Employees | 74 | 6 | 8.6% | 81 | 97 | 20.1% | 129 | 59.6% | 150 | 86.3% | 356 | 341.2% |
| Administrative workers | 43 | 2 | 3.7% | 45 | 56 | 25.6% | 74 | 65.6% | 88 | 96.7% | 210 | 370.7% |
| **Total** | **1,056** | **174** | **16.4%** | **1,230** | **1,378** | **12.0%** | **1,815** | **47.5%** | **2,135** | **73.6%** | **5,075** | **312.6%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 45 | 6 | 13.5% | 51 | 59 | 15.4% | 76 | 49.7% | 90 | 77.4% | 213 | 319.9% |
| **Snr Management SME** | 98 | 7 | 7.0% | 105 | 128 | 22.0% | 168 | 60.4% | 199 | 90.1% | 476 | 354.6% |
| **Supervisory** | 100 | 7 | 6.9% | 107 | 132 | 23.4% | 172 | 60.7% | 203 | 90.1% | 480 | 348.8% |
| **Middle / Junior Management** | 96 | 7 | 7.3% | 103 | 126 | 21.8% | 164 | 59.6% | 194 | 88.1% | 466 | 351.8% |
| **Designer / Developer** | 18 | 2 | 13.0% | 21 | 24 | 16.0% | 31 | 52.4% | 37 | 77.5% | 88 | 328.2% |
| **Clerical** | 51 | 0 | 0.1% | 52 | 68 | 31.3% | 88 | 70.3% | 104 | 101.2% | 249 | 383.4% |
| **Self Employed** | 25 | 2 | 6.8% | 27 | 32 | 22.0% | 43 | 61.3% | 51 | 91.5% | 119 | 348.6% |
| **Advisor or Agent** | 32 | 2 | 6.7% | 34 | 42 | 22.9% | 55 | 59.9% | 64 | 87.6% | 154 | 348.8% |
| **Educator** | 2 | 0 | 6.4% | 2 | 3 | 28.9% | 4 | 63.6% | 4 | 94.8% | 10 | 352.3% |
| **Specialist or Consultant** | 50 | 1 | 2.1% | 51 | 65 | 27.9% | 86 | 68.2% | 102 | 98.5% | 242 | 372.6% |
| **Editor** | 6 | 0 | 1.3% | 6 | 7 | 31.0% | 10 | 71.4% | 11 | 96.2% | 26 | 372.2% |
| **Industrial Researchers** | 45 | 1 | 3.2% | 47 | 59 | 25.9% | 77 | 63.6% | 92 | 95.4% | 216 | 361.0% |
| **Scientist** | 8 | 1 | 13.1% | 9 | 10 | 15.2% | 13 | 52.0% | 15 | 76.8% | 37 | 325.8% |
| **Maintenance Engineer** | 125 | 5 | 4.3% | 130 | 164 | 26.3% | 213 | 64.0% | 253 | 94.6% | 601 | 362.4% |
| **Civil Engineer** | 19 | 3 | 13.9% | 22 | 25 | 15.4% | 33 | 50.3% | 38 | 77.3% | 91 | 319.4% |
| **Production Engineer** | 19 | 4 | 19.9% | 22 | 25 | 9.4% | 32 | 42.8% | 38 | 69.3% | 90 | 298.8% |
| **Power distribution Engineer** | 62 | 13 | 20.8% | 75 | 82 | 8.7% | 108 | 43.8% | 127 | 68.6% | 297 | 295.3% |
| **Construction Engineer** | 24 | 2 | 10.2% | 26 | 31 | 18.4% | 41 | 56.6% | 48 | 83.3% | 112 | 331.5% |
| **Sales Exec** | 47 | 3 | 7.0% | 50 | 62 | 22.0% | 80 | 58.3% | 94 | 86.5% | 224 | 344.5% |
| **Marketing Personnel** | 42 | 3 | 6.8% | 45 | 55 | 21.6% | 73 | 60.1% | 86 | 89.8% | 204 | 349.6% |
| **General Semi Skilled Worker** | 121 | 2 | 1.3% | 123 | 161 | 31.1% | 207 | 68.7% | 244 | 98.7% | 579 | 370.9% |
| **General Labour** | 68 | 0 | 0.0% | 68 | 89 | 31.1% | 116 | 71.9% | 137 | 101.7% | 327 | 382.6% |
| **Other Employees** | 131 | 4 | 3.3% | 135 | 170 | 25.2% | 226 | 66.9% | 264 | 95.0% | 635 | 369.5% |
| **Administrative workers** | 63 | 1 | 1.3% | 64 | 82 | 29.0% | 110 | 71.9% | 126 | 96.6% | 302 | 373.6% |
| **Total** | **1,297** | **77** | **5.9%** | **1,374** | **1,700** | **23.7%** | **2,225** | **61.9%** | **2,620** | **90.7%** | **6,240** | **354.1%** |

## Water and Waste Water Treatment

| SOC | Water & Waste Water Treatment: Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030: Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030: Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050: Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050: Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 64 | 6 | 9.2% | 70 | 84 | 20.2% | 110 | 57.4% | 129 | 85.3% | 307 | 340.6% |
| Snr Management SME | 126 | 6 | 5.0% | 133 | 168 | 26.2% | 218 | 63.8% | 255 | 92.2% | 618 | 365.8% |
| Supervisory | 122 | 6 | 4.6% | 127 | 158 | 24.3% | 208 | 62.9% | 244 | 91.4% | 581 | 356.0% |
| Middle / Junior Management | 116 | 5 | 4.5% | 121 | 150 | 23.6% | 197 | 63.1% | 237 | 96.3% | 554 | 358.2% |
| Designer / Developer | 25 | 2 | 9.8% | 27 | 33 | 20.6% | 43 | 57.1% | 51 | 86.0% | 119 | 337.0% |
| Clerical | 59 | 0 | 0.1% | 59 | 76 | 29.7% | 100 | 70.9% | 118 | 101.0% | 282 | 379.7% |
| Self Employed | 32 | 1 | 4.6% | 33 | 41 | 23.8% | 55 | 65.9% | 64 | 94.5% | 153 | 363.2% |
| Advisor or Agent | 4 | 0 | 4.5% | 4 | 6 | 24.8% | 7 | 62.9% | 9 | 93.4% | 21 | 363.8% |
| Educator | 0 | 0 | 5.0% | 0 | 0 | 22.4% | 0 | 65.6% | 0 | 89.1% | 1 | 363.5% |
| Specialist or Consultant | 66 | 1 | 1.4% | 67 | 87 | 30.5% | 112 | 68.6% | 132 | 98.7% | 314 | 372.5% |
| Editor | 2 | 0 | 0.9% | 2 | 3 | 31.3% | 4 | 70.3% | 4 | 101.8% | 10 | 371.6% |
| Industrial Researchers | 5 | 0 | 2.4% | 5 | 7 | 26.8% | 9 | 68.3% | 11 | 96.4% | 25 | 365.4% |
| Scientist | 2 | 0 | 9.8% | 2 | 3 | 19.4% | 3 | 53.7% | 4 | 87.1% | 10 | 340.4% |
| Maintenance Engineer | 165 | 4 | 2.7% | 169 | 214 | 26.4% | 284 | 67.7% | 333 | 97.0% | 788 | 365.3% |
| Civil Engineer | 21 | 2 | 9.1% | 23 | 27 | 19.3% | 36 | 57.6% | 42 | 85.4% | 100 | 343.3% |
| Production Engineer | 32 | 4 | 13.4% | 37 | 42 | 15.7% | 55 | 51.5% | 65 | 78.1% | 154 | 322.2% |
| Power distribution Engineer | 80 | 12 | 14.7% | 91 | 103 | 13.1% | 135 | 47.6% | 162 | 77.6% | 385 | 321.9% |
| Construction Engineer | 28 | 2 | 6.9% | 30 | 37 | 22.7% | 48 | 59.8% | 57 | 87.5% | 137 | 351.6% |
| Sales Exec | 52 | 2 | 4.6% | 54 | 68 | 26.0% | 88 | 62.4% | 103 | 89.9% | 247 | 356.7% |
| Marketing Personnel | 48 | 2 | 4.9% | 50 | 63 | 25.9% | 84 | 66.4% | 97 | 91.9% | 230 | 357.0% |
| General Semi Skilled Worker | 154 | 1 | 0.9% | 155 | 198 | 27.8% | 264 | 69.8% | 307 | 97.9% | 724 | 366.7% |
| General Labour | 74 | 0 | 0.0% | 74 | 97 | 31.3% | 127 | 72.5% | 149 | 102.5% | 353 | 378.5% |
| Other Employees | 151 | 3 | 2.3% | 154 | 197 | 27.9% | 256 | 65.8% | 305 | 97.9% | 726 | 370.8% |
| Administrative workers | 70 | 1 | 0.9% | 71 | 92 | 30.7% | 121 | 70.7% | 142 | 100.4% | 338 | 378.6% |
| **Total** | **1,496** | **63** | **4.2%** | **1,559** | **1,954** | **25.3%** | **2,562** | **64.4%** | **3,021** | **93.8%** | **7,177** | **360.4%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 104 | 15 | 14.0% | 119 | 137 | 15.1% | 177 | 49.1% | 210 | 77.0% | 502 | 322.9% |
| **Snr Management SME** | 373 | 26 | 6.9% | 399 | 484 | 21.1% | 644 | 61.3% | 755 | 89.0% | 1,772 | 343.7% |
| **Supervisory** | 358 | 26 | 7.2% | 384 | 469 | 22.3% | 614 | 59.9% | 726 | 89.2% | 1,727 | 350.1% |
| **Middle / Junior Management** | 339 | 23 | 6.8% | 362 | 446 | 23.0% | 586 | 61.7% | 685 | 89.2% | 1,650 | 355.4% |
| **Designer / Developer** | 15 | 2 | 14.6% | 17 | 20 | 13.7% | 26 | 50.0% | 30 | 75.4% | 71 | 313.6% |
| **Clerical** | 173 | 0 | 0.1% | 173 | 225 | 29.6% | 297 | 71.2% | 356 | 105.1% | 821 | 373.4% |
| **Self Employed** | 27 | 2 | 6.5% | 28 | 35 | 22.9% | 46 | 60.4% | 54 | 90.8% | 128 | 349.3% |
| **Advisor or Agent** | 3 | 0 | 7.6% | 3 | 4 | 17.2% | 5 | 54.5% | 6 | 82.1% | 14 | 341.7% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 154 | 3 | 2.0% | 157 | 201 | 28.4% | 266 | 69.7% | 310 | 97.6% | 736 | 369.3% |
| **Editor** | 0 | 0 | 1.5% | 0 | 1 | 26.0% | 1 | 73.0% | 1 | 98.7% | 2 | 366.6% |
| **Industrial Researchers** | 4 | 0 | 3.7% | 4 | 5 | 26.9% | 7 | 60.1% | 8 | 86.9% | 19 | 369.2% |
| **Scientist** | 1 | 0 | 15.3% | 1 | 1 | 10.4% | 1 | 50.0% | 1 | 68.2% | 4 | 328.6% |
| **Maintenance Engineer** | 420 | 18 | 4.3% | 438 | 544 | 24.1% | 720 | 64.4% | 844 | 92.7% | 1,995 | 355.6% |
| **Civil Engineer** | 14 | 2 | 13.3% | 16 | 19 | 17.6% | 25 | 52.1% | 29 | 77.9% | 68 | 318.5% |
| **Production Engineer** | 54 | 11 | 20.1% | 65 | 71 | 9.8% | 93 | 43.3% | 110 | 69.4% | 259 | 298.9% |
| **Power distribution Engineer** | 193 | 39 | 20.4% | 232 | 251 | 8.1% | 333 | 43.1% | 391 | 68.4% | 916 | 294.4% |
| **Construction Engineer** | 40 | 4 | 10.8% | 44 | 51 | 16.9% | 68 | 54.6% | 80 | 82.5% | 189 | 330.5% |
| **Sales Exec** | 155 | 10 | 6.8% | 165 | 204 | 23.5% | 267 | 61.2% | 318 | 92.1% | 745 | 350.7% |
| **Marketing Personnel** | 147 | 10 | 6.8% | 157 | 194 | 23.9% | 254 | 62.1% | 294 | 87.9% | 710 | 353.3% |
| **General Semi Skilled Worker** | 397 | 6 | 1.4% | 403 | 519 | 28.9% | 679 | 68.7% | 797 | 98.0% | 1,918 | 376.4% |
| **General Labour** | 435 | 0 | 0.0% | 435 | 567 | 30.5% | 749 | 72.2% | 878 | 102.0% | 2,104 | 384.1% |
| **Other Employees** | 439 | 15 | 3.4% | 454 | 571 | 25.8% | 746 | 64.4% | 877 | 93.2% | 2,111 | 365.2% |
| **Administrative workers** | 183 | 2 | 1.4% | 185 | 240 | 29.4% | 317 | 71.0% | 368 | 98.4% | 880 | 374.7% |
| **Total** | **4,027** | **215** | **5.3%** | **4,242** | **5,258** | **23.9%** | **6,918** | **63.1%** | **8,129** | **91.6%** | **19,342** | **355.9%** |

# D2N2 LEP

## Alternative Fuel Vehicle

| | Alternative Fuel Vehicle Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 15 | 7 | 46.1% | 22 | 19 | -11.5% | 26 | 17.8% | 31 | 40.3% | 73 | 232.7% |
| **Snr Management SME** | 29 | 6 | 21.9% | 36 | 38 | 7.1% | 50 | 40.5% | 59 | 66.2% | 141 | 296.8% |
| **Supervisory** | 35 | 7 | 21.5% | 42 | 45 | 7.3% | 59 | 40.5% | 70 | 66.3% | 165 | 290.4% |
| **Middle / Junior Management** | 34 | 8 | 22.8% | 42 | 45 | 6.2% | 59 | 40.1% | 70 | 64.9% | 166 | 291.1% |
| **Designer / Developer** | 4 | 2 | 46.1% | 6 | 5 | -10.5% | 7 | 17.3% | 8 | 37.3% | 18 | 231.2% |
| **Clerical** | 20 | 0 | 0.5% | 20 | 26 | 29.9% | 35 | 70.8% | 41 | 100.4% | 97 | 376.4% |
| **Self Employed** | 21 | 5 | 22.0% | 26 | 28 | 6.7% | 36 | 40.8% | 43 | 65.1% | 102 | 295.6% |
| **Advisor or Agent** | 34 | 8 | 23.1% | 42 | 44 | 5.8% | 58 | 39.9% | 68 | 63.6% | 164 | 294.0% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 3 | 0 | 6.2% | 4 | 5 | 24.1% | 6 | 62.6% | 7 | 92.4% | 17 | 355.3% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 58 | 7 | 11.3% | 65 | 76 | 18.1% | 99 | 52.9% | 117 | 81.9% | 282 | 337.4% |
| **Scientist** | 6 | 3 | 45.9% | 9 | 8 | -11.8% | 10 | 17.1% | 12 | 38.2% | 29 | 229.3% |
| **Maintenance Engineer** | 50 | 7 | 13.9% | 57 | 65 | 14.9% | 85 | 50.4% | 100 | 75.8% | 238 | 318.7% |
| **Civil Engineer** | 7 | 3 | 43.6% | 10 | 9 | -9.2% | 12 | 18.5% | 14 | 40.7% | 34 | 239.0% |
| **Production Engineer** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Power distribution Engineer** | 7 | 5 | 69.3% | 13 | 10 | -23.1% | 13 | 0.8% | 15 | 19.5% | 35 | 181.8% |
| **Construction Engineer** | 7 | 2 | 34.3% | 10 | 10 | -1.5% | 12 | 26.6% | 15 | 50.5% | 35 | 257.9% |
| **Sales Exec** | 38 | 9 | 23.6% | 47 | 50 | 6.2% | 65 | 38.5% | 76 | 62.4% | 184 | 291.3% |
| **Marketing Personnel** | 39 | 9 | 23.0% | 47 | 51 | 7.1% | 66 | 39.7% | 77 | 62.1% | 185 | 291.5% |
| **General Semi Skilled Worker** | 33 | 2 | 4.7% | 35 | 43 | 24.6% | 57 | 64.5% | 66 | 91.6% | 159 | 357.9% |
| **General Labour** | 53 | 0 | 0.0% | 53 | 70 | 31.2% | 91 | 71.9% | 108 | 103.6% | 255 | 379.4% |
| **Other Employees** | 39 | 4 | 10.9% | 43 | 50 | 17.1% | 67 | 55.2% | 79 | 82.6% | 187 | 334.7% |
| **Administrative workers** | 29 | 1 | 4.6% | 31 | 39 | 25.4% | 50 | 64.0% | 59 | 93.1% | 141 | 358.5% |
| **Total** | **562** | **95** | **16.9%** | **658** | **735** | **11.8%** | **964** | **46.7%** | **1,135** | **72.6%** | **2,707** | **311.7%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 111 | 38 | 34.4% | 150 | 144 | -3.5% | 189 | 26.5% | 224 | 49.6% | 529 | 253.5% |
| **Snr Management SME** | 109 | 20 | 18.5% | 129 | 143 | 10.9% | 188 | 45.8% | 221 | 71.5% | 521 | 303.9% |
| **Supervisory** | 127 | 24 | 19.1% | 151 | 165 | 9.3% | 216 | 43.2% | 256 | 70.0% | 609 | 304.2% |
| **Middle / Junior Management** | 122 | 22 | 18.3% | 145 | 160 | 10.3% | 208 | 43.9% | 251 | 73.4% | 590 | 307.7% |
| **Designer / Developer** | 22 | 8 | 37.1% | 30 | 28 | -5.3% | 37 | 25.2% | 44 | 49.1% | 104 | 252.9% |
| **Clerical** | 60 | 0 | 0.4% | 60 | 79 | 30.9% | 103 | 71.2% | 122 | 103.2% | 288 | 379.0% |
| **Self Employed** | 34 | 6 | 18.4% | 40 | 44 | 9.9% | 60 | 47.4% | 69 | 70.4% | 165 | 309.2% |
| **Advisor or Agent** | 3 | 0 | 18.7% | 3 | 3 | 8.4% | 5 | 45.0% | 5 | 69.0% | 13 | 308.0% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 88 | 4 | 5.0% | 93 | 113 | 22.4% | 151 | 62.8% | 180 | 94.3% | 433 | 367.4% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 44 | 4 | 9.4% | 48 | 58 | 19.5% | 76 | 57.0% | 91 | 87.9% | 216 | 347.7% |
| **Scientist** | 84 | 27 | 32.5% | 111 | 110 | -0.7% | 147 | 31.9% | 169 | 52.5% | 406 | 265.2% |
| **Maintenance Engineer** | 160 | 17 | 10.9% | 177 | 209 | 17.9% | 273 | 54.1% | 325 | 83.5% | 775 | 337.1% |
| **Civil Engineer** | 1 | 0 | 35.7% | 1 | 1 | -2.4% | 1 | 26.1% | 1 | 46.9% | 3 | 256.9% |
| **Production Engineer** | 80 | 43 | 53.8% | 123 | 104 | -15.6% | 137 | 10.9% | 161 | 30.3% | 401 | 225.3% |
| **Power distribution Engineer** | 28 | 14 | 50.8% | 43 | 38 | -12.1% | 49 | 13.6% | 57 | 33.0% | 136 | 216.2% |
| **Construction Engineer** | 1 | 0 | 26.0% | 1 | 1 | 3.1% | 1 | 36.3% | 1 | 61.5% | 3 | 280.2% |
| **Sales Exec** | 120 | 22 | 18.6% | 142 | 155 | 9.2% | 205 | 44.2% | 242 | 70.5% | 573 | 303.8% |
| **Marketing Personnel** | 120 | 21 | 17.6% | 141 | 157 | 11.1% | 208 | 47.7% | 242 | 72.2% | 575 | 308.5% |
| **General Semi Skilled Worker** | 157 | 6 | 3.5% | 162 | 204 | 26.0% | 272 | 67.7% | 317 | 95.6% | 757 | 367.3% |
| **General Labour** | 211 | 0 | 0.0% | 211 | 274 | 30.1% | 361 | 71.1% | 427 | 102.5% | 1,017 | 382.5% |
| **Other Employees** | 139 | 13 | 9.3% | 151 | 181 | 19.8% | 238 | 57.5% | 282 | 86.3% | 670 | 342.5% |
| **Administrative workers** | 84 | 3 | 3.6% | 87 | 109 | 25.3% | 145 | 66.2% | 170 | 94.7% | 406 | 365.8% |
| **Total** | **1,903** | **296** | **15.5%** | **2,198** | **2,481** | **12.8%** | **3,268** | **48.6%** | **3,858** | **75.5%** | **9,191** | **318.1%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 63 | 15 | 23.2% | 78 | 83 | 6.3% | 107 | 38.2% | 128 | 64.1% | 307 | 294.3% |
| **Snr Management SME** | 290 | 34 | 11.7% | 324 | 383 | 18.2% | 499 | 54.0% | 584 | 80.1% | 1,405 | 333.6% |
| **Supervisory** | 271 | 33 | 12.2% | 304 | 355 | 16.8% | 469 | 54.1% | 543 | 78.6% | 1,311 | 331.4% |
| **Middle / Junior Management** | 264 | 30 | 11.4% | 294 | 347 | 18.2% | 457 | 55.5% | 537 | 82.7% | 1,265 | 330.6% |
| **Designer / Developer** | 32 | 7 | 22.9% | 39 | 42 | 6.8% | 55 | 41.0% | 65 | 65.3% | 152 | 289.0% |
| **Clerical** | 129 | 0 | 0.2% | 130 | 168 | 29.8% | 221 | 70.3% | 260 | 100.4% | 620 | 378.1% |
| **Self Employed** | 14 | 2 | 12.3% | 16 | 18 | 16.3% | 24 | 53.7% | 28 | 78.6% | 67 | 330.0% |
| **Advisor or Agent** | 4 | 0 | 11.2% | 4 | 5 | 17.7% | 7 | 55.4% | 8 | 81.4% | 19 | 333.7% |
| **Educator** | 0 | 0 | 11.6% | 0 | 0 | 21.3% | 0 | 52.5% | 0 | 83.6% | 0 | 326.1% |
| **Specialist or Consultant** | 140 | 5 | 3.5% | 145 | 182 | 25.2% | 241 | 66.1% | 287 | 97.3% | 677 | 366.0% |
| **Editor** | 4 | 0 | 2.3% | 4 | 5 | 27.2% | 7 | 66.9% | 8 | 97.5% | 19 | 373.4% |
| **Industrial Researchers** | 6 | 0 | 5.8% | 6 | 7 | 24.1% | 10 | 63.3% | 11 | 90.0% | 27 | 354.2% |
| **Scientist** | 9 | 2 | 23.2% | 11 | 12 | 6.5% | 15 | 38.9% | 18 | 63.7% | 41 | 282.0% |
| **Maintenance Engineer** | 274 | 20 | 7.3% | 294 | 361 | 22.7% | 470 | 59.8% | 559 | 90.2% | 1,317 | 347.7% |
| **Civil Engineer** | 4 | 1 | 22.4% | 5 | 5 | 6.4% | 7 | 40.9% | 8 | 64.9% | 20 | 293.7% |
| **Production Engineer** | 40 | 14 | 35.2% | 54 | 52 | -3.1% | 68 | 27.8% | 81 | 50.6% | 190 | 255.1% |
| **Power distribution Engineer** | 132 | 48 | 36.7% | 180 | 174 | -3.6% | 229 | 26.9% | 269 | 49.4% | 634 | 251.9% |
| **Construction Engineer** | 4 | 1 | 17.3% | 4 | 5 | 11.5% | 7 | 46.5% | 8 | 72.0% | 18 | 308.8% |
| **Sales Exec** | 125 | 15 | 11.8% | 140 | 164 | 17.1% | 214 | 53.1% | 252 | 80.2% | 604 | 331.9% |
| **Marketing Personnel** | 124 | 14 | 11.5% | 138 | 162 | 17.1% | 212 | 53.7% | 249 | 80.6% | 587 | 325.0% |
| **General Semi Skilled Worker** | 255 | 6 | 2.3% | 261 | 334 | 28.0% | 432 | 65.7% | 519 | 99.1% | 1,226 | 370.2% |
| **General Labour** | 271 | 0 | 0.0% | 271 | 349 | 28.7% | 463 | 70.9% | 553 | 104.2% | 1,295 | 378.1% |
| **Other Employees** | 352 | 20 | 5.7% | 372 | 462 | 24.3% | 605 | 62.6% | 716 | 92.5% | 1,702 | 357.8% |
| **Administrative workers** | 141 | 3 | 2.5% | 145 | 184 | 26.8% | 245 | 69.3% | 288 | 99.3% | 675 | 366.6% |
| **Total** | **2,947** | **271** | **9.2%** | **3,218** | **3,858** | **19.9%** | **5,064** | **57.3%** | **5,978** | **85.8%** | **14,181** | **340.6%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 117 | 16 | 13.5% | 132 | 153 | 15.3% | 200 | 51.1% | 233 | 76.3% | 560 | 323.0% |
| Snr Management SME | 327 | 22 | 6.8% | 349 | 427 | 22.3% | 558 | 59.7% | 660 | 89.0% | 1,576 | 351.5% |
| Supervisory | 307 | 21 | 6.8% | 328 | 399 | 21.7% | 528 | 61.2% | 623 | 90.2% | 1,463 | 346.5% |
| Middle / Junior Management | 298 | 21 | 7.2% | 319 | 388 | 21.7% | 511 | 60.1% | 597 | 87.1% | 1,433 | 349.1% |
| Designer / Developer | 36 | 5 | 13.6% | 41 | 48 | 15.2% | 63 | 51.2% | 73 | 76.9% | 175 | 323.0% |
| Clerical | 151 | 0 | 0.1% | 152 | 198 | 30.7% | 261 | 72.1% | 308 | 103.1% | 714 | 370.9% |
| Self Employed | 35 | 2 | 6.5% | 38 | 46 | 23.0% | 61 | 61.3% | 71 | 89.7% | 170 | 352.6% |
| Advisor or Agent | 39 | 3 | 7.0% | 42 | 50 | 20.8% | 67 | 60.8% | 79 | 88.9% | 187 | 348.7% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 150 | 3 | 2.0% | 153 | 196 | 27.9% | 257 | 67.4% | 304 | 98.6% | 718 | 368.7% |
| Editor | 1 | 0 | 1.3% | 1 | 2 | 29.4% | 2 | 68.7% | 3 | 98.2% | 6 | 378.0% |
| Industrial Researchers | 77 | 3 | 3.4% | 80 | 100 | 26.0% | 132 | 65.8% | 156 | 95.3% | 370 | 364.4% |
| Scientist | 11 | 2 | 13.8% | 12 | 14 | 15.1% | 19 | 50.0% | 22 | 77.6% | 52 | 321.4% |
| Maintenance Engineer | 317 | 13 | 4.0% | 330 | 410 | 24.3% | 547 | 65.8% | 644 | 95.3% | 1,529 | 363.8% |
| Civil Engineer | 18 | 2 | 13.8% | 20 | 23 | 15.0% | 31 | 50.3% | 36 | 76.6% | 87 | 325.8% |
| Production Engineer | 37 | 8 | 20.5% | 45 | 49 | 9.0% | 64 | 41.9% | 75 | 66.7% | 182 | 302.3% |
| Power distribution Engineer | 160 | 31 | 19.5% | 191 | 207 | 8.1% | 273 | 42.9% | 326 | 70.4% | 772 | 303.8% |
| Construction Engineer | 29 | 3 | 10.3% | 32 | 38 | 18.4% | 50 | 55.7% | 58 | 82.2% | 140 | 338.2% |
| Sales Exec | 137 | 9 | 6.8% | 147 | 179 | 22.1% | 235 | 60.2% | 279 | 90.0% | 660 | 349.4% |
| Marketing Personnel | 136 | 9 | 6.6% | 145 | 179 | 23.4% | 236 | 62.0% | 275 | 89.0% | 657 | 352.0% |
| General Semi Skilled Worker | 305 | 4 | 1.4% | 310 | 400 | 29.2% | 524 | 69.3% | 618 | 99.6% | 1,471 | 375.1% |
| General Labour | 562 | 0 | 0.0% | 562 | 735 | 30.8% | 963 | 71.3% | 1,140 | 102.7% | 2,713 | 382.5% |
| Other Employees | 395 | 13 | 3.4% | 409 | 517 | 26.6% | 679 | 66.0% | 805 | 96.9% | 1,908 | 366.8% |
| Administrative workers | 182 | 3 | 1.4% | 185 | 240 | 29.7% | 313 | 69.3% | 365 | 97.4% | 876 | 374.2% |
| **Total** | **3,830** | **193** | **5.0%** | **4,023** | **4,999** | **24.3%** | **6,571** | **63.3%** | **7,750** | **92.6%** | **18,420** | **357.8%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 20 | 9 | 44.9% | 29 | 26 | -9.6% | 34 | 18.2% | 40 | 38.5% | 96 | 231.7% |
| **Snr Management SME** | 42 | 9 | 21.4% | 50 | 54 | 7.4% | 71 | 41.3% | 85 | 68.1% | 199 | 295.0% |
| **Supervisory** | 42 | 9 | 21.1% | 51 | 55 | 8.1% | 72 | 41.3% | 85 | 66.9% | 205 | 299.9% |
| **Middle / Junior Management** | 41 | 9 | 21.8% | 50 | 53 | 7.2% | 70 | 40.6% | 82 | 65.6% | 194 | 290.6% |
| **Designer / Developer** | 11 | 5 | 44.2% | 16 | 14 | -9.3% | 19 | 19.4% | 22 | 39.9% | 52 | 235.2% |
| **Clerical** | 21 | 0 | 0.5% | 21 | 27 | 29.7% | 35 | 70.7% | 42 | 102.6% | 99 | 377.0% |
| **Self Employed** | 10 | 2 | 22.5% | 12 | 13 | 6.9% | 17 | 40.6% | 20 | 64.4% | 48 | 289.7% |
| **Advisor or Agent** | 8 | 2 | 22.5% | 10 | 11 | 6.9% | 14 | 41.3% | 17 | 65.7% | 40 | 294.1% |
| **Educator** | 0 | 0 | 22.1% | 0 | 0 | 8.6% | 0 | 38.8% | 1 | 63.5% | 1 | 293.0% |
| **Specialist or Consultant** | 22 | 2 | 6.8% | 24 | 29 | 23.1% | 37 | 58.9% | 45 | 89.6% | 106 | 352.4% |
| **Editor** | 4 | 0 | 4.5% | 4 | 5 | 24.1% | 6 | 61.3% | 8 | 96.1% | 18 | 355.3% |
| **Industrial Researchers** | 8 | 1 | 11.6% | 9 | 10 | 17.4% | 14 | 53.7% | 16 | 80.8% | 38 | 330.4% |
| **Scientist** | 4 | 2 | 44.3% | 6 | 6 | -9.4% | 8 | 19.2% | 9 | 41.7% | 21 | 236.1% |
| **Maintenance Engineer** | 52 | 7 | 13.5% | 59 | 68 | 14.6% | 90 | 51.6% | 106 | 79.0% | 251 | 324.3% |
| **Civil Engineer** | 7 | 3 | 45.7% | 11 | 10 | -9.6% | 13 | 17.7% | 15 | 39.3% | 35 | 230.2% |
| **Production Engineer** | 9 | 6 | 66.8% | 15 | 12 | -22.0% | 15 | 2.8% | 18 | 21.9% | 43 | 187.6% |
| **Power distribution Engineer** | 24 | 17 | 68.2% | 41 | 32 | -22.5% | 42 | 1.9% | 49 | 20.4% | 115 | 182.7% |
| **Construction Engineer** | 8 | 3 | 34.5% | 11 | 11 | -2.6% | 14 | 27.3% | 16 | 50.5% | 39 | 258.7% |
| **Sales Exec** | 23 | 5 | 23.1% | 29 | 30 | 5.4% | 40 | 40.6% | 47 | 64.5% | 113 | 291.2% |
| **Marketing Personnel** | 22 | 5 | 21.8% | 27 | 29 | 8.2% | 38 | 40.5% | 45 | 66.5% | 106 | 296.2% |
| **General Semi Skilled Worker** | 45 | 2 | 4.5% | 47 | 59 | 25.4% | 79 | 66.1% | 93 | 95.7% | 217 | 359.1% |
| **General Labour** | 70 | 0 | 0.0% | 70 | 91 | 30.8% | 119 | 71.2% | 141 | 102.0% | 334 | 380.1% |
| **Other Employees** | 57 | 6 | 11.2% | 63 | 74 | 17.4% | 98 | 54.7% | 115 | 82.0% | 273 | 332.3% |
| **Administrative workers** | 26 | 1 | 4.4% | 27 | 34 | 24.6% | 45 | 64.5% | 53 | 92.4% | 127 | 363.9% |
| **Total** | **577** | **105** | **18.2%** | **681** | **753** | **10.6%** | **990** | **45.3%** | **1,168** | **71.5%** | **2,771** | **306.7%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 31 | 14 | 45.2% | 45 | 41 | -9.8% | 53 | 17.5% | 63 | 39.2% | 151 | 231.0% |
| Snr Management SME | 137 | 32 | 23.2% | 168 | 179 | 6.5% | 233 | 38.3% | 275 | 63.5% | 656 | 289.4% |
| Supervisory | 128 | 29 | 22.4% | 156 | 167 | 7.0% | 219 | 40.2% | 257 | 64.7% | 611 | 291.0% |
| Middle / Junior Management | 124 | 28 | 22.3% | 151 | 162 | 7.4% | 211 | 39.9% | 249 | 65.0% | 595 | 293.9% |
| Designer / Developer | 15 | 7 | 44.8% | 21 | 19 | -9.6% | 25 | 18.1% | 30 | 39.9% | 70 | 230.1% |
| Clerical | 62 | 0 | 0.5% | 62 | 80 | 29.7% | 106 | 71.1% | 124 | 100.1% | 296 | 377.1% |
| Self Employed | 7 | 2 | 23.1% | 9 | 10 | 6.8% | 13 | 39.4% | 15 | 63.6% | 36 | 289.2% |
| Advisor or Agent | 6 | 1 | 22.8% | 8 | 8 | 7.8% | 11 | 39.7% | 13 | 64.4% | 31 | 293.6% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 62 | 4 | 6.7% | 66 | 81 | 22.7% | 106 | 61.0% | 126 | 90.4% | 297 | 349.2% |
| Editor | 3 | 0 | 4.3% | 4 | 4 | 25.9% | 6 | 63.6% | 7 | 92.4% | 16 | 362.9% |
| Industrial Researchers | 5 | 1 | 11.1% | 5 | 6 | 17.4% | 8 | 55.3% | 10 | 82.5% | 23 | 329.7% |
| Scientist | 4 | 2 | 44.9% | 6 | 5 | -8.9% | 7 | 18.2% | 8 | 39.9% | 18 | 229.5% |
| Maintenance Engineer | 136 | 18 | 13.2% | 154 | 177 | 15.2% | 233 | 51.5% | 274 | 77.9% | 661 | 329.1% |
| Civil Engineer | 6 | 3 | 45.2% | 9 | 8 | -9.8% | 11 | 17.6% | 13 | 38.2% | 30 | 231.8% |
| Production Engineer | 21 | 15 | 69.9% | 36 | 27 | -23.5% | 36 | 0.8% | 43 | 18.8% | 102 | 185.0% |
| Power distribution Engineer | 65 | 43 | 66.6% | 108 | 85 | -21.6% | 112 | 3.4% | 132 | 21.4% | 312 | 187.6% |
| Construction Engineer | 5 | 2 | 34.8% | 7 | 7 | -2.7% | 9 | 27.4% | 11 | 49.7% | 25 | 255.5% |
| Sales Exec | 64 | 14 | 21.9% | 78 | 83 | 7.2% | 110 | 41.9% | 129 | 66.2% | 307 | 295.4% |
| Marketing Personnel | 62 | 14 | 22.6% | 76 | 82 | 7.1% | 106 | 39.2% | 125 | 64.3% | 296 | 289.2% |
| General Semi Skilled Worker | 126 | 6 | 4.5% | 131 | 164 | 25.0% | 216 | 64.3% | 255 | 94.1% | 602 | 358.7% |
| General Labour | 187 | 0 | 0.0% | 187 | 245 | 30.9% | 323 | 72.5% | 379 | 102.2% | 913 | 387.2% |
| Other Employees | 167 | 19 | 11.6% | 187 | 219 | 17.0% | 285 | 52.4% | 339 | 81.5% | 808 | 332.6% |
| Administrative workers | 69 | 3 | 4.4% | 72 | 90 | 24.9% | 119 | 65.1% | 139 | 93.9% | 328 | 357.1% |
| **Total** | **1,492** | **255** | **17.1%** | **1,747** | **1,952** | **11.7%** | **2,558** | **46.4%** | **3,015** | **72.5%** | **7,184** | **311.1%** |

## Photovoltaic

| SOC | Photovoltaic Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 103 | 9 | 8.8% | 112 | 135 | 20.9% | 176 | 57.7% | 205 | 83.7% | 495 | 343.6% |
| Snr Management SME | 341 | 15 | 4.4% | 356 | 448 | 25.8% | 585 | 64.4% | 688 | 93.3% | 1,641 | 360.7% |
| Supervisory | 323 | 14 | 4.3% | 337 | 421 | 24.9% | 558 | 65.8% | 657 | 95.0% | 1,544 | 358.4% |
| Middle / Junior Management | 311 | 14 | 4.6% | 325 | 404 | 24.3% | 538 | 65.6% | 630 | 93.8% | 1,506 | 363.3% |
| Designer / Developer | 24 | 2 | 8.8% | 26 | 31 | 20.5% | 40 | 56.8% | 48 | 86.5% | 112 | 337.2% |
| Clerical | 153 | 0 | 0.1% | 154 | 199 | 29.3% | 260 | 69.1% | 311 | 102.3% | 739 | 380.9% |
| Self Employed | 17 | 1 | 4.3% | 18 | 23 | 25.0% | 30 | 64.7% | 35 | 94.3% | 83 | 361.7% |
| Advisor or Agent | 2 | 0 | 4.7% | 2 | 3 | 25.0% | 4 | 62.6% | 4 | 91.7% | 10 | 357.7% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 141 | 2 | 1.4% | 142 | 186 | 30.6% | 242 | 70.1% | 285 | 100.2% | 671 | 370.8% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 11 | 0 | 2.3% | 12 | 15 | 27.9% | 20 | 67.5% | 23 | 96.4% | 55 | 371.8% |
| Scientist | 0 | 0 | 9.9% | 0 | 0 | 18.4% | 1 | 57.0% | 1 | 81.6% | 2 | 338.0% |
| Maintenance Engineer | 333 | 9 | 2.6% | 341 | 430 | 26.0% | 572 | 67.4% | 675 | 97.6% | 1,606 | 370.4% |
| Civil Engineer | 8 | 1 | 8.8% | 9 | 11 | 20.1% | 14 | 58.7% | 16 | 85.0% | 40 | 343.6% |
| Production Engineer | 42 | 6 | 13.5% | 47 | 55 | 15.9% | 71 | 50.8% | 85 | 79.3% | 202 | 325.8% |
| Power distribution Engineer | 162 | 22 | 13.8% | 184 | 212 | 15.1% | 277 | 50.0% | 328 | 78.1% | 782 | 324.1% |
| Construction Engineer | 17 | 1 | 6.4% | 18 | 22 | 21.7% | 29 | 63.0% | 34 | 91.5% | 80 | 351.4% |
| Sales Exec | 148 | 6 | 4.3% | 155 | 194 | 25.3% | 254 | 63.9% | 301 | 94.2% | 715 | 361.8% |
| Marketing Personnel | 147 | 7 | 4.5% | 154 | 194 | 26.2% | 253 | 64.7% | 297 | 93.1% | 713 | 363.3% |
| General Semi Skilled Worker | 320 | 3 | 0.9% | 323 | 419 | 29.8% | 549 | 69.8% | 643 | 98.8% | 1,527 | 372.4% |
| General Labour | 412 | 0 | 0.0% | 412 | 540 | 31.1% | 706 | 71.2% | 834 | 102.3% | 1,981 | 380.3% |
| Other Employees | 415 | 9 | 2.2% | 424 | 539 | 27.1% | 710 | 67.4% | 831 | 95.9% | 1,989 | 369.2% |
| Administrative workers | 172 | 2 | 0.9% | 174 | 224 | 29.1% | 297 | 70.8% | 346 | 99.4% | 820 | 372.2% |
| **Total** | **3,602** | **123** | **3.4%** | **3,725** | **4,704** | **26.3%** | **6,184** | **66.0%** | **7,276** | **95.3%** | **17,311** | **364.7%** |

