

Coventry and Warwickshire LEP

Low Carbon Environmental Goods and Services Market Snapshot

Midlands Energy Hub

2017/18 to 2019/20

Final Report March 2021

kMatrix Data Services Ltd



Disclaimer

kMatrix

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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 world².

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.

¹https://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 is one of a series which quantify the LCEGS sector for the MEH as a region and from the perspective of the nine LEPs which comprise the MEH. The data in this report are produced using the kMatrix Big Data Analytical Tool, with full methodology paper delivered to the MEH.

The MEH Regional analysis of the LCEGS sector, at the Local Authority level is available in a separate report. The data in this report is specifically for the Coventry and Warwickshire Local Enterprise Partnership (LEP) and constituent Local Authorities. The reason for this delineation is the presence of some Local Authorities in more than one LEP, for example Hinckley & Bosworth is served by both Coventry and Warwick LEP and Leicester and Leicestershire LEP. Likewise Bromsgrove, Redditch and Wyre Forest are all served by both Greater Birmingham and Solihull LEP and Worcestershire LEP. The purpose of the data at the LEP-level is to provide the individual LEPs with a snapshot of the LCEGS sector within the geographical area they serve, regardless of whether the Local Authorities within their boundaries are also served by other LEPs. To avoid the issue of double counting, the data at the Regional and LEP-level have been segregated, except for limited LEP-level data being available in the Regional report for growth rate comparison.

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.

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

Local Authorities within the Coventry and Warwickshire LEP

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 the Coventry and Warwickshire LEP are listed below:

Formal name	Shortened label
Coventry City Council	Coventry
Warwick DC	Warwick
Stratford-on-Avon DC	Stratford-on-Avon
North Warwickshire BC	North Warwickshire
Nuneaton & Bedworth BC	Nuneaton & Bedworth
Rugby BC	Rugby
Hinckley & Bosworth BC	Hinckley & Bosworth

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Executive Summary

Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services (LCEGS) sector 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 28,000 people in the sector in 2019/20.

Sales and growth

The Low Carbon and Environmental Goods and Services sector in the Coventry and Warwickshire LEP grew year on year since 2017/18. In 2017/18 total sales in the sector were worth £3.1bn have now reached £3.4bn in 2019/20.

The sector in the Coventry and Warwickshire LEP grew by 5.1% during the financial year 2017/18 to 2018/19 and 6.1% during 2018/19 to 2019/20. This rate of growth is stronger the MEH average (5.2% and 5.9% respectively) but slower than the UK average for the same period (10.0% and 8.1% respectively), however, the fast rate of growth in London raises the UK average.

Employment

Employment in Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was 28,064, up from 24,222 in 2017/18. Annual growth rate in employment was 7.0% between 2017/18 and 2018/19 and 8.3% between 2018/19 and 2019/20. This rate of growth is stronger the MEH average (5.7% and 5.0% respectively), but slower than the UK average for the same period (9.4% and 7.3% respectively) however, the fast rate of growth in London raises the UK average.

Companies

The number of companies in Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was 1,286, up from 1,222 in 2017/18. Annual growth rate in the number of companies was 4.9% between 2017/18 and 2018/19 and 0.4% between 2018/19 and 2019/20. This rate of growth was variable compared with both the MEH average (3.7% and 6.9% respectively) and the UK average for the same period (9.3% and 10.3% respectively) however, the fast rate of growth in London raises the UK average.

Coventry and Warwickshire LEP's sub-sectors

In 2019/20 Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services sector was made up by the following proportions: Renewable Energy 39%, Low Carbon 38% and Environmental 23%.

Coventry and Warwickshire LEP's sub-sector strengths

The five largest sub-sectors in the Low Carbon and Environmental Goods and Services sector by sales account for 64% of the Coventry and Warwickshire LEP's total sales and are made up of:

- Wind (£564m) – this includes control systems development and manufacture, drive train development, manufacture and systems integration, consulting houses and companies providing power firming systems and services, maintenance services and grid integration services.
- Building Technologies (£528m) - this includes head office functions, building systems design and consultancy and building systems providers and installers.
- Alternative Fuels (£483m) – this includes R&D functions, alternative fuel providers, designers and consultancy, process implementation, sales and accounting and application development specialists.

- Photovoltaic (£368m) - this includes head office functions, systems developers, providers and installers.
- Water & Waste Water Treatment (£274m) - development and implementation by utilities along with supply, consultancy and implementation by independent consulting engineers

The next six largest sub-sectors by sales account for a further 32% of Coventry and Warwickshire LEP's total sales and are made up of:

- Waste Management (£243m) - this includes process development and new process implementation and consulting, public and private operations management and supply and installation of operational equipment.
- Biomass (£241m) - this includes systems development, supply, implementation and R&D.
- Alternative Fuel Vehicle (£197m) - include selling agencies, alternative fuel development companies and consulting and applications development for vehicle conversion specialists.
- Recovery and Recycling (£188m) – this includes waste collection, glass stock processing and paper feedstock processing.
- Geothermal (£153m) - this includes branch office functions, design, international consultancy, lateral geothermal systems providers and installers at the domestic and small commercial level and vertical control systems developers and suppliers.
- Energy Management (£74m) – this includes registered gas engineers, measurement and control systems and fitting and maintenance.

Sub-sector growth

Coventry and Warwickshire LEP's five largest sub-sectors by sales have all enjoyed high levels of growth in sales, number of employees and number of companies between 2017/18 and 2019/20:

- Wind – sales have grown from £505.8m to £564m (11.5%), number of employees by 16.1% and number of companies by 6.3%
- Building Technologies – sales have grown from £472m to £528m (11.9%), number of employees by 16.4% and number of companies by 5.3%
- Alternative Fuels – sales have grown from £432m to £483m (11.4% increase), number of employees by 3.1% and number of companies by 5.1%
- Photovoltaic – sales have grown from £368m to £368m (11.5% increase), number of employees by 15.8% and number of companies by 23.3%
- Water & Waste Water Treatment – sales have grown from £246m to £274m (11.3% increase), number of employees by 15.5% and number of companies also by 4.2%

Sub-sectors which saw stronger growth than the UK average between 2017/18 and 2019/20 include:

- Energy Management with 11.7% (MEH 11.4%, UK 5.7%)
- Air Pollution with 11.7% (MEH 11.4%, UK 5.8%)
- Alternative Fuel Vehicle with 11.7% (MEH 11.4%, UK 5.7%)
- Contaminated Land Reclamation and Remediation with 11.5% (MEH 11.4%, UK 1.0%)
- Hydro with 11.0% (MEH 11.0%, UK 1.8%)

Sub-sectors which saw weaker growth than the UK average between 2017/18 and 2019/20 include:

- Environmental Consultancy with 11.6% (MEH 11.3%, UK 16.8%)
- Noise & Vibration Control with 11.6% (MEH 11.4%, UK 23.3%)
- Additional Energy Sources with 11.6% (MEH 11.3%, UK 15.9%)
- Carbon Capture & Storage with 11.6% (MEH 11.3%, UK 19.0%)
- Biomass with 11.4% (MEH 11.3%, UK 28.2%)
- Geothermal with 11.3% (MEH 11.3%, UK 18.8%)
- Photovoltaic with 11.5% (MEH 11.3%, UK 24.3%)

- Wave & Tidal with 11.2% (MEH 11.2%, UK 24.9%)
- Wind with 11.5% (MEH 11.3%, UK 42.2%)

Investment in R&D

Investment in R&D within Coventry and Warwickshire LEP grew in all three categories of investment between 2017/18 and 2019/20:

- Private Equity Investment in R&D grew 5.0% from £160m in 2017/18 to £168m in 2019/20
- Venture capital Investment in R&D grew 4.5% from £326m in 2017/18 to £340m in 2019/20
- Other Investment in R&D grew 3.4% from £485m in 2017/18 to £501m in 2019/20

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 CO₂ reduction.

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

- Environmental Consultancy with low estimated potential impact and small market

Coventry and Warwickshire LEP's Exports

The value of exports in Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was £368m, an increase from £329m in 2017/18. This accounted for 12% of the MEH's LCEGS exports in 2019/20 and is in line with Coventry and Warwickshire LEP's 13% share of the overall MEH LCEGS market.

Coventry and Warwickshire LEP's LCEGS exports grew by 3.6% and 8.0% over the last three years which compared with MEH growth of 4.5% and 6.2% and UK growth of approximately 8.7% and 9.5% respectively.

Coventry and Warwickshire LEP's top Export sub-sectors which saw large export market and strong growth include:

- Wind - £59m
- Biomass - £26m
- Recovery and Recycling - £20m
- Geothermal - £17m
- Building Technologies - £58m
- Alternative Fuels - £53m

Coventry and Warwickshire LEP's Imports

The value of imports in Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services sector in 2019/20 was £360m, an increase from £311m in 2017/18. This accounted for 14% of the MEH's LCEGS imports in 2019/20 and is slightly larger than Coventry and Warwickshire LEP's 13% share of the overall MEH LCEGS market.

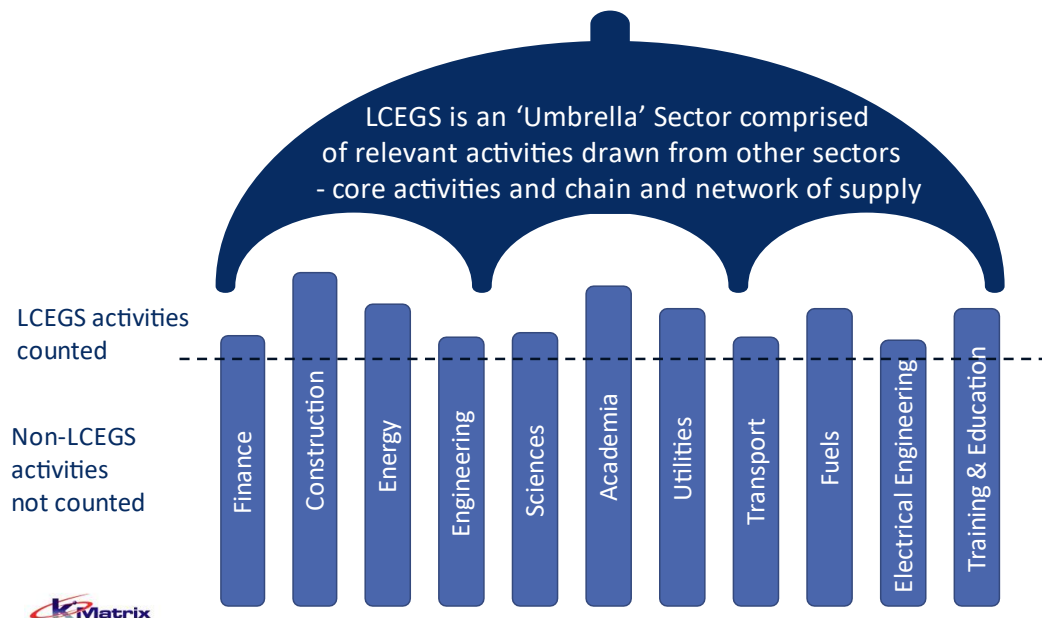
Coventry and Warwickshire LEP's LCEGS imports grew by 5.9% and 9.5% over the last three years which compared with MEH growth of 5.8% and 5.9% and UK growth of approximately 10.0% and 7.4% respectively.

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:



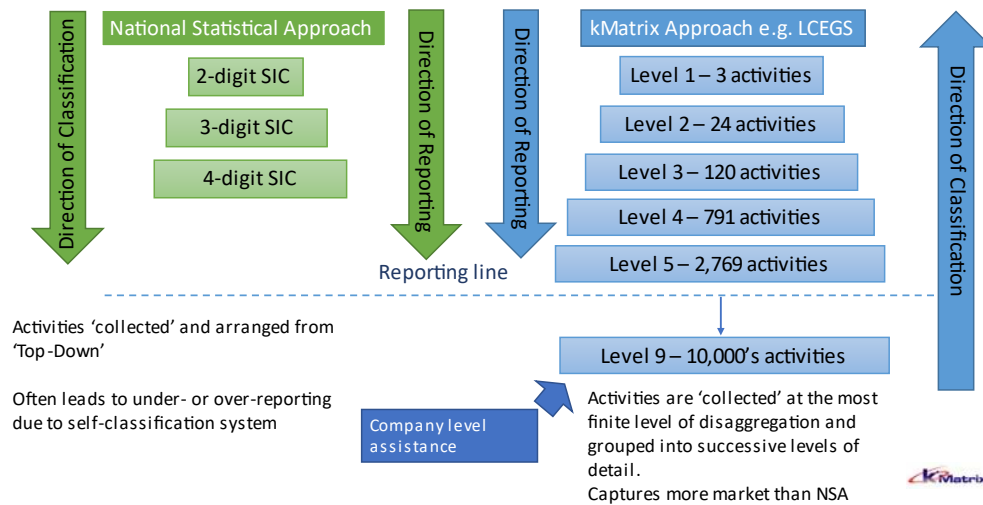
The sector is comprised of both core elements and those in the chain and network of supply, without whom the sector could not function.

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 as 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

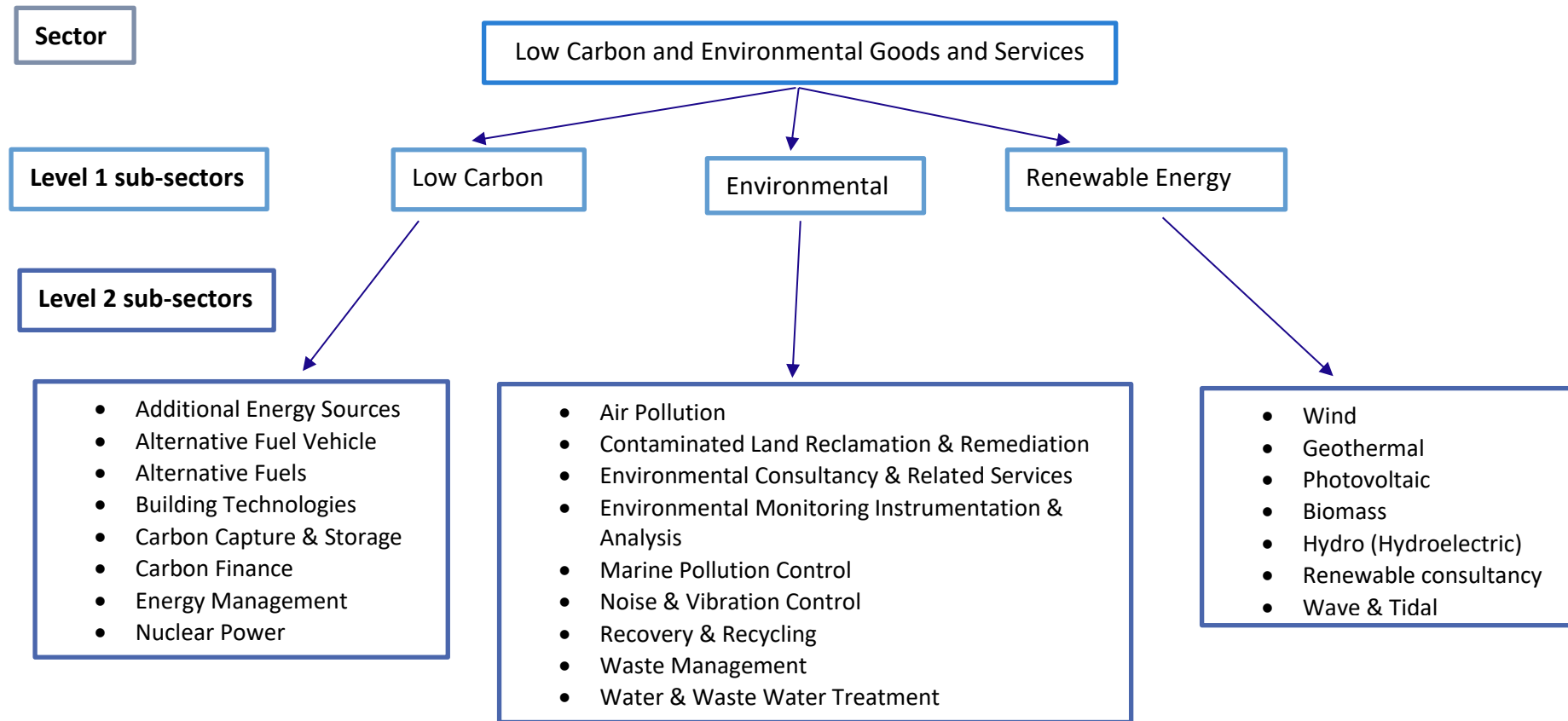
The data used in this report is based upon the work and methodology used by kMatrix to provide datasets on the UK's Low Carbon Environmental Goods and Services (LCEGS) sector for UK Government reported annually by the Department for Business, Innovation and Skills (BIS) from 2008/09 to 2011/12 and further 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 through 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:



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 through 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.

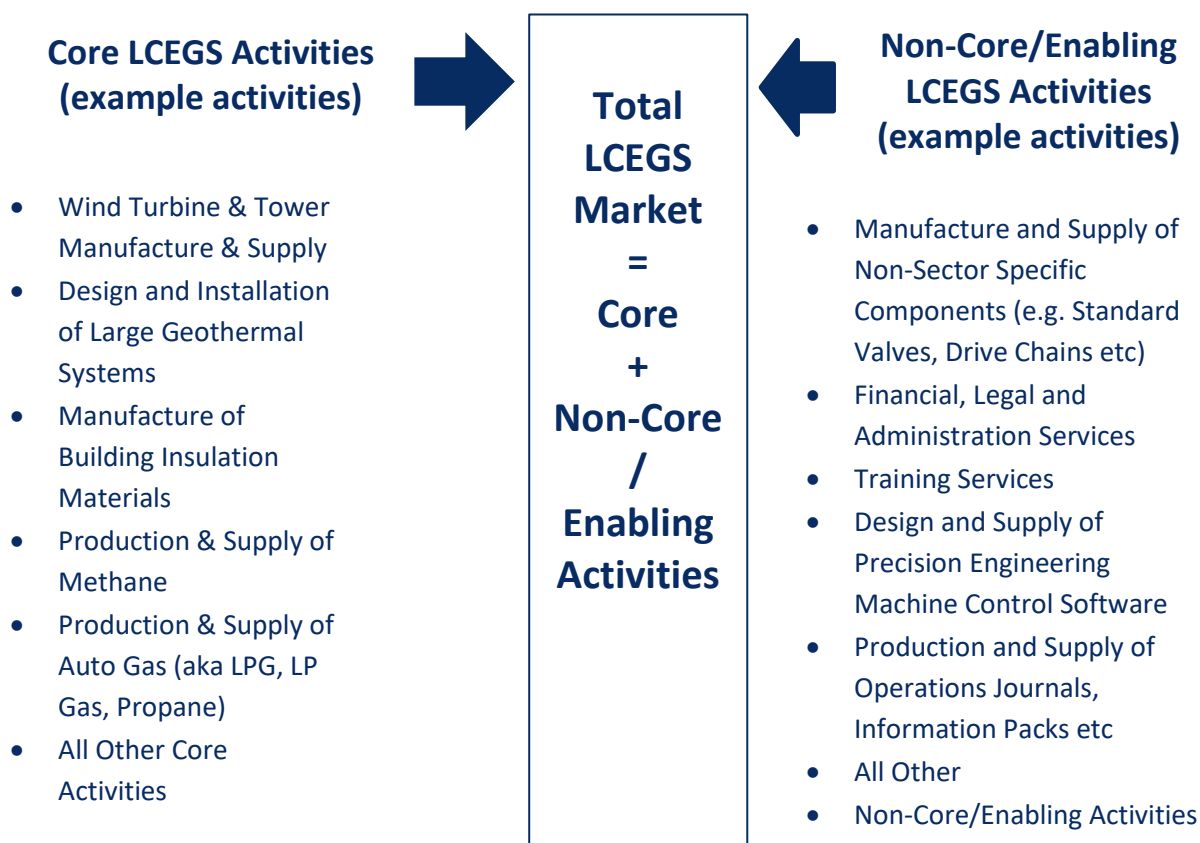
The purpose of the LCEGS dataset in its original form, is to provide a standardized measure of the complete LCEGS sector. The whole dataset includes those 'core' activities, which would immediately come to mind such as the manufacture of a wind turbine blade, but also the less obvious 'non-core' activities, 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.



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.



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 considerations³.

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 gCO₂eq/kWh⁴. 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.⁵ 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 heat⁶, 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

³ 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>

⁴ https://www.climateexchange.org.uk/media/1459/life_cycle_wind_-_executive_summary_.pdf

⁵ 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

⁶ 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 treatment⁷.

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 UK⁸, 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.

⁷ Environ. Sci.: Water Res. Technol., 2020, 6, 153

⁸ 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

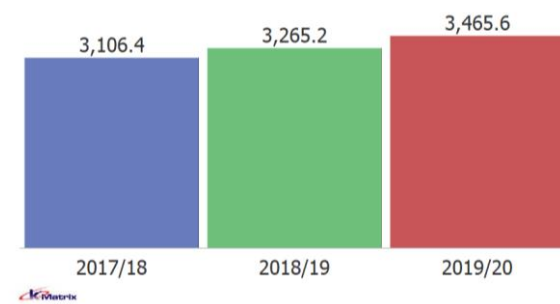
1. Coventry and Warwickshire LEP's Low Carbon and Environmental Goods and Services (LCEGS) Analysis

This section of the report analyses the Coventry and Warwickshire LEP's LCEGS at Level 1 and Level 2. It also provides information at Level 3 to show the type of activities included in these sub-sectors.

1.1 LCEGS Compared by Year

In this section of the report, the Coventry and Warwickshire LEP's LCEGS performance is compared for the last three years for the three key measures of Sales, Employment and Growth.

Figure 1: Sales 2017/18 to 2019/20 in £m

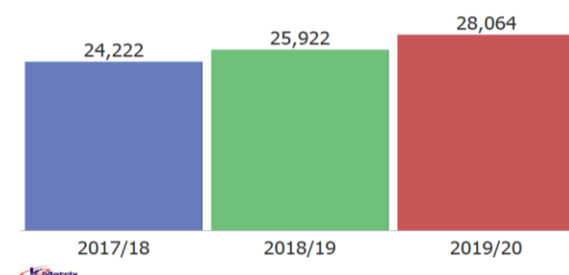


Coventry and Warwickshire LEP's LCEGS sales in 2019/20 were £3.5bn, up from £3.1bn in 2017/18.

Annual sales growth in Coventry and Warwickshire LEP's LCEGS was 5.1% from 2017/18 to 2018/19 and 6.1% from 2018/19 to 2019/20.

In comparison MEH Regional sales growth in LCEGS was 5.2% and 5.9% respectively.

Figure 2: Employment 2017/18 to 2019/20

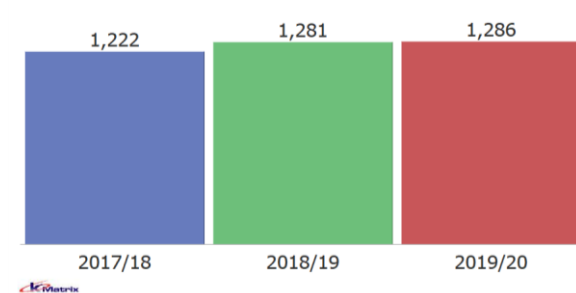


Coventry and Warwickshire LEP's LCEGS employment in 2019/20 was 28,064, up from 24,222 in 2017/18.

Annual employment growth in Coventry and Warwickshire LEP's LCEGS was 7.0% from 2017/18 to 2018/19 and 8.3% from 2018/19 to 2019/20.

In comparison MEH Regional employment growth in LCEGS was 5.7% and 5.0% respectively.

Figure 3: Companies 2017/18 to 2019/20



Coventry and Warwickshire LEP's LCEGS company count in 2019/20 was 1,286, up from 1,222 in 2017/18.

Annual company growth in Coventry and Warwickshire LEP's LCEGS was 4.9% from 2017/18 to 2018/19 and 0.4% from 2018/19 to 2019/20.

In comparison MEH Regional company growth in LCEGS was 3.7% and 6.9% respectively.

Growth in the Coventry and Warwickshire LEP has been higher for sales and employment and lower for companies 2017/18 and 2019/20 when compared with the MEH Region as a whole.

1.2 Coventry and Warwickshire LEP's LCEGS at Level 1

The analysis in this section of the report focuses on the Level 1 and Level 2 split of LCEGS in the Coventry and Warwickshire LEP for each of the last three years.

Figure 4: Sales 2017/18 to 2019/20 in £m (Level 1)

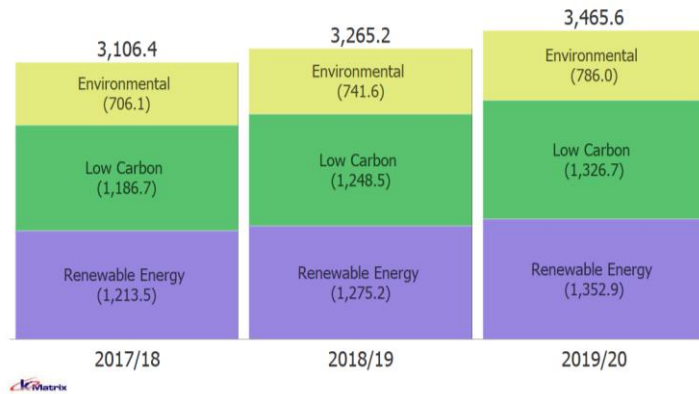


Figure 4 shows the three-year LCEGS sales split by Level 1.

In 2017/18 the split was 39% Renewable Energy, 38% Low Carbon and 23% Environmental. The split had not changed in 2019/20.

Figure 5: Employment 2017/18 to 2019/20 (Level 1)

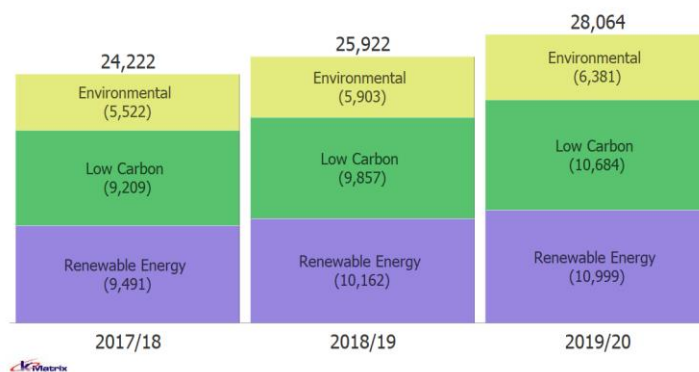


Figure 5 shows the three-year employment split by Level 1.

In 2017/18 the split was 39% Renewable Energy, 38% Low Carbon and 23% Environmental. The split had not changed in 2019/20.

Figure 6: Companies 2017/18 to 2019/20 (Level 1)

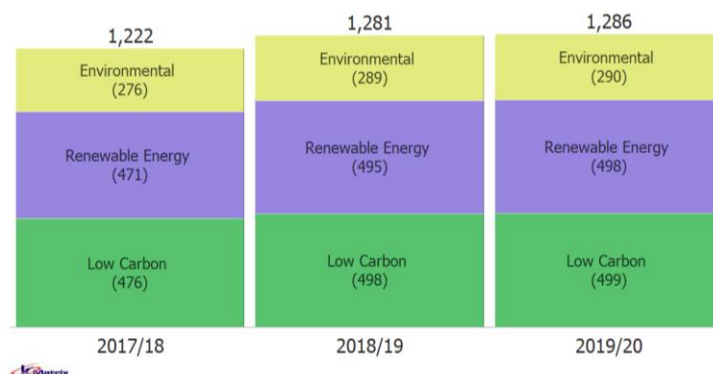


Figure 6 shows the three-year company split by Level 1.

In 2017/18 the split was 39% Low Carbon, 39% Renewable Energy and 23% Environmental. The split had not changed in 2019/20.

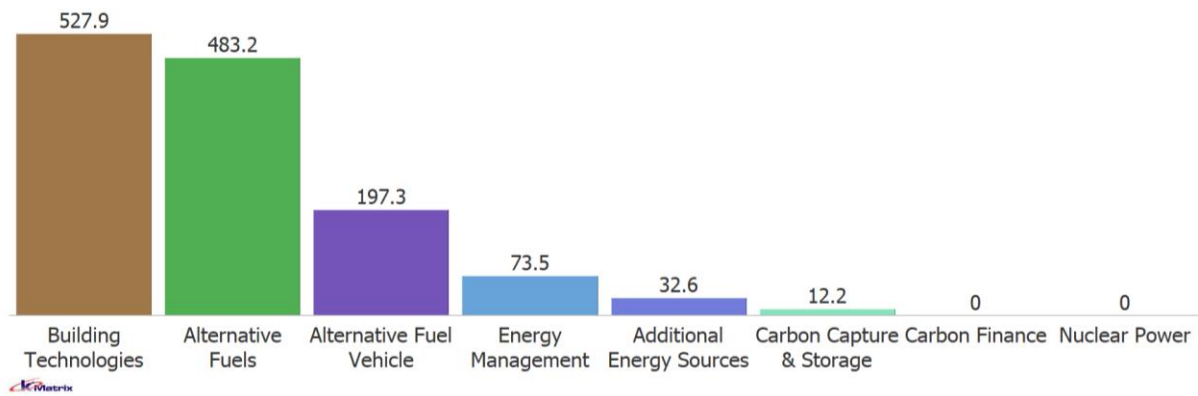
In 2019/20 MEH Regional LCEGS sales was split - Renewable Energy 39%, Low Carbon 39% and Environmental 22%.

1.3 Coventry and Warwickshire LEP's LCEGS Level 1 - Low Carbon Market

In this section we look at the Low Carbon market in greater detail. Initially we split the market into eight further sub-sectors (Level 2) and then look at the highest performing Level 2 sub-sectors in more detail by highlighting activity happening within them at Level 3.

1.3.1 Low Carbon Market (Level 2)

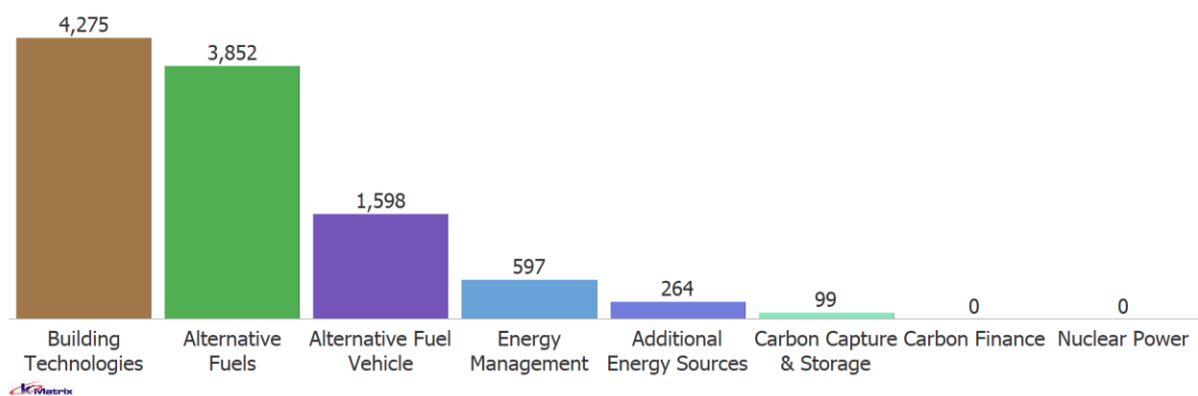
Figure 7: Sales 2019/20 in £m (Level 2)



Low Carbon is further sub-divided into eight sub-sectors, of which four account for 97% of sales (Figure 7). These four are made up of Building Technologies 40%, Alternative Fuels 36%, Alternative Fuel Vehicle 15% and Energy Management 6%.

Each of these four sub-sectors grew between 2017/18 and 2019/20: Building Technologies from £471.8m to £527.9m; Alternative Fuels from £432.4m to £483.2m; Alternative Fuel Vehicle from £176.7m to £197.3m and Energy Management from £65.8m to £73.5m.

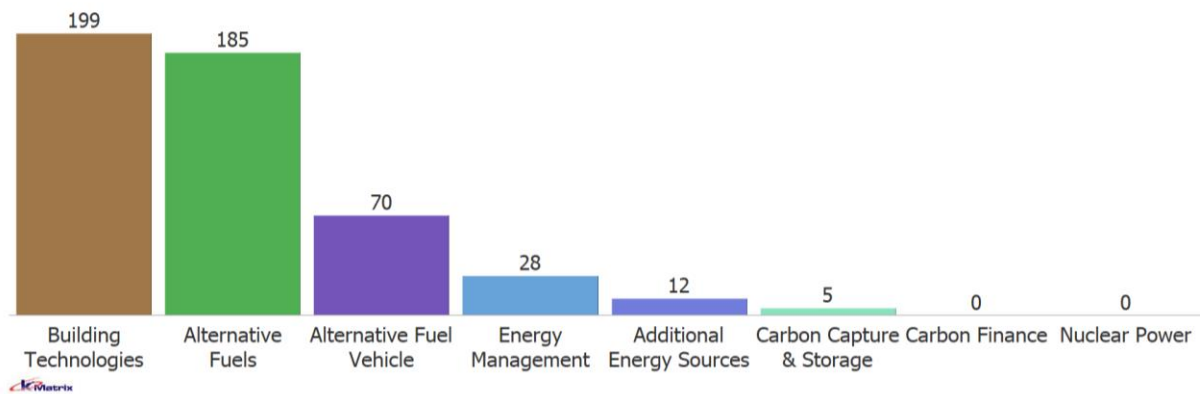
Figure 8: Employment 2019/20 (Level 2)



The same four sub-sectors account for 97% of employment (Figure 8). They are Building Technologies 40%, Alternative Fuels 36%, Alternative Fuel Vehicle 15% and Energy Management 6%.

Each of these four sub-sectors grew between 2017/18 and 2019/20: Building Technologies from 3,674 to 4,275; Alternative Fuels from 3,331 to 3,852; Alternative Fuel Vehicle from 1,377 to 1,598 and Energy Management from 514 to 597.

