

**Proposal to Develop Biomethane Gas to Grid Plant Scheme
Court Farm, Hindlip Lane, Hindlip, Worcester, WR4 8SS**



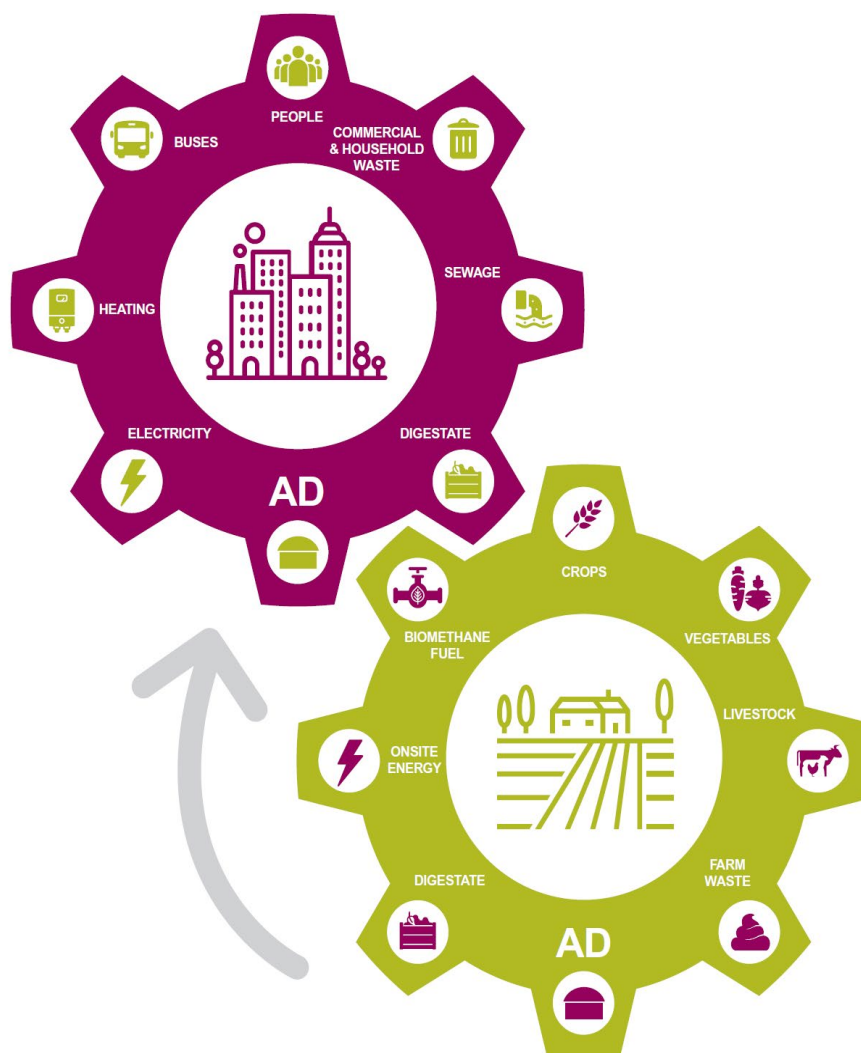
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1. Executive Summary

Stenergy is pleased to submit their detailed proposal to Worcester County Council, detailing the construction and operation of a Anaerobic Digestion Biomethane Plant that will produce and inject 'green gas' (2.8 MWe) into Cadent's Local Transmission System and by so doing, transform Worcester's Heat for Homes, Transport and Food Waste Management strategies. This Waste Food Gas to Grid project aligns with the objectives of COP 26.

We have taken a 'whole systems approach', where individual components are identified within the schematic below. Stenergy is pleased to recommend this proposal to Worcester County Council and look forward to developing a meaningful partnership and working relationship, by delivering an outstanding and credible 'holistic green scheme' for Worcester County Council and the City of Worcester.



