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Herefordshire Council – Anaerobic Digestion Feasibility Note

V1.0

Environmental and sustainability solutions provided to

Midlands Net Zero Hub

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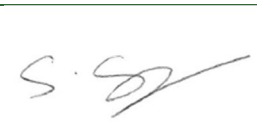	

1.0 PURPOSE AND CONTEXT

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 circular 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. Herefordshire Council (HC) applied for this project, and the main findings and conclusions are summarised below.

2.0 PROJECT OVERVIEW

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

A reference design AD plant suitable for HC was developed and potential suitable locations identified. Relevant planning policy and environmental permit requirements, the availability of suitable local AD feedstocks (food, green and agricultural wastes) and the location of gas grid and electricity grid connections was assessed. This information was compiled into an outline techno-economic feasibility assessment of the reference AD design for Herefordshire.

3.0 PROJECT FINDINGS

Findings of this outline study are provided below.

1. A feedstock estimation exercise identified 85,000 tonnes per annum of organic material potentially available for capture, derived from the following sources:

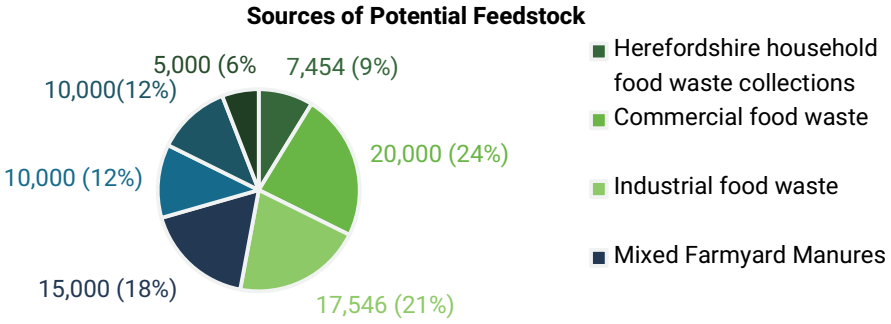

Figure 1 - Sources of potential AD feedstock

2. The plant was assigned an 85,000 tonnes per annum waste processing capacity. This capacity level was determined by the current and prevailing economics of an operation, based on the revenues associated with incentive tariff schemes for renewable energy, such as the Green Gas Support Scheme (GGSS).

3. The conventional '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. Engagement with HC resulted in the Skylon Park, Hereford Enterprise Zone site being selected as the case study site. Existing commercial plots present at Skylon Park owned by HC, access to the road network of the A49 to facilitate movements of waste, proximity to Hereford and the potential of co-adjacencies in the area were key determinants in the selection of the site.

   It was noted that the site resides within a level two flood zone and is proximate to multiple commercial and industrial receptors within the Hereford Enterprise Zone. 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 £28,358,075 (note: this figure includes an 10% contingency allowance) to develop in Herefordshire and this has been factored into the net-margin values. Four of the five modelled scenarios resulted in positive cashflows over the assumed 15-year project timescale, as shown in Table 1.

Table 1 - Financial summary of modelled scenarios

Scenario and Description of Scenario	Average Net Margin Per Annum (£)	Project total - 15-year lifecycle (£)
1a – 100% of produced biomethane injected into the gas grid, claiming GGSS tariff payments.	2,397,029	35,955,440
1b – Scenario 1a however GGSS tariff payments are removed.	-2,955,735	-44,336,020
2a – 50% of produced biomethane injected into the gas grid to claim GGSS tariff payments, and 50% for on-site Bio-CNG fuelling.	2,392,009	35,880,130
2b – 50% of produced biomethane injected into the gas grid is sent to an external Bio-CNG station to earn RTFC and 50% for on-site Bio-CNG fuelling.	1,471,271	22,069,063
3 –75% of biomethane injected into the grid receives GGSS tariff payments, and 25% is used for on-site Bio-CNG fuelling.	2,388,636	35,829,536

2. Over 15 years, all scenarios produce 1,147,309 Megawatt hours (MWh) of biogas, 812,798 tonnes of PAS 110 digestate and 106,452 tonnes of CO_2. Annually, scenario's 2a and 2b produce ~2,301,076 litres of diesel equivalent of Bio-CNG fuel and Scenario 3 produces ~1,150,538 litres of diesel equivalent.

   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 for 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 to meet the facility commissioning deadline of the GGSS.

5.0 NEXT STEPS

1. The work has found that the development of an AD facility in Herefordshire is technically feasible, financially viable and deliverable under four of the five project scenarios.

2. Should HC wish to explore AD development opportunities further, several recommendations are provided below 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 has concluded by setting 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 and averting risk to the GGSS deadline (please see Supporting Document A).

6.0 CONCLUDING REMARKS

The extension to the GGSS application deadline provides 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.