Figure 9: Companies 2019/20 (Level 2)

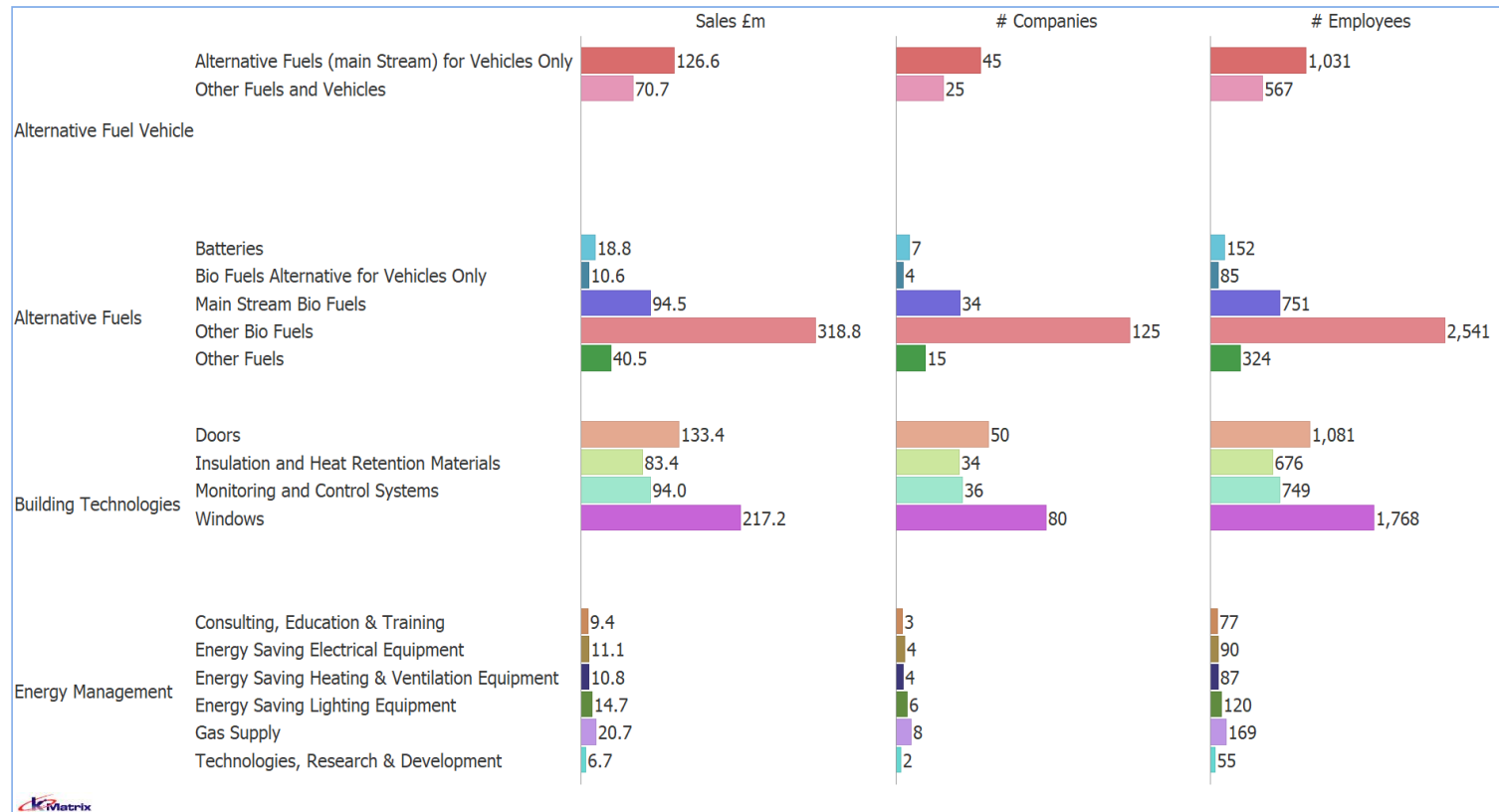


The same four sub-sectors again account for 97% of companies (Figure 9). They are Building Technologies 40%, Alternative Fuels 37%, Alternative Fuel Vehicle 14% and Energy Management 6%.

Each of these four sub-sectors grew between 2017/18 and 2019/20: Building Technologies from 189 to 199; Alternative Fuels from 178 to 185; Alternative Fuel Vehicle from 66 to 70 and Energy Management from 26 to 28.

1.3.2 Low Carbon Market at Level 3

Figure 10: Summary of selected metrics for 2019/20 for selected Low Carbon Level 2 sub-sectors at Level 3



The top four Level 2 sub-sectors for Low Carbon are Alternative Fuel Vehicle, Alternative Fuels, Building Technologies and Energy Management, making up 97% of the Low Carbon market in the Coventry and Warwickshire LEP. Figure 10 shows a summary of the Sales, Companies and Employees for these Level 2 sub-sectors, broken out into their Level 3 sub-sectors.

Building Technologies is the largest Level 2 sub-sector and Windows is the largest of the four Level 3 sub-sectors, making up 41% of the market. Example companies in this sub-sector would include window manufacturers, agents and installers.

Alternative Fuels has five sub-sectors at level 3, of which, Other Biofuels accounts for 66% of Sales. Example companies of this sub-sector would include process designers and consultancy, process implementation and sales and application development specialists.

Alternative Fuel Vehicles has only two sub-sectors at level 3, with Alternative Fuels (main stream) for Vehicles Only holding 64% of the market share. Example companies in this sub-sector would include selling agencies, alternative fuel development companies and consulting and applications development for vehicle conversion specialists.

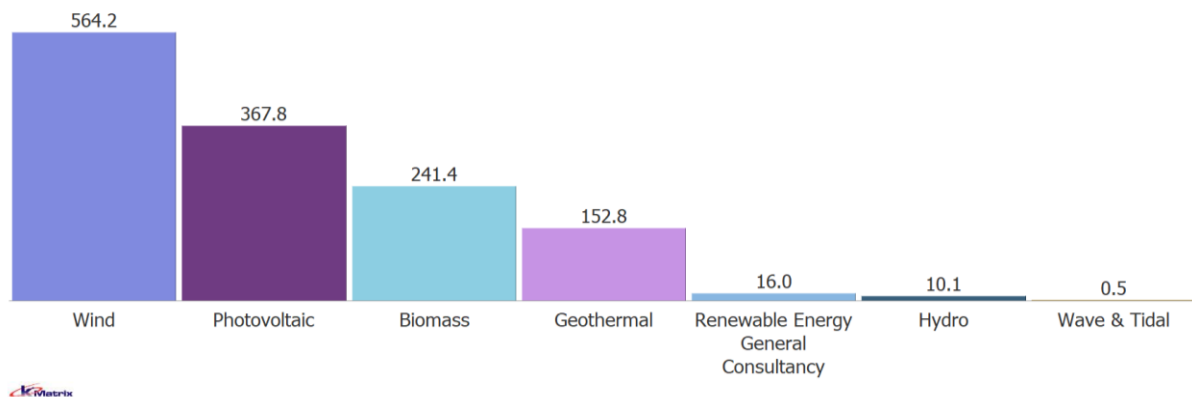
Energy Management has six sub-sectors at level 3, with Gas Supply holding 28% of the market share. Example companies in this sub-sector would include registered gas engineers, measurement and control systems and fitting and maintenance.

1.4 Coventry and Warwickshire LEP's LCEGS Level 1 - Renewable Energy Market

In this section we look at the Renewable Energy market in greater detail. Initially we split the market into eight further sub-sectors, Level 2, and then look at the highest performing Level 2 sub-sectors in more detail by highlighting activity happening within them at Level 3.

1.4.1 Renewable Energy Market at Level 2

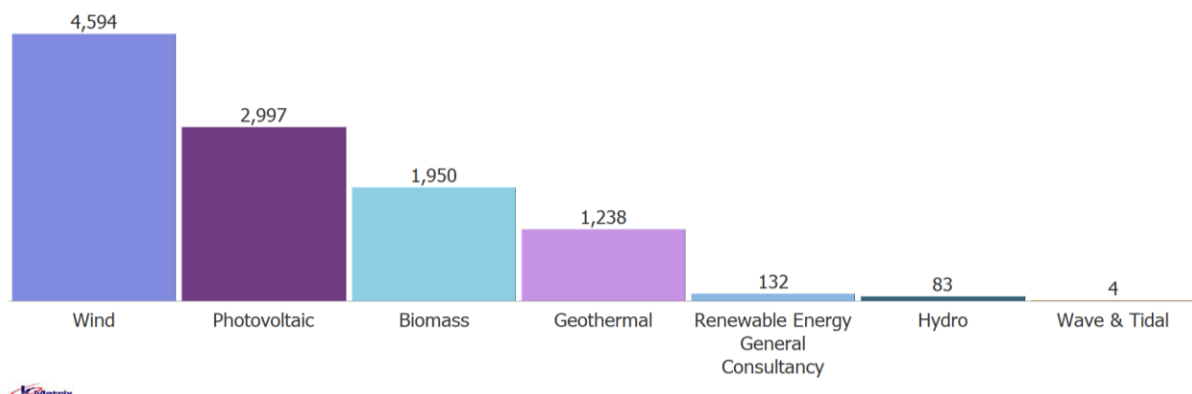
Figure 11: Sales 2019/20 in £m (Level 2)



Renewable Energy is then split into seven sub-sectors, of which four account for 98% of sales (Figure 11). These four are made up of Wind 42%, Photovoltaic 27%, Biomass 18% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from £505.8m to £564.2m; Photovoltaic from £329.8m to £367.8m; Biomass from £216.6m to £241.4m and Geothermal from £137.3m to £152.8m.

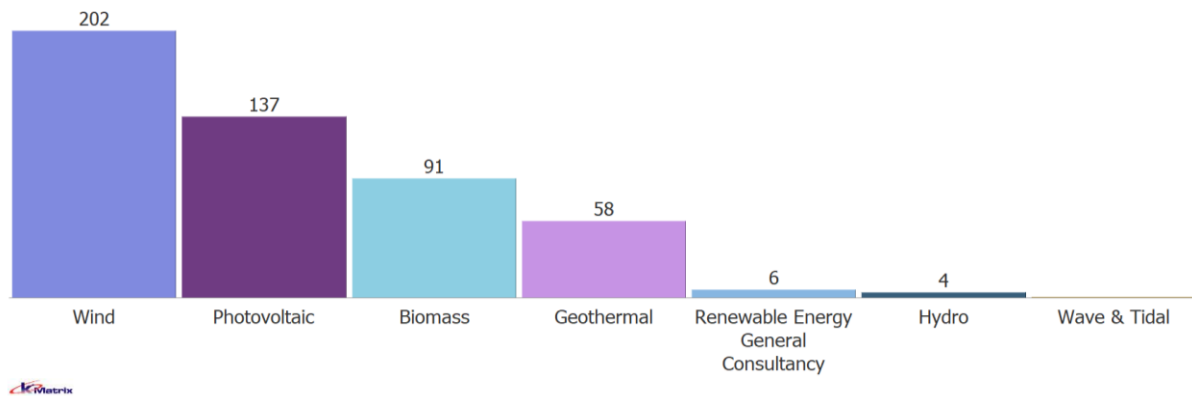
Figure 12: Employment 2019/20 (Level 2)



The same four sub-sectors account for 98% of employment (Figure 12). They are made up of Wind 42%, Photovoltaic 27%, Biomass 18% and Geothermal 11%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from 3,956 to 4,594; Photovoltaic from 2,589 to 2,997; Biomass from 1,685 to 1,950 and Geothermal from 1,071 to 1,238.

Figure 13: Companies 2019/20 (Level 2)



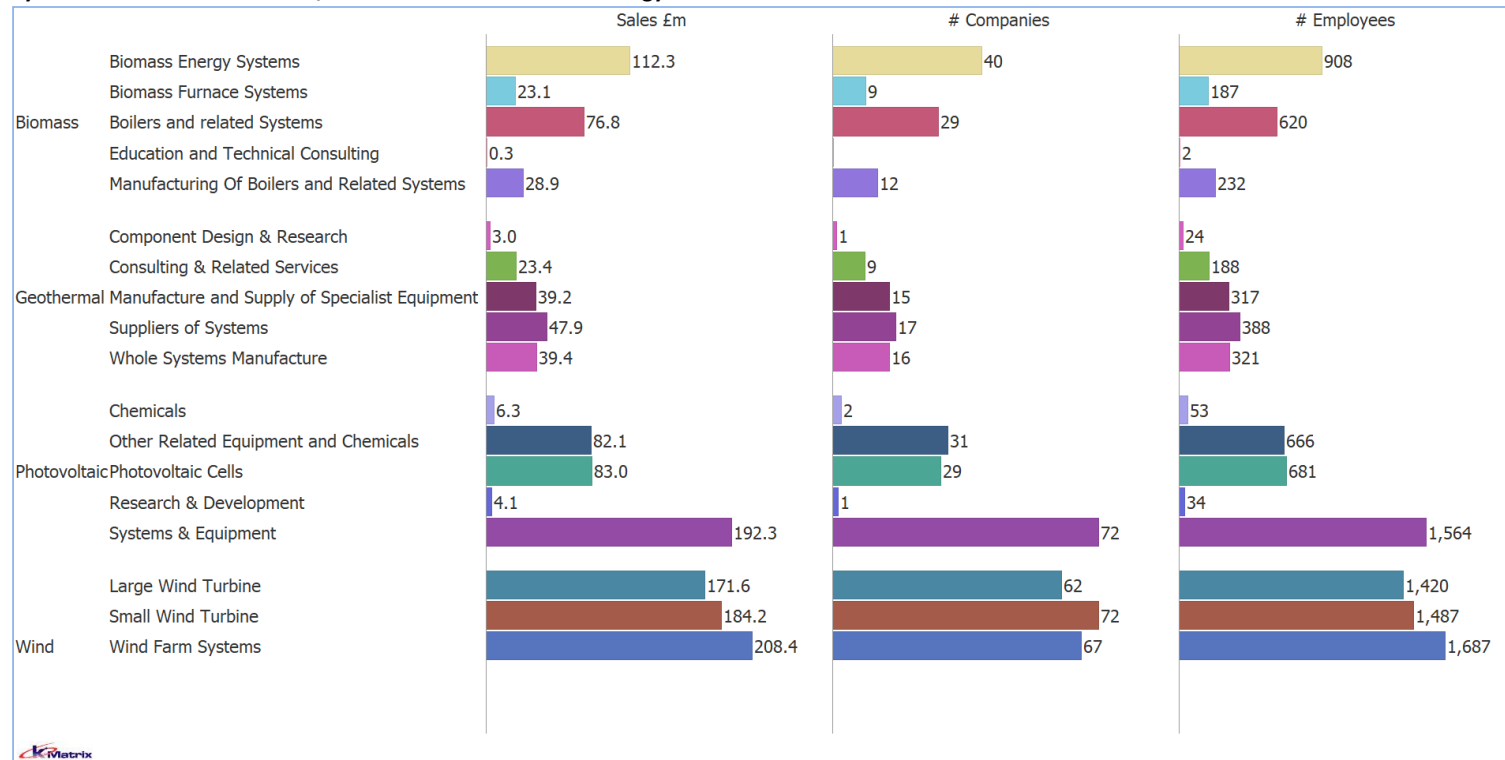
The same four sub-sectors also account for 98% of companies (Figure 13). They are made up of Wind 41%, Photovoltaic 28%, Biomass 18% and Geothermal 12%.

Each of these four sub-sectors have grown between 2017/18 and 2019/20: Wind from 190 to 202; Photovoltaic from 130 to 137; Biomass from 86 to 91 and Geothermal from 55 to 58.

Note: there are 0 companies listed for Wave & Tidal, because these are engineering services to the wave and tidal sector from various companies, delivered by the equivalent of 4 employees from various organisations, however counting all of those organisations as companies would give a false impression of the sub-sector being larger than it is. The sales are opportunistic and not necessarily regular by their nature.

1.4.2 Renewable Energy Market at Level 3

Figure 14: Summary of selected metrics for 2019/20 for selected Renewable Energy Level 2 sub-sectors at Level 3



The top four Level 2 sub-sectors for Low Carbon are Wind, Photovoltaic, Biomass and Geothermal, making up 98% of the Renewable Energy market in the Coventry and Warwickshire LEP. Figure 14 shows a summary of the Sales, Companies and Employees for these Level 2 sub-sectors, broken out into their Level 3 sub-sectors.

Wind is the largest Level 2 sub-sector with 42% of sales and has three sub-sectors at Level 3, the largest being Wind Farm Systems which makes up 37% of sales in this market. Example companies include those providing power firming systems and services, maintenance services and grid integration services.

Photovoltaic has five sub-sectors at level 3, the largest being Systems & Equipment which makes up 52% of sales in this market. Example companies include systems developers, suppliers and installers.

Biomass has five sub-sectors at level 3, the largest being Biomass Energy Systems which makes up 47% of the sales in this market, example companies include developers, installers and consultancies.

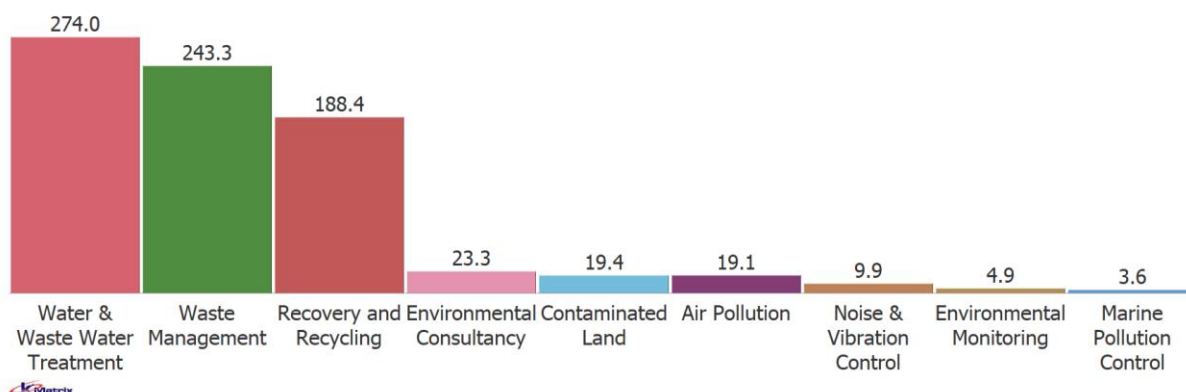
Geothermal has five sub-sectors at Level 3, the largest being Suppliers of Systems which makes up 31% of the sales in this market. Example companies include lateral geothermal systems providers and installers at the domestic and small commercial level and vertical control systems developers and suppliers.

1.5 Coventry and Warwickshire LEP's LCEGS Level 1 - Environmental Market

In this section we look at the Environmental market in greater detail. Initially we split the market into eight further sub-sectors, Level 2, and then look at the highest performing Level 2 sub-sectors in more detail by highlighting the activity happening within them at Level 3.

1.5.1 Environmental Market at Level 2

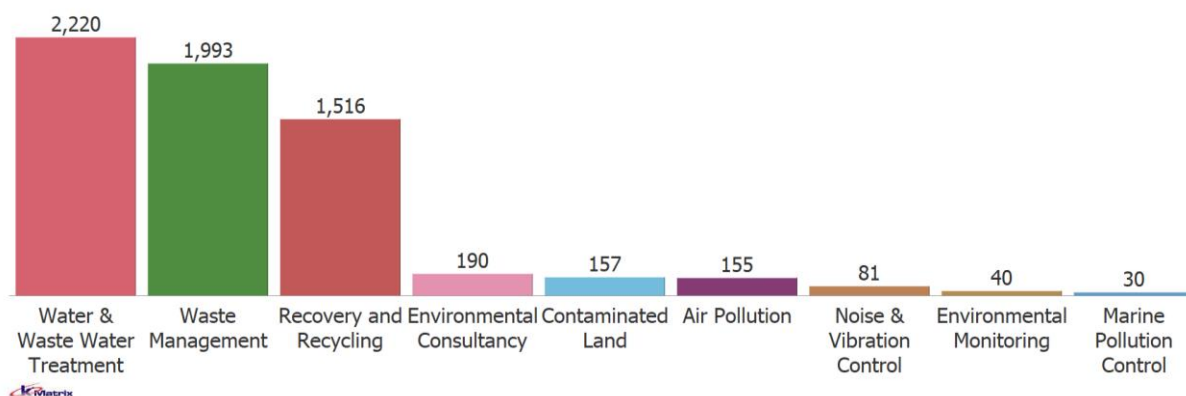
Figure 15: Sales 2019/20 in £m (Level 2)



Environmental is split into nine sub-sectors, of which three account for 90% of sales (Figure 15). These three are made up of Water Supply & Waste Water Treatment 35%, Waste Management 31% and Recovery & Recycling 24%.

Each of these three sub-sectors have grown between 2017/18 and 2019/20: Water Supply and Waste Water Treatment from £246.1m to £274.0m; Waste Management from £218.6m to £243.3m and Recovery and Recycling from £169.4m to £188.4m.

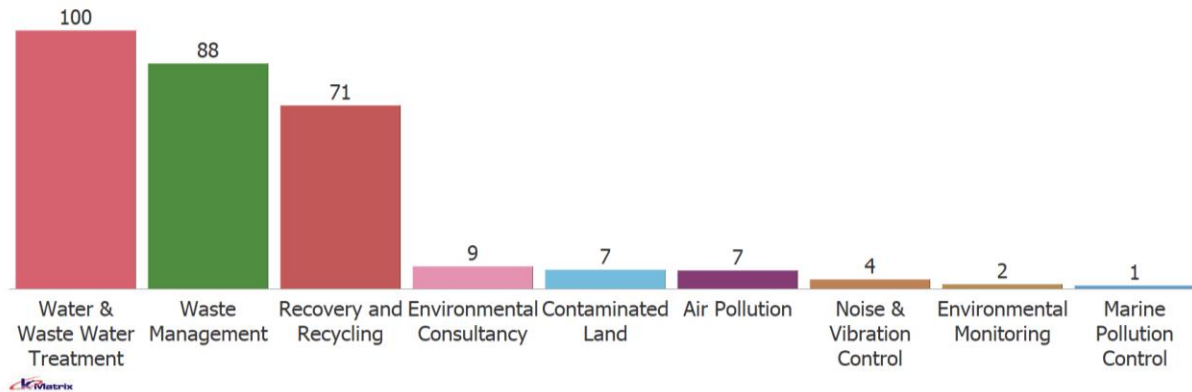
Figure 16: Employment 2019/20 (Level 2)



The same three sub-sectors account for 90% of employment (Figure 16). They are made up of Water Supply & Waste Water Treatment 35%, Waste Management 31% and Recovery & Recycling 24%.

Each of these three sub-sectors have grown between 2017/18 and 2019/20: Water & Waste Water Treatment from 1,922 to 2,220; Waste Management from 1,724 to 1,993 and Recovery and Recycling from 1,313 to 1,516.

Figure 17: Companies 2019/20 (Level 2)



The same three sub-sectors also account for 89% of companies (Figure 17). They are made up of Water Supply & Waste Water Treatment 34%, Waste Management 30% and Recovery & Recycling 24%.

Each of these three sub-sectors have grown between 2017/18 and 2019/20: Water & Waste Water Treatment from 96 to 100; Waste Management from 83 to 88 and Recovery and Recycling from 68 to 71.

1.5.2 Environmental Market at Level 3

Figure 18: Summary of selected metrics for 2019/20 for Waste Management and Water & Waste Water Treatment sub-sectors at Level 3



Figure 18 shows the Sales, Companies and Employees for the Waste Management and Water & Waste Water Treatment Level 2 sub-sectors broken down into their Level 3 sub-sectors.

Water & Waste Water Treatment is made up of four Level 3 sub-sectors, the largest being Water Treatment and Distribution which makes up 77% of sales. Example activities include development and implementation by utilities along with supply, consultancy and implementation by independent consulting engineers.

Waste Management is made up of four Level 3 sub-sectors with sales more evenly distributed across them than for the Water and Waste Water Treatment market. The largest Level 3 sub-sector is Equipment for Waste Treatment which makes up 36% of sales in the market. Example companies are those involved in development, manufacture and supply. The next largest sub-sector is Construction & Operation of Waste Treatment Facilities which makes up 34% of sales. Example companies are those involved in both public and private operations management and supply and installation of operational equipment.

Figure 19: Summary of selected metrics for 2019/20 for Recovery and Recycling at Level 3

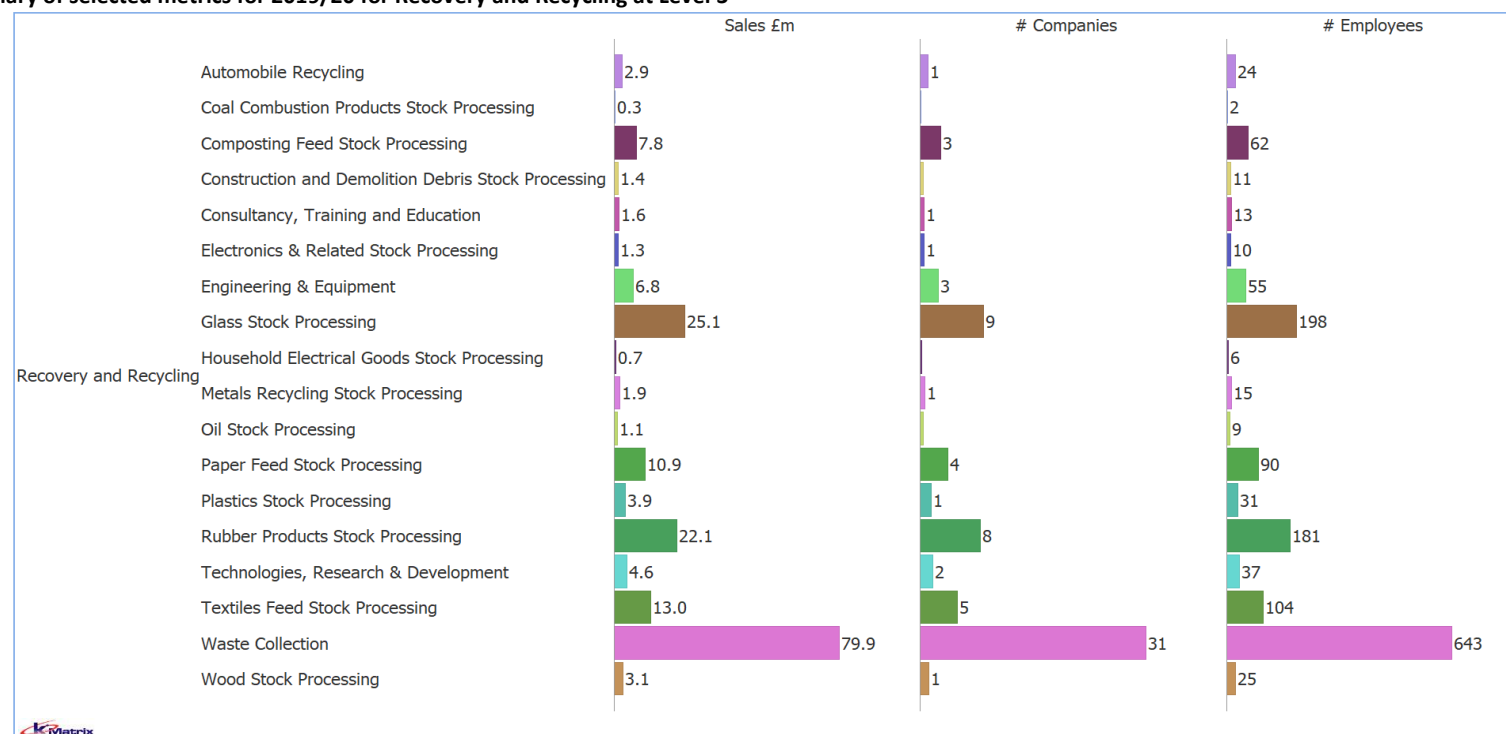


Figure 19 shows the Sales, Companies and Employees for the Level 2 Recovery & Recycling sub-sector broken down into its Level 3 sub-sectors. There are eighteen Level 3 sub-sectors and Waste Collection, including the collection of all waste, both municipal and commercial (landfill and recyclates), is clearly the largest sub-sector making up 42% of all sales in the Recovery and Recycling sub-sector. There are then a number of waste stream stock processing sub-sectors with the largest ones being Glass, Rubber Products, Textiles, Paper and Composting.

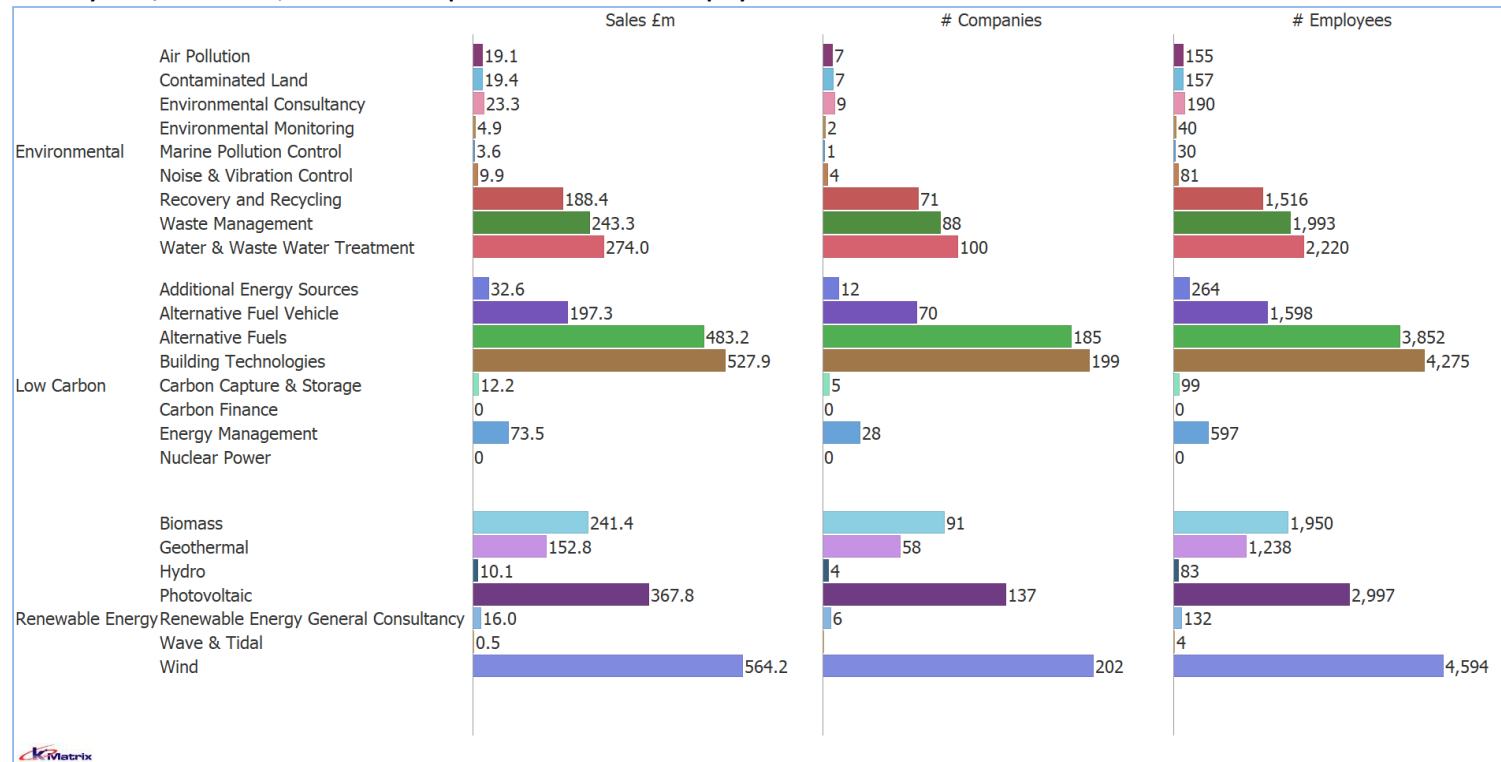
1.6 Coventry and Warwickshire LEP's LCEGS Level 2 Summary

Figure 20 compares all 24 sub-sectors of LCEGS and shows that the five leading sub-sectors: Wind (16%), Building Technologies (15%), Alternative Fuels (14%), Photovoltaic (11%) and Water & Waste Water Treatment (8%) have the largest share in terms of sales, company numbers and employment and accounted for 64% of Coventry and Warwickshire LEP's LCEGS sector activity in 2019/20.

There is then a second grouping of six sub-sectors that are: Waste Management 7%, Biomass 7%, Alternative Fuel Vehicle 6%, Recovery and Recycling 5%, Geothermal 4% and Energy Management 2%, and that make up a further 32% of the LCEGS sector sales in 2019/20.

These 11 sub-sectors dominate the LCEGS sector sales and together made up 96% of its overall sales in 2019/20.

Figure 20: LCEGS Summary 2019/20 for Sales, Number of Companies and Number of Employees



1.7 Coventry and Warwickshire LEP and the MEH's LCEGS compared

Coventry and Warwickshire LEP accounts for 13% of the Midlands Energy Hub Region's LCEGS sector.

Figure 21: Coventry and Warwickshire LEP Measures 2019/20 by Level 1

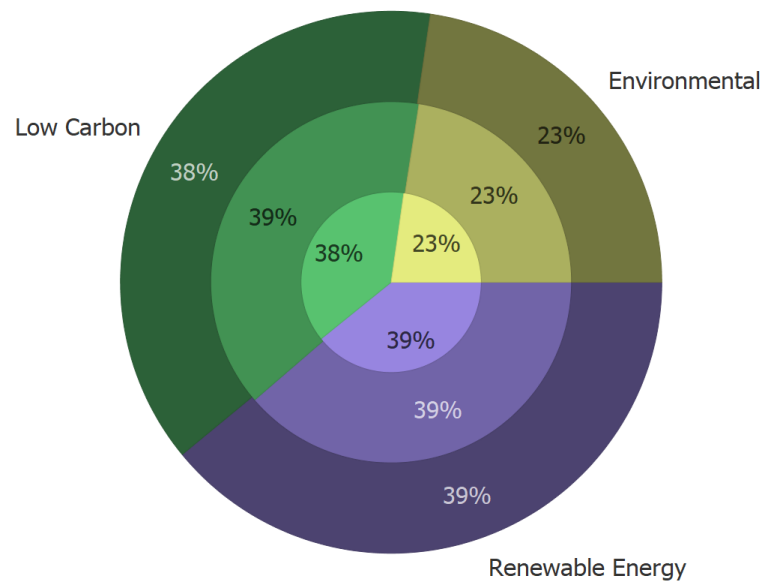
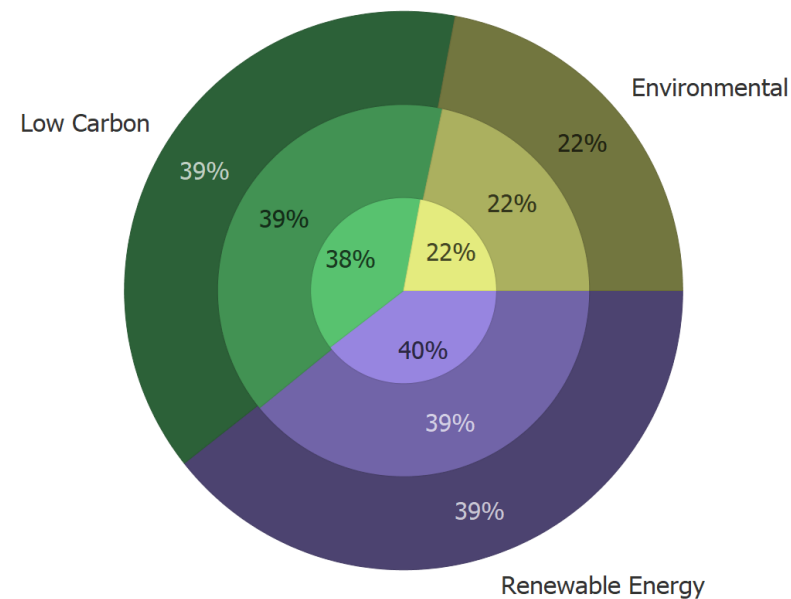


Figure 22: MEH Measures 2019/20 by Level 1



Figures 21 and 22 compare the profile of the Coventry and Warwickshire LEP and the MEH region's LCEGS activities at Level 1 for sales (outer circle), companies (middle circle) and employment (inner circle). Coventry and Warwickshire LEP is broadly in line with the MEH LCEGS sector, with slightly more market within the Environmental sub-sector than the regional average.

