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MNZH – Anaerobic Digestion Feasibility Summary Report

V1.0

Environmental and sustainability solutions provided to

Midlands Net Zero Hub

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CONTENTS

1.0 INTRODUCTION

1.1 Appointment and Scope

A key ambition of the Midlands Net Zero Hub (MNZH) is to assist local authorities across the Midlands to better understand anaerobic digestion (AD), and its crucial role in generating renewable energy, managing the processing of organic wastes and resolving issues in the renewable energy supply chain. Supported by its accountable body, Nottingham City Council (NCC) and project sponsor, the Department for Energy Security and Net Zero (DESNZ), NCC appointed Walker Resource Management Limited (WRM) to carry out an outline feasibility assessment of AD development potential for local authorities within the Midlands region.

The MNZH released a detailed consultancy specification setting out their requirements to enhance AD understanding and opportunity development across the Midlands region. WRM commenced the project with the following aims in mind:

1. To engage with key stakeholders to further understand the role of farming, agri-food, and land-based sectors to understand potential ways to decarbonise the Midlands;
2. The reporting of findings to policy makers and wider stakeholders, whilst potentially identifying commercial opportunities for the projects;
3. To support local authorities in understanding the opportunities that could arise with undertaking waste treatment through AD;
4. The undertaking of five studies to aid understanding in how AD can support these authorities in meeting their declared net-zero/carbon neutrality targets; and
5. To work with project partners to develop a range of potential AD projects that may be taken forward for detailed assessment.

The project commenced with the production of a briefing report. The briefing report served to introduced AD as a technology, set against fiscal, political and economic contexts, and provided commentary on the current landscape of AD across the Midlands region.

Following the completion of an information dissemination event in July 2025, the MNZH commenced an Expression of Interest (EOI) process. Midlands-based local authorities were invited to respond to this Expression of Interest, outlining how they might benefit from the undertaking of an AD feasibility study and the potential impact it could have on their local net-zero/carbon neutrality efforts.

Of the EOIs received, five local authorities were chosen to receive an outline AD feasibility report, as set out below:

- Herefordshire Council;
- Lincolnshire County Council;
- Nottinghamshire County Council/Nottingham City Council;
- Walsall Council; and,
- Worcestershire County Council.

1.2 Project Approach

To address the project aims, the work was structured into seven specific work packages

1) EOI Review, Stakeholder Engagement and Policy Context

Phase one of the project comprised of a review of the returned EOI form. This review confirmed Council priorities, both commercially and from a national and local waste policy perspective. The contributions of relevant stakeholders, including the Council's waste and sustainability teams, were used to shape the outline feasibility studies insofar as possible.

2) Quantifying Material Flows

Phase two of the project focused on quantifying the amount of feedstock potentially available to the plants for processing. Organic waste arisings for municipal, commercial and industrial sources were calculated using robust methodologies.

3) Plant Sizing and Reference Design

Phase three of the project consisted of a plant sizing assessment based on the feedstock estimation exercise undertaken in phase two. A project-specific reference design was developed, with the specification of the plant incorporated into the techno-economic assessment, conducted in phase five of the work.

4) Planning and Permissions

Phase four of the work comprised a planning and permissions review. The work included a review of local authority waste core strategies and other pertinent planning documents, together with further stakeholder engagement, to identify sites potentially suitable for AD development. Sites were assessed from a range of planning and permit variables such as location relative to sensitive and ecological receptors. During site identification, a biomethane and electricity grid connection feasibility assessment, together with exploratory work on other technology adjacencies, was undertaken to further assess the suitability of identified sites.

5) Techno-economic assessment

Phase five of the project comprised the development of a discounted whole life cost and carbon emissions model to evaluate the to evaluate the inputs, outputs and cash flows associated with each project's reference plant design. Capital and operational costs, revenues and product output were calculated for each project. Sensitivity analysis was undertaken to further define the importance/influence of key variables for each project.

6) Commercial Risk Assessment and Legal Implications

A qualitative commercial risk assessment was undertaken for each project. The tool assesses several commercial matters to evaluate overall project risk and supported the quantitative techno-economic assessment. Commentary covering legal considerations relating to landowner/tenant relationship and typical property lease Heads of Terms was provided as part of the work package.

7) Governance and Implementation

Phase seven provided a summary of the governance and asset ownership structures that predominate the AD market, including an overview of suppliers and operators of UK-based AD assets. This phase concluded with the development of an implementation plan and project schedule focused on the planning, construction and operational phases of developing an AD facility. The project schedule includes mobilisation tasks, preliminary market engagement, procurement, infrastructure lead timescales, planning and permitting, construction and commissioning, and monitoring frameworks.