## Recovery and Recycling

| | Recovery and Recycling | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 72 | 26 | 36.6% | 99 | 94 | -4.6% | 124 | 25.7% | 146 | 48.2% | 348 | 253.4% |
| Snr Management SME | 92 | 17 | 18.4% | 109 | 119 | 9.8% | 158 | 44.8% | 185 | 70.0% | 445 | 308.6% |
| Supervisory | 93 | 17 | 18.5% | 110 | 120 | 9.5% | 157 | 43.2% | 186 | 69.7% | 447 | 306.9% |
| Middle / Junior Management | 90 | 16 | 18.4% | 106 | 116 | 9.0% | 155 | 46.0% | 182 | 71.3% | 425 | 301.0% |
| Designer / Developer | 67 | 25 | 36.8% | 91 | 87 | -4.9% | 115 | 25.7% | 135 | 47.4% | 321 | 251.0% |
| Clerical | 44 | 0 | 0.4% | 44 | 57 | 29.8% | 75 | 70.8% | 88 | 100.7% | 210 | 377.2% |
| Self Employed | 23 | 4 | 18.3% | 27 | 30 | 10.8% | 39 | 44.9% | 46 | 71.4% | 108 | 306.1% |
| Advisor or Agent | 8 | 1 | 18.9% | 9 | 10 | 9.2% | 13 | 44.0% | 15 | 70.9% | 36 | 303.7% |
| Educator | 0 | 0 | 17.4% | 0 | 0 | 12.3% | 1 | 43.6% | 1 | 72.5% | 2 | 308.5% |
| Specialist or Consultant | 71 | 4 | 5.4% | 74 | 92 | 23.2% | 121 | 62.6% | 143 | 92.3% | 339 | 355.0% |
| Editor | 3 | 0 | 3.7% | 4 | 5 | 27.1% | 6 | 67.7% | 7 | 97.6% | 17 | 365.2% |
| Industrial Researchers | 20 | 2 | 9.1% | 21 | 26 | 20.7% | 34 | 57.9% | 40 | 85.9% | 95 | 342.5% |
| Scientist | 18 | 7 | 37.4% | 25 | 24 | -4.6% | 31 | 24.7% | 36 | 46.0% | 86 | 249.4% |
| Maintenance Engineer | 118 | 13 | 11.0% | 130 | 153 | 17.1% | 202 | 55.1% | 237 | 81.6% | 564 | 332.2% |
| Civil Engineer | 32 | 12 | 36.8% | 44 | 42 | -4.2% | 56 | 25.3% | 66 | 48.5% | 156 | 252.6% |
| Production Engineer | 39 | 22 | 56.3% | 61 | 51 | -16.4% | 67 | 9.6% | 79 | 29.5% | 187 | 206.5% |
| Power distribution Engineer | 62 | 34 | 54.3% | 95 | 81 | -15.4% | 105 | 10.0% | 124 | 29.9% | 295 | 210.1% |
| Construction Engineer | 34 | 9 | 27.8% | 43 | 44 | 2.4% | 58 | 34.5% | 69 | 58.0% | 163 | 276.1% |
| Sales Exec | 72 | 13 | 18.3% | 85 | 94 | 10.8% | 123 | 44.5% | 146 | 71.7% | 345 | 306.2% |
| Marketing Personnel | 58 | 11 | 18.3% | 68 | 75 | 9.9% | 99 | 45.1% | 117 | 71.3% | 279 | 309.5% |
| General Semi Skilled Worker | 144 | 5 | 3.5% | 149 | 186 | 25.1% | 248 | 66.7% | 292 | 95.7% | 690 | 363.3% |
| General Labour | 147 | 0 | 0.0% | 147 | 192 | 30.5% | 254 | 72.3% | 297 | 101.5% | 709 | 381.5% |
| Other Employees | 113 | 10 | 9.0% | 123 | 148 | 20.8% | 193 | 56.9% | 229 | 86.7% | 537 | 337.1% |
| Administrative workers | 65 | 2 | 3.7% | 68 | 85 | 25.9% | 111 | 64.1% | 132 | 94.8% | 315 | 364.8% |
| **Total** | **1,483** | **251** | **16.9%** | **1,734** | **1,932** | **11.4%** | **2,543** | **46.7%** | **2,997** | **72.9%** | **7,121** | **310.8%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 60 | 8 | 13.4% | 68 | 78 | 14.9% | 102 | 49.9% | 121 | 78.4% | 290 | 326.3% |
| **Snr Management SME** | 121 | 9 | 7.1% | 130 | 158 | 21.8% | 210 | 61.6% | 248 | 91.2% | 583 | 348.8% |
| **Supervisory** | 129 | 9 | 6.8% | 138 | 169 | 22.4% | 222 | 61.4% | 260 | 89.0% | 618 | 348.8% |
| **Middle / Junior Management** | 125 | 9 | 6.9% | 134 | 164 | 22.8% | 215 | 61.1% | 254 | 89.8% | 599 | 347.8% |
| **Designer / Developer** | 27 | 4 | 13.9% | 31 | 35 | 14.4% | 46 | 50.1% | 54 | 76.6% | 130 | 323.4% |
| **Clerical** | 64 | 0 | 0.1% | 65 | 85 | 31.7% | 111 | 71.3% | 131 | 102.8% | 311 | 382.5% |
| **Self Employed** | 33 | 2 | 6.9% | 35 | 43 | 22.8% | 57 | 60.7% | 67 | 89.1% | 158 | 346.0% |
| **Advisor or Agent** | 41 | 3 | 6.5% | 44 | 54 | 22.6% | 71 | 61.4% | 83 | 88.5% | 200 | 354.2% |
| **Educator** | 3 | 0 | 6.0% | 3 | 4 | 23.4% | 5 | 66.2% | 5 | 90.3% | 13 | 355.5% |
| **Specialist or Consultant** | 61 | 1 | 2.0% | 63 | 80 | 27.9% | 105 | 67.5% | 125 | 98.9% | 292 | 366.0% |
| **Editor** | 7 | 0 | 1.3% | 7 | 9 | 31.6% | 12 | 71.8% | 14 | 99.7% | 32 | 372.4% |
| **Industrial Researchers** | 61 | 2 | 3.3% | 63 | 80 | 27.8% | 105 | 66.7% | 123 | 96.3% | 294 | 367.9% |
| **Scientist** | 12 | 2 | 13.8% | 13 | 15 | 14.1% | 20 | 51.7% | 23 | 77.0% | 56 | 321.2% |
| **Maintenance Engineer** | 160 | 7 | 4.1% | 166 | 210 | 26.3% | 274 | 65.2% | 321 | 93.2% | 770 | 363.8% |
| **Civil Engineer** | 23 | 3 | 13.7% | 26 | 30 | 15.0% | 39 | 50.3% | 46 | 78.4% | 110 | 324.1% |
| **Production Engineer** | 26 | 5 | 20.0% | 32 | 34 | 8.6% | 45 | 42.5% | 53 | 67.4% | 127 | 301.7% |
| **Power distribution Engineer** | 77 | 16 | 20.5% | 93 | 102 | 9.1% | 132 | 41.6% | 156 | 66.9% | 374 | 300.9% |
| **Construction Engineer** | 30 | 3 | 10.1% | 33 | 39 | 19.0% | 51 | 55.4% | 60 | 83.1% | 144 | 336.3% |
| **Sales Exec** | 59 | 4 | 6.8% | 63 | 78 | 22.5% | 102 | 61.3% | 119 | 88.2% | 284 | 348.6% |
| **Marketing Personnel** | 56 | 4 | 6.7% | 60 | 74 | 22.7% | 96 | 59.8% | 113 | 87.9% | 269 | 347.6% |
| **General Semi Skilled Worker** | 135 | 2 | 1.4% | 137 | 175 | 28.1% | 232 | 69.5% | 271 | 98.0% | 649 | 373.8% |
| **General Labour** | 84 | 0 | 0.0% | 84 | 110 | 31.0% | 144 | 70.8% | 170 | 101.9% | 405 | 381.4% |
| **Other Employees** | 175 | 6 | 3.4% | 181 | 229 | 26.6% | 298 | 64.9% | 354 | 95.9% | 841 | 365.6% |
| **Administrative workers** | 86 | 1 | 1.3% | 88 | 113 | 29.0% | 149 | 70.4% | 174 | 98.8% | 417 | 376.0% |
| **Total** | **1,657** | **98** | **5.9%** | **1,755** | **2,169** | **23.6%** | **2,844** | **62.0%** | **3,347** | **90.7%** | **7,967** | **353.9%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 92 | 8 | 8.9% | 100 | 120 | 20.2% | 157 | 57.2% | 185 | 86.0% | 438 | 339.8% |
| Snr Management SME | 172 | 7 | 4.3% | 179 | 226 | 26.1% | 295 | 65.0% | 347 | 94.0% | 827 | 361.8% |
| Supervisory | 168 | 8 | 4.5% | 176 | 219 | 24.7% | 289 | 64.3% | 339 | 92.7% | 812 | 361.4% |
| Middle / Junior Management | 161 | 7 | 4.4% | 168 | 211 | 25.3% | 276 | 63.8% | 327 | 94.1% | 774 | 359.6% |
| Designer / Developer | 39 | 3 | 9.0% | 42 | 51 | 19.9% | 67 | 58.4% | 78 | 84.6% | 188 | 344.2% |
| Clerical | 79 | 0 | 0.1% | 80 | 104 | 30.8% | 137 | 72.2% | 159 | 100.4% | 380 | 377.7% |
| Self Employed | 43 | 2 | 4.5% | 45 | 56 | 24.9% | 74 | 65.2% | 87 | 93.4% | 208 | 361.3% |
| Advisor or Agent | 6 | 0 | 4.4% | 6 | 7 | 23.6% | 10 | 63.0% | 11 | 92.8% | 27 | 358.0% |
| Educator | 0 | 0 | 4.4% | 0 | 0 | 21.9% | 0 | 61.7% | 0 | 93.0% | 1 | 366.2% |
| Specialist or Consultant | 87 | 1 | 1.3% | 89 | 115 | 29.7% | 150 | 69.5% | 176 | 99.1% | 423 | 377.4% |
| Editor | 3 | 0 | 0.9% | 3 | 4 | 29.4% | 5 | 70.5% | 5 | 97.5% | 13 | 370.7% |
| Industrial Researchers | 7 | 0 | 2.3% | 7 | 9 | 27.8% | 12 | 66.8% | 15 | 98.2% | 34 | 368.6% |
| Scientist | 3 | 0 | 9.1% | 3 | 4 | 18.4% | 5 | 55.8% | 6 | 84.7% | 15 | 333.8% |
| Maintenance Engineer | 227 | 6 | 2.7% | 234 | 299 | 27.9% | 390 | 67.0% | 460 | 96.9% | 1,100 | 371.1% |
| Civil Engineer | 26 | 2 | 8.9% | 28 | 34 | 20.7% | 44 | 58.3% | 52 | 86.1% | 123 | 340.5% |
| Production Engineer | 47 | 6 | 13.0% | 54 | 62 | 15.0% | 81 | 51.8% | 95 | 78.1% | 227 | 323.7% |
| Power distribution Engineer | 105 | 14 | 13.3% | 119 | 137 | 14.9% | 182 | 52.1% | 212 | 77.5% | 511 | 328.5% |
| Construction Engineer | 37 | 2 | 6.6% | 40 | 49 | 22.1% | 64 | 61.3% | 75 | 88.5% | 179 | 348.2% |
| Sales Exec | 69 | 3 | 4.7% | 72 | 90 | 25.6% | 117 | 62.6% | 139 | 93.3% | 331 | 361.6% |
| Marketing Personnel | 68 | 3 | 4.5% | 71 | 89 | 24.3% | 116 | 62.8% | 137 | 91.9% | 328 | 359.6% |
| General Semi Skilled Worker | 186 | 2 | 0.9% | 187 | 243 | 29.6% | 318 | 69.7% | 376 | 100.7% | 894 | 377.1% |
| General Labour | 95 | 0 | 0.0% | 95 | 124 | 30.4% | 162 | 70.2% | 192 | 101.5% | 456 | 377.9% |
| Other Employees | 223 | 5 | 2.3% | 228 | 291 | 27.6% | 383 | 67.7% | 455 | 99.1% | 1,068 | 367.8% |
| Administrative workers | 103 | 1 | 0.9% | 104 | 136 | 29.9% | 176 | 69.2% | 210 | 101.3% | 496 | 375.3% |
| **Total** | **2,048** | **83** | **4.0%** | **2,131** | **2,679** | **25.7%** | **3,512** | **64.8%** | **4,141** | **94.3%** | **9,853** | **362.4%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 153 | 21 | 13.6% | 174 | 202 | 16.0% | 263 | 51.1% | 309 | 77.8% | 732 | 320.6% |
| Snr Management SME | 516 | 36 | 7.0% | 552 | 671 | 21.6% | 889 | 61.0% | 1,045 | 89.3% | 2,462 | 345.8% |
| Supervisory | 499 | 35 | 7.0% | 534 | 649 | 21.5% | 864 | 61.7% | 1,014 | 89.9% | 2,424 | 353.7% |
| Middle / Junior Management | 488 | 33 | 6.8% | 521 | 635 | 21.8% | 840 | 61.2% | 972 | 86.6% | 2,339 | 349.0% |
| Designer / Developer | 24 | 3 | 13.7% | 28 | 31 | 13.2% | 42 | 50.8% | 49 | 76.4% | 117 | 323.0% |
| Clerical | 238 | 0 | 0.1% | 238 | 314 | 32.0% | 412 | 73.3% | 478 | 100.8% | 1,143 | 380.5% |
| Self Employed | 38 | 3 | 6.8% | 41 | 50 | 22.1% | 65 | 60.3% | 77 | 88.0% | 183 | 348.8% |
| Advisor or Agent | 4 | 0 | 7.0% | 4 | 5 | 19.5% | 7 | 59.3% | 8 | 87.3% | 19 | 362.9% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 214 | 5 | 2.1% | 219 | 281 | 28.2% | 368 | 68.1% | 436 | 98.9% | 1,038 | 374.0% |
| Editor | 1 | 0 | 1.5% | 1 | 1 | 29.7% | 1 | 68.3% | 1 | 97.0% | 3 | 356.1% |
| Industrial Researchers | 6 | 0 | 3.9% | 6 | 7 | 22.7% | 10 | 64.7% | 11 | 91.6% | 27 | 355.2% |
| Scientist | 1 | 0 | 13.4% | 1 | 1 | 15.7% | 2 | 49.0% | 2 | 78.7% | 6 | 330.1% |
| Maintenance Engineer | 583 | 24 | 4.1% | 607 | 767 | 26.4% | 1,007 | 66.0% | 1,182 | 94.9% | 2,765 | 355.8% |
| Civil Engineer | 18 | 2 | 13.4% | 21 | 24 | 15.5% | 31 | 51.4% | 37 | 77.9% | 88 | 325.8% |
| Production Engineer | 82 | 17 | 20.9% | 99 | 108 | 8.3% | 141 | 41.7% | 164 | 65.5% | 396 | 299.2% |
| Power distribution Engineer | 265 | 53 | 20.0% | 318 | 349 | 9.8% | 456 | 43.2% | 542 | 70.4% | 1,278 | 301.6% |
| Construction Engineer | 54 | 5 | 9.9% | 60 | 71 | 19.9% | 93 | 55.4% | 109 | 82.5% | 261 | 337.8% |
| Sales Exec | 214 | 14 | 6.7% | 229 | 283 | 23.8% | 367 | 60.7% | 435 | 90.1% | 1,047 | 358.0% |
| Marketing Personnel | 215 | 14 | 6.6% | 230 | 282 | 22.7% | 371 | 61.5% | 436 | 89.8% | 1,038 | 352.1% |
| General Semi Skilled Worker | 492 | 7 | 1.3% | 498 | 633 | 27.1% | 854 | 71.3% | 998 | 100.4% | 2,342 | 370.1% |
| General Labour | 585 | 0 | 0.0% | 585 | 766 | 30.9% | 1,002 | 71.2% | 1,174 | 100.6% | 2,814 | 381.1% |
| Other Employees | 692 | 23 | 3.3% | 715 | 893 | 24.9% | 1,177 | 64.7% | 1,397 | 95.5% | 3,336 | 366.8% |
| Administrative workers | 279 | 4 | 1.4% | 282 | 363 | 28.7% | 480 | 70.0% | 565 | 100.0% | 1,353 | 379.1% |
| **Total** | **5,661** | **300** | **5.3%** | **5,961** | **7,386** | **23.9%** | **9,740** | **63.4%** | **11,440** | **91.9%** | **27,210** | **356.4%** |

# Greater Birmingham and Solihull LEP

## Alternative Fuel Vehicle

| | Alternative Fuel Vehicle | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 19 | 9 | 46.5% | 28 | 25 | -11.0% | 33 | 18.9% | 39 | 40.4% | 91 | 228.8% |
| **Snr Management SME** | 32 | 7 | 21.9% | 39 | 41 | 6.6% | 55 | 42.2% | 65 | 68.3% | 157 | 304.0% |
| **Supervisory** | 44 | 10 | 22.0% | 54 | 57 | 6.0% | 76 | 39.7% | 89 | 63.8% | 214 | 294.6% |
| **Middle / Junior Management** | 44 | 11 | 23.9% | 55 | 59 | 7.6% | 75 | 36.8% | 89 | 62.7% | 209 | 281.2% |
| **Designer / Developer** | 5 | 2 | 45.3% | 7 | 6 | -10.0% | 8 | 20.8% | 10 | 41.2% | 22 | 225.4% |
| **Clerical** | 27 | 0 | 0.4% | 27 | 35 | 30.9% | 46 | 70.9% | 54 | 98.4% | 129 | 375.8% |
| **Self Employed** | 29 | 7 | 24.3% | 36 | 38 | 7.5% | 49 | 36.5% | 57 | 60.6% | 140 | 291.9% |
| **Advisor or Agent** | 47 | 11 | 23.2% | 58 | 62 | 6.3% | 80 | 38.2% | 96 | 64.8% | 227 | 290.2% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 27 | 1 | 5.5% | 28 | 35 | 24.9% | 45 | 60.1% | 55 | 94.7% | 135 | 377.6% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 66 | 8 | 11.5% | 73 | 88 | 19.4% | 113 | 53.7% | 135 | 83.2% | 322 | 337.8% |
| **Scientist** | 7 | 3 | 46.3% | 10 | 9 | -10.1% | 12 | 17.1% | 14 | 39.5% | 34 | 233.9% |
| **Maintenance Engineer** | 62 | 8 | 13.3% | 70 | 81 | 16.1% | 105 | 51.1% | 125 | 79.6% | 289 | 314.4% |
| **Civil Engineer** | 8 | 4 | 47.4% | 12 | 11 | -11.6% | 14 | 16.2% | 17 | 37.3% | 40 | 228.6% |
| **Production Engineer** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Power distribution Engineer** | 9 | 6 | 64.6% | 15 | 12 | -20.4% | 16 | 5.1% | 18 | 21.2% | 44 | 195.6% |
| **Construction Engineer** | 10 | 3 | 34.7% | 13 | 13 | -3.0% | 17 | 27.5% | 19 | 48.5% | 47 | 258.6% |
| **Sales Exec** | 47 | 11 | 22.5% | 58 | 63 | 7.9% | 83 | 42.9% | 96 | 65.3% | 230 | 296.0% |
| **Marketing Personnel** | 51 | 12 | 23.8% | 64 | 66 | 4.2% | 90 | 40.9% | 107 | 68.0% | 250 | 292.4% |
| **General Semi Skilled Worker** | 44 | 2 | 4.4% | 46 | 57 | 25.3% | 74 | 63.2% | 88 | 94.2% | 209 | 358.5% |
| **General Labour** | 65 | 0 | 0.0% | 65 | 87 | 34.2% | 110 | 69.7% | 132 | 104.0% | 311 | 379.5% |
| **Other Employees** | 55 | 7 | 12.0% | 61 | 73 | 19.2% | 94 | 52.8% | 112 | 82.2% | 268 | 336.4% |
| **Administrative workers** | 36 | 2 | 4.8% | 38 | 46 | 22.9% | 62 | 63.7% | 73 | 92.9% | 172 | 356.0% |
| **Total** | **733** | **123** | **16.8%** | **856** | **965** | **12.7%** | **1,256** | **46.8%** | **1,490** | **74.0%** | **3,537** | **313.2%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 140 | 50 | 35.5% | 190 | 181 | -4.8% | 249 | 31.1% | 292 | 53.9% | 684 | 260.2% |
| **Snr Management SME** | 110 | 19 | 17.4% | 129 | 142 | 9.8% | 189 | 46.5% | 220 | 69.9% | 529 | 309.5% |
| **Supervisory** | 156 | 26 | 16.9% | 182 | 199 | 9.0% | 268 | 47.1% | 310 | 70.1% | 751 | 311.9% |
| **Middle / Junior Management** | 150 | 24 | 15.9% | 173 | 193 | 11.0% | 263 | 51.3% | 300 | 72.7% | 739 | 325.7% |
| **Designer / Developer** | 26 | 9 | 33.5% | 34 | 33 | -3.7% | 45 | 30.3% | 51 | 48.7% | 128 | 272.4% |
| **Clerical** | 76 | 0 | 0.4% | 76 | 101 | 32.4% | 128 | 68.6% | 153 | 100.9% | 376 | 394.5% |
| **Self Employed** | 44 | 8 | 18.3% | 52 | 58 | 11.8% | 73 | 42.1% | 88 | 70.3% | 207 | 301.7% |
| **Advisor or Agent** | 3 | 1 | 19.2% | 4 | 5 | 12.0% | 6 | 42.9% | 7 | 71.4% | 17 | 310.8% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 132 | 6 | 4.8% | 139 | 166 | 19.2% | 225 | 61.8% | 268 | 93.1% | 626 | 351.1% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 47 | 4 | 9.5% | 52 | 60 | 16.4% | 79 | 53.5% | 97 | 87.5% | 231 | 347.6% |
| **Scientist** | 90 | 29 | 32.7% | 119 | 117 | -2.5% | 152 | 27.5% | 188 | 57.0% | 436 | 265.1% |
| **Maintenance Engineer** | 185 | 21 | 11.6% | 206 | 238 | 15.4% | 320 | 55.1% | 374 | 81.3% | 879 | 325.9% |
| **Civil Engineer** | 1 | 0 | 36.1% | 1 | 1 | -5.5% | 1 | 25.4% | 1 | 47.2% | 3 | 246.4% |
| **Production Engineer** | 100 | 58 | 57.6% | 158 | 126 | -20.7% | 173 | 9.1% | 197 | 24.7% | 480 | 203.0% |
| **Power distribution Engineer** | 32 | 15 | 47.5% | 48 | 41 | -13.9% | 54 | 12.5% | 65 | 36.8% | 153 | 220.4% |
| **Construction Engineer** | 1 | 0 | 31.1% | 1 | 1 | -3.3% | 1 | 29.2% | 1 | 50.3% | 3 | 260.7% |
| **Sales Exec** | 144 | 27 | 18.7% | 171 | 194 | 13.2% | 248 | 45.0% | 286 | 66.9% | 695 | 305.5% |
| **Marketing Personnel** | 153 | 24 | 15.9% | 177 | 199 | 12.7% | 267 | 51.1% | 305 | 72.5% | 751 | 324.9% |
| **General Semi Skilled Worker** | 198 | 7 | 3.4% | 204 | 263 | 28.7% | 342 | 67.2% | 407 | 98.9% | 958 | 368.7% |
| **General Labour** | 256 | 0 | 0.0% | 256 | 334 | 30.9% | 447 | 75.1% | 513 | 100.7% | 1,230 | 381.4% |
| **Other Employees** | 188 | 18 | 9.4% | 206 | 243 | 18.0% | 323 | 57.0% | 379 | 83.9% | 895 | 334.6% |
| **Administrative workers** | 99 | 3 | 3.4% | 103 | 130 | 26.5% | 169 | 63.9% | 198 | 92.3% | 491 | 377.2% |
| **Total** | **2,331** | **351** | **15.1%** | **2,682** | **3,022** | **12.7%** | **4,023** | **50.0%** | **4,699** | **75.2%** | **11,263** | **319.9%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 81 | 19 | 23.6% | 100 | 108 | 8.0% | 141 | 40.1% | 165 | 64.9% | 393 | 291.5% |
| Snr Management SME | 326 | 38 | 11.6% | 363 | 416 | 14.4% | 563 | 54.9% | 657 | 80.7% | 1,541 | 323.9% |
| Supervisory | 367 | 40 | 10.9% | 407 | 476 | 17.0% | 631 | 55.2% | 743 | 82.7% | 1,794 | 341.2% |
| Middle / Junior Management | 352 | 40 | 11.4% | 392 | 459 | 17.0% | 605 | 54.3% | 714 | 81.9% | 1,669 | 325.5% |
| Designer / Developer | 39 | 9 | 24.4% | 48 | 50 | 3.8% | 68 | 40.4% | 78 | 60.8% | 188 | 289.0% |
| Clerical | 177 | 0 | 0.2% | 178 | 236 | 32.5% | 309 | 73.9% | 357 | 100.8% | 863 | 385.2% |
| Self Employed | 19 | 2 | 12.9% | 21 | 24 | 14.4% | 32 | 49.5% | 38 | 77.5% | 90 | 326.0% |
| Advisor or Agent | 6 | 1 | 11.5% | 6 | 7 | 16.9% | 10 | 54.4% | 11 | 79.7% | 27 | 334.8% |
| Educator | 0 | 0 | 12.0% | 0 | 0 | 19.0% | 0 | 48.6% | 0 | 94.9% | 0 | 335.4% |
| Specialist or Consultant | 194 | 7 | 3.4% | 201 | 258 | 28.7% | 332 | 65.4% | 385 | 91.8% | 941 | 368.5% |
| Editor | 5 | 0 | 2.5% | 5 | 6 | 26.5% | 9 | 68.1% | 10 | 99.1% | 23 | 360.3% |
| Industrial Researchers | 6 | 0 | 6.0% | 7 | 8 | 22.9% | 11 | 61.8% | 13 | 91.8% | 30 | 355.8% |
| Scientist | 9 | 2 | 23.1% | 12 | 12 | 6.7% | 16 | 41.8% | 19 | 67.5% | 44 | 280.3% |
| Maintenance Engineer | 347 | 24 | 6.9% | 371 | 454 | 22.4% | 608 | 64.2% | 708 | 91.1% | 1,690 | 356.2% |
| Civil Engineer | 5 | 1 | 23.7% | 6 | 6 | 3.6% | 9 | 38.9% | 10 | 63.4% | 24 | 287.2% |
| Production Engineer | 53 | 18 | 33.6% | 70 | 70 | -0.5% | 93 | 31.8% | 107 | 53.1% | 251 | 258.1% |
| Power distribution Engineer | 163 | 52 | 32.0% | 215 | 212 | -1.2% | 280 | 30.6% | 331 | 54.3% | 799 | 272.3% |
| Construction Engineer | 5 | 1 | 17.0% | 6 | 7 | 13.3% | 9 | 47.7% | 10 | 73.1% | 25 | 314.2% |
| Sales Exec | 160 | 18 | 11.1% | 178 | 212 | 19.3% | 273 | 54.0% | 325 | 83.1% | 773 | 335.3% |
| Marketing Personnel | 177 | 20 | 11.4% | 197 | 231 | 17.4% | 301 | 53.2% | 354 | 79.9% | 862 | 338.2% |
| General Semi Skilled Worker | 345 | 7 | 2.2% | 352 | 447 | 26.9% | 598 | 69.6% | 697 | 97.9% | 1,694 | 380.9% |
| General Labour | 333 | 0 | 0.0% | 333 | 436 | 30.7% | 575 | 72.6% | 667 | 100.1% | 1,618 | 385.4% |
| Other Employees | 503 | 30 | 6.0% | 533 | 662 | 24.3% | 845 | 58.7% | 1,029 | 93.1% | 2,446 | 359.1% |
| Administrative workers | 179 | 4 | 2.2% | 182 | 232 | 27.1% | 305 | 67.2% | 364 | 99.3% | 860 | 371.5% |
| **Total** | **3,849** | **334** | **8.7%** | **4,183** | **5,030** | **20.2%** | **6,623** | **58.3%** | **7,793** | **86.3%** | **18,647** | **345.8%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 159 | 22 | 13.6% | 181 | 204 | 12.5% | 273 | 50.6% | 321 | 77.3% | 771 | 325.6% |
| **Snr Management SME** | 372 | 24 | 6.5% | 396 | 485 | 22.5% | 648 | 63.5% | 748 | 88.9% | 1,794 | 352.9% |
| **Supervisory** | 415 | 27 | 6.6% | 442 | 550 | 24.4% | 720 | 62.8% | 842 | 90.4% | 1,982 | 348.3% |
| **Middle / Junior Management** | 400 | 27 | 6.8% | 427 | 527 | 23.4% | 684 | 60.2% | 793 | 85.8% | 1,945 | 355.7% |
| **Designer / Developer** | 46 | 7 | 14.3% | 53 | 60 | 13.2% | 79 | 49.1% | 93 | 75.6% | 221 | 317.6% |
| **Clerical** | 213 | 0 | 0.1% | 213 | 280 | 31.4% | 363 | 70.5% | 432 | 102.7% | 1,005 | 371.4% |
| **Self Employed** | 50 | 3 | 7.0% | 54 | 65 | 21.3% | 87 | 62.1% | 100 | 87.5% | 238 | 344.8% |
| **Advisor or Agent** | 55 | 4 | 7.0% | 59 | 74 | 25.3% | 96 | 61.5% | 112 | 88.3% | 268 | 352.0% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 329 | 7 | 2.3% | 337 | 442 | 31.3% | 578 | 71.6% | 659 | 95.6% | 1,563 | 364.2% |
| **Editor** | 2 | 0 | 1.4% | 2 | 2 | 29.3% | 3 | 70.7% | 3 | 99.9% | 8 | 371.6% |
| **Industrial Researchers** | 88 | 3 | 3.6% | 91 | 114 | 25.1% | 152 | 67.2% | 177 | 94.2% | 425 | 366.8% |
| **Scientist** | 13 | 2 | 14.5% | 14 | 17 | 14.2% | 22 | 49.8% | 25 | 73.2% | 61 | 320.6% |
| **Maintenance Engineer** | 403 | 16 | 4.0% | 420 | 528 | 25.8% | 695 | 65.7% | 829 | 97.6% | 1,960 | 366.9% |
| **Civil Engineer** | 22 | 3 | 15.0% | 25 | 28 | 13.7% | 37 | 47.6% | 45 | 79.0% | 105 | 320.0% |
| **Production Engineer** | 50 | 11 | 21.6% | 60 | 65 | 7.0% | 86 | 41.6% | 102 | 68.1% | 243 | 302.0% |
| **Power distribution Engineer** | 202 | 45 | 22.4% | 247 | 266 | 7.5% | 348 | 40.8% | 409 | 65.6% | 972 | 293.2% |
| **Construction Engineer** | 41 | 4 | 10.1% | 45 | 54 | 20.5% | 70 | 57.7% | 81 | 81.9% | 195 | 337.6% |
| **Sales Exec** | 176 | 12 | 6.9% | 188 | 228 | 21.4% | 303 | 61.3% | 363 | 92.8% | 818 | 334.5% |
| **Marketing Personnel** | 191 | 13 | 6.8% | 204 | 254 | 24.3% | 330 | 61.5% | 398 | 95.2% | 916 | 348.9% |
| **General Semi Skilled Worker** | 415 | 6 | 1.4% | 420 | 532 | 26.6% | 715 | 70.0% | 838 | 99.4% | 1,967 | 367.9% |
| **General Labour** | 735 | 0 | 0.0% | 735 | 964 | 31.2% | 1,260 | 71.5% | 1,485 | 102.2% | 3,500 | 376.4% |
| **Other Employees** | 567 | 21 | 3.7% | 588 | 743 | 26.3% | 985 | 67.3% | 1,138 | 93.4% | 2,727 | 363.4% |
| **Administrative workers** | 232 | 3 | 1.3% | 235 | 309 | 31.5% | 399 | 69.7% | 465 | 97.6% | 1,122 | 376.9% |
| **Total** | **5,175** | **262** | **5.1%** | **5,437** | **6,791** | **24.9%** | **8,932** | **64.3%** | **10,459** | **92.4%** | **24,805** | **356.2%** |

## Carbon Finance

| | Carbon Finance | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Snr Management SME | 24 | 5 | 21.1% | 30 | 32 | 7.9% | 43 | 45.8% | 50 | 68.3% | 116 | 291.2% |
| Supervisory | 81 | 17 | 20.9% | 98 | 106 | 8.2% | 142 | 44.1% | 166 | 68.8% | 391 | 297.0% |
| Middle / Junior Management | 55 | 13 | 22.9% | 68 | 73 | 6.6% | 95 | 38.6% | 113 | 65.2% | 264 | 287.1% |
| Designer / Developer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Clerical | 52 | 0 | 0.5% | 52 | 68 | 31.2% | 91 | 74.9% | 105 | 101.4% | 251 | 382.6% |
| Self Employed | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Advisor or Agent | 19 | 4 | 22.6% | 24 | 25 | 6.8% | 33 | 40.3% | 40 | 68.0% | 91 | 285.1% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 107 | 8 | 7.7% | 115 | 139 | 20.9% | 182 | 58.5% | 210 | 82.6% | 509 | 343.5% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Scientist | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Maintenance Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Civil Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Construction Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Sales Exec | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Marketing Personnel | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| General Semi Skilled Worker | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| General Labour | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Other Employees | 20 | 2 | 9.9% | 22 | 27 | 21.2% | 34 | 55.8% | 41 | 86.8% | 99 | 349.7% |
| Administrative workers | 76 | 3 | 4.4% | 80 | 98 | 23.5% | 134 | 67.6% | 154 | 93.1% | 368 | 361.4% |
| **Total** | **435** | **53** | **12.2%** | **488** | **568** | **16.4%** | **753** | **54.3%** | **878** | **79.7%** | **2,088** | **327.6%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 25 | 11 | 44.8% | 37 | 33 | -9.0% | 44 | 19.3% | 51 | 39.3% | 121 | 230.8% |
| **Snr Management SME** | 46 | 11 | 23.0% | 56 | 58 | 4.1% | 78 | 39.7% | 93 | 65.8% | 218 | 288.5% |
| **Supervisory** | 54 | 12 | 22.2% | 66 | 72 | 9.9% | 92 | 38.9% | 108 | 64.1% | 260 | 295.2% |
| **Middle / Junior Management** | 52 | 12 | 23.3% | 64 | 68 | 5.9% | 90 | 39.9% | 106 | 65.1% | 255 | 295.0% |
| **Designer / Developer** | 13 | 7 | 48.6% | 20 | 17 | -12.2% | 22 | 12.7% | 27 | 37.2% | 65 | 225.4% |
| **Clerical** | 27 | 0 | 0.5% | 27 | 35 | 30.6% | 46 | 70.7% | 53 | 98.2% | 129 | 377.7% |
| **Self Employed** | 14 | 3 | 21.8% | 17 | 19 | 8.7% | 24 | 40.4% | 28 | 63.0% | 67 | 289.9% |
| **Advisor or Agent** | 12 | 3 | 23.0% | 14 | 15 | 6.1% | 20 | 38.5% | 23 | 61.0% | 55 | 288.2% |
| **Educator** | 0 | 0 | 21.9% | 0 | 0 | 5.0% | 1 | 43.5% | 1 | 56.8% | 2 | 291.0% |
| **Specialist or Consultant** | 34 | 2 | 6.5% | 36 | 46 | 25.6% | 60 | 64.6% | 67 | 84.7% | 166 | 355.3% |
| **Editor** | 5 | 0 | 4.1% | 5 | 6 | 27.4% | 8 | 64.2% | 10 | 93.9% | 22 | 348.9% |
| **Industrial Researchers** | 9 | 1 | 11.8% | 10 | 12 | 17.2% | 16 | 55.8% | 18 | 81.9% | 43 | 325.1% |
| **Scientist** | 5 | 2 | 49.0% | 8 | 7 | -13.0% | 9 | 16.8% | 10 | 37.3% | 24 | 214.4% |
| **Maintenance Engineer** | 62 | 9 | 13.8% | 71 | 82 | 14.9% | 106 | 49.6% | 125 | 75.3% | 300 | 321.8% |
| **Civil Engineer** | 9 | 4 | 42.9% | 13 | 12 | -9.0% | 15 | 19.2% | 18 | 43.8% | 42 | 227.6% |
| **Production Engineer** | 11 | 8 | 72.2% | 19 | 15 | -24.7% | 19 | -1.1% | 23 | 18.2% | 54 | 179.5% |
| **Power distribution Engineer** | 29 | 20 | 68.3% | 48 | 37 | -22.7% | 50 | 3.4% | 58 | 20.1% | 140 | 188.7% |
| **Construction Engineer** | 11 | 4 | 34.9% | 15 | 14 | -4.7% | 19 | 28.0% | 22 | 46.7% | 53 | 254.1% |
| **Sales Exec** | 30 | 7 | 21.9% | 36 | 39 | 7.5% | 51 | 41.4% | 60 | 66.1% | 143 | 295.3% |
| **Marketing Personnel** | 30 | 6 | 21.7% | 36 | 39 | 6.9% | 50 | 38.7% | 60 | 64.5% | 142 | 292.0% |
| **General Semi Skilled Worker** | 58 | 3 | 4.6% | 61 | 77 | 26.6% | 100 | 63.5% | 116 | 89.8% | 279 | 356.8% |
| **General Labour** | 85 | 0 | 0.0% | 85 | 112 | 32.2% | 146 | 71.7% | 171 | 101.1% | 410 | 382.6% |
| **Other Employees** | 78 | 9 | 12.0% | 87 | 102 | 17.1% | 133 | 53.0% | 156 | 78.8% | 377 | 332.9% |
| **Administrative workers** | 32 | 1 | 4.6% | 34 | 41 | 23.5% | 55 | 62.7% | 65 | 92.7% | 154 | 360.0% |
| **Total** | **731** | **135** | **18.4%** | **866** | **960** | **10.8%** | **1,254** | **44.8%** | **1,469** | **69.6%** | **3,520** | **306.3%** |