Figure 23: Coventry and Warwickshire LEP's LCEGS sub-sectors for 2019/20 at Level 2

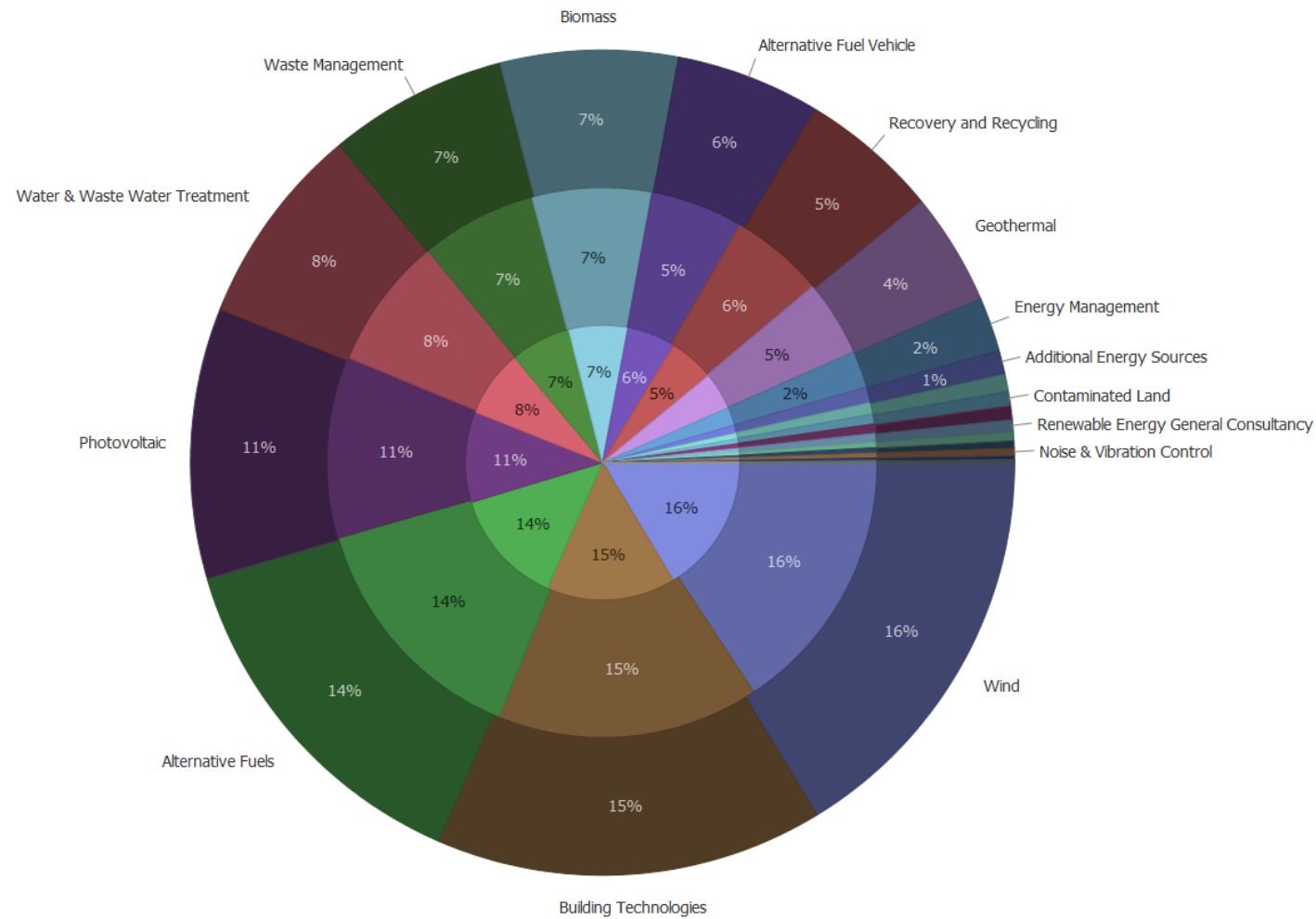
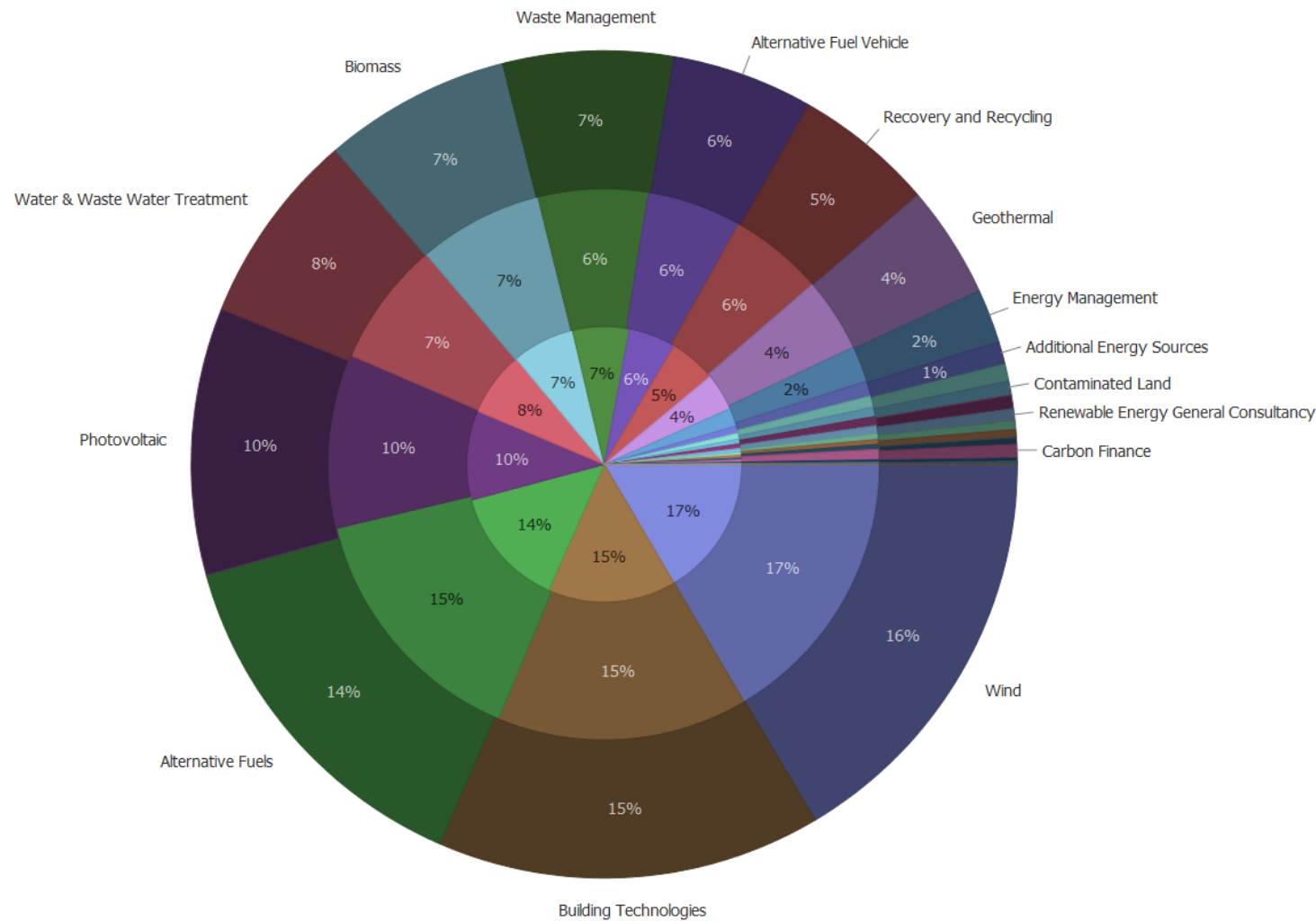


Figure 24: MEH's LCEGS sub-sectors for 2019/20 at Level 2



Figures 23 and 24 extends the analysis by comparing the profile of the Coventry and Warwickshire LEP and MEH's LCEGS activities at Level 2 for sales (outer circle), companies (middle circle) and employment (inner circle).

There are only subtle differences between the two, such as slightly stronger Photovoltaic sub-sector and Waste Management being slightly stronger than Biomass in the Coventry and Warwickshire LEP than the regional average.

Other differences relate to percentage share of market for the different measures, although this is within 1% of the Regional average.

1.8 Coventry and Warwickshire LEP's LCEGS Investment in R&D

This section examines the investment profile of the Coventry and Warwickshire LEP at the sector level and Level 1 for 2017/18, 2018/19 and 2019/20 and for Level 2 and the top Level 3 subsectors.

Figure 25: Coventry and Warwickshire LEP's LCEGS Investment in R&D by Fiscal Year

Private Equity Investment in R&D

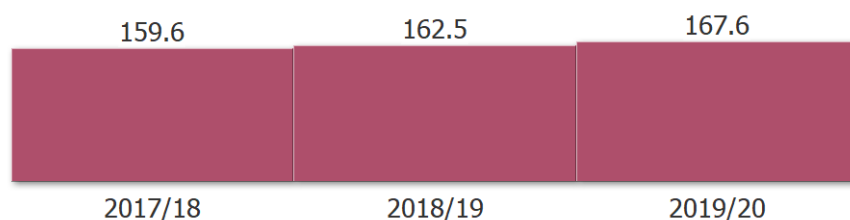
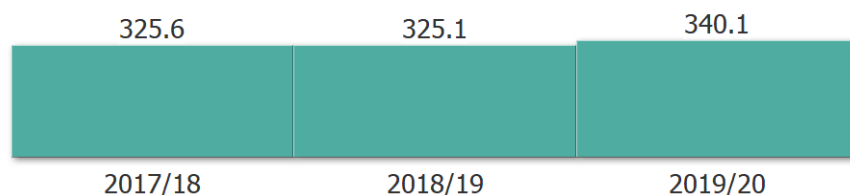


Figure 25 shows the investment for the three financial years of the sector study, made into the whole LCEGS sector.

Private Equity Investment has grown from £160m in 2017/18 to £168m in 2019/20, representing 1.8% growth between 2017/18 and 2018/19 and 3.1% growth between 2018/19 and 2019/20.

By comparison, the MEH region's growth rates were 5.8% and 6.1%.

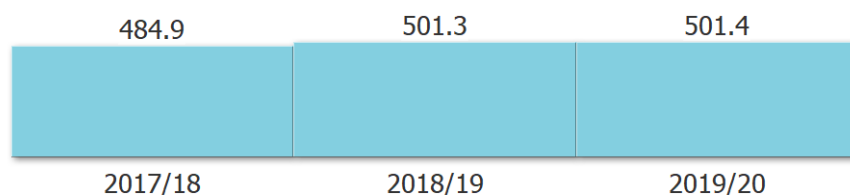
Venture Capital Investment in R&D



Venture Capital Investment has grown from £326m in 2017/18 to £340m in 2019/20, representing -0.2% growth between 2017/18 and 2018/19 and 4.6% growth between 2018/19 and 2019/20.

By comparison, the MEH region's growth rates were 5.4% and 6.2%.

Other Investment in R&D



Other Investment has grown from £485m in 2017/18 to £501m in 2019/20, representing 3.4% growth between 2017/18 and 2018/19 and 0.02% growth between 2018/19 and 2019/20.

By comparison, the MEH region's growth rates were 6.2% and 5.6%.

Figure 26: Coventry and Warwickshire LEP's LCEGS Investment in R&D by Fiscal Year – Level 1

Private Equity Investment in R&D

2017/18	2018/19	2019/20
159.6	162.5	167.6
Environmental (35.6)	Environmental (37.1)	Environmental (38.2)
Renewable Energy (60.9)	Low Carbon (62.1)	Renewable Energy (63.9)
Low Carbon (63.1)	Renewable Energy (63.4)	Low Carbon (65.5)

Figure 26 shows the investment for the three financial years of the sector study, made into the LCEGS sector, split into Level 1.

Private Equity Investment was split in 2019/20 Renewable Energy 38%, Low Carbon 39% and Environmental 23%. This is broadly in line with the sales split of 39%, 38% and 23%.

Venture Capital Investment in R&D

2017/18	2018/19	2019/20
325.6	325.1	340.1
Environmental (70.8)	Environmental (73.4)	Environmental (73.3)
Renewable Energy (126.9)	Renewable Energy (123.0)	Low Carbon (133.0)
Low Carbon (127.9)	Low Carbon (128.7)	Renewable Energy (133.8)

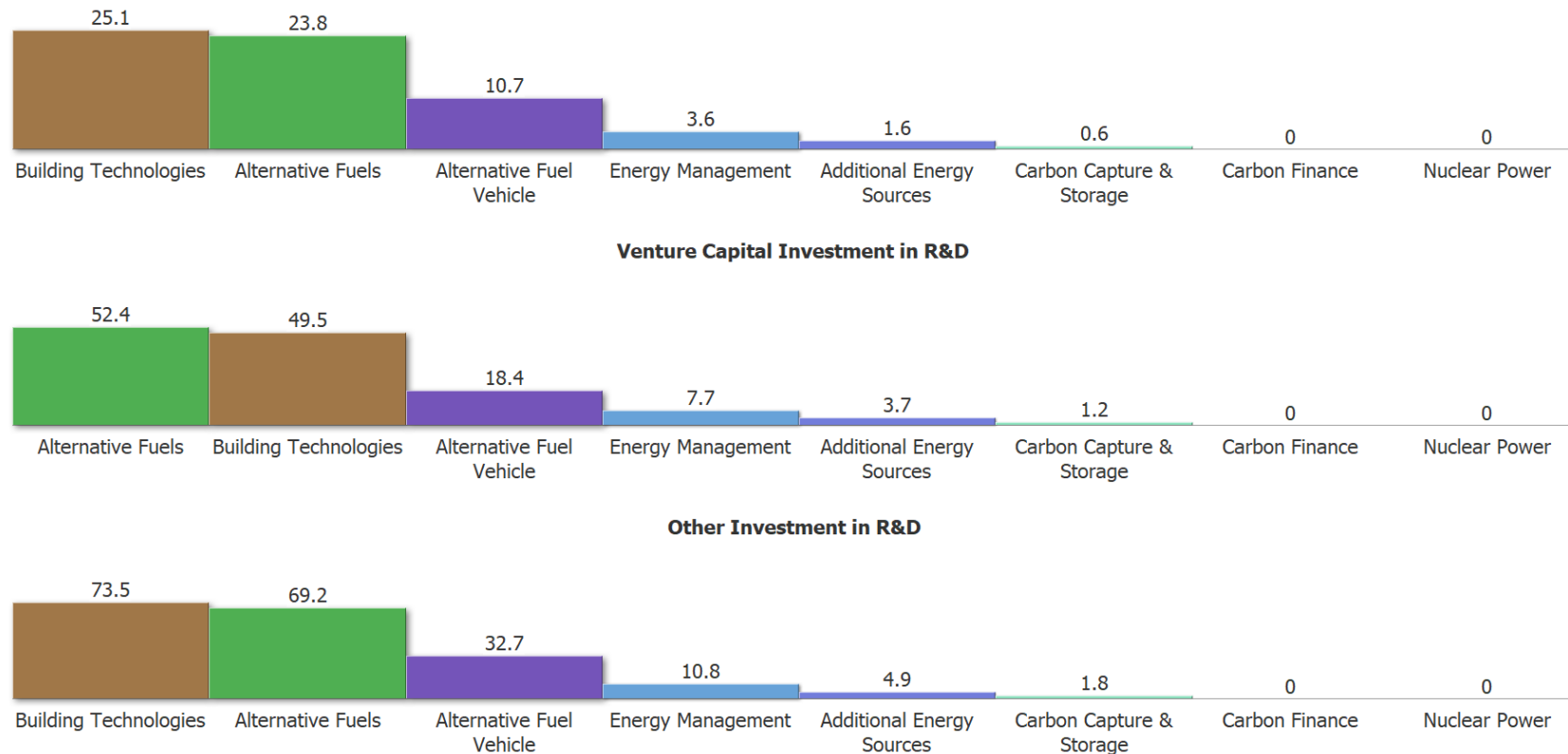
Venture Capital Investment was split in 2019/20 Renewable Energy 39%, Low Carbon 39% and Environmental 22%. This is broadly in line with the sales split of 39%, 38% and 23%.

Other Investment in R&D

2017/18	2018/19	2019/20
484.9	501.3	501.4
Environmental (111.1)	Environmental (111.3)	Environmental (113.2)
Low Carbon (186.5)	Renewable Energy (182.9)	Low Carbon (192.9)
Renewable Energy (187.3)	Low Carbon (207.2)	Renewable Energy (195.3)

Other Investment was split in 2019/20 Renewable Energy 39%, Low Carbon 38% and Environmental 23%. This is in line with the sales split of 39%, 38% and 23%.

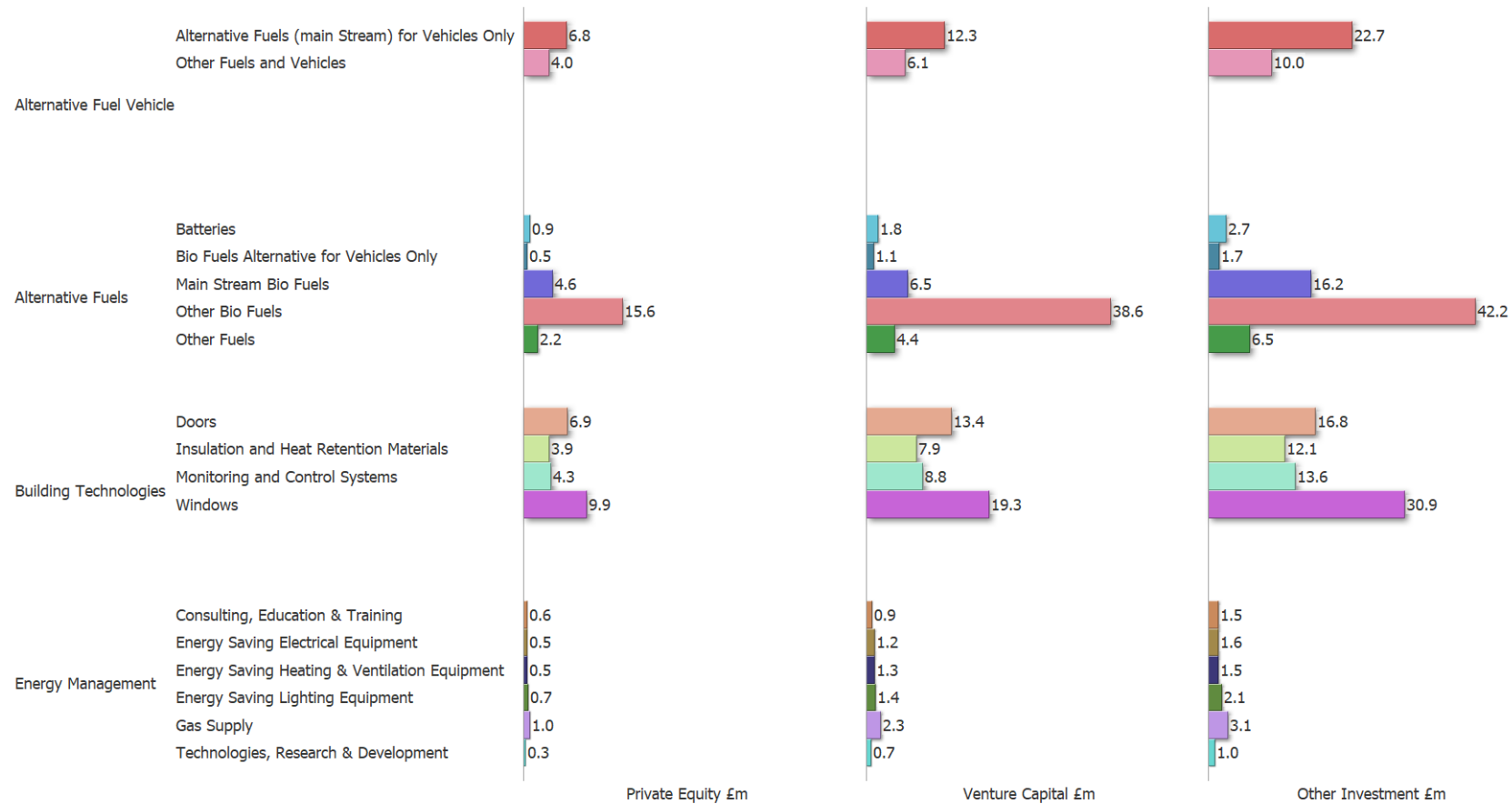
Figure 27: Coventry and Warwickshire LEP's LCEGS Investment in R&D 2019/20 – Level 2 Low Carbon Private Equity Investment in R&D



Investment for most of the top four Low Carbon sub-sectors grew between 2017/18 and 2019/20:

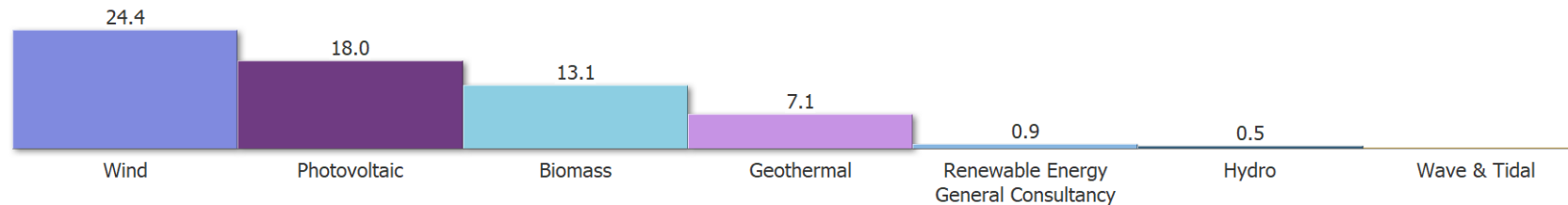
- Building Technologies from £24m to £25m for Private Equity, down from £51m to £50m for Venture Capital and steady at £74m for Other Investment
- Alternative Fuels steady at £24m for Private Equity, from £47m to £52m for Venture Capital and steady at £69m Other Investment
- Alternative Fuel Vehicle from £11m to £74m for Private Equity, down from £19m to £18m for Venture Capital and £27m to £33m for Other Investment
- Energy Management from £3m to £4m for Private Equity, £7m to £8m for Venture Capital and £10m to £11m for Other Investment

Figure 28: Coventry and Warwickshire LEP's LCEGS Investment in R&D by 2019/20 – Low Carbon top Level 3 sub-sectors

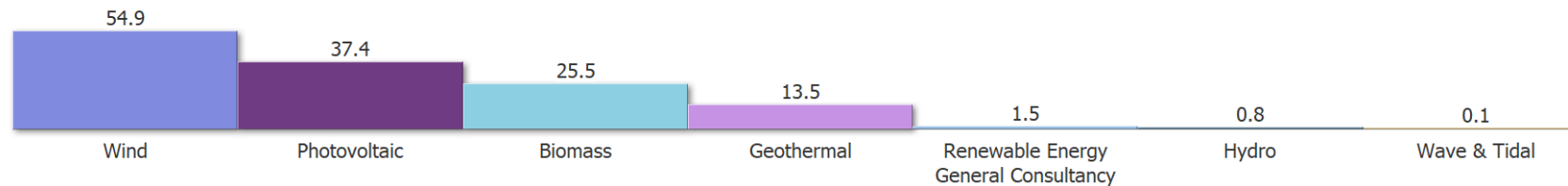


Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Low Carbon have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.3.

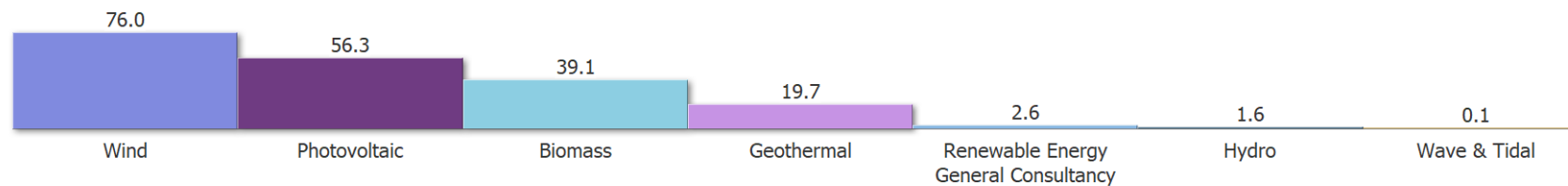
Figure 29: Coventry and Warwickshire LEP's LCEGS Investment in R&D 2019/20 – Level 2 Renewable Energy
Private Equity Investment in R&D



Venture Capital Investment in R&D



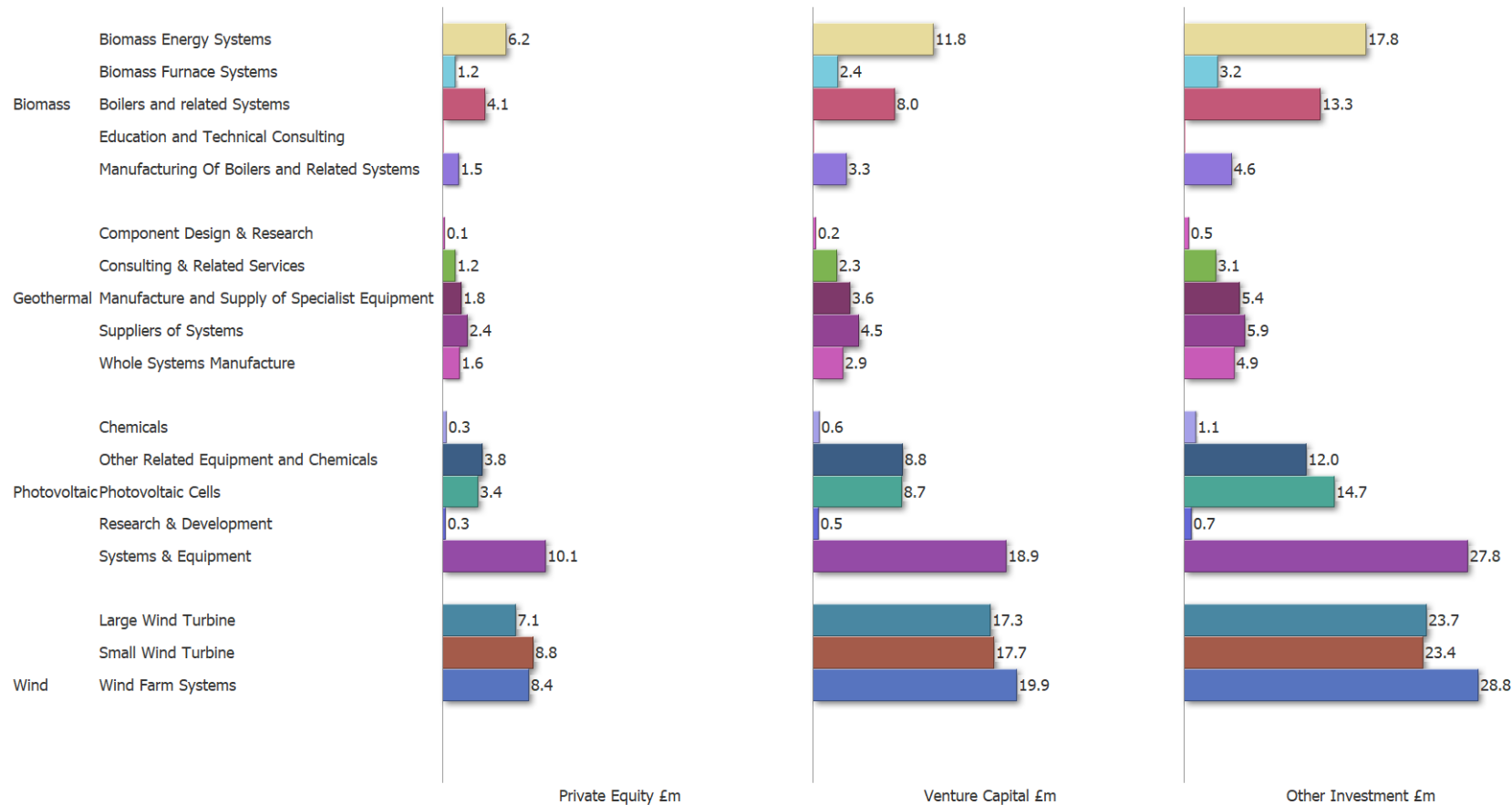
Other Investment in R&D



Investment for most of the top four Renewable Energy sub-sectors grew between 2017/18 and 2019/20:

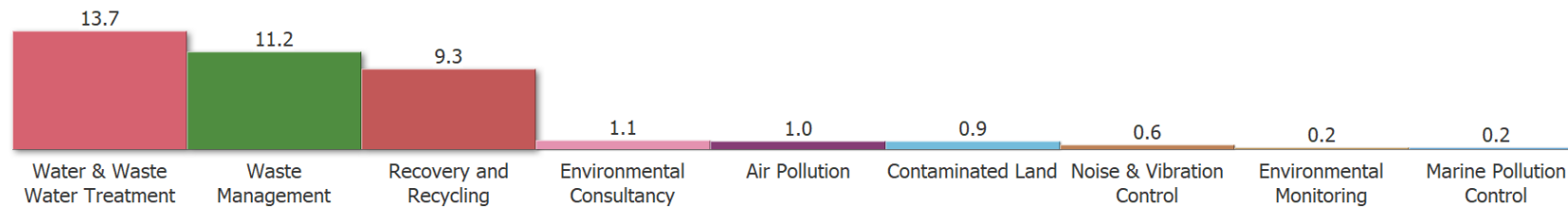
- Wind fell from £26m to £24m for Private Equity, was steady at £55m for Venture Capital and fell from £81m to £76m for Other Investment
- Photovoltaic from £16m to £18m for Private Equity, £34m to £37m for Venture Capital and £51m to £56m for Other Investment
- Biomass from £10m to £13m for Private Equity, £20m to £26m for Venture Capital and £39m to £39m for Other Investment
- Geothermal was steady at £7m for Private Equity, down from £15m to £14m for Venture Capital and down from £22m to £20m for Other Investment.

Figure 30: Coventry and Warwickshire LEP's LCEGS Investment in R&D 2019/20 – Renewable Energy top Level 3 sub-sectors

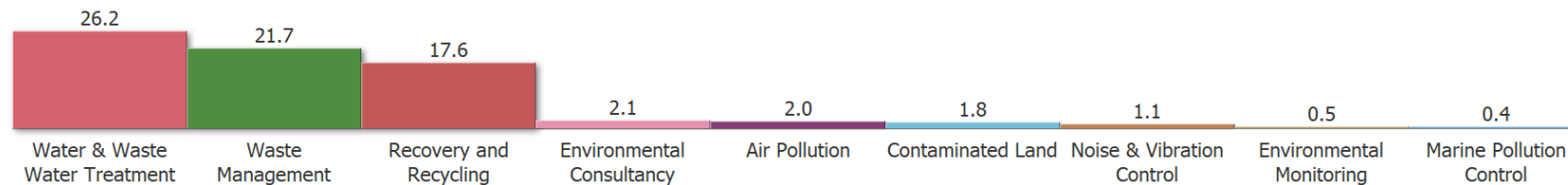


Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Renewable Energy have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.4.

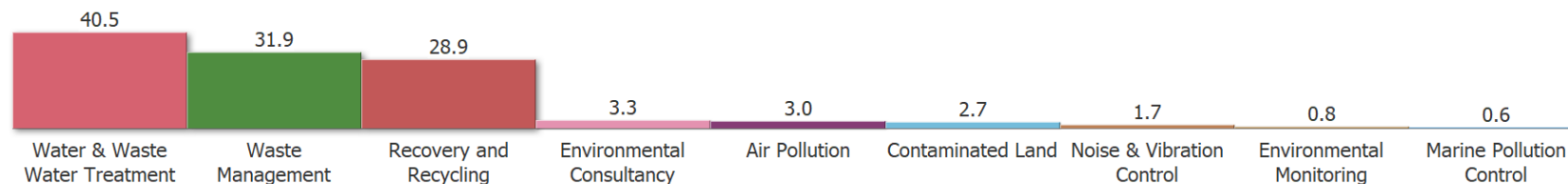
Figure 31: Coventry and Warwickshire LEP's LCEGS Investment in R&D 2019/20 – Level 2 Environmental
Private Equity Investment in R&D



Venture Capital Investment in R&D



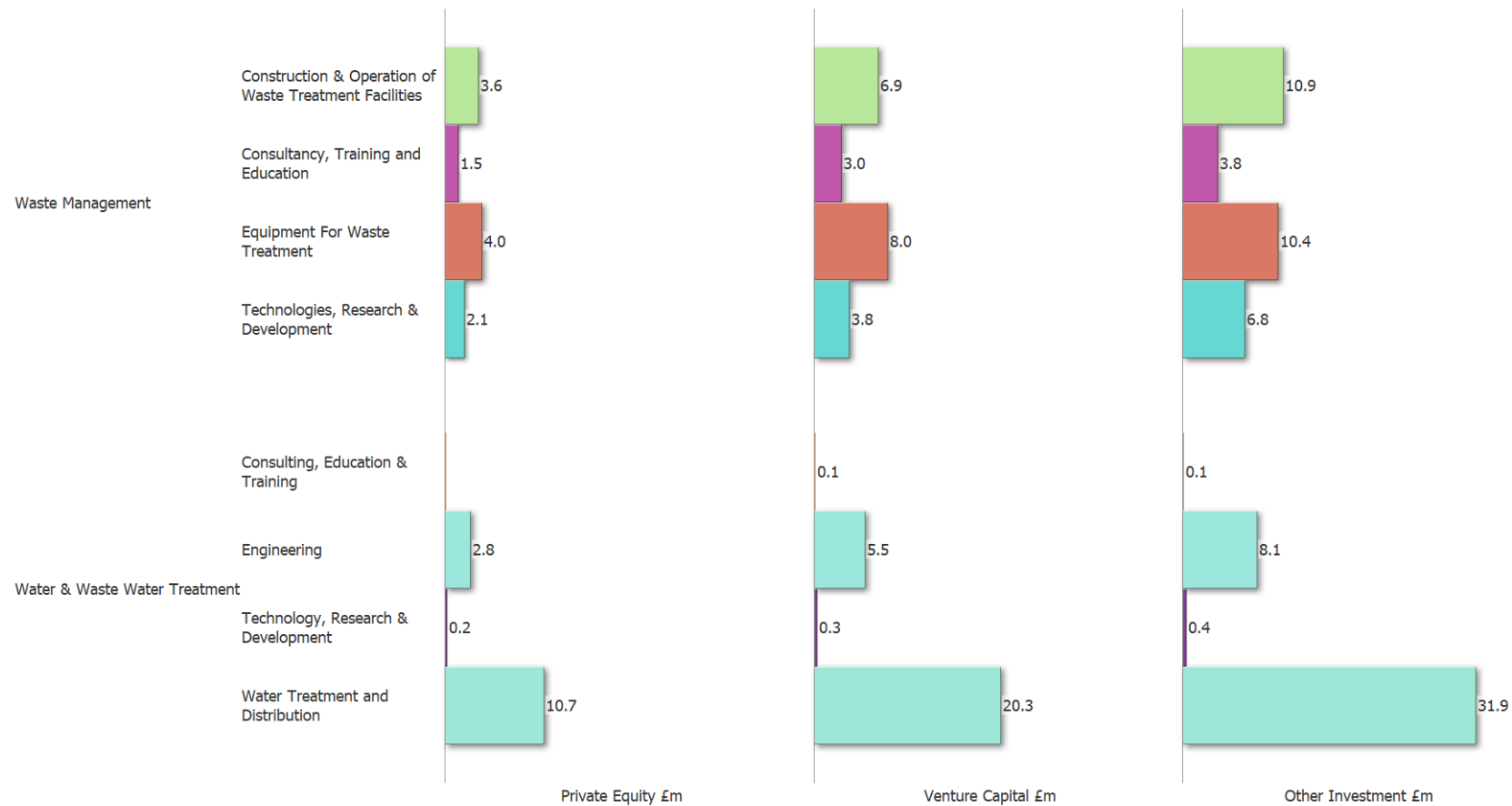
Other Investment in R&D



Investment for each of the top three Environmental sub-sectors grew between 2017/18 and 2019/20:

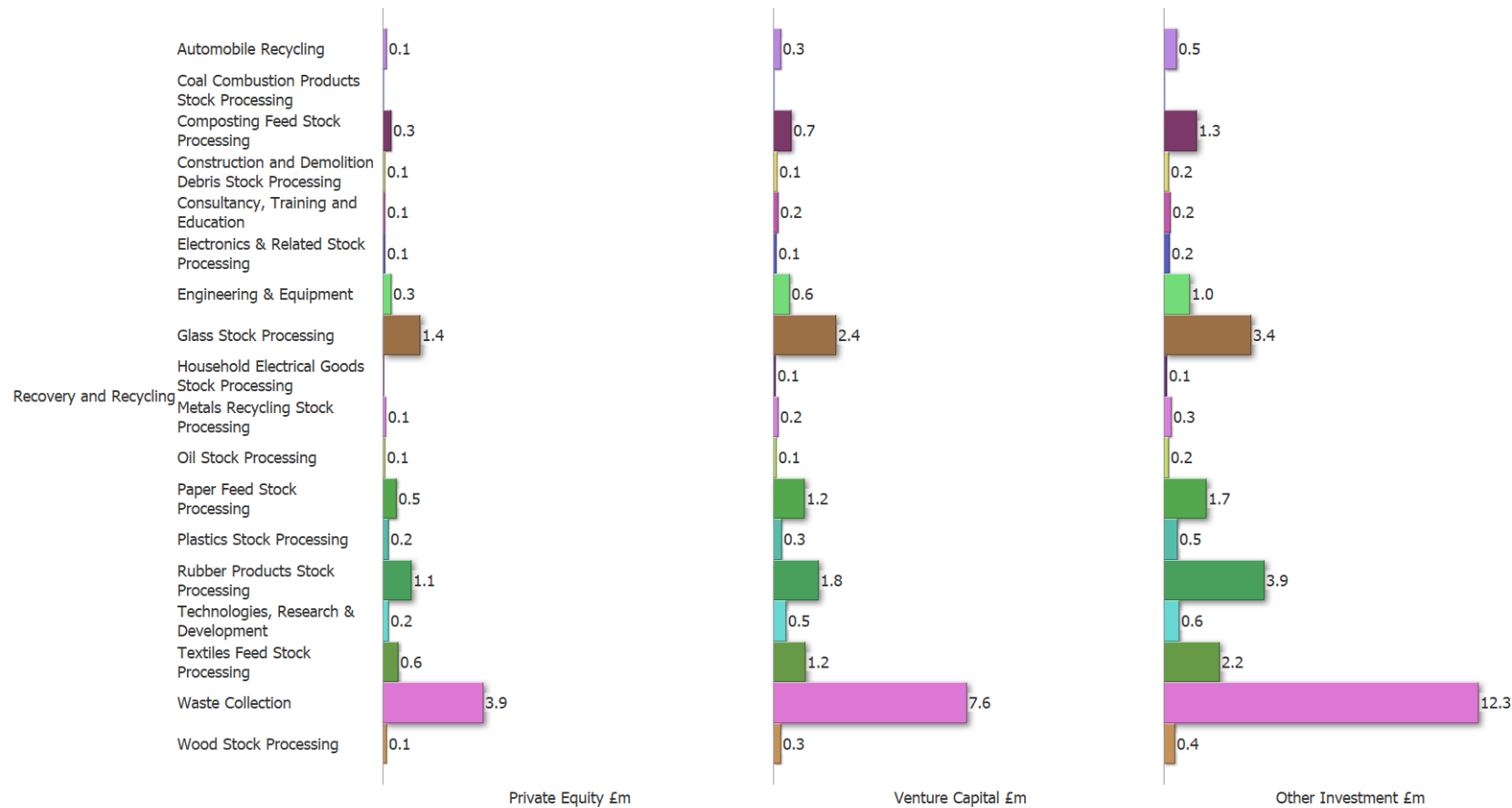
- Water & Waste Water Treatment from £13m to £14m for Private Equity, £25m to £26m for Venture Capital and £40m to £41m for Other Investment
- Waste Management was steady at £11m for Private Equity, grew from £21m to £22m for Venture Capital and fell from £35m to £32m for Other Investment.
- Recovery and Recycling grew from £8m to £9m for Private Equity, was steady at £18m for Venture Capital and grew from £26m to £29m for Other Investment.