2.0 PROJECT FINDINGS

A summary of overarching findings for the project is presented in sections 2.1 to 2.7, below.

2.1 Policy and Waste Strategy Drivers for AD

The Environment Act 2021 mandates for all waste collection authorities in England to provide a weekly kerbside collection of food waste to all households by 31st March 2026 (except where transitional arrangements apply). Simpler recycling policy was updated in November 2024 and confirmed that garden and food waste could be co-collected in the same waste receptacle.

All business and non-domestic premises in England (such as schools and hospitals) were required to have a food waste recycling collection in place by 31st March 2025. Micro-firms[1] have a separate implementation date and shall be required to have a food waste collection

[1] Micro firms are defined as businesses employing fewer than 10 members of staff and have a turnover or balance sheet of less than £1.7 million.

service in place by 31st March 2027. The Government's preference for unavoidable food waste to be treated by AD provides a clear rationale for investigating AD feasibility.

Through the declaration of local authority net-zero/carbon neutrality targets, several decisions are required that serve to shape future waste strategy at a local and regional level. Engagement with each Council's waste and sustainability teams was undertaken at the outset of the project to confirm both commercial and waste strategy priorities in respect to each project.

The commercial and waste strategy priorities incorporated into the study were as follows:

- The utilisation of a several sources of organic feedstock above and beyond arisings from kerbside collections. Other sources included grass verge cuttings, food wastes arising from commercial and industrial premises, and agricultural wastes such as farmyard manure and straw.
- Technologies adjacent to the AD process, including Carbon Capture Usage and Storage (CCUS), gas to grid injection and vehicle refuelling using Bio-Compressed Natural Gas (Bio-CNG).

2.2 Feedstock Quantification

The five plants modelled within this study have been assumed to process a total of 355,000 tonnes per annum of feedstocks (3 x 80,000 tonnes per annum, 1 x 85,000 tonnes per annum, 1 x 30,000 tonnes per annum).

The study has assumed a variety of feedstocks to be available to the AD plants and have been estimated by several methodologies. Household food wastes arisings from local authority kerbside collections were estimated according to the food waste estimation approach from Evaluation of the WRAP separate food waste collection trials from 2009. Commercial and industrial food wastes have been estimated by applying a range of waste generation factors (derived from a report by the Centre for Process Innovation CPI) to the ONS *business activity, size and location* datasets (2024). Agricultural and horticultural feedstocks were identified based on communications with the local councils to determine the county's land use and production make-up.

The largest feedstock source to AD plants within the Midlands arise is the food waste that is expected to arise from weekly household food waste collections following service

implementation. This comprises approximately 40% of the assumed overall feedstock mix, as shown in Figure 1. Feedstock considerations for individual studies are set out below:

1. In addition to the food waste collected across the county of Worcestershire, the reference plant is assumed to process 13,475 tonnes per annum of food waste derived from neighbouring authorities
2. Nottinghamshire's reference plant processes an expected 19,000 tonnes per annum of Derbyshire's kerbside collected food waste.
3. Walsall Council's reference AD plant is designed to process kerbside-collected food waste, alongside 19,000 tonnes per annum of kerbside-collected garden waste.