2. Worcester Bosch Letter to Worcester County Council



BOSCH

Worcester Bosch
Cotswold Way, Warndon
Worcester, WR4 9SW
Telephone: 0330 123 9559

CA/saw
14th May 2021

Worcester County Council
Spetchley Road
Worcester
WR5 2NP

Dear Sirs

Worcester Bosch are pleased to provide their support for Stenergy's Initiative to 'Green' The City of Worcester, providing green Biomethane to our Manufacturing Plant at Warndon which produces around 250,000 Gas-Fired boilers annually. These appliances can already work on small blends of Bio-Methane, Hydrogen and Natural Gas. We have also developed the first domestic 100% Hydrogen Ready appliance and we are optimistic that the Government will mandate that only Hydrogen Ready appliances can be placed onto the market to assist in achieving the UK's gas energy transition.

Stenergy's proposed Food Waste Feedstock Gas to Grid Plant and (Phase 2) two HGV Biomethane Refuelling stations will greatly assist Worcester City meet with the UK Governments 2035 Net Zero environmental targets and accords with Worcester Bosch's outlook on the UK's Energy transition.

Biomethane is an important green fuel of both the now and the future, where Stenergy's biomethane Gas to Grid Plant will be capable of producing Hydrogen utilising the Steam/Methane Reformation Process (SMR) to future proof green gas from 2040 onwards.

This is an exciting time for the UK and its energy transition to a more sustainable and planet friendly future, one where Worcester Bosch both welcome and support this initiative.

We always welcome job creation and this project will create both direct & indirect spin-off jobs in the County.

Yours faithfully

Carl Amtzen
CEO, Worcester Bosch Group

Worcester Bosch is a brand name of Bosch Thermotechnology Ltd.
Registered office: Cotswold Way, Warndon, Worcester, WR4 9SW.
Registered in England No. 1993294. 8 716 111 863 06/18



By Appointment to
Her Majesty The Queen
Boiler Manufacturer
Worcester, Bosch Group
T/A Bosch Thermotechnology Ltd. Worcester

3. Beverley Nielsen Letter to Worcester County Council



Fieldwood House
Leigh
Worcestershire
WR6 5LE
12th July 2021

Dear Sirs,

I am pleased to support Stenergy's Initiative to 'Green' our beautiful county of Worcestershire and in particular assist in providing a readily available, accessible, practical low-cost source of energy to our homes and people at this time of energy transition.

The proposed initiative will provide biomethane, not only to heat our homes and fuel HGVs, but to the Worcester Bosch Manufacturing Plant at Warndon which produces around 250,000 Gas-Fired boilers annually and is responsible for thousands of jobs. Their heating appliances already work on small blends of biomethane, hydrogen and fossil fuel natural gas (interchangeable with biomethane) and they are working on more innovations as the country seeks to transition to a higher percentage mix of hydrogen in our gas network. Stenergy's biomethane Gas-to-Grid Plant is projected to be capable of producing Hydrogen utilising the Steam/Methane Reformation Process (SMR) to futureproof green gas from 2040 onwards.

This company's proposed Food Waste Feedstock Gas-to-Grid Plant and (Phase 2) two HGV Biomethane Refuelling stations will be an important asset in assisting Worcester City and our county to meet with the UK Governments 2035 Net Zero environmental targets, reducing carbon emissions by 78%. One kilogram of biomethane is capable of providing more energy than a litre of either diesel or petrol demonstrating just how practical this source of energy is. In addition, earlier this year in May, the UN Environment Programme highlighted that cutting methane emissions from landfill and waste, amongst other sources, is one of the strongest levers we have to slow the impacts of climate change and reduce greenhouse gas emissions.

This development will support welcome job creation and this project will create both direct and indirect spin-off jobs in the County.