Figure 32: Coventry and Warwickshire LEP's LCEGS Investment in 2019/20 – Environmental top Level 3 sub-sectors, Waste Management and Water and Waste Water Treatment



Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Environmental have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.5.

Figure 33: Coventry and Warwickshire LEP's LCEGS Investment in R&D 2019/20 – Environmental top Level 3 sub-sectors, Recovery and Recycling



Investment for the Level 3 sub-sectors of the top Level 2 sub-sectors within Environmental have grown between 2017/18 and 2019/20. The pattern of investment for Private Equity, Venture Capital and Other Investment is similar to the Sales pattern in section 2.5.

1.9 Coventry and Warwickshire LEP's LCEGS Company Size

In this section we look at the number of companies within the Coventry and Warwickshire LEP, split by size of company, using the standard classification of company size. Growth between one year and the next is shown in red.

Company size classifications:

- Start-up = any company formed during the previous 12 months, for 2017/18 that would include companies formed during 2016/17 and so on
- Micro = companies with 2-9 employees
- SME = Small and Medium-sized companies, with 10-249 employees
- Large = companies with 250-1,500 employees
- Corporations = any company with 1,501 or more employees
- Total Companies = the total company count

Start-ups listed in 2017/18 will have been formed in 2016/17, those listed in 2018/19 will have been formed in 2017/18 and those in 2019/20 will have been formed in 2018/19. Start-up companies are a discrete category, not dependent on number of employees and are not double counted in the other categories.

Table 1 shows the company count for the LCEGS sector across the Coventry and Warwickshire LEP, split by Start-up, Micro, SME, Large and Corporations, with the Total Number of Companies for reference. The table is also split by Level 1, providing both a sector and Level 1 overview.

Table 1: Coventry and Warwickshire LEP's LCEGS Number of Companies Split by Company Size, with Growth 2017/18 to 2019/20 – Level 1

# Start-up						# Micro					# SMEs				
Level 1	Growth		Growth		2019/20	2017/18	Growth		Growth		2019/20	Growth		Growth	
	2017/18	%	2018/19	%			2017/18	%	2018/19	%		2017/18	%	2018/19	%
Environmental	14	4.8%	14	0.7%	15	83	4.6%	87	0.3%	87	138	4.9%	144	0.3%	145
Low Carbon	24	4.4%	25	0.3%	25	143	4.1%	149	1.3%	151	238	5.0%	249	-0.4%	248
Renewable Energy	24	4.9%	25	0.8%	25	141	5.5%	149	0.3%	149	235	5.0%	247	0.7%	249
Total	61	4.7%	64	0.6%	64	367	4.7%	385	0.7%	387	611	5.0%	641	0.2%	642

# Large						# Corporations					Total # Companies				
Level 1	Growth		Growth		2019/20	2017/18	Growth		Growth		2019/20	Growth		Growth	
	2017/18	%	2018/19	%			2017/18	%	2018/19	%		2017/18	%	2018/19	%
Environmental	28	4.9%	29	0.1%	29	14	4.6%	14	0.6%	15	276	4.8%	289	0.3%	290
Low Carbon	47	4.5%	49	0.5%	50	24	4.9%	25	0.8%	25	476	4.6%	498	0.3%	499
Renewable Energy	47	5.1%	50	0.4%	50	23	5.6%	25	0.6%	25	471	5.2%	495	0.5%	498
Total	122	4.8%	128	0.4%	128	61	5.1%	64	0.7%	64	1,222	4.9%	1,281	0.4%	1,286

Table 1 shows that the growth in the number of companies per size grouping is similar across the Level 1 sub-sectors, with growth between 2018/19 and 2019/20 being slower in all size groupings than the previous year.

The strongest growth between 2018/19 and 2019/20 of 0.8% was seen in Start-up's in the Renewable Energy sub-sector and Corporations in the Low Carbon sub-sectors, with the weakest growth, being contraction with -0.4% for SME's in the Low Carbon sub-sector.

Tables 2a and 2b show the company count for the LCEGS sector across the Coventry and Warwickshire LEP, split by Start-up, Micro, SME, Large and Corporations, with the Total Number of Companies again for reference. The table is also split by Level 2.

Table 2a: Coventry and Warwickshire LEP's LCEGS Number of Companies Split by Company Size, with Growth 2017/18 to 2019/20 – Level 2

Level 1	Level 2	# Start-up					# Micro					# SMEs				
		Growth		Growth		2019/20	Growth		Growth		2019/20	Growth		Growth		2019/20
		2017/18	%	2018/19	%		2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Environmental	Air Pollution	0	0.0%	0	0.0%	0	2	0.0%	2	0.0%	2	3	33.3%	4	0.0%	4
Environmental	Contaminated Land	0	0.0%	0	0.0%	0	2	0.0%	2	0.0%	2	4	0.0%	4	0.0%	4
Environmental	Environmental Consultancy	0	0.0%	0	0.0%	0	2	50.0%	3	0.0%	3	4	0.0%	4	0.0%	4
Environmental	Environmental Monitoring	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	1	0.0%	1	0.0%	1
Environmental	Marine Pollution Control	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1
Environmental	Noise & Vibration Control	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	2	0.0%	2	0.0%	2
Environmental	Recovery and Recycling	3	33.3%	4	0.0%	4	20	5.0%	21	0.0%	21	34	5.9%	36	0.0%	36
Environmental	Waste Management	4	0.0%	4	0.0%	4	25	4.0%	26	0.0%	26	42	4.8%	44	0.0%	44
Environmental	Water & Waste Water Treatment	5	0.0%	5	0.0%	5	29	3.4%	30	0.0%	30	48	4.2%	50	0.0%	50
Low Carbon	Additional Energy Sources	1	0.0%	1	0.0%	1	3	33.3%	4	0.0%	4	6	0.0%	6	0.0%	6
Low Carbon	Alternative Fuel Vehicle	3	0.0%	3	33.3%	4	20	5.0%	21	0.0%	21	33	6.1%	35	0.0%	35
Low Carbon	Alternative Fuels	9	0.0%	9	0.0%	9	54	1.9%	55	3.6%	57	89	4.5%	93	-1.1%	92
Low Carbon	Building Technologies	9	11.1%	10	0.0%	10	57	5.3%	60	0.0%	60	95	4.2%	99	0.0%	99
Low Carbon	Carbon Capture & Storage	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	2	0.0%	2	0.0%	2
Low Carbon	Carbon Finance	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Low Carbon	Energy Management	1	0.0%	1	0.0%	1	8	0.0%	8	0.0%	8	13	7.7%	14	0.0%	14
Low Carbon	Nuclear Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewable Energy	Biomass	4	0.0%	4	25.0%	5	26	3.8%	27	0.0%	27	43	4.7%	45	0.0%	45
Renewable Energy	Geothermal	3	0.0%	3	0.0%	3	17	0.0%	17	0.0%	17	28	3.6%	29	0.0%	29
Renewable Energy	Hydro	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1	2	0.0%	2	0.0%	2
Renewable Energy	Photovoltaic	6	16.7%	7	0.0%	7	39	5.1%	41	0.0%	41	65	4.6%	68	1.5%	69
Renewable Energy	Renewable Consultancy	0	0.0%	0	0.0%	0	2	0.0%	2	0.0%	2	3	0.0%	3	0.0%	3
Renewable Energy	Wave & Tidal	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Renewable Energy	Wind	10	0.0%	10	0.0%	10	57	5.3%	60	1.7%	61	95	5.3%	100	1.0%	101
Total		58	5.2%	61	3.3%	63	367	4.4%	383	0.8%	386	613	4.7%	642	0.2%	643

Table 2b: Coventry and Warwickshire LEP's LCEGS Number of Companies Split by Company Size, with Growth 2017/18 to 2019/20 – Level 2

Level 1	Level 2	# Large					# Corporations					Total # Companies				
		Growth		Growth		2019/20	Growth		Growth		2019/20	Growth		Growth		2019/20
		2017/18	%	2018/19	%		2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Environmental	Air Pollution	1	0.0%	1	0.0%	1	0	0.0%	0	0.0%	0	7	0.0%	7	0.0%	7
Environmental	Contaminated Land	1	0.0%	1	0.0%	1	0	0.0%	0	0.0%	0	7	0.0%	7	0.0%	7
Environmental	Environmental Consultancy	1	0.0%	1	0.0%	1	0	0.0%	0	0.0%	0	8	12.5%	9	0.0%	9
Environmental	Environmental Monitoring	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	2	0.0%	2	0.0%	2
Environmental	Marine Pollution Control	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	1	0.0%	1	0.0%	1
Environmental	Noise & Vibration Control	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	4	0.0%	4	0.0%	4
Environmental	Recovery and Recycling	7	0.0%	7	0.0%	7	3	33.3%	4	0.0%	4	68	4.4%	71	0.0%	71
Environmental	Waste Management	8	12.5%	9	0.0%	9	4	0.0%	4	0.0%	4	83	6.0%	88	0.0%	88
Environmental	Water & Waste Water Treatment	10	0.0%	10	0.0%	10	5	0.0%	5	0.0%	5	96	4.2%	100	0.0%	100
Low Carbon	Additional Energy Sources	1	0.0%	1	0.0%	1	1	0.0%	1	0.0%	1	11	9.1%	12	0.0%	12
Low Carbon	Alternative Fuel Vehicle	7	0.0%	7	0.0%	7	3	33.3%	4	0.0%	4	66	6.1%	70	0.0%	70
Low Carbon	Alternative Fuels	18	0.0%	18	0.0%	18	9	0.0%	9	0.0%	9	178	3.9%	185	0.0%	185
Low Carbon	Building Technologies	19	5.3%	20	0.0%	20	9	11.1%	10	0.0%	10	189	5.3%	199	0.0%	199
Low Carbon	Carbon Capture & Storage	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	4	25.0%	5	0.0%	5
Low Carbon	Carbon Finance	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Low Carbon	Energy Management	3	0.0%	3	0.0%	3	1	0.0%	1	0.0%	1	26	7.7%	28	0.0%	28
Low Carbon	Nuclear Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewable Energy	Biomass	9	0.0%	9	0.0%	9	4	25.0%	5	0.0%	5	86	4.7%	90	1.1%	91
Renewable Energy	Geothermal	6	0.0%	6	0.0%	6	3	0.0%	3	0.0%	3	55	5.5%	58	0.0%	58
Renewable Energy	Hydro	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	4	0.0%	4	0.0%	4
Renewable Energy	Photovoltaic	13	7.7%	14	0.0%	14	6	16.7%	7	0.0%	7	130	4.6%	136	0.7%	137
Renewable Energy	Renewable Consultancy	1	0.0%	1	0.0%	1	0	0.0%	0	0.0%	0	6	0.0%	6	0.0%	6
Renewable Energy	Wave & Tidal	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Renewable Energy	Wind	19	5.3%	20	0.0%	20	9	11.1%	10	0.0%	10	190	5.8%	201	0.5%	202
Total		124	3.2%	128	0.0%	128	57	10.5%	63	0.0%	63	1,221	5.1%	1,283	0.2%	1,286

Table 2 shows that the growth in the number of companies per size grouping is more variable at this level of detail, as would be expected with a smaller number of companies having a greater impact on growth rates. For example, a 25% increase in Biomass is seen in the Corporations category when 4 companies grew to 5.

1.10 Coventry and Warwickshire LEP's LCEGS by Skills

In this section we look at the skills within the Coventry and Warwickshire LEP, through the number of employees listed in accordance with Standard Occupational Classification 2020 Index. This data will be overlaid with demand mapping during the Policy development and Growth forecasting phase of the study. Table 3 shows the number of employees within each standard Occupational Class for the LCEGS sector as a whole, per year.

Table 3: Coventry and Warwickshire LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – LCEGS Sector

Skill	LCEGS Sector Totals				
	2017/18	Growth %	2018/19	Growth %	2019/20
Technicians	590	2.9%	607	-1.9%	596
Snr Management SME	1,360	3.4%	1,406	17.2%	1,648
Supervisory	1,369	1.8%	1,394	14.5%	1,596
Middle / Junior Management	1,368	2.8%	1,406	7.7%	1,514
Designer / Developer	201	4.8%	211	-4.5%	202
Clerical	701	0.2%	703	10.9%	779
Self Employed	191	-0.8%	190	11.5%	212
Advisor or Agent	138	2.8%	142	2.2%	145
Educator	5	1.4%	5	17.6%	6
Specialist or Consultant	728	7.9%	785	2.8%	807
Editor	23	9.6%	25	4.1%	26
Industrial Researchers	237	6.2%	252	0.5%	253
Scientist	101	1.0%	102	-2.7%	99
Maintenance Engineer	1,543	8.9%	1,680	7.5%	1,807
Civil Engineer	116	5.3%	123	8.5%	133
Production Engineer	293	-2.3%	286	1.5%	291
Power distribution Engineer	727	0.7%	733	16.0%	849
Construction Engineer	164	9.2%	179	1.7%	182
Sales Exec	746	-3.4%	720	13.1%	815
Marketing Personnel	729	0.6%	733	3.0%	756
General Semi Skilled Worker	1,512	1.6%	1,537	23.1%	1,892
General Labour	1,830	6.7%	1,951	6.6%	2,079
Other Employees	2,050	17.3%	2,406	-21.2%	1,895
Administrative workers	796	0.6%	801	9.2%	875
Total Number of Employees	24,222	7.0%	25,922	8.3%	28,064

At the sector-level we can see that the number of employees per occupational classification varies considerably between each year. For example, the Designer/Developer classification saw growth of 4.8% between 2017/18 and -4.5% between 2018/19.

Due to the varied nature of the LCEGS sector, which draws from many more traditional sectors such as Engineering, Construction and many others, the decrease in employee numbers from year to year can be a result of employees working within the same company, but within a different sector. An example would be a company engineering components within both the Wind sub-sector and Automotive sector, where one year the company services more Wind than Automotive contracts, the employee numbers would count more Wind employees; the following year the company services more Automotive contracts than Wind contracts, resulting in an apparent reduction in the number of employees for the Wind sector, which is true with regards to those working *within the LCEGS Sector* but it does not necessarily follow that they are job losses within companies themselves.

The Total Number of Employees increases year on year, which is more reliable indication of employment growth due to the larger numbers being less impacted by the natural fluctuations mentioned above.

Table 4 shows the number of employees within each standard Occupational Class for the Level 1 sub-sectors.

Table 4: Coventry and Warwickshire LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Level 1

Skill	Low Carbon					Renewable Energy					Environmental				
	2017/18	Growth %	2018/19	Growth %	2019/20	2017/18	Growth %	2018/19	Growth %	2019/20	2017/18	Growth %	2018/19	Growth %	2019/20
Technicians	183	3.1%	189	-1.8%	185	238	3.1%	246	-2.0%	241	169	2.5%	173	-2.0%	169
Snr Management SME	319	3.7%	331	17.1%	388	777	3.3%	803	17.3%	942	263	3.3%	272	17.3%	319
Supervisory	333	2.0%	340	14.6%	390	762	1.8%	776	14.4%	888	273	1.5%	278	14.6%	318
Middle / Junior Management	334	3.0%	345	7.5%	370	760	2.8%	781	7.9%	842	274	2.7%	281	7.5%	302
Designer / Developer	50	4.9%	53	-4.5%	50	60	4.7%	62	-4.3%	60	92	4.8%	96	-4.6%	92
Clerical	174	0.2%	174	11.1%	193	386	0.2%	387	10.9%	429	141	0.4%	142	10.8%	157
Self Employed	67	-0.5%	67	11.3%	75	50	-0.6%	50	11.0%	55	73	-1.1%	73	11.9%	81
Advisor or Agent	67	2.7%	69	2.5%	71	17	2.9%	18	1.8%	18	53	2.9%	55	1.8%	56
Educator	0	1.1%	0	18.2%	0	0	1.4%	0	17.4%	0	4	1.4%	4	17.6%	5
Specialist or Consultant	190	8.4%	206	2.8%	212	371	7.9%	400	2.9%	412	167	7.4%	179	2.6%	184
Editor	5	9.8%	5	4.1%	6	5	9.3%	6	4.4%	6	13	9.6%	14	3.9%	14
Industrial Researchers	133	6.2%	141	0.8%	142	27	6.4%	29	0.2%	29	77	6.3%	82	0.1%	82
Scientist	66	1.0%	67	-2.6%	65	10	1.1%	10	-2.7%	10	25	1.0%	25	-2.7%	24
Maintenance Engineer	374	9.1%	408	7.5%	438	820	8.9%	893	7.5%	960	349	8.5%	379	7.7%	408
Civil Engineer	27	5.4%	28	8.7%	31	27	5.4%	28	8.9%	31	63	5.3%	66	8.2%	72
Production Engineer	86	-2.2%	84	1.5%	85	124	-2.1%	121	1.4%	123	83	-2.6%	81	1.7%	82
Power distribution Engineer	151	1.0%	153	16.1%	177	400	0.7%	403	16.0%	467	176	0.5%	177	15.6%	205
Construction Engineer	34	9.3%	37	1.7%	38	55	9.5%	60	1.3%	61	75	8.9%	82	2.0%	83
Sales Exec	220	-3.4%	212	13.1%	240	373	-3.4%	360	13.2%	407	153	-3.4%	148	12.9%	167
Marketing Personnel	220	0.6%	221	3.2%	228	370	0.5%	372	3.1%	383	139	0.9%	140	2.7%	144
General Semi Skilled Worker	377	1.8%	383	23.3%	473	792	1.6%	805	23.1%	991	344	1.5%	349	22.9%	429
General Labour	615	6.9%	657	6.9%	702	968	6.5%	1,031	6.4%	1,097	247	6.7%	264	6.5%	281
Other Employees	471	19.0%	561	-20.0%	448	1,163	16.1%	1,351	-22.1%	1,053	416	18.8%	494	-20.2%	394
Administrative workers	210	0.7%	212	9.2%	231	408	0.5%	410	9.3%	448	179	0.8%	180	8.8%	196
Total Number of Employees	9,209	7.0%	9,857	8.4%	10,684	9,491	7.1%	10,162	8.2%	10,999	5,522	6.9%	5,903	8.1%	6,381

A similar pattern is seen the Level 1 figures, with natural fluctuations in employee numbers. The numbers do give an indication of the relative scale of employment between sub-sectors in the different occupational classes.

The top 11 sub-sectors account for 96% of employment in the LCEGS sector in the Coventry and Warwickshire LEP. Tables 5a-5d shows the number of employees within each standard Occupational Class for the top 11 Level 2 sub-sectors of the LCEGS sector.

Table 5a: Coventry and Warwickshire LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Alternative Fuel Vehicle, Alternative Fuels and Biomass

Skill	Alternative Fuel Vehicle					Alternative Fuels					Biomass				
	Growth		Growth		2019/20	Growth		Growth		2019/20	Growth		Growth		2019/20
	2017/18	%	2018/19	%		2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Technicians	10	3.8%	11	-1.9%	11	70	3.0%	72	-2.1%	71	40	2.8%	42	-1.9%	41
Snr Management SME	18	3.7%	19	16.8%	22	61	3.9%	64	16.7%	74	164	3.3%	169	17.3%	198
Supervisory	23	2.3%	23	14.3%	26	73	1.9%	75	14.2%	85	160	1.8%	163	14.6%	187
Middle / Junior Management	23	2.9%	23	8.2%	25	74	3.1%	76	7.5%	82	158	2.5%	162	7.6%	174
Designer / Developer	2	4.9%	3	-4.3%	2	13	4.9%	14	-4.8%	13	18	4.6%	19	-4.0%	19
Clerical	14	0.1%	14	11.0%	15	37	0.6%	38	10.6%	42	80	0.1%	80	10.8%	89
Self Employed	14	-0.2%	14	10.8%	15	20	-0.3%	20	11.1%	22	8	-1.0%	8	12.6%	9
Advisor or Agent	25	3.0%	25	2.0%	26	2	2.9%	2	2.4%	2	3	2.6%	3	2.2%	3
Educator	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	0	1.4%	0	17.4%	0
Specialist or Consultant	3	8.4%	4	2.6%	4	56	8.1%	60	2.5%	62	88	7.8%	95	3.4%	98
Editor	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0	2	9.2%	3	4.6%	3
Industrial Researchers	39	6.1%	41	0.7%	42	27	6.0%	29	0.6%	29	3	6.0%	4	0.7%	4
Scientist	4	1.3%	4	-2.7%	4	50	1.0%	50	-2.6%	49	5	1.2%	5	-2.8%	5
Maintenance Engineer	31	9.1%	34	7.4%	36	93	8.9%	101	7.6%	109	160	8.5%	173	7.3%	186
Civil Engineer	5	5.7%	5	8.4%	6	0	5.6%	0	7.9%	0	3	5.6%	3	8.0%	3
Production Engineer	0	0.0%	0	0.0%	0	51	-2.4%	49	1.5%	50	25	-2.2%	24	1.9%	25
Power distribution Engineer	5	0.8%	5	15.8%	6	17	0.5%	17	16.0%	19	80	0.9%	81	15.5%	93
Construction Engineer	5	9.3%	5	1.6%	5	0	9.3%	0	1.7%	0	2	8.7%	3	2.3%	3
Sales Exec	26	-3.3%	25	13.6%	28	76	-3.2%	73	12.9%	83	80	-3.5%	77	13.0%	87
Marketing Personnel	26	0.0%	26	3.6%	27	77	0.8%	77	2.9%	80	79	0.4%	80	3.3%	82
General Semi Skilled Worker	22	2.0%	23	23.3%	28	97	2.1%	99	22.9%	122	161	1.4%	164	23.0%	201
General Labour	37	6.3%	39	6.9%	42	134	6.2%	142	7.3%	153	169	6.6%	181	6.4%	192
Other Employees	28	27.1%	35	-17.5%	29	89	28.9%	115	-17.5%	95	237	17.3%	278	-21.8%	217
Administrative workers	19	0.4%	19	9.8%	21	50	0.3%	50	9.5%	55	82	1.0%	83	8.7%	90
Total Number of Employees	1,377	7.1%	1,476	8.3%	1,598	3,331	6.9%	3,562	8.2%	3,852	1,685	6.9%	1,801	8.3%	1,950

Table 5b: Coventry and Warwickshire LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Building Technologies, Energy Management and Geothermal

Skill	Building Technologies					Energy Management					Geothermal				
	Growth		Growth		2019/20	Growth		Growth		2019/20	Growth		Growth		2019/20
	2017/18	%	2018/19	%		2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Technicians	81	3.1%	83	-1.5%	82	13	3.2%	14	-1.7%	14	22	2.6%	22	-1.8%	22
Snr Management SME	199	3.6%	206	17.3%	241	25	3.6%	26	17.1%	30	84	3.3%	87	17.5%	102
Supervisory	193	2.1%	197	14.8%	227	26	1.7%	26	14.5%	30	81	1.4%	83	14.6%	95
Middle / Junior Management	194	3.0%	200	7.3%	214	26	2.9%	26	8.0%	29	81	2.6%	84	7.2%	90
Designer / Developer	23	4.8%	24	-4.3%	23	7	5.1%	7	-4.7%	7	9	4.9%	10	-4.6%	9
Clerical	100	0.1%	100	11.2%	111	13	0.1%	13	11.3%	15	41	0.4%	41	10.9%	46
Self Employed	23	-0.7%	23	11.7%	26	6	-0.4%	6	11.0%	7	5	-0.8%	5	11.4%	5
Advisor or Agent	28	2.5%	29	3.0%	29	6	3.0%	6	2.3%	6	4	2.8%	5	1.7%	5
Educator	0	0.0%	0	0.0%	0	0	0.9%	0	18.4%	0	0	0.0%	0	0.0%	0
Specialist or Consultant	106	8.7%	115	3.0%	119	15	8.0%	16	3.0%	16	43	7.6%	46	2.8%	47
Editor	1	9.7%	1	4.4%	1	3	9.8%	3	3.9%	3	2	9.5%	2	4.2%	3
Industrial Researchers	53	6.3%	56	1.0%	56	5	6.4%	6	0.4%	6	3	6.1%	3	0.0%	3
Scientist	7	1.2%	7	-2.6%	7	3	0.9%	3	-2.5%	3	2	1.2%	2	-2.7%	2
Maintenance Engineer	196	9.2%	214	7.5%	230	32	9.3%	35	7.4%	37	85	8.7%	93	7.7%	100
Civil Engineer	12	5.3%	13	9.0%	14	5	5.6%	5	8.5%	6	4	5.5%	4	8.3%	5
Production Engineer	26	-1.7%	25	1.5%	26	6	-1.9%	6	1.2%	6	14	-2.5%	14	1.7%	14
Power distribution Engineer	103	1.1%	105	16.1%	121	15	0.8%	15	15.8%	18	42	0.6%	42	15.7%	49
Construction Engineer	19	9.3%	21	1.8%	22	5	9.6%	6	1.5%	6	3	9.1%	4	1.8%	4
Sales Exec	92	-3.6%	89	13.2%	100	16	-3.2%	15	13.0%	17	44	-3.5%	43	13.0%	48
Marketing Personnel	92	0.5%	93	3.5%	96	15	0.8%	15	3.0%	15	42	0.8%	43	2.8%	44
General Semi Skilled Worker	206	1.6%	209	23.5%	258	30	1.8%	31	23.2%	38	85	1.4%	86	23.0%	106
General Labour	384	7.3%	412	6.8%	440	45	6.2%	48	6.6%	51	125	6.6%	133	6.7%	142
Other Employees	287	15.5%	331	-21.3%	261	40	17.2%	47	-20.0%	37	122	16.8%	142	-22.7%	110
Administrative workers	113	0.9%	114	9.0%	124	16	0.5%	16	9.7%	18	43	1.0%	44	8.3%	47
Total Number of Employees	3,674	7.1%	3,934	8.7%	4,275	514	7.2%	551	8.3%	597	1,071	6.9%	1,145	8.1%	1,238

Table 5c: Coventry and Warwickshire LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Photovoltaic, Recovery & Recycling and Waste Management

Skill	Photovoltaic					Recovery and Recycling					Waste Management				
	Growth		Growth		2019/20	Growth		Growth		2019/20	Growth		Growth		2019/20
	2017/18	%	2018/19	%		2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Technicians	70	3.2%	73	-2.1%	71	48	2.3%	49	-2.0%	48	45	2.5%	46	-1.8%	45
Snr Management SME	215	3.5%	223	17.0%	261	55	3.2%	57	17.2%	67	81	3.1%	83	17.6%	98
Supervisory	208	1.5%	211	14.3%	241	57	1.3%	58	14.5%	66	86	1.6%	87	14.8%	100
Middle / Junior Management	209	2.7%	215	8.2%	232	57	2.8%	58	7.1%	62	87	2.5%	89	8.0%	96
Designer / Developer	15	5.0%	16	-4.6%	15	41	4.5%	43	-4.5%	41	18	5.1%	19	-4.9%	18
Clerical	105	0.3%	105	10.9%	117	28	0.4%	29	10.7%	32	46	0.3%	46	11.1%	51
Self Employed	11	-0.3%	11	10.1%	12	14	-1.3%	14	12.7%	16	23	-1.1%	22	11.4%	25
Advisor or Agent	1	2.7%	2	2.4%	2	5	2.4%	5	2.4%	5	31	3.0%	32	1.7%	32
Educator	0	0.0%	0	0.0%	0	0	0.6%	0	17.6%	0	2	1.5%	2	17.6%	2
Specialist or Consultant	99	7.6%	106	2.8%	109	47	7.5%	51	2.6%	52	46	7.3%	49	2.5%	50
Editor	0	0.0%	0	0.0%	0	2	9.3%	2	4.7%	3	5	9.9%	5	3.3%	6
Industrial Researchers	8	6.4%	8	0.2%	8	13	5.8%	14	0.7%	14	43	6.4%	46	-0.2%	45
Scientist	0	0.8%	0	-2.3%	0	11	1.3%	11	-3.2%	11	8	0.5%	8	-2.2%	8
Maintenance Engineer	210	8.9%	229	7.4%	246	71	8.1%	77	7.9%	83	106	8.8%	116	7.6%	125
Civil Engineer	6	5.7%	6	8.8%	6	22	4.8%	23	8.4%	25	17	5.6%	18	8.4%	19
Production Engineer	29	-2.3%	29	1.3%	29	26	-2.7%	25	1.8%	25	19	-2.4%	19	1.3%	19
Power distribution Engineer	110	0.5%	110	15.9%	128	39	0.6%	39	15.4%	45	53	0.4%	54	16.2%	62
Construction Engineer	11	9.6%	12	1.2%	12	22	8.7%	24	2.2%	24	21	9.1%	23	1.8%	24
Sales Exec	104	-3.1%	101	13.2%	114	48	-3.4%	46	12.7%	52	43	-3.6%	42	13.2%	47
Marketing Personnel	104	0.9%	105	2.9%	108	39	1.0%	39	2.5%	40	41	0.6%	41	2.8%	42
General Semi Skilled Worker	221	1.9%	226	22.9%	277	95	1.4%	96	22.8%	118	97	1.6%	99	23.0%	121
General Labour	281	6.1%	298	6.8%	319	96	6.8%	103	6.4%	110	60	6.6%	64	6.1%	68
Other Employees	310	16.8%	362	-23.5%	277	78	23.4%	96	-23.0%	74	137	17.7%	161	-18.8%	131
Administrative workers	111	0.1%	111	10.1%	122	39	1.2%	40	8.2%	43	58	0.4%	58	9.2%	63
Total Number of Employees	2,589	7.1%	2,773	8.1%	2,998	1,313	6.8%	1,402	8.1%	1,516	1,724	7.0%	1,846	8.0%	1,993

Table 5d: Coventry and Warwickshire LEP's LCEGS Skills, measured as Job Descriptions with growth 2017/18 to 2019/20 – Water & Waste Water Treatment

Skill	Water & Waste Water Treatment					Wind				
	Growth		Growth		2019/20	Growth		Growth		2019/20
	2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Technicians	64	2.5%	65	-2.0%	64	103	3.3%	106	-2.0%	104
Snr Management SME	104	3.5%	108	17.0%	126	308	3.2%	318	17.4%	373
Supervisory	105	1.5%	107	14.3%	122	306	2.2%	313	14.4%	358
Middle / Junior Management	105	2.7%	108	7.2%	116	305	3.1%	314	8.0%	339
Designer / Developer	25	4.9%	26	-4.7%	25	15	4.5%	16	-4.2%	15
Clerical	53	0.5%	53	10.6%	59	156	0.0%	156	10.9%	173
Self Employed	28	-1.1%	28	12.1%	32	24	-0.6%	24	10.7%	27
Advisor or Agent	4	2.9%	4	1.6%	4	3	2.7%	3	2.3%	3
Educator	0	0.9%	0	17.8%	0	0	0.0%	0	0.0%	0
Specialist or Consultant	60	7.4%	64	2.6%	66	138	8.2%	150	2.7%	154
Editor	2	9.4%	2	3.9%	2	0	9.4%	0	5.6%	0
Industrial Researchers	5	6.0%	5	0.3%	5	4	6.5%	4	0.4%	4
Scientist	2	1.1%	2	-2.7%	2	1	0.8%	1	-2.5%	1
Maintenance Engineer	141	8.4%	153	7.6%	165	358	9.1%	390	7.6%	420
Civil Engineer	18	5.4%	19	7.9%	21	13	5.1%	13	9.5%	14
Production Engineer	32	-2.7%	32	1.9%	32	54	-1.8%	53	1.2%	54
Power distribution Engineer	69	0.6%	69	15.3%	80	165	0.8%	166	16.5%	193
Construction Engineer	26	8.9%	28	2.1%	28	36	9.6%	39	1.1%	40
Sales Exec	47	-3.2%	46	12.8%	52	142	-3.5%	137	13.3%	155
Marketing Personnel	46	1.0%	47	2.6%	48	142	0.1%	142	3.2%	147
General Semi Skilled Worker	123	1.6%	125	22.8%	154	317	1.6%	322	23.3%	397
General Labour	65	6.5%	69	6.8%	74	384	6.8%	410	6.0%	435
Other Employees	162	17.6%	190	-20.7%	151	485	15.0%	557	-21.3%	439
Administrative workers	64	0.8%	64	8.8%	70	166	0.4%	167	9.4%	183
Total Number of Employees	1,922	6.8%	2,053	8.1%	2,220	3,956	7.2%	4,240	8.3%	4,594

Again, a similar pattern is seen the Level 2 figures as those in Level 1, with natural fluctuations in employee numbers. As for Level 1, the numbers do give an indication of the relative scale of employment between sub-sectors in the different occupational classes.