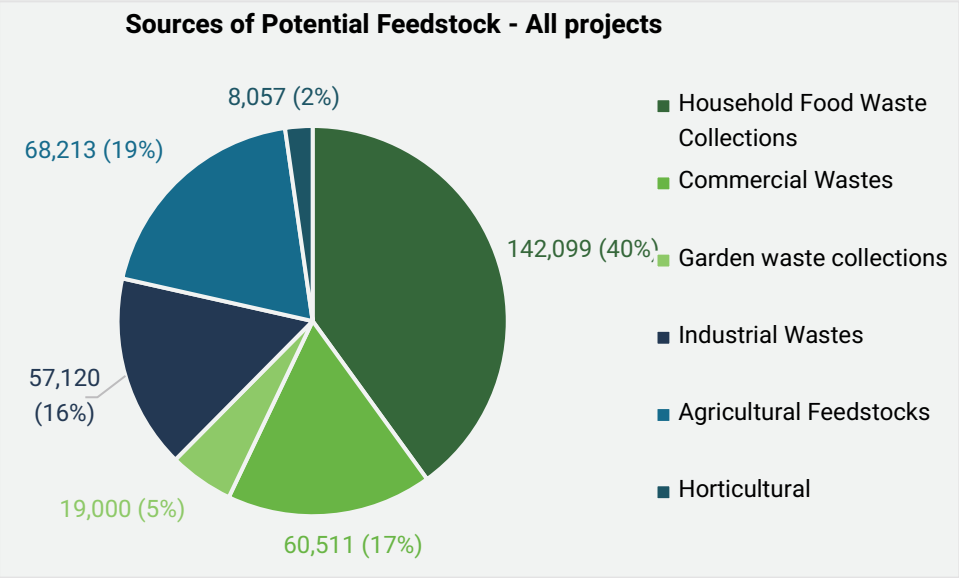

Figure 1 - Sources of Potential Feedstock for the five feasibility projects

A total of 68,213 tonnes per annum of agricultural feedstocks were estimated in the form of mixed farmyard manures, straw and poultry litter. These were target feedstocks for plants based in Herefordshire and Lincolnshire, owing to the surrounding agriculture of each county. Moreover, a total of 8,057 tonnes per annum of feedstock, derived from horticultural and highways maintenance activities, respectively, were assumed to be available. 5,000 tonnes per annum of apple pomace was assumed for the Herefordshire plant – noting the County's cider production industry – and 3,057 tonnes per annum of roadside verge cuttings for the Worcestershire plant respectively.

2.3 Plant Sizing and Reference Design

As set out in section 2.2, the five plants modelled in the work have a cumulative maximum processing capacity of 355,000 tonnes per annum. Four of the five designs assumed the use

of a 'wet' AD two-stage digestion system, with the remaining design assuming the use of a 'dry' AD batch processing system for food and green wastes.

The waste processing capacities of the 'wet' AD reference plants were set at 80,000 tonnes per annum (3 No.) and 85,000 tonnes per annum (1 No.) respectively. The selection of this capacity level was determined by the current and prevailing economics of an operation, particularly the revenues associated with incentive tariffs for renewable energy generation schemes such as the Green Gas Support Scheme.

The waste processing capacity of the 'dry' AD reference plant was set at 30,000 tonnes. The selection of this capacity was predicated on the treatment requirement for Walsall's organic waste, and the land availability at the chosen case study site.

2.4 Permitting and Planning

Within this study the assessment of initial sites was predicated on compliance with permitting and planning requirements; all anaerobic digestion plants that accept controlled wastes are required to hold an Environmental Permit issued by the waste management sector's regulator, the Environment Agency. Given the nature of operations to be undertaken at the AD plant, it is likely a bespoke permit would be required. To refine the selection of identified sites, the sensitive receptor criteria within the AD standard rule permit was used as a useful starting point to assess site suitability, through assessment of the sites' proximity to sensitive and ecological receptors. Factors within the criteria included:

- 200 metres to the nearest receptor as measured from any combustion stack;
- 250 metres to the presence of great crested newts;
- 50 metres to a Local Nature Reserve, Local Wildlife Site, Ancient Woodland or Scheduled Monument

The criteria above are not exhaustive and in total there are 9 sensitive receptor requirements. Additional requirements to assess a site, such as distance to the local authority's city centre, road network, land size and presence in a flood zone were reviewed.

To assess the site's compliance to planning requirements, the local policies of each council considered in the project were reviewed. Policies which supported anaerobic digestion at the site were listed, and a review undertaken of the appropriate mitigation controls that an AD site would need to have in place, prior to operating, to achieve environmental permit approval and to minimise environmental impact insofar as possible.

Table 1 provides a summary of the case-study sites identified for each authority with permitting and planning considerations listed, and the results of the gas and electric feasibility enquiries provided.