Yours sincerely,

Beverley Nielsen

Beverley Nielsen
Chair, Ultra Light Rail Partners Ltd
Executive Director, Institute for Design, Economic Acceleration & Sustainability (I D E A S)
Birmingham City University

4. ADBA Letter to Worcester County Council

Anaerobic Digestion & Bioresources Association
Sustainable Bankside II
25 Lavington Street
London
SE1 0NZ

4th February 2021

Worcester County Council
Spetchley Road
Worcester WR5 2NP

Dear Worcester County Council,

The letter is written to explain the benefits of the anaerobic digestion (AD) industry. Our letter does not specify a particular plant due to the variances between design, operations, and management but is submitted in relation to the application submitted by Stenergy (Worcester) Limited.

The Anaerobic Digestion and Bioresources Association (ADBA) is the trade association that represents the range of interests and matters related to the anaerobic digestion (AD) of organic materials across the UK, including the collection of wastes for use as feedstock. ADBA understands the complex range of skills required by developers of new AD plants, from feedstock management through technology to energy production, and resources-to-land. With over 300 members, including Stenergy (Worcester) Limited, from across the AD industry, our organisation represents the interests of a wide range of companies and individuals, including farms, local councils, private financiers, research institutes, consultants and equipment suppliers. There are currently 675 AD plants operating within the UK, generating approximately 15.5 TWh of renewable biogas – enough to heat 1.3 million homes – and cutting greenhouse gas (GHG) emissions by over 5 million tonnes of CO₂-eq. every year.

The AD industry, and plants similar to the one which is the subject of Stenergy (Worcester) Limited's planning application, operate across multiple *essential* sectors – waste management, agriculture, energy, and transport – delivering a broad range of socio-economic and environmental benefits therein. It is an excellent example of the circular economy: capturing and recycling organic wastes into green energy, carbon dioxide, organic biofertilisers and other valuable bio-products.

All organic wastes, like the food waste that makes up 100% of the tonnage to be fed into the Stenergy (Worcester) Limited facility, *must* be managed. It is crucial that they are treated using the optimal technology. When left to rot in the open air, they release the potent greenhouse gas (GHG) methane directly into the atmosphere. AD enables these emissions to be captured and harnesses them as a valuable renewable fuel. Consequently, AD is recognised as the most efficient technology to treat organic wastes¹, yet with over 140 million tonnes of readily available organic wastes left undigested in the UK every year, the AD sector is currently achieving just one fifth of its full potential. More AD plants are therefore needed.

The recently published EU methane strategy² has emphasised the role biogas can play in methane reduction from biowastes, which highlights the technology's green credentials. The report states 'biogas from agricultural waste or residues can also cost-effectively mitigate methane emissions in the agriculture and the waste sectors.' This is because the biogas resulting from such feedstocks [wastes] is a source of highly sustainable and useful renewable energy with multiple applications, while the material that remains after anaerobic digestion (digestate) can, after further processing, be used as a soil improver.

The report goes on to state that biogas from agricultural wastes or residues can also cost-effectively mitigate methane emissions in the agriculture and the waste sectors and the collection and use of high methane emitting organic wastes

¹ [https://wrap.org.uk/sites/files/wrap/Food %20surplus and waste in the UK key facts Jan 2020.pdf](https://wrap.org.uk/sites/files/wrap/Food%20surplus%20and%20waste%20in%20the%20UK%20key%20facts%20Jan%202020.pdf)

² https://ec.europa.eu/energy/sites/ener/files/eu_methane_strategy.pdf

or residues from farming as biogas substrates should be further incentivised that could include the use of digestate as a sustainable soil improver in lieu of mined fertilisers. This shows the EU wide recognition of anaerobic digestion of agricultural wastes.

