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# Nottinghamshire County Council / Nottingham City 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 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. Nottinghamshire County Council (Nottinghamshire CC) and NCC jointly 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 Nottinghamshire. The project is an initial, high-level feasibility study to identify opportunities and barriers for AD in Nottinghamshire rather than a detailed feasibility study.

A reference design AD plant suitable for Nottinghamshire CC and NCC needs was developed and potential suitable locations identified. Relevant planning policy and environmental permit requirements, the availability of suitable local AD feedstocks (food and green 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 Nottinghamshire.

## 3.0 PROJECT FINDINGS

Findings of this outline study are provided below.

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

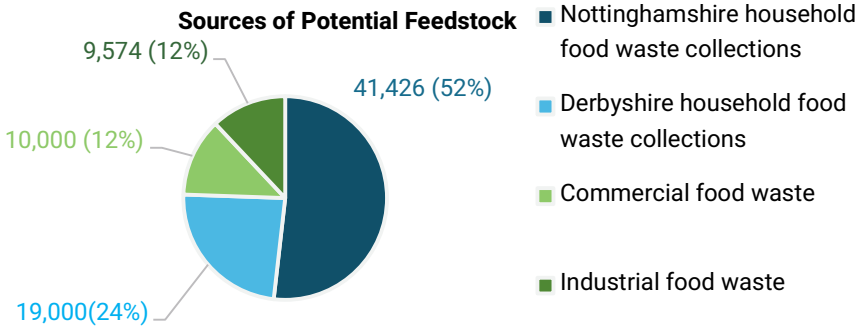


**Figure 1 - Sources of potential AD feedstock**

2. The plant was assigned an 80,000 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 '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 Nottinghamshire CC and NCC, resulted in the Former Colliery site in Watnall being selected as the case study site. The site was chosen due to its proximity to Nottingham City, Derbyshire, and the arterial road network of the M1, facilitating effective transport of collected wastes. Connection to both the national gas grid and national electricity grid were considered achievable.

   It was noted that the site resides in the Watnall Brickyard Local Wildlife Site and on the Nottinghamshire Green Belt. 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 £29,510,673 (note: this figure includes a 10% contingency allowance) to develop in Nottinghamshire, and this has been factored into the net-margin values. Three of the four 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. | 3,517,520 | 52,762,795 |
| 1b – Scenario 1a however GGSS tariff payments are removed. | -1,819,286 | -27,289,296 |
| 2a – 90% of produced biomethane injected into the gas grid to claim GGSS tariff payments, and 10% for on-site Bio-CNG fuelling. | 3,507,098 | 52,606,475 |
| 2b – Scenario 2a, however 50% of biomethane injected into the grid receives GGSS tariff payments, and 50% is gas sleeved to earn RTFCs. | 2,505,864 | 37,587,956 |

2. Over 15 years, all scenarios produce 1,143,889 Megawatt hours (MWh) of biogas, 899,060 tonnes of PAS 110 digestate and captures 106,135 tonnes of $CO_2$. Annually, scenario's 2a and 2b produce ~407,861 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.

   Although the Department for Energy and Security (DESNZ) has extended 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 in order 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 Nottinghamshire is technically feasible, financially viable and deliverable under three of the four project scenarios.

2. Should Nottinghamshire CC/NCC 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 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.