1.11 Coventry and Warwickshire LEP's LCEGS Growth

In Section 1.1 annual growth in Coventry and Warwickshire LEP's LCEGS sales, companies and employment was compared with growth in the MEH's LCEGS sector as a whole for 2017/18 to 2019/20. Table 6 shows the Coventry and Warwickshire LEP's annual growth in more detail by breaking it down into sub-sectors for each of the three years. Growth between one year and the next is shown in red.

The Coventry and Warwickshire LEP covers 13% of the MEH's total LCEGS sector in terms of sales. The growth rates for the Coventry and Warwickshire LEP are in line with the MEH regional average, being relatively uniform across sub-sector compare with the UK. The UK growth rates are affected by the activity in London, which are more volatile than in other areas of the country, such as the MEH region. As such, the MEH growth rates are more indicative of the growth rates you would expect in regions not affected by activities in London. The growth rates for the Coventry and Warwickshire LEP are broadly in line with this trend, with exceptions such as Marine Pollution Control, Carbon Capture and Storage and Hydro.

While annual growth in the LCEGS sector as a whole has varied between 0.2 and 8.3% for each of the three parameters, Table 6 shows that the sector has grown evenly in terms of sales across the Level 2 sub-sectors. The advantage of even growth is less volatility and more stability and certainty in the market. It is illustrative of the whole LCEGS sector growing together due to better coordination across networks and chains of supply than the national average. There is more variation in growth between sub-sectors in terms of the number of employees and companies, as they respond to different pressures within different sub-sectors.

The Coventry and Warwickshire LEP has grown in line with the MEH average, and is above the UK average for some Level 2 sub-sectors, which are a reflection of the opportunities that are being created by drivers of growth including policy, regulation and consumer choices, these include:

- Air Pollution, where the Coventry and Warwickshire LEP growth rates were 5.3% between 2017/18 and 2018/19 and 6.1% between 2018/19 and 2019/20 and the UK growth rates were 1.7% between 2017/18 and 2018/19 and -4.3% between 2018/19 and 2019/20
- Alternative Fuel Vehicle, where the Coventry and Warwickshire LEP growth rates were 5.1% between 2017/18 and 2018/19 and 6.2% between 2018/19 and 2019/20 and the UK growth rates were 7.4% between 2017/18 and 2018/19 and -1.6% between 2018/19 and 2019/20
- Alternative Fuels, where the Coventry and Warwickshire LEP growth rates were 5.2% between 2017/18 and 2018/19 and 6.3% between 2018/19 and 2019/20 and the UK growth rates were 10.2% between 2017/18 and 2018/19 and 3.3% between 2018/19 and 2019/20
- Contaminated Land, where the Coventry and Warwickshire LEP growth rates were 5.2% between 2017/18 and 2018/19 and 6.0% between 2018/19 and 2019/20 and the UK growth rates were 5.5% between 2017/18 and 2018/19 and -4.3% between 2018/19 and 2019/20
- Energy Management, where the Coventry and Warwickshire LEP growth rates were 5.2% between 2017/18 and 2018/19 and 6.2% between 2018/19 and 2019/20 and the UK growth rates were 6.7% between 2017/18 and 2018/19 and -1.0% between 2018/19 and 2019/20

- Hydro, where the Coventry and Warwickshire LEP growth rates were 4.4% between 2017/18 and 2018/19 and 6.3% between 2018/19 and 2019/20 and the UK growth rates were 5.6% between 2017/18 and 2018/19 and -3.6% between 2018/19 and 2019/20

Table 6: Coventry and Warwickshire LEP's LCEGS Sales (£m), Company and Employment Growth 2017/18 to 2019/20

Level 1	Level 2	Sales £m					# Companies					# Employees				
		Growth		Growth		2019/20	Growth		Growth		2019/20	Growth		Growth		2019/20
		2017/18	%	2018/19	%		2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Environmental	Air Pollution	17.1	5.3%	18.0	6.1%	19.1	7	0.0%	7	0.0%	7	133	7.5%	143	8.4%	155
Environmental	Contaminated Land	17.4	5.2%	18.3	6.0%	19.4	7	0.0%	7	0.0%	7	135	7.4%	145	8.3%	157
Environmental	Environmental Consultancy	20.9	5.3%	22.0	5.9%	23.3	8	12.5%	9	0.0%	9	164	6.7%	175	8.6%	190
Environmental	Environmental Monitoring	4.4	6.8%	4.7	4.3%	4.9	2	0.0%	2	0.0%	2	35	5.7%	37	8.1%	40
Environmental	Marine Pollution Control	3.3	3.0%	3.4	5.9%	3.6	1	0.0%	1	0.0%	1	26	3.8%	27	11.1%	30
Environmental	Noise & Vibration Control	8.9	5.6%	9.4	5.3%	9.9	4	0.0%	4	0.0%	4	70	5.7%	74	9.5%	81
Environmental	Recovery and Recycling	169.4	5.0%	177.9	5.9%	188.4	68	4.4%	71	0.0%	71	1,313	6.8%	1,402	8.1%	1,516
Environmental	Waste Management	218.6	5.0%	229.6	6.0%	243.3	83	6.0%	88	0.0%	88	1,724	7.1%	1,846	8.0%	1,993
Environmental	Water & Waste Water Treatment	246.1	5.0%	258.5	6.0%	274.0	96	4.2%	100	0.0%	100	1,922	6.8%	2,053	8.1%	2,220
Low Carbon	Additional Energy Sources	29.2	5.1%	30.7	6.2%	32.6	11	9.1%	12	0.0%	12	227	7.0%	243	8.6%	264
Low Carbon	Alternative Fuel Vehicle	176.7	5.1%	185.8	6.2%	197.3	66	6.1%	70	0.0%	70	1,377	7.2%	1,476	8.3%	1,598
Low Carbon	Alternative Fuels	432.4	5.2%	454.7	6.3%	483.2	178	3.9%	185	0.0%	185	3,331	6.9%	3,562	8.1%	3,852
Low Carbon	Building Technologies	471.8	5.3%	496.6	6.3%	527.9	189	5.3%	199	0.0%	199	3,674	7.1%	3,934	8.7%	4,275
Low Carbon	Carbon Capture & Storage	11.0	4.5%	11.5	6.1%	12.2	4	25.0%	5	0.0%	5	85	7.1%	91	8.8%	99
Low Carbon	Carbon Finance	0.0	0.0%	0.0	0.0%	0.0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Low Carbon	Energy Management	65.8	5.2%	69.2	6.2%	73.5	26	7.7%	28	0.0%	28	514	7.2%	551	8.3%	597
Low Carbon	Nuclear Power	0.0	0.0%	0.0	0.0%	0.0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
Renewable Energy	Biomass	216.6	5.1%	227.6	6.1%	241.4	86	4.7%	90	1.1%	91	1,685	6.9%	1,801	8.3%	1,950
Renewable Energy	Geothermal	137.3	5.0%	144.2	6.0%	152.8	55	5.5%	58	0.0%	58	1,071	6.9%	1,145	8.1%	1,238
Renewable Energy	Hydro	9.1	4.4%	9.5	6.3%	10.1	4	0.0%	4	0.0%	4	72	6.9%	77	7.8%	83
Renewable Energy	Photovoltaic	329.8	5.1%	346.7	6.1%	367.8	130	4.6%	136	0.7%	137	2,589	7.1%	2,773	8.1%	2,997
Renewable Energy	Renewable Consultancy	14.4	4.9%	15.1	6.0%	16.0	6	0.0%	6	0.0%	6	114	7.0%	122	8.2%	132
Renewable Energy	Wave & Tidal	0.5	0.0%	0.5	0.0%	0.5	0	0.0%	0	0.0%	0	4	0.0%	4	0.0%	4
Renewable Energy	Wind	505.8	5.1%	531.7	6.1%	564.2	190	5.8%	201	0.5%	202	3,956	7.2%	4,240	8.3%	4,594
Total		3,106.5	5.1%	3,265.6	6.1%	3,465.4	1,221	5.1%	1,283	0.2%	1,286	24,221	7.0%	25,921	8.3%	28,065

Some sub-sectors have shown stronger growth across the 3-year study period 2017/18 to 2019/20 than the UK average and should be considered strengths of the region and include:

- Energy Management with 11.7% (MEH 11.4%, UK 5.7%)

- Air Pollution with 11.7% (MEH 11.4%, UK 5.8%)
- Alternative Fuel Vehicle with 11.7% (MEH 11.4%, UK 5.7%)
- Contaminated Land Reclamation and Remediation with 11.5% (MEH 11.4%, UK 1.0%)
- Hydro with 11.0% (MEH 11.0%, UK 1.8%)

Some sub-sectors have shown weaker growth across the 3-year study period 2017/18 to 2019/20 than the UK average and include:

- Environmental Consultancy with 11.6% (MEH 11.3%, UK 16.8%)
- Noise & Vibration Control with 11.6% (MEH 11.4%, UK 23.3%)
- Additional Energy Sources with 11.6% (MEH 11.3%, UK 15.9%)
- Carbon Capture & Storage with 11.6% (MEH 11.3%, UK 19.0%)
- Biomass with 11.4% (MEH 11.3%, UK 28.2%)
- Geothermal with 11.3% (MEH 11.3%, UK 18.8%)
- Photovoltaic with 11.5% (MEH 11.3%, UK 24.3%)
- Wave & Tidal with 11.2% (MEH 11.2%, UK 24.9%)
- Wind with 11.5% (MEH 11.3%, UK 42.2%)

By overlaying the sales for each sub-sector as a proportion of the UK market, the impact of stronger or weaker sales growth can be examined more closely. Table 7 shows how the Coventry and Warwickshire LEP compares with the UK as a whole for the 24 Level 2 sub-sectors. The LEP as a % of UK Sales and MEH Sales has been converted to a Proportionality Factor, where 1.0 equals the sector value (1.6% and 13.1% respectively), below 1.0 represents a smaller market than the sector total proportion and above 1.0 represents a market which is larger than the sector total proportion. Likewise the LEP/ UK and LEP/MEH Growth Factor indicates where growth is stronger than the UK (above 1.0) or weaker than the UK (below 1.0)

Table 7: UK, MEH and Coventry and Warwickshire LEP's LCEGS Sales (£m) and 3-Year Growth Comparison

		UK		MEH			LEP							
Level 1	Level 2	UK Sales	UK 3- Year	MEH Sales £m 2019/20	MEH 3- year Growth %	MEH as % of UK	LEP Sales £m 2019/20	LEP 3- year growth %	LEP			LEP/MEH		
		£m 2019/20	Growth %						LEP as % of UK	LEP/UK Sales Prop.	LEP/UK Growth Factor	LEP as % of MEH	LEP/MEH Growth Factor	LEP/MEH Sales Prop
Environmental	Air Pollution	1,283.9	5.8%	143.2	11.4%	11.2%	19.1	11.8%	1.5%	0.9	2.0	13.3%	1.0	1.0
Environmental	Contaminated Land Reclamation & Remediation	1,269.2	1.0%	143.3	11.4%	11.3%	19.4	11.5%	1.5%	1.0	12.0	13.5%	1.0	1.0
Environmental	Environmental Consultancy and Related Services	1,268.4	16.8%	179.9	11.3%	14.2%	23.3	11.6%	1.8%	1.2	0.7	13.0%	1.0	1.0
Environmental	Environmental Monitoring, Instrumentation and Analysis	247.6	12.2%	38.0	11.3%	15.4%	4.9	11.7%	2.0%	1.3	1.0	13.0%	1.0	1.0
Environmental	Marine Pollution Control	206.3	12.7%	27.7	11.4%	13.4%	3.6	11.2%	1.8%	1.1	0.9	13.1%	1.0	1.0
Environmental	Noise & Vibration Control	394.7	23.3%	79.5	11.4%	20.1%	9.9	11.6%	2.5%	1.6	0.5	12.5%	1.0	1.0
Environmental	Recovery and Recycling	11,071.7	13.7%	1,452.5	11.3%	13.1%	188.4	11.2%	1.7%	1.1	0.8	13.0%	1.0	1.0
Environmental	Waste Management	7,384.8	12.6%	1,769.7	11.2%	24.0%	243.3	11.3%	3.3%	2.1	0.9	13.8%	1.0	1.1
Environmental	Water Supply and Waste Water Treatment	10,943.9	12.7%	2,014.9	11.3%	18.4%	274.0	11.3%	2.5%	1.6	0.9	13.6%	1.0	1.0
Low Carbon	Additional Energy Sources	2,129.7	15.9%	234.7	11.3%	11.0%	32.6	11.6%	1.5%	1.0	0.7	13.9%	1.0	1.1
Low Carbon	Alternative Fuel Vehicle	19,578.8	5.7%	1,472.3	11.4%	7.5%	197.3	11.7%	1.0%	0.6	2.0	13.4%	1.0	1.0
Low Carbon	Alternative Fuels	32,416.4	13.8%	3,761.4	11.4%	11.6%	483.2	11.8%	1.5%	0.9	0.9	12.8%	1.0	1.0
Low Carbon	Building Technologies	24,963.7	13.7%	3,995.6	11.5%	16.0%	527.9	11.9%	2.1%	1.3	0.9	13.2%	1.0	1.0
Low Carbon	Carbon Capture & Storage	816.0	19.0%	90.3	11.3%	11.1%	12.2	11.6%	1.5%	1.0	0.6	13.6%	1.0	1.0
Low Carbon	Carbon Finance	16,336.5	27.6%	133.9	17.7%	0.8%	0.0	0.0%	0.0%	0.0	0.0	0.0%	0.0	0.0
Low Carbon	Energy Management	3,950.9	5.7%	559.7	11.4%	14.2%	73.5	11.7%	1.9%	1.2	2.1	13.1%	1.0	1.0
Low Carbon	Nuclear Power	4,946.3	2.9%	5.4	29.0%	0.1%	0.0	0.0%	0.0%	0.0	0.0	0.0%	0.0	0.0
Renewable Energy	Biomass	11,234.4	28.2%	1,943.2	11.3%	17.3%	241.4	11.4%	2.1%	1.4	0.4	12.4%	1.0	1.0
Renewable Energy	Geothermal	19,687.0	18.8%	1,163.0	11.3%	5.9%	152.8	11.3%	0.8%	0.5	0.6	13.1%	1.0	1.0
Renewable Energy	Hydro	703.5	1.8%	74.4	11.0%	10.6%	10.1	11.3%	1.4%	0.9	6.2	13.6%	1.0	1.0
Renewable Energy	Photovoltaic	11,132.4	24.3%	2,773.4	11.3%	24.9%	367.8	11.5%	3.3%	2.1	0.5	13.3%	1.0	1.0
Renewable Energy	Renewable Energy General Consultancy	722.1	10.8%	122.8	11.3%	17.0%	16.0	11.4%	2.2%	1.4	1.1	13.0%	1.0	1.0
Renewable Energy	Wave & Tidal	171.5	24.9%	4.1	11.2%	2.4%	0.5	11.2%	0.3%	0.2	0.4	12.5%	1.0	1.0
Renewable Energy	Wind	36,664.3	42.2%	4,373.1	11.3%	11.9%	564.2	11.5%	1.5%	1.0	0.3	12.9%	1.0	1.0
		219,523.9	18.9%	26,556.2	11.4%	12.1%	3,465.6	11.6%	1.6%			13.1%		

Figure 34 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 1.1 %. 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 = 1.1% of the UK market
- >1 = larger than 1.1% share
- <1 = smaller than 1.1% 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
- >1 = stronger than the UK average growth
- <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 34 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 34: LEP/UK Sales proportionality factor vs. LEP/UK Growth factor of Level 2 Sub-sectors – Bubbles Sized by Sales £m

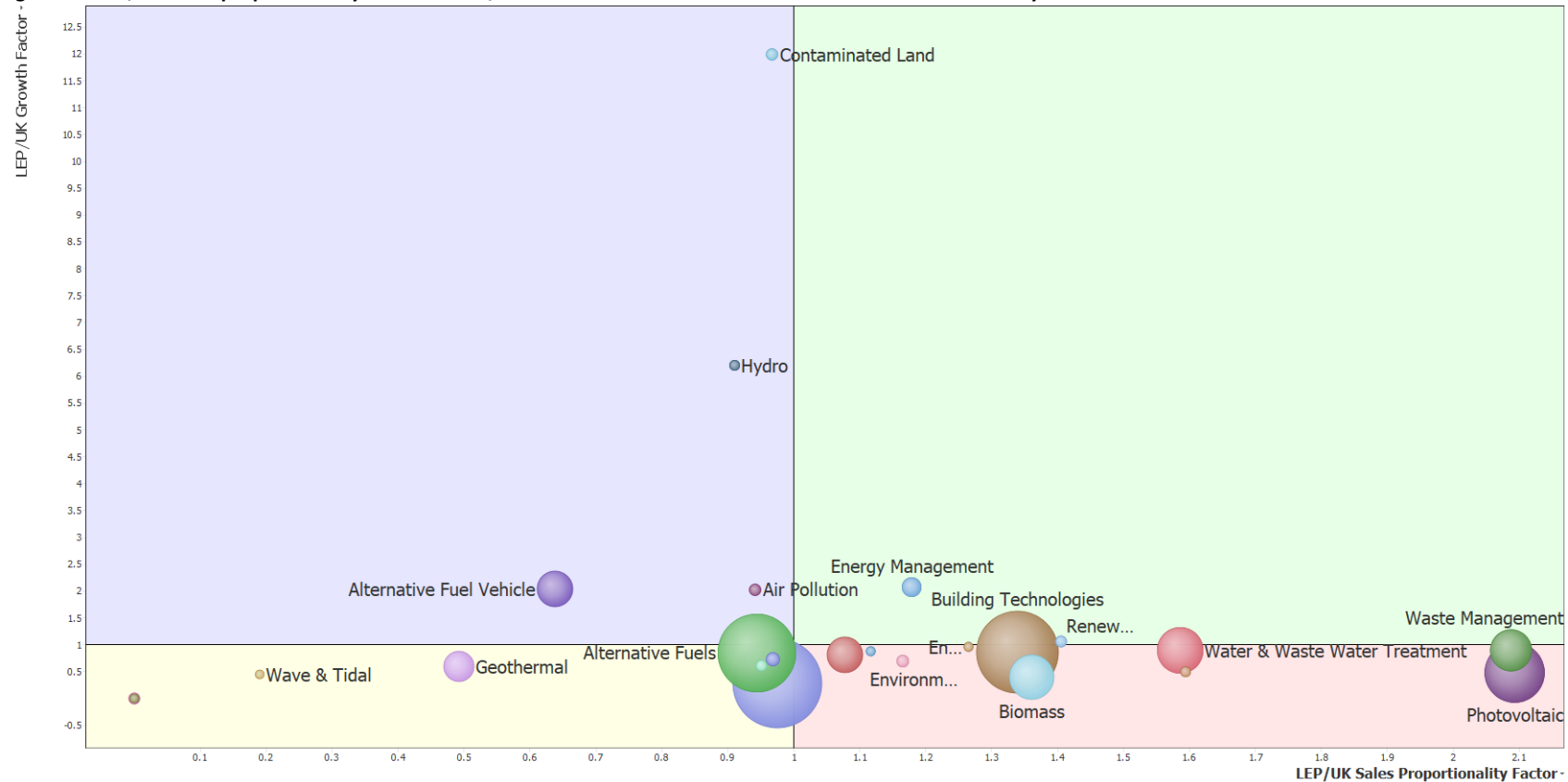
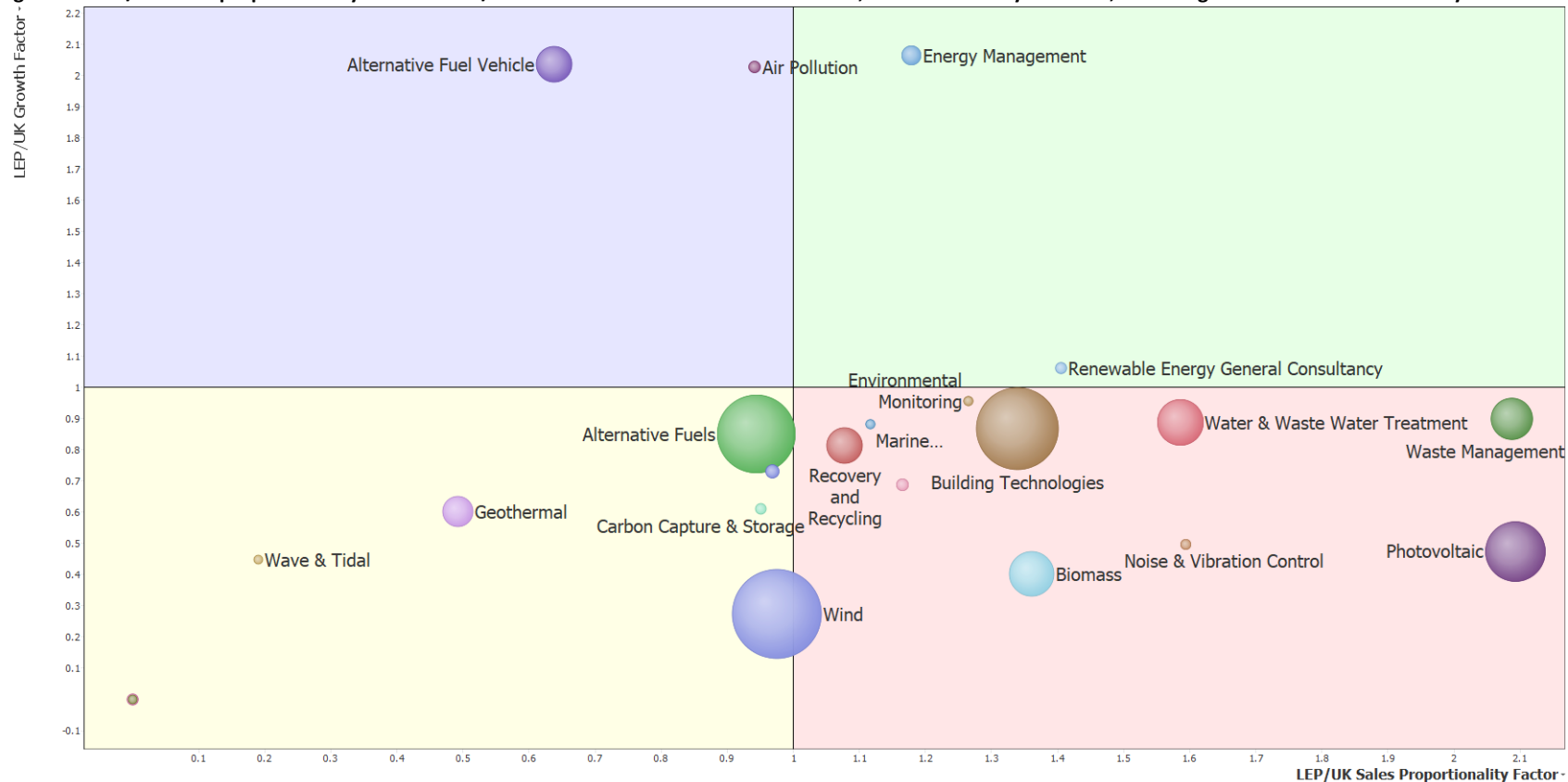


Figure 35 provides the same information as figure 34, but with Contaminated Land and Hydro excluded. By excluding these outliers with very strong growth, we can examine the other sub-sectors. Energy Management and Air Pollution have the ideal characteristics of above UK average growth and above LEP average 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 35: 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



1.12 Coventry and Warwickshire LEP's LCEGS Sector Scalability

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 as 'Low' with a score of 1

Calculation:

$$\frac{(11 \times 3) + (15 \times 2) + (4 \times 1)}{30} = 2.23$$

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 36 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 has good GVA but low scalability. Scalability graphs for each Local Authority can be found in Appendix 4.

Figure 36: Coventry and Warwickshire LEP's Scalability vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA

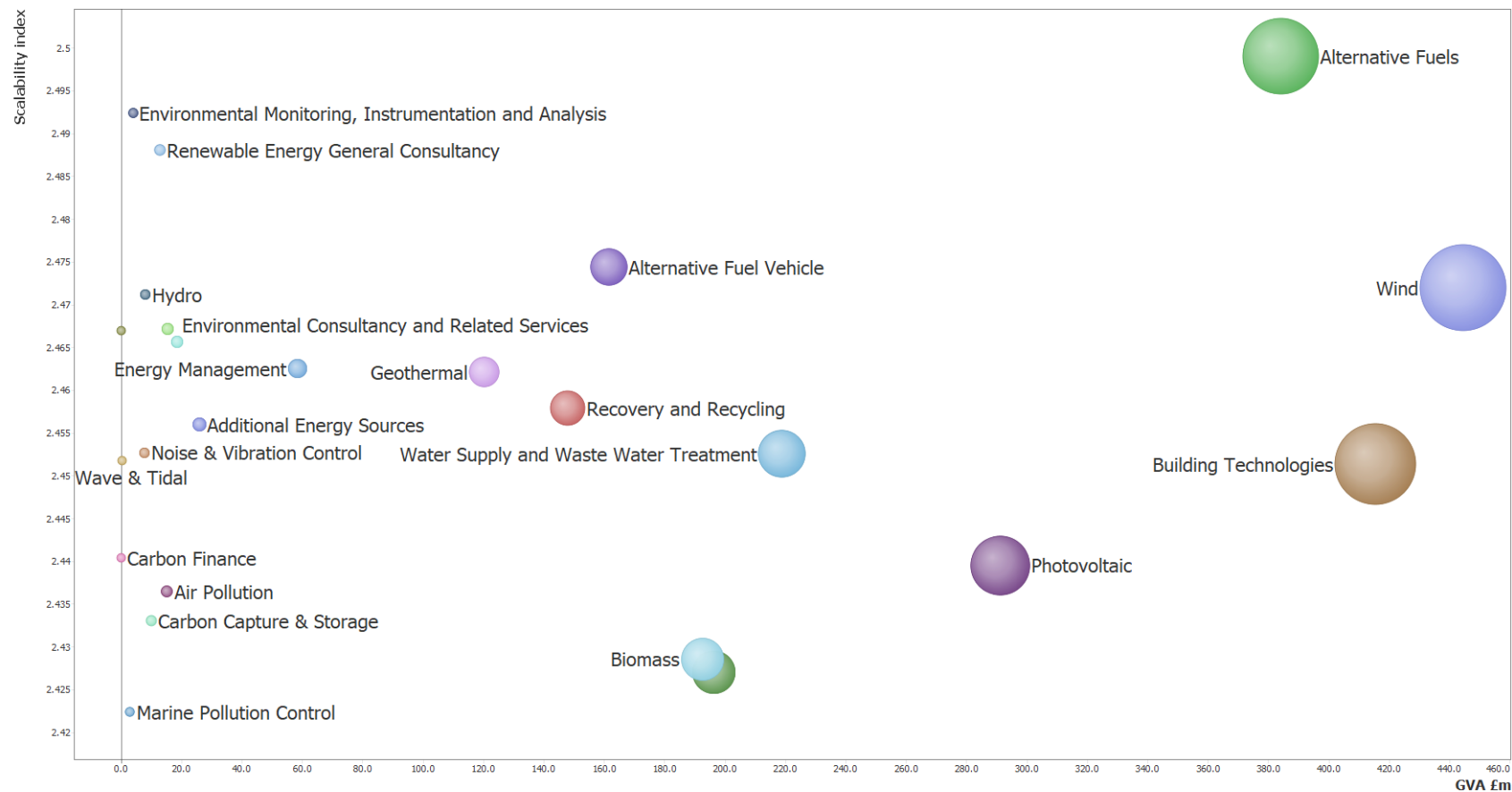
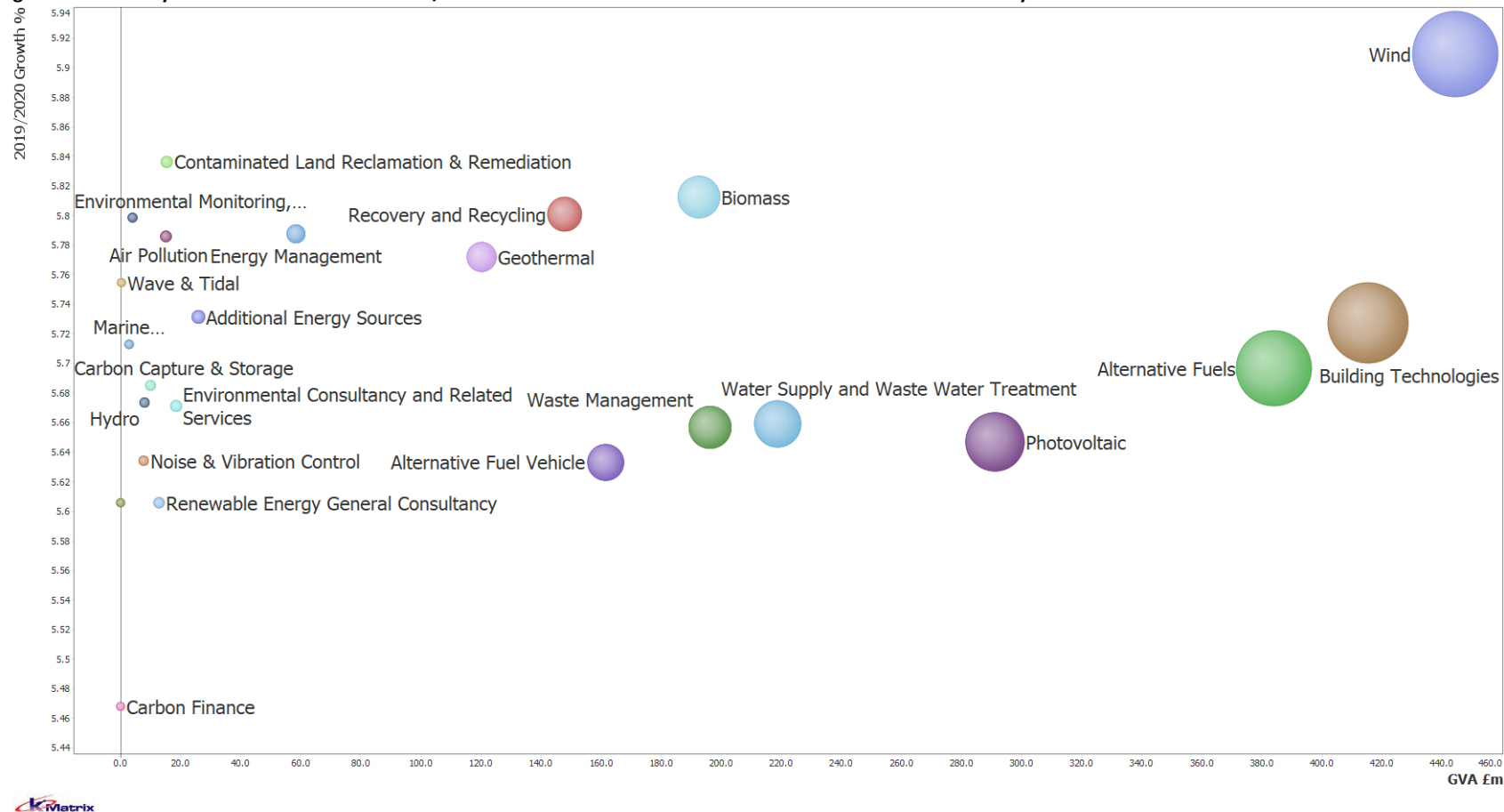


Figure 37 shows the same principle as Figure 36, but with GVA plotted against the growth rates of the Level 2 sub-sectors for 2019/20. This figure illustrates a different pattern of opportunity to the use of the scalability index. When only viewing growth, we can see that the Wind sub-sector occupies 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 37: Coventry and Warwickshire LEP's 2019/20 Growth Rates vs. GVA of Level 2 Sub-sectors – Bubbles Sized by GVA



1.13 Coventry and Warwickshire LEP's LCEGS Demand Analysis

This section provides data and analysis regarding the demand analysis which feeds into the Growth 2030/2050 sister report, produced as part of this project. There are three sub-sections:

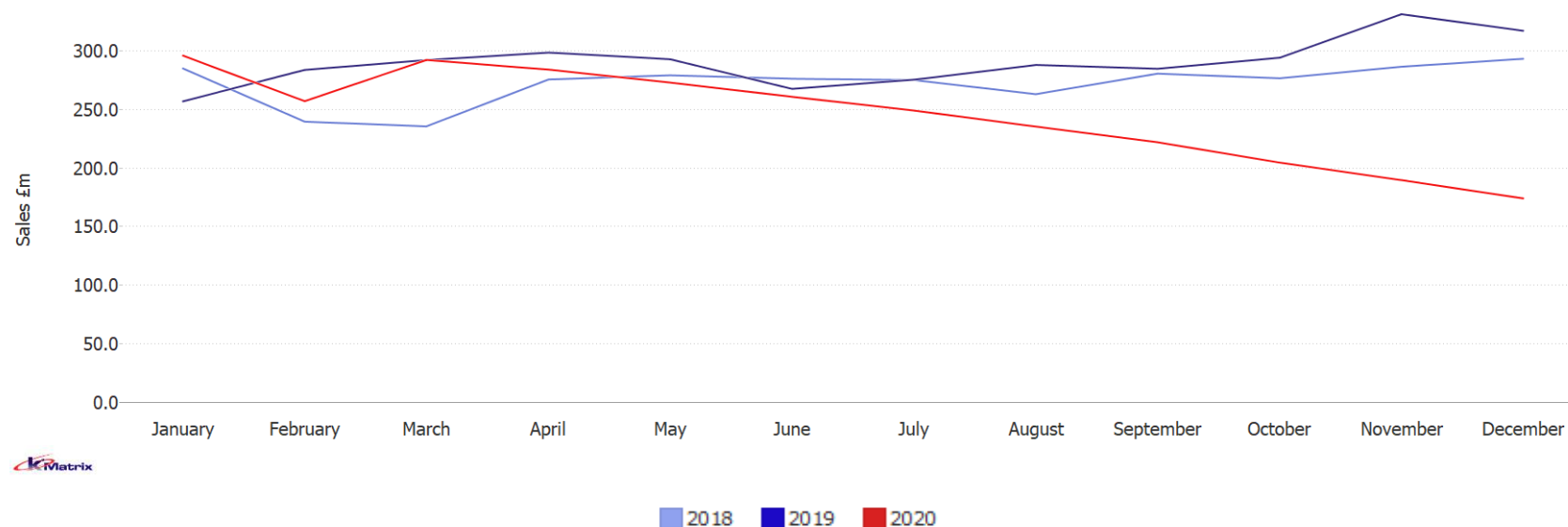
- 1.12.1 Current employment and growth required for 2030 and 2050 net zero targets.
- 1.12.2 Current training provision and potential for upskilling of the current workforce within each Level 2 sub-sector
- 1.12.3 Potential of Level 2 sub-sectors to impact on CO2 reduction.

