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Walsall Council – Anaerobic Digestion Feasibility Briefing Note

V1.0

Environmental and sustainability solutions provided to

Midlands Net Zero Hub

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Author: James Hay	Reviewer: Sophie Spouge
	

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 Walsall Council.

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 Walsall area. The project is an initial, high-level full feasibility study to identify opportunities and barriers for AD in Walsall rather than a detailed feasibility study.

A reference design AD plant suitable for Walsall Council's needs was developed and potentially 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 Walsall.

3.0 PROJECT FINDINGS

Findings of this outline study are provided below.

1. The feedstock estimation exercise identified 30,000 tonnes per annum of organic material potentially available for capture, derived from the following sources:

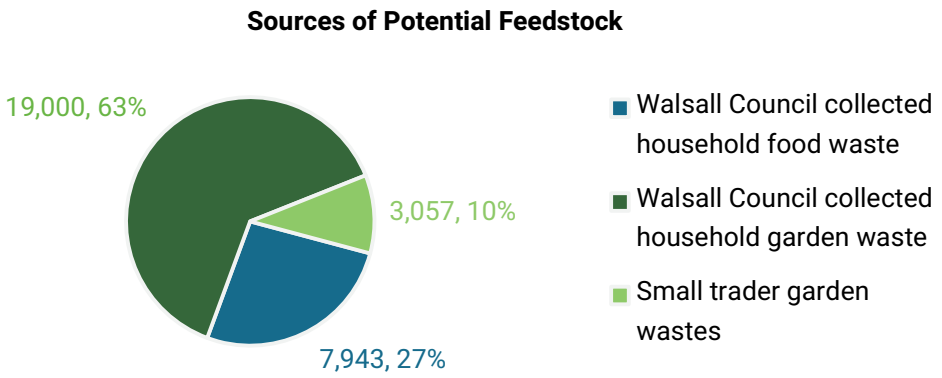

Figure 1 - Sources of potential AD feedstock

2. Available feedstock meets the waste processing capacity threshold for the reference plant, set at 30,000 tonnes. This capacity level was set against the available site footprint and organic waste disposal requirements of Walsall Council.

3. Following engagement with Walsall Council, land available at the Middlemore Lane site was selected as the case study site. Co-location of a facility with the existing waste management assets was a key determinant 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 a NO_x Air Quality Management Area (AQMA) a Woodland Priority Habitat Network: High Spatial Priority and Low Spatial Priority habitat. Engagement with the planning authority is recommended to further assess land suitability prior to any anticipated development taking place here.

4. A batch-processing dry AD treatment process was selected, based on the available land take. The treatment process comprises de-packaging, pre-treatment, sanitisation (akin to pasteurisation in a wet AD process), and batch digestion. Biomethane was the primary renewable output, as well as heat and electricity to support the plant's parasitic load demand. PAS 110-compliant digestate output was also quantified.

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 a dry AD plant stands at £21,239,789 (note: this figure includes a 10% contingency allowance) to develop in Walsall, and this has been factored into the net-margin values. None of the four modelled scenarios result in positive cashflows over the assumed 15-year project terms as set out 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 – 100% of produced biomethane injected into gas grid. GGSS tariff payments and Green Gas Guarantee of Origin (GGGO) claimed.	-3,437,346	-31,785,697
1b – 100% of produced biomethane injected into gas grid. GGGO claimed but no GGSS tariff payments.	-4,316,184	-48,150,275
2a – 100% of biogas combusted to export electricity (electricity sales and Renewable Energy Guarantee of Origin (REGO) certificates.	-4,429,158	-50,253,920
2 – 50% biomethane to gird (GGSS and GGGO), 50% combusted to export electricity (electricity sales and Renewable Energy Guarantee of Origin (REGO) certificates.	-3,933,252	-41,019,808

2. Over 15 years, all scenarios produce 199,276 Megawatt hours (MWh) of biogas, 311,971 tonnes of PAS110 digestate.

It is noted that the size of the reference plant used in the work was set against the available site footprint and organic waste disposal requirements of Walsall Council. Processing capacity of a facility is intrinsically linked to plant size; the limited land availability of the Middlemore Lane site constrains the size (and thus processing capacity) a plant could attain.

2. 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 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.

3. The overarching finding of the work is that the development of a dry AD facility in Walsall is not technically feasible.

5.0 NEXT STEPS

1. The project finding does not necessarily negate the prospect of dry AD as a viable treatment technology for processing Walsall's organic waste. Should Walsall Council wish to further investigate potential development opportunities for AD, several recommendations are provided below that serve to progress the opportunity.

   - Investigate potential treatment routes for organic material – This could comprise dry AD or In-Vessel Composting (IVC), for which co-mingled waste is also a target feedstock
   - 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).
   - Selection of an appropriate development site – that accords with planning and environmental permit requirements and has the land area available to build a site of sufficient scale to be considered commercially viable.

2. 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 proposed regulations to extend 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.