## Geothermal

| SOC | Geothermal Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 41 | 18 | 44.7% | 59 | 53 | -10.0% | 70 | 18.6% | 82 | 39.2% | 195 | 232.0% |
| Snr Management SME | 153 | 37 | 24.1% | 189 | 200 | 5.4% | 263 | 39.1% | 306 | 61.8% | 728 | 284.4% |
| Supervisory | 167 | 38 | 22.6% | 205 | 214 | 4.5% | 288 | 40.8% | 334 | 63.4% | 813 | 297.4% |
| Middle / Junior Management | 164 | 38 | 23.3% | 203 | 212 | 4.8% | 278 | 37.1% | 336 | 65.8% | 785 | 287.7% |
| Designer / Developer | 18 | 8 | 45.8% | 27 | 24 | -10.3% | 31 | 16.8% | 37 | 37.8% | 88 | 228.5% |
| Clerical | 84 | 0 | 0.5% | 84 | 110 | 30.9% | 144 | 71.0% | 173 | 106.2% | 403 | 378.8% |
| Self Employed | 10 | 2 | 22.8% | 13 | 13 | 5.6% | 18 | 41.5% | 21 | 62.8% | 50 | 293.5% |
| Advisor or Agent | 9 | 2 | 22.2% | 11 | 12 | 7.7% | 16 | 40.3% | 18 | 64.1% | 43 | 290.4% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 87 | 6 | 7.3% | 93 | 113 | 21.3% | 151 | 61.7% | 174 | 86.4% | 425 | 355.7% |
| Editor | 4 | 0 | 4.5% | 5 | 6 | 25.4% | 8 | 66.3% | 9 | 94.6% | 21 | 360.8% |
| Industrial Researchers | 6 | 1 | 11.2% | 6 | 7 | 18.9% | 10 | 54.3% | 11 | 82.7% | 27 | 332.4% |
| Scientist | 4 | 2 | 45.3% | 6 | 6 | -10.8% | 8 | 17.6% | 9 | 40.6% | 21 | 232.7% |
| Maintenance Engineer | 168 | 25 | 14.6% | 193 | 222 | 15.3% | 281 | 45.7% | 338 | 75.3% | 805 | 317.1% |
| Civil Engineer | 7 | 3 | 46.6% | 11 | 10 | -11.3% | 13 | 15.9% | 15 | 39.7% | 35 | 227.4% |
| Production Engineer | 28 | 20 | 70.7% | 47 | 36 | -23.1% | 47 | 0.5% | 56 | 18.2% | 131 | 177.4% |
| Power distribution Engineer | 78 | 51 | 64.4% | 129 | 102 | -20.7% | 134 | 4.3% | 158 | 22.8% | 376 | 191.7% |
| Construction Engineer | 7 | 2 | 31.1% | 9 | 9 | 0.3% | 12 | 31.0% | 15 | 56.5% | 35 | 271.5% |
| Sales Exec | 81 | 19 | 23.8% | 100 | 106 | 6.5% | 136 | 36.3% | 161 | 61.0% | 392 | 292.2% |
| Marketing Personnel | 87 | 21 | 23.7% | 107 | 114 | 5.8% | 148 | 37.9% | 174 | 62.5% | 416 | 287.8% |
| General Semi Skilled Worker | 167 | 7 | 4.5% | 175 | 218 | 24.9% | 287 | 64.5% | 341 | 95.1% | 815 | 366.6% |
| General Labour | 237 | 0 | 0.0% | 237 | 310 | 30.8% | 403 | 70.1% | 478 | 102.1% | 1,141 | 382.0% |
| Other Employees | 240 | 27 | 11.1% | 267 | 310 | 16.5% | 412 | 54.7% | 478 | 79.5% | 1,122 | 321.0% |
| Administrative workers | 86 | 4 | 4.5% | 90 | 113 | 25.6% | 149 | 64.5% | 175 | 93.6% | 418 | 362.8% |
| **Total** | **1,934** | **331** | **17.1%** | **2,265** | **2,521** | **11.3%** | **3,306** | **45.9%** | **3,900** | **72.2%** | **9,286** | **309.9%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 135 | 11 | 8.3% | 147 | 177 | 20.8% | 231 | 57.6% | 280 | 90.9% | 652 | 344.5% |
| **Snr Management SME** | 384 | 16 | 4.3% | 401 | 510 | 27.2% | 670 | 67.3% | 796 | 98.6% | 1,835 | 357.9% |
| **Supervisory** | 420 | 19 | 4.6% | 439 | 543 | 23.8% | 727 | 65.7% | 848 | 93.1% | 2,058 | 368.7% |
| **Middle / Junior Management** | 411 | 16 | 3.9% | 427 | 544 | 27.3% | 703 | 64.6% | 831 | 94.5% | 1,952 | 356.8% |
| **Designer / Developer** | 30 | 2 | 8.3% | 32 | 40 | 22.3% | 52 | 60.7% | 61 | 89.4% | 143 | 342.7% |
| **Clerical** | 206 | 0 | 0.1% | 207 | 273 | 32.1% | 354 | 71.4% | 419 | 103.0% | 982 | 375.6% |
| **Self Employed** | 24 | 1 | 4.4% | 26 | 32 | 23.7% | 42 | 64.2% | 49 | 90.6% | 118 | 360.2% |
| **Advisor or Agent** | 3 | 0 | 4.3% | 3 | 4 | 19.4% | 5 | 71.4% | 6 | 93.6% | 14 | 366.8% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 199 | 3 | 1.4% | 201 | 265 | 31.5% | 333 | 65.5% | 402 | 99.8% | 945 | 369.1% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 13 | 0 | 2.5% | 14 | 18 | 27.9% | 23 | 69.4% | 27 | 96.9% | 65 | 370.6% |
| **Scientist** | 0 | 0 | 8.0% | 0 | 1 | 20.4% | 1 | 63.0% | 1 | 83.7% | 2 | 355.2% |
| **Maintenance Engineer** | 406 | 11 | 2.6% | 417 | 527 | 26.4% | 707 | 69.5% | 823 | 97.5% | 1,954 | 368.9% |
| **Civil Engineer** | 10 | 1 | 9.1% | 11 | 13 | 20.5% | 17 | 55.3% | 21 | 88.2% | 49 | 349.4% |
| **Production Engineer** | 53 | 7 | 13.2% | 60 | 69 | 14.6% | 90 | 50.2% | 109 | 80.8% | 256 | 326.2% |
| **Power distribution Engineer** | 198 | 28 | 13.9% | 226 | 258 | 14.5% | 342 | 51.8% | 388 | 71.9% | 951 | 321.7% |
| **Construction Engineer** | 23 | 2 | 7.1% | 25 | 30 | 22.4% | 39 | 59.1% | 47 | 89.6% | 112 | 352.6% |
| **Sales Exec** | 184 | 8 | 4.5% | 192 | 235 | 22.4% | 315 | 64.0% | 375 | 95.3% | 873 | 354.7% |
| **Marketing Personnel** | 206 | 10 | 4.6% | 216 | 268 | 24.1% | 357 | 65.3% | 418 | 93.6% | 980 | 353.8% |
| **General Semi Skilled Worker** | 425 | 4 | 0.9% | 428 | 552 | 28.9% | 738 | 72.2% | 845 | 97.4% | 2,002 | 367.6% |
| **General Labour** | 527 | 0 | 0.0% | 527 | 688 | 30.7% | 907 | 72.2% | 1,072 | 103.6% | 2,529 | 380.4% |
| **Other Employees** | 571 | 11 | 2.0% | 583 | 744 | 27.8% | 960 | 64.8% | 1,158 | 98.8% | 2,730 | 368.5% |
| **Administrative workers** | 222 | 2 | 0.9% | 224 | 289 | 29.1% | 375 | 67.4% | 441 | 96.7% | 1,053 | 369.9% |
| **Total** | **4,652** | **152** | **3.3%** | **4,804** | **6,079** | **26.5%** | **7,989** | **66.3%** | **9,416** | **96.0%** | **22,255** | **363.2%** |

## Recovery and Recycling

| SOC | Recovery and Recycling – Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 – Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 – Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 – Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 – Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 91 | 33 | 36.8% | 124 | 119 | -4.3% | 155 | 25.0% | 185 | 49.0% | 434 | 249.3% |
| Snr Management SME | 98 | 19 | 19.2% | 116 | 127 | 9.0% | 164 | 41.1% | 194 | 66.6% | 468 | 302.1% |
| Supervisory | 115 | 22 | 19.3% | 137 | 149 | 8.5% | 201 | 46.2% | 228 | 66.3% | 555 | 304.6% |
| Middle / Junior Management | 113 | 22 | 19.9% | 135 | 145 | 7.4% | 194 | 44.1% | 228 | 68.8% | 548 | 306.0% |
| Designer / Developer | 79 | 29 | 36.0% | 108 | 104 | -3.4% | 136 | 26.1% | 158 | 46.3% | 381 | 252.3% |
| Clerical | 57 | 0 | 0.4% | 57 | 75 | 31.3% | 98 | 72.3% | 117 | 104.9% | 269 | 371.5% |
| Self Employed | 30 | 6 | 18.4% | 36 | 39 | 9.9% | 52 | 45.1% | 61 | 70.7% | 147 | 313.1% |
| Advisor or Agent | 10 | 2 | 19.2% | 12 | 14 | 10.0% | 18 | 42.7% | 20 | 66.6% | 49 | 296.8% |
| Educator | 0 | 0 | 18.4% | 0 | 1 | 13.7% | 1 | 42.4% | 1 | 67.2% | 2 | 290.0% |
| Specialist or Consultant | 95 | 6 | 6.0% | 101 | 123 | 22.2% | 161 | 59.9% | 192 | 90.7% | 460 | 357.2% |
| Editor | 4 | 0 | 3.7% | 4 | 6 | 27.0% | 7 | 61.1% | 9 | 97.9% | 21 | 361.1% |
| Industrial Researchers | 22 | 2 | 9.1% | 24 | 28 | 20.2% | 37 | 56.6% | 44 | 85.7% | 103 | 337.7% |
| Scientist | 20 | 7 | 36.8% | 27 | 26 | -3.8% | 34 | 25.8% | 40 | 48.0% | 96 | 252.2% |
| Maintenance Engineer | 140 | 16 | 11.3% | 155 | 183 | 18.0% | 241 | 55.0% | 282 | 81.6% | 675 | 334.1% |
| Civil Engineer | 38 | 14 | 36.0% | 51 | 49 | -3.8% | 65 | 26.6% | 77 | 50.0% | 182 | 255.0% |
| Production Engineer | 48 | 26 | 54.9% | 75 | 63 | -14.9% | 82 | 10.4% | 98 | 30.9% | 233 | 213.0% |
| Power distribution Engineer | 72 | 42 | 57.9% | 113 | 93 | -17.7% | 121 | 7.2% | 144 | 27.0% | 348 | 207.3% |
| Construction Engineer | 44 | 12 | 27.7% | 57 | 57 | 1.5% | 77 | 35.6% | 90 | 59.4% | 213 | 275.7% |
| Sales Exec | 88 | 16 | 18.5% | 104 | 115 | 10.1% | 152 | 45.9% | 175 | 67.9% | 422 | 304.9% |
| Marketing Personnel | 77 | 15 | 19.0% | 91 | 100 | 9.6% | 131 | 43.6% | 156 | 71.6% | 365 | 300.7% |
| General Semi Skilled Worker | 183 | 7 | 3.8% | 190 | 243 | 27.9% | 319 | 67.9% | 369 | 93.8% | 883 | 364.2% |
| General Labour | 178 | 0 | 0.0% | 178 | 232 | 30.2% | 306 | 71.6% | 361 | 102.6% | 855 | 379.9% |
| Other Employees | 152 | 14 | 9.2% | 166 | 197 | 18.3% | 259 | 55.9% | 310 | 86.3% | 740 | 345.1% |
| Administrative workers | 77 | 3 | 3.8% | 80 | 100 | 24.8% | 132 | 64.9% | 156 | 95.9% | 375 | 368.8% |
| **Total** | **1,830** | **313** | **17.1%** | **2,143** | **2,388** | **11.4%** | **3,143** | **46.7%** | **3,695** | **72.4%** | **8,822** | **311.7%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 76 | 11 | 13.9% | 87 | 99 | 14.1% | 131 | 50.6% | 156 | 79.9% | 372 | 327.6% |
| Snr Management SME | 129 | 9 | 7.2% | 138 | 168 | 21.6% | 226 | 63.1% | 264 | 90.4% | 620 | 347.8% |
| Supervisory | 158 | 12 | 7.5% | 170 | 205 | 20.5% | 273 | 60.2% | 319 | 87.5% | 759 | 345.5% |
| Middle / Junior Management | 158 | 11 | 6.7% | 169 | 205 | 21.2% | 274 | 62.2% | 316 | 87.1% | 758 | 348.6% |
| Designer / Developer | 32 | 4 | 13.1% | 36 | 42 | 14.1% | 56 | 53.0% | 65 | 79.7% | 153 | 321.6% |
| Clerical | 82 | 0 | 0.1% | 82 | 106 | 28.8% | 143 | 73.4% | 166 | 101.7% | 389 | 371.8% |
| Self Employed | 45 | 3 | 6.6% | 48 | 59 | 22.5% | 77 | 59.4% | 91 | 88.7% | 218 | 350.9% |
| Advisor or Agent | 58 | 4 | 6.6% | 61 | 76 | 24.3% | 99 | 61.8% | 115 | 87.4% | 279 | 353.4% |
| Educator | 3 | 0 | 6.8% | 3 | 4 | 21.6% | 5 | 59.6% | 7 | 95.4% | 15 | 338.4% |
| Specialist or Consultant | 100 | 2 | 2.2% | 102 | 130 | 27.1% | 171 | 67.8% | 203 | 98.9% | 476 | 365.9% |
| Editor | 8 | 0 | 1.2% | 9 | 11 | 28.7% | 15 | 70.6% | 17 | 101.2% | 41 | 381.6% |
| Industrial Researchers | 69 | 2 | 3.5% | 71 | 89 | 24.8% | 118 | 66.3% | 137 | 92.8% | 324 | 355.6% |
| Scientist | 13 | 2 | 12.8% | 15 | 17 | 14.8% | 23 | 52.2% | 27 | 79.1% | 64 | 330.0% |
| Maintenance Engineer | 188 | 8 | 4.3% | 196 | 245 | 25.2% | 321 | 64.0% | 377 | 92.2% | 900 | 359.3% |
| Civil Engineer | 27 | 4 | 13.1% | 30 | 35 | 13.9% | 46 | 51.1% | 54 | 78.3% | 129 | 326.8% |
| Production Engineer | 33 | 7 | 20.8% | 40 | 43 | 8.2% | 56 | 40.6% | 67 | 68.1% | 159 | 298.9% |
| Power distribution Engineer | 88 | 20 | 22.3% | 108 | 116 | 7.4% | 151 | 40.1% | 180 | 66.1% | 423 | 291.2% |
| Construction Engineer | 40 | 4 | 10.6% | 44 | 52 | 18.0% | 69 | 55.1% | 80 | 81.4% | 191 | 332.6% |
| Sales Exec | 73 | 5 | 6.6% | 78 | 98 | 25.2% | 125 | 60.4% | 149 | 90.8% | 357 | 357.1% |
| Marketing Personnel | 74 | 5 | 7.1% | 79 | 96 | 21.5% | 128 | 62.5% | 147 | 87.1% | 354 | 349.1% |
| General Semi Skilled Worker | 175 | 2 | 1.4% | 177 | 227 | 28.0% | 299 | 68.7% | 354 | 100.2% | 849 | 379.2% |
| General Labour | 105 | 0 | 0.0% | 105 | 136 | 30.0% | 180 | 71.2% | 211 | 101.6% | 502 | 378.3% |
| Other Employees | 232 | 9 | 3.8% | 240 | 301 | 25.1% | 395 | 64.2% | 476 | 97.9% | 1,112 | 362.8% |
| Administrative workers | 105 | 1 | 1.4% | 106 | 137 | 28.6% | 178 | 67.2% | 211 | 98.3% | 497 | 368.0% |
| **Total** | **2,072** | **125** | **6.1%** | **2,197** | **2,697** | **22.7%** | **3,558** | **61.9%** | **4,190** | **90.7%** | **9,941** | **352.4%** |

## Water and Waste Water Treatment

| SOC | Water & Waste Water Treatment Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 113 | 11 | 9.4% | 123 | 147 | 19.1% | 195 | 58.4% | 226 | 83.2% | 541 | 338.3% |
| Snr Management SME | 175 | 8 | 4.8% | 184 | 233 | 26.8% | 307 | 67.3% | 355 | 93.0% | 839 | 356.7% |
| Supervisory | 205 | 9 | 4.2% | 213 | 263 | 23.5% | 350 | 64.1% | 418 | 96.1% | 992 | 365.2% |
| Middle / Junior Management | 194 | 8 | 4.1% | 202 | 254 | 26.1% | 332 | 64.3% | 396 | 96.1% | 923 | 357.4% |
| Designer / Developer | 46 | 4 | 9.5% | 50 | 60 | 20.0% | 78 | 55.2% | 92 | 83.0% | 220 | 337.0% |
| Clerical | 98 | 0 | 0.1% | 99 | 128 | 29.4% | 170 | 72.9% | 198 | 100.6% | 469 | 376.1% |
| Self Employed | 58 | 3 | 4.5% | 60 | 73 | 22.0% | 99 | 65.1% | 116 | 93.6% | 276 | 358.0% |
| Advisor or Agent | 7 | 0 | 4.7% | 8 | 10 | 25.7% | 13 | 63.2% | 15 | 88.1% | 35 | 349.3% |
| Educator | 0 | 0 | 4.7% | 0 | 0 | 27.2% | 0 | 68.1% | 0 | 93.6% | 1 | 360.7% |
| Specialist or Consultant | 116 | 2 | 1.5% | 118 | 154 | 30.9% | 196 | 66.9% | 233 | 98.5% | 562 | 378.2% |
| Editor | 3 | 0 | 1.0% | 3 | 4 | 27.1% | 6 | 68.4% | 7 | 98.5% | 17 | 374.7% |
| Industrial Researchers | 8 | 0 | 2.3% | 8 | 10 | 28.2% | 13 | 67.8% | 16 | 98.8% | 37 | 372.8% |
| Scientist | 3 | 0 | 10.3% | 4 | 4 | 17.4% | 6 | 56.2% | 7 | 85.7% | 17 | 334.7% |
| Maintenance Engineer | 260 | 7 | 2.7% | 267 | 337 | 25.9% | 451 | 68.7% | 531 | 98.5% | 1,244 | 365.2% |
| Civil Engineer | 29 | 3 | 9.6% | 32 | 38 | 17.9% | 51 | 57.3% | 60 | 84.7% | 141 | 336.2% |
| Production Engineer | 57 | 8 | 14.0% | 65 | 74 | 13.7% | 98 | 51.6% | 115 | 76.9% | 276 | 325.7% |
| Power distribution Engineer | 119 | 17 | 14.4% | 136 | 158 | 16.3% | 206 | 51.8% | 241 | 77.8% | 563 | 314.7% |
| Construction Engineer | 48 | 3 | 7.2% | 52 | 63 | 22.8% | 83 | 61.4% | 98 | 89.1% | 232 | 349.6% |
| Sales Exec | 81 | 4 | 4.6% | 85 | 107 | 25.9% | 141 | 67.2% | 163 | 92.7% | 394 | 365.7% |
| Marketing Personnel | 85 | 4 | 5.1% | 90 | 115 | 27.9% | 147 | 64.0% | 175 | 94.3% | 409 | 354.9% |
| General Semi Skilled Worker | 225 | 2 | 0.9% | 227 | 297 | 30.7% | 393 | 73.1% | 461 | 103.2% | 1,092 | 380.9% |
| General Labour | 112 | 0 | 0.0% | 112 | 149 | 32.7% | 193 | 71.6% | 226 | 101.3% | 543 | 383.0% |
| Other Employees | 282 | 7 | 2.3% | 289 | 366 | 26.8% | 479 | 65.8% | 567 | 96.3% | 1,358 | 370.0% |
| Administrative workers | 119 | 1 | 1.0% | 120 | 154 | 28.0% | 202 | 67.8% | 238 | 98.1% | 572 | 375.7% |
| **Total** | **2,446** | **101** | **4.1%** | **2,547** | **3,200** | **25.6%** | **4,211** | **65.4%** | **4,953** | **94.5%** | **11,751** | **361.4%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 199 | 26 | 13.0% | 225 | 260 | 15.6% | 337 | 50.1% | 401 | 78.5% | 959 | 327.0% |
| Snr Management SME | 582 | 41 | 7.0% | 623 | 766 | 22.9% | 993 | 59.4% | 1,186 | 90.4% | 2,766 | 344.0% |
| Supervisory | 638 | 41 | 6.5% | 679 | 822 | 21.0% | 1,054 | 55.2% | 1,311 | 93.0% | 3,078 | 353.0% |
| Middle / Junior Management | 640 | 43 | 6.8% | 683 | 833 | 21.9% | 1,085 | 58.8% | 1,268 | 85.6% | 3,108 | 355.0% |
| Designer / Developer | 30 | 4 | 13.4% | 34 | 40 | 17.1% | 51 | 48.4% | 62 | 80.0% | 146 | 324.5% |
| Clerical | 320 | 0 | 0.1% | 320 | 423 | 32.0% | 548 | 71.1% | 641 | 100.2% | 1,531 | 378.3% |
| Self Employed | 53 | 3 | 6.0% | 56 | 70 | 24.4% | 92 | 63.5% | 107 | 89.4% | 253 | 349.7% |
| Advisor or Agent | 6 | 0 | 6.6% | 6 | 8 | 23.4% | 11 | 70.4% | 12 | 89.2% | 29 | 359.5% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 294 | 6 | 2.0% | 300 | 383 | 27.5% | 502 | 67.2% | 593 | 97.6% | 1,386 | 361.9% |
| Editor | 1 | 0 | 1.2% | 1 | 1 | 32.2% | 1 | 71.5% | 1 | 109.3% | 3 | 365.2% |
| Industrial Researchers | 7 | 0 | 3.1% | 7 | 9 | 22.9% | 12 | 74.2% | 13 | 86.7% | 32 | 354.4% |
| Scientist | 1 | 0 | 12.3% | 1 | 2 | 21.8% | 2 | 56.3% | 3 | 80.4% | 7 | 344.6% |
| Maintenance Engineer | 708 | 29 | 4.1% | 737 | 922 | 25.0% | 1,198 | 62.5% | 1,443 | 95.6% | 3,414 | 362.9% |
| Civil Engineer | 22 | 3 | 12.9% | 24 | 28 | 16.4% | 37 | 50.4% | 44 | 79.5% | 105 | 328.5% |
| Production Engineer | 105 | 20 | 19.2% | 125 | 138 | 10.5% | 181 | 44.9% | 212 | 69.7% | 508 | 306.5% |
| Power distribution Engineer | 312 | 54 | 17.5% | 366 | 410 | 12.1% | 529 | 44.6% | 641 | 75.1% | 1,508 | 312.0% |
| Construction Engineer | 73 | 8 | 10.3% | 81 | 97 | 20.0% | 124 | 54.1% | 151 | 86.7% | 356 | 341.2% |
| Sales Exec | 276 | 18 | 6.5% | 294 | 357 | 21.7% | 473 | 61.1% | 557 | 89.8% | 1,327 | 352.0% |
| Marketing Personnel | 295 | 19 | 6.5% | 314 | 373 | 18.6% | 513 | 63.3% | 589 | 87.5% | 1,414 | 350.0% |
| General Semi Skilled Worker | 646 | 9 | 1.3% | 654 | 847 | 29.5% | 1,093 | 67.1% | 1,307 | 99.8% | 3,186 | 387.0% |
| General Labour | 738 | 0 | 0.0% | 738 | 980 | 32.8% | 1,278 | 73.3% | 1,486 | 101.4% | 3,566 | 383.3% |
| Other Employees | 975 | 33 | 3.4% | 1,008 | 1,280 | 27.0% | 1,691 | 67.7% | 1,971 | 95.5% | 4,768 | 372.9% |
| Administrative workers | 348 | 4 | 1.3% | 353 | 456 | 29.2% | 592 | 67.7% | 703 | 99.2% | 1,687 | 378.0% |
| **Total** | **7,268** | **363** | **5.0%** | **7,631** | **9,504** | **24.5%** | **12,399** | **62.5%** | **14,701** | **92.6%** | **35,136** | **360.4%** |

# Greater Lincolnshire LEP

## Alternative Fuel Vehicle

| SOC | Alternative Fuel Vehicle Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 7 | 3 | 43.9% | 10 | 9 | -9.1% | 12 | 19.6% | 14 | 42.5% | 34 | 235.8% |
| Snr Management SME | 13 | 3 | 23.3% | 16 | 16 | 5.0% | 22 | 39.2% | 26 | 65.7% | 60 | 286.0% |
| Supervisory | 16 | 4 | 22.1% | 20 | 21 | 6.4% | 27 | 39.6% | 32 | 65.6% | 76 | 291.7% |
| Middle / Junior Management | 15 | 4 | 23.0% | 19 | 20 | 5.4% | 26 | 40.4% | 31 | 65.4% | 72 | 281.6% |
| Designer / Developer | 2 | 1 | 45.4% | 2 | 2 | -9.6% | 3 | 18.6% | 3 | 39.4% | 8 | 230.2% |
| Clerical | 10 | 0 | 0.5% | 10 | 13 | 29.4% | 16 | 68.6% | 20 | 100.5% | 47 | 383.6% |
| Self Employed | 9 | 2 | 22.9% | 11 | 12 | 6.6% | 16 | 39.5% | 18 | 63.8% | 44 | 296.5% |
| Advisor or Agent | 17 | 4 | 23.0% | 21 | 22 | 4.7% | 30 | 39.7% | 35 | 63.3% | 83 | 289.0% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 1 | 0 | 6.9% | 1 | 2 | 20.6% | 2 | 58.1% | 2 | 90.8% | 6 | 344.2% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 24 | 3 | 11.6% | 27 | 32 | 17.6% | 41 | 53.5% | 49 | 82.7% | 115 | 329.4% |
| Scientist | 3 | 1 | 45.5% | 4 | 4 | -10.2% | 5 | 17.3% | 6 | 37.7% | 13 | 232.5% |
| Maintenance Engineer | 21 | 3 | 14.2% | 24 | 28 | 13.6% | 36 | 48.2% | 44 | 79.4% | 101 | 313.4% |
| Civil Engineer | 3 | 1 | 43.6% | 5 | 4 | -8.7% | 6 | 18.8% | 7 | 40.0% | 16 | 237.5% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 3 | 2 | 70.5% | 6 | 4 | -23.3% | 6 | 0.5% | 7 | 19.1% | 16 | 184.9% |
| Construction Engineer | 3 | 1 | 33.5% | 4 | 4 | -2.0% | 6 | 29.1% | 7 | 51.7% | 16 | 262.7% |
| Sales Exec | 17 | 4 | 22.3% | 21 | 22 | 7.5% | 30 | 42.0% | 35 | 65.7% | 83 | 299.0% |
| Marketing Personnel | 19 | 4 | 23.0% | 23 | 25 | 5.6% | 32 | 39.5% | 38 | 65.4% | 89 | 284.5% |
| General Semi Skilled Worker | 16 | 1 | 4.7% | 16 | 21 | 25.0% | 27 | 63.6% | 32 | 92.8% | 76 | 359.4% |
| General Labour | 26 | 0 | 0.0% | 26 | 33 | 29.5% | 44 | 69.4% | 52 | 102.7% | 123 | 379.1% |
| Other Employees | 18 | 2 | 11.6% | 20 | 23 | 18.5% | 31 | 54.8% | 36 | 81.4% | 85 | 329.0% |
| Administrative workers | 12 | 1 | 4.5% | 12 | 16 | 25.7% | 21 | 64.6% | 24 | 94.8% | 58 | 363.0% |
| **Total** | **255** | **43** | **17.0%** | **299** | **333** | **11.4%** | **437** | **46.4%** | **518** | **73.4%** | **1,222** | **309.3%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 51 | 17 | 34.3% | 68 | 67 | -1.9% | 85 | 24.8% | 103 | 50.5% | 249 | 264.4% |
| **Snr Management SME** | 44 | 8 | 18.6% | 52 | 57 | 9.4% | 75 | 44.3% | 89 | 70.4% | 212 | 306.5% |
| **Supervisory** | 55 | 10 | 19.0% | 66 | 72 | 9.2% | 93 | 42.4% | 112 | 70.2% | 265 | 304.6% |
| **Middle / Junior Management** | 53 | 9 | 18.1% | 62 | 69 | 11.4% | 90 | 44.4% | 107 | 72.8% | 255 | 310.9% |
| **Designer / Developer** | 10 | 3 | 36.5% | 13 | 13 | -3.5% | 16 | 25.9% | 19 | 46.2% | 45 | 245.2% |
| **Clerical** | 27 | 0 | 0.4% | 28 | 36 | 30.9% | 47 | 71.7% | 55 | 99.9% | 132 | 378.1% |
| **Self Employed** | 14 | 2 | 18.1% | 16 | 18 | 10.6% | 24 | 45.7% | 28 | 68.9% | 66 | 302.6% |
| **Advisor or Agent** | 1 | 0 | 19.7% | 2 | 2 | 8.9% | 2 | 42.8% | 3 | 67.6% | 6 | 303.4% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 37 | 2 | 5.8% | 40 | 49 | 24.3% | 66 | 66.5% | 77 | 93.7% | 179 | 352.3% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 17 | 2 | 10.0% | 19 | 23 | 18.2% | 30 | 58.6% | 35 | 82.5% | 83 | 330.8% |
| **Scientist** | 37 | 13 | 34.6% | 50 | 48 | -3.6% | 63 | 27.5% | 73 | 47.6% | 180 | 261.1% |
| **Maintenance Engineer** | 68 | 8 | 11.1% | 76 | 89 | 17.9% | 117 | 54.1% | 137 | 81.5% | 325 | 329.4% |
| **Civil Engineer** | 0 | 0 | 37.6% | 0 | 0 | -5.7% | 0 | 25.8% | 1 | 48.9% | 1 | 250.8% |
| **Production Engineer** | 37 | 23 | 61.3% | 60 | 48 | -19.4% | 64 | 7.2% | 75 | 25.9% | 180 | 202.6% |
| **Power distribution Engineer** | 12 | 7 | 55.8% | 19 | 16 | -15.5% | 21 | 10.1% | 25 | 31.1% | 58 | 204.8% |
| **Construction Engineer** | 0 | 0 | 29.8% | 0 | 0 | 0.6% | 0 | 32.3% | 1 | 57.3% | 1 | 269.3% |
| **Sales Exec** | 53 | 10 | 18.8% | 63 | 70 | 11.4% | 90 | 43.3% | 108 | 72.4% | 254 | 303.4% |
| **Marketing Personnel** | 56 | 10 | 17.7% | 65 | 73 | 11.7% | 95 | 45.9% | 110 | 68.6% | 269 | 312.1% |
| **General Semi Skilled Worker** | 72 | 3 | 3.6% | 75 | 94 | 25.7% | 124 | 65.6% | 146 | 95.7% | 348 | 365.7% |
| **General Labour** | 99 | 0 | 0.0% | 99 | 127 | 28.7% | 170 | 72.1% | 200 | 102.7% | 474 | 379.8% |
| **Other Employees** | 55 | 5 | 9.4% | 60 | 72 | 19.6% | 95 | 58.1% | 111 | 83.4% | 265 | 338.7% |
| **Administrative workers** | 34 | 1 | 3.7% | 35 | 44 | 23.8% | 57 | 63.2% | 68 | 93.0% | 162 | 360.2% |
| **Total** | **833** | **135** | **16.2%** | **968** | **1,087** | **12.4%** | **1,428** | **47.6%** | **1,682** | **73.9%** | **4,010** | **314.4%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 30 | 7 | 22.7% | 37 | 40 | 6.6% | 53 | 41.7% | 61 | 64.4% | 146 | 291.7% |
| Snr Management SME | 124 | 14 | 11.3% | 138 | 162 | 17.7% | 209 | 51.8% | 254 | 84.4% | 591 | 328.9% |
| Supervisory | 126 | 14 | 11.3% | 140 | 163 | 16.6% | 219 | 56.1% | 252 | 79.6% | 604 | 331.3% |
| Middle / Junior Management | 119 | 13 | 11.1% | 133 | 158 | 19.3% | 204 | 53.7% | 243 | 83.1% | 577 | 335.4% |
| Designer / Developer | 14 | 3 | 22.5% | 17 | 18 | 6.2% | 24 | 40.0% | 29 | 65.0% | 68 | 294.3% |
| Clerical | 63 | 0 | 0.2% | 63 | 82 | 30.5% | 109 | 72.4% | 127 | 101.0% | 299 | 374.0% |
| Self Employed | 6 | 1 | 10.6% | 7 | 8 | 18.2% | 11 | 55.7% | 12 | 82.7% | 30 | 338.9% |
| Advisor or Agent | 2 | 0 | 11.2% | 2 | 3 | 18.2% | 4 | 54.4% | 4 | 81.7% | 10 | 334.3% |
| Educator | 0 | 0 | 12.1% | 0 | 0 | 17.6% | 0 | 54.5% | 0 | 87.2% | 0 | 309.9% |
| Specialist or Consultant | 63 | 2 | 3.4% | 65 | 82 | 25.5% | 108 | 65.8% | 129 | 96.8% | 302 | 362.5% |
| Editor | 2 | 0 | 2.3% | 2 | 2 | 28.4% | 3 | 68.6% | 4 | 98.6% | 9 | 368.5% |
| Industrial Researchers | 2 | 0 | 5.7% | 2 | 3 | 24.5% | 4 | 63.3% | 5 | 91.4% | 11 | 350.5% |
| Scientist | 4 | 1 | 21.3% | 5 | 5 | 7.8% | 7 | 42.3% | 8 | 65.6% | 19 | 290.8% |
| Maintenance Engineer | 121 | 8 | 6.8% | 129 | 157 | 22.1% | 206 | 60.2% | 244 | 89.7% | 580 | 350.4% |
| Civil Engineer | 2 | 0 | 22.5% | 2 | 3 | 5.9% | 3 | 40.4% | 4 | 65.0% | 10 | 293.8% |
| Production Engineer | 19 | 6 | 33.8% | 25 | 25 | -0.8% | 33 | 29.3% | 38 | 50.3% | 91 | 259.8% |
| Power distribution Engineer | 59 | 21 | 35.5% | 80 | 77 | -4.1% | 101 | 26.0% | 118 | 47.4% | 283 | 253.9% |
| Construction Engineer | 2 | 0 | 16.8% | 2 | 2 | 12.0% | 3 | 47.5% | 4 | 72.3% | 9 | 315.0% |
| Sales Exec | 58 | 7 | 11.4% | 64 | 76 | 18.2% | 98 | 53.7% | 115 | 78.8% | 276 | 331.0% |
| Marketing Personnel | 61 | 7 | 11.0% | 68 | 80 | 17.1% | 104 | 53.6% | 124 | 82.9% | 295 | 333.8% |
| General Semi Skilled Worker | 123 | 3 | 2.2% | 125 | 162 | 29.1% | 210 | 67.9% | 250 | 99.5% | 585 | 366.7% |
| General Labour | 133 | 0 | 0.0% | 133 | 174 | 31.3% | 227 | 70.7% | 268 | 101.8% | 638 | 380.1% |
| Other Employees | 160 | 9 | 5.5% | 169 | 206 | 22.2% | 274 | 62.5% | 325 | 92.7% | 769 | 355.6% |
| Administrative workers | 58 | 1 | 2.2% | 59 | 77 | 29.9% | 99 | 67.2% | 118 | 97.9% | 280 | 371.0% |
| **Total** | **1,351** | **118** | **8.7%** | **1,469** | **1,767** | **20.3%** | **2,314** | **57.5%** | **2,735** | **86.2%** | **6,483** | **341.3%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 57 | 8 | 13.7% | 65 | 74 | 14.9% | 98 | 51.5% | 113 | 75.8% | 272 | 321.0% |
| **Snr Management SME** | 146 | 10 | 7.0% | 156 | 189 | 21.2% | 248 | 58.7% | 295 | 88.9% | 697 | 346.4% |
| **Supervisory** | 144 | 10 | 6.8% | 154 | 190 | 23.6% | 247 | 60.5% | 293 | 90.7% | 692 | 350.6% |
| **Middle / Junior Management** | 135 | 9 | 6.8% | 145 | 177 | 22.1% | 231 | 60.1% | 275 | 90.3% | 653 | 351.7% |
| **Designer / Developer** | 16 | 2 | 13.7% | 19 | 21 | 15.1% | 28 | 49.6% | 33 | 76.9% | 79 | 322.9% |
| **Clerical** | 73 | 0 | 0.1% | 73 | 96 | 31.0% | 126 | 71.6% | 149 | 102.6% | 352 | 378.6% |
| **Self Employed** | 15 | 1 | 6.8% | 16 | 20 | 22.8% | 26 | 60.5% | 31 | 88.4% | 74 | 350.0% |
| **Advisor or Agent** | 20 | 1 | 7.0% | 21 | 25 | 20.3% | 34 | 62.1% | 39 | 88.8% | 93 | 345.6% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 66 | 1 | 2.1% | 67 | 87 | 29.1% | 113 | 67.4% | 134 | 98.9% | 317 | 369.8% |
| **Editor** | 1 | 0 | 1.3% | 1 | 1 | 27.8% | 1 | 67.8% | 1 | 99.4% | 3 | 374.1% |
| **Industrial Researchers** | 33 | 1 | 3.3% | 34 | 43 | 27.9% | 55 | 64.1% | 66 | 95.8% | 156 | 361.1% |
| **Scientist** | 5 | 1 | 13.0% | 6 | 6 | 15.0% | 8 | 50.7% | 10 | 78.1% | 24 | 325.4% |
| **Maintenance Engineer** | 140 | 6 | 4.1% | 146 | 183 | 25.5% | 242 | 66.0% | 283 | 94.5% | 672 | 361.4% |
| **Civil Engineer** | 9 | 1 | 13.3% | 10 | 11 | 15.1% | 15 | 51.8% | 18 | 78.7% | 41 | 321.9% |
| **Production Engineer** | 18 | 4 | 21.0% | 22 | 24 | 7.7% | 31 | 42.7% | 37 | 69.9% | 88 | 297.5% |
| **Power distribution Engineer** | 72 | 15 | 20.2% | 87 | 95 | 9.7% | 125 | 43.6% | 148 | 71.0% | 347 | 300.0% |
| **Construction Engineer** | 13 | 1 | 10.6% | 15 | 18 | 18.2% | 23 | 55.1% | 27 | 84.5% | 65 | 338.4% |
| **Sales Exec** | 63 | 4 | 6.8% | 68 | 82 | 21.9% | 107 | 58.7% | 128 | 89.8% | 304 | 349.6% |
| **Marketing Personnel** | 68 | 5 | 6.9% | 73 | 88 | 21.1% | 118 | 62.0% | 138 | 90.0% | 326 | 348.0% |
| **General Semi Skilled Worker** | 150 | 2 | 1.4% | 152 | 198 | 30.4% | 255 | 68.1% | 305 | 101.1% | 710 | 368.0% |
| **General Labour** | 272 | 0 | 0.0% | 272 | 356 | 30.9% | 467 | 71.5% | 549 | 101.6% | 1,309 | 381.0% |
| **Other Employees** | 177 | 6 | 3.6% | 183 | 231 | 26.2% | 305 | 66.6% | 356 | 94.6% | 845 | 361.5% |
| **Administrative workers** | 76 | 1 | 1.4% | 77 | 100 | 29.8% | 131 | 70.1% | 153 | 99.0% | 365 | 374.5% |
| **Total** | **1,769** | **90** | **5.1%** | **1,859** | **2,316** | **24.6%** | **3,034** | **63.2%** | **3,584** | **92.8%** | **8,483** | **356.3%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 9 | 4 | 45.4% | 13 | 12 | -10.4% | 15 | 17.7% | 18 | 39.2% | 43 | 230.1% |
| Snr Management SME | 17 | 4 | 22.6% | 21 | 22 | 6.9% | 29 | 38.2% | 34 | 64.1% | 82 | 290.1% |
| Supervisory | 18 | 4 | 22.3% | 23 | 24 | 7.8% | 31 | 38.9% | 37 | 64.1% | 89 | 293.0% |
| Middle / Junior Management | 18 | 4 | 22.6% | 22 | 23 | 6.0% | 31 | 40.3% | 36 | 64.9% | 85 | 291.2% |
| Designer / Developer | 5 | 2 | 46.3% | 7 | 6 | -10.9% | 8 | 15.8% | 9 | 37.4% | 22 | 227.1% |
| Clerical | 9 | 0 | 0.4% | 9 | 12 | 30.4% | 16 | 71.8% | 19 | 102.2% | 45 | 377.5% |
| Self Employed | 4 | 1 | 22.9% | 5 | 6 | 6.9% | 7 | 40.2% | 9 | 65.1% | 20 | 291.4% |
| Advisor or Agent | 4 | 1 | 23.2% | 5 | 5 | 6.5% | 7 | 40.5% | 8 | 65.4% | 19 | 286.4% |
| Educator | 0 | 0 | 22.7% | 0 | 0 | 5.3% | 0 | 38.7% | 0 | 64.1% | 1 | 285.1% |
| Specialist or Consultant | 9 | 1 | 6.5% | 10 | 12 | 22.0% | 16 | 59.8% | 19 | 91.0% | 45 | 352.9% |
| Editor | 2 | 0 | 4.0% | 2 | 2 | 26.1% | 3 | 64.3% | 3 | 95.9% | 8 | 363.7% |
| Industrial Researchers | 3 | 0 | 11.5% | 4 | 4 | 17.4% | 5 | 54.4% | 6 | 82.5% | 15 | 329.4% |
| Scientist | 2 | 1 | 45.8% | 3 | 3 | -10.1% | 3 | 18.2% | 4 | 39.4% | 10 | 233.0% |
| Maintenance Engineer | 22 | 3 | 13.3% | 25 | 29 | 15.6% | 38 | 51.5% | 45 | 80.3% | 105 | 325.3% |
| Civil Engineer | 3 | 2 | 46.3% | 5 | 4 | -10.4% | 6 | 18.6% | 7 | 36.8% | 17 | 232.1% |
| Production Engineer | 4 | 3 | 69.4% | 7 | 5 | -22.3% | 7 | 1.3% | 8 | 19.8% | 20 | 185.4% |
| Power distribution Engineer | 10 | 7 | 66.8% | 17 | 13 | -21.6% | 17 | 3.1% | 21 | 22.3% | 49 | 191.3% |
| Construction Engineer | 4 | 1 | 34.5% | 5 | 5 | -2.6% | 6 | 27.9% | 7 | 49.5% | 17 | 254.0% |
| Sales Exec | 10 | 2 | 22.4% | 13 | 14 | 7.6% | 18 | 39.8% | 21 | 63.6% | 50 | 290.3% |
| Marketing Personnel | 10 | 2 | 21.5% | 12 | 13 | 7.4% | 17 | 40.2% | 21 | 65.6% | 49 | 296.6% |
| General Semi Skilled Worker | 21 | 1 | 4.6% | 22 | 27 | 25.3% | 35 | 63.8% | 41 | 92.3% | 99 | 361.2% |
| General Labour | 32 | 0 | 0.0% | 32 | 42 | 31.1% | 55 | 70.8% | 65 | 102.0% | 154 | 380.7% |
| Other Employees | 23 | 3 | 11.5% | 26 | 31 | 17.8% | 40 | 55.1% | 47 | 79.2% | 113 | 332.8% |
| Administrative workers | 10 | 0 | 4.5% | 11 | 13 | 24.4% | 18 | 65.5% | 21 | 93.2% | 50 | 362.8% |
| **Total** | **251** | **46** | **18.4%** | **297** | **329** | **10.6%** | **430** | **44.8%** | **507** | **70.6%** | **1,207** | **306.4%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 15 | 7 | 44.8% | 21 | 19 | -9.9% | 25 | 18.3% | 30 | 39.1% | 71 | 232.0% |
| Snr Management SME | 59 | 13 | 21.7% | 72 | 77 | 8.0% | 102 | 42.0% | 119 | 65.5% | 282 | 293.3% |
| Supervisory | 58 | 12 | 20.8% | 71 | 76 | 7.7% | 101 | 42.5% | 117 | 66.5% | 283 | 301.3% |
| Middle / Junior Management | 56 | 13 | 22.3% | 69 | 73 | 6.0% | 96 | 39.2% | 113 | 65.2% | 268 | 290.9% |
| Designer / Developer | 6 | 3 | 44.8% | 9 | 8 | -9.6% | 11 | 18.7% | 13 | 39.9% | 31 | 232.1% |
| Clerical | 30 | 0 | 0.4% | 30 | 39 | 30.7% | 50 | 69.2% | 60 | 101.1% | 142 | 377.5% |
| Self Employed | 3 | 1 | 22.9% | 4 | 4 | 6.9% | 5 | 40.3% | 6 | 64.4% | 15 | 287.8% |
| Advisor or Agent | 3 | 1 | 21.6% | 4 | 4 | 7.1% | 6 | 40.6% | 7 | 65.8% | 16 | 294.5% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 28 | 2 | 6.6% | 30 | 37 | 23.0% | 47 | 59.3% | 56 | 90.2% | 134 | 351.9% |
| Editor | 1 | 0 | 4.5% | 2 | 2 | 26.2% | 3 | 63.7% | 3 | 93.5% | 7 | 359.0% |
| Industrial Researchers | 2 | 0 | 11.4% | 2 | 3 | 17.6% | 3 | 54.0% | 4 | 82.1% | 10 | 333.5% |
| Scientist | 2 | 1 | 44.1% | 3 | 2 | -9.4% | 3 | 20.3% | 4 | 40.2% | 8 | 233.1% |
| Maintenance Engineer | 60 | 8 | 13.3% | 68 | 79 | 15.4% | 103 | 51.2% | 122 | 79.5% | 289 | 324.2% |
| Civil Engineer | 3 | 1 | 42.3% | 4 | 4 | -8.4% | 5 | 20.7% | 6 | 42.2% | 14 | 235.4% |
| Production Engineer | 10 | 6 | 64.6% | 17 | 13 | -20.4% | 17 | 4.3% | 20 | 22.9% | 48 | 189.8% |
| Power distribution Engineer | 29 | 19 | 65.8% | 48 | 38 | -20.6% | 49 | 2.9% | 58 | 22.0% | 138 | 189.6% |
| Construction Engineer | 2 | 1 | 34.0% | 3 | 3 | -2.8% | 4 | 29.2% | 5 | 50.8% | 11 | 259.3% |
| Sales Exec | 29 | 6 | 21.6% | 35 | 38 | 8.1% | 50 | 40.6% | 59 | 67.1% | 138 | 289.6% |
| Marketing Personnel | 30 | 7 | 22.0% | 37 | 40 | 7.0% | 52 | 40.4% | 62 | 67.9% | 147 | 294.5% |
| General Semi Skilled Worker | 60 | 3 | 4.4% | 62 | 78 | 25.5% | 102 | 63.7% | 120 | 92.2% | 286 | 359.2% |
| General Labour | 91 | 0 | 0.0% | 91 | 120 | 31.2% | 157 | 71.7% | 184 | 102.2% | 438 | 380.5% |
| Other Employees | 74 | 8 | 11.1% | 82 | 97 | 17.8% | 126 | 53.8% | 149 | 82.0% | 356 | 333.8% |
| Administrative workers | 28 | 1 | 4.3% | 29 | 37 | 26.1% | 48 | 63.9% | 57 | 93.0% | 137 | 365.7% |
| **Total** | **680** | **112** | **16.4%** | **792** | **890** | **12.4%** | **1,165** | **47.1%** | **1,375** | **73.6%** | **3,268** | **312.6%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 47 | 4 | 9.1% | 52 | 62 | 20.8% | 82 | 58.2% | 97 | 87.2% | 228 | 342.3% |
| Snr Management SME | 146 | 7 | 4.7% | 153 | 191 | 25.5% | 249 | 63.5% | 295 | 93.6% | 699 | 358.0% |
| Supervisory | 143 | 7 | 4.7% | 149 | 187 | 24.9% | 249 | 66.9% | 287 | 91.9% | 689 | 361.1% |
| Middle / Junior Management | 137 | 7 | 4.7% | 144 | 177 | 23.1% | 235 | 63.5% | 279 | 93.7% | 657 | 356.8% |
| Designer / Developer | 10 | 1 | 9.1% | 11 | 13 | 20.1% | 17 | 56.3% | 20 | 84.2% | 49 | 342.1% |
| Clerical | 72 | 0 | 0.1% | 72 | 93 | 28.8% | 125 | 72.2% | 146 | 101.4% | 348 | 380.6% |
| Self Employed | 7 | 0 | 4.4% | 8 | 9 | 24.1% | 12 | 64.9% | 15 | 96.6% | 35 | 360.9% |
| Advisor or Agent | 1 | 0 | 4.4% | 1 | 1 | 25.1% | 2 | 65.2% | 2 | 92.1% | 5 | 357.1% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 62 | 1 | 1.4% | 63 | 81 | 29.3% | 107 | 70.5% | 125 | 100.0% | 296 | 372.9% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 5 | 0 | 2.1% | 5 | 6 | 28.1% | 8 | 68.5% | 9 | 97.2% | 22 | 371.0% |
| Scientist | 0 | 0 | 8.6% | 0 | 0 | 20.8% | 0 | 58.1% | 0 | 84.7% | 1 | 342.9% |
| Maintenance Engineer | 143 | 4 | 2.8% | 147 | 187 | 27.7% | 246 | 67.5% | 291 | 98.1% | 677 | 361.3% |
| Civil Engineer | 4 | 0 | 8.8% | 4 | 5 | 21.3% | 6 | 57.3% | 8 | 86.6% | 18 | 341.3% |
| Production Engineer | 20 | 3 | 13.7% | 22 | 26 | 16.3% | 34 | 50.3% | 40 | 78.4% | 96 | 327.3% |
| Power distribution Engineer | 71 | 10 | 13.6% | 81 | 93 | 15.0% | 121 | 50.5% | 143 | 77.5% | 341 | 323.2% |
| Construction Engineer | 7 | 0 | 6.7% | 8 | 10 | 21.3% | 13 | 62.3% | 15 | 89.2% | 36 | 351.8% |
| Sales Exec | 66 | 3 | 4.5% | 69 | 86 | 24.8% | 112 | 63.0% | 133 | 94.3% | 316 | 361.2% |
| Marketing Personnel | 71 | 3 | 4.5% | 74 | 92 | 24.4% | 123 | 65.6% | 143 | 93.4% | 344 | 364.7% |
| General Semi Skilled Worker | 150 | 1 | 0.9% | 151 | 195 | 28.8% | 257 | 70.0% | 303 | 100.3% | 719 | 375.9% |
| General Labour | 199 | 0 | 0.0% | 199 | 260 | 30.4% | 341 | 71.2% | 406 | 103.5% | 960 | 381.2% |
| Other Employees | 178 | 4 | 2.4% | 182 | 234 | 28.5% | 302 | 66.4% | 361 | 98.6% | 863 | 374.7% |
| Administrative workers | 69 | 1 | 0.9% | 70 | 91 | 30.5% | 118 | 69.7% | 139 | 99.1% | 335 | 379.9% |
| **Total** | **1,608** | **56** | **3.5%** | **1,664** | **2,100** | **26.2%** | **2,761** | **65.9%** | **3,257** | **95.8%** | **7,734** | **364.9%** |