1.13.1 Current employment, skills gaps and forecasts for 2030 and 2050 net zero targets

In this section we explore the current levels of employment, per Standard Occupational Classification, identifying skills 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 38, 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 38: Coventry and Warwickshire LEP LCEGS Sales, by month 2018, 2019 and 2020

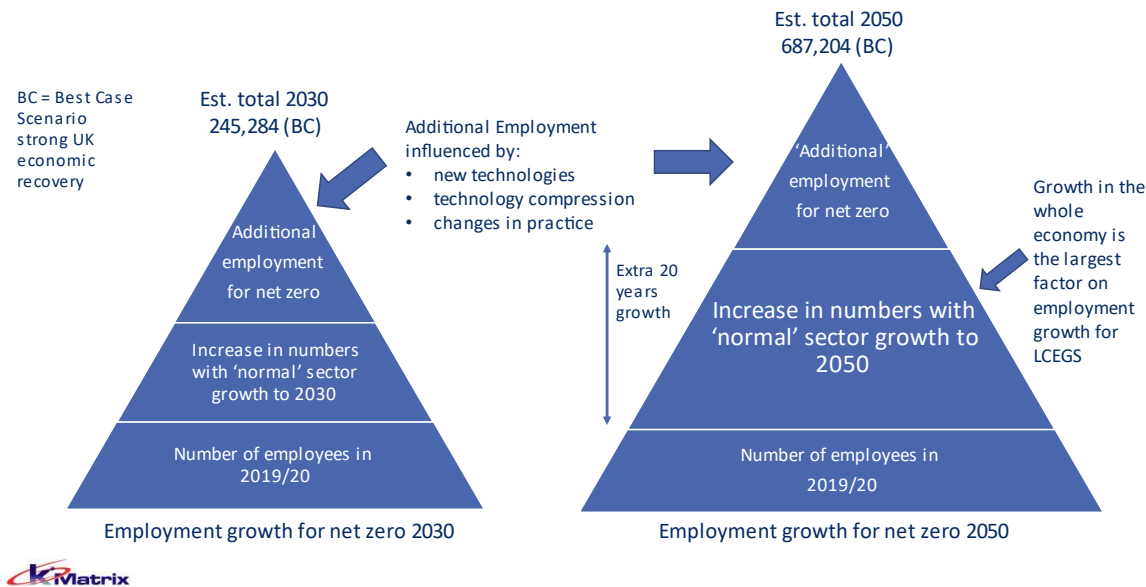


Due to the uncertainty surrounding the current and potential future economic performance of the UK (and global) economy, the forecasting estimates have been produced on a best case vs. worst case scenario basis:

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.

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 8 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 SOC's 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 8: Coventry and Warwickshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Sector Data

SOC	Current Employment				Net Zero by 2030				Net Zero by 2050			
	# Employees 2019/20	Shortage of Employees		# Employees if Skills Gap Filled	Worst Case Scenario		Best Case Scenario		Worst Case Scenario		Best Case Scenario	
		2019/20	Shortage as a % of Total Employees		Estimated # 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 8 shows that the skills gap throughout the sector varies considerably between SOC's 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 9, 10 and 11 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 5.

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

SOC	Low Carbon				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		Best Case Scenario	
	# Employees 2019/20	Shortage of 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)
		2019/20	Shortage as a % of Total Employees									
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 10: Coventry and Warwickshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Renewable Energy

SOC	Renewable Energy				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		Best Case Scenario	
	# Employees 2019/20	Shortage of 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)
		2019/20	Shortage as a % of Total Employees									
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 11: Coventry and Warwickshire LEP's LCEGS Current Employment and Net Zero 2030 and 2050 Estimated Employment Requirements – Environmental

SOC	Environmental				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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%

1.13.2 Current Training Provision and Potential for Upskilling of the Current Workforce within each Level 2 sub-sector

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 as 'Low' with a score of 1

Calculation:

$$\frac{(21 \times 3) + (9 \times 2) + (0 \times 1)}{30} = 2.7$$

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 as 'Low' with a score of 1

Calculation:

$$\frac{(15 \times 3) + (15 \times 2) + (0 \times 1)}{30} = 2.5$$

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 39 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 39: Coventry and Warwickshire LEP's LCEGS Current Training Capacity against the Potential Upskilling of the Workforce by Level 2 Sub-sector

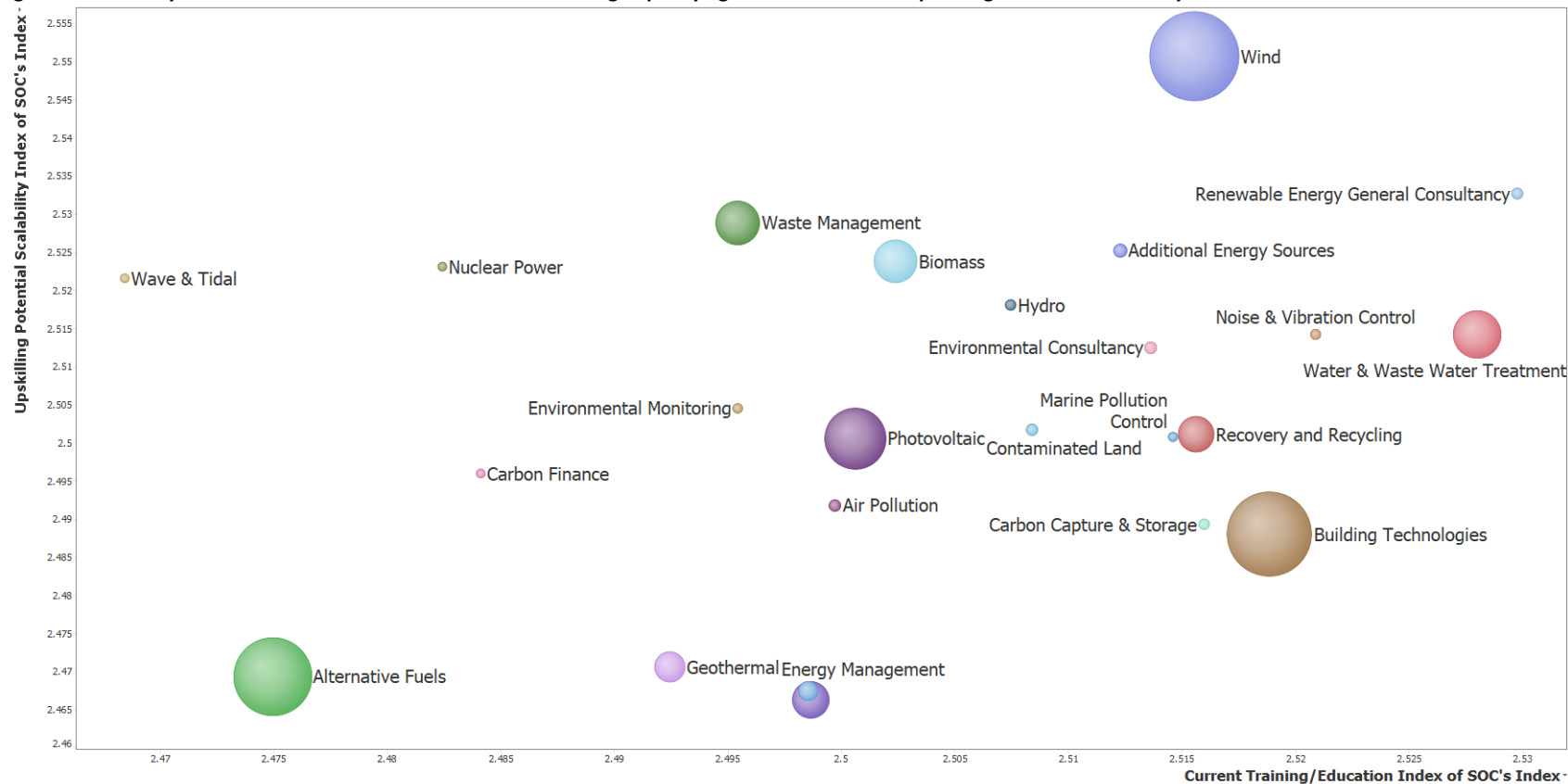


Figure 39 shows that Wind holds a strong position, with good current training capacity combined with a strong potential for upskilling. Water and Waste Water Treatment also holds a strong position with high training capacity and good upskilling potential. Alternative Fuels holds the least favourable position.

1.13.3 Potential of Level 2 sub-sectors to impact on CO₂ reduction

In this section we estimate CO₂ 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 CO₂ reduction potential of products and services. As such, the potential reduction in CO₂ 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 CO₂ 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 CO₂ 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

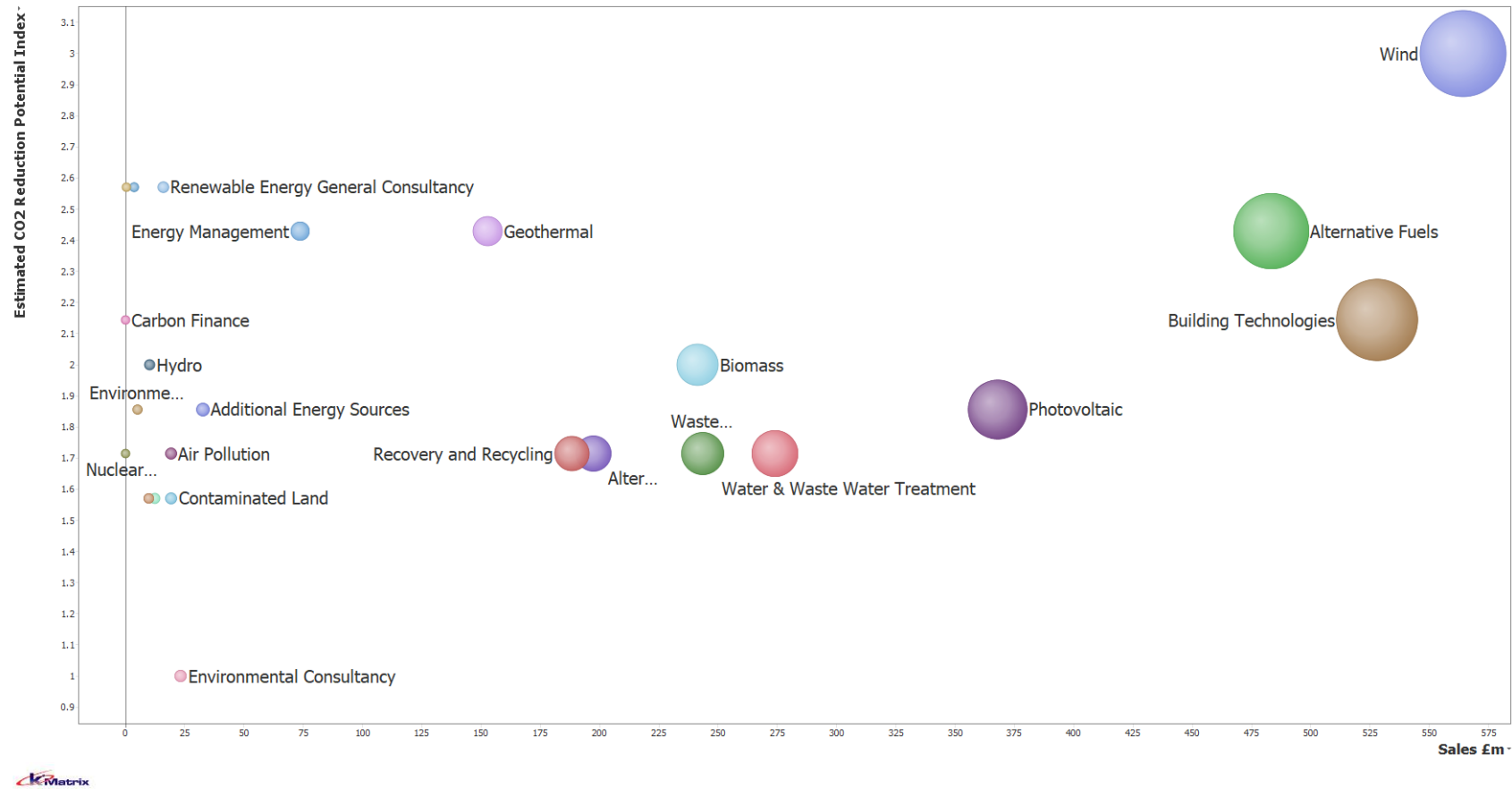
6 Local Authorities estimated as 'Low' with a score of 1

Calculation:

$$\frac{(7 \times 3) + (4 \times 2) + (6 \times 1)}{17} = 1.9$$

Figure 40 shows the estimated CO₂ 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 CO₂ 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 CO₂ reduction potential compared with the other Level 2 sub-sectors. Conversely, it also highlights the relatively small size and CO₂ 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 CO₂ reduction potential. Photovoltaic is also in a favourable position, with high CO₂ reduction potential and reasonably large market.

Figure 40: Coventry and Warwickshire LEP's LCEGS Estimated CO2 Reduction Potential against Sales (£m) by Level 2 Sub-sector



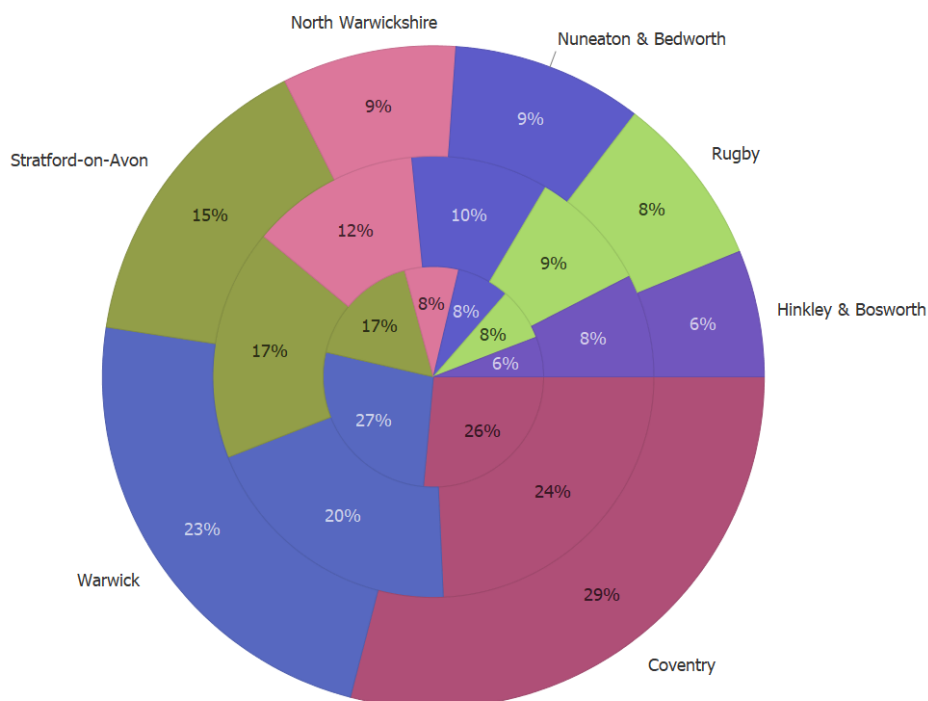
2. Coventry and Warwickshire LEP's LCEGS by Local Authority

2.1 LCEGS by Local Authority

This section of the report analyses the Coventry and Warwickshire LEP's 7 Local Authorities.

Figure 41 shows LCEGS for 2019/20 split by Local Authority for sales (outer circle), companies (middle circle) and employment (inner circle). Coventry accounts for 29% of Coventry and Warwickshire LEP's LCEGS sales, 24% of companies and 26% of employment, the next largest is Warwick with 23% of sales, 20% of companies and 27% of employment. The smallest Local Authority is Hinckley & Bosworth with 6% of the market.

Figure 41: Coventry and Warwickshire LEP's LCEGS 2019/20 by Local Authority for Sales, Companies and Employment



Local Authorities are analysed in more detail, by year, by economic measure and by LCEGS activity in the following section.

2.2 Local Authority Analysis by Year and Sector

Table 12 shows the key metrics of Sales, Available Sales, GVA, Number of Companies and Number of Employees for each Local Authority at the Sector Level for three years with growth rates.

Sales represent the value of sales transactions (£m) and represent the turnover of companies. Available Sales (£m) provides a value for the portion of the market that is not 'locked' by long term contracts and is realistically available for market penetration by new market entrants, without the need for aggressive marketing or pricing strategies. GVA means the Gross Value Added and is the value of the transactions minus raw materials etc and represents the profit made.

Available sales fluctuate in all Local Authorities as contracts end and new ones begin

GVA tracks sales with identical growth rates.

The fluctuation between company and employees numbers are not entirely independent, but they don't necessarily track each other. The fluctuation of employees can represent employees who are redeployed into other sectors within the same company and do not necessarily represent unemployment. Redeployment to other sectors (often with the same product e.g. financial analytics) is often due to the fluctuations in contracts affecting Available Sales.

Company number fluctuations might be a result of trading in other sectors, not that the company itself has ceased to trade.

Growth is similar between years for many of the Local Authorities, with the 2018/19-2019/20 growth less than 0.5% stronger than the previous year; with outliers such as Nuneaton & Bedworth with 2.7% difference (14.8% & 17.5%) and Warwick with 1.4% difference (7.7% & 9.1%).

There is significant difference in the growth rates between Local Authorities, with the strongest growth between 2018/19 and 2019/20 seen in:

- Nuneaton & Bedworth – 17.5%
- Warwick – 9.1%
- Coventry – 7.0%

Table 12: Local Authorities Sales, Available Sales, GVA, Number of Employees and Number of Companies 2017/18 to 2019/20

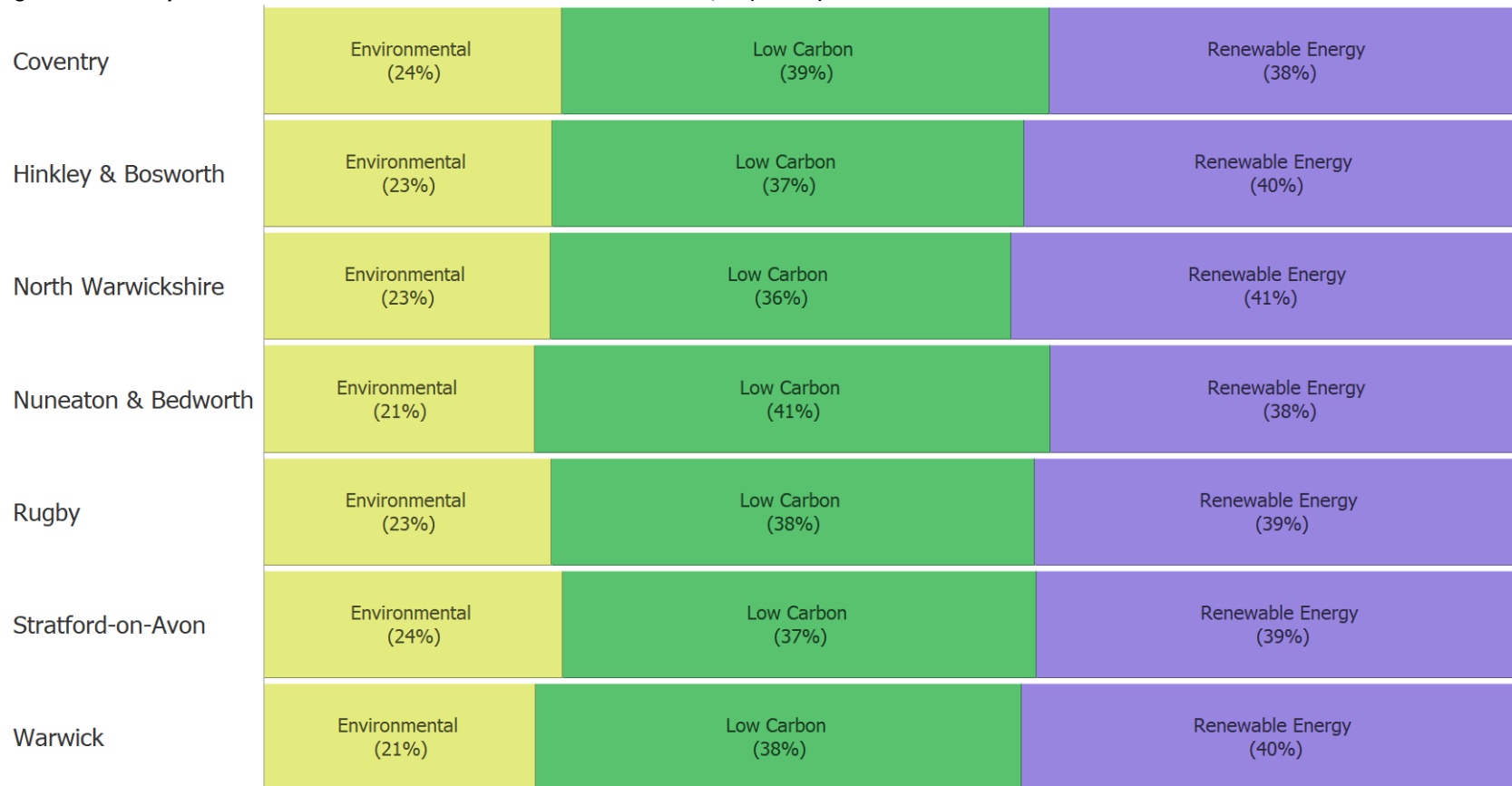
Local Authority	Sales £m					Available Sales £m					GVA £m				
	Growth		Growth		2019/20	Growth		Growth		2019/20	Growth		Growth		2019/20
	2017/18	%	2018/19	%		2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Coventry	887.2	6.0%	940.8	7.0%	1,006.4	527.4	6.1%	559.5	8.4%	606.3	703.3	6.0%	745.6	7.0%	797.7
Hinkley & Bosworth	204.4	2.4%	209.3	2.4%	214.4	124.7	-1.4%	123.0	5.6%	129.8	160.3	2.4%	164.1	2.4%	168.1
North Warwickshire	279.8	2.4%	286.5	2.8%	294.6	169.5	-0.5%	168.7	4.6%	176.4	221.1	2.4%	226.5	2.8%	232.9
Nuneaton & Bedworth	239.3	14.8%	274.7	17.5%	322.9	141.5	17.6%	166.5	16.8%	194.5	191.2	14.7%	219.5	17.5%	257.9
Rugby	288.1	0.6%	289.8	0.6%	291.4	168.8	5.0%	177.2	-0.4%	176.5	227.9	0.6%	229.2	0.6%	230.5
Stratford-on-Avon	518.5	0.7%	522.2	0.8%	526.4	315.0	-1.7%	309.5	1.2%	313.2	412.1	0.7%	415.1	0.8%	418.4
Warwick	689.0	7.7%	741.8	9.1%	809.4	419.7	3.1%	432.6	13.2%	489.5	549.9	7.7%	592.0	9.1%	645.8
Total	3,106.4	5.1%	3,265.2	6.1%	3,465.6	1,866.6	3.8%	1,937.0	7.7%	2,086.2	2,465.9	5.1%	2,592.0	6.1%	2,751.3

Local Authority	# Employees					# Companies				
	Growth		Growth		2019/20	Growth		Growth		2019/20
	2017/18	%	2018/19	%		2017/18	%	2018/19	%	
Coventry	6,090	5.0%	6,395	16.0%	7,420	319	1.0%	322	-3.0%	312
Hinkley & Bosworth	1,633	-2.6%	1,590	3.4%	1,644	90	-2.6%	88	10.4%	97
North Warwickshire	1,948	8.4%	2,112	5.4%	2,227	130	10.4%	144	11.4%	160
Nuneaton & Bedworth	1,595	10.8%	1,766	21.8%	2,152	95	22.8%	117	10.7%	129
Rugby	2,334	-3.4%	2,254	-3.4%	2,176	129	-8.4%	118	-2.4%	115
Stratford-on-Avon	4,725	6.7%	5,043	-4.3%	4,827	236	-0.3%	235	-7.3%	218
Warwick	5,897	14.6%	6,761	12.7%	7,618	223	15.6%	258	-1.3%	254
Total	24,221.6	7.0%	25,921.6	8.3%	28,064.3	1,221.9	4.9%	1,281.4	0.4%	1,286.4

2.3 Local Authority Analysis by Year – Level 1

Figure 42 shows the different profiles of the Coventry and Warwickshire LEP's Local Authorities when sales is split at Level 1. The Local authorities show variation in Environmental of 24% for Coventry and Stratford-on-Avon, to 21% for Nuneaton & Bedworth and Warwick; Low carbon from 41% for Nuneaton & Bedworth, to 36% for North Warwickshire; and Renewable Energy from 41% for North Warwickshire to 38% for Coventry and Nuneaton & Bedworth. This highlights that Coventry and Warwickshire LEP's Local Authorities are not a homogeneous market, but they actually show subtle regional variations in activity within the LCEGS sector. This is further confirmed by Figure 42 below.

Figure 42: Coventry and Warwickshire LEP's Local Authorities LCEGS Sales 2019/20 (Level 1)



2.4 Local Authority Analysis by Year – Level 2

Figure 43 extends the analysis to include the Top 7 sub-sectors for each of Coventry and Warwickshire LEP's Local Authorities. Typically, seven sub-sectors account for over 75% of the total value, but the sub-sectors and their rankings do differ across the 7 Local Authorities. There are consistent sub-sectors running through many of the Coventry and Warwickshire LEP's Local Authorities and these include Wind, Building Technologies, Alternative Fuels and Photovoltaic, they are represented in all of Coventry and Warwickshire LEP's Local Authorities and are consistent with the LEP's top four sub-sectors.

Figure 43: Coventry and Warwickshire LEP's Local Authorities LCEGS Sales 2019/20 at Level 2

Coventry	Building Technologies (16%)	Wind (16%)	Alternative Fuels (14%)	Photovoltaic (10%)	Water & Waste Water Treatmen...	Waste Managemen t (7%)	Biomass (7%)	17 others (22%)
Hinkley & Bosworth	Wind (16%)	Building Technologies (15%)	Alternative Fuels (13%)	Photovoltaic (11%)	Biomass (8%)	Water & Waste Water Treatmen...	Waste Managemen t (7%)	17 others (22%)
North Warwickshire	Wind (18%)	Building Technologies (14%)	Alternative Fuels (13%)	Photovoltaic (11%)	Water & Waste Water Treatme...	Biomass (7%)	Waste Managemen t (7%)	17 others (22%)
Nuneaton & Bedworth	Building Technologies (16%)	Alternative Fuels (15%)	Wind (15%)	Photovoltaic (11%)	Water & Waste Water Treatmen...	Biomass (7%)	Waste Managemen t (6%)	17 others (22%)
Rugby	Wind (17%)	Alternative Fuels (15%)	Building Technologies (15%)	Photovoltaic (11%)	Water & Waste Water Treatmen...	Waste Managemen t (7%)	Biomass (7%)	17 others (22%)
Stratford-on-Avon	Wind (15%)	Building Technologies (14%)	Alternative Fuels (14%)	Photovoltaic (11%)	Water & Waste Water Treatment (8%)	Waste Managemen t (8%)	Biomass (7%)	17 others (22%)
Warwick	Wind (18%)	Building Technologies (16%)	Alternative Fuels (13%)	Photovoltaic (11%)	Water & Waste Water Treatm...	Waste Managemen t (7%)	Biomass (7%)	17 others (21%)

2.5 Local Authority LCEGS Company Size

In Section we look at the sizes of companies within each Local Authority, with Table 13 showing a good range of growth rates between the Local Authorities.

Table 13: Local Authorities Companies by Size from 2017/18 to 2019/20

	# Start-up					# Micro					# SMEs							
	Growth			Growth			Growth			Growth			Growth					
Local Authority	2017/18	%		2018/19	%	2019/20	2017/18	%		2018/19	%	2019/20	2017/18	%		2018/19	%	2019/20
Coventry	16	1.3%		16	-2.8%	16	96	0.3%		96	-2.1%	94	159	1.3%		161	-3.3%	156
Hinkley & Bosworth	5	-2.2%		4	9.3%	5	27	-1.7%		27	9.3%	29	45	-3.2%		44	11.0%	49
North Warwickshire	6	10.0%		7	11.9%	8	39	9.9%		43	12.1%	48	65	10.8%		72	10.8%	80
Nuneaton & Bedworth	5	22.6%		6	10.9%	6	29	22.2%		35	11.5%	39	48	23.2%		59	10.1%	65
Rugby	6	-8.3%		6	-2.2%	6	39	-8.6%		35	-1.6%	35	64	-8.2%		59	-2.6%	57
Stratford-on-Avon	12	-1.4%		12	-6.6%	11	70	0.4%		70	-6.9%	66	118	-0.5%		118	-7.6%	109
Warwick	11	15.4%		13	-1.3%	13	67	15.4%		78	-2.2%	76	111	15.8%		128	-1.0%	127
Total	61	4.7%		64	0.6%	64	367	4.7%		385	0.7%	387	611	5.0%		641	0.2%	642
	# Large					# Corporations					Total # Companies							
	Growth			Growth			Growth			Growth			Growth			Growth		
Local Authority	2017/18	%		2018/19	%	2019/20	2017/18	%		2018/19	%	2019/20	2017/18	%		2018/19	%	2019/20
Coventry	32	1.5%		32	-3.6%	31	16	1.5%		16	-3.3%	16	319	1.0%		322	-3.0%	312
Hinkley & Bosworth	9	-2.8%		9	10.8%	10	5	-2.9%		4	10.8%	5	90	-2.6%		88	10.4%	97
North Warwickshire	13	10.3%		14	12.0%	16	6	10.8%		7	11.9%	8	130	10.4%		144	11.4%	160
Nuneaton & Bedworth	9	22.4%		12	11.5%	13	5	22.2%		6	10.7%	6	95	22.8%		117	10.7%	129
Rugby	13	-8.9%		12	-4.1%	11	6	-8.8%		6	-2.0%	6	129	-8.4%		118	-2.4%	115
Stratford-on-Avon	24	-0.5%		23	-7.5%	22	12	-0.5%		12	-6.3%	11	236	-0.3%		235	-7.3%	218
Warwick	22	15.5%		26	-0.5%	26	11	16.7%		13	-1.0%	13	223	15.6%		258	-1.3%	254
Total	122	4.8%		128	0.4%	128	61	5.1%		64	0.7%	64	1,222	4.9%		1,281	0.4%	1,286

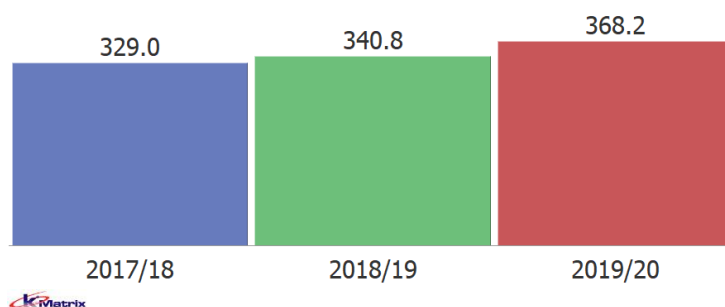
Company number fluctuations may represent companies in more than one sector (such as automotive), who trade sporadically within the LCEGS sector. Decreases in company numbers can therefore be a result of trading in other sectors, not that the company itself has ceased to trade.

3. Coventry and Warwickshire LEP's LCEGS and International Trade

3.1 Coventry and Warwickshire LEP's LCEGS Exports

This section of the report addresses Coventry and Warwickshire LEP's LCEGS Exports over the past three years when compared with UK totals and then identifies leading LCEGS export products and services and their destination markets.

Figure 44: Coventry and Warwickshire LEP's Exports (£m) 2015/16 to 2017/18

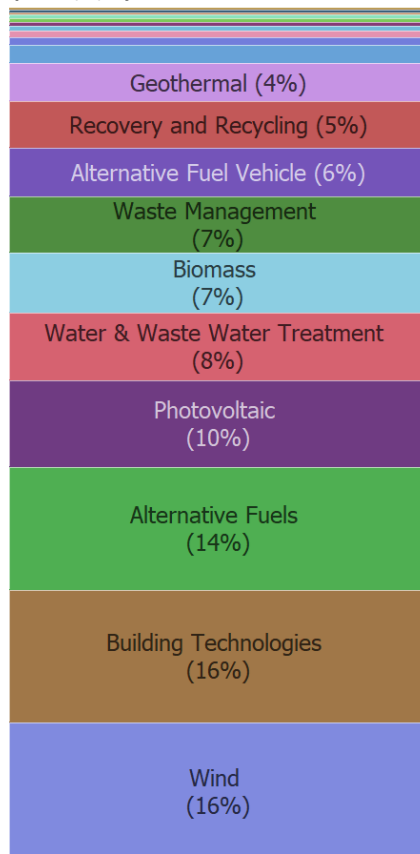


The value of Coventry and Warwickshire LEP's LCEGS Exports was £329m in 2017/18 and has grown to £368m in 2019/20.

Growth between 2017/18 and 2018/19 was 3.6% and growth between 2018/19 and 2019/20 was 8.0%.

This is compared with MEH growth of 4.5% and 6.2% and UK growth of approximately 8.7% and 9.5% respectively.

Figure 45: Coventry and Warwickshire LEP's Exports (%) by Sub-Sector 2019/20

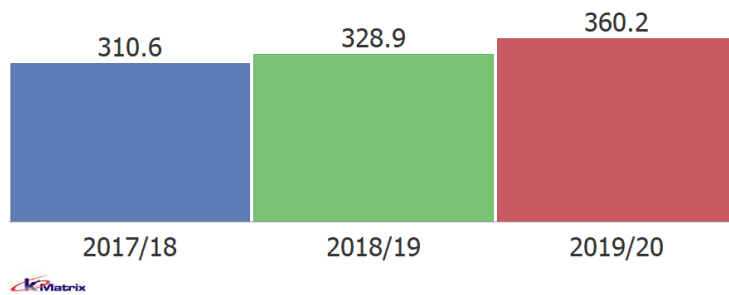


Coventry and Warwickshire LEP represented 12% of all MEH LCEGS exports in 2019/20. This is slightly below Coventry and Warwickshire LEP's 13% of overall MEH Sales.

Figure 45 shows the proportion of Coventry and Warwickshire LEP's LCEGS exports by Level 2 sub-sector, with Wind (16%), Building Technologies (16%), Alternative Fuels (14%), Photovoltaic (10%) and Water & Waste Water Treatment (8%) being the leading sub-sectors and accounting for 64% of all Coventry and Warwickshire LEP's LCEGS exports.

This compares with the MEH proportions of Wind (17%), Building Technologies (15%), Alternative Fuels (15%), Photovoltaic (11%) and Water & Waste Water Treatment (8%) accounting for 66% of exports.

Figure 46: Coventry and Warwickshire LEP's Imports (£m) 2015/16 to 2017/18

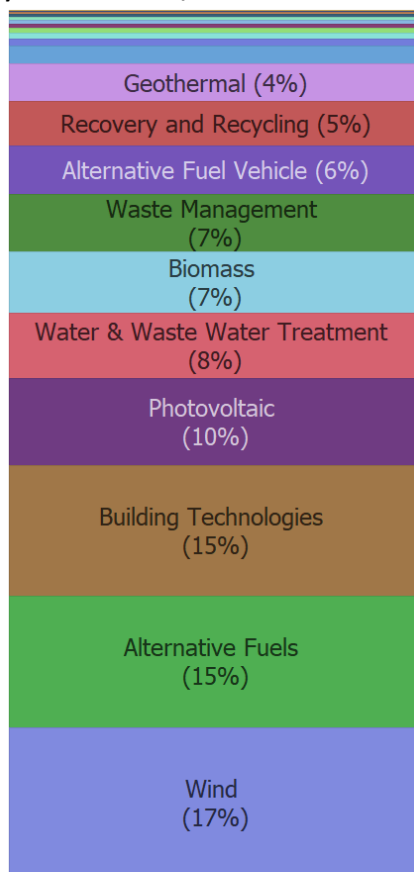


The value of Coventry and Warwickshire LEP's LCEGS Imports was £311m in 2017/18 and has grown to £360m in 2019/20.

Growth between 2017/18 and 2018/19 was 5.9% and growth between 2018/19 and 2019/20 was 9.5%.

This is compared with MEH growth of approximately 5.8% and 5.9% and UK growth of approximately 10.0% and 7.4% respectively.

Figure 47: Coventry and Warwickshire LEP's Imports (%) by Sub-Sector 2019/20



Coventry and Warwickshire LEP represented 14% of all MEH LCEGS imports in 2019/20. This is slightly higher than Coventry and Warwickshire LEP's 13% of overall MEH Sales. This means that the Coventry and Warwickshire LEP has a larger share of the import market than the MEH domestic market.

Figure 47 shows the proportion of Coventry and Warwickshire LEP's LCEGS imports by Level 2 sub-sector, with Wind (17%), Building Technologies (15%), Alternative Fuels (15%), Photovoltaic (10%) and Water & Waste Water Treatment (8%) being the leading sub-sectors and accounting for 65% of all Coventry and Warwickshire LEP's LCEGS imports.

In Table 14 Coventry and Warwickshire LEP's LCEGS exports are shown by sub-sector for each of the three years of the report and have been expressed as a percentage of that sub-sector's overall sales. The overall average for 2019/20 is 10.6%, with less than 1.0 percentage point variation between sub-sectors, which is consistent across the three years, indicating a stable and established export market.