Table 1 - Identified case-study sites

	Herefordshire	Lincolnshire	Nottinghamshire	Walsall	Worcestershire
Site	**Hereford Enterprise Zone**	**Riverside Industrial Estate**	**Former Colliery, Watnall**	**Middlemore Lane, Aldridge**	**Hartlebury Trading Estate**
Permitting considerations	Less than 50 metres to commercial receptors such as Thorn Business Park and NMITE Skylon Campus. Situated within a level two flood zone.	Less than 200 metres to several commercial units, e.g. South Lincs Pallets, Wakefield Autos. Adjacent to Boston Household Waste Recycling Centre and Biomass Nr 3. Site is within a level three flood zone.	Less than 200 metres to the Watnall Solar Farm south of the site. Drain present 12m from site. A groundwater risk and surface drainage assessment must be conducted. Located within the Watnall Brickyard Local Wildlife Site and priority habitat – deciduous woodland. Site is located within Nottinghamshire's Green Belt.	Less than 200 metres to several commercial receptors such as MFT Commercials, a make-up clinic and Geddes Packaging. Less than 50 metres to the Red Star Athletic Football Club. Located within a priority habitat – deciduous woodland. Located within a nitrogen oxide (NOx) air quality management area (AQMA).	Less than 50 metres to residential receptors and adjacent to industrial receptors from the Hartlebury Trading Estate, including Wienerberger Ltd brick manufacturing, Circet Wireless Limited and Proptech, a vehicle repair business. The site is around 250m from a great crested newt class survey license return. Located within the West Midlands Green Belt and operates under a Blanket Tree Preservation Order.
Planning considerations	The site complies with several waste policies from Herefordshire's Minerals and Waste Local Plan, both in terms of sustainable, circular	The site complies with several waste policies from Lincolnshire Minerals and Waste Local Plan, including spatial strategy, area	The site complies with several waste policies from Nottinghamshire and Nottingham's Waste Local Plan, including future waste management provision, broad	The site complies with the locational policy for new waste management facilities within the Black Country Core Strategy, deeming AD	The site complies with the locational policies in the Worcestershire Core Strategy, enabling waste management facilities to be permitted at all levels of the geographic

	Herefordshire	Lincolnshire	Nottinghamshire	Walsall	Worcestershire
	economy waste management and locational policies.	allocations, and biological treatment of waste policies.	locations of waste facilities and sustainable movement of waste policies.	development suitable on all employment land. Site has current planning permission (reference 17/0485) for a waste transfer station, weighbridge, welfare facilities and a Household Waste Recycling Centre.	hierarchy, and other waste recovery facilities will be permitted in levels one and two.
Gas Feasibility	A gas injection rate of 0-790 standard cubic metre (scm)/hour (h) is acceptable into a Medium Pressure Network on a continuous basis. 790sm/h is acceptable on to the Local Transmission System continuously.	A gas injection rate of 20-800scm/h is acceptable into a Medium Pressure and an Intermediate Pressure Network on a variable basis. 800scm/h is acceptable on to the Local Transmission System continuously.	A gas injection rate of 50-750scm/h is acceptable on to the Medium Pressure and Intermediate Pressure Network on a variable basis. 750scm/h is acceptable on to the Local Transmission System continuously.	A gas injection rate of 792scm/h is acceptable on to the Medium Pressure Network on a continuous basis. 792scm/h is acceptable on to the Local Transmission System continuously.	A gas injection rate of 792scm/h is acceptable on to the Medium Pressure Network on a continuous basis. 792scm/h is acceptable on to the Local Transmission System continuously.
Electric Feasibility	1.1 miles to the Hereford South Primary Substation with >5MW capacity available.	320m to the Marsh Lane 33 Primary Substation, however has <1MW capacity available.	1.3 miles to the Watnall 33 11Kv Primary Substation, with >5MW capacity available.	1.8 miles to the Rushall Primary Substation with >5MW capacity available.	2.3 miles to the Stourport Primary Substation with >5MW capacity available.

Table 1 shows that no sites fully comply with the standard permit receptor requirements in their entirety. Owing to the scale and nature of the operations that would likely take place, it is assumed that the AD plants would apply for a bespoke permit.

Sites proximate to sensitive receptors must demonstrate mitigation measures to adequately control fugitive emissions for noise, odour and other sources to comply with the Environmental Permitting Regulations.

Flood Risk Zone

AD developers who contain a site which are in a flood risk zone must complete a flood risk assessment (FRA), which includes site details, sources of flood risk, flood risk impacts and flood mitigation measures which should be demonstrated through the site design. A sustainable drainage system (SUDS) should also be attached and designed in accordance with the national standards for SUDS guidance.

Ecological Receptor

Sites which are located within an ecological receptor, such as a priority habitat, great crested newts' area and local wildlife sites, must ensure that appropriate mitigation measures are demonstrated whilst enhancing biodiversity of the area. A thorough environmental risk assessment and ecological assessment will be required as well as an ecological appraisal to be submitted as part of the planning application. Benefits of the application must clearly outweigh the impacts on the ecological receptor. Benefits of the development must also clearly outweigh the impacts caused to the receptor. Sites which are proximate to water courses must conduct a groundwater risk and surface drainage assessment which identifies sources and risks of discharging pollutants into the watercourse, and the plant must produce and environment management system, setting out the measures the plant will undertake to limit its impact on the environment, to comply with the bespoke permit.