## Recovery and Recycling

| | Recovery and Recycling | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 35 | 13 | 36.7% | 47 | 45 | -4.1% | 60 | 25.7% | 70 | 47.3% | 167 | 252.0% |
| **Snr Management SME** | 41 | 7 | 18.3% | 48 | 53 | 10.9% | 69 | 42.5% | 83 | 71.8% | 194 | 304.5% |
| **Supervisory** | 43 | 8 | 18.4% | 51 | 56 | 9.8% | 73 | 43.7% | 88 | 71.3% | 210 | 310.8% |
| **Middle / Junior Management** | 41 | 8 | 18.6% | 48 | 53 | 10.2% | 69 | 43.6% | 83 | 70.8% | 198 | 308.2% |
| **Designer / Developer** | 29 | 11 | 37.9% | 41 | 38 | -5.3% | 51 | 24.5% | 59 | 46.5% | 141 | 248.6% |
| **Clerical** | 22 | 0 | 0.4% | 22 | 29 | 32.0% | 37 | 71.9% | 44 | 100.4% | 104 | 376.7% |
| **Self Employed** | 10 | 2 | 18.7% | 12 | 13 | 10.6% | 17 | 44.5% | 20 | 70.3% | 47 | 303.6% |
| **Advisor or Agent** | 4 | 1 | 18.1% | 5 | 5 | 10.4% | 7 | 45.1% | 8 | 70.3% | 18 | 303.0% |
| **Educator** | 0 | 0 | 17.5% | 0 | 0 | 11.6% | 0 | 43.3% | 0 | 77.0% | 1 | 315.3% |
| **Specialist or Consultant** | 33 | 2 | 5.7% | 34 | 42 | 22.9% | 55 | 60.9% | 66 | 91.6% | 157 | 355.7% |
| **Editor** | 1 | 0 | 3.6% | 2 | 2 | 24.1% | 3 | 63.7% | 3 | 94.2% | 7 | 361.5% |
| **Industrial Researchers** | 8 | 1 | 9.2% | 9 | 11 | 20.2% | 14 | 57.2% | 17 | 85.4% | 40 | 339.1% |
| **Scientist** | 8 | 3 | 36.1% | 11 | 11 | -4.0% | 14 | 26.2% | 16 | 47.8% | 39 | 253.9% |
| **Maintenance Engineer** | 53 | 6 | 11.3% | 59 | 70 | 18.3% | 90 | 53.9% | 106 | 80.7% | 253 | 330.9% |
| **Civil Engineer** | 16 | 6 | 36.9% | 21 | 20 | -4.6% | 27 | 25.3% | 32 | 48.1% | 75 | 249.8% |
| **Production Engineer** | 19 | 10 | 55.4% | 29 | 25 | -16.1% | 32 | 9.9% | 38 | 30.5% | 91 | 209.8% |
| **Power distribution Engineer** | 28 | 16 | 56.9% | 44 | 37 | -15.9% | 48 | 9.6% | 57 | 29.4% | 135 | 207.4% |
| **Construction Engineer** | 16 | 4 | 28.5% | 20 | 21 | 1.7% | 27 | 33.0% | 32 | 57.6% | 75 | 273.3% |
| **Sales Exec** | 34 | 6 | 18.6% | 40 | 44 | 10.0% | 58 | 44.5% | 67 | 68.7% | 163 | 308.1% |
| **Marketing Personnel** | 29 | 5 | 18.6% | 34 | 38 | 11.2% | 50 | 45.8% | 58 | 71.1% | 137 | 301.1% |
| **General Semi Skilled Worker** | 69 | 3 | 3.7% | 72 | 91 | 26.6% | 119 | 64.8% | 141 | 95.2% | 336 | 366.2% |
| **General Labour** | 72 | 0 | 0.0% | 72 | 95 | 31.4% | 124 | 71.3% | 146 | 102.2% | 347 | 380.5% |
| **Other Employees** | 50 | 5 | 9.4% | 55 | 66 | 20.2% | 86 | 56.8% | 103 | 87.3% | 242 | 342.2% |
| **Administrative workers** | 27 | 1 | 3.8% | 28 | 35 | 25.2% | 46 | 65.2% | 55 | 94.9% | 131 | 366.8% |
| **Total** | **686** | **117** | **17.1%** | **804** | **899** | **11.9%** | **1,174** | **46.1%** | **1,389** | **72.8%** | **3,305** | **311.2%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 29 | 4 | 13.8% | 33 | 38 | 14.3% | 51 | 52.6% | 59 | 77.9% | 141 | 321.1% |
| Snr Management SME | 53 | 4 | 6.9% | 57 | 69 | 21.2% | 90 | 59.6% | 107 | 88.9% | 254 | 347.8% |
| Supervisory | 60 | 4 | 6.8% | 64 | 79 | 22.1% | 104 | 60.9% | 122 | 88.7% | 290 | 350.1% |
| Middle / Junior Management | 57 | 4 | 6.9% | 61 | 75 | 22.7% | 97 | 59.5% | 115 | 88.9% | 273 | 348.6% |
| Designer / Developer | 12 | 2 | 13.4% | 14 | 16 | 14.8% | 21 | 50.7% | 25 | 79.4% | 58 | 318.3% |
| Clerical | 31 | 0 | 0.1% | 31 | 41 | 30.8% | 54 | 72.4% | 63 | 101.8% | 151 | 381.2% |
| Self Employed | 15 | 1 | 6.9% | 16 | 20 | 23.1% | 26 | 60.7% | 30 | 89.5% | 72 | 351.8% |
| Advisor or Agent | 22 | 1 | 6.8% | 23 | 28 | 21.8% | 38 | 60.7% | 45 | 91.1% | 104 | 346.0% |
| Educator | 1 | 0 | 5.8% | 1 | 2 | 23.5% | 2 | 60.3% | 2 | 90.1% | 6 | 351.2% |
| Specialist or Consultant | 28 | 1 | 2.0% | 29 | 37 | 29.4% | 49 | 70.4% | 56 | 94.4% | 136 | 373.6% |
| Editor | 3 | 0 | 1.3% | 3 | 4 | 28.2% | 5 | 69.6% | 6 | 94.6% | 15 | 374.2% |
| Industrial Researchers | 26 | 1 | 3.3% | 27 | 34 | 27.3% | 45 | 66.6% | 53 | 95.3% | 127 | 371.5% |
| Scientist | 6 | 1 | 13.2% | 6 | 7 | 14.8% | 9 | 50.5% | 11 | 78.6% | 27 | 326.0% |
| Maintenance Engineer | 72 | 3 | 4.0% | 75 | 93 | 24.5% | 124 | 65.6% | 145 | 93.6% | 346 | 360.3% |
| Civil Engineer | 11 | 2 | 13.9% | 13 | 15 | 14.2% | 19 | 50.4% | 23 | 76.1% | 55 | 325.3% |
| Production Engineer | 13 | 3 | 19.9% | 15 | 17 | 8.2% | 22 | 43.2% | 26 | 68.9% | 62 | 303.6% |
| Power distribution Engineer | 35 | 7 | 20.4% | 42 | 45 | 8.5% | 60 | 43.6% | 70 | 67.3% | 167 | 297.2% |
| Construction Engineer | 14 | 1 | 10.3% | 16 | 19 | 18.3% | 25 | 56.3% | 29 | 83.8% | 70 | 340.2% |
| Sales Exec | 28 | 2 | 6.7% | 30 | 37 | 24.8% | 47 | 58.2% | 56 | 90.5% | 133 | 350.0% |
| Marketing Personnel | 28 | 2 | 6.5% | 30 | 37 | 23.7% | 48 | 60.1% | 58 | 92.2% | 136 | 353.4% |
| General Semi Skilled Worker | 66 | 1 | 1.4% | 67 | 86 | 28.4% | 114 | 70.0% | 134 | 99.7% | 319 | 374.8% |
| General Labour | 42 | 0 | 0.0% | 42 | 54 | 29.9% | 71 | 71.3% | 84 | 102.2% | 201 | 381.0% |
| Other Employees | 83 | 3 | 3.3% | 85 | 109 | 27.3% | 142 | 66.1% | 167 | 95.4% | 392 | 359.4% |
| Administrative workers | 37 | 0 | 1.3% | 37 | 48 | 29.1% | 63 | 69.5% | 74 | 98.4% | 175 | 371.8% |
| **Total** | **773** | **46** | **5.9%** | **818** | **1,010** | **23.4%** | **1,327** | **62.1%** | **1,561** | **90.7%** | **3,708** | **353.1%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 41 | 4 | 9.1% | 45 | 54 | 19.8% | 70 | 57.0% | 83 | 85.6% | 197 | 341.7% |
| Snr Management SME | 69 | 3 | 4.4% | 72 | 90 | 23.8% | 118 | 62.5% | 140 | 93.3% | 333 | 359.7% |
| Supervisory | 74 | 3 | 4.6% | 77 | 96 | 24.8% | 125 | 62.3% | 148 | 92.1% | 352 | 357.3% |
| Middle / Junior Management | 69 | 3 | 4.3% | 72 | 91 | 26.2% | 118 | 64.5% | 140 | 94.2% | 334 | 363.7% |
| Designer / Developer | 16 | 1 | 9.2% | 17 | 21 | 19.8% | 27 | 57.8% | 32 | 85.4% | 78 | 345.7% |
| Clerical | 36 | 0 | 0.1% | 36 | 48 | 32.4% | 63 | 72.4% | 74 | 102.4% | 175 | 379.5% |
| Self Employed | 18 | 1 | 4.6% | 18 | 23 | 25.1% | 30 | 63.6% | 35 | 92.0% | 84 | 358.2% |
| Advisor or Agent | 3 | 0 | 4.6% | 3 | 4 | 26.3% | 5 | 65.5% | 5 | 92.8% | 13 | 360.2% |
| Educator | 0 | 0 | 5.0% | 0 | 0 | 24.5% | 0 | 64.0% | 0 | 91.1% | 0 | 358.3% |
| Specialist or Consultant | 37 | 0 | 1.3% | 37 | 49 | 29.8% | 64 | 70.1% | 75 | 101.2% | 177 | 372.9% |
| Editor | 1 | 0 | 0.9% | 1 | 2 | 31.7% | 2 | 68.4% | 2 | 102.1% | 5 | 369.8% |
| Industrial Researchers | 3 | 0 | 2.2% | 3 | 4 | 27.3% | 5 | 66.7% | 6 | 97.5% | 14 | 371.4% |
| Scientist | 1 | 0 | 9.3% | 1 | 2 | 19.2% | 2 | 58.5% | 3 | 84.0% | 6 | 332.3% |
| Maintenance Engineer | 94 | 3 | 2.7% | 97 | 123 | 26.5% | 162 | 66.8% | 189 | 95.5% | 452 | 366.8% |
| Civil Engineer | 11 | 1 | 9.1% | 13 | 15 | 20.0% | 20 | 56.7% | 23 | 84.8% | 55 | 339.7% |
| Production Engineer | 21 | 3 | 14.0% | 24 | 27 | 13.6% | 36 | 51.3% | 43 | 77.9% | 102 | 322.4% |
| Power distribution Engineer | 44 | 6 | 13.4% | 50 | 57 | 14.8% | 76 | 52.0% | 88 | 77.1% | 210 | 322.5% |
| Construction Engineer | 16 | 1 | 6.6% | 17 | 21 | 23.6% | 28 | 60.3% | 33 | 89.2% | 77 | 350.2% |
| Sales Exec | 30 | 1 | 4.6% | 31 | 39 | 24.6% | 51 | 63.3% | 60 | 92.8% | 145 | 366.6% |
| Marketing Personnel | 32 | 1 | 4.2% | 33 | 42 | 26.7% | 55 | 66.9% | 64 | 95.4% | 151 | 359.7% |
| General Semi Skilled Worker | 83 | 1 | 0.9% | 84 | 108 | 29.8% | 141 | 68.3% | 167 | 99.6% | 402 | 381.1% |
| General Labour | 44 | 0 | 0.0% | 44 | 57 | 30.4% | 75 | 71.7% | 88 | 102.7% | 210 | 381.9% |
| Other Employees | 96 | 2 | 2.3% | 98 | 125 | 28.1% | 163 | 66.2% | 195 | 99.7% | 456 | 366.2% |
| Administrative workers | 40 | 0 | 0.9% | 40 | 52 | 28.3% | 68 | 69.5% | 80 | 99.9% | 192 | 376.4% |
| **Total** | **878** | **36** | **4.1%** | **914** | **1,148** | **25.6%** | **1,503** | **64.4%** | **1,776** | **94.2%** | **4,223** | **362.0%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 71 | 10 | 13.5% | 81 | 94 | 16.0% | 122 | 50.7% | 143 | 77.3% | 342 | 322.3% |
| Snr Management SME | 219 | 15 | 6.8% | 234 | 288 | 23.1% | 373 | 59.5% | 444 | 90.1% | 1,055 | 351.5% |
| Supervisory | 227 | 16 | 6.9% | 242 | 293 | 20.9% | 388 | 60.2% | 459 | 89.5% | 1,085 | 348.1% |
| Middle / Junior Management | 215 | 15 | 6.7% | 230 | 280 | 21.9% | 369 | 60.6% | 436 | 89.6% | 1,047 | 355.5% |
| Designer / Developer | 11 | 1 | 13.6% | 12 | 14 | 15.3% | 18 | 50.4% | 21 | 76.0% | 52 | 330.2% |
| Clerical | 113 | 0 | 0.1% | 113 | 147 | 29.5% | 195 | 72.1% | 231 | 103.8% | 544 | 380.4% |
| Self Employed | 16 | 1 | 6.8% | 17 | 21 | 21.4% | 28 | 60.9% | 32 | 86.4% | 77 | 344.2% |
| Advisor or Agent | 2 | 0 | 6.5% | 2 | 3 | 24.0% | 3 | 59.5% | 4 | 94.3% | 9 | 352.6% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 94 | 2 | 2.0% | 96 | 123 | 28.1% | 162 | 68.2% | 190 | 97.9% | 454 | 371.7% |
| Editor | 0 | 0 | 1.3% | 0 | 0 | 33.1% | 0 | 72.0% | 0 | 94.4% | 1 | 380.5% |
| Industrial Researchers | 2 | 0 | 2.6% | 2 | 3 | 27.4% | 4 | 70.5% | 5 | 102.4% | 11 | 362.9% |
| Scientist | 1 | 0 | 13.2% | 1 | 1 | 14.6% | 1 | 51.7% | 1 | 79.7% | 2 | 320.9% |
| Maintenance Engineer | 250 | 10 | 4.1% | 261 | 322 | 23.4% | 428 | 64.3% | 509 | 95.4% | 1,199 | 360.3% |
| Civil Engineer | 9 | 1 | 14.0% | 10 | 11 | 14.6% | 15 | 50.6% | 17 | 75.6% | 42 | 324.9% |
| Production Engineer | 38 | 8 | 19.8% | 46 | 50 | 8.2% | 65 | 42.5% | 79 | 71.1% | 184 | 300.8% |
| Power distribution Engineer | 113 | 22 | 19.6% | 135 | 147 | 8.4% | 194 | 43.3% | 229 | 69.1% | 541 | 299.6% |
| Construction Engineer | 24 | 3 | 10.8% | 27 | 32 | 18.9% | 42 | 56.2% | 50 | 84.1% | 118 | 335.4% |
| Sales Exec | 96 | 7 | 6.9% | 103 | 126 | 22.2% | 166 | 61.8% | 193 | 87.4% | 466 | 353.1% |
| Marketing Personnel | 105 | 7 | 6.6% | 112 | 138 | 23.6% | 178 | 59.4% | 211 | 88.7% | 498 | 346.0% |
| General Semi Skilled Worker | 233 | 3 | 1.3% | 236 | 308 | 30.5% | 400 | 69.6% | 471 | 99.7% | 1,110 | 370.9% |
| General Labour | 276 | 0 | 0.0% | 276 | 360 | 30.2% | 473 | 71.3% | 559 | 102.3% | 1,332 | 382.2% |
| Other Employees | 304 | 10 | 3.3% | 314 | 399 | 27.0% | 520 | 65.4% | 612 | 94.8% | 1,442 | 358.8% |
| Administrative workers | 111 | 1 | 1.3% | 113 | 146 | 29.5% | 191 | 69.2% | 223 | 98.2% | 531 | 371.3% |
| **Total** | **2,532** | **131** | **5.2%** | **2,663** | **3,304** | **24.0%** | **4,336** | **62.8%** | **5,120** | **92.3%** | **12,143** | **356.0%** |

# Leicester and Leicestershire LEP

## Alternative Fuel Vehicle

| SOC | Alternative Fuel Vehicle Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 9 | 4 | 43.7% | 13 | 12 | -7.3% | 15 | 18.7% | 18 | 40.3% | 44 | 236.0% |
| Snr Management SME | 15 | 3 | 22.3% | 18 | 19 | 7.4% | 25 | 37.7% | 30 | 67.1% | 72 | 301.0% |
| Supervisory | 21 | 5 | 23.2% | 26 | 28 | 5.7% | 37 | 41.0% | 43 | 61.3% | 106 | 299.6% |
| Middle / Junior Management | 19 | 4 | 21.8% | 23 | 25 | 8.0% | 33 | 39.9% | 39 | 67.6% | 93 | 295.4% |
| Designer / Developer | 2 | 1 | 44.9% | 3 | 3 | -9.8% | 4 | 18.5% | 4 | 40.9% | 10 | 237.5% |
| Clerical | 12 | 0 | 0.5% | 12 | 16 | 30.4% | 21 | 71.7% | 25 | 99.1% | 61 | 386.6% |
| Self Employed | 13 | 3 | 21.9% | 15 | 17 | 7.1% | 22 | 40.3% | 25 | 64.2% | 60 | 291.0% |
| Advisor or Agent | 21 | 5 | 22.7% | 25 | 27 | 7.5% | 35 | 40.3% | 41 | 64.1% | 99 | 292.2% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 4 | 0 | 7.9% | 4 | 5 | 19.2% | 6 | 56.6% | 7 | 88.0% | 18 | 348.0% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 32 | 4 | 11.3% | 36 | 42 | 16.6% | 56 | 56.7% | 66 | 83.2% | 153 | 326.7% |
| Scientist | 3 | 2 | 43.6% | 5 | 4 | -10.1% | 6 | 19.8% | 7 | 40.6% | 16 | 230.9% |
| Maintenance Engineer | 27 | 4 | 13.5% | 30 | 35 | 14.1% | 45 | 49.8% | 55 | 80.2% | 128 | 323.5% |
| Civil Engineer | 4 | 2 | 44.8% | 6 | 5 | -9.8% | 7 | 18.0% | 8 | 38.5% | 20 | 231.7% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 4 | 3 | 68.7% | 7 | 5 | -22.9% | 7 | 0.4% | 8 | 19.7% | 20 | 184.1% |
| Construction Engineer | 5 | 2 | 33.6% | 6 | 6 | -3.6% | 8 | 28.2% | 9 | 49.8% | 22 | 260.8% |
| Sales Exec | 24 | 5 | 22.5% | 30 | 31 | 5.9% | 42 | 41.5% | 50 | 69.3% | 117 | 293.6% |
| Marketing Personnel | 26 | 6 | 22.6% | 32 | 33 | 5.6% | 44 | 40.3% | 52 | 64.2% | 123 | 290.8% |
| General Semi Skilled Worker | 20 | 1 | 4.6% | 20 | 26 | 24.6% | 33 | 62.8% | 40 | 94.8% | 94 | 358.7% |
| General Labour | 34 | 0 | 0.0% | 34 | 44 | 30.1% | 58 | 71.4% | 68 | 101.3% | 164 | 386.5% |
| Other Employees | 24 | 3 | 10.6% | 26 | 31 | 18.3% | 40 | 54.4% | 48 | 81.5% | 114 | 333.2% |
| Administrative workers | 17 | 1 | 4.6% | 18 | 22 | 24.9% | 29 | 64.9% | 35 | 95.4% | 80 | 353.3% |
| **Total** | **335** | **56** | **16.6%** | **391** | **437** | **11.8%** | **576** | **47.2%** | **679** | **73.7%** | **1,615** | **313.1%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 66 | 23 | 35.0% | 88 | 85 | -3.5% | 112 | 26.1% | 135 | 52.1% | 318 | 259.4% |
| **Snr Management SME** | 51 | 10 | 18.9% | 61 | 67 | 9.6% | 88 | 43.9% | 103 | 69.6% | 248 | 306.7% |
| **Supervisory** | 72 | 13 | 18.3% | 85 | 94 | 10.1% | 123 | 44.3% | 144 | 68.9% | 346 | 306.5% |
| **Middle / Junior Management** | 65 | 13 | 20.1% | 78 | 85 | 8.0% | 112 | 42.4% | 133 | 70.0% | 312 | 298.7% |
| **Designer / Developer** | 11 | 4 | 31.8% | 15 | 15 | -2.1% | 20 | 32.3% | 23 | 54.5% | 56 | 270.8% |
| **Clerical** | 34 | 0 | 0.3% | 34 | 45 | 30.8% | 60 | 73.8% | 69 | 101.2% | 165 | 377.2% |
| **Self Employed** | 19 | 3 | 18.6% | 22 | 24 | 8.2% | 32 | 45.4% | 37 | 65.2% | 91 | 309.1% |
| **Advisor or Agent** | 2 | 0 | 17.6% | 2 | 2 | 9.3% | 3 | 45.4% | 3 | 65.7% | 8 | 310.3% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 53 | 3 | 5.7% | 56 | 70 | 24.4% | 91 | 61.7% | 110 | 96.6% | 255 | 354.9% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 23 | 2 | 8.9% | 26 | 30 | 17.9% | 40 | 57.7% | 47 | 85.2% | 111 | 336.2% |
| **Scientist** | 45 | 16 | 36.0% | 62 | 58 | -5.1% | 75 | 21.7% | 93 | 50.2% | 212 | 244.1% |
| **Maintenance Engineer** | 82 | 9 | 10.7% | 90 | 106 | 16.7% | 141 | 56.4% | 169 | 86.4% | 396 | 337.7% |
| **Civil Engineer** | 0 | 0 | 39.7% | 0 | 0 | -5.5% | 1 | 24.9% | 1 | 43.7% | 1 | 238.8% |
| **Production Engineer** | 48 | 25 | 52.0% | 73 | 62 | -14.3% | 83 | 13.6% | 95 | 30.8% | 223 | 206.8% |
| **Power distribution Engineer** | 15 | 8 | 51.4% | 23 | 20 | -12.6% | 26 | 13.3% | 30 | 33.5% | 72 | 219.5% |
| **Construction Engineer** | 0 | 0 | 27.2% | 0 | 0 | 2.7% | 1 | 38.8% | 1 | 60.1% | 2 | 280.6% |
| **Sales Exec** | 71 | 12 | 16.8% | 83 | 92 | 10.2% | 122 | 46.8% | 141 | 69.1% | 344 | 312.8% |
| **Marketing Personnel** | 76 | 14 | 17.9% | 90 | 100 | 12.0% | 127 | 41.5% | 156 | 74.5% | 368 | 311.3% |
| **General Semi Skilled Worker** | 85 | 3 | 3.6% | 88 | 110 | 25.7% | 145 | 64.9% | 171 | 95.4% | 406 | 363.2% |
| **General Labour** | 126 | 0 | 0.0% | 126 | 167 | 33.0% | 219 | 74.2% | 251 | 99.7% | 606 | 382.2% |
| **Other Employees** | 74 | 7 | 9.1% | 81 | 96 | 18.8% | 126 | 55.6% | 150 | 85.7% | 353 | 336.7% |
| **Administrative workers** | 45 | 2 | 3.4% | 47 | 60 | 27.6% | 77 | 64.5% | 92 | 97.3% | 216 | 361.1% |
| **Total** | **1,064** | **166** | **15.6%** | **1,231** | **1,389** | **12.9%** | **1,821** | **48.0%** | **2,155** | **75.1%** | **5,110** | **315.3%** |

## Biomass

| SOC | Biomass Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 40 | 9 | 23.3% | 49 | 52 | 6.6% | 68 | 38.3% | 80 | 62.6% | 193 | 293.4% |
| Snr Management SME | 149 | 16 | 10.8% | 165 | 194 | 17.7% | 255 | 54.2% | 301 | 82.2% | 723 | 337.5% |
| Supervisory | 170 | 19 | 11.1% | 189 | 221 | 16.9% | 295 | 55.9% | 344 | 81.9% | 814 | 330.4% |
| Middle / Junior Management | 150 | 16 | 10.8% | 167 | 197 | 18.1% | 256 | 53.9% | 304 | 82.4% | 727 | 336.8% |
| Designer / Developer | 18 | 4 | 21.7% | 22 | 23 | 5.9% | 30 | 40.8% | 35 | 63.9% | 86 | 298.3% |
| Clerical | 84 | 0 | 0.2% | 84 | 111 | 31.4% | 145 | 72.9% | 167 | 98.6% | 408 | 385.6% |
| Self Employed | 8 | 1 | 11.3% | 9 | 11 | 17.5% | 14 | 51.2% | 17 | 80.9% | 40 | 334.1% |
| Advisor or Agent | 2 | 0 | 11.4% | 3 | 3 | 17.8% | 4 | 54.3% | 5 | 80.0% | 12 | 330.3% |
| Educator | 0 | 0 | 12.5% | 0 | 0 | 11.1% | 0 | 54.6% | 0 | 81.6% | 0 | 324.6% |
| Specialist or Consultant | 89 | 3 | 3.3% | 92 | 117 | 27.5% | 155 | 68.5% | 181 | 96.4% | 429 | 366.9% |
| Editor | 2 | 0 | 2.4% | 3 | 3 | 27.4% | 4 | 70.2% | 5 | 95.1% | 12 | 374.3% |
| Industrial Researchers | 3 | 0 | 5.5% | 3 | 4 | 24.2% | 5 | 62.8% | 6 | 92.6% | 15 | 352.7% |
| Scientist | 5 | 1 | 23.4% | 6 | 7 | 6.6% | 9 | 38.2% | 10 | 60.9% | 25 | 292.0% |
| Maintenance Engineer | 153 | 11 | 6.9% | 164 | 201 | 22.4% | 267 | 62.8% | 304 | 85.3% | 740 | 351.2% |
| Civil Engineer | 3 | 1 | 23.1% | 3 | 3 | 7.2% | 4 | 38.8% | 5 | 64.0% | 12 | 291.0% |
| Production Engineer | 25 | 8 | 32.5% | 33 | 33 | 1.1% | 42 | 28.5% | 50 | 52.3% | 120 | 263.4% |
| Power distribution Engineer | 76 | 26 | 33.9% | 102 | 100 | -1.9% | 132 | 29.9% | 155 | 52.0% | 365 | 258.7% |
| Construction Engineer | 3 | 0 | 17.3% | 3 | 3 | 11.5% | 4 | 46.5% | 5 | 71.9% | 12 | 311.1% |
| Sales Exec | 80 | 9 | 10.7% | 88 | 104 | 17.2% | 137 | 54.6% | 165 | 86.2% | 389 | 339.7% |
| Marketing Personnel | 87 | 9 | 10.5% | 96 | 113 | 17.9% | 149 | 56.0% | 176 | 84.1% | 414 | 332.6% |
| General Semi Skilled Worker | 152 | 3 | 2.2% | 156 | 199 | 27.8% | 256 | 64.8% | 310 | 99.1% | 742 | 376.5% |
| General Labour | 172 | 0 | 0.0% | 172 | 224 | 30.0% | 297 | 72.5% | 348 | 102.3% | 833 | 384.2% |
| Other Employees | 232 | 13 | 5.4% | 245 | 301 | 23.1% | 400 | 63.3% | 462 | 88.6% | 1,116 | 356.0% |
| Administrative workers | 84 | 2 | 2.1% | 85 | 108 | 26.4% | 143 | 67.6% | 170 | 99.2% | 408 | 377.7% |
| **Total** | **1,788** | **151** | **8.4%** | **1,938** | **2,332** | **20.3%** | **3,073** | **58.5%** | **3,604** | **85.9%** | **8,635** | **345.5%** |