Table 14: Coventry and Warwickshire LEP's LCEGS Exports as a % of Sales 2017/18 to 2019/20

Level 1	Level 2	2017/18			2018/19			2019/20		
		Sales £m	Exports as a % of Sales	Exports as a % of Sales	Sales £m	Exports as a % of Sales	Exports as a % of Sales	Sales £m	Exports as a % of Sales	Exports as a % of Sales
Environmental	Air Pollution	17.1	1.8	10.4%	18.0	1.9	10.5%	19.1	2.0	10.2%
Environmental	Contaminated Land	17.4	1.8	10.5%	18.3	1.9	10.2%	19.4	2.1	10.6%
Environmental	Environmental Consultancy	20.9	2.3	10.8%	22.0	2.3	10.7%	23.3	2.6	11.0%
Environmental	Environmental Monitoring	4.4	0.5	10.5%	4.7	0.5	10.7%	4.9	0.5	10.6%
Environmental	Marine Pollution Control	3.3	0.3	10.3%	3.4	0.4	10.7%	3.6	0.4	10.7%
Environmental	Noise & Vibration Control	8.9	0.9	10.5%	9.4	1.0	10.5%	9.9	1.0	10.6%
Environmental	Recovery and Recycling	169.4	18.0	10.6%	177.9	18.4	10.3%	188.4	20.0	10.6%
Environmental	Waste Management	218.6	23.4	10.7%	229.6	23.6	10.3%	243.3	24.3	10.0%
Environmental	Water & Waste Water Treatment	246.1	25.0	10.1%	258.5	27.0	10.5%	274.0	29.1	10.6%
Low Carbon	Additional Energy Sources	29.2	3.1	10.6%	30.7	3.1	10.1%	32.6	3.4	10.4%
Low Carbon	Alternative Fuel Vehicle	176.7	18.3	10.4%	185.8	17.4	9.3%	197.3	21.2	10.7%
Low Carbon	Alternative Fuels	432.4	48.1	11.1%	454.7	48.0	10.5%	483.2	52.8	10.9%
Low Carbon	Building Technologies	471.8	51.5	10.9%	496.6	53.3	10.7%	527.9	57.5	10.9%
Low Carbon	Carbon Capture & Storage	11.0	1.1	10.4%	11.5	1.2	10.5%	12.2	1.3	10.7%
Low Carbon	Carbon Finance	0.0	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
Low Carbon	Energy Management	65.8	7.0	10.6%	69.2	7.2	10.4%	73.5	7.9	10.8%
Low Carbon	Nuclear Power	0.0	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
Renewable Energy	Biomass	216.6	21.7	10.0%	227.6	24.9	10.9%	241.4	26.0	10.8%
Renewable Energy	Geothermal	137.3	14.7	10.7%	144.2	15.3	10.6%	152.8	16.5	10.8%
Renewable Energy	Hydro	9.1	0.9	10.3%	9.5	1.0	10.3%	10.1	1.0	10.2%
Renewable Energy	Photovoltaic	329.8	34.9	10.6%	346.7	36.2	10.5%	367.8	37.7	10.2%
Renewable Energy	Renewable Consultancy	14.4	1.5	10.5%	15.1	1.6	10.9%	16.0	1.7	10.5%
Renewable Energy	Wave & Tidal	0.5	0.0	9.6%	0.5	0.1	10.6%	0.5	0.1	11.1%
Renewable Energy	Wind	505.8	52.1	10.3%	531.7	54.5	10.3%	564.2	59.3	10.5%
Total		3,106.5	329.0	10.6%	3,265.6	340.8	10.4%	3,465.4	368.2	10.6%

In Table 15 Coventry and Warwickshire LEP's LCEGS available exports are shown by sub-sector for each of the three years of the report and have been expressed as a percentage of that sub-sector's overall exports. The overall average for 2019/20 is 23.9%, with subtle variation between sub-sectors.

Table 15: Coventry and Warwickshire LEP's LCEGS Available Exports and Available Exports as a % of Exports 2017/18 to 2019/20

Level 1	Level 2	2017/18			2018/19			2019/20		
		Exports £m	Available Exports £m	Available Exports as a % of Exports	Exports £m	Available Exports £m	Available Exports as a % of Exports	Exports £m	Available Exports £m	Available Exports as a % of Exports
Environmental	Air Pollution	1.8	0.4	24.8%	1.9	0.5	24.1%	2.0	0.5	24.3%
Environmental	Contaminated Land	1.8	0.4	24.4%	1.9	0.4	24.1%	2.1	0.5	23.4%
Environmental	Environmental Consultancy	2.3	0.6	24.6%	2.3	0.6	24.8%	2.6	0.6	24.3%
Environmental	Environmental Monitoring	0.5	0.1	23.9%	0.5	0.1	23.7%	0.5	0.1	24.2%
Environmental	Marine Pollution Control	0.3	0.1	24.3%	0.4	0.1	26.0%	0.4	0.1	25.8%
Environmental	Noise & Vibration Control	0.9	0.2	25.2%	1.0	0.2	23.1%	1.0	0.2	23.8%
Environmental	Recovery and Recycling	18.0	4.5	25.0%	18.4	4.7	25.4%	20.0	4.9	24.5%
Environmental	Waste Management	23.4	5.8	24.8%	23.6	5.8	24.7%	24.3	6.0	24.6%
Environmental	Water & Waste Water Treatment	25.0	6.3	25.4%	27.0	6.4	23.8%	29.1	7.5	25.6%
Low Carbon	Additional Energy Sources	3.1	0.8	25.2%	3.1	0.7	24.1%	3.4	0.8	24.0%
Low Carbon	Alternative Fuel Vehicle	18.3	4.5	24.6%	17.4	4.3	24.7%	21.2	4.5	21.3%
Low Carbon	Alternative Fuels	48.1	10.6	22.1%	48.0	10.8	22.6%	52.8	11.3	21.5%
Low Carbon	Building Technologies	51.5	12.6	24.4%	53.3	13.3	25.0%	57.5	14.5	25.2%
Low Carbon	Carbon Capture & Storage	1.1	0.3	24.8%	1.2	0.3	24.3%	1.3	0.3	23.3%
Low Carbon	Carbon Finance	0.0	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
Low Carbon	Energy Management	7.0	1.8	25.2%	7.2	1.8	25.0%	7.9	1.9	24.5%
Low Carbon	Nuclear Power	0.0	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
Renewable Energy	Biomass	21.7	5.6	25.8%	24.9	5.9	23.7%	26.0	6.2	24.0%
Renewable Energy	Geothermal	14.7	3.5	23.8%	15.3	3.7	24.0%	16.5	4.2	25.6%
Renewable Energy	Hydro	0.9	0.2	24.3%	1.0	0.2	24.3%	1.0	0.2	22.4%
Renewable Energy	Photovoltaic	34.9	8.5	24.2%	36.2	8.3	23.0%	37.7	9.1	24.1%
Renewable Energy	Renewable Consultancy	1.5	0.4	23.2%	1.6	0.4	25.4%	1.7	0.4	24.3%
Renewable Energy	Wave & Tidal	0.0	0.0	24.5%	0.1	0.0	23.7%	0.1	0.0	24.4%
Renewable Energy	Wind	52.1	12.4	23.7%	54.5	13.8	25.3%	59.3	14.0	23.6%
Total		329.0	79.5	24.2%	340.8	82.5	24.2%	368.2	88.0	23.9%

The sub-sectors with the highest available export to export ratio in 2019/20 are: Marine Pollution Control 25.8%; Water and Waste Water Treatment 25.6%; Geothermal 25.6%; Building Technologies 25.3%; Waste Management 24.6%; Energy Management 24.5% and Recovery and Recycling 24.5%.

This compares with the MEH sub-sectors with the highest available export to export ratio in 2019/20 of: Geothermal 25.0%; Building Technologies 24.9%; Marine Pollution Control 24.9%; Carbon Capture and Storage 24.9%; Environmental Consultancy 24.8% and Environmental Monitoring 24.7%.

In Table 16 Coventry and Warwickshire LEP's LCEGS imports are shown by sub-sector for each of the three years of the report and have been expressed as a percentage of that sub-sector's overall sales. The overall average for 2019/20 is 10.4%, with less than 1.0 percentage point variation between sub-sectors, which is consistent across the three years, indicating a stable and established import market.

Table 16: Coventry and Warwickshire LEP's LCEGS Imports as a % of Sales 2017/18 to 2019/20

Level 1	Level 2	2017/18			2018/19			2019/20		
		Sales £m	Imports £m	Imports as a % of Sales	Sales £m	Imports £m	Imports as a % of Sales	Sales £m	Imports £m	Imports as a % of Sales
Environmental	Air Pollution	17.1	1.8	10.4%	18.0	1.8	9.8%	19.1	1.9	9.8%
Environmental	Contaminated Land	17.4	1.7	10.0%	18.3	1.8	9.8%	19.4	2.1	10.7%
Environmental	Environmental Consultancy	20.9	2.2	10.5%	22.0	2.2	10.0%	23.3	2.3	9.9%
Environmental	Environmental Monitoring	4.4	0.4	10.1%	4.7	0.5	9.8%	4.9	0.5	10.1%
Environmental	Marine Pollution Control	3.3	0.3	9.2%	3.4	0.4	10.5%	3.6	0.4	9.7%
Environmental	Noise & Vibration Control	8.9	0.9	10.2%	9.4	0.9	10.1%	9.9	0.9	9.3%
Environmental	Recovery and Recycling	169.4	17.0	10.0%	177.9	16.5	9.3%	188.4	18.5	9.8%
Environmental	Waste Management	218.6	20.9	9.5%	229.6	23.5	10.3%	243.3	23.5	9.7%
Environmental	Water & Waste Water Treatment	246.1	23.8	9.7%	258.5	26.5	10.3%	274.0	27.4	10.0%
Low Carbon	Additional Energy Sources	29.2	2.9	10.0%	30.7	3.1	10.0%	32.6	3.1	9.5%
Low Carbon	Alternative Fuel Vehicle	176.7	18.0	10.2%	185.8	20.7	11.2%	197.3	20.2	10.3%
Low Carbon	Alternative Fuels	432.4	39.5	9.1%	454.7	46.2	10.2%	483.2	54.7	11.3%
Low Carbon	Building Technologies	471.8	49.1	10.4%	496.6	49.3	9.9%	527.9	54.1	10.3%
Low Carbon	Carbon Capture & Storage	11.0	1.1	10.2%	11.5	1.3	10.9%	12.2	1.2	9.8%
Low Carbon	Carbon Finance	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0
Low Carbon	Energy Management	65.8	6.1	9.3%	69.2	6.8	9.9%	73.5	7.3	9.9%
Low Carbon	Nuclear Power	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0
Renewable Energy	Biomass	216.6	22.0	10.1%	227.6	24.7	10.9%	241.4	25.4	10.5%
Renewable Energy	Geothermal	137.3	13.1	9.6%	144.2	14.8	10.2%	152.8	15.5	10.1%
Renewable Energy	Hydro	9.1	0.9	10.0%	9.5	1.1	11.9%	10.1	1.0	10.2%
Renewable Energy	Photovoltaic	329.8	32.9	10.0%	346.7	34.5	10.0%	367.8	35.9	9.8%
Renewable Energy	Renewable Consultancy	14.4	1.3	9.3%	15.1	1.5	9.9%	16.0	1.6	9.9%
Renewable Energy	Wave & Tidal	0.5	0.0	9.8%	0.5	0.0	10.1%	0.5	0.1	10.7%
Renewable Energy	Wind	505.8	54.4	10.8%	531.7	50.8	9.6%	564.2	62.8	11.1%
Total		3,106.4	310.6	10.0%	3,265.2	328.9	10.1%	3,465.6	360.2	10.4%

Figure 48 shows the Exports plotted against the Coventry and Warwickshire LEP's Growth from 2018/19 to 2019/20 for all Level 2 sub-sectors, with the bubbles sized according to the size of the Exports. Here we can see that the Wind sub-sector holds the most desirable position of large market and strong growth. Biomass, Recovery and Recycling and Geothermal are within the top 11 sub-sectors and have good export market and high growth. Markets that should be considered Export strengths include: Wind, Biomass, Recovery and Recycling and Geothermal due to their strong growth and Building Technologies and Alternative Fuels due to their large size.

Figure 48: Coventry and Warwickshire LEP's LCEGS Exports vs Coventry and Warwickshire LEP's Level 2 Growth for 2019/20

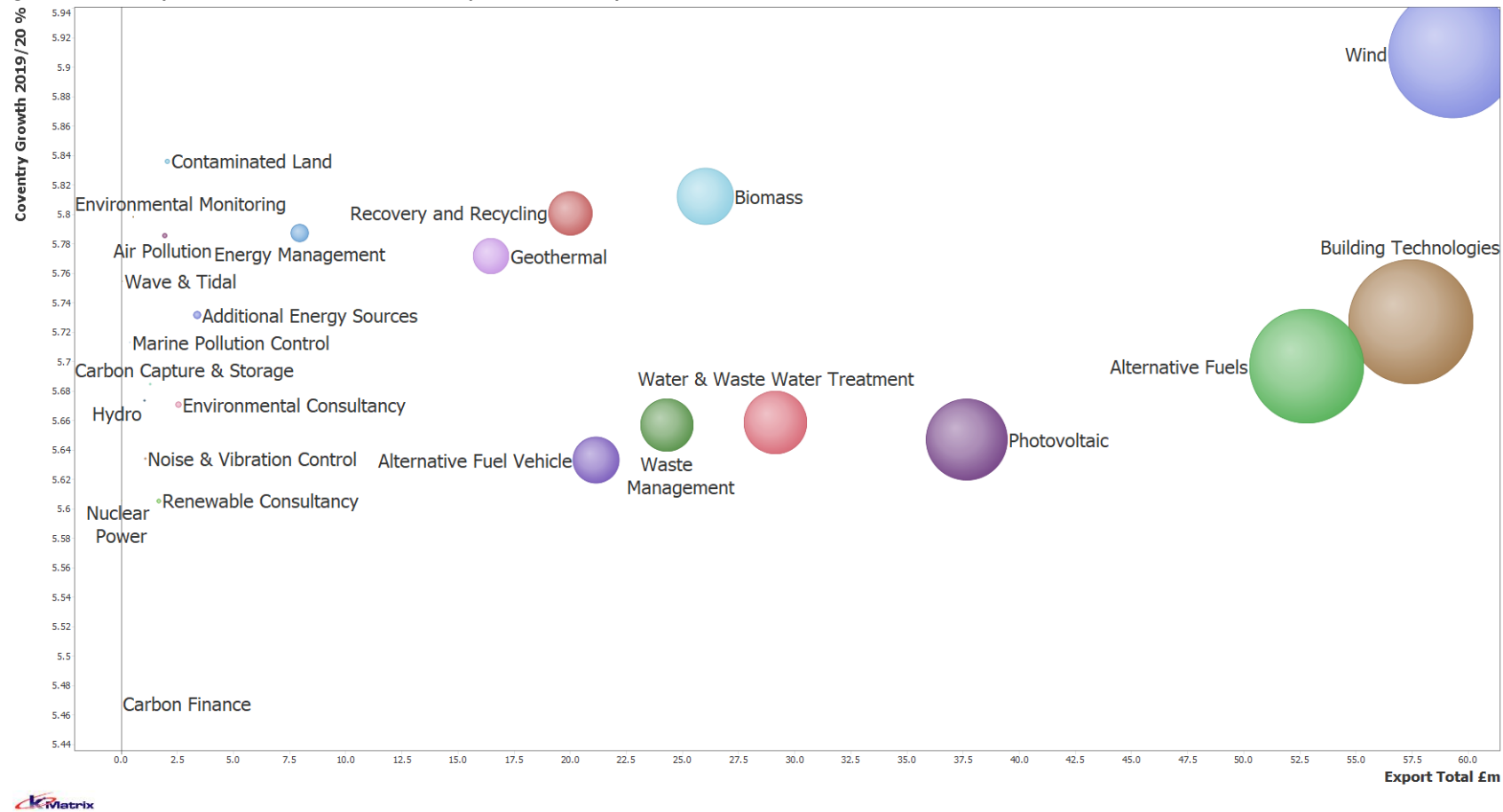
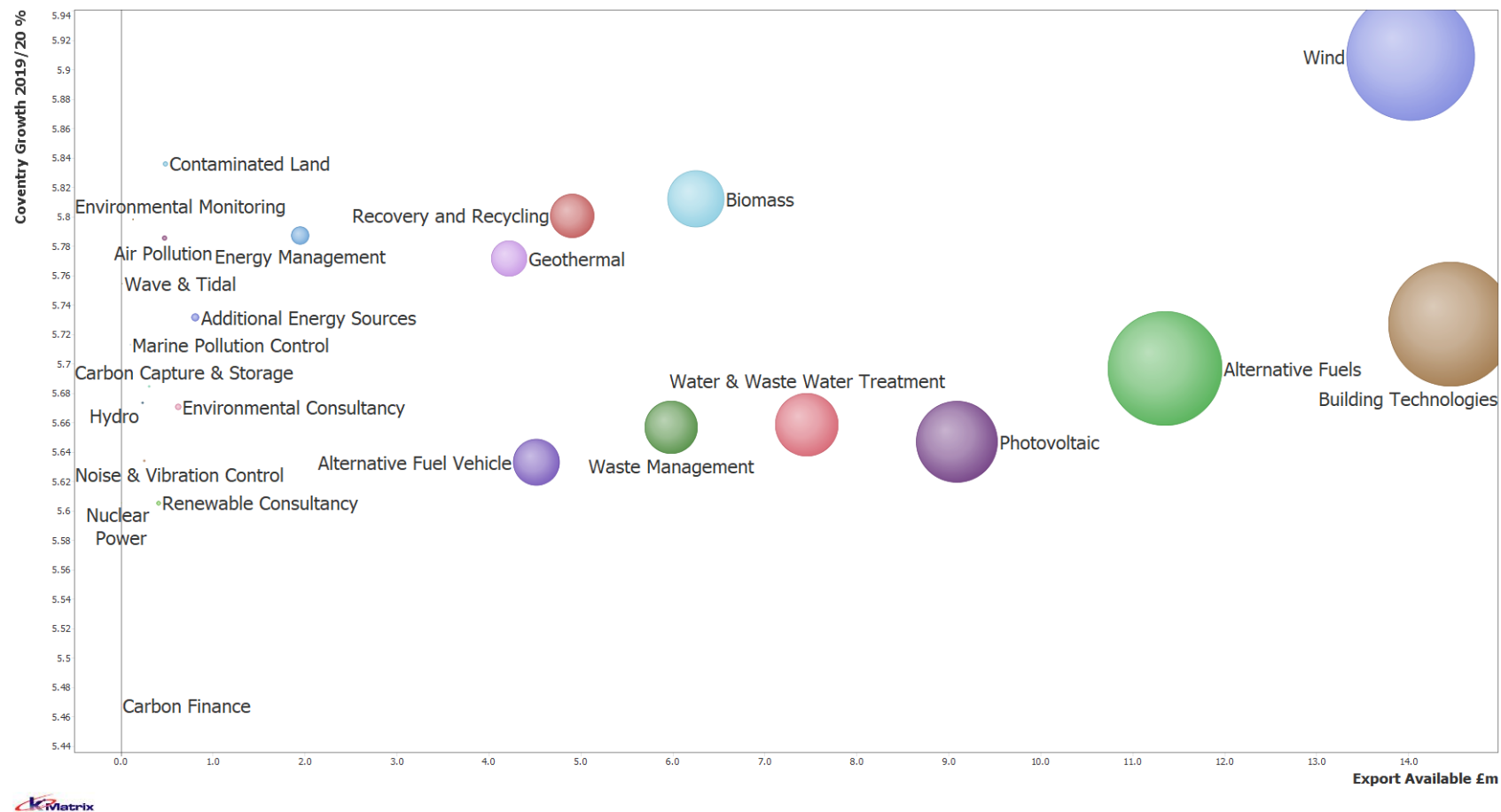


Figure 49 shows the Available Exports plotted against the Coventry and Warwickshire LEP's Growth from 2018/19 to 2019/20 for all Level 2 sub-sectors, with the bubbles sized according to the size of the Exports. Here we can see that the pattern is slightly different from the Export graph in figure 48, Wind and Alternative Fuels have moved slightly to the left as the Available Market is not as attractive, while Building technologies has moved to the right as there is good Export Market Available.

Figure 49: Coventry and Warwickshire LEP's LCEGS Available Exports vs Coventry and Warwickshire LEP's Level 2 Growth for 2019/20

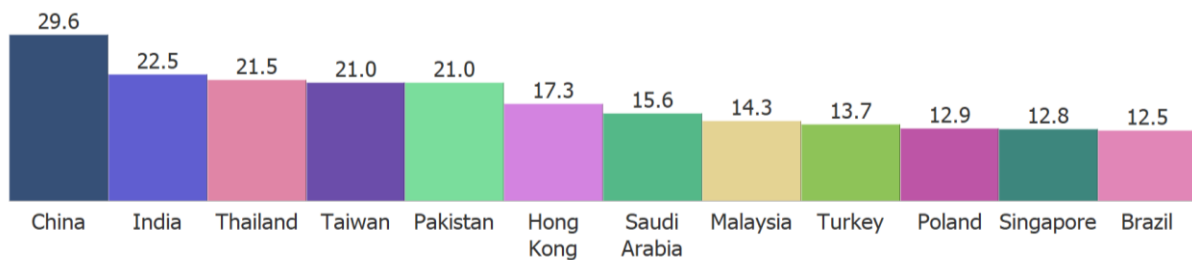


The Top 12 destinations for Coventry and Warwickshire LEP's LCEGS exports are shown in Figure 50. China is the top destination, followed by India, Thailand, Taiwan, Pakistan, Hong Kong, Saudi Arabia, Malaysia, Turkey, Poland, Singapore and Brazil.

The USA, Germany and France, who are three of the UK's largest trading partners, are conspicuously absent from the Top 12 destinations for LCEGS and this has been a feature of international trade in LCEGS since 2007/08 when the analysis first began.

The LCEGS sector has a very different trading pattern to other mainstream UK sectors, predominantly due to long term, historic trading relationships within this sector.

Figure 50: Top 12 Coventry and Warwickshire LEP's LCEGS Export Destinations 2019/20



3.2 Coventry and Warwickshire LEP's LCEGS Priority Markets

Table 17 combines analysis of Coventry and Warwickshire LEP LCEGS product and service exports with destination countries using a heat map. The table shows the value of exports in £m and then colour codes the values – dark green for higher values and white for lower values. The table has been simplified by excluding the lowest value destination countries and lowest value products/services. The results show the top 32 export destinations and the top 11 (out of 24) sub-sectors.

Table 17: Coventry and Warwickshire LEP's Level 2 Exports by Country for 2019/20 in £m

Level 1	Level 2	Australia	Brazil	Canada	Chile	China	Denmark	France	Germany	Hong Kong	Hungary	India	Indonesia	Italy	Japan	Malaysia	Mexico
Environmental	Recovery and Recycling	0.28	0.63	0.50	0.07	1.61	0.38	0.33	0.35	0.89	0.47	1.10	0.28	0.32	0.35	0.70	0.17
Environmental	Waste Management	0.32	0.68	0.53	0.07	1.67	0.37	0.33	0.34	0.90	0.51	1.19	0.29	0.35	0.35	0.75	0.18
Environmental	Water & Waste Water Treatment	0.41	0.94	0.71	0.10	2.00	0.55	0.48	0.57	1.25	0.71	1.68	0.42	0.46	0.54	1.05	0.25
Low Carbon	Alternative Fuel Vehicle	0.52	1.19	0.93	0.13	2.76	0.73	0.59	0.67	1.58	0.92	2.16	0.54	0.68	0.71	1.40	0.34
Low Carbon	Alternative Fuels	0.70	2.01	1.38	0.20	3.83	1.06	1.01	0.92	2.65	1.32	3.45	0.89	0.76	0.94	2.24	0.46
Low Carbon	Building Technologies	0.57	1.31	1.08	0.16	3.65	0.85	0.72	0.82	1.91	1.07	2.54	0.64	0.73	0.75	1.61	0.40
Low Carbon	Carbon Finance	0.19	0.45	0.40	0.05	1.04	0.25	0.21	0.29	0.60	0.35	0.61	0.18	0.24	0.19	0.56	0.12
Low Carbon	Energy Management	0.12	0.29	0.22	0.03	0.66	0.16	0.14	0.16	0.39	0.21	0.60	0.13	0.13	0.17	0.31	0.08
Renewable Energy	Biomass	0.29	0.65	0.53	0.07	1.68	0.37	0.36	0.38	1.04	0.53	1.11	0.31	0.32	0.34	0.77	0.17
Renewable Energy	Geothermal	0.72	1.54	1.19	0.18	3.92	0.91	0.74	0.87	2.21	1.17	2.76	0.69	0.71	0.83	1.71	0.43
Renewable Energy	Photovoltaic	0.44	0.91	0.75	0.11	2.24	0.51	0.48	0.50	1.28	0.78	1.87	0.44	0.49	0.53	1.02	0.24
Renewable Energy	Wind	0.52	1.15	0.94	0.12	2.70	0.62	0.50	0.62	1.55	0.86	1.95	0.50	0.55	0.61	1.21	0.31

Level 1	Level 2	Netherlands	Pakistan	Poland	Portugal	Romania	Russia	Saudi Arabia	Singapore	A Africa	S Korea	Sweden	Taiwan	Thailand	Turkey	UAE	US
Environmental	Recovery and Recycling	0.44	1.11	0.67	0.29	0.42	0.33	0.84	0.71	0.33	0.33	0.22	1.12	1.14	0.70	0.59	0.23
Environmental	Waste Management	0.42	1.12	0.68	0.28	0.46	0.32	0.80	0.68	0.32	0.35	0.22	1.16	1.23	0.70	0.64	0.23
Environmental	Water & Waste Water Treatment	0.63	1.53	0.98	0.40	0.57	0.44	1.17	0.89	0.46	0.52	0.30	1.59	1.60	0.94	0.89	0.31
Low Carbon	Alternative Fuel Vehicle	0.88	2.23	1.12	0.57	0.82	0.66	1.51	1.31	0.54	0.71	0.45	1.69	1.77	1.31	1.22	0.43
Low Carbon	Alternative Fuels	1.15	2.92	1.95	0.71	1.27	0.80	2.31	1.67	1.08	1.15	0.68	2.83	3.31	2.08	1.78	0.63
Low Carbon	Building Technologies	0.96	2.24	1.41	0.70	0.90	0.75	1.88	1.50	0.73	0.77	0.46	2.37	2.27	1.59	1.34	0.49
Low Carbon	Carbon Finance	0.28	0.82	0.49	0.22	0.31	0.19	0.52	0.50	0.21	0.26	0.18	0.67	0.86	0.46	0.36	0.16
Low Carbon	Energy Management	0.17	0.53	0.30	0.14	0.19	0.15	0.36	0.29	0.13	0.16	0.10	0.51	0.49	0.31	0.28	0.10
Renewable Energy	Biomass	0.45	1.02	0.74	0.29	0.48	0.34	0.86	0.73	0.39	0.37	0.24	1.21	1.21	0.73	0.62	0.24
Renewable Energy	Geothermal	0.96	2.61	1.55	0.73	1.03	0.81	1.85	1.66	0.74	0.82	0.53	2.75	2.59	1.66	1.46	0.57
Renewable Energy	Photovoltaic	0.64	1.55	0.99	0.47	0.69	0.50	1.20	0.97	0.50	0.55	0.32	1.74	1.63	1.06	0.88	0.33
Renewable Energy	Wind	0.74	1.93	1.19	0.45	0.73	0.60	1.28	1.03	0.57	0.62	0.38	1.96	1.99	1.25	0.97	0.39

Table 17 can be read horizontally to identify the strongest exporting sub-sectors i.e. Alternative Fuels, vertically to identify the strongest trading partners i.e. China, and using both vertical and horizontal you can identify strong niches like Geothermal to Taiwan and Alternative Fuels to India.

Tables 18a, 18b and 18c apply the same conventions as Table 13, but this time broken down to Level 3, which reveals Coventry and Warwickshire LEP's priority exports in more detail. The tables show the same 32 destination countries but for 30 out of a total of 126 Level 3 market activities.

Table 18a: Coventry and Warwickshire LEP's Level 3 Exports by Country for 2019/20 in £m

Level 2	Level 3	Australia	Brazil	Canada	Chile	China	Denmark	France	Germany	Hong Kong	Hungary	India
Recovery and Recycling	Consultancy, Training and Education	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01
Recovery and Recycling	Glass Stock Processing	0.04	0.10	0.07	0.01	0.24	0.06	0.04	0.04	0.10	0.06	0.16
Recovery and Recycling	Technologies, Research & Development	0.01	0.02	0.01	0.00	0.04	0.01	0.01	0.01	0.03	0.01	0.03
Recovery and Recycling	Waste Collection	0.12	0.26	0.22	0.03	0.68	0.17	0.14	0.16	0.38	0.21	0.46
Waste Management	Construction & Operation of Waste Treatment Facilities	0.10	0.22	0.16	0.02	0.47	0.12	0.13	0.11	0.32	0.15	0.33
Waste Management	Consultancy, Training and Education	0.04	0.09	0.08	0.01	0.21	0.04	0.05	0.05	0.09	0.06	0.18
Waste Management	Equipment For Waste Treatment	0.12	0.26	0.21	0.03	0.63	0.14	0.10	0.11	0.35	0.20	0.43
Waste Management	Technologies, Research & Development	0.06	0.11	0.09	0.01	0.35	0.07	0.06	0.07	0.14	0.10	0.25
Water & Waste Water Treatment	Engineering	0.09	0.17	0.14	0.02	0.43	0.13	0.11	0.12	0.29	0.14	0.33
Water & Waste Water Treatment	Water Treatment and Distribution	0.31	0.76	0.56	0.08	1.54	0.42	0.36	0.44	0.95	0.56	1.32
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	0.38	0.86	0.72	0.10	2.06	0.57	0.44	0.50	1.14	0.71	1.60
Alternative Fuel Vehicle	Other Fuels and Vehicles	0.14	0.32	0.21	0.04	0.70	0.16	0.16	0.17	0.45	0.21	0.57
Alternative Fuels	Main Stream Bio Fuels	0.12	0.33	0.29	0.04	0.67	0.16	0.16	0.17	0.44	0.29	0.54
Alternative Fuels	Other Bio Fuels	0.49	1.41	0.91	0.13	2.43	0.79	0.75	0.62	1.84	0.88	2.46
Alternative Fuels	Other Fuels	0.06	0.18	0.11	0.02	0.51	0.06	0.06	0.08	0.26	0.09	0.30
Building Technologies	Doors	0.14	0.34	0.29	0.05	1.01	0.27	0.17	0.24	0.55	0.27	0.72
Building Technologies	Insulation and Heat Retention Materials	0.11	0.22	0.20	0.03	0.57	0.13	0.11	0.14	0.29	0.16	0.42
Building Technologies	Monitoring and Control Systems	0.10	0.21	0.15	0.02	0.47	0.13	0.09	0.11	0.31	0.16	0.38
Building Technologies	Windows	0.24	0.54	0.45	0.06	1.60	0.32	0.35	0.32	0.76	0.47	1.02
Energy Management	Technologies, Research & Development	0.01	0.02	0.02	0.00	0.05	0.01	0.01	0.01	0.03	0.02	0.04
Biomass	Biomass Energy Systems	0.11	0.29	0.21	0.03	0.77	0.16	0.17	0.18	0.51	0.24	0.48
Biomass	Biomass Furnace Systems	0.03	0.06	0.05	0.01	0.15	0.03	0.04	0.03	0.09	0.04	0.11
Biomass	Boilers and related Systems	0.10	0.21	0.17	0.02	0.57	0.13	0.11	0.12	0.32	0.17	0.39
Biomass	Manufacturing Of Boilers and Related Systems	0.05	0.09	0.09	0.01	0.19	0.05	0.05	0.05	0.12	0.08	0.14
Geothermal	Manufacture and Supply of Specialist Equipment	0.21	0.48	0.31	0.05	1.14	0.28	0.23	0.23	0.59	0.33	0.70
Geothermal	Suppliers of Systems	0.21	0.44	0.32	0.06	1.19	0.27	0.25	0.25	0.69	0.31	0.88
Geothermal	Whole Systems Manufacture	0.18	0.38	0.35	0.04	0.99	0.22	0.14	0.23	0.59	0.31	0.66
Photovoltaic	Other Related Equipment and Chemicals	0.09	0.17	0.13	0.02	0.46	0.10	0.09	0.11	0.27	0.15	0.36
Photovoltaic	Photovoltaic Cells	0.10	0.17	0.19	0.02	0.41	0.10	0.09	0.12	0.24	0.15	0.36
Photovoltaic	Systems & Equipment	0.23	0.54	0.40	0.07	1.27	0.29	0.28	0.26	0.72	0.46	1.08
Wind	Large Wind Turbine	0.21	0.53	0.35	0.05	1.10	0.26	0.17	0.23	0.67	0.39	0.77
Wind	Small Wind Turbine	0.12	0.27	0.28	0.03	0.67	0.18	0.16	0.19	0.44	0.25	0.58
Wind	Wind Farm Systems	0.18	0.35	0.31	0.04	0.92	0.18	0.17	0.20	0.43	0.22	0.61

At Level 3 greater levels of detail are created that reveal more niche export markets, i.e. Other Bio Fuels to India, Large Wind Turbine to Taiwan and Thailand, Alternative Fuels (Main Stream for Vehicles Only) to Pakistan and Water Treatment and Distribution to China.