Air Quality Management Area (AQMA)

The Walsall site is located within a NO_x AQMA; an Air Quality Impact Assessment must be conducted to demonstrate that emissions from the plant do not exceed the Emission Limit Values stated in relevant national and local air quality policy.

Sites located on Green Belt

Sites which are located within the Green Belt shall be permitted where very special circumstances exist. Per Worcestershire's Waste Core Strategy, policy WCS13 states that harm to the green belt must be clearly outweighed by other considerations such as locational needs and wider environmental and economic benefits. Nottinghamshire's and Nottingham's

Waste Local Plan policy SP7 states that a waste facility, such as waste disposal for recovery, may be classed as appropriate development and its planning application supported should it maintain the openness of the green belt.

Noting the permitting and planning considerations, it is advised the plant operates under a bespoke permit and engagement is undertaken with the relevant planning authority to investigate how planning policies may be overcome and challenged should AD plants be developed at the above case-study sites.

Grid Feasibility

Initial gas enquiries sent to the Gas Network Operator (GNO), Cadent Gas Networks, showed that all case-study sites are proximate to a local transmission system which have capacity for gas injection rates of 750 – 792 standard cubic metres/hour continuously. Three of the sites can inject into a medium pressure network continuously whilst two sites are able to on a variable basis. It is noted that the enquiries did not constitute as a formal offer from Cadent to accept biomethane into the gas grid.

Engagement with National Grid Electricity Distributions' (NGED) network opportunity map showed that four of the five case-study sites were proximate to a primary substation with >5MW capacity available. The proposed plant in Lincolnshire was not proximate to a primary substation with capacity - however, the plant is expected to generate predominantly biomethane which potentially minimises electricity grid connection requirements.

It is recommended that further engagement is undertaken with the GNO and NGED should the project progress to a detailed business case.

2.5 Techno-economic Assessment

With the feedstock and initial site location identified, a techno-economic model was produced to quantify the AD outputs, revenues, and cashflows of an AD plant within each local authority respectively. The EBITDA value was calculated. EBITDA stands for earnings before interest, taxes, depreciation and amortisation. The model incorporated capital costs of the plant (within Table 2 below) benchmarked from previous WRM reference projects. Variable and operational cost items have also been benchmarked. The feedstock inputs, technical parameters and model assumptions can be found in the appendices of each local authority's feasibility report.

Outputs of the plant ranged from amount of biogas produced from anaerobic digestion, amount of biomethane injected to the grid, the quantum of PAS 110 digestate produced, and the quantum of CO_2 captured from the process. Depending on the renewable energy pathway that a council wished to explore, alternative output quantum of Bio-CNG and electricity export to the grid were also provided.

The project outputs were communicated to each local council, and a range of scenarios were interrogated which provided variance to the baseline results. The quantum of biomethane injected into the grid, set against that utilised for Bio-CNG fuel, is one such example.

Local Councils displayed varying degrees of interest in how they might wish for the produced biomethane to be utilised and hence a range of scenarios were modelled to reflect this. Out of all modelled scenarios, injecting 100% of biomethane into the grid to claim GGSS tariff payments yielded the highest net 15-year EBITDA value. Outputs related to this scenario for each local authority has been illustrated in Table 2.

Table 2 - Estimated outputs, capital costs and EBITDA of AD plants in the Midlands for the highest earning scenario (100% Biomethane to Grid, claiming GGSS tariff payments)

Local Authority	Yearly Output (Megawatt per hour – MWh) (Tonnes per annum (tpa) –)	Capital Costs (note: includes a 10% added contingency)	Net 15-year EBITDA (Total) (inclusive of capital costs)
Herefordshire	Biomethane to grid: 54,187 MWh PAS110 digestate: 61,289 tpa Captured CO2: 7,097 tpa	£28,215,779	£35,955,440
Lincolnshire	Biomethane to grid: 44,692 MWh PAS110 digestate: 60,216 tpa Captured CO2: 5,853 tpa	£34,159,009	£12,035,183
Nottinghamshire	Biomethane to grid: 54,025 MWh PAS110 digestate: 59,937 tpa Captured CO2: 7,076 tpa	£29,368,377	£52,762,795
Walsall	Biomethane to grid: 11,044 MWh PAS110 10mm digestate: 12,999 tpa PAS110 40mm digestate: 7,799 tpa	£21,239,789	-£31,785,697
Worcestershire	Biomethane to grid: 53,152 MWh PAS110 digestate: 58,916 Captured CO2: 6,961 tpa	£34,159,009	£43,056,786