## Building Technologies

| | Building Technologies Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 69 | 9 | 13.5% | 79 | 90 | 15.0% | 118 | 50.3% | 140 | 78.3% | 333 | 322.7% |
| **Snr Management SME** | 159 | 11 | 6.7% | 170 | 208 | 22.5% | 271 | 59.4% | 319 | 87.7% | 769 | 352.6% |
| **Supervisory** | 176 | 13 | 7.1% | 188 | 229 | 21.6% | 299 | 58.8% | 362 | 92.2% | 852 | 352.5% |
| **Middle / Junior Management** | 162 | 11 | 7.1% | 173 | 212 | 22.5% | 276 | 59.0% | 326 | 87.9% | 782 | 351.1% |
| **Designer / Developer** | 19 | 3 | 13.4% | 22 | 25 | 15.4% | 33 | 50.9% | 39 | 77.0% | 93 | 321.6% |
| **Clerical** | 88 | 0 | 0.1% | 89 | 116 | 31.0% | 152 | 71.2% | 178 | 101.0% | 424 | 378.2% |
| **Self Employed** | 20 | 1 | 6.5% | 21 | 26 | 22.1% | 34 | 58.9% | 40 | 89.9% | 95 | 350.4% |
| **Advisor or Agent** | 23 | 2 | 6.6% | 24 | 30 | 24.0% | 39 | 61.8% | 47 | 92.4% | 111 | 356.9% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 92 | 2 | 2.0% | 94 | 119 | 27.4% | 160 | 70.7% | 185 | 97.6% | 442 | 372.2% |
| **Editor** | 1 | 0 | 1.3% | 1 | 1 | 28.5% | 1 | 69.3% | 2 | 100.0% | 4 | 371.0% |
| **Industrial Researchers** | 42 | 1 | 3.5% | 43 | 54 | 24.6% | 71 | 65.5% | 84 | 94.2% | 199 | 360.4% |
| **Scientist** | 6 | 1 | 13.9% | 7 | 8 | 14.3% | 10 | 49.9% | 12 | 77.1% | 29 | 323.6% |
| **Maintenance Engineer** | 161 | 7 | 4.1% | 168 | 210 | 25.4% | 275 | 64.0% | 321 | 91.3% | 774 | 361.3% |
| **Civil Engineer** | 10 | 1 | 14.7% | 12 | 13 | 14.4% | 17 | 49.3% | 20 | 73.7% | 48 | 318.0% |
| **Production Engineer** | 22 | 4 | 19.4% | 26 | 29 | 9.4% | 38 | 45.0% | 44 | 69.4% | 105 | 300.7% |
| **Power distribution Engineer** | 86 | 18 | 21.4% | 104 | 112 | 6.8% | 146 | 40.2% | 173 | 65.9% | 412 | 294.1% |
| **Construction Engineer** | 18 | 2 | 9.6% | 19 | 23 | 18.6% | 30 | 54.2% | 36 | 83.8% | 85 | 338.0% |
| **Sales Exec** | 81 | 6 | 6.9% | 87 | 104 | 20.3% | 139 | 60.2% | 162 | 86.6% | 390 | 350.1% |
| **Marketing Personnel** | 86 | 6 | 6.5% | 91 | 112 | 22.3% | 146 | 60.2% | 172 | 88.4% | 409 | 347.7% |
| **General Semi Skilled Worker** | 169 | 2 | 1.4% | 171 | 223 | 30.0% | 291 | 69.9% | 341 | 99.3% | 812 | 373.9% |
| **General Labour** | 338 | 0 | 0.0% | 338 | 444 | 31.0% | 582 | 71.9% | 683 | 101.7% | 1,632 | 382.2% |
| **Other Employees** | 238 | 8 | 3.2% | 246 | 312 | 26.6% | 407 | 65.1% | 483 | 96.3% | 1,156 | 369.4% |
| **Administrative workers** | 99 | 1 | 1.5% | 100 | 129 | 28.7% | 168 | 67.3% | 200 | 98.8% | 473 | 370.8% |
| **Total** | **2,165** | **109** | **5.0%** | **2,274** | **2,829** | **24.4%** | **3,703** | **62.8%** | **4,368** | **92.1%** | **10,426** | **358.4%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 13 | 6 | 46.9% | 19 | 17 | -11.1% | 22 | 15.8% | 26 | 38.6% | 63 | 228.8% |
| Snr Management SME | 21 | 5 | 22.9% | 26 | 28 | 7.0% | 36 | 37.8% | 43 | 63.7% | 104 | 294.1% |
| Supervisory | 26 | 6 | 24.2% | 32 | 34 | 4.9% | 44 | 36.8% | 53 | 62.7% | 125 | 286.1% |
| Middle / Junior Management | 24 | 6 | 23.1% | 29 | 31 | 5.3% | 40 | 36.9% | 49 | 64.9% | 115 | 292.1% |
| Designer / Developer | 6 | 3 | 47.4% | 9 | 8 | -10.2% | 11 | 16.3% | 13 | 35.4% | 31 | 230.6% |
| Clerical | 13 | 0 | 0.5% | 13 | 17 | 28.6% | 22 | 71.9% | 26 | 101.0% | 61 | 369.8% |
| Self Employed | 6 | 1 | 22.2% | 8 | 8 | 5.9% | 11 | 40.5% | 13 | 68.2% | 30 | 292.7% |
| Advisor or Agent | 5 | 1 | 21.3% | 6 | 7 | 7.6% | 9 | 41.8% | 11 | 66.3% | 26 | 301.3% |
| Educator | 0 | 0 | 18.4% | 0 | 0 | 6.6% | 0 | 45.9% | 0 | 68.9% | 1 | 295.3% |
| Specialist or Consultant | 14 | 1 | 6.8% | 15 | 18 | 22.6% | 24 | 59.1% | 28 | 89.9% | 68 | 354.0% |
| Editor | 2 | 0 | 4.8% | 3 | 3 | 24.7% | 4 | 67.1% | 5 | 92.6% | 12 | 362.5% |
| Industrial Researchers | 5 | 1 | 11.3% | 5 | 6 | 17.7% | 8 | 55.5% | 9 | 81.3% | 22 | 332.6% |
| Scientist | 3 | 1 | 49.3% | 4 | 3 | -13.4% | 5 | 16.1% | 6 | 36.7% | 13 | 215.1% |
| Maintenance Engineer | 29 | 4 | 13.5% | 32 | 37 | 14.4% | 49 | 51.1% | 58 | 78.6% | 136 | 319.0% |
| Civil Engineer | 5 | 2 | 46.9% | 7 | 6 | -11.3% | 8 | 17.0% | 9 | 35.7% | 22 | 224.1% |
| Production Engineer | 6 | 4 | 72.8% | 10 | 7 | -24.6% | 10 | -0.4% | 12 | 16.9% | 27 | 176.3% |
| Power distribution Engineer | 14 | 10 | 69.8% | 23 | 18 | -22.7% | 24 | 2.6% | 28 | 19.6% | 66 | 184.4% |
| Construction Engineer | 5 | 2 | 36.5% | 7 | 7 | -4.2% | 9 | 25.6% | 11 | 49.9% | 26 | 253.2% |
| Sales Exec | 15 | 3 | 22.4% | 18 | 20 | 7.1% | 26 | 40.5% | 30 | 64.1% | 72 | 290.1% |
| Marketing Personnel | 15 | 3 | 23.2% | 18 | 19 | 5.8% | 26 | 40.5% | 30 | 62.2% | 73 | 295.6% |
| General Semi Skilled Worker | 27 | 1 | 4.5% | 28 | 35 | 23.9% | 46 | 63.9% | 55 | 93.0% | 130 | 361.7% |
| General Labour | 44 | 0 | 0.0% | 44 | 59 | 32.2% | 76 | 71.6% | 89 | 100.4% | 214 | 380.8% |
| Other Employees | 36 | 4 | 11.4% | 40 | 47 | 17.9% | 62 | 55.6% | 72 | 80.5% | 174 | 334.2% |
| Administrative workers | 15 | 1 | 4.7% | 16 | 20 | 24.3% | 26 | 63.9% | 31 | 92.7% | 74 | 364.7% |
| **Total** | **349** | **66** | **18.8%** | **415** | **457** | **10.0%** | **599** | **44.3%** | **705** | **69.8%** | **1,682** | **305.2%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 20 | 9 | 45.3% | 28 | 25 | -10.4% | 33 | 17.8% | 39 | 38.9% | 93 | 228.0% |
| Snr Management SME | 70 | 16 | 22.4% | 85 | 92 | 7.4% | 119 | 39.4% | 141 | 65.7% | 337 | 294.5% |
| Supervisory | 79 | 18 | 22.7% | 97 | 103 | 6.9% | 134 | 38.9% | 157 | 62.9% | 377 | 290.1% |
| Middle / Junior Management | 72 | 16 | 22.3% | 88 | 95 | 7.8% | 123 | 39.9% | 143 | 63.1% | 343 | 289.4% |
| Designer / Developer | 8 | 4 | 45.8% | 12 | 11 | -10.4% | 14 | 17.3% | 16 | 38.4% | 39 | 228.2% |
| Clerical | 38 | 0 | 0.5% | 39 | 51 | 32.3% | 66 | 72.3% | 78 | 101.7% | 182 | 373.4% |
| Self Employed | 4 | 1 | 23.2% | 6 | 6 | 5.4% | 8 | 38.6% | 9 | 63.5% | 22 | 293.3% |
| Advisor or Agent | 4 | 1 | 23.6% | 5 | 5 | 5.5% | 7 | 38.2% | 8 | 64.2% | 19 | 287.2% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 38 | 3 | 6.8% | 41 | 50 | 22.4% | 66 | 60.2% | 77 | 88.0% | 185 | 350.0% |
| Editor | 2 | 0 | 4.5% | 2 | 3 | 24.7% | 4 | 64.8% | 4 | 95.6% | 10 | 355.7% |
| Industrial Researchers | 3 | 0 | 10.7% | 3 | 4 | 16.1% | 5 | 54.7% | 6 | 81.2% | 13 | 332.1% |
| Scientist | 2 | 1 | 45.0% | 3 | 3 | -9.9% | 4 | 18.5% | 5 | 39.1% | 11 | 231.8% |
| Maintenance Engineer | 73 | 10 | 13.7% | 83 | 95 | 14.6% | 124 | 49.1% | 147 | 76.5% | 356 | 327.3% |
| Civil Engineer | 4 | 2 | 47.5% | 5 | 5 | -11.1% | 6 | 15.6% | 7 | 36.7% | 18 | 227.9% |
| Production Engineer | 13 | 9 | 68.7% | 22 | 17 | -22.4% | 23 | 2.0% | 26 | 19.9% | 63 | 183.7% |
| Power distribution Engineer | 36 | 26 | 70.9% | 62 | 47 | -23.7% | 62 | 0.1% | 73 | 18.0% | 176 | 183.6% |
| Construction Engineer | 3 | 1 | 35.0% | 5 | 4 | -2.8% | 6 | 27.4% | 7 | 47.9% | 16 | 254.9% |
| Sales Exec | 40 | 9 | 23.1% | 50 | 53 | 7.1% | 69 | 38.0% | 82 | 64.7% | 194 | 290.9% |
| Marketing Personnel | 41 | 9 | 22.0% | 50 | 54 | 7.5% | 70 | 41.1% | 83 | 65.5% | 197 | 294.3% |
| General Semi Skilled Worker | 74 | 3 | 4.6% | 77 | 96 | 24.0% | 126 | 63.8% | 150 | 94.3% | 357 | 362.1% |
| General Labour | 117 | 0 | 0.0% | 117 | 152 | 29.9% | 200 | 70.8% | 234 | 99.8% | 564 | 382.3% |
| Other Employees | 106 | 12 | 11.0% | 118 | 139 | 18.1% | 182 | 54.5% | 217 | 84.2% | 504 | 328.3% |
| Administrative workers | 39 | 2 | 4.5% | 41 | 51 | 24.9% | 68 | 65.1% | 79 | 91.9% | 189 | 357.7% |
| **Total** | **887** | **151** | **17.0%** | **1,039** | **1,161** | **11.8%** | **1,518** | **46.2%** | **1,789** | **72.3%** | **4,263** | **310.4%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 64 | 6 | 8.9% | 70 | 84 | 19.0% | 110 | 56.0% | 131 | 86.0% | 312 | 343.8% |
| **Snr Management SME** | 178 | 8 | 4.4% | 186 | 232 | 24.7% | 305 | 64.1% | 360 | 94.1% | 852 | 359.0% |
| **Supervisory** | 201 | 9 | 4.3% | 210 | 264 | 25.6% | 347 | 65.3% | 406 | 93.3% | 969 | 361.7% |
| **Middle / Junior Management** | 181 | 8 | 4.5% | 189 | 236 | 25.0% | 310 | 64.1% | 369 | 95.1% | 857 | 353.2% |
| **Designer / Developer** | 13 | 1 | 8.7% | 14 | 17 | 20.5% | 23 | 58.4% | 27 | 84.5% | 64 | 341.8% |
| **Clerical** | 98 | 0 | 0.1% | 98 | 127 | 29.8% | 167 | 70.8% | 198 | 102.8% | 471 | 381.8% |
| **Self Employed** | 10 | 0 | 4.6% | 11 | 13 | 22.9% | 17 | 60.5% | 21 | 94.3% | 48 | 350.1% |
| **Advisor or Agent** | 1 | 0 | 4.8% | 1 | 2 | 26.3% | 2 | 60.1% | 3 | 93.7% | 6 | 364.7% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 89 | 1 | 1.4% | 90 | 116 | 29.0% | 154 | 71.2% | 180 | 100.0% | 423 | 370.6% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 6 | 0 | 2.3% | 7 | 8 | 27.4% | 11 | 68.0% | 13 | 96.4% | 31 | 372.6% |
| **Scientist** | 0 | 0 | 9.1% | 0 | 0 | 16.7% | 0 | 60.5% | 0 | 86.2% | 1 | 340.9% |
| **Maintenance Engineer** | 182 | 5 | 2.7% | 187 | 239 | 27.9% | 313 | 67.4% | 365 | 94.9% | 863 | 361.2% |
| **Civil Engineer** | 5 | 0 | 9.1% | 5 | 6 | 18.3% | 8 | 58.3% | 10 | 86.7% | 23 | 338.7% |
| **Production Engineer** | 27 | 4 | 13.9% | 30 | 35 | 15.6% | 46 | 51.7% | 54 | 76.4% | 129 | 324.5% |
| **Power distribution Engineer** | 93 | 12 | 12.7% | 105 | 122 | 16.2% | 161 | 52.6% | 185 | 76.0% | 440 | 318.4% |
| **Construction Engineer** | 11 | 1 | 6.5% | 11 | 14 | 20.3% | 18 | 62.8% | 21 | 88.0% | 51 | 353.2% |
| **Sales Exec** | 95 | 4 | 4.4% | 99 | 127 | 27.9% | 162 | 63.7% | 194 | 96.2% | 455 | 359.2% |
| **Marketing Personnel** | 100 | 4 | 4.2% | 105 | 132 | 26.7% | 173 | 65.3% | 207 | 97.9% | 480 | 359.0% |
| **General Semi Skilled Worker** | 190 | 2 | 0.9% | 192 | 248 | 28.9% | 327 | 70.4% | 383 | 99.1% | 907 | 372.0% |
| **General Labour** | 265 | 0 | 0.0% | 265 | 346 | 30.3% | 455 | 71.7% | 540 | 103.5% | 1,275 | 380.6% |
| **Other Employees** | 267 | 6 | 2.3% | 274 | 356 | 30.2% | 455 | 66.5% | 542 | 98.1% | 1,285 | 369.6% |
| **Administrative workers** | 101 | 1 | 0.9% | 102 | 133 | 30.1% | 176 | 72.1% | 205 | 100.9% | 489 | 379.7% |
| **Total** | **2,180** | **72** | **3.3%** | **2,252** | **2,857** | **26.9%** | **3,741** | **66.1%** | **4,412** | **95.9%** | **10,432** | **363.3%** |

## Recovery and Recycling

| SOC | Recovery and Recycling – Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 – Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 – Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 – Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 – Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 46 | 17 | 37.1% | 62 | 60 | -4.6% | 78 | 25.1% | 92 | 47.2% | 219 | 250.1% |
| Snr Management SME | 48 | 10 | 19.7% | 58 | 64 | 10.8% | 82 | 42.1% | 97 | 67.2% | 231 | 299.5% |
| Supervisory | 58 | 11 | 19.8% | 69 | 76 | 10.0% | 100 | 43.6% | 118 | 69.3% | 274 | 293.7% |
| Middle / Junior Management | 52 | 10 | 19.4% | 62 | 69 | 9.8% | 89 | 42.2% | 106 | 69.9% | 253 | 304.5% |
| Designer / Developer | 37 | 14 | 37.4% | 51 | 49 | -4.3% | 64 | 25.4% | 75 | 47.4% | 180 | 252.0% |
| Clerical | 28 | 0 | 0.4% | 28 | 37 | 30.9% | 48 | 72.1% | 56 | 99.3% | 133 | 377.9% |
| Self Employed | 13 | 2 | 18.3% | 16 | 18 | 10.3% | 23 | 45.0% | 27 | 71.8% | 64 | 301.0% |
| Advisor or Agent | 5 | 1 | 18.5% | 6 | 6 | 9.4% | 8 | 46.6% | 9 | 66.9% | 22 | 304.4% |
| Educator | 0 | 0 | 15.9% | 0 | 0 | 9.6% | 0 | 47.5% | 0 | 70.1% | 1 | 298.6% |
| Specialist or Consultant | 44 | 3 | 5.7% | 47 | 57 | 23.4% | 75 | 62.0% | 88 | 88.7% | 212 | 356.8% |
| Editor | 2 | 0 | 3.4% | 2 | 3 | 26.2% | 4 | 70.0% | 4 | 95.7% | 10 | 364.0% |
| Industrial Researchers | 11 | 1 | 9.5% | 12 | 15 | 19.7% | 19 | 56.8% | 23 | 84.0% | 54 | 339.9% |
| Scientist | 10 | 4 | 37.2% | 14 | 14 | -4.5% | 18 | 25.2% | 21 | 47.6% | 50 | 251.2% |
| Maintenance Engineer | 65 | 7 | 10.7% | 72 | 86 | 19.5% | 110 | 53.3% | 131 | 83.1% | 309 | 330.0% |
| Civil Engineer | 19 | 7 | 35.7% | 26 | 25 | -2.9% | 33 | 26.0% | 39 | 48.8% | 93 | 253.8% |
| Production Engineer | 25 | 13 | 54.6% | 38 | 32 | -15.6% | 42 | 11.1% | 49 | 30.6% | 118 | 211.4% |
| Power distribution Engineer | 36 | 20 | 55.4% | 55 | 46 | -17.0% | 61 | 10.4% | 72 | 29.9% | 170 | 208.3% |
| Construction Engineer | 22 | 6 | 27.8% | 28 | 28 | 2.0% | 37 | 34.0% | 44 | 56.9% | 105 | 276.4% |
| Sales Exec | 46 | 8 | 18.3% | 55 | 60 | 10.2% | 79 | 43.8% | 93 | 69.9% | 220 | 303.2% |
| Marketing Personnel | 39 | 7 | 18.2% | 46 | 52 | 12.8% | 67 | 45.8% | 80 | 72.2% | 187 | 303.3% |
| General Semi Skilled Worker | 86 | 3 | 3.7% | 89 | 111 | 25.2% | 146 | 64.2% | 172 | 93.6% | 411 | 363.2% |
| General Labour | 94 | 0 | 0.0% | 94 | 124 | 30.8% | 163 | 72.9% | 189 | 100.5% | 453 | 379.1% |
| Other Employees | 72 | 6 | 8.6% | 78 | 94 | 20.4% | 125 | 61.4% | 145 | 86.0% | 344 | 342.5% |
| Administrative workers | 38 | 1 | 3.7% | 40 | 50 | 25.3% | 66 | 66.0% | 77 | 93.5% | 184 | 362.0% |
| **Total** | **897** | **152** | **17.0%** | **1,049** | **1,175** | **12.0%** | **1,539** | **46.7%** | **1,807** | **72.2%** | **4,297** | **309.6%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 39 | 5 | 12.9% | 44 | 51 | 17.2% | 66 | 50.9% | 78 | 78.0% | 188 | 328.3% |
| Snr Management SME | 62 | 4 | 6.8% | 66 | 82 | 23.1% | 106 | 60.6% | 125 | 89.5% | 301 | 354.9% |
| Supervisory | 80 | 5 | 6.6% | 85 | 107 | 25.2% | 136 | 59.5% | 161 | 89.1% | 383 | 349.3% |
| Middle / Junior Management | 72 | 5 | 6.6% | 76 | 94 | 22.7% | 122 | 59.8% | 145 | 89.9% | 342 | 347.9% |
| Designer / Developer | 15 | 2 | 12.8% | 17 | 20 | 15.8% | 26 | 52.1% | 31 | 79.4% | 73 | 325.3% |
| Clerical | 41 | 0 | 0.1% | 41 | 53 | 30.5% | 70 | 72.3% | 82 | 101.0% | 195 | 378.2% |
| Self Employed | 20 | 1 | 6.7% | 22 | 27 | 22.9% | 35 | 60.2% | 41 | 90.9% | 98 | 353.5% |
| Advisor or Agent | 25 | 2 | 6.9% | 27 | 33 | 21.9% | 43 | 60.0% | 51 | 88.5% | 121 | 350.6% |
| Educator | 2 | 0 | 6.5% | 2 | 2 | 23.6% | 3 | 62.6% | 3 | 80.0% | 8 | 346.8% |
| Specialist or Consultant | 41 | 1 | 2.0% | 42 | 54 | 29.5% | 70 | 68.4% | 82 | 97.6% | 199 | 377.7% |
| Editor | 4 | 0 | 1.4% | 4 | 6 | 30.2% | 7 | 71.2% | 8 | 99.7% | 20 | 373.1% |
| Industrial Researchers | 34 | 1 | 3.3% | 35 | 44 | 25.5% | 59 | 66.3% | 70 | 98.6% | 164 | 366.3% |
| Scientist | 7 | 1 | 13.7% | 8 | 9 | 14.4% | 12 | 51.4% | 14 | 77.2% | 32 | 319.6% |
| Maintenance Engineer | 88 | 3 | 3.9% | 91 | 115 | 25.8% | 150 | 64.4% | 176 | 92.4% | 424 | 364.9% |
| Civil Engineer | 14 | 2 | 13.5% | 16 | 18 | 15.9% | 24 | 51.4% | 28 | 80.0% | 66 | 324.2% |
| Production Engineer | 17 | 3 | 19.1% | 20 | 22 | 9.5% | 28 | 43.4% | 33 | 69.0% | 80 | 303.1% |
| Power distribution Engineer | 44 | 9 | 20.3% | 53 | 57 | 7.6% | 76 | 42.7% | 89 | 67.4% | 212 | 299.8% |
| Construction Engineer | 20 | 2 | 9.9% | 22 | 26 | 19.7% | 34 | 56.0% | 40 | 82.9% | 94 | 335.6% |
| Sales Exec | 38 | 2 | 6.6% | 40 | 49 | 21.9% | 64 | 59.4% | 77 | 89.7% | 185 | 358.6% |
| Marketing Personnel | 39 | 3 | 6.7% | 41 | 51 | 23.0% | 66 | 59.1% | 79 | 91.3% | 188 | 355.7% |
| General Semi Skilled Worker | 79 | 1 | 1.2% | 80 | 102 | 27.3% | 137 | 70.2% | 160 | 99.1% | 380 | 372.9% |
| General Labour | 53 | 0 | 0.0% | 53 | 70 | 30.9% | 92 | 72.6% | 109 | 104.5% | 257 | 382.5% |
| Other Employees | 118 | 4 | 3.3% | 122 | 154 | 26.1% | 205 | 68.8% | 235 | 93.0% | 569 | 367.5% |
| Administrative workers | 51 | 1 | 1.4% | 52 | 67 | 29.2% | 88 | 69.6% | 103 | 98.3% | 247 | 376.8% |
| **Total** | **1,002** | **58** | **5.7%** | **1,059** | **1,311** | **23.8%** | **1,719** | **62.3%** | **2,020** | **90.7%** | **4,829** | **355.9%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 57 | 5 | 9.6% | 62 | 75 | 20.1% | 97 | 56.9% | 113 | 82.2% | 274 | 341.0% |
| **Snr Management SME** | 86 | 4 | 4.7% | 90 | 112 | 25.3% | 147 | 63.8% | 171 | 91.5% | 410 | 357.8% |
| **Supervisory** | 99 | 4 | 4.5% | 103 | 126 | 22.6% | 170 | 65.3% | 198 | 92.2% | 475 | 361.2% |
| **Middle / Junior Management** | 91 | 4 | 4.5% | 95 | 119 | 25.4% | 156 | 63.7% | 183 | 92.0% | 437 | 359.6% |
| **Designer / Developer** | 21 | 2 | 9.1% | 23 | 28 | 19.9% | 37 | 57.4% | 43 | 85.9% | 102 | 337.7% |
| **Clerical** | 49 | 0 | 0.1% | 49 | 64 | 30.2% | 84 | 71.1% | 100 | 103.3% | 239 | 387.2% |
| **Self Employed** | 25 | 1 | 4.5% | 26 | 33 | 24.6% | 44 | 65.2% | 51 | 94.1% | 121 | 359.7% |
| **Advisor or Agent** | 3 | 0 | 4.4% | 3 | 4 | 25.4% | 6 | 63.0% | 7 | 93.9% | 16 | 364.0% |
| **Educator** | 0 | 0 | 4.5% | 0 | 0 | 26.4% | 0 | 66.5% | 0 | 94.1% | 0 | 362.3% |
| **Specialist or Consultant** | 53 | 1 | 1.4% | 53 | 69 | 29.3% | 91 | 69.8% | 106 | 97.5% | 253 | 374.0% |
| **Editor** | 2 | 0 | 0.9% | 2 | 2 | 28.6% | 3 | 70.3% | 3 | 102.1% | 8 | 374.6% |
| **Industrial Researchers** | 4 | 0 | 2.2% | 4 | 5 | 28.6% | 7 | 66.6% | 8 | 98.6% | 19 | 371.2% |
| **Scientist** | 2 | 0 | 8.8% | 2 | 2 | 19.6% | 3 | 57.8% | 4 | 87.3% | 8 | 338.5% |
| **Maintenance Engineer** | 120 | 3 | 2.8% | 123 | 157 | 27.4% | 206 | 67.1% | 244 | 98.1% | 576 | 367.9% |
| **Civil Engineer** | 15 | 1 | 9.1% | 16 | 20 | 20.2% | 26 | 57.2% | 30 | 83.8% | 73 | 341.4% |
| **Production Engineer** | 29 | 4 | 14.0% | 33 | 38 | 14.5% | 50 | 49.6% | 59 | 78.8% | 139 | 318.7% |
| **Power distribution Engineer** | 58 | 9 | 14.7% | 67 | 77 | 14.5% | 100 | 49.0% | 117 | 75.1% | 284 | 324.0% |
| **Construction Engineer** | 24 | 2 | 6.7% | 25 | 31 | 22.2% | 40 | 60.6% | 48 | 89.1% | 113 | 350.6% |
| **Sales Exec** | 43 | 2 | 4.7% | 45 | 56 | 26.5% | 74 | 65.1% | 86 | 92.0% | 204 | 357.2% |
| **Marketing Personnel** | 44 | 2 | 4.4% | 46 | 58 | 24.4% | 76 | 65.3% | 89 | 91.8% | 215 | 365.7% |
| **General Semi Skilled Worker** | 104 | 1 | 0.9% | 105 | 136 | 29.6% | 177 | 68.9% | 210 | 100.6% | 496 | 373.8% |
| **General Labour** | 59 | 0 | 0.0% | 59 | 78 | 31.8% | 101 | 71.2% | 119 | 101.9% | 284 | 381.5% |
| **Other Employees** | 144 | 3 | 2.3% | 148 | 191 | 29.5% | 246 | 66.7% | 292 | 97.4% | 694 | 369.6% |
| **Administrative workers** | 58 | 1 | 0.9% | 59 | 77 | 30.5% | 99 | 69.3% | 117 | 99.7% | 279 | 375.7% |
| **Total** | **1,189** | **50** | **4.2%** | **1,239** | **1,557** | **25.7%** | **2,038** | **64.5%** | **2,397** | **93.5%** | **5,719** | **361.7%** |

## Wind

| SOC | Wind: Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030: Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030: Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050: Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050: Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 100 | 13 | 13.4% | 113 | 130 | 14.5% | 170 | 50.5% | 203 | 79.2% | 487 | 330.0% |
| Snr Management SME | 275 | 19 | 7.0% | 295 | 365 | 23.8% | 472 | 60.2% | 550 | 86.9% | 1,331 | 351.8% |
| Supervisory | 326 | 24 | 7.2% | 350 | 434 | 24.0% | 572 | 63.6% | 663 | 89.5% | 1,564 | 347.2% |
| Middle / Junior Management | 290 | 20 | 6.9% | 310 | 375 | 20.8% | 499 | 60.8% | 586 | 88.9% | 1,377 | 343.8% |
| Designer / Developer | 14 | 2 | 13.8% | 16 | 19 | 17.2% | 24 | 52.8% | 28 | 78.6% | 68 | 324.6% |
| Clerical | 157 | 0 | 0.1% | 157 | 201 | 28.3% | 267 | 70.1% | 322 | 105.7% | 758 | 383.5% |
| Self Employed | 23 | 2 | 6.7% | 25 | 31 | 23.9% | 40 | 63.2% | 47 | 88.1% | 112 | 351.4% |
| Advisor or Agent | 2 | 0 | 6.9% | 2 | 3 | 19.5% | 4 | 62.6% | 5 | 91.0% | 11 | 341.6% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 138 | 3 | 2.1% | 141 | 181 | 27.9% | 238 | 68.6% | 283 | 100.5% | 674 | 376.9% |
| Editor | 0 | 0 | 1.1% | 0 | 0 | 28.2% | 1 | 77.4% | 1 | 95.2% | 2 | 366.3% |
| Industrial Researchers | 3 | 0 | 3.3% | 3 | 4 | 28.0% | 5 | 59.9% | 6 | 92.7% | 15 | 386.6% |
| Scientist | 1 | 0 | 15.2% | 1 | 1 | 15.8% | 1 | 50.8% | 1 | 72.4% | 3 | 335.1% |
| Maintenance Engineer | 331 | 14 | 4.2% | 345 | 437 | 26.7% | 576 | 67.2% | 669 | 94.2% | 1,590 | 361.3% |
| Civil Engineer | 11 | 2 | 13.9% | 13 | 15 | 14.9% | 19 | 50.0% | 22 | 76.8% | 54 | 323.0% |
| Production Engineer | 53 | 11 | 20.7% | 65 | 69 | 6.3% | 92 | 43.1% | 108 | 67.0% | 257 | 297.8% |
| Power distribution Engineer | 153 | 32 | 21.2% | 185 | 201 | 8.9% | 263 | 42.3% | 311 | 68.1% | 729 | 294.2% |
| Construction Engineer | 36 | 4 | 11.0% | 40 | 47 | 18.1% | 61 | 53.7% | 72 | 81.2% | 172 | 332.5% |
| Sales Exec | 142 | 10 | 7.2% | 152 | 181 | 19.2% | 240 | 58.3% | 281 | 84.9% | 666 | 338.9% |
| Marketing Personnel | 152 | 11 | 7.1% | 163 | 196 | 20.5% | 260 | 59.8% | 302 | 85.7% | 737 | 353.5% |
| General Semi Skilled Worker | 302 | 4 | 1.4% | 306 | 394 | 28.5% | 524 | 71.0% | 608 | 98.4% | 1,474 | 380.8% |
| General Labour | 369 | 0 | 0.0% | 369 | 488 | 32.3% | 634 | 71.9% | 745 | 102.1% | 1,773 | 380.9% |
| Other Employees | 470 | 16 | 3.5% | 486 | 617 | 26.9% | 809 | 66.3% | 954 | 96.1% | 2,249 | 362.2% |
| Administrative workers | 167 | 2 | 1.3% | 169 | 220 | 30.5% | 286 | 69.2% | 336 | 98.8% | 799 | 372.9% |
| **Total** | **3,515** | **190** | **5.4%** | **3,705** | **4,607** | **24.3%** | **6,059** | **63.5%** | **7,104** | **91.8%** | **16,900** | **356.2%** |

# Marches LEP

## Alternative Fuel Vehicle

| | Alternative Fuel Vehicle | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 5 | 2 | 45.7% | 8 | 7 | -10.8% | 9 | 19.4% | 11 | 39.1% | 25 | 227.3% |
| **Snr Management SME** | 10 | 3 | 25.2% | 13 | 13 | 2.0% | 17 | 39.2% | 21 | 63.9% | 47 | 278.3% |
| **Supervisory** | 12 | 3 | 24.1% | 15 | 16 | 6.2% | 21 | 35.6% | 25 | 64.2% | 58 | 283.6% |
| **Middle / Junior Management** | 11 | 3 | 24.3% | 14 | 15 | 5.0% | 19 | 36.6% | 23 | 63.3% | 54 | 288.6% |
| **Designer / Developer** | 1 | 1 | 50.3% | 2 | 2 | -12.5% | 2 | 15.4% | 3 | 36.0% | 6 | 224.7% |
| **Clerical** | 8 | 0 | 0.5% | 8 | 10 | 29.3% | 13 | 71.9% | 15 | 100.3% | 37 | 379.9% |
| **Self Employed** | 7 | 2 | 24.2% | 9 | 10 | 6.2% | 13 | 41.3% | 15 | 61.2% | 35 | 283.2% |
| **Advisor or Agent** | 13 | 3 | 25.6% | 16 | 16 | 4.8% | 22 | 37.6% | 25 | 59.0% | 60 | 282.7% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 2 | 0 | 7.5% | 2 | 3 | 28.0% | 3 | 65.0% | 4 | 80.0% | 9 | 352.1% |
| **Editor** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Industrial Researchers** | 21 | 3 | 11.8% | 24 | 28 | 19.1% | 36 | 51.8% | 43 | 82.3% | 103 | 335.6% |
| **Scientist** | 2 | 1 | 46.4% | 3 | 3 | -10.2% | 3 | 18.0% | 4 | 39.5% | 9 | 230.2% |
| **Maintenance Engineer** | 19 | 3 | 15.7% | 22 | 25 | 13.9% | 33 | 51.8% | 39 | 77.0% | 93 | 325.0% |
| **Civil Engineer** | 2 | 1 | 45.3% | 3 | 3 | -9.3% | 4 | 19.5% | 5 | 39.7% | 11 | 230.4% |
| **Production Engineer** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Power distribution Engineer** | 2 | 2 | 66.9% | 4 | 3 | -23.0% | 4 | 3.4% | 5 | 21.2% | 11 | 181.3% |
| **Construction Engineer** | 3 | 1 | 36.5% | 4 | 4 | -3.4% | 5 | 25.5% | 6 | 50.8% | 14 | 251.7% |
| **Sales Exec** | 14 | 4 | 24.7% | 18 | 19 | 6.2% | 24 | 36.4% | 28 | 58.0% | 70 | 288.9% |
| **Marketing Personnel** | 15 | 4 | 25.4% | 19 | 19 | 4.5% | 26 | 38.4% | 30 | 62.7% | 70 | 275.8% |
| **General Semi Skilled Worker** | 12 | 1 | 5.0% | 12 | 16 | 26.5% | 20 | 60.1% | 24 | 92.9% | 57 | 362.9% |
| **General Labour** | 20 | 0 | 0.0% | 20 | 26 | 29.5% | 34 | 69.6% | 40 | 99.4% | 98 | 385.6% |
| **Other Employees** | 9 | 1 | 12.4% | 10 | 11 | 14.3% | 15 | 54.6% | 17 | 79.4% | 40 | 321.1% |
| **Administrative workers** | 9 | 0 | 5.2% | 9 | 11 | 25.6% | 15 | 59.5% | 17 | 87.4% | 42 | 355.9% |
| **Total** | **197** | **36** | **18.2%** | **233** | **259** | **11.0%** | **339** | **45.2%** | **399** | **70.8%** | **951** | **307.6%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 45 | 19 | 42.6% | 64 | 59 | -8.4% | 76 | 18.3% | 91 | 42.1% | 208 | 222.5% |
| Snr Management SME | 40 | 7 | 17.3% | 47 | 53 | 14.2% | 70 | 50.2% | 80 | 70.2% | 193 | 312.1% |
| Supervisory | 45 | 9 | 19.5% | 54 | 59 | 9.8% | 76 | 41.1% | 91 | 70.2% | 213 | 295.7% |
| Middle / Junior Management | 43 | 8 | 17.7% | 51 | 57 | 12.3% | 75 | 48.7% | 87 | 71.8% | 205 | 304.5% |
| Designer / Developer | 9 | 3 | 38.0% | 12 | 11 | -9.1% | 15 | 22.2% | 17 | 41.6% | 42 | 241.3% |
| Clerical | 24 | 0 | 0.4% | 24 | 32 | 32.1% | 40 | 66.3% | 48 | 102.1% | 113 | 371.0% |
| Self Employed | 12 | 2 | 17.5% | 14 | 16 | 12.7% | 20 | 38.5% | 24 | 70.9% | 59 | 311.4% |
| Advisor or Agent | 1 | 0 | 22.1% | 1 | 1 | 10.5% | 2 | 37.9% | 2 | 68.2% | 4 | 282.1% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 41 | 2 | 5.5% | 44 | 53 | 22.0% | 69 | 58.8% | 86 | 96.6% | 203 | 364.2% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 19 | 2 | 11.0% | 21 | 24 | 13.2% | 33 | 52.9% | 38 | 78.4% | 97 | 351.4% |
| Scientist | 32 | 13 | 39.3% | 45 | 43 | -3.8% | 54 | 21.3% | 61 | 37.3% | 154 | 245.1% |
| Maintenance Engineer | 64 | 7 | 10.9% | 71 | 84 | 18.5% | 109 | 53.4% | 132 | 85.2% | 307 | 331.0% |
| Civil Engineer | 0 | 0 | 37.3% | 0 | 0 | -4.0% | 0 | 26.0% | 0 | 45.3% | 1 | 257.9% |
| Production Engineer | 35 | 25 | 69.2% | 60 | 47 | -21.0% | 59 | -0.8% | 71 | 19.1% | 171 | 185.2% |
| Power distribution Engineer | 10 | 6 | 56.0% | 16 | 13 | -19.5% | 18 | 12.1% | 21 | 27.6% | 50 | 212.4% |
| Construction Engineer | 0 | 0 | 27.9% | 0 | 0 | 1.0% | 0 | 30.7% | 0 | 61.2% | 1 | 274.5% |
| Sales Exec | 47 | 8 | 18.0% | 55 | 61 | 11.2% | 79 | 44.3% | 92 | 67.9% | 223 | 304.6% |
| Marketing Personnel | 51 | 9 | 18.2% | 60 | 67 | 11.2% | 87 | 44.5% | 104 | 74.1% | 242 | 303.2% |
| General Semi Skilled Worker | 63 | 2 | 3.7% | 66 | 85 | 29.8% | 109 | 65.5% | 130 | 97.9% | 307 | 366.2% |
| General Labour | 88 | 0 | 0.0% | 88 | 113 | 29.4% | 149 | 70.5% | 177 | 101.9% | 435 | 396.8% |
| Other Employees | 32 | 3 | 9.4% | 35 | 42 | 20.2% | 54 | 56.2% | 64 | 84.9% | 158 | 355.4% |
| Administrative workers | 27 | 1 | 4.2% | 28 | 36 | 25.1% | 48 | 69.1% | 55 | 92.7% | 132 | 364.4% |
| **Total** | **730** | **127** | **17.4%** | **856** | **958** | **11.9%** | **1,244** | **45.3%** | **1,475** | **72.2%** | **3,516** | **310.6%** |