Table 18b: Coventry and Warwickshire LEP's Level 3 Exports by Country for 2019/20 in £m

Level 2	Level 3	Indonesia	Italy	Japan	Malaysia	Mexico	Netherlands	Pakistan	Poland	Portugal	Romania	Russia
Recovery and Recycling	Consultancy, Training and Education	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Recovery and Recycling	Glass Stock Processing	0.03	0.04	0.05	0.08	0.02	0.06	0.17	0.10	0.03	0.05	0.04
Recovery and Recycling	Technologies, Research & Development	0.01	0.01	0.01	0.02	0.00	0.01	0.03	0.02	0.01	0.01	0.01
Recovery and Recycling	Waste Collection	0.12	0.14	0.15	0.30	0.08	0.19	0.47	0.27	0.13	0.17	0.14
Waste Management	Construction & Operation of Waste Treatment Facilities	0.09	0.11	0.10	0.24	0.06	0.14	0.36	0.20	0.09	0.15	0.09
Waste Management	Consultancy, Training and Education	0.05	0.04	0.04	0.10	0.02	0.05	0.15	0.08	0.03	0.05	0.04
Waste Management	Equipment For Waste Treatment	0.11	0.14	0.14	0.27	0.06	0.16	0.40	0.27	0.10	0.18	0.13
Waste Management	Technologies, Research & Development	0.05	0.06	0.07	0.13	0.04	0.06	0.20	0.12	0.05	0.07	0.05
Water & Waste Water Treatment	Engineering	0.09	0.09	0.11	0.20	0.05	0.12	0.35	0.18	0.07	0.12	0.08
Water & Waste Water Treatment	Water Treatment and Distribution	0.32	0.36	0.42	0.84	0.20	0.50	1.16	0.78	0.32	0.44	0.36
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	0.39	0.54	0.54	1.09	0.25	0.68	1.73	0.85	0.41	0.61	0.50
Alternative Fuel Vehicle	Other Fuels and Vehicles	0.15	0.13	0.17	0.31	0.08	0.20	0.51	0.27	0.15	0.21	0.16
Alternative Fuels	Main Stream Bio Fuels	0.13	0.17	0.18	0.35	0.09	0.20	0.57	0.36	0.14	0.19	0.12
Alternative Fuels	Other Bio Fuels	0.63	0.49	0.63	1.63	0.29	0.80	1.98	1.32	0.46	0.95	0.56
Alternative Fuels	Other Fuels	0.09	0.06	0.08	0.16	0.05	0.09	0.23	0.17	0.06	0.07	0.08
Building Technologies	Doors	0.15	0.17	0.18	0.38	0.11	0.25	0.63	0.38	0.19	0.26	0.21
Building Technologies	Insulation and Heat Retention Materials	0.11	0.11	0.12	0.25	0.06	0.15	0.37	0.24	0.11	0.15	0.12
Building Technologies	Monitoring and Control Systems	0.09	0.12	0.11	0.22	0.06	0.15	0.39	0.21	0.10	0.12	0.10
Building Technologies	Windows	0.29	0.33	0.34	0.75	0.17	0.41	0.85	0.57	0.31	0.37	0.33
Energy Management	Technologies, Research & Development	0.01	0.01	0.01	0.02	0.01	0.01	0.04	0.02	0.01	0.01	0.01
Biomass	Biomass Energy Systems	0.14	0.14	0.14	0.34	0.08	0.20	0.45	0.30	0.13	0.20	0.15
Biomass	Biomass Furnace Systems	0.03	0.03	0.03	0.08	0.01	0.04	0.09	0.06	0.03	0.04	0.03
Biomass	Boilers and related Systems	0.10	0.10	0.12	0.24	0.06	0.14	0.36	0.27	0.09	0.16	0.13
Biomass	Manufacturing Of Boilers and Related Systems	0.04	0.04	0.05	0.10	0.02	0.07	0.13	0.12	0.04	0.07	0.04
Geothermal	Manufacture and Supply of Specialist Equipment	0.20	0.18	0.23	0.47	0.13	0.28	0.65	0.40	0.21	0.26	0.20
Geothermal	Suppliers of Systems	0.20	0.20	0.25	0.54	0.12	0.26	0.83	0.51	0.21	0.31	0.24
Geothermal	Whole Systems Manufacture	0.16	0.18	0.20	0.40	0.11	0.24	0.64	0.37	0.18	0.28	0.22
Photovoltaic	Other Related Equipment and Chemicals	0.08	0.10	0.10	0.18	0.05	0.13	0.33	0.21	0.09	0.13	0.10
Photovoltaic	Photovoltaic Cells	0.09	0.09	0.11	0.24	0.06	0.15	0.28	0.21	0.10	0.17	0.11
Photovoltaic	Systems & Equipment	0.25	0.29	0.30	0.56	0.12	0.34	0.88	0.53	0.26	0.37	0.27
Wind	Large Wind Turbine	0.21	0.22	0.24	0.50	0.13	0.30	0.82	0.46	0.18	0.29	0.25
Wind	Small Wind Turbine	0.12	0.15	0.16	0.35	0.08	0.20	0.50	0.32	0.13	0.20	0.15
Wind	Wind Farm Systems	0.16	0.18	0.21	0.37	0.09	0.24	0.61	0.41	0.13	0.24	0.20

Table 18c: Coventry and Warwickshire LEP's Level 3 Exports by Country for 2019/20 in £m

Level 2	Level 3	Saudi Arabia	Singapore	South Africa	South Korea	Sweden	Taiwan	Thailand	Turkey	UAE	US
Recovery and Recycling	Consultancy, Training and Education	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Recovery and Recycling	Glass Stock Processing	0.12	0.09	0.04	0.04	0.02	0.17	0.15	0.11	0.07	0.03
Recovery and Recycling	Technologies, Research & Development	0.02	0.02	0.01	0.01	0.01	0.03	0.03	0.02	0.02	0.01
Recovery and Recycling	Waste Collection	0.37	0.32	0.15	0.16	0.10	0.49	0.48	0.28	0.27	0.10
Waste Management	Construction & Operation of Waste Treatment Facilities	0.27	0.22	0.10	0.11	0.07	0.35	0.40	0.23	0.20	0.06
Waste Management	Consultancy, Training and Education	0.10	0.08	0.04	0.04	0.03	0.14	0.15	0.09	0.09	0.04
Waste Management	Equipment For Waste Treatment	0.29	0.24	0.12	0.13	0.08	0.45	0.45	0.23	0.26	0.09
Waste Management	Technologies, Research & Development	0.14	0.14	0.05	0.06	0.04	0.21	0.24	0.14	0.09	0.04
Water & Waste Water Treatment	Engineering	0.24	0.18	0.11	0.11	0.07	0.33	0.36	0.18	0.19	0.06
Water & Waste Water Treatment	Water Treatment and Distribution	0.90	0.70	0.34	0.40	0.23	1.24	1.23	0.75	0.69	0.25
Alternative Fuel Vehicle	Alternative Fuels (main Stream) for Vehicles Only	1.17	1.02	0.39	0.56	0.36	1.18	1.28	1.02	0.94	0.33
Alternative Fuel Vehicle	Other Fuels and Vehicles	0.35	0.29	0.15	0.14	0.10	0.51	0.50	0.29	0.28	0.10
Alternative Fuels	Main Stream Bio Fuels	0.36	0.30	0.18	0.15	0.12	0.49	0.54	0.29	0.30	0.10
Alternative Fuels	Other Bio Fuels	1.67	1.12	0.76	0.88	0.48	1.99	2.36	1.49	1.24	0.43
Alternative Fuels	Other Fuels	0.17	0.16	0.09	0.08	0.05	0.20	0.25	0.21	0.15	0.07
Building Technologies	Doors	0.57	0.38	0.18	0.21	0.13	0.67	0.63	0.44	0.33	0.12
Building Technologies	Insulation and Heat Retention Materials	0.26	0.22	0.12	0.13	0.07	0.40	0.31	0.26	0.24	0.08
Building Technologies	Monitoring and Control Systems	0.26	0.24	0.11	0.12	0.07	0.35	0.35	0.22	0.17	0.08
Building Technologies	Windows	0.78	0.66	0.32	0.32	0.18	0.95	0.97	0.67	0.61	0.21
Energy Management	Technologies, Research & Development	0.03	0.02	0.01	0.01	0.01	0.04	0.04	0.02	0.02	0.01
Biomass	Biomass Energy Systems	0.42	0.31	0.19	0.17	0.12	0.55	0.58	0.27	0.28	0.11
Biomass	Biomass Furnace Systems	0.07	0.06	0.03	0.03	0.02	0.11	0.11	0.06	0.07	0.02
Biomass	Boilers and related Systems	0.27	0.26	0.12	0.12	0.07	0.39	0.38	0.27	0.19	0.08
Biomass	Manufacturing Of Boilers and Related Systems	0.11	0.10	0.05	0.06	0.03	0.15	0.13	0.12	0.08	0.03
Geothermal	Manufacture and Supply of Specialist Equipment	0.60	0.49	0.22	0.22	0.14	0.70	0.81	0.44	0.35	0.17
Geothermal	Suppliers of Systems	0.54	0.51	0.25	0.27	0.17	0.77	0.80	0.46	0.44	0.18
Geothermal	Whole Systems Manufacture	0.36	0.40	0.15	0.19	0.14	0.77	0.51	0.46	0.41	0.12
Photovoltaic	Other Related Equipment and Chemicals	0.23	0.20	0.09	0.11	0.07	0.33	0.33	0.23	0.19	0.07
Photovoltaic	Photovoltaic Cells	0.23	0.22	0.13	0.11	0.07	0.39	0.31	0.20	0.17	0.06
Photovoltaic	Systems & Equipment	0.70	0.53	0.27	0.31	0.17	0.97	0.94	0.60	0.50	0.18
Wind	Large Wind Turbine	0.54	0.39	0.25	0.23	0.15	0.79	0.80	0.50	0.41	0.17
Wind	Small Wind Turbine	0.35	0.28	0.15	0.18	0.11	0.55	0.59	0.35	0.28	0.10
Wind	Wind Farm Systems	0.38	0.36	0.17	0.21	0.12	0.62	0.60	0.40	0.28	0.12

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
<i>Indexed numbers for the rows above show that growth in the manufacturing and construction sectors is similar for both the SIC and kMatrix definitions</i>		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.

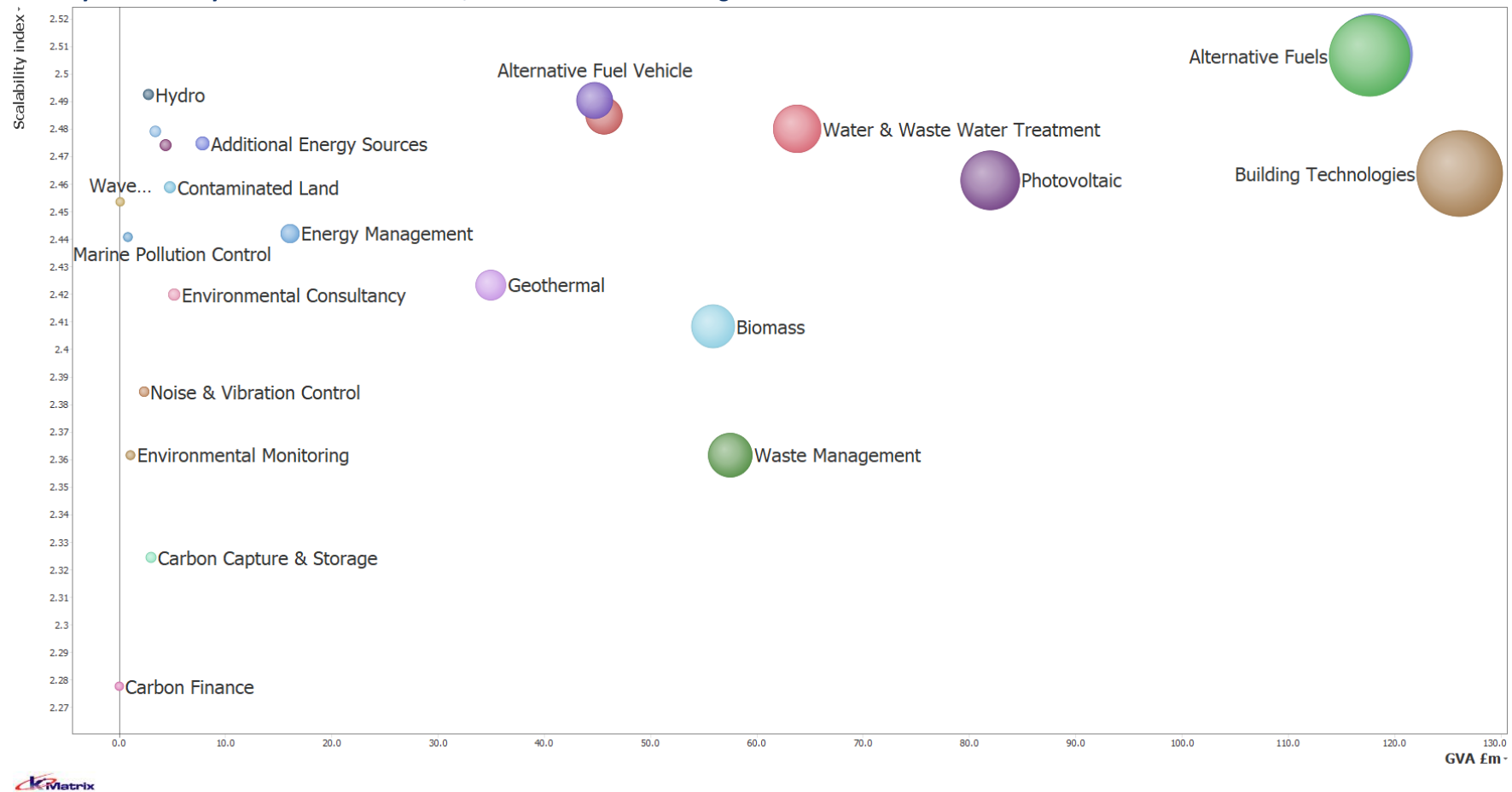
Table 2: kMatrix and ONS – EGSS Comparison Summary Table

	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		

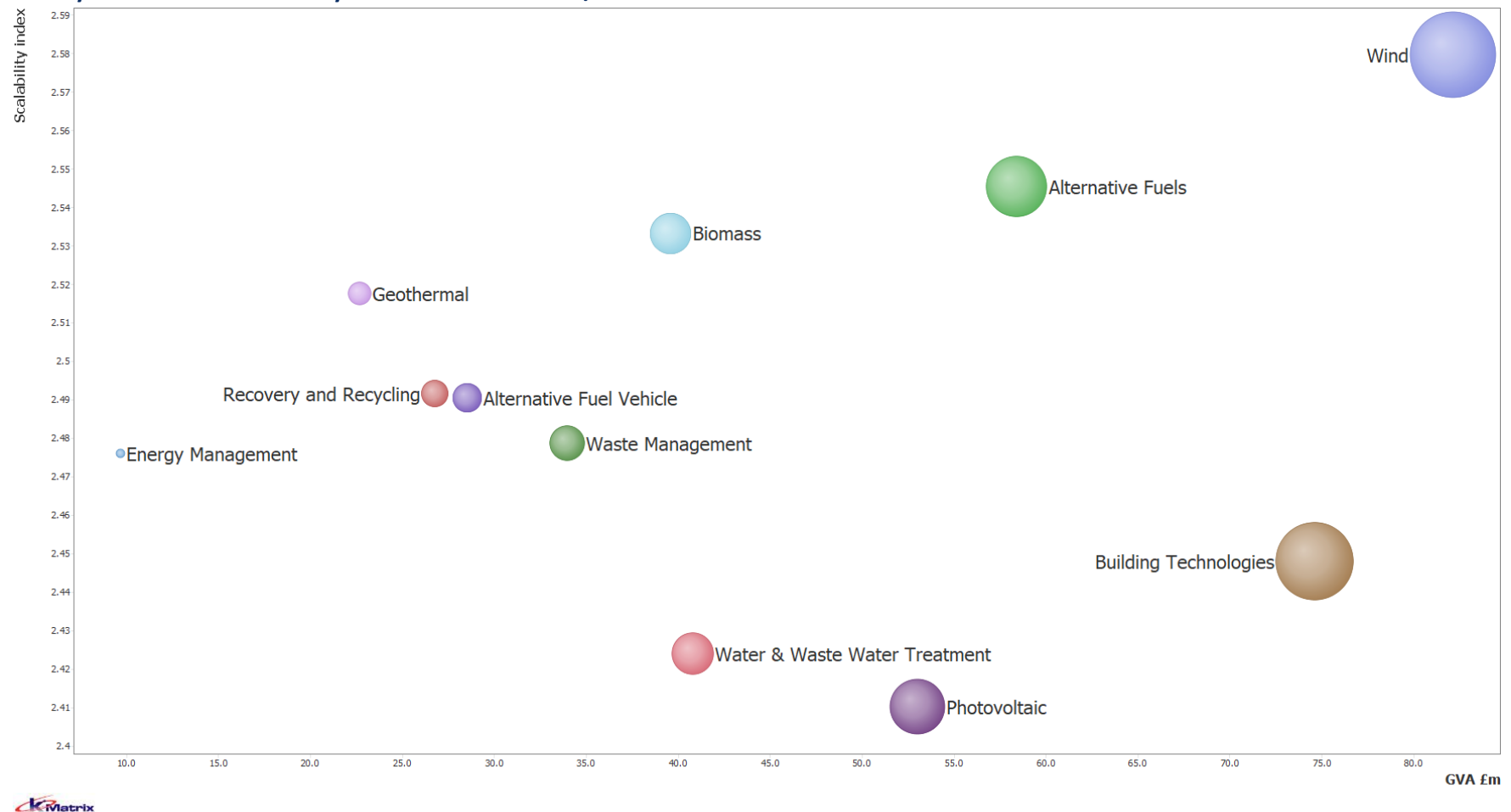
Appendix 4

LCEGS Scalability vs. GVA by Local Authority for Level 2

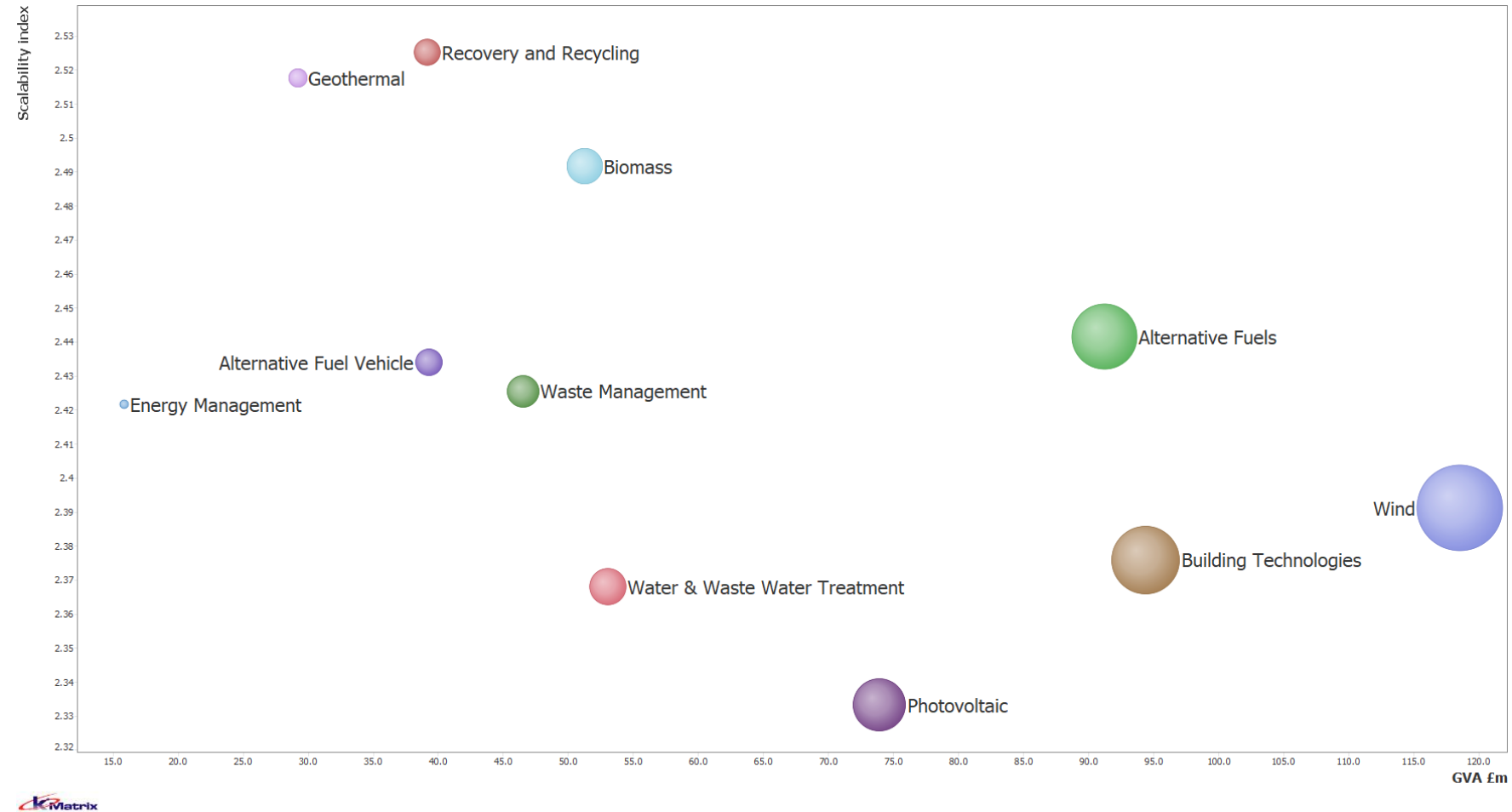
Coventry – Scalability Index vs. GVA for 2019/20 – Note: Wind is sitting behind Alternative Fuels



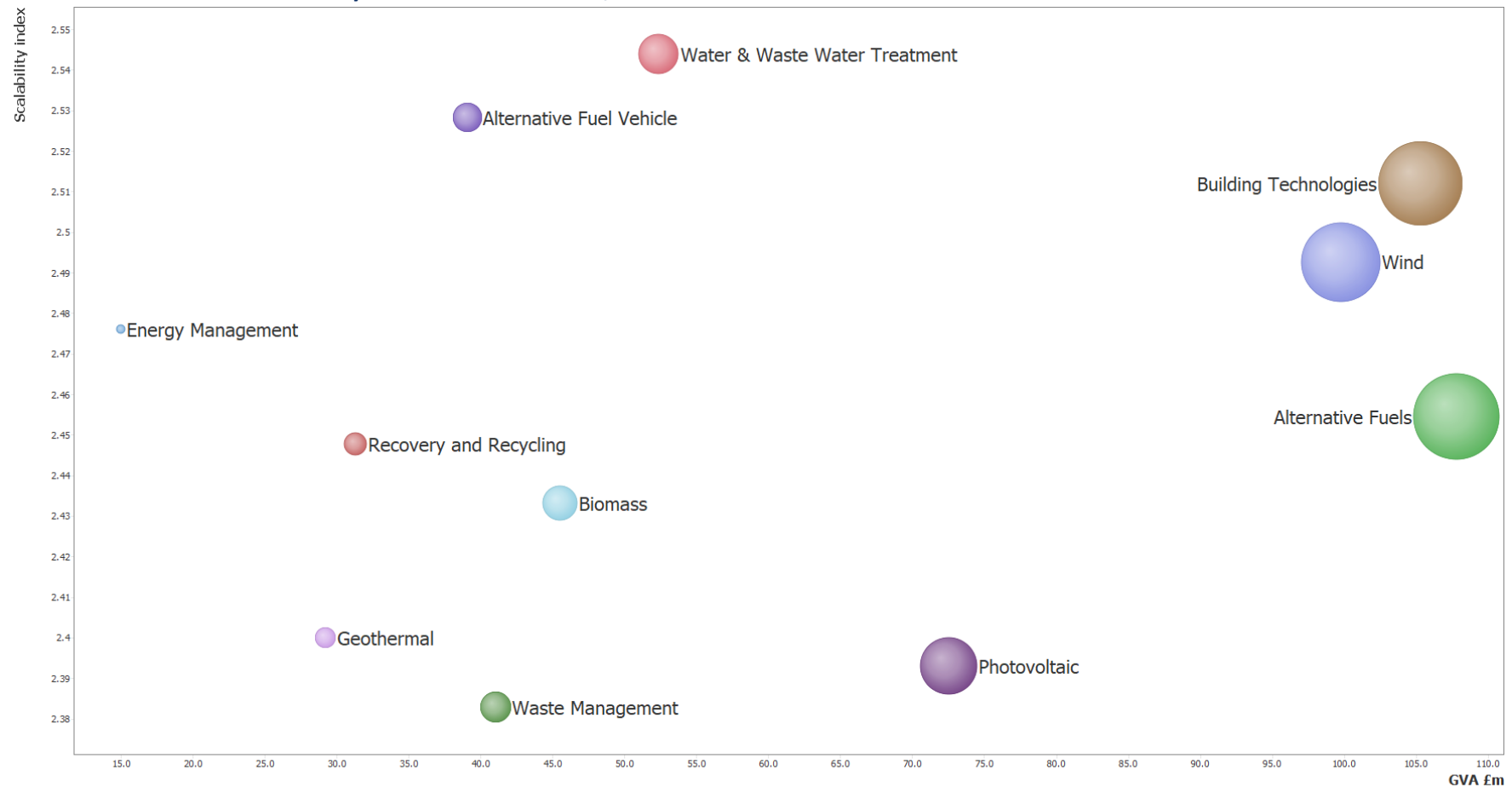
Hinckley & Bosworth – Scalability Index vs. GVA for 2019/20



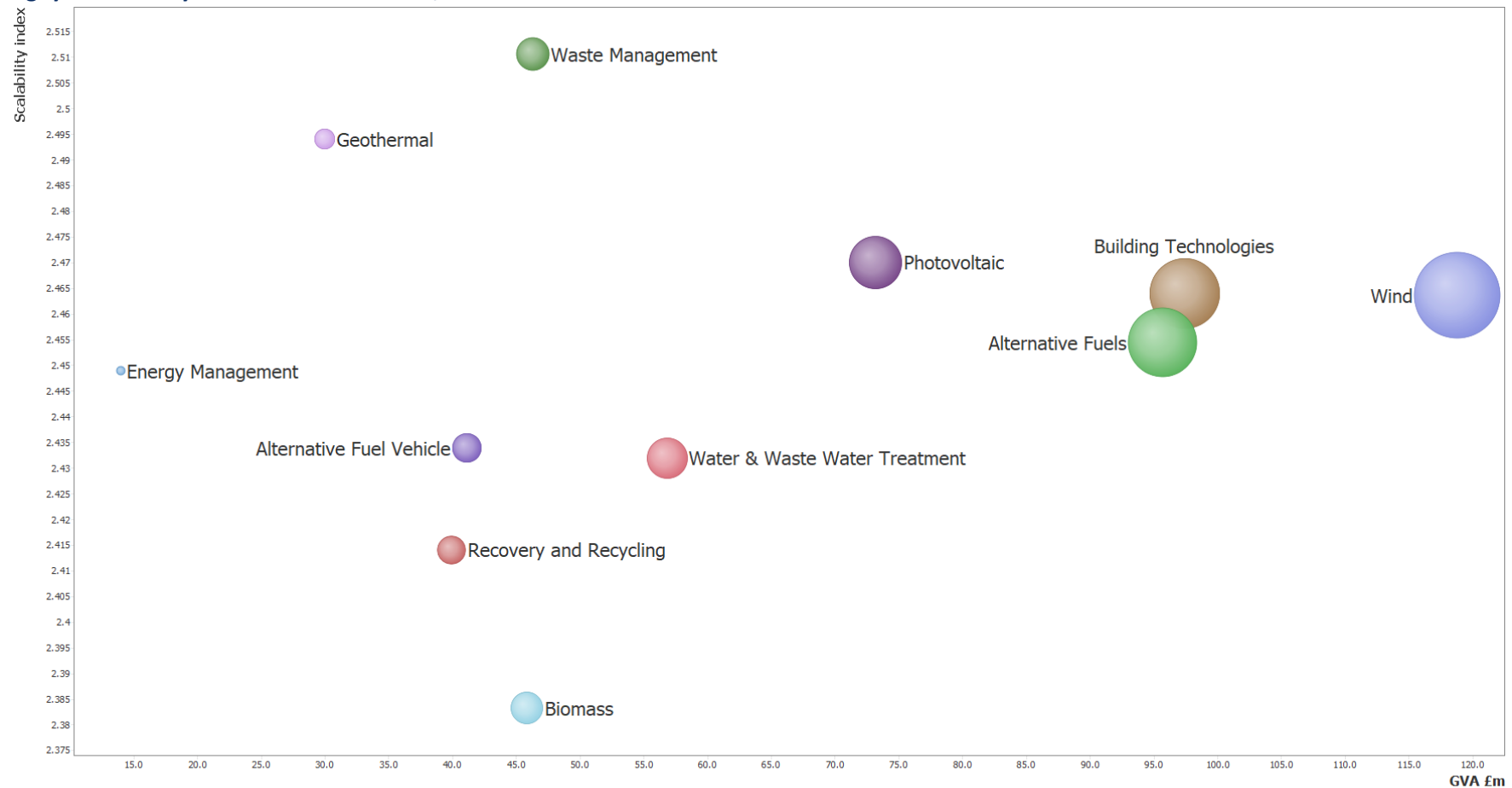
North Warwickshire – Scalability Index vs. GVA for 2019/20



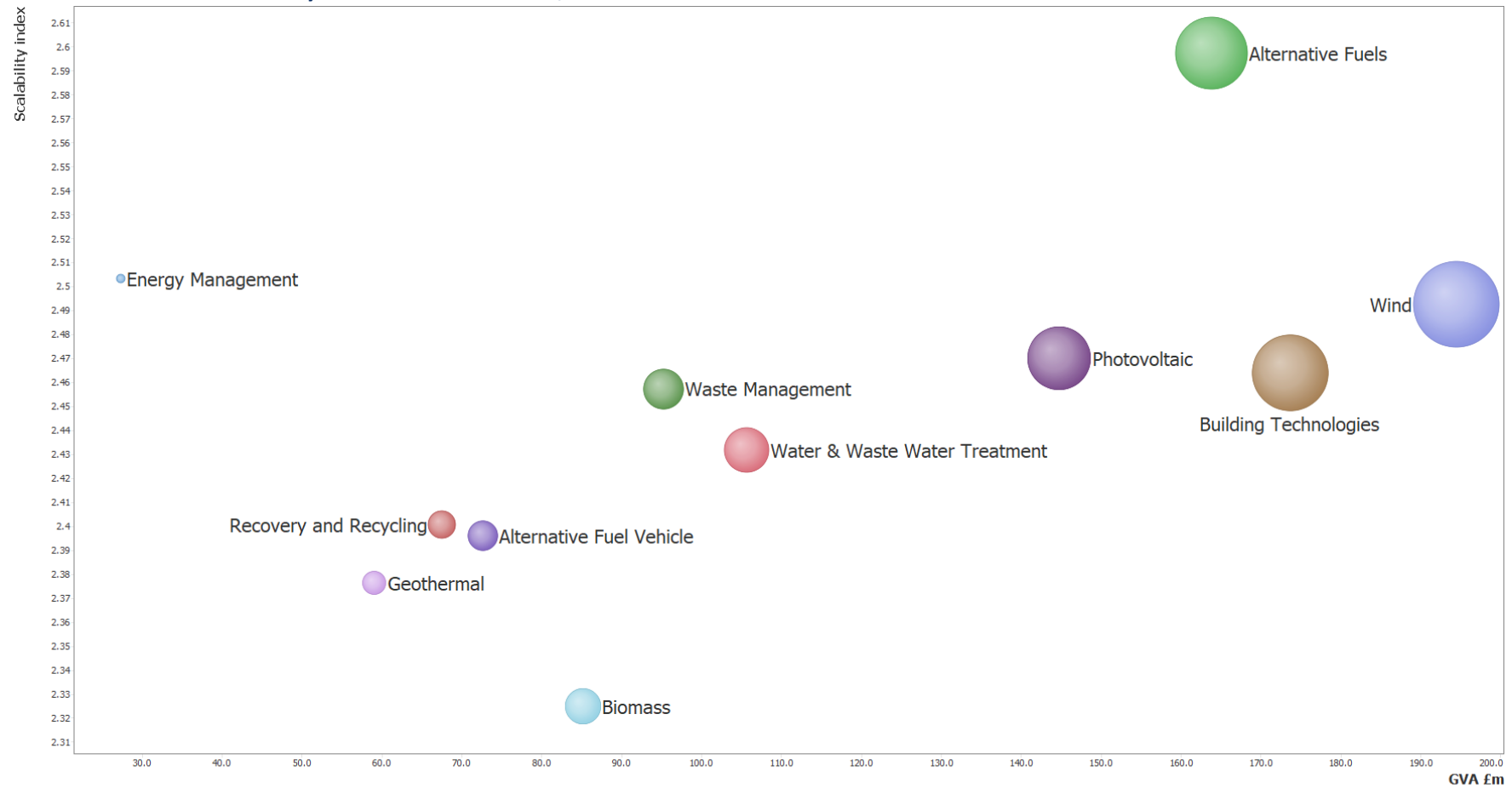
Nuneaton & Bedworth – Scalability Index vs. GVA for 2019/20



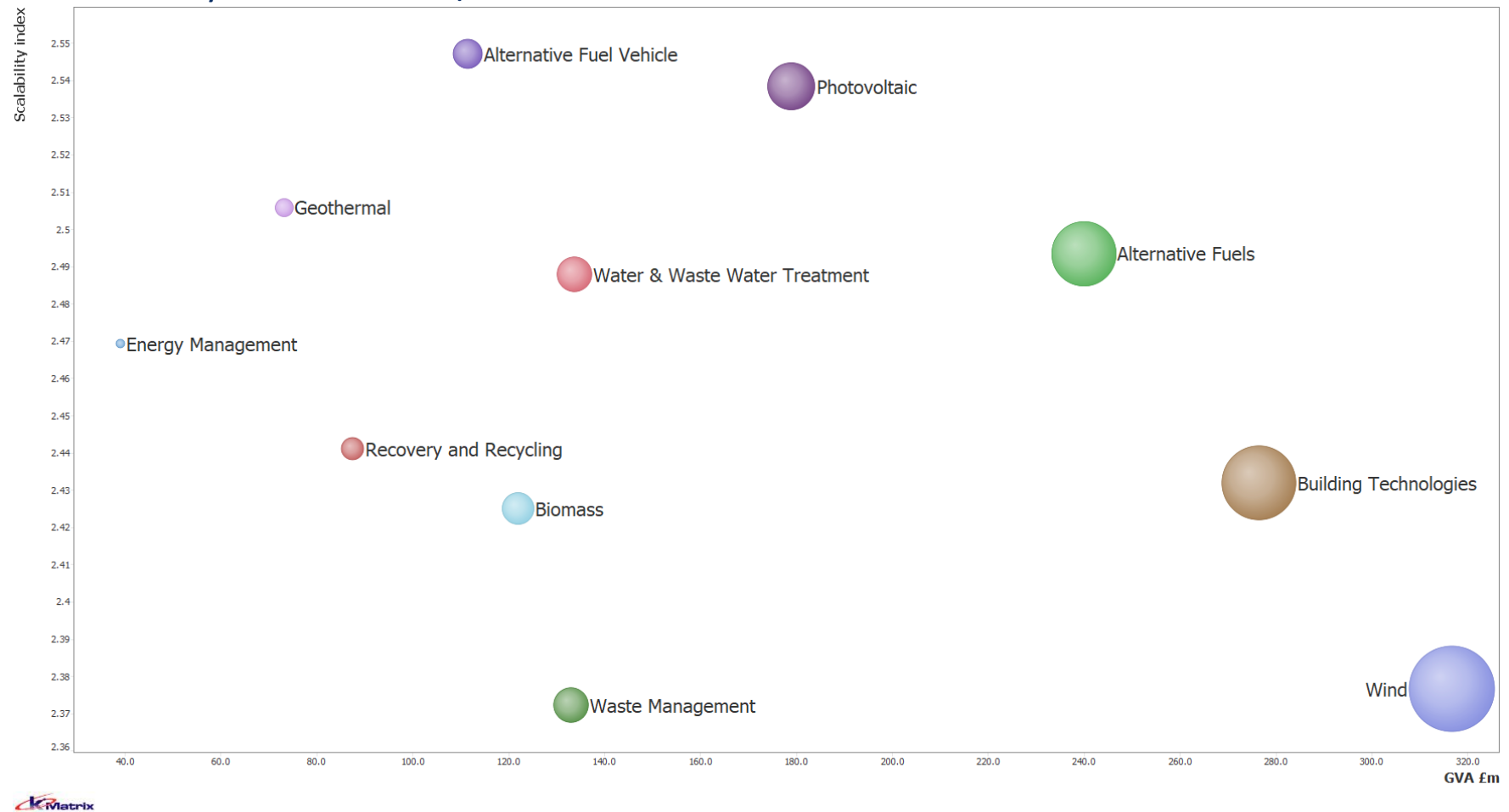
Rugby – Scalability Index vs. GVA for 2019/20



Stratford-on-Avon – Scalability Index vs. GVA for 2019/20



Warwick – Scalability Index vs. GVA for 2019/20



Appendix 5

LCEGS Current Employment, Skills Gaps and Forecasts for Net Zero 2030 and 2050 Scenarios for Top Level 2 Sub-sectors

Alternative Fuel Vehicle

SOC	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	
	# Employees 2019/20	Shortage of 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)
		2019/20	Shortage as a % of Total Employees									
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

SOC	Alternative Fuels				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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

SOC	Biomass				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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

SOC	Building Technologies				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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

SOC	Energy Management				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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

SOC	Geothermal				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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

SOC	Photovoltaic				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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

SOC	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	
	# 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

SOC	Waste Management				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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

SOC	Wind				Net Zero by 2030				Net Zero by 2050			
	Current Employment				Worst Case Scenario		Best Case Scenario		Worst Case Scenario		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	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%