Local Authority	Yearly Output (Megawatt per hour – MWh) (Tonnes per annum (tpa) –)	Capital Costs (note: includes a 10% added contingency)	Net 15-year EBITDA (Total) (inclusive of capital costs)
Total outputs (if all viable plants realised)	**Biomethane to grid: 206,056 MWh per annum** **PAS110 digestate: 240,358 tpa** **Captured CO2: 26,987 tpa**		

Within Table 2, a total of 206,056 MWh of renewable biomethane, 240,358 tonnes of PAS110 digestate and 26,987 tonnes of CO_2 would be generated per annum if all projects were realised. A total 206,056 MWh of biomethane injected the grid is expected to generate renewable energy for around 19,200 homes across the Midlands region[2]. Here the financial incentive of the GGSS is illustrated; claiming all biomethane with GGSS payments offers the highest 15-year net EBITDA for the AD developer for all viable projects.

As illustrated in section 2.3, Walsall Council elected to investigate the dry AD process which yielded a net negative EBITDA of £31.8 million. This was a result of constrained feedstock capacity, treatment route of neighbouring authorities (source-segregated over co-mingled food and garden waste), and the limited footprint of the case-study site. The treatment of co-mingled material was not disregarded and it was recommended to Walsall Council that 1) a larger case-study site is identified to accommodate a higher feedstock input to increase GGSS tariff payments claimed, and 2) to undertake preliminary market engagement to investigate the capability of the market to process co-mingled waste through In-Vessel Composting (IVC).

Alternative scenarios for local authorities investigated a proportion of produced biomethane to be utilised as Bio-CNG, either gas sleeved through the network to an external Bio-CNG station, or to be used on-site via vehicle pumps. Table 3 below shows the maximum total Bio-CNG produced by each plant with their respective scenario and EBITDA value.

[2] Calculated by dividing to total properties in the Midlands (ONS Census) to Total Gas Consumption in the Midlands (Based on "Subnational gas consumption, Great Britain, 2005 - 2023" - published by DESNZ)

Table 3 - Scenario, total Bio-CNG and EBITDA if realised

Local Authority	Scenario	Bio-CNG	Net 15-year EBITDA (Total)
Herefordshire	50% of biomethane used for on-site Bio-CNG and 50% gas sleeved to an external Bio-CNG station	On site: 2,301,076 litres of diesel equivalent Gas sleeved: 2,301,076 litres of diesel equivalent	£22, 069,063
Lincolnshire	50% of biomethane used for on-site Bio-CNG and 50% gas sleeved to an external Bio-CNG station	On site: 1,897,881 litres of diesel equivalent Gas sleeved: 1,897,881 litres of diesel equivalent	£551,052
Nottinghamshire	90% of biomethane injected into the grid, with 50% (of 90%) being gas sleeved to an external Bio-CNG station, 50% claimed on GGSS and 10% used for on-site Bio-CNG	On site: 407,861 litres of diesel equivalent Gas sleeved: 1,835,372 litres of diesel equivalent	£37,587,956
Worcestershire	90% of biomethane injected into the grid, with 50% (of 90%) being gas sleeved to an external Bio-CNG station, 50% claimed on GGSS and 10% used for on-site Bio-CNG	On site: 401,271 litres of diesel equivalent Gas sleeved: 1,805,719 litres of diesel equivalent	£30,707,465
Total Bio-CNG outputs	On site Bio-CNG station: 5,008,089 litres of diesel equivalent Gas sleeved to an external Bio-CNG station: 7,840,048 litres of diesel equivalent		

Table 3 illustrates that despite diverting large quantum of biomethane to be used as Bio-CNG, all plants maintain their commercial viability. For example, Herefordshire's plant, in which all biomethane is reliant on the RTFO scheme rather than the GGSS, yielded a net EBITDA of £22.1 million. This is based on the fluctuations present within the RTFO as a market-based mechanism, and policy analysis undertaken by the Anaerobic Digestion & Bioresources Association (ABDA) notes that the RTFC price is forecasted to exceed payments made by the GGSS, linked to an increase in sustainable aviation fuel (SAF) demand and the spot market price for cooking oil.

A hybrid option of claiming GGSS payments, (fixed subsidy scheme) through grid injection and RTFC (market-based scheme) from Bio-CNG can provide commercial viability to a plant

and the AD operator can switch between these biomethane uses to maximise revenues in line with fluctuations in the market (i.e. supply and demand of Bio-CNG)., which can be seen in Nottinghamshire's and Worcestershire's plants. However, attaining the commissioning date of March 31st 2028 for the GGSS scheme is crucial in accessing this revenue and minimising commercial risk.