## Biomass

| | Biomass Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 24 | 5 | 21.8% | 29 | 31 | 5.3% | 41 | 39.4% | 49 | 67.2% | 115 | 294.9% |
| Snr Management SME | 107 | 12 | 11.0% | 119 | 139 | 17.2% | 182 | 53.0% | 216 | 81.8% | 515 | 333.5% |
| Supervisory | 98 | 11 | 10.8% | 109 | 130 | 19.6% | 170 | 56.3% | 197 | 81.4% | 470 | 332.7% |
| Middle / Junior Management | 91 | 11 | 11.8% | 102 | 122 | 19.7% | 154 | 51.8% | 181 | 78.2% | 428 | 320.9% |
| Designer / Developer | 12 | 3 | 22.1% | 14 | 15 | 4.8% | 21 | 42.7% | 24 | 64.1% | 58 | 296.7% |
| Clerical | 51 | 0 | 0.2% | 52 | 67 | 30.3% | 88 | 71.1% | 105 | 104.1% | 245 | 376.0% |
| Self Employed | 5 | 1 | 10.0% | 6 | 7 | 18.6% | 9 | 56.2% | 10 | 81.8% | 24 | 328.5% |
| Advisor or Agent | 2 | 0 | 11.0% | 2 | 2 | 18.0% | 3 | 54.2% | 3 | 84.0% | 7 | 332.1% |
| Educator | 0 | 0 | 9.5% | 0 | 0 | 12.6% | 0 | 56.8% | 0 | 82.5% | 0 | 372.7% |
| Specialist or Consultant | 59 | 2 | 3.5% | 61 | 78 | 28.1% | 98 | 60.9% | 118 | 93.4% | 289 | 372.4% |
| Editor | 2 | 0 | 2.1% | 2 | 2 | 26.7% | 3 | 72.9% | 3 | 97.9% | 8 | 364.5% |
| Industrial Researchers | 2 | 0 | 5.9% | 2 | 3 | 22.3% | 4 | 65.5% | 4 | 87.9% | 10 | 356.9% |
| Scientist | 3 | 1 | 20.7% | 4 | 4 | 14.2% | 5 | 39.2% | 6 | 73.5% | 14 | 292.2% |
| Maintenance Engineer | 112 | 7 | 6.4% | 119 | 145 | 22.0% | 188 | 58.0% | 224 | 87.9% | 541 | 354.1% |
| Civil Engineer | 2 | 0 | 22.9% | 2 | 2 | 7.4% | 3 | 39.5% | 3 | 63.3% | 7 | 295.2% |
| Production Engineer | 16 | 5 | 34.5% | 21 | 21 | -4.1% | 27 | 24.0% | 32 | 50.5% | 76 | 255.5% |
| Power distribution Engineer | 45 | 15 | 32.8% | 60 | 59 | -1.9% | 78 | 30.2% | 89 | 49.1% | 215 | 258.3% |
| Construction Engineer | 2 | 0 | 17.6% | 2 | 2 | 11.8% | 3 | 46.3% | 3 | 71.3% | 8 | 311.7% |
| Sales Exec | 50 | 6 | 11.3% | 55 | 64 | 15.9% | 85 | 52.9% | 100 | 81.5% | 240 | 334.5% |
| Marketing Personnel | 53 | 6 | 11.5% | 59 | 70 | 18.2% | 92 | 54.2% | 107 | 80.3% | 257 | 331.7% |
| General Semi Skilled Worker | 100 | 2 | 2.2% | 103 | 128 | 24.9% | 173 | 69.0% | 207 | 101.8% | 488 | 375.5% |
| General Labour | 111 | 0 | 0.0% | 111 | 147 | 32.3% | 190 | 71.4% | 226 | 103.0% | 534 | 379.9% |
| Other Employees | 111 | 6 | 5.5% | 117 | 144 | 22.9% | 192 | 64.5% | 225 | 92.3% | 523 | 347.0% |
| Administrative workers | 45 | 1 | 2.2% | 46 | 59 | 28.6% | 77 | 67.0% | 91 | 98.7% | 215 | 367.7% |
| **Total** | **1,102** | **94** | **8.5%** | **1,196** | **1,441** | **20.5%** | **1,884** | **57.5%** | **2,226** | **86.1%** | **5,287** | **342.0%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 47 | 7 | 14.6% | 54 | 62 | 14.4% | 80 | 47.4% | 95 | 75.3% | 225 | 315.0% |
| Snr Management SME | 132 | 9 | 6.6% | 140 | 169 | 20.6% | 225 | 59.9% | 269 | 91.8% | 632 | 350.2% |
| Supervisory | 118 | 8 | 7.1% | 126 | 153 | 21.1% | 201 | 59.2% | 238 | 88.0% | 564 | 346.4% |
| Middle / Junior Management | 111 | 7 | 6.5% | 118 | 146 | 23.0% | 193 | 63.3% | 222 | 87.8% | 540 | 356.3% |
| Designer / Developer | 15 | 2 | 13.3% | 17 | 19 | 16.5% | 25 | 50.5% | 29 | 78.2% | 70 | 323.1% |
| Clerical | 65 | 0 | 0.1% | 65 | 85 | 31.1% | 109 | 68.2% | 130 | 99.9% | 308 | 374.1% |
| Self Employed | 14 | 1 | 7.2% | 15 | 19 | 21.2% | 25 | 60.7% | 29 | 88.7% | 70 | 357.3% |
| Advisor or Agent | 16 | 1 | 7.1% | 17 | 21 | 22.6% | 27 | 57.7% | 32 | 88.7% | 78 | 357.3% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 72 | 1 | 2.0% | 74 | 95 | 29.5% | 125 | 70.1% | 148 | 101.3% | 346 | 369.9% |
| Editor | 1 | 0 | 1.5% | 1 | 1 | 29.1% | 1 | 67.5% | 1 | 102.1% | 3 | 373.3% |
| Industrial Researchers | 31 | 1 | 3.7% | 33 | 41 | 25.8% | 53 | 63.2% | 65 | 99.1% | 150 | 360.5% |
| Scientist | 4 | 1 | 13.8% | 4 | 5 | 14.8% | 7 | 52.9% | 8 | 78.1% | 19 | 325.4% |
| Maintenance Engineer | 137 | 6 | 4.0% | 142 | 175 | 23.1% | 236 | 66.3% | 278 | 96.0% | 644 | 353.0% |
| Civil Engineer | 7 | 1 | 14.3% | 8 | 9 | 14.2% | 12 | 50.8% | 14 | 79.0% | 33 | 327.3% |
| Production Engineer | 17 | 4 | 22.0% | 20 | 21 | 6.0% | 29 | 43.5% | 33 | 64.8% | 79 | 292.1% |
| Power distribution Engineer | 59 | 13 | 21.2% | 72 | 77 | 7.7% | 102 | 41.7% | 120 | 67.5% | 286 | 298.0% |
| Construction Engineer | 12 | 1 | 10.6% | 14 | 16 | 18.5% | 21 | 53.7% | 25 | 83.3% | 60 | 337.4% |
| Sales Exec | 58 | 4 | 6.9% | 62 | 76 | 22.5% | 100 | 61.0% | 118 | 90.1% | 280 | 350.5% |
| Marketing Personnel | 62 | 4 | 6.8% | 66 | 82 | 24.0% | 107 | 61.2% | 125 | 88.0% | 303 | 356.4% |
| General Semi Skilled Worker | 125 | 2 | 1.4% | 127 | 164 | 28.7% | 217 | 70.4% | 255 | 100.9% | 611 | 380.9% |
| General Labour | 249 | 0 | 0.0% | 249 | 324 | 30.2% | 427 | 71.3% | 498 | 99.9% | 1,213 | 386.9% |
| Other Employees | 123 | 4 | 3.2% | 127 | 161 | 26.7% | 207 | 63.3% | 256 | 102.0% | 592 | 366.6% |
| Administrative workers | 61 | 1 | 1.4% | 62 | 82 | 32.4% | 103 | 67.2% | 121 | 96.4% | 292 | 372.8% |
| **Total** | **1,536** | **77** | **5.0%** | **1,614** | **2,004** | **24.2%** | **2,632** | **63.1%** | **3,112** | **92.8%** | **7,400** | **358.5%** |

## Energy Management

| | Energy Management Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 7 | 3 | 47.2% | 11 | 9 | -10.7% | 12 | 16.6% | 14 | 36.1% | 35 | 226.4% |
| Snr Management SME | 15 | 3 | 22.0% | 18 | 20 | 8.4% | 26 | 40.1% | 30 | 66.3% | 72 | 293.2% |
| Supervisory | 15 | 3 | 22.4% | 18 | 19 | 5.7% | 26 | 40.3% | 30 | 64.4% | 71 | 289.8% |
| Middle / Junior Management | 14 | 3 | 23.0% | 17 | 18 | 5.6% | 23 | 38.8% | 27 | 60.3% | 66 | 289.9% |
| Designer / Developer | 4 | 2 | 42.5% | 6 | 5 | -7.6% | 7 | 17.0% | 8 | 44.4% | 19 | 243.6% |
| Clerical | 8 | 0 | 0.4% | 8 | 10 | 29.3% | 13 | 67.6% | 16 | 100.2% | 38 | 376.4% |
| Self Employed | 4 | 1 | 23.3% | 4 | 5 | 7.5% | 6 | 41.2% | 7 | 65.2% | 18 | 295.4% |
| Advisor or Agent | 3 | 1 | 21.6% | 4 | 4 | 7.6% | 5 | 40.9% | 6 | 65.2% | 15 | 288.7% |
| Educator | 0 | 0 | 26.3% | 0 | 0 | 4.3% | 0 | 29.4% | 0 | 59.9% | 0 | 282.9% |
| Specialist or Consultant | 9 | 1 | 7.2% | 10 | 12 | 23.8% | 16 | 61.7% | 19 | 87.1% | 45 | 353.0% |
| Editor | 1 | 0 | 4.8% | 2 | 2 | 25.8% | 2 | 61.3% | 3 | 90.1% | 7 | 370.5% |
| Industrial Researchers | 3 | 0 | 11.6% | 3 | 4 | 16.5% | 5 | 52.7% | 6 | 82.3% | 15 | 330.1% |
| Scientist | 2 | 1 | 46.2% | 2 | 2 | -10.3% | 3 | 18.3% | 3 | 36.7% | 7 | 235.3% |
| Maintenance Engineer | 20 | 3 | 14.2% | 23 | 26 | 15.1% | 35 | 50.4% | 41 | 78.1% | 97 | 321.3% |
| Civil Engineer | 3 | 1 | 48.1% | 4 | 3 | -12.2% | 4 | 16.1% | 5 | 38.7% | 12 | 218.9% |
| Production Engineer | 3 | 3 | 73.9% | 6 | 4 | -25.8% | 6 | -1.3% | 7 | 15.9% | 17 | 176.6% |
| Power distribution Engineer | 8 | 5 | 69.6% | 13 | 10 | -21.6% | 14 | 2.7% | 16 | 17.7% | 38 | 185.5% |
| Construction Engineer | 3 | 1 | 34.2% | 4 | 4 | -4.7% | 6 | 25.8% | 7 | 51.5% | 16 | 258.8% |
| Sales Exec | 9 | 2 | 23.7% | 11 | 11 | 3.4% | 16 | 40.2% | 18 | 63.4% | 43 | 292.0% |
| Marketing Personnel | 9 | 2 | 22.4% | 11 | 12 | 6.2% | 16 | 39.6% | 18 | 64.8% | 44 | 298.3% |
| General Semi Skilled Worker | 17 | 1 | 4.6% | 18 | 22 | 25.0% | 29 | 62.5% | 35 | 98.0% | 81 | 361.4% |
| General Labour | 27 | 0 | 0.0% | 27 | 36 | 31.7% | 46 | 70.4% | 55 | 103.4% | 130 | 376.9% |
| Other Employees | 15 | 2 | 10.8% | 17 | 20 | 19.0% | 26 | 54.3% | 31 | 82.5% | 72 | 332.1% |
| Administrative workers | 8 | 0 | 4.9% | 8 | 10 | 24.7% | 14 | 65.0% | 16 | 91.8% | 38 | 354.8% |
| **Total** | **207** | **38** | **18.5%** | **246** | **272** | **10.5%** | **355** | **44.4%** | **419** | **70.7%** | **997** | **305.6%** |

## Geothermal

| | Geothermal Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 11 | 5 | 47.7% | 16 | 15 | -9.7% | 19 | 17.3% | 22 | 36.8% | 53 | 222.0% |
| Snr Management SME | 48 | 11 | 22.8% | 59 | 62 | 5.6% | 80 | 37.0% | 96 | 64.3% | 234 | 299.6% |
| Supervisory | 44 | 11 | 25.0% | 54 | 57 | 4.1% | 75 | 37.5% | 88 | 62.1% | 211 | 286.3% |
| Middle / Junior Management | 40 | 9 | 23.3% | 50 | 53 | 5.8% | 69 | 39.0% | 83 | 65.5% | 193 | 286.8% |
| Designer / Developer | 5 | 2 | 46.7% | 8 | 7 | -10.6% | 9 | 17.7% | 10 | 36.8% | 25 | 225.7% |
| Clerical | 23 | 0 | 0.5% | 23 | 30 | 29.7% | 39 | 70.4% | 46 | 100.2% | 111 | 379.9% |
| Self Employed | 3 | 1 | 23.1% | 3 | 3 | 4.4% | 5 | 39.5% | 6 | 65.2% | 13 | 292.9% |
| Advisor or Agent | 2 | 1 | 22.6% | 3 | 3 | 7.7% | 4 | 39.0% | 5 | 65.2% | 12 | 295.8% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 25 | 2 | 7.0% | 26 | 32 | 22.4% | 42 | 59.7% | 49 | 88.6% | 120 | 356.5% |
| Editor | 1 | 0 | 4.6% | 1 | 2 | 26.6% | 2 | 61.0% | 3 | 92.5% | 6 | 348.9% |
| Industrial Researchers | 2 | 0 | 11.4% | 2 | 2 | 18.1% | 3 | 52.5% | 4 | 79.9% | 9 | 329.4% |
| Scientist | 1 | 1 | 43.4% | 2 | 2 | -7.9% | 2 | 21.2% | 3 | 40.5% | 6 | 238.3% |
| Maintenance Engineer | 52 | 7 | 13.7% | 59 | 67 | 14.5% | 87 | 48.7% | 103 | 76.2% | 247 | 322.1% |
| Civil Engineer | 2 | 1 | 47.8% | 3 | 3 | -10.5% | 4 | 14.2% | 4 | 34.4% | 10 | 224.8% |
| Production Engineer | 8 | 5 | 65.9% | 13 | 11 | -20.3% | 14 | 2.6% | 16 | 22.9% | 38 | 185.1% |
| Power distribution Engineer | 21 | 15 | 70.6% | 36 | 27 | -23.4% | 36 | 1.2% | 42 | 16.2% | 101 | 180.8% |
| Construction Engineer | 2 | 1 | 34.4% | 3 | 3 | -1.7% | 4 | 26.9% | 4 | 50.8% | 10 | 259.5% |
| Sales Exec | 24 | 6 | 23.8% | 29 | 31 | 5.8% | 40 | 36.9% | 48 | 63.4% | 115 | 294.5% |
| Marketing Personnel | 25 | 6 | 24.8% | 31 | 33 | 5.1% | 42 | 35.2% | 50 | 60.7% | 120 | 283.9% |
| General Semi Skilled Worker | 46 | 2 | 4.7% | 48 | 59 | 23.0% | 81 | 68.0% | 93 | 91.9% | 218 | 351.9% |
| General Labour | 74 | 0 | 0.0% | 74 | 97 | 31.7% | 127 | 71.6% | 148 | 100.5% | 355 | 380.6% |
| Other Employees | 47 | 6 | 11.9% | 53 | 62 | 16.6% | 81 | 53.6% | 94 | 77.5% | 229 | 333.2% |
| Administrative workers | 20 | 1 | 4.6% | 21 | 26 | 24.1% | 34 | 64.6% | 40 | 92.8% | 97 | 365.8% |
| **Total** | **526** | **92** | **17.5%** | **618** | **686** | **11.1%** | **900** | **45.7%** | **1,057** | **71.1%** | **2,531** | **309.9%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 39 | 3 | 8.6% | 43 | 51 | 19.5% | 67 | 56.4% | 79 | 84.5% | 188 | 338.9% |
| Snr Management SME | 132 | 5 | 4.0% | 138 | 176 | 28.1% | 222 | 61.4% | 263 | 91.6% | 628 | 356.8% |
| Supervisory | 121 | 5 | 3.9% | 126 | 157 | 24.7% | 212 | 68.4% | 243 | 93.2% | 588 | 368.3% |
| Middle / Junior Management | 114 | 5 | 4.1% | 118 | 146 | 23.6% | 198 | 66.7% | 232 | 95.8% | 541 | 357.0% |
| Designer / Developer | 9 | 1 | 8.0% | 10 | 12 | 21.8% | 15 | 54.1% | 18 | 85.4% | 45 | 352.5% |
| Clerical | 64 | 0 | 0.1% | 64 | 82 | 28.3% | 109 | 71.4% | 129 | 102.3% | 303 | 375.1% |
| Self Employed | 6 | 0 | 4.7% | 6 | 8 | 24.5% | 11 | 65.9% | 13 | 95.4% | 29 | 350.8% |
| Advisor or Agent | 1 | 0 | 4.2% | 1 | 1 | 28.3% | 1 | 63.2% | 2 | 99.0% | 4 | 356.1% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 62 | 1 | 1.2% | 63 | 80 | 27.4% | 105 | 67.5% | 127 | 102.7% | 297 | 374.4% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 4 | 0 | 2.2% | 5 | 6 | 29.0% | 8 | 71.6% | 9 | 99.2% | 21 | 374.4% |
| Scientist | 0 | 0 | 8.3% | 0 | 0 | 25.9% | 0 | 57.7% | 0 | 92.8% | 1 | 345.7% |
| Maintenance Engineer | 139 | 4 | 2.6% | 143 | 188 | 31.9% | 238 | 67.3% | 284 | 98.9% | 661 | 363.5% |
| Civil Engineer | 3 | 0 | 8.2% | 3 | 4 | 22.8% | 5 | 59.3% | 6 | 85.7% | 14 | 346.6% |
| Production Engineer | 18 | 2 | 13.3% | 21 | 24 | 15.4% | 32 | 55.5% | 36 | 77.3% | 88 | 328.0% |
| Power distribution Engineer | 58 | 7 | 12.4% | 66 | 76 | 15.3% | 101 | 53.4% | 118 | 79.9% | 279 | 325.6% |
| Construction Engineer | 7 | 0 | 6.6% | 7 | 9 | 23.0% | 11 | 60.2% | 13 | 87.1% | 32 | 350.1% |
| Sales Exec | 61 | 2 | 3.8% | 63 | 78 | 22.5% | 108 | 70.3% | 123 | 94.8% | 295 | 365.5% |
| Marketing Personnel | 66 | 3 | 3.8% | 68 | 86 | 25.5% | 113 | 65.3% | 130 | 90.3% | 316 | 363.8% |
| General Semi Skilled Worker | 128 | 1 | 0.9% | 129 | 167 | 29.1% | 222 | 71.2% | 260 | 100.7% | 592 | 357.6% |
| General Labour | 172 | 0 | 0.0% | 172 | 224 | 30.1% | 296 | 72.3% | 343 | 99.9% | 819 | 376.7% |
| Other Employees | 134 | 3 | 2.0% | 136 | 176 | 28.8% | 223 | 63.4% | 262 | 91.8% | 649 | 376.0% |
| Administrative workers | 56 | 0 | 0.9% | 56 | 72 | 28.9% | 97 | 72.3% | 110 | 95.1% | 262 | 366.2% |
| **Total** | **1,394** | **43** | **3.1%** | **1,437** | **1,821** | **26.7%** | **2,392** | **66.5%** | **2,799** | **94.8%** | **6,652** | **363.0%** |

## Recovery and Recycling

| SOC | Recovery and Recycling Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Net Zero by 2030 Worst Case Scenario: Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Net Zero by 2030 Best Case Scenario: Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Net Zero by 2050 Worst Case Scenario: Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Net Zero by 2050 Best Case Scenario: Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 27 | 10 | 37.8% | 37 | 35 | -4.4% | 46 | 26.0% | 54 | 47.5% | 129 | 250.0% |
| Snr Management SME | 34 | 6 | 19.0% | 40 | 44 | 10.1% | 59 | 47.3% | 68 | 70.7% | 162 | 302.5% |
| Supervisory | 32 | 7 | 20.8% | 39 | 43 | 11.6% | 54 | 39.8% | 65 | 68.7% | 153 | 295.9% |
| Middle / Junior Management | 30 | 6 | 20.5% | 36 | 39 | 9.7% | 50 | 40.6% | 61 | 70.4% | 140 | 293.3% |
| Designer / Developer | 24 | 9 | 37.2% | 34 | 32 | -4.9% | 42 | 24.9% | 49 | 46.7% | 118 | 252.4% |
| Clerical | 17 | 0 | 0.4% | 17 | 23 | 30.3% | 31 | 75.1% | 35 | 102.2% | 84 | 382.6% |
| Self Employed | 8 | 1 | 17.7% | 10 | 11 | 11.4% | 14 | 45.0% | 17 | 69.8% | 41 | 312.5% |
| Advisor or Agent | 3 | 1 | 18.7% | 3 | 4 | 8.3% | 5 | 47.0% | 6 | 70.2% | 14 | 297.5% |
| Educator | 0 | 0 | 17.8% | 0 | 0 | 9.2% | 0 | 43.1% | 0 | 66.8% | 0 | 328.0% |
| Specialist or Consultant | 30 | 2 | 5.8% | 32 | 38 | 21.9% | 52 | 64.0% | 60 | 91.4% | 146 | 360.9% |
| Editor | 1 | 0 | 3.5% | 1 | 2 | 23.7% | 2 | 62.8% | 3 | 92.1% | 6 | 364.4% |
| Industrial Researchers | 8 | 1 | 8.9% | 8 | 10 | 19.8% | 13 | 55.7% | 15 | 86.4% | 37 | 343.3% |
| Scientist | 6 | 2 | 37.0% | 8 | 8 | -4.8% | 10 | 25.4% | 12 | 49.0% | 29 | 249.4% |
| Maintenance Engineer | 46 | 5 | 11.5% | 51 | 60 | 17.3% | 78 | 52.0% | 93 | 80.4% | 223 | 335.1% |
| Civil Engineer | 11 | 4 | 36.5% | 15 | 15 | -4.0% | 19 | 25.1% | 23 | 46.0% | 54 | 249.8% |
| Production Engineer | 15 | 9 | 57.2% | 24 | 20 | -16.6% | 26 | 9.0% | 31 | 28.4% | 74 | 208.8% |
| Power distribution Engineer | 20 | 12 | 58.7% | 33 | 27 | -17.7% | 35 | 8.5% | 41 | 26.8% | 98 | 202.2% |
| Construction Engineer | 14 | 4 | 27.3% | 17 | 18 | 2.9% | 23 | 35.6% | 28 | 59.0% | 66 | 279.7% |
| Sales Exec | 28 | 5 | 19.3% | 33 | 36 | 8.1% | 48 | 44.1% | 57 | 68.7% | 135 | 302.5% |
| Marketing Personnel | 24 | 4 | 18.5% | 29 | 33 | 13.3% | 41 | 44.0% | 49 | 69.0% | 118 | 310.1% |
| General Semi Skilled Worker | 54 | 2 | 3.6% | 56 | 70 | 25.0% | 92 | 65.8% | 109 | 96.2% | 256 | 359.7% |
| General Labour | 59 | 0 | 0.0% | 59 | 77 | 31.1% | 101 | 70.2% | 119 | 102.2% | 281 | 376.2% |
| Other Employees | 27 | 3 | 11.0% | 29 | 35 | 18.8% | 45 | 54.1% | 55 | 87.4% | 130 | 340.9% |
| Administrative workers | 20 | 1 | 4.0% | 20 | 26 | 26.8% | 34 | 65.1% | 39 | 91.7% | 94 | 359.2% |
| **Total** | **538** | **95** | **17.6%** | **633** | **706** | **11.5%** | **923** | **45.9%** | **1,090** | **72.3%** | **2,588** | **309.0%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 21 | 3 | 13.5% | 24 | 28 | 15.4% | 36 | 51.8% | 43 | 77.6% | 100 | 316.5% |
| **Snr Management SME** | 42 | 3 | 7.3% | 45 | 54 | 22.0% | 72 | 60.9% | 83 | 85.5% | 201 | 350.5% |
| **Supervisory** | 42 | 3 | 7.0% | 45 | 55 | 22.2% | 72 | 61.0% | 86 | 93.1% | 198 | 343.0% |
| **Middle / Junior Management** | 39 | 2 | 6.2% | 41 | 51 | 22.8% | 66 | 58.9% | 78 | 89.7% | 187 | 351.2% |
| **Designer / Developer** | 9 | 1 | 13.6% | 11 | 12 | 13.8% | 16 | 50.6% | 19 | 76.8% | 44 | 321.7% |
| **Clerical** | 24 | 0 | 0.1% | 24 | 31 | 29.2% | 40 | 69.6% | 48 | 103.2% | 114 | 380.3% |
| **Self Employed** | 11 | 1 | 6.9% | 12 | 15 | 21.5% | 19 | 61.5% | 23 | 91.0% | 54 | 347.4% |
| **Advisor or Agent** | 15 | 1 | 7.0% | 16 | 20 | 24.4% | 26 | 59.0% | 30 | 83.2% | 72 | 347.3% |
| **Educator** | 1 | 0 | 6.1% | 1 | 1 | 25.6% | 1 | 56.4% | 2 | 88.8% | 4 | 381.8% |
| **Specialist or Consultant** | 25 | 0 | 1.9% | 25 | 32 | 28.3% | 42 | 67.9% | 49 | 98.1% | 117 | 367.3% |
| **Editor** | 3 | 0 | 1.3% | 3 | 3 | 28.0% | 4 | 69.5% | 5 | 101.6% | 12 | 369.2% |
| **Industrial Researchers** | 22 | 1 | 3.2% | 23 | 28 | 25.2% | 38 | 66.3% | 44 | 96.1% | 107 | 374.0% |
| **Scientist** | 4 | 0 | 13.4% | 4 | 5 | 15.8% | 6 | 50.8% | 7 | 77.7% | 18 | 328.4% |
| **Maintenance Engineer** | 59 | 2 | 3.9% | 61 | 77 | 26.4% | 100 | 62.5% | 122 | 99.9% | 286 | 366.5% |
| **Civil Engineer** | 8 | 1 | 13.5% | 9 | 10 | 14.4% | 13 | 48.8% | 15 | 77.7% | 36 | 322.4% |
| **Production Engineer** | 10 | 2 | 20.9% | 12 | 13 | 7.8% | 17 | 40.0% | 20 | 65.7% | 47 | 299.5% |
| **Power distribution Engineer** | 25 | 5 | 19.9% | 29 | 32 | 9.6% | 42 | 41.2% | 49 | 65.7% | 119 | 303.8% |
| **Construction Engineer** | 11 | 1 | 10.0% | 12 | 15 | 20.8% | 20 | 57.0% | 23 | 84.6% | 54 | 332.5% |
| **Sales Exec** | 22 | 1 | 6.4% | 24 | 29 | 23.2% | 38 | 62.8% | 45 | 90.4% | 107 | 354.5% |
| **Marketing Personnel** | 22 | 1 | 6.2% | 23 | 29 | 24.9% | 37 | 60.3% | 45 | 94.6% | 104 | 353.3% |
| **General Semi Skilled Worker** | 48 | 1 | 1.3% | 49 | 64 | 31.1% | 81 | 66.9% | 96 | 97.6% | 232 | 375.6% |
| **General Labour** | 32 | 0 | 0.0% | 32 | 42 | 32.3% | 54 | 70.9% | 63 | 99.4% | 152 | 382.3% |
| **Other Employees** | 50 | 2 | 3.4% | 52 | 65 | 24.1% | 85 | 64.3% | 102 | 96.0% | 243 | 367.6% |
| **Administrative workers** | 25 | 0 | 1.3% | 25 | 33 | 31.8% | 44 | 72.3% | 50 | 99.1% | 119 | 371.9% |
| **Total** | **567** | **33** | **5.8%** | **600** | **743** | **23.8%** | **968** | **61.4%** | **1,148** | **91.3%** | **2,729** | **354.6%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 33 | 3 | 9.0% | 36 | 44 | 20.6% | 57 | 57.5% | 68 | 85.4% | 159 | 334.8% |
| Snr Management SME | 62 | 3 | 4.6% | 65 | 80 | 23.6% | 107 | 66.0% | 124 | 92.3% | 296 | 358.0% |
| Supervisory | 57 | 3 | 4.4% | 60 | 74 | 23.2% | 100 | 68.1% | 115 | 92.7% | 273 | 357.2% |
| Middle / Junior Management | 54 | 2 | 4.4% | 57 | 71 | 26.2% | 92 | 61.8% | 107 | 89.7% | 256 | 352.0% |
| Designer / Developer | 14 | 1 | 9.1% | 15 | 18 | 19.0% | 24 | 59.6% | 28 | 86.2% | 66 | 337.1% |
| Clerical | 31 | 0 | 0.1% | 32 | 43 | 35.0% | 55 | 74.4% | 63 | 101.2% | 156 | 394.0% |
| Self Employed | 16 | 1 | 4.5% | 16 | 21 | 26.7% | 27 | 63.8% | 31 | 92.7% | 74 | 355.5% |
| Advisor or Agent | 2 | 0 | 4.7% | 2 | 3 | 26.3% | 4 | 64.1% | 4 | 93.4% | 10 | 358.2% |
| Educator | 0 | 0 | 5.5% | 0 | 0 | 23.3% | 0 | 62.0% | 0 | 97.9% | 0 | 353.9% |
| Specialist or Consultant | 36 | 0 | 1.4% | 36 | 47 | 27.9% | 61 | 69.1% | 72 | 97.1% | 175 | 380.9% |
| Editor | 1 | 0 | 0.9% | 1 | 1 | 27.2% | 2 | 68.1% | 2 | 101.4% | 5 | 362.2% |
| Industrial Researchers | 3 | 0 | 2.3% | 3 | 3 | 25.7% | 5 | 67.3% | 5 | 97.2% | 13 | 374.6% |
| Scientist | 1 | 0 | 8.9% | 1 | 1 | 23.7% | 2 | 53.2% | 2 | 86.1% | 5 | 337.3% |
| Maintenance Engineer | 88 | 2 | 2.8% | 90 | 115 | 27.2% | 149 | 64.5% | 179 | 98.6% | 419 | 363.2% |
| Civil Engineer | 9 | 1 | 8.9% | 10 | 12 | 21.1% | 15 | 55.7% | 18 | 87.5% | 42 | 337.1% |
| Production Engineer | 19 | 3 | 14.0% | 21 | 25 | 15.2% | 32 | 49.5% | 38 | 77.2% | 92 | 327.1% |
| Power distribution Engineer | 35 | 5 | 13.4% | 40 | 46 | 14.8% | 59 | 49.1% | 70 | 75.5% | 167 | 319.7% |
| Construction Engineer | 15 | 1 | 6.3% | 16 | 19 | 21.3% | 26 | 62.4% | 30 | 90.6% | 72 | 354.9% |
| Sales Exec | 27 | 1 | 4.8% | 29 | 37 | 29.1% | 47 | 65.3% | 56 | 95.4% | 137 | 378.8% |
| Marketing Personnel | 28 | 1 | 4.4% | 30 | 37 | 26.1% | 49 | 65.2% | 56 | 88.7% | 139 | 369.6% |
| General Semi Skilled Worker | 70 | 1 | 0.9% | 71 | 93 | 31.3% | 119 | 68.4% | 140 | 98.4% | 340 | 381.7% |
| General Labour | 37 | 0 | 0.0% | 37 | 49 | 30.7% | 64 | 70.9% | 75 | 101.4% | 180 | 380.0% |
| Other Employees | 68 | 2 | 2.2% | 70 | 90 | 29.4% | 117 | 67.8% | 142 | 103.1% | 332 | 375.8% |
| Administrative workers | 31 | 0 | 0.9% | 31 | 40 | 29.6% | 54 | 72.6% | 62 | 100.0% | 151 | 385.6% |
| **Total** | **738** | **30** | **4.1%** | **768** | **968** | **26.1%** | **1,266** | **64.9%** | **1,489** | **93.9%** | **3,557** | **363.2%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 55 | 7 | 12.6% | 62 | 72 | 17.1% | 95 | 53.4% | 111 | 80.4% | 260 | 321.1% |
| **Snr Management SME** | 181 | 13 | 7.3% | 194 | 235 | 20.8% | 308 | 58.6% | 360 | 85.2% | 854 | 339.2% |
| **Supervisory** | 174 | 12 | 6.9% | 186 | 223 | 20.2% | 298 | 60.2% | 348 | 87.4% | 844 | 354.3% |
| **Middle / Junior Management** | 161 | 11 | 6.8% | 171 | 209 | 21.7% | 277 | 61.3% | 327 | 90.6% | 777 | 353.3% |
| **Designer / Developer** | 8 | 1 | 14.1% | 10 | 11 | 13.5% | 14 | 47.7% | 17 | 77.9% | 41 | 330.4% |
| **Clerical** | 93 | 0 | 0.1% | 93 | 122 | 31.7% | 158 | 70.4% | 185 | 98.9% | 448 | 382.5% |
| **Self Employed** | 13 | 1 | 6.2% | 14 | 18 | 26.0% | 22 | 60.9% | 27 | 91.2% | 61 | 342.3% |
| **Advisor or Agent** | 1 | 0 | 5.3% | 1 | 2 | 21.7% | 2 | 56.9% | 3 | 89.2% | 6 | 331.5% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 88 | 2 | 2.2% | 90 | 114 | 26.2% | 150 | 66.3% | 181 | 100.5% | 419 | 364.6% |
| **Editor** | 0 | 0 | 1.5% | 0 | 0 | 27.5% | 0 | 74.1% | 0 | 95.3% | 1 | 334.8% |
| **Industrial Researchers** | 2 | 0 | 3.5% | 2 | 3 | 36.6% | 3 | 70.2% | 4 | 99.8% | 10 | 391.3% |
| **Scientist** | 0 | 0 | 12.9% | 0 | 0 | 21.7% | 1 | 60.3% | 1 | 76.9% | 2 | 315.9% |
| **Maintenance Engineer** | 218 | 9 | 4.3% | 228 | 283 | 24.4% | 379 | 66.5% | 451 | 98.1% | 1,067 | 368.4% |
| **Civil Engineer** | 6 | 1 | 12.1% | 7 | 8 | 16.8% | 10 | 53.1% | 12 | 79.9% | 29 | 328.1% |
| **Production Engineer** | 31 | 7 | 21.3% | 38 | 41 | 6.7% | 55 | 43.8% | 63 | 65.9% | 153 | 300.2% |
| **Power distribution Engineer** | 84 | 18 | 21.0% | 101 | 109 | 7.2% | 143 | 41.6% | 174 | 71.8% | 407 | 301.6% |
| **Construction Engineer** | 21 | 2 | 9.4% | 23 | 27 | 20.5% | 36 | 57.9% | 42 | 87.0% | 98 | 334.0% |
| **Sales Exec** | 82 | 6 | 7.0% | 88 | 106 | 20.9% | 143 | 62.0% | 167 | 89.5% | 402 | 356.4% |
| **Marketing Personnel** | 88 | 6 | 6.7% | 94 | 117 | 24.6% | 151 | 60.7% | 171 | 81.8% | 428 | 355.5% |
| **General Semi Skilled Worker** | 182 | 3 | 1.4% | 185 | 239 | 29.4% | 316 | 70.9% | 372 | 101.1% | 874 | 372.6% |
| **General Labour** | 225 | 0 | 0.0% | 225 | 290 | 28.7% | 386 | 71.2% | 455 | 101.9% | 1,067 | 373.8% |
| **Other Employees** | 207 | 7 | 3.5% | 215 | 271 | 26.4% | 354 | 64.8% | 418 | 94.6% | 1,012 | 371.2% |
| **Administrative workers** | 80 | 1 | 1.3% | 81 | 102 | 26.2% | 138 | 69.7% | 161 | 98.1% | 395 | 386.7% |
| **Total** | **2,002** | **106** | **5.3%** | **2,108** | **2,603** | **23.4%** | **3,439** | **63.1%** | **4,049** | **92.0%** | **9,653** | **357.9%** |

## Stoke and Staffordshire LEP

### Alternative Fuel Vehicle

| SOC | Alternative Fuel Vehicle Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 8 | 4 | 45.4% | 12 | 11 | -9.6% | 14 | 16.8% | 17 | 39.9% | 40 | 227.1% |
| Snr Management SME | 14 | 3 | 23.3% | 18 | 18 | 3.0% | 24 | 37.9% | 29 | 62.5% | 69 | 292.5% |
| Supervisory | 18 | 4 | 21.9% | 22 | 23 | 6.5% | 30 | 39.7% | 35 | 63.6% | 85 | 293.1% |
| Middle / Junior Management | 18 | 4 | 22.6% | 22 | 23 | 7.4% | 30 | 38.9% | 35 | 63.7% | 85 | 291.3% |
| Designer / Developer | 2 | 1 | 44.1% | 3 | 3 | -8.2% | 3 | 19.3% | 4 | 41.3% | 10 | 232.2% |
| Clerical | 11 | 0 | 0.5% | 11 | 14 | 29.7% | 19 | 70.8% | 22 | 100.7% | 53 | 381.0% |
| Self Employed | 10 | 2 | 22.1% | 12 | 13 | 7.5% | 17 | 38.3% | 20 | 64.9% | 49 | 292.3% |
| Advisor or Agent | 17 | 4 | 22.0% | 21 | 22 | 6.1% | 29 | 39.0% | 35 | 66.8% | 83 | 292.9% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 2 | 0 | 7.4% | 2 | 2 | 23.1% | 3 | 60.5% | 4 | 86.8% | 8 | 337.9% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 31 | 3 | 11.2% | 35 | 41 | 17.3% | 54 | 55.1% | 63 | 82.0% | 150 | 334.7% |
| Scientist | 3 | 1 | 44.8% | 5 | 4 | -9.7% | 6 | 18.5% | 7 | 40.6% | 16 | 234.2% |
| Maintenance Engineer | 24 | 3 | 12.6% | 28 | 32 | 16.1% | 42 | 52.8% | 49 | 79.3% | 118 | 326.9% |
| Civil Engineer | 4 | 2 | 41.7% | 5 | 5 | -7.6% | 6 | 21.6% | 8 | 43.9% | 18 | 235.6% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 4 | 2 | 64.3% | 6 | 5 | -21.5% | 6 | 4.1% | 8 | 24.9% | 18 | 193.9% |
| Construction Engineer | 4 | 1 | 33.0% | 5 | 5 | -1.0% | 7 | 29.6% | 8 | 52.2% | 19 | 260.6% |
| Sales Exec | 22 | 5 | 21.7% | 27 | 29 | 7.9% | 38 | 43.6% | 44 | 63.9% | 105 | 293.4% |
| Marketing Personnel | 22 | 5 | 21.1% | 26 | 29 | 9.2% | 37 | 42.2% | 44 | 68.8% | 102 | 289.6% |
| General Semi Skilled Worker | 18 | 1 | 4.3% | 19 | 24 | 24.8% | 31 | 63.1% | 37 | 93.4% | 89 | 366.6% |
| General Labour | 31 | 0 | 0.0% | 31 | 41 | 31.4% | 53 | 72.3% | 62 | 100.5% | 148 | 377.6% |
| Other Employees | 22 | 2 | 11.0% | 25 | 29 | 17.4% | 39 | 55.5% | 45 | 80.3% | 107 | 331.0% |
| Administrative workers | 14 | 1 | 4.4% | 15 | 19 | 25.6% | 25 | 64.0% | 29 | 96.3% | 69 | 362.3% |
| **Total** | **300** | **49** | **16.2%** | **349** | **392** | **12.4%** | **515** | **47.7%** | **605** | **73.6%** | **1,440** | **313.0%** |

## Alternative Fuels

| | Alternative Fuels | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 62 | 22 | 35.3% | 84 | 82 | -2.0% | 105 | 25.9% | 126 | 50.2% | 291 | 247.6% |
| Snr Management SME | 50 | 9 | 17.9% | 59 | 66 | 11.4% | 85 | 44.5% | 100 | 69.7% | 242 | 309.7% |
| Supervisory | 61 | 11 | 17.5% | 71 | 79 | 11.5% | 105 | 47.0% | 122 | 71.6% | 290 | 307.0% |
| Middle / Junior Management | 62 | 11 | 18.5% | 74 | 81 | 10.3% | 107 | 45.4% | 126 | 71.7% | 302 | 310.8% |
| Designer / Developer | 11 | 4 | 30.9% | 15 | 15 | -1.9% | 19 | 30.0% | 23 | 54.9% | 55 | 266.8% |
| Clerical | 31 | 0 | 0.4% | 31 | 41 | 31.6% | 53 | 73.6% | 62 | 101.0% | 147 | 377.2% |
| Self Employed | 15 | 3 | 19.9% | 18 | 20 | 8.4% | 26 | 41.8% | 31 | 69.2% | 74 | 302.7% |
| Advisor or Agent | 1 | 0 | 19.1% | 2 | 2 | 11.8% | 2 | 41.6% | 3 | 70.3% | 6 | 301.0% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 45 | 2 | 5.2% | 47 | 59 | 26.2% | 75 | 60.8% | 90 | 93.2% | 208 | 345.1% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 24 | 2 | 8.8% | 26 | 31 | 19.4% | 42 | 62.2% | 48 | 85.2% | 112 | 337.5% |
| Scientist | 45 | 17 | 37.8% | 61 | 58 | -5.8% | 77 | 25.6% | 87 | 41.2% | 211 | 243.9% |
| Maintenance Engineer | 75 | 8 | 10.7% | 83 | 100 | 20.3% | 128 | 53.6% | 151 | 81.4% | 364 | 336.3% |
| Civil Engineer | 0 | 0 | 35.2% | 0 | 0 | -2.1% | 1 | 28.4% | 1 | 51.2% | 1 | 253.2% |
| Production Engineer | 43 | 23 | 54.0% | 66 | 56 | -15.8% | 75 | 12.5% | 87 | 31.1% | 203 | 206.6% |
| Power distribution Engineer | 14 | 8 | 55.1% | 21 | 18 | -17.4% | 23 | 8.9% | 28 | 31.7% | 67 | 210.7% |
| Construction Engineer | 0 | 0 | 26.2% | 0 | 0 | 3.7% | 1 | 35.3% | 1 | 59.2% | 1 | 282.3% |
| Sales Exec | 66 | 12 | 18.3% | 78 | 87 | 11.2% | 114 | 45.9% | 133 | 69.8% | 322 | 311.5% |
| Marketing Personnel | 63 | 12 | 18.8% | 74 | 83 | 10.9% | 108 | 45.0% | 127 | 70.3% | 302 | 305.7% |
| General Semi Skilled Worker | 84 | 3 | 3.5% | 87 | 110 | 26.3% | 144 | 66.0% | 171 | 96.9% | 400 | 360.5% |
| General Labour | 121 | 0 | 0.0% | 121 | 161 | 33.1% | 210 | 73.0% | 244 | 100.9% | 584 | 381.8% |
| Other Employees | 69 | 7 | 9.7% | 76 | 90 | 18.9% | 118 | 55.3% | 138 | 81.9% | 335 | 340.2% |
| Administrative workers | 41 | 1 | 3.6% | 43 | 54 | 28.0% | 70 | 65.2% | 83 | 95.2% | 195 | 359.7% |
| **Total** | **983** | **155** | **15.8%** | **1,139** | **1,293** | **13.6%** | **1,689** | **48.4%** | **1,982** | **74.0%** | **4,715** | **314.1%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 35 | 8 | 23.0% | 43 | 46 | 6.6% | 60 | 39.1% | 72 | 65.0% | 169 | 289.5% |
| Snr Management SME | 142 | 17 | 11.9% | 159 | 189 | 19.0% | 244 | 53.4% | 289 | 81.7% | 679 | 327.8% |
| Supervisory | 138 | 15 | 10.9% | 153 | 182 | 18.7% | 235 | 53.4% | 278 | 81.7% | 667 | 335.0% |
| Middle / Junior Management | 138 | 15 | 11.0% | 154 | 180 | 17.3% | 237 | 54.4% | 285 | 85.8% | 670 | 335.8% |
| Designer / Developer | 16 | 4 | 23.0% | 20 | 21 | 5.4% | 28 | 38.6% | 33 | 63.8% | 78 | 287.3% |
| Clerical | 71 | 0 | 0.2% | 71 | 94 | 31.6% | 123 | 72.4% | 147 | 106.4% | 341 | 379.3% |
| Self Employed | 7 | 1 | 10.5% | 7 | 9 | 19.9% | 11 | 52.9% | 13 | 84.8% | 31 | 326.4% |
| Advisor or Agent | 2 | 0 | 11.1% | 2 | 3 | 17.5% | 4 | 55.3% | 4 | 82.2% | 10 | 330.9% |
| Educator | 0 | 0 | 10.8% | 0 | 0 | 17.1% | 0 | 59.7% | 0 | 91.1% | 0 | 333.5% |
| Specialist or Consultant | 71 | 2 | 3.4% | 73 | 93 | 26.6% | 122 | 65.9% | 144 | 96.0% | 344 | 369.9% |
| Editor | 2 | 0 | 2.2% | 2 | 3 | 26.8% | 4 | 65.4% | 4 | 97.6% | 10 | 367.0% |
| Industrial Researchers | 3 | 0 | 5.6% | 3 | 4 | 23.3% | 5 | 60.4% | 6 | 95.0% | 14 | 356.1% |
| Scientist | 5 | 1 | 22.0% | 6 | 6 | 8.2% | 8 | 42.8% | 9 | 65.9% | 22 | 293.6% |
| Maintenance Engineer | 135 | 10 | 7.0% | 145 | 179 | 23.5% | 232 | 60.1% | 271 | 87.0% | 647 | 347.0% |
| Civil Engineer | 2 | 1 | 22.8% | 3 | 3 | 5.8% | 4 | 39.7% | 5 | 65.7% | 11 | 288.6% |
| Production Engineer | 22 | 7 | 33.4% | 29 | 28 | -1.8% | 37 | 29.7% | 44 | 51.0% | 105 | 262.5% |
| Power distribution Engineer | 65 | 22 | 34.2% | 88 | 85 | -3.6% | 113 | 28.4% | 133 | 51.7% | 315 | 258.6% |
| Construction Engineer | 2 | 0 | 17.1% | 3 | 3 | 11.6% | 4 | 46.9% | 4 | 71.7% | 10 | 311.0% |
| Sales Exec | 72 | 8 | 11.6% | 80 | 94 | 16.9% | 124 | 53.6% | 144 | 79.4% | 343 | 326.8% |
| Marketing Personnel | 70 | 8 | 11.5% | 78 | 92 | 18.6% | 119 | 53.3% | 140 | 80.1% | 330 | 324.5% |
| General Semi Skilled Worker | 141 | 3 | 2.3% | 144 | 183 | 27.1% | 241 | 67.2% | 284 | 97.4% | 682 | 373.3% |
| General Labour | 157 | 0 | 0.0% | 157 | 206 | 31.2% | 270 | 72.0% | 315 | 100.2% | 765 | 386.7% |
| Other Employees | 204 | 12 | 6.0% | 216 | 262 | 21.0% | 348 | 61.0% | 417 | 92.9% | 971 | 349.4% |
| Administrative workers | 68 | 2 | 2.2% | 70 | 89 | 26.7% | 118 | 68.6% | 138 | 97.0% | 332 | 374.8% |
| **Total** | **1,569** | **137** | **8.8%** | **1,706** | **2,052** | **20.3%** | **2,689** | **57.6%** | **3,179** | **86.3%** | **7,546** | **342.3%** |

