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Worcestershire County Council – Anaerobic Digestion Feasibility Briefing Note

V1.0

Environmental and sustainability solutions provided to

Midlands Net Zero Hub

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1.0 PURPOSE AND CONTEXT

An ambition of the Midlands Net Zero Hub (MNZH) is to support local authorities across the Midlands region to better understand Anaerobic Digestion (AD) and its role in generating renewable energy, contributing to energy security and providing a low impact solution for managing food and other organic waste streams. 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 five local authorities within the Midlands region. This briefing note focuses on the project undertaken for Worcestershire County Council (WCC).

2.0 PROJECT OVERVIEW

This project was to deliver an outline techno-economic feasibility study for a 'reference design' AD plant at potentially suitable locations in the Worcestershire area. The project is an initial, high-level feasibility study to identify opportunities and barriers for AD in Worcestershire rather than a detailed feasibility study.

A reference design AD plant suitable for WCC needs was developed and potential suitable locations identified. This project assessed relevant planning policy and environmental permit requirements, estimated the availability of suitable local AD feedstocks (food and green wastes) and identified the proximity of gas grid and electricity grid connections. This information was compiled into an outline techno-economic feasibility assessment of this reference AD design for Worcestershire.

3.0 PROJECT FINDINGS

Findings of this outline study are provided below.

1. The feedstock estimation exercise identified 80,000 tonnes per annum of organic material potentially available for capture, derived from the following sources:

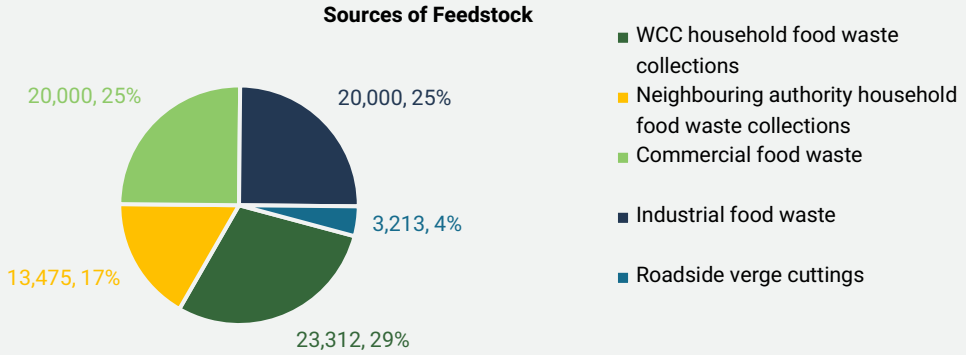

Figure 1 - Sources of potential AD feedstock

2. Available feedstock meets the waste processing capacity threshold for the reference plant, set at 80,000 tonnes. 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 (GGSS).

3. The 'wet' AD treatment process was chosen, comprising of de-packaging, pre-treatment, pasteurisation, and primary and secondary stage digestion. Biomethane was the primary renewable output, as well as heat and electricity to support the plant's parasitic load demand. Bio-CNG (vehicle fuel), digestate (natural fertiliser) and CO_2 outputs were also modelled.

4. Following engagement with WCC, a site at the Hartlebury Trading Estate was selected as the case study site. Proximity to the arterial road network (the A449), and the nearby presence of the EnviRecover Energy Recovery Facility were key determinants in the selection of the site. Connection to both the national gas grid and national electricity grid were considered achievable.

   It was noted that the site resides within the West Midlands Green Belt and is located within an area affected by a Blanket Tree Preservation Order. Engagement with the planning authority is recommended to further assess land suitability prior to any anticipated development taking place here.

4.0 TECHNO-ECONOMIC MODELLING

1. Several scenarios were created to be inputted into the techno-economic model, integrating the reference AD design to produce financial and technical outputs of the process. Capital cost benchmarking demonstrated that the cost to develop an AD plant stands at £34,301,673 (note: this figure is inclusive of a 10% contingency allowance) to develop in Worcestershire, and this has been factored into the net-margin values. Three of the five modelled scenarios resulted in positive cashflows over the assumed 15-year project timescale, as shown in Table 1, below.

Table 1 - Financial summary of modelled scenarios

Scenario and Description of Scenario	Average Net Margin Per Annum (£)	Project total - 15-year lifecycle (£)
1a – 90% of produced biomethane injected into gas grid, 10% for Bio-CNG vehicle fuelling. GGSS tariff payments and Green Gas Guarantee of Origin (GGGO) claimed.	2,860,009	42,900,141
1b – 90% of produced biomethane injected into gas grid; 50% claimed under GGSS and GGGO and 50% claimed under Renewable Transport Fuel Obligations (RTFO). 10% for Bio-CNG fuelling.	2,047,164	30,707,465
2a – 100% of produced biomethane injected into gas grid. GGSS tariff payments claimed.	2,870,452	43,056,786
2b – Same as 2a, but GGSS tariff payments removed. GGGO payments are source of revenue.	-2,380,125	-35,701,931
3 – 50% biomethane to gird (GGSS and GGGO), 50% combusted to export electricity (electricity sales and Renewable Energy Guarantee of Origin (REGO) certificates.	-1,095,748	-16,436,225

2. Over 15 years, all scenarios produce 1,125,407 Megawatt hours (MWh) of biogas, 883,733 tonnes of PAS 110 digestate and captures 104,420 tonnes of CO_2. Annually, scenarios 1a and 1b produce 401,271 litres of diesel equivalent of Bio-CNG fuel.

The findings highlight the robust financial incentive that the GGSS provides. Moreover, a hybrid of GGSS and RTFC can also provide commercial viability, and the AD operator can switch between biomethane uses to maximise this. However, attaining GGSS accreditation by the commissioning deadline is crucial for ensuring commercial viability of the AD project.

3. Qualitative risks identified at this stage of the project generally pertained to items such as site, ownership/rent considerations, and planning and permitting constraints. Such risks would be investigated and appropriately mitigated during the detailed planning and design phase for a facility.

   Despite 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.

5.0 NEXT STEPS

1. The overarching finding of the work is that the development of an AD facility in Worcestershire is technically feasible, financially viable and deliverable under three of the five project scenarios.

2. Should WCC 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 exploring partnership opportunities with proximate local authorities also required to collect food waste from 31st March 2026.
   - Selection of an appropriate development site – that accords with planning and environmental permit requirements.
   - 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).

3. The project report (Supporting Document A) sets out a programme for the delivery of pre-planning, planning, construction and operational stages of the project, providing structure for the next steps in advancing this initiative.

6.0 CONCLUDING REMARKS

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 a future development would stand the best chance of achieving commercial viability for the full available tariff duration.