2.6 Commercial Risk Assessment

The techno-economic assessment undertaken provided a quantitative risk assessment based upon the revenue and cost cash flows calculated within the work. Whilst the technical specification of each project was devised, and outline deliverability assessed, the implementation of project options is not without risk. A qualitative risk assessment was undertaken for each feasibility study. The topics considered within the risk assessment are summarised in Table 4 :

Table 4 - Summary of matters considered within commercial risk assessment

Risk Category	Risk Item Matters Considered
Host Site	Site ownership, rights of way, ground condition/contamination, landscape designations and utility connections.
Technology Supplier and Extended Supply Chain	Engineering, Procurement and Construction (EPC) wrap, including developer experience and reference project, maintenance package/support and equipment and performance guarantees.
Technology Assessment	Technology system, layout and design, plant performance and load requirements.
Mass Balance	Mass balance and capacity analysis.
Feedstock	Supply agreement, material character and composition and digestion suitability, cost of feedstock and processing requirements, biogas potential.
Energy Off-takes and Gird Connection	Grid connection capacity and constraints, incentive eligibility, energy security.
Digestate Management	Digestate planning and contamination management, digestate off-take agreements, digestate storage and transport.
Construction	Time and budget considerations, regulation compliance, delivery timescales, project handover.
Commissioning and Maintenance	Commissioning and maintenance planning, manuals and documentation, commissioning training.

Risk Category	Risk Item Matters Considered
Health and Safety	Risk identification, procedures, COSSH, DSEAR, ATEX and personal monitoring.
Operations	Management structure and roles and responsibilities, management plans and contingency plans, Insurances, operational cost.
Financial	Techno-economic integrity, financial standing of organisation, capital costs, quote assumptions and exclusions,

Each risk item was assessed individually using WRM's risk rating criteria and given an overall score. This is calculated by multiplying the likelihood score by the significance score with the resulting value indicating the overall level of risk on a scale of 1 -5.

A description of the risk categories assigned is provided below:

- **Low risk (1-5)** – minor risks that are unlikely and would have a low impact on the project performance. Aspects with this rating are considered to have adequate management systems or mitigation measures to address any identified risks.
- **Medium risk (6-14)** – moderate risks that have potential to impact the financial performance of the project. The proactive implementation of described mitigation measures prior to development, or (for operational measures) as an agreed condition of finance will enable risk level to be reduced to an acceptable level.
- **High risk (15-25)** – Major risks that have the potential to undermine and destabilise the project, thereby causing excessive investment risk. Special measures such as the redesign of a project aspect, additional development of project detail, or submission of further information is required in order to avoid, modify or transfer risk from the project developer/operator. WRM recommends that the allocation of any red risk rating within a project should preclude financial investment until a satisfactory solution that reduces risk level is agreed.

Where project risk was identified during the risk assessment exercise, WRM proposed mitigation measures as appropriate that serve to reduce risk level, improve best practice and operational performance of a project. Where suggested, risk mitigation measures were proposed in line with the risk ratings set out below:

- **Low risks** – WRM suggests that these measures as a means of promoting best practice or driving optimisation into a project.

- **Medium risk** – WRM strongly recommends that these measures are implemented prior to the project proceeding into operational phase.
- **High risk (15-25)** – WRM views the implementation of these measures as an absolute pre-requisite for the project to proceed to the operational phase.

It must be recognised that the project has considered the feasibility of implementing AD infrastructure across the Midlands region at an outline level. The risk assessment was undertaken with this in mind, and, as such, precluded detailed commentary on specific project particulars, such as ownership consideration, technology provider and the structure of contractual arrangements as set out in any future contract. Where possible, WRM have provided advice on next steps, considered useful for a local authority that may wish to progress a project further.

The main qualitative risks identified across the projects pertained to matters such as site selection and ownership, sources of feedstock, gas and electricity gird connectivity and planning and permitting constraints. Such matters would be subject to further investigation and appropriately mitigated during a more detailed planning and design phase for a future facility.

2.7 Governance and Implementation

A governance and implementation plan was produced for each project, clearly setting out project stages, work packages and tasks required within the pre-planning, planning, construction and operational phases of the project programme. (Supporting Document A to main project reports) The key phases of the planning, permitting and procurement process of an anaerobic digestion project are summarised in Table 5 overleaf.

The results of the techo-economic assessments highlight the importance that having a robust financial incentive in place to promote new AD development has in ensuring the commercial viability of an AD project. The Green Gas Support Scheme (GGSS) offers a guaranteed tariff for grid-injected biomethane from anaerobic digestion.