## Building Technologies

| | Building Technologies | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 69 | 9 | 13.1% | 78 | 90 | 14.9% | 119 | 52.1% | 140 | 78.1% | 332 | 323.3% |
| **Snr Management SME** | 168 | 12 | 6.9% | 179 | 218 | 21.6% | 287 | 60.1% | 341 | 90.1% | 796 | 343.9% |
| **Supervisory** | 161 | 11 | 6.9% | 172 | 207 | 20.7% | 276 | 60.6% | 325 | 89.0% | 771 | 348.9% |
| **Middle / Junior Management** | 164 | 11 | 6.9% | 176 | 215 | 22.4% | 281 | 60.2% | 330 | 88.0% | 795 | 353.0% |
| **Designer / Developer** | 20 | 3 | 13.3% | 22 | 26 | 15.1% | 34 | 52.2% | 40 | 78.3% | 95 | 325.2% |
| **Clerical** | 85 | 0 | 0.1% | 85 | 112 | 31.1% | 146 | 70.8% | 172 | 100.9% | 410 | 380.5% |
| **Self Employed** | 18 | 1 | 7.0% | 19 | 23 | 21.1% | 30 | 60.3% | 36 | 90.7% | 85 | 351.5% |
| **Advisor or Agent** | 21 | 1 | 6.6% | 22 | 27 | 23.6% | 35 | 60.2% | 43 | 92.7% | 99 | 347.7% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 79 | 2 | 2.1% | 81 | 103 | 26.6% | 137 | 69.4% | 161 | 98.3% | 379 | 367.7% |
| **Editor** | 1 | 0 | 1.4% | 1 | 1 | 27.0% | 1 | 68.6% | 1 | 99.6% | 4 | 377.0% |
| **Industrial Researchers** | 43 | 1 | 3.3% | 45 | 57 | 27.2% | 75 | 66.8% | 88 | 97.3% | 206 | 360.9% |
| **Scientist** | 6 | 1 | 13.6% | 7 | 8 | 15.0% | 11 | 52.4% | 12 | 76.8% | 29 | 325.5% |
| **Maintenance Engineer** | 162 | 7 | 4.1% | 169 | 211 | 25.0% | 277 | 63.9% | 328 | 94.4% | 777 | 360.5% |
| **Civil Engineer** | 10 | 1 | 13.3% | 11 | 13 | 16.6% | 17 | 51.3% | 20 | 77.9% | 48 | 320.3% |
| **Production Engineer** | 21 | 4 | 19.9% | 26 | 28 | 8.9% | 37 | 44.7% | 43 | 68.7% | 103 | 301.0% |
| **Power distribution Engineer** | 83 | 17 | 20.5% | 100 | 108 | 8.6% | 143 | 43.5% | 166 | 66.8% | 398 | 298.8% |
| **Construction Engineer** | 17 | 2 | 9.8% | 18 | 22 | 19.6% | 29 | 57.8% | 34 | 82.5% | 80 | 338.0% |
| **Sales Exec** | 82 | 6 | 6.8% | 87 | 106 | 21.7% | 140 | 60.6% | 166 | 89.9% | 396 | 354.3% |
| **Marketing Personnel** | 79 | 5 | 6.9% | 85 | 104 | 22.7% | 134 | 58.1% | 162 | 91.1% | 381 | 350.0% |
| **General Semi Skilled Worker** | 179 | 2 | 1.4% | 181 | 230 | 27.2% | 309 | 70.5% | 359 | 98.2% | 857 | 373.3% |
| **General Labour** | 345 | 0 | 0.0% | 345 | 447 | 29.7% | 591 | 71.3% | 696 | 101.9% | 1,658 | 380.6% |
| **Other Employees** | 234 | 8 | 3.3% | 242 | 310 | 28.3% | 407 | 68.1% | 469 | 93.9% | 1,125 | 365.2% |
| **Administrative workers** | 93 | 1 | 1.3% | 95 | 122 | 29.2% | 161 | 70.1% | 189 | 99.2% | 450 | 375.3% |
| **Total** | **2,140** | **106** | **4.9%** | **2,246** | **2,789** | **24.2%** | **3,677** | **63.7%** | **4,320** | **92.4%** | **10,275** | **357.6%** |

## Energy Management

| SOC | Energy Management Current Employment | | | | Net Zero by 2030 Worst Case Scenario | | Net Zero by 2030 Best Case Scenario | | Net Zero by 2050 Worst Case Scenario | | Net Zero by 2050 Best Case Scenario | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 11 | 5 | 45.6% | 15 | 14 | -10.2% | 18 | 18.1% | 22 | 39.7% | 51 | 232.1% |
| Snr Management SME | 19 | 4 | 22.9% | 24 | 25 | 5.9% | 33 | 39.2% | 39 | 64.0% | 95 | 296.2% |
| Supervisory | 20 | 5 | 23.4% | 25 | 26 | 4.7% | 34 | 38.3% | 41 | 64.2% | 95 | 285.2% |
| Middle / Junior Management | 20 | 5 | 22.7% | 25 | 26 | 6.8% | 35 | 40.6% | 41 | 66.0% | 98 | 296.0% |
| Designer / Developer | 5 | 2 | 44.4% | 8 | 7 | -9.7% | 9 | 19.1% | 11 | 39.6% | 26 | 231.7% |
| Clerical | 10 | 0 | 0.5% | 10 | 14 | 30.1% | 18 | 70.8% | 21 | 101.3% | 51 | 383.7% |
| Self Employed | 5 | 1 | 22.0% | 6 | 6 | 5.4% | 8 | 42.3% | 9 | 65.9% | 22 | 294.7% |
| Advisor or Agent | 4 | 1 | 22.2% | 5 | 5 | 7.9% | 7 | 40.2% | 8 | 64.0% | 19 | 291.0% |
| Educator | 0 | 0 | 22.9% | 0 | 0 | 4.3% | 0 | 41.8% | 0 | 66.2% | 1 | 292.0% |
| Specialist or Consultant | 11 | 1 | 6.6% | 11 | 14 | 23.0% | 18 | 60.1% | 22 | 90.9% | 52 | 352.4% |
| Editor | 2 | 0 | 4.3% | 2 | 3 | 24.6% | 3 | 63.2% | 4 | 94.7% | 10 | 364.0% |
| Industrial Researchers | 4 | 0 | 11.6% | 5 | 5 | 17.9% | 7 | 53.0% | 8 | 80.0% | 19 | 330.7% |
| Scientist | 2 | 1 | 41.5% | 3 | 3 | -6.9% | 4 | 21.3% | 4 | 39.5% | 11 | 237.4% |
| Maintenance Engineer | 24 | 3 | 13.9% | 28 | 32 | 15.3% | 41 | 49.3% | 49 | 77.4% | 116 | 322.5% |
| Civil Engineer | 4 | 2 | 42.5% | 5 | 5 | -9.7% | 6 | 21.0% | 8 | 41.0% | 18 | 232.0% |
| Production Engineer | 5 | 3 | 66.1% | 8 | 6 | -20.7% | 8 | 3.3% | 9 | 21.3% | 22 | 190.0% |
| Power distribution Engineer | 11 | 7 | 65.4% | 18 | 15 | -21.1% | 19 | 3.3% | 22 | 21.5% | 53 | 186.5% |
| Construction Engineer | 4 | 1 | 34.4% | 6 | 6 | -2.6% | 7 | 28.8% | 9 | 50.0% | 21 | 255.9% |
| Sales Exec | 13 | 3 | 22.4% | 16 | 17 | 5.6% | 22 | 41.4% | 26 | 65.9% | 61 | 291.0% |
| Marketing Personnel | 12 | 3 | 22.6% | 14 | 15 | 6.9% | 20 | 41.2% | 23 | 63.8% | 55 | 289.5% |
| General Semi Skilled Worker | 24 | 1 | 4.6% | 25 | 31 | 24.5% | 41 | 64.4% | 48 | 92.9% | 113 | 355.3% |
| General Labour | 39 | 0 | 0.0% | 39 | 50 | 30.5% | 67 | 72.1% | 78 | 101.9% | 185 | 378.8% |
| Other Employees | 30 | 3 | 11.4% | 34 | 40 | 17.0% | 52 | 54.1% | 62 | 81.8% | 146 | 328.9% |
| Administrative workers | 12 | 1 | 4.7% | 13 | 16 | 23.9% | 21 | 64.8% | 25 | 93.0% | 59 | 358.8% |
| **Total** | **291** | **53** | **18.0%** | **344** | **380** | **10.5%** | **500** | **45.5%** | **589** | **71.2%** | **1,397** | **306.5%** |

## Geothermal

| | Geothermal | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 18 | 8 | 47.2% | 26 | 23 | -11.5% | 30 | 16.8% | 36 | 37.1% | 85 | 227.8% |
| Snr Management SME | 68 | 16 | 23.7% | 84 | 89 | 6.8% | 116 | 39.2% | 136 | 62.9% | 322 | 285.1% |
| Supervisory | 63 | 15 | 23.0% | 78 | 83 | 6.5% | 109 | 40.2% | 127 | 63.1% | 300 | 284.8% |
| Middle / Junior Management | 66 | 16 | 23.9% | 82 | 87 | 6.1% | 114 | 37.9% | 136 | 64.8% | 320 | 289.0% |
| Designer / Developer | 8 | 4 | 46.4% | 11 | 10 | -11.7% | 13 | 17.4% | 15 | 37.8% | 37 | 229.6% |
| Clerical | 33 | 0 | 0.5% | 33 | 44 | 30.4% | 57 | 71.4% | 67 | 100.8% | 160 | 378.7% |
| Self Employed | 4 | 1 | 23.2% | 4 | 5 | 5.3% | 6 | 39.1% | 7 | 63.4% | 17 | 289.7% |
| Advisor or Agent | 3 | 1 | 22.2% | 4 | 4 | 7.6% | 6 | 40.1% | 7 | 64.6% | 16 | 293.6% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 32 | 2 | 7.0% | 34 | 42 | 22.1% | 54 | 59.2% | 64 | 87.5% | 155 | 353.5% |
| Editor | 2 | 0 | 4.8% | 2 | 2 | 24.0% | 3 | 63.5% | 4 | 93.3% | 9 | 359.0% |
| Industrial Researchers | 3 | 0 | 11.4% | 3 | 3 | 16.7% | 4 | 54.1% | 5 | 81.8% | 13 | 335.8% |
| Scientist | 2 | 1 | 46.6% | 3 | 3 | -11.9% | 4 | 17.5% | 4 | 37.7% | 10 | 226.6% |
| Maintenance Engineer | 67 | 9 | 14.2% | 76 | 87 | 13.6% | 116 | 51.5% | 135 | 76.7% | 320 | 319.1% |
| Civil Engineer | 3 | 2 | 47.8% | 5 | 4 | -12.8% | 6 | 14.5% | 7 | 38.0% | 16 | 226.4% |
| Production Engineer | 12 | 8 | 69.9% | 20 | 15 | -22.9% | 20 | 0.5% | 23 | 19.3% | 55 | 178.5% |
| Power distribution Engineer | 32 | 23 | 71.1% | 55 | 42 | -23.8% | 54 | -0.3% | 64 | 17.6% | 152 | 177.9% |
| Construction Engineer | 3 | 1 | 33.5% | 4 | 4 | -2.3% | 5 | 29.4% | 6 | 51.0% | 14 | 261.2% |
| Sales Exec | 37 | 9 | 23.6% | 46 | 49 | 6.3% | 63 | 38.0% | 75 | 63.7% | 179 | 291.4% |
| Marketing Personnel | 35 | 8 | 22.7% | 43 | 46 | 6.7% | 60 | 40.2% | 70 | 64.3% | 167 | 290.9% |
| General Semi Skilled Worker | 70 | 3 | 4.7% | 73 | 91 | 24.5% | 121 | 64.3% | 141 | 91.4% | 339 | 361.8% |
| General Labour | 111 | 0 | 0.0% | 111 | 145 | 30.9% | 191 | 72.8% | 224 | 101.8% | 534 | 381.9% |
| Other Employees | 97 | 11 | 11.0% | 108 | 128 | 18.6% | 167 | 54.7% | 197 | 82.4% | 469 | 334.6% |
| Administrative workers | 34 | 2 | 4.6% | 35 | 44 | 24.9% | 58 | 64.2% | 69 | 93.7% | 162 | 357.1% |
| **Total** | **802** | **139** | **17.3%** | **940** | **1,050** | **11.6%** | **1,378** | **46.5%** | **1,618** | **72.1%** | **3,850** | **309.4%** |

## Photovoltaic

| SOC | Photovoltaic Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 58 | 5 | 9.0% | 63 | 75 | 19.5% | 99 | 56.4% | 117 | 85.0% | 278 | 342.0% |
| Snr Management SME | 169 | 8 | 4.7% | 177 | 221 | 24.3% | 287 | 61.6% | 338 | 90.5% | 810 | 356.4% |
| Supervisory | 161 | 7 | 4.5% | 168 | 212 | 26.1% | 275 | 63.5% | 324 | 92.7% | 771 | 359.0% |
| Middle / Junior Management | 164 | 7 | 4.4% | 172 | 214 | 24.8% | 281 | 63.5% | 329 | 91.9% | 786 | 357.6% |
| Designer / Developer | 12 | 1 | 9.0% | 13 | 16 | 20.1% | 21 | 58.5% | 25 | 88.0% | 59 | 342.0% |
| Clerical | 84 | 0 | 0.1% | 84 | 109 | 29.6% | 144 | 71.6% | 172 | 105.2% | 399 | 375.8% |
| Self Employed | 8 | 0 | 4.7% | 9 | 11 | 24.0% | 14 | 63.5% | 17 | 92.5% | 40 | 363.3% |
| Advisor or Agent | 1 | 0 | 5.0% | 1 | 1 | 27.2% | 2 | 62.0% | 2 | 98.0% | 5 | 356.1% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 72 | 1 | 1.4% | 73 | 94 | 28.8% | 123 | 69.1% | 145 | 99.2% | 343 | 371.6% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 6 | 0 | 2.3% | 6 | 8 | 27.4% | 10 | 66.9% | 12 | 97.4% | 29 | 370.3% |
| Scientist | 0 | 0 | 9.6% | 0 | 0 | 18.5% | 0 | 58.7% | 0 | 84.2% | 1 | 326.4% |
| Maintenance Engineer | 163 | 4 | 2.7% | 167 | 215 | 28.4% | 281 | 68.2% | 326 | 94.9% | 778 | 365.0% |
| Civil Engineer | 4 | 0 | 9.6% | 5 | 6 | 19.5% | 8 | 56.0% | 9 | 84.2% | 21 | 333.1% |
| Production Engineer | 23 | 3 | 13.3% | 26 | 30 | 15.8% | 39 | 51.6% | 46 | 78.7% | 110 | 323.3% |
| Power distribution Engineer | 80 | 11 | 13.8% | 91 | 105 | 15.3% | 136 | 49.5% | 163 | 78.7% | 384 | 320.5% |
| Construction Engineer | 9 | 1 | 7.3% | 10 | 12 | 23.8% | 16 | 59.8% | 19 | 91.4% | 44 | 346.8% |
| Sales Exec | 85 | 4 | 4.2% | 89 | 113 | 26.7% | 149 | 67.3% | 172 | 93.1% | 408 | 358.5% |
| Marketing Personnel | 82 | 4 | 4.5% | 86 | 108 | 26.1% | 141 | 64.2% | 169 | 96.1% | 398 | 362.9% |
| General Semi Skilled Worker | 179 | 2 | 0.9% | 180 | 234 | 29.7% | 309 | 71.4% | 360 | 99.6% | 857 | 375.1% |
| General Labour | 245 | 0 | 0.0% | 245 | 319 | 29.9% | 421 | 71.7% | 496 | 102.3% | 1,174 | 378.6% |
| Other Employees | 237 | 5 | 2.1% | 242 | 311 | 28.9% | 398 | 64.8% | 480 | 98.5% | 1,144 | 373.4% |
| Administrative workers | 86 | 1 | 0.9% | 86 | 113 | 30.6% | 146 | 69.3% | 172 | 99.1% | 412 | 376.6% |
| **Total** | **1,929** | **65** | **3.4%** | **1,994** | **2,527** | **26.7%** | **3,301** | **65.5%** | **3,893** | **95.2%** | **9,251** | **363.9%** |

## Recovery and Recycling

| SOC | Recovery and Recycling Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 40 | 15 | 36.7% | 55 | 53 | -4.5% | 69 | 25.3% | 82 | 48.0% | 194 | 252.3% |
| Snr Management SME | 46 | 8 | 17.2% | 54 | 61 | 13.3% | 78 | 46.3% | 92 | 72.1% | 221 | 312.5% |
| Supervisory | 47 | 8 | 17.8% | 55 | 62 | 11.8% | 80 | 45.0% | 94 | 71.0% | 225 | 307.7% |
| Middle / Junior Management | 47 | 9 | 17.9% | 56 | 62 | 10.7% | 81 | 45.1% | 96 | 70.8% | 229 | 309.9% |
| Designer / Developer | 34 | 12 | 36.5% | 46 | 44 | -3.9% | 58 | 25.4% | 68 | 47.9% | 162 | 251.6% |
| Clerical | 24 | 0 | 0.4% | 24 | 31 | 30.0% | 41 | 70.7% | 49 | 103.4% | 114 | 374.5% |
| Self Employed | 11 | 2 | 18.2% | 12 | 14 | 10.6% | 18 | 44.1% | 21 | 70.3% | 51 | 307.5% |
| Advisor or Agent | 4 | 1 | 18.4% | 4 | 5 | 9.9% | 7 | 46.2% | 8 | 70.4% | 18 | 301.7% |
| Educator | 0 | 0 | 19.6% | 0 | 0 | 11.5% | 0 | 41.7% | 0 | 68.8% | 1 | 308.6% |
| Specialist or Consultant | 36 | 2 | 5.5% | 38 | 48 | 23.7% | 62 | 61.2% | 74 | 91.1% | 176 | 358.0% |
| Editor | 2 | 0 | 3.4% | 2 | 3 | 26.5% | 3 | 65.0% | 4 | 95.4% | 9 | 367.1% |
| Industrial Researchers | 10 | 1 | 9.4% | 11 | 14 | 20.1% | 18 | 57.2% | 21 | 84.1% | 49 | 338.4% |
| Scientist | 9 | 3 | 36.0% | 13 | 12 | -3.5% | 16 | 25.9% | 19 | 48.5% | 45 | 253.1% |
| Maintenance Engineer | 58 | 6 | 10.5% | 64 | 76 | 19.3% | 99 | 54.8% | 118 | 83.5% | 279 | 335.3% |
| Civil Engineer | 17 | 6 | 37.3% | 23 | 22 | -5.5% | 29 | 25.8% | 34 | 46.9% | 82 | 249.9% |
| Production Engineer | 21 | 11 | 54.9% | 32 | 27 | -15.9% | 36 | 9.8% | 42 | 30.8% | 101 | 211.4% |
| Power distribution Engineer | 31 | 16 | 53.3% | 47 | 40 | -14.7% | 53 | 12.4% | 62 | 33.1% | 146 | 212.8% |
| Construction Engineer | 18 | 5 | 27.5% | 23 | 24 | 2.9% | 31 | 34.7% | 37 | 57.9% | 88 | 276.4% |
| Sales Exec | 41 | 7 | 17.9% | 48 | 54 | 10.9% | 71 | 46.2% | 83 | 71.2% | 198 | 308.3% |
| Marketing Personnel | 32 | 6 | 17.6% | 37 | 42 | 11.9% | 55 | 46.6% | 64 | 71.4% | 151 | 304.6% |
| General Semi Skilled Worker | 80 | 3 | 3.6% | 83 | 106 | 27.1% | 138 | 66.0% | 161 | 93.9% | 383 | 361.7% |
| General Labour | 84 | 0 | 0.0% | 84 | 110 | 30.0% | 145 | 72.2% | 171 | 102.8% | 407 | 382.3% |
| Other Employees | 64 | 6 | 9.0% | 69 | 82 | 18.1% | 109 | 57.4% | 129 | 85.9% | 306 | 341.1% |
| Administrative workers | 32 | 1 | 3.5% | 33 | 42 | 26.4% | 54 | 63.9% | 65 | 96.0% | 154 | 366.7% |
| Total | 788 | 129 | 16.4% | 917 | 1,031 | 12.5% | 1,351 | 47.4% | 1,593 | 73.7% | 3,790 | 313.3% |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 34 | 5 | 13.9% | 39 | 45 | 14.5% | 58 | 50.0% | 69 | 77.2% | 163 | 318.8% |
| **Snr Management SME** | 59 | 4 | 7.1% | 63 | 77 | 22.5% | 101 | 60.2% | 119 | 88.6% | 287 | 354.3% |
| **Supervisory** | 64 | 4 | 6.9% | 68 | 82 | 21.0% | 109 | 60.5% | 129 | 88.6% | 309 | 354.2% |
| **Middle / Junior Management** | 65 | 4 | 6.7% | 69 | 85 | 23.2% | 111 | 60.0% | 130 | 88.0% | 312 | 349.6% |
| **Designer / Developer** | 14 | 2 | 13.9% | 16 | 18 | 13.9% | 24 | 50.8% | 28 | 78.0% | 67 | 319.4% |
| **Clerical** | 35 | 0 | 0.1% | 35 | 46 | 31.0% | 60 | 72.4% | 70 | 100.8% | 169 | 381.3% |
| **Self Employed** | 16 | 1 | 6.9% | 17 | 21 | 21.6% | 27 | 59.4% | 33 | 90.0% | 78 | 352.0% |
| **Advisor or Agent** | 21 | 1 | 6.7% | 23 | 28 | 23.1% | 36 | 60.5% | 43 | 88.2% | 102 | 349.4% |
| **Educator** | 1 | 0 | 5.9% | 2 | 2 | 19.4% | 3 | 63.4% | 3 | 88.1% | 7 | 354.0% |
| **Specialist or Consultant** | 32 | 1 | 2.2% | 32 | 41 | 26.6% | 55 | 69.0% | 65 | 99.1% | 153 | 371.5% |
| **Editor** | 4 | 0 | 1.3% | 4 | 5 | 31.1% | 7 | 71.2% | 8 | 99.5% | 18 | 374.0% |
| **Industrial Researchers** | 32 | 1 | 3.3% | 33 | 42 | 26.3% | 55 | 65.5% | 65 | 94.1% | 157 | 369.5% |
| **Scientist** | 6 | 1 | 13.7% | 7 | 8 | 15.9% | 11 | 49.7% | 12 | 75.4% | 30 | 327.3% |
| **Maintenance Engineer** | 79 | 3 | 4.1% | 82 | 102 | 24.6% | 136 | 66.3% | 158 | 93.4% | 380 | 364.4% |
| **Civil Engineer** | 12 | 2 | 13.1% | 14 | 16 | 15.7% | 21 | 51.7% | 25 | 78.7% | 59 | 321.9% |
| **Production Engineer** | 14 | 3 | 21.3% | 17 | 19 | 8.1% | 24 | 41.1% | 28 | 64.7% | 68 | 295.6% |
| **Power distribution Engineer** | 38 | 8 | 20.9% | 46 | 50 | 8.4% | 65 | 41.6% | 76 | 66.9% | 180 | 293.8% |
| **Construction Engineer** | 17 | 2 | 10.2% | 18 | 22 | 17.6% | 29 | 55.5% | 34 | 83.6% | 80 | 337.9% |
| **Sales Exec** | 34 | 2 | 6.6% | 37 | 45 | 24.2% | 59 | 62.5% | 70 | 91.2% | 165 | 352.0% |
| **Marketing Personnel** | 31 | 2 | 6.8% | 34 | 41 | 22.0% | 54 | 61.4% | 64 | 89.8% | 151 | 347.9% |
| **General Semi Skilled Worker** | 75 | 1 | 1.4% | 76 | 98 | 29.1% | 128 | 68.6% | 152 | 99.9% | 363 | 376.3% |
| **General Labour** | 49 | 0 | 0.0% | 49 | 64 | 31.8% | 84 | 71.7% | 99 | 103.3% | 236 | 382.7% |
| **Other Employees** | 107 | 4 | 3.5% | 110 | 140 | 27.0% | 183 | 66.2% | 213 | 93.5% | 510 | 362.8% |
| **Administrative workers** | 42 | 1 | 1.4% | 43 | 55 | 28.5% | 73 | 69.3% | 86 | 99.7% | 202 | 371.5% |
| **Total** | **882** | **52** | **5.9%** | **934** | **1,153** | **23.4%** | **1,515** | **62.1%** | **1,779** | **90.5%** | **4,246** | **354.5%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 50 | 5 | 9.1% | 55 | 66 | 19.6% | 86 | 56.5% | 102 | 85.9% | 240 | 338.5% |
| **Snr Management SME** | 80 | 4 | 4.5% | 84 | 105 | 26.1% | 137 | 64.4% | 160 | 91.5% | 383 | 358.3% |
| **Supervisory** | 81 | 4 | 4.5% | 84 | 105 | 24.9% | 139 | 64.5% | 163 | 93.3% | 386 | 358.0% |
| **Middle / Junior Management** | 82 | 4 | 4.3% | 85 | 107 | 25.4% | 141 | 65.4% | 164 | 92.1% | 393 | 361.5% |
| **Designer / Developer** | 20 | 2 | 9.4% | 21 | 26 | 20.5% | 33 | 54.8% | 40 | 85.3% | 94 | 338.9% |
| **Clerical** | 41 | 0 | 0.1% | 41 | 54 | 29.5% | 71 | 71.7% | 82 | 98.9% | 198 | 378.3% |
| **Self Employed** | 20 | 1 | 4.6% | 21 | 27 | 25.2% | 35 | 62.9% | 41 | 93.7% | 98 | 358.1% |
| **Advisor or Agent** | 3 | 0 | 4.5% | 3 | 4 | 25.6% | 5 | 64.8% | 6 | 94.6% | 13 | 358.8% |
| **Educator** | 0 | 0 | 4.4% | 0 | 0 | 24.1% | 0 | 62.4% | 0 | 91.8% | 0 | 354.3% |
| **Specialist or Consultant** | 43 | 1 | 1.3% | 44 | 56 | 28.7% | 75 | 69.9% | 88 | 101.2% | 210 | 377.9% |
| **Editor** | 1 | 0 | 1.0% | 2 | 2 | 28.0% | 3 | 69.1% | 3 | 99.9% | 7 | 378.8% |
| **Industrial Researchers** | 4 | 0 | 2.4% | 4 | 5 | 27.8% | 6 | 67.9% | 8 | 98.1% | 18 | 370.0% |
| **Scientist** | 2 | 0 | 9.4% | 2 | 2 | 18.9% | 3 | 57.2% | 3 | 82.7% | 8 | 340.3% |
| **Maintenance Engineer** | 107 | 3 | 2.7% | 110 | 140 | 27.1% | 184 | 66.5% | 216 | 96.3% | 512 | 364.6% |
| **Civil Engineer** | 14 | 1 | 9.4% | 15 | 18 | 19.1% | 23 | 56.5% | 27 | 85.1% | 65 | 337.6% |
| **Production Engineer** | 25 | 3 | 13.5% | 28 | 33 | 14.6% | 43 | 50.4% | 50 | 76.9% | 121 | 325.1% |
| **Power distribution Engineer** | 50 | 7 | 13.5% | 57 | 66 | 15.2% | 86 | 50.7% | 102 | 78.2% | 244 | 325.2% |
| **Construction Engineer** | 20 | 1 | 7.1% | 22 | 26 | 22.0% | 35 | 59.9% | 41 | 87.9% | 97 | 349.4% |
| **Sales Exec** | 38 | 2 | 4.7% | 40 | 50 | 24.2% | 66 | 64.6% | 77 | 92.8% | 183 | 358.1% |
| **Marketing Personnel** | 36 | 2 | 4.6% | 38 | 47 | 23.3% | 62 | 64.8% | 73 | 93.4% | 174 | 359.8% |
| **General Semi Skilled Worker** | 99 | 1 | 0.9% | 100 | 128 | 28.1% | 169 | 69.4% | 196 | 97.0% | 476 | 377.7% |
| **General Labour** | 54 | 0 | 0.0% | 54 | 70 | 30.4% | 92 | 72.0% | 108 | 100.3% | 259 | 381.6% |
| **Other Employees** | 132 | 3 | 2.3% | 135 | 174 | 29.2% | 226 | 67.4% | 265 | 96.4% | 632 | 368.4% |
| **Administrative workers** | 49 | 0 | 0.9% | 50 | 64 | 29.4% | 84 | 70.1% | 99 | 99.5% | 238 | 380.4% |
| **Total** | **1,051** | **43** | **4.1%** | **1,094** | **1,373** | **25.5%** | **1,803** | **64.8%** | **2,115** | **93.3%** | **5,049** | **361.5%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 87 | 12 | 13.6% | 98 | 113 | 15.2% | 148 | 50.5% | 175 | 77.6% | 411 | 318.3% |
| **Snr Management SME** | 255 | 17 | 6.7% | 272 | 335 | 23.2% | 438 | 61.0% | 516 | 89.9% | 1,222 | 349.2% |
| **Supervisory** | 249 | 17 | 6.8% | 266 | 328 | 23.2% | 428 | 61.2% | 503 | 89.3% | 1,186 | 346.2% |
| **Middle / Junior Management** | 258 | 18 | 6.9% | 276 | 339 | 22.8% | 444 | 60.9% | 520 | 88.4% | 1,237 | 348.3% |
| **Designer / Developer** | 13 | 2 | 15.0% | 15 | 17 | 13.8% | 22 | 50.1% | 26 | 77.0% | 61 | 320.7% |
| **Clerical** | 129 | 0 | 0.1% | 129 | 169 | 30.7% | 222 | 71.2% | 261 | 102.0% | 625 | 382.8% |
| **Self Employed** | 18 | 1 | 7.1% | 19 | 24 | 23.6% | 30 | 59.3% | 36 | 90.2% | 86 | 351.6% |
| **Advisor or Agent** | 2 | 0 | 6.8% | 2 | 3 | 19.6% | 3 | 63.3% | 4 | 90.5% | 10 | 351.5% |
| **Educator** | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Specialist or Consultant** | 110 | 2 | 2.2% | 112 | 143 | 27.9% | 189 | 68.5% | 224 | 100.2% | 526 | 369.3% |
| **Editor** | 0 | 0 | 1.4% | 0 | 0 | 25.3% | 1 | 68.4% | 1 | 96.7% | 2 | 382.7% |
| **Industrial Researchers** | 3 | 0 | 3.1% | 3 | 4 | 22.5% | 5 | 68.3% | 6 | 99.2% | 14 | 357.2% |
| **Scientist** | 1 | 0 | 13.7% | 1 | 1 | 18.2% | 1 | 48.1% | 1 | 80.8% | 3 | 329.5% |
| **Maintenance Engineer** | 286 | 12 | 4.3% | 299 | 380 | 27.3% | 488 | 63.6% | 577 | 93.3% | 1,379 | 361.9% |
| **Civil Engineer** | 10 | 1 | 13.7% | 11 | 13 | 15.7% | 17 | 51.0% | 20 | 78.4% | 47 | 324.5% |
| **Production Engineer** | 45 | 10 | 21.5% | 54 | 59 | 8.5% | 77 | 42.5% | 90 | 65.2% | 214 | 294.8% |
| **Power distribution Engineer** | 127 | 28 | 22.0% | 155 | 168 | 8.2% | 218 | 40.3% | 257 | 65.0% | 611 | 293.0% |
| **Construction Engineer** | 29 | 3 | 10.1% | 32 | 38 | 19.9% | 50 | 56.3% | 59 | 83.5% | 140 | 336.6% |
| **Sales Exec** | 124 | 9 | 7.5% | 133 | 163 | 22.2% | 212 | 59.3% | 252 | 89.0% | 588 | 341.2% |
| **Marketing Personnel** | 120 | 9 | 7.3% | 128 | 156 | 21.6% | 206 | 60.4% | 242 | 88.6% | 576 | 348.1% |
| **General Semi Skilled Worker** | 271 | 4 | 1.4% | 274 | 356 | 29.9% | 459 | 67.5% | 550 | 100.6% | 1,299 | 373.9% |
| **General Labour** | 333 | 0 | 0.0% | 333 | 440 | 32.3% | 571 | 71.5% | 673 | 102.4% | 1,593 | 378.6% |
| **Other Employees** | 404 | 15 | 3.7% | 419 | 525 | 25.3% | 698 | 66.6% | 812 | 93.9% | 1,922 | 358.9% |
| **Administrative workers** | 137 | 2 | 1.4% | 138 | 177 | 28.1% | 232 | 67.5% | 273 | 97.4% | 656 | 373.6% |
| **Total** | **3,008** | **163** | **5.4%** | **3,171** | **3,951** | **24.6%** | **5,160** | **62.7%** | **6,079** | **91.7%** | **14,407** | **354.4%** |

# Worcestershire LEP
## Alternative Fuel Vehicle

| | Alternative Fuel Vehicle Current Employment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 5 | 2 | 45.4% | 8 | 7 | -10.9% | 9 | 17.1% | 11 | 40.5% | 25 | 230.1% |
| Snr Management SME | 9 | 2 | 24.1% | 12 | 12 | 5.2% | 16 | 38.2% | 19 | 64.3% | 46 | 299.7% |
| Supervisory | 11 | 3 | 23.0% | 14 | 15 | 4.6% | 19 | 36.1% | 23 | 62.9% | 55 | 293.3% |
| Middle / Junior Management | 11 | 2 | 21.7% | 13 | 14 | 6.5% | 18 | 40.5% | 21 | 65.7% | 52 | 300.4% |
| Designer / Developer | 1 | 1 | 45.0% | 2 | 1 | -10.4% | 2 | 16.8% | 2 | 40.5% | 5 | 231.8% |
| Clerical | 7 | 0 | 0.4% | 7 | 9 | 30.4% | 11 | 72.2% | 13 | 99.8% | 32 | 374.2% |
| Self Employed | 7 | 2 | 24.1% | 8 | 9 | 6.2% | 12 | 38.4% | 14 | 61.9% | 32 | 284.9% |
| Advisor or Agent | 12 | 3 | 23.1% | 15 | 16 | 4.3% | 21 | 37.1% | 25 | 64.6% | 60 | 291.7% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 1 | 0 | 6.0% | 1 | 1 | 23.4% | 2 | 60.8% | 2 | 92.4% | 4 | 337.2% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 19 | 2 | 11.3% | 21 | 24 | 16.3% | 32 | 54.2% | 38 | 81.1% | 90 | 329.6% |
| Scientist | 2 | 1 | 45.0% | 3 | 3 | -9.1% | 3 | 19.7% | 4 | 39.1% | 9 | 232.8% |
| Maintenance Engineer | 15 | 2 | 13.7% | 17 | 19 | 14.4% | 25 | 49.2% | 30 | 77.9% | 72 | 321.1% |
| Civil Engineer | 2 | 1 | 47.7% | 4 | 3 | -11.7% | 4 | 15.8% | 5 | 37.0% | 12 | 225.9% |
| Production Engineer | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Power distribution Engineer | 2 | 2 | 65.6% | 4 | 3 | -20.5% | 4 | 3.3% | 5 | 19.6% | 11 | 183.6% |
| Construction Engineer | 3 | 1 | 35.7% | 3 | 3 | -3.7% | 4 | 26.0% | 5 | 48.5% | 12 | 256.1% |
| Sales Exec | 13 | 3 | 22.6% | 16 | 18 | 7.7% | 23 | 38.8% | 27 | 66.3% | 62 | 280.1% |
| Marketing Personnel | 13 | 3 | 21.4% | 16 | 17 | 6.9% | 23 | 43.3% | 26 | 64.7% | 62 | 284.9% |
| General Semi Skilled Worker | 10 | 0 | 4.6% | 10 | 13 | 26.4% | 17 | 64.0% | 20 | 91.0% | 48 | 359.9% |
| General Labour | 17 | 0 | 0.0% | 17 | 23 | 32.1% | 30 | 73.4% | 35 | 100.6% | 83 | 379.3% |
| Other Employees | 10 | 1 | 12.1% | 11 | 13 | 16.5% | 16 | 51.6% | 19 | 77.2% | 46 | 326.8% |
| Administrative workers | 9 | 0 | 4.3% | 9 | 12 | 26.4% | 16 | 66.6% | 18 | 91.0% | 43 | 361.2% |
| **Total** | **180** | **31** | **17.3%** | **211** | **235** | **11.2%** | **308** | **45.9%** | **363** | **71.6%** | **863** | **308.2%** |

## Alternative Fuels

| SOC | Alternative Fuels: Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030: Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030: Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050: Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050: Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 36 | 12 | 34.2% | 48 | 46 | -4.0% | 61 | 26.4% | 73 | 50.7% | 172 | 256.7% |
| Snr Management SME | 33 | 6 | 18.6% | 39 | 42 | 9.3% | 55 | 43.0% | 66 | 70.6% | 156 | 303.0% |
| Supervisory | 37 | 6 | 16.8% | 43 | 48 | 13.5% | 62 | 44.4% | 74 | 73.8% | 173 | 305.9% |
| Middle / Junior Management | 35 | 6 | 16.6% | 41 | 45 | 11.7% | 60 | 46.5% | 71 | 73.3% | 169 | 315.3% |
| Designer / Developer | 6 | 2 | 32.4% | 8 | 8 | 2.3% | 11 | 31.0% | 12 | 49.4% | 30 | 265.2% |
| Clerical | 18 | 0 | 0.4% | 18 | 23 | 30.1% | 30 | 67.8% | 36 | 100.6% | 87 | 386.6% |
| Self Employed | 10 | 2 | 19.1% | 12 | 13 | 10.3% | 17 | 43.5% | 20 | 69.7% | 47 | 299.7% |
| Advisor or Agent | 1 | 0 | 19.5% | 1 | 1 | 9.5% | 2 | 44.8% | 2 | 70.3% | 4 | 303.6% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 28 | 1 | 4.8% | 29 | 37 | 27.2% | 48 | 66.3% | 57 | 97.4% | 130 | 349.2% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 13 | 1 | 7.6% | 14 | 16 | 17.7% | 22 | 60.7% | 26 | 86.4% | 62 | 350.9% |
| Scientist | 25 | 9 | 34.3% | 34 | 32 | -4.1% | 43 | 29.0% | 49 | 47.0% | 120 | 256.6% |
| Maintenance Engineer | 46 | 5 | 10.8% | 51 | 59 | 17.1% | 79 | 55.5% | 93 | 83.9% | 220 | 335.4% |
| Civil Engineer | 0 | 0 | 37.8% | 0 | 0 | -8.5% | 0 | 24.4% | 0 | 48.0% | 1 | 242.8% |
| Production Engineer | 25 | 12 | 49.9% | 37 | 31 | -14.6% | 42 | 14.9% | 49 | 32.1% | 118 | 219.4% |
| Power distribution Engineer | 9 | 4 | 46.7% | 13 | 11 | -11.0% | 15 | 15.9% | 17 | 34.7% | 41 | 226.0% |
| Construction Engineer | 0 | 0 | 27.8% | 0 | 0 | 1.5% | 0 | 36.3% | 0 | 58.9% | 1 | 271.0% |
| Sales Exec | 39 | 7 | 18.0% | 46 | 52 | 11.9% | 67 | 44.8% | 79 | 70.5% | 188 | 306.6% |
| Marketing Personnel | 39 | 7 | 17.8% | 46 | 50 | 9.5% | 67 | 45.3% | 78 | 70.3% | 188 | 308.4% |
| General Semi Skilled Worker | 44 | 1 | 3.4% | 45 | 58 | 27.6% | 75 | 64.4% | 86 | 90.3% | 210 | 362.3% |
| General Labour | 64 | 0 | 0.0% | 64 | 84 | 30.1% | 109 | 68.5% | 131 | 103.2% | 306 | 375.3% |
| Other Employees | 34 | 3 | 9.2% | 37 | 44 | 18.6% | 59 | 60.4% | 69 | 85.0% | 164 | 343.1% |
| Administrative workers | 24 | 1 | 3.7% | 25 | 32 | 25.9% | 42 | 66.5% | 48 | 92.4% | 116 | 363.2% |
| **Total** | **564** | **86** | **15.3%** | **650** | **736** | **13.1%** | **965** | **48.4%** | **1,137** | **74.7%** | **2,704** | **315.8%** |

## Biomass

| | Biomass | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 21 | 5 | 23.1% | 26 | 28 | 8.4% | 36 | 38.4% | 42 | 62.5% | 99 | 282.2% |
| **Snr Management SME** | 90 | 11 | 12.4% | 101 | 117 | 15.4% | 153 | 51.2% | 183 | 80.5% | 436 | 330.3% |
| **Supervisory** | 82 | 10 | 12.2% | 92 | 107 | 15.7% | 140 | 52.2% | 166 | 80.7% | 392 | 325.8% |
| **Middle / Junior Management** | 79 | 10 | 12.4% | 89 | 104 | 16.8% | 135 | 52.2% | 159 | 78.3% | 380 | 327.5% |
| **Designer / Developer** | 9 | 2 | 21.7% | 11 | 12 | 6.8% | 15 | 40.8% | 18 | 65.6% | 43 | 292.0% |
| **Clerical** | 40 | 0 | 0.2% | 40 | 52 | 29.6% | 70 | 72.6% | 82 | 103.2% | 192 | 376.0% |
| **Self Employed** | 4 | 1 | 12.2% | 5 | 6 | 19.8% | 7 | 51.2% | 8 | 76.4% | 21 | 331.6% |
| **Advisor or Agent** | 1 | 0 | 11.3% | 2 | 2 | 17.4% | 2 | 55.1% | 3 | 82.7% | 7 | 334.3% |
| **Educator** | 0 | 0 | 11.4% | 0 | 0 | 17.5% | 0 | 47.0% | 0 | 81.2% | 0 | 324.5% |
| **Specialist or Consultant** | 47 | 2 | 3.6% | 49 | 62 | 26.4% | 81 | 65.2% | 95 | 93.6% | 228 | 364.4% |
| **Editor** | 1 | 0 | 2.2% | 1 | 2 | 25.1% | 2 | 64.0% | 3 | 96.3% | 6 | 366.7% |
| **Industrial Researchers** | 2 | 0 | 5.4% | 2 | 2 | 23.9% | 3 | 62.9% | 3 | 93.6% | 8 | 358.8% |
| **Scientist** | 3 | 1 | 22.3% | 3 | 4 | 6.3% | 5 | 40.8% | 5 | 63.6% | 13 | 292.0% |
| **Maintenance Engineer** | 81 | 6 | 7.3% | 87 | 105 | 20.1% | 140 | 60.3% | 163 | 87.4% | 396 | 354.1% |
| **Civil Engineer** | 1 | 0 | 21.8% | 2 | 2 | 6.1% | 2 | 40.9% | 3 | 66.5% | 7 | 294.4% |
| **Production Engineer** | 13 | 4 | 34.8% | 17 | 17 | -2.3% | 22 | 27.8% | 26 | 51.6% | 61 | 255.2% |
| **Power distribution Engineer** | 41 | 14 | 35.0% | 56 | 54 | -2.6% | 70 | 26.3% | 84 | 50.1% | 201 | 259.6% |
| **Construction Engineer** | 1 | 0 | 16.5% | 2 | 2 | 12.5% | 2 | 48.0% | 3 | 73.7% | 6 | 311.8% |
| **Sales Exec** | 42 | 5 | 12.2% | 47 | 54 | 15.0% | 72 | 53.5% | 85 | 80.5% | 204 | 331.6% |
| **Marketing Personnel** | 42 | 5 | 11.7% | 47 | 56 | 17.9% | 72 | 52.7% | 85 | 79.1% | 205 | 332.6% |
| **General Semi Skilled Worker** | 73 | 2 | 2.2% | 75 | 96 | 28.2% | 126 | 68.0% | 151 | 101.5% | 352 | 370.8% |
| **General Labour** | 85 | 0 | 0.0% | 85 | 110 | 29.9% | 146 | 71.8% | 170 | 100.8% | 405 | 377.8% |
| **Other Employees** | 104 | 6 | 5.9% | 110 | 137 | 24.6% | 174 | 58.0% | 211 | 91.3% | 502 | 354.6% |
| **Administrative workers** | 42 | 1 | 2.4% | 43 | 54 | 26.8% | 71 | 66.2% | 84 | 97.4% | 201 | 371.3% |
| **Total** | **907** | **85** | **9.4%** | **992** | **1,184** | **19.3%** | **1,549** | **56.1%** | **1,833** | **84.8%** | **4,365** | **340.0%** |

## Building Technologies

| SOC | Building Technologies Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 39 | 5 | 13.5% | 44 | 51 | 15.5% | 66 | 50.5% | 79 | 78.9% | 187 | 324.1% |
| Snr Management SME | 101 | 7 | 6.6% | 108 | 132 | 22.1% | 173 | 60.4% | 209 | 93.3% | 481 | 346.1% |
| Supervisory | 93 | 6 | 7.0% | 100 | 122 | 22.2% | 160 | 59.6% | 190 | 90.4% | 445 | 345.6% |
| Middle / Junior Management | 88 | 6 | 6.9% | 94 | 115 | 22.5% | 151 | 60.7% | 178 | 89.8% | 427 | 355.5% |
| Designer / Developer | 10 | 1 | 13.4% | 12 | 14 | 15.1% | 18 | 51.1% | 21 | 79.1% | 50 | 323.8% |
| Clerical | 47 | 0 | 0.1% | 47 | 62 | 32.3% | 80 | 71.5% | 93 | 99.5% | 223 | 376.4% |
| Self Employed | 11 | 1 | 7.0% | 11 | 14 | 22.9% | 19 | 61.5% | 22 | 88.1% | 51 | 343.8% |
| Advisor or Agent | 14 | 1 | 7.1% | 15 | 18 | 23.5% | 23 | 61.1% | 27 | 87.0% | 66 | 353.7% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 48 | 1 | 2.0% | 49 | 62 | 27.5% | 83 | 69.6% | 95 | 95.0% | 228 | 367.9% |
| Editor | 0 | 0 | 1.4% | 0 | 1 | 28.6% | 1 | 68.6% | 1 | 97.4% | 2 | 371.1% |
| Industrial Researchers | 24 | 1 | 3.2% | 25 | 31 | 26.1% | 41 | 65.9% | 49 | 96.9% | 118 | 373.9% |
| Scientist | 3 | 0 | 13.8% | 4 | 4 | 13.3% | 6 | 52.4% | 7 | 75.9% | 17 | 323.3% |
| Maintenance Engineer | 92 | 4 | 4.1% | 96 | 122 | 26.4% | 160 | 65.9% | 187 | 94.1% | 443 | 360.4% |
| Civil Engineer | 6 | 1 | 14.1% | 7 | 8 | 14.6% | 10 | 49.7% | 12 | 79.0% | 29 | 324.1% |
| Production Engineer | 12 | 2 | 20.3% | 15 | 16 | 7.8% | 21 | 42.7% | 24 | 68.3% | 59 | 306.7% |
| Power distribution Engineer | 50 | 10 | 20.7% | 60 | 66 | 9.1% | 86 | 42.2% | 101 | 66.7% | 240 | 297.6% |
| Construction Engineer | 10 | 1 | 10.3% | 11 | 13 | 17.8% | 17 | 56.6% | 20 | 84.2% | 47 | 337.4% |
| Sales Exec | 45 | 3 | 7.0% | 48 | 60 | 23.5% | 78 | 60.8% | 92 | 90.6% | 219 | 352.6% |
| Marketing Personnel | 46 | 3 | 6.8% | 49 | 60 | 23.3% | 79 | 61.5% | 92 | 88.9% | 218 | 346.3% |
| General Semi Skilled Worker | 89 | 1 | 1.3% | 90 | 118 | 31.0% | 153 | 68.9% | 180 | 99.1% | 433 | 378.3% |
| General Labour | 176 | 0 | 0.0% | 176 | 228 | 29.5% | 303 | 72.5% | 355 | 101.9% | 837 | 376.1% |
| Other Employees | 115 | 4 | 3.5% | 119 | 151 | 27.2% | 197 | 65.5% | 231 | 94.2% | 543 | 357.4% |
| Administrative workers | 53 | 1 | 1.3% | 54 | 69 | 29.3% | 90 | 68.6% | 107 | 99.4% | 254 | 374.1% |
| **Total** | **1,172** | **61** | **5.2%** | **1,233** | **1,536** | **24.6%** | **2,013** | **63.3%** | **2,371** | **92.4%** | **5,617** | **355.6%** |

## Energy Management

| | Energy Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 6 | 3 | 43.8% | 9 | 8 | -9.2% | 11 | 19.8% | 13 | 41.1% | 31 | 230.8% |
| Snr Management SME | 13 | 3 | 21.9% | 15 | 17 | 7.7% | 22 | 41.2% | 26 | 67.1% | 60 | 291.9% |
| Supervisory | 12 | 3 | 22.1% | 15 | 16 | 5.8% | 21 | 39.8% | 25 | 64.8% | 59 | 295.4% |
| Middle / Junior Management | 12 | 3 | 21.5% | 14 | 15 | 8.4% | 20 | 43.9% | 23 | 65.9% | 56 | 298.3% |
| Designer / Developer | 3 | 1 | 42.3% | 4 | 4 | -8.4% | 5 | 18.5% | 6 | 40.9% | 15 | 234.3% |
| Clerical | 6 | 0 | 0.4% | 6 | 8 | 30.2% | 11 | 71.9% | 12 | 98.5% | 30 | 377.6% |
| Self Employed | 3 | 1 | 23.1% | 4 | 4 | 5.9% | 5 | 39.7% | 6 | 66.2% | 15 | 294.2% |
| Advisor or Agent | 3 | 1 | 21.3% | 3 | 4 | 9.4% | 5 | 40.9% | 6 | 67.1% | 14 | 293.8% |
| Educator | 0 | 0 | 27.0% | 0 | 0 | 2.3% | 0 | 37.2% | 0 | 58.8% | 0 | 280.8% |
| Specialist or Consultant | 7 | 0 | 6.8% | 7 | 9 | 22.8% | 12 | 58.7% | 14 | 92.7% | 34 | 352.9% |
| Editor | 1 | 0 | 4.3% | 1 | 1 | 21.7% | 2 | 66.3% | 2 | 97.0% | 5 | 349.4% |
| Industrial Researchers | 2 | 0 | 11.6% | 3 | 3 | 17.5% | 4 | 54.2% | 5 | 81.9% | 12 | 329.5% |
| Scientist | 1 | 1 | 45.7% | 2 | 2 | -8.9% | 2 | 21.0% | 3 | 38.6% | 7 | 229.1% |
| Maintenance Engineer | 15 | 2 | 13.1% | 17 | 19 | 16.4% | 25 | 51.1% | 30 | 78.5% | 70 | 321.9% |
| Civil Engineer | 2 | 1 | 43.5% | 4 | 3 | -8.4% | 4 | 21.1% | 5 | 40.4% | 12 | 234.3% |
| Production Engineer | 3 | 2 | 66.5% | 5 | 4 | -20.5% | 5 | 3.5% | 6 | 22.1% | 14 | 190.8% |
| Power distribution Engineer | 7 | 5 | 66.4% | 12 | 10 | -21.1% | 13 | 3.8% | 15 | 21.7% | 36 | 187.8% |
| Construction Engineer | 3 | 1 | 33.8% | 4 | 4 | -2.1% | 5 | 26.9% | 5 | 50.2% | 13 | 260.2% |
| Sales Exec | 8 | 2 | 20.8% | 9 | 10 | 7.6% | 13 | 42.7% | 16 | 66.8% | 37 | 296.7% |
| Marketing Personnel | 7 | 2 | 21.3% | 9 | 9 | 7.3% | 12 | 41.4% | 15 | 66.3% | 35 | 297.7% |
| General Semi Skilled Worker | 13 | 1 | 4.3% | 13 | 17 | 24.8% | 22 | 64.0% | 26 | 94.5% | 60 | 355.7% |
| General Labour | 21 | 0 | 0.0% | 21 | 27 | 30.0% | 36 | 71.6% | 42 | 100.3% | 100 | 377.8% |
| Other Employees | 15 | 2 | 11.2% | 17 | 20 | 16.6% | 26 | 53.7% | 31 | 81.4% | 74 | 331.6% |
| Administrative workers | 8 | 0 | 4.4% | 8 | 10 | 26.1% | 13 | 65.2% | 15 | 92.7% | 36 | 358.6% |
| **Total** | **172** | **31** | **18.3%** | **203** | **225** | **10.5%** | **295** | **45.2%** | **347** | **70.7%** | **825** | **305.3%** |

## Geothermal

| SOC | Geothermal Current Employment: # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Net Zero by 2030 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2030 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Worst Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Net Zero by 2050 Best Case Scenario: Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technicians | 10 | 5 | 45.1% | 15 | 14 | -10.0% | 18 | 17.5% | 21 | 39.3% | 50 | 231.0% |
| Snr Management SME | 43 | 9 | 21.9% | 52 | 56 | 7.7% | 73 | 41.0% | 87 | 66.9% | 204 | 293.2% |
| Supervisory | 39 | 9 | 22.1% | 47 | 50 | 6.5% | 66 | 40.3% | 78 | 66.7% | 185 | 293.7% |
| Middle / Junior Management | 37 | 8 | 21.8% | 44 | 48 | 8.4% | 63 | 41.0% | 73 | 64.6% | 176 | 296.5% |
| Designer / Developer | 4 | 2 | 42.7% | 6 | 6 | -8.0% | 7 | 20.5% | 9 | 41.6% | 20 | 237.6% |
| Clerical | 19 | 0 | 0.4% | 19 | 25 | 30.6% | 33 | 71.1% | 38 | 99.6% | 92 | 379.4% |
| Self Employed | 2 | 1 | 22.7% | 3 | 3 | 6.9% | 4 | 41.4% | 5 | 65.8% | 11 | 291.8% |
| Advisor or Agent | 2 | 0 | 22.0% | 3 | 3 | 7.8% | 4 | 40.3% | 5 | 65.3% | 11 | 292.0% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 21 | 1 | 7.0% | 22 | 27 | 22.8% | 35 | 58.9% | 42 | 88.6% | 100 | 346.9% |
| Editor | 1 | 0 | 4.7% | 1 | 1 | 24.1% | 2 | 65.2% | 2 | 91.2% | 5 | 353.0% |
| Industrial Researchers | 1 | 0 | 11.3% | 2 | 2 | 16.8% | 3 | 55.9% | 3 | 82.0% | 7 | 336.2% |
| Scientist | 1 | 1 | 46.3% | 2 | 2 | -10.2% | 2 | 16.9% | 2 | 37.9% | 6 | 233.7% |
| Maintenance Engineer | 40 | 5 | 12.7% | 45 | 52 | 15.6% | 67 | 49.6% | 80 | 79.8% | 190 | 325.6% |
| Civil Engineer | 2 | 1 | 45.9% | 3 | 3 | -10.9% | 4 | 17.4% | 4 | 39.3% | 10 | 230.9% |
| Production Engineer | 7 | 5 | 66.8% | 11 | 9 | -21.6% | 12 | 2.4% | 14 | 21.9% | 32 | 183.8% |
| Power distribution Engineer | 20 | 13 | 67.2% | 34 | 26 | -21.4% | 34 | 1.8% | 41 | 21.1% | 96 | 185.8% |
| Construction Engineer | 2 | 1 | 33.5% | 2 | 2 | -2.2% | 3 | 28.2% | 4 | 51.1% | 8 | 258.7% |
| Sales Exec | 21 | 5 | 22.4% | 26 | 27 | 5.8% | 36 | 39.0% | 42 | 64.1% | 102 | 293.6% |
| Marketing Personnel | 21 | 5 | 22.2% | 25 | 27 | 5.4% | 35 | 38.6% | 42 | 65.6% | 102 | 301.9% |
| General Semi Skilled Worker | 36 | 2 | 4.5% | 38 | 47 | 24.4% | 63 | 64.7% | 74 | 93.6% | 176 | 361.3% |
| General Labour | 59 | 0 | 0.0% | 59 | 77 | 31.6% | 101 | 71.2% | 117 | 99.6% | 282 | 380.0% |
| Other Employees | 49 | 5 | 10.6% | 54 | 64 | 18.4% | 84 | 55.6% | 98 | 80.8% | 235 | 332.9% |
| Administrative workers | 20 | 1 | 4.5% | 21 | 26 | 23.8% | 35 | 64.6% | 41 | 92.8% | 97 | 356.3% |
| **Total** | **457** | **77** | **16.9%** | **535** | **598** | **11.8%** | **783** | **46.3%** | **922** | **72.5%** | **2,198** | **311.0%** |

## Photovoltaic

| | Photovoltaic | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 33 | 3 | 8.9% | 36 | 43 | 21.1% | 56 | 57.4% | 66 | 85.8% | 157 | 342.4% |
| Snr Management SME | 102 | 5 | 4.9% | 107 | 132 | 22.8% | 175 | 63.6% | 207 | 93.1% | 493 | 360.1% |
| Supervisory | 92 | 4 | 4.3% | 96 | 120 | 24.8% | 159 | 65.7% | 187 | 94.1% | 443 | 360.5% |
| Middle / Junior Management | 88 | 4 | 4.6% | 92 | 116 | 26.2% | 148 | 61.9% | 177 | 93.1% | 428 | 366.9% |
| Designer / Developer | 6 | 1 | 8.7% | 7 | 8 | 20.3% | 11 | 58.7% | 13 | 85.2% | 31 | 345.1% |
| Clerical | 46 | 0 | 0.1% | 46 | 59 | 29.4% | 78 | 69.6% | 93 | 102.8% | 221 | 382.7% |
| Self Employed | 5 | 0 | 4.4% | 5 | 7 | 25.5% | 9 | 65.5% | 10 | 92.0% | 23 | 352.5% |
| Advisor or Agent | 1 | 0 | 4.4% | 1 | 1 | 26.3% | 1 | 67.2% | 1 | 97.6% | 3 | 371.7% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 45 | 1 | 1.4% | 45 | 59 | 30.7% | 76 | 66.5% | 91 | 100.0% | 218 | 378.5% |
| Editor | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Industrial Researchers | 3 | 0 | 2.3% | 4 | 4 | 26.4% | 6 | 66.2% | 7 | 98.3% | 17 | 371.0% |
| Scientist | 0 | 0 | 10.0% | 0 | 0 | 20.9% | 0 | 55.3% | 0 | 82.1% | 1 | 333.3% |
| Maintenance Engineer | 93 | 3 | 2.7% | 96 | 122 | 27.2% | 160 | 66.9% | 187 | 94.6% | 449 | 368.0% |
| Civil Engineer | 3 | 0 | 9.1% | 3 | 3 | 21.4% | 4 | 56.9% | 5 | 86.0% | 13 | 344.9% |
| Production Engineer | 13 | 2 | 13.9% | 15 | 17 | 15.4% | 22 | 49.8% | 26 | 79.7% | 61 | 320.0% |
| Power distribution Engineer | 49 | 7 | 13.9% | 56 | 64 | 14.3% | 83 | 49.3% | 98 | 75.9% | 235 | 320.8% |
| Construction Engineer | 5 | 0 | 6.5% | 6 | 7 | 24.5% | 9 | 62.4% | 11 | 89.7% | 25 | 354.8% |
| Sales Exec | 47 | 2 | 4.5% | 49 | 62 | 25.7% | 80 | 61.9% | 95 | 92.8% | 229 | 365.2% |
| Marketing Personnel | 48 | 2 | 4.6% | 50 | 62 | 24.0% | 83 | 65.6% | 97 | 94.3% | 229 | 357.3% |
| General Semi Skilled Worker | 87 | 1 | 0.9% | 88 | 114 | 29.6% | 148 | 67.9% | 175 | 99.0% | 426 | 383.5% |
| General Labour | 126 | 0 | 0.0% | 126 | 164 | 30.6% | 217 | 72.3% | 255 | 102.6% | 599 | 376.6% |
| Other Employees | 119 | 3 | 2.2% | 121 | 153 | 26.3% | 206 | 70.3% | 240 | 98.0% | 574 | 373.6% |
| Administrative workers | 48 | 0 | 0.9% | 49 | 64 | 30.9% | 82 | 69.0% | 98 | 101.8% | 234 | 380.8% |
| **Total** | **1,059** | **38** | **3.5%** | **1,096** | **1,382** | **26.1%** | **1,814** | **65.5%** | **2,139** | **95.2%** | **5,109** | **366.1%** |

## Recovery and Recycling

| | Recovery and Recycling | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 24 | 9 | 35.9% | 33 | 32 | -4.5% | 42 | 25.2% | 49 | 48.7% | 117 | 253.1% |
| Snr Management SME | 29 | 5 | 17.0% | 34 | 38 | 12.9% | 49 | 46.5% | 59 | 73.7% | 139 | 311.2% |
| Supervisory | 27 | 5 | 18.6% | 33 | 36 | 9.9% | 48 | 46.4% | 56 | 70.7% | 131 | 301.6% |
| Middle / Junior Management | 26 | 5 | 18.5% | 31 | 34 | 10.7% | 45 | 44.3% | 53 | 70.3% | 127 | 308.0% |
| Designer / Developer | 19 | 7 | 36.1% | 26 | 25 | -4.3% | 32 | 26.4% | 38 | 48.8% | 91 | 253.5% |
| Clerical | 13 | 0 | 0.4% | 13 | 18 | 31.7% | 23 | 69.8% | 27 | 102.6% | 64 | 371.5% |
| Self Employed | 7 | 1 | 18.4% | 8 | 9 | 10.2% | 12 | 44.9% | 14 | 71.1% | 34 | 308.1% |
| Advisor or Agent | 3 | 0 | 18.5% | 3 | 3 | 10.2% | 5 | 44.4% | 5 | 70.8% | 13 | 305.7% |
| Educator | 0 | 0 | 21.7% | 0 | 0 | 4.9% | 0 | 41.2% | 0 | 65.1% | 0 | 301.6% |
| Specialist or Consultant | 24 | 1 | 5.5% | 25 | 31 | 23.5% | 41 | 64.0% | 48 | 90.7% | 113 | 353.2% |
| Editor | 1 | 0 | 3.6% | 1 | 1 | 26.9% | 2 | 66.2% | 2 | 96.5% | 5 | 368.6% |
| Industrial Researchers | 6 | 1 | 9.0% | 7 | 8 | 19.3% | 11 | 57.0% | 12 | 83.8% | 29 | 338.3% |
| Scientist | 6 | 2 | 36.7% | 8 | 7 | -4.0% | 10 | 24.9% | 11 | 48.4% | 27 | 255.9% |
| Maintenance Engineer | 34 | 4 | 10.9% | 38 | 44 | 17.8% | 58 | 54.3% | 69 | 83.7% | 164 | 334.3% |
| Civil Engineer | 11 | 4 | 36.3% | 15 | 14 | -4.0% | 19 | 26.4% | 22 | 48.5% | 53 | 252.9% |
| Production Engineer | 13 | 7 | 55.3% | 20 | 16 | -16.1% | 22 | 10.4% | 25 | 29.4% | 61 | 210.5% |
| Power distribution Engineer | 19 | 11 | 55.6% | 30 | 25 | -16.5% | 33 | 10.3% | 39 | 29.8% | 93 | 210.1% |
| Construction Engineer | 12 | 3 | 28.6% | 15 | 15 | 1.9% | 20 | 34.8% | 23 | 58.0% | 55 | 271.1% |
| Sales Exec | 24 | 4 | 18.4% | 29 | 32 | 10.1% | 42 | 45.7% | 48 | 69.0% | 116 | 303.8% |
| Marketing Personnel | 19 | 4 | 18.6% | 23 | 25 | 9.3% | 33 | 45.3% | 39 | 71.8% | 91 | 298.9% |
| General Semi Skilled Worker | 41 | 2 | 3.8% | 43 | 54 | 26.4% | 71 | 66.3% | 84 | 95.9% | 199 | 364.7% |
| General Labour | 46 | 0 | 0.0% | 46 | 60 | 30.3% | 79 | 71.5% | 93 | 101.3% | 221 | 380.0% |
| Other Employees | 29 | 3 | 9.7% | 32 | 39 | 22.5% | 50 | 56.3% | 59 | 84.6% | 140 | 336.9% |
| Administrative workers | 19 | 1 | 3.7% | 20 | 25 | 25.1% | 32 | 63.7% | 39 | 96.6% | 92 | 367.2% |
| **Total** | **453** | **78** | **17.2%** | **531** | **593** | **11.6%** | **778** | **46.5%** | **917** | **72.6%** | **2,175** | **309.5%** |

## Waste Management

| | Waste Management | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| **Technicians** | 21 | 3 | 13.6% | 24 | 27 | 15.9% | 36 | 51.1% | 42 | 79.2% | 100 | 325.3% |
| **Snr Management SME** | 38 | 3 | 6.8% | 40 | 50 | 23.1% | 65 | 62.4% | 76 | 87.5% | 177 | 339.1% |
| **Supervisory** | 40 | 3 | 6.8% | 42 | 53 | 25.6% | 68 | 60.8% | 80 | 87.8% | 190 | 348.2% |
| **Middle / Junior Management** | 37 | 2 | 6.3% | 40 | 49 | 22.4% | 65 | 63.5% | 75 | 89.7% | 180 | 353.1% |
| **Designer / Developer** | 8 | 1 | 13.6% | 9 | 10 | 14.9% | 14 | 52.7% | 16 | 78.8% | 38 | 320.9% |
| **Clerical** | 20 | 0 | 0.1% | 20 | 27 | 30.5% | 35 | 71.0% | 40 | 98.7% | 98 | 379.0% |
| **Self Employed** | 10 | 1 | 6.8% | 11 | 14 | 22.0% | 18 | 59.7% | 21 | 89.1% | 50 | 351.0% |
| **Advisor or Agent** | 15 | 1 | 6.3% | 16 | 19 | 21.3% | 25 | 60.1% | 30 | 91.6% | 70 | 353.5% |
| **Educator** | 1 | 0 | 6.7% | 1 | 1 | 21.9% | 1 | 59.1% | 2 | 87.1% | 4 | 366.0% |
| **Specialist or Consultant** | 21 | 0 | 2.0% | 21 | 27 | 27.8% | 36 | 68.2% | 42 | 98.9% | 99 | 370.1% |
| **Editor** | 2 | 0 | 1.4% | 2 | 3 | 30.3% | 4 | 66.7% | 4 | 97.9% | 11 | 373.1% |
| **Industrial Researchers** | 19 | 1 | 3.1% | 20 | 25 | 26.4% | 33 | 69.1% | 39 | 97.3% | 91 | 360.4% |
| **Scientist** | 4 | 0 | 12.9% | 4 | 5 | 15.6% | 6 | 52.2% | 8 | 80.7% | 18 | 325.5% |
| **Maintenance Engineer** | 48 | 2 | 3.9% | 49 | 63 | 27.1% | 82 | 66.0% | 96 | 94.0% | 228 | 360.4% |
| **Civil Engineer** | 8 | 1 | 14.1% | 9 | 10 | 14.4% | 13 | 51.4% | 16 | 75.9% | 37 | 321.1% |
| **Production Engineer** | 9 | 2 | 19.7% | 11 | 12 | 10.5% | 15 | 44.5% | 18 | 68.0% | 43 | 306.0% |
| **Power distribution Engineer** | 25 | 5 | 20.0% | 29 | 32 | 10.0% | 42 | 44.3% | 50 | 69.5% | 119 | 304.9% |
| **Construction Engineer** | 10 | 1 | 10.3% | 11 | 14 | 19.4% | 18 | 54.4% | 21 | 82.1% | 50 | 335.4% |
| **Sales Exec** | 20 | 1 | 6.6% | 22 | 26 | 21.7% | 35 | 59.9% | 41 | 90.2% | 98 | 351.7% |
| **Marketing Personnel** | 20 | 1 | 6.7% | 21 | 26 | 23.6% | 33 | 58.8% | 40 | 90.5% | 94 | 347.3% |
| **General Semi Skilled Worker** | 40 | 0 | 1.2% | 41 | 52 | 29.1% | 69 | 68.9% | 80 | 98.4% | 189 | 367.2% |
| **General Labour** | 27 | 0 | 0.0% | 27 | 35 | 30.0% | 46 | 71.1% | 54 | 102.0% | 128 | 379.1% |
| **Other Employees** | 51 | 2 | 3.4% | 52 | 66 | 25.2% | 86 | 64.7% | 103 | 96.0% | 244 | 365.6% |
| **Administrative workers** | 26 | 0 | 1.3% | 26 | 34 | 30.4% | 44 | 68.0% | 52 | 99.1% | 124 | 370.9% |
| **Total** | **518** | **31** | **5.9%** | **549** | **679** | **23.8%** | **890** | **62.1%** | **1,046** | **90.6%** | **2,481** | **352.1%** |

## Water and Waste Water Treatment

| | Water & Waste Water Treatment | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 30 | 3 | 9.1% | 33 | 39 | 20.4% | 52 | 58.2% | 60 | 84.0% | 144 | 340.4% |
| Snr Management SME | 50 | 2 | 4.3% | 52 | 65 | 24.5% | 86 | 64.9% | 102 | 93.8% | 241 | 360.6% |
| Supervisory | 49 | 2 | 4.5% | 51 | 64 | 26.2% | 83 | 63.1% | 99 | 94.9% | 234 | 359.6% |
| Middle / Junior Management | 46 | 2 | 4.4% | 48 | 61 | 25.5% | 79 | 63.8% | 94 | 93.8% | 225 | 366.7% |
| Designer / Developer | 11 | 1 | 9.4% | 12 | 14 | 20.6% | 19 | 57.6% | 22 | 84.7% | 52 | 337.2% |
| Clerical | 23 | 0 | 0.1% | 24 | 31 | 29.8% | 40 | 72.0% | 47 | 100.9% | 114 | 383.8% |
| Self Employed | 13 | 1 | 4.4% | 13 | 17 | 26.0% | 22 | 65.0% | 26 | 94.7% | 62 | 363.6% |
| Advisor or Agent | 2 | 0 | 4.5% | 2 | 2 | 23.5% | 3 | 62.8% | 4 | 92.6% | 9 | 362.4% |
| Educator | 0 | 0 | 4.4% | 0 | 0 | 25.2% | 0 | 62.2% | 0 | 94.1% | 0 | 363.5% |
| Specialist or Consultant | 27 | 0 | 1.2% | 28 | 36 | 28.4% | 47 | 69.9% | 56 | 100.1% | 131 | 372.4% |
| Editor | 1 | 0 | 1.0% | 1 | 1 | 29.9% | 1 | 69.1% | 2 | 99.4% | 4 | 379.8% |
| Industrial Researchers | 2 | 0 | 2.3% | 2 | 3 | 28.2% | 4 | 66.7% | 4 | 98.5% | 10 | 371.3% |
| Scientist | 1 | 0 | 8.8% | 1 | 1 | 21.1% | 2 | 56.9% | 2 | 86.9% | 5 | 349.9% |
| Maintenance Engineer | 64 | 2 | 2.7% | 66 | 84 | 28.1% | 111 | 69.3% | 130 | 97.5% | 306 | 365.5% |
| Civil Engineer | 8 | 1 | 8.6% | 9 | 11 | 20.6% | 14 | 58.2% | 17 | 86.1% | 41 | 343.2% |
| Production Engineer | 15 | 2 | 13.1% | 17 | 19 | 14.5% | 26 | 51.8% | 30 | 79.0% | 72 | 328.3% |
| Power distribution Engineer | 32 | 4 | 13.1% | 36 | 42 | 16.8% | 54 | 51.3% | 64 | 77.4% | 152 | 323.1% |
| Construction Engineer | 12 | 1 | 6.7% | 13 | 16 | 23.2% | 21 | 62.4% | 25 | 89.7% | 59 | 352.3% |
| Sales Exec | 22 | 1 | 3.9% | 23 | 29 | 25.4% | 38 | 64.2% | 45 | 93.0% | 106 | 359.5% |
| Marketing Personnel | 22 | 1 | 4.7% | 23 | 29 | 25.8% | 37 | 63.1% | 45 | 94.7% | 105 | 356.5% |
| General Semi Skilled Worker | 51 | 0 | 0.9% | 52 | 67 | 28.8% | 89 | 71.3% | 104 | 100.9% | 248 | 379.8% |
| General Labour | 29 | 0 | 0.0% | 29 | 38 | 30.9% | 50 | 72.4% | 58 | 101.0% | 138 | 381.6% |
| Other Employees | 63 | 1 | 2.3% | 64 | 82 | 27.5% | 107 | 66.5% | 127 | 98.6% | 299 | 366.6% |
| Administrative workers | 29 | 0 | 0.9% | 29 | 38 | 29.2% | 50 | 70.5% | 59 | 100.8% | 140 | 380.1% |
| **Total** | **603** | **25** | **4.1%** | **628** | **789** | **25.7%** | **1,036** | **65.0%** | **1,220** | **94.4%** | **2,899** | **361.9%** |

## Wind

| | Wind | | | | Net Zero by 2030 | | | | Net Zero by 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current Employment | | | | Worst Case Scenario | | Best Case Scenario | | Worst Case Scenario | | Best Case Scenario | |
| SOC | # Employees 2019/20 | Shortage of Employees 2019/20 | Shortage as a % of Total Employees | # Employees if Skills Gap Filled | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2030 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) | Estimated # Employees Needed to Reach Net Zero by 2050 | Growth in Employees Required (assumes no skills gap) |
| Technicians | 51 | 7 | 13.1% | 58 | 67 | 15.9% | 88 | 52.3% | 102 | 77.6% | 246 | 326.6% |
| Snr Management SME | 159 | 11 | 6.8% | 170 | 208 | 22.5% | 272 | 60.1% | 322 | 89.2% | 756 | 344.9% |
| Supervisory | 151 | 10 | 6.6% | 161 | 198 | 22.8% | 255 | 58.2% | 307 | 90.7% | 720 | 347.8% |
| Middle / Junior Management | 143 | 10 | 6.8% | 153 | 186 | 21.9% | 245 | 60.7% | 289 | 89.4% | 678 | 344.0% |
| Designer / Developer | 7 | 1 | 14.4% | 8 | 9 | 15.8% | 12 | 49.5% | 14 | 76.3% | 35 | 324.5% |
| Clerical | 75 | 0 | 0.1% | 75 | 97 | 29.8% | 129 | 72.7% | 152 | 103.6% | 361 | 383.4% |
| Self Employed | 11 | 1 | 6.1% | 12 | 15 | 24.2% | 19 | 62.8% | 23 | 91.6% | 54 | 353.9% |
| Advisor or Agent | 1 | 0 | 6.5% | 1 | 2 | 24.1% | 2 | 59.7% | 3 | 91.2% | 7 | 369.4% |
| Educator | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Specialist or Consultant | 71 | 1 | 2.0% | 72 | 92 | 27.7% | 121 | 67.4% | 144 | 99.4% | 342 | 373.0% |
| Editor | 0 | 0 | 1.5% | 0 | 0 | 38.7% | 0 | 68.1% | 0 | 98.3% | 1 | 355.4% |
| Industrial Researchers | 2 | 0 | 3.7% | 2 | 2 | 26.3% | 3 | 71.7% | 4 | 98.9% | 9 | 375.6% |
| Scientist | 0 | 0 | 13.1% | 0 | 0 | 18.4% | 1 | 57.1% | 1 | 77.8% | 2 | 330.9% |
| Maintenance Engineer | 169 | 7 | 4.0% | 176 | 220 | 24.9% | 290 | 64.7% | 342 | 94.5% | 815 | 362.9% |
| Civil Engineer | 6 | 1 | 13.2% | 7 | 8 | 14.2% | 10 | 49.2% | 12 | 80.0% | 29 | 322.2% |
| Production Engineer | 26 | 5 | 20.3% | 32 | 35 | 8.9% | 46 | 43.7% | 53 | 67.3% | 128 | 303.2% |
| Power distribution Engineer | 83 | 17 | 20.7% | 100 | 107 | 6.9% | 140 | 40.4% | 167 | 67.7% | 399 | 299.9% |
| Construction Engineer | 18 | 2 | 9.3% | 20 | 24 | 20.1% | 31 | 57.4% | 36 | 84.7% | 87 | 345.6% |
| Sales Exec | 71 | 4 | 6.2% | 76 | 93 | 22.8% | 121 | 59.9% | 145 | 91.6% | 347 | 357.9% |
| Marketing Personnel | 72 | 5 | 6.8% | 77 | 94 | 21.4% | 124 | 60.8% | 146 | 89.1% | 348 | 350.8% |
| General Semi Skilled Worker | 141 | 2 | 1.4% | 143 | 187 | 30.8% | 245 | 71.0% | 285 | 99.0% | 679 | 373.8% |
| General Labour | 178 | 0 | 0.0% | 178 | 234 | 31.3% | 305 | 71.2% | 362 | 103.4% | 865 | 385.7% |
| Other Employees | 206 | 7 | 3.2% | 213 | 273 | 27.9% | 361 | 69.5% | 414 | 94.3% | 993 | 365.9% |
| Administrative workers | 81 | 1 | 1.3% | 82 | 106 | 29.2% | 140 | 69.8% | 163 | 98.1% | 387 | 370.4% |
| **Total** | **1,724** | **91** | **5.3%** | **1,816** | **2,256** | **24.3%** | **2,960** | **63.0%** | **3,488** | **92.1%** | **8,287** | **356.4%** |