Despite the recent announcement from the Department for Energy and Security (DESNZ) extending the commissioning deadline of the GGSS from 31st March 2028 to 31st March 2030, a participant will only receive the tariff payment lifetime of 15 years where a facility is commissioned by 31st March 2028 (facilities registered for the scheme by March 2028 have until March 2030 to achieve full commissioning, but will still only be able to claim tariff payments until March 2043). Given the influence the GGSS has on commercial viability, local

authorities intending to support AD developments must commence activity in earnest in order to meet the facility commissioning deadline of the GGSS.

Table 5 - Summary of key stages of the planning, permitting and procurement process of an anaerobic digestion project

Stage	Objective	Description	Council Decision Pathway and Approvals
Pre-Planning	**Project Business Case & Approvals**	Production of a project feasibility study and business case for both technical and financial considerations. Includes identification of feedstock and development site, equipment and infrastructure quotations, grid connection enquiries, cost modelling and risk assessment.	Decision to proceed with development of anaerobic digestion facility, based on findings of the outline business case. Other factors such as alignment to Council values (e.g. renewable energy focus) may influence the decision taken.
Planning & Procurement	**Procurement**	Sourcing of project developers, equipment and infrastructure and preliminary market engagement.	Drafting of a contract principles paper, which sets out the key (and often necessary) objectives of the project. The contract principles paper and procurement documents would be subject to sign off by Portfolio Holder/Environment Overview and Scrutiny Panel. Selection of preferred partnerships in accordance with procurement tender evaluation process.
	Forming Partnerships	Developing partnerships between developer, operator, suppliers and funders.	
	Planning	Obtaining planning permission from the relevant local authority.	Planning permission to be approved by Walsall Council Planning Services in first instance.
	Permitting	Identifying and applying for the necessary environmental permits.	Environmental permit application to be approved by the Environment Agency.
	Detailed Design of Gas Grid Connection	Full plans for the gas grid connection follow confirmation that sufficient grid capacity is available.	Approval granted and reservation of gas connection point by Gas Distribution Network Operator contingent on sufficient grid capacity being available.
	Secure Gas Connection Point	Reservation of gas connection point whilst the project progresses. As an example, another GNO, Northern Gas Networks, reserve the point for 9 months initially, with an option to extend a further 6 months should this time be required.	
	Agreements	Completion of documentation for the gas grid connection, including network entry agreement, construction agreement and ownership agreement.	Roles and responsibilities clarified in the gas grid connection agreement documentation.
	GGS	Application for GGSS.	GGSS support (ideally for the full tariff duration of 15 years) is a key determinant in ensuring the financial viability of the project.
	Funder Due Diligence	Scrutiny of funding options.	Method by which the project is to be funded should be discussed prior to the commencement of a procurement and set out in the contract principles paper and procurement documents. Could be raised as an item for discussion at a Preliminary Market Engagement event. A design build operate delivery option (DBO) would see a facility designed, built and operated by a third-party on the Council's behalf, with the Council partially or wholly funding the development. It should be noted that Councils typically have access to prudential rates of borrowing (c.3.5%) when compared to private sector investment (c.9%). A design build finance operate delivery option (DBFO) would see a facility designed, built, financed and operated by a third-party, processing the Council's food waste.

3.0 CONCLUDING REMARKS

The project has assessed the outline feasibility of five AD developments to be sited across the Midlands region. Should a local authority wish to further investigate potential development opportunities for AD several recommendations are provided below that serve to progress the opportunity:

- Confirm sources of feedstock – this may include a waste collection authority exploring partnership opportunities with proximate local authorities also required to collect food waste from 31st March 2026.
- Selection of an appropriate development site – Choosing a site that accords with planning and environmental permit requirements and is proximate to local electricity and gas transmission networks.
- The undertaking of preliminary market engagement with prospective contractors to understand capacity and capability to service Council requirements. This can be undertaken formally, in accordance with the Procurement Act (2023). Such an exercise would also provide early notification of a potential future council procurement intention within prospective contractor bid teams.

The extension announcement to the GGSS application deadline provide a strong market signal and help to build confidence among AD developers and local authorities alike. Considering the delivery pathway of infrastructure projects, and timescales associated with the governance and approval process, local authorities intending to support AD developments must commence activity in earnest to meet the facility commissioning deadline of the GGSS. Achieving this would ensure that any future development would stand the best chance of achieving commercial viability for the full available tariff duration.