The AD industry often faces the challenge of education. The public does not often fully appreciate the resource that organic wastes can be and the health benefits they can deliver through decarbonisation of carbon intensive industries such as transport, heat and agriculture - notably cleaner air. The following outlines six additional wider benefits of AD that are not always fully appreciated and valued:

1. **Green jobs** – For every MWe-e (megawatt electrical-equivalence) of capacity deployed within the AD sector, an estimated 14 *temporary* jobs are directly created to design, develop, and construct a plant, and 3 *permanent* jobs to operate and maintain them³. These figures may be doubled when expanded to include the indirect jobs created within the wider bioeconomy, such as those responsible for feed-stock procurement and management. Crucially, as plant locations correspond with sources of organic waste/material, these green jobs are evenly distributed across the UK, providing often-neglected rural communities new opportunities for employment and training.
2. **Diversification of agricultural economies** – With Brexit and the phasing-out of CAP's Basic Payment Scheme (BPS), it is vital that farms find new sources of revenue to remain operational – BPS typically forms 50-80% of UK farms annual income⁴. AD offers agricultural systems an opportunity to diversify their income, while increasing the sustainability of operations. With over 90 million tonnes of manure already collected and stored by UK farms each year, integrating AD into these systems could support the generation of 17-24 TWh of renewable energy. Based solely on wholesale gas prices (Jan 2020⁵), this gas could bring an additional £160-230 million each year to the agricultural sector. Income and economic resilience may be further supplemented through the sustainable integration of bioenergy crops into farming and the feedstock mix. This may be through: (i) sequential cropping, maximising agricultural efficiency by using arable land between food-crop harvests to grow bioenergy crops for AD and using its digestate to recycle soil nutrients; or (ii) periodically growing herbal lays and cover crops to help restore soil carbon, fix nitrogen and enhance environmental biodiversity, beneficial for long-term productivity, before digesting plant material after use. The Committee on Climate Change (CCC) recognise the need to embrace bioenergy crops to meet the low carbon energy demand necessary for Net Zero⁶, and when sustainably farmed can promote biodiversity and restore soil structure⁷.
3. **Balancing the energy network** – AD creates flexibility within the energy system – it can easily be stored and transported through the existing energy infrastructure, providing low carbon energy when and where demanded. Importantly, it can also be used to generate base load electricity, used to produce green hydrogen, and used to store excess renewable electricity via electrolysis and biomethanation.
4. **Production of biofertiliser 'digestate'** – After the extraction of the energy during the anaerobic digestion process, the remaining solid/liquid residue retains the nutrients from the organic material fed into the digester. The nutrients and remaining organic matter can then be returned to the land to fertilise crops and restore soil health, and therefore is central to developing the UK's circular economy for organic material. The use of digestate also helps displace the need for artificial fertilisers, which are highly energy intensive to manufacture and generally involve the mining of finite mineral resources.
5. **Deep decarbonisation** – AD prevents GHG emissions in three key ways: (i) displacement of fossil fuels through its generation of biogas; (ii) displacement of artificial fertilisers through its production of digestate; and (iii) prevention of emissions from decomposing wastes. The CCC says that AD needs to

³ <https://www.nnfcc.co.uk/publications/report-uk-jobs-bioenergy-sector-2020>

⁴ <https://www.parliament.uk/documents/commons-library/Brexit-UK-agriculture-policy-CBP-8218.pdf>

⁵ <https://www.ofgem.gov.uk/data-portal/all-charts/policy-area/gas-wholesale-markets>

⁶ <https://www.theccc.org.uk/publication/land-use-policies-for-a-net-zero-uk/>

⁷ <https://www.nfuonline.com/nfu-online/news/united-by-our-environment-our-food-our-future/>

be used more widely on farms if the UK is to meet its fifth carbon budget. Moreover, the AD process captures and concentrates CO₂ inside the digester thus, when integrated with innovative CCUS technology, converts AD into a carbon negative technology – actively reversing UK emissions. For the UK to achieve its Net Zero by 2050 target, it must optimise its management of all bioresources through AD.

6. **Exportable sector as a global leader** – While the UK may be achieving around one fifth of AD's full potential, the world is delivering just 2% of the global potential⁸. As countries enact changes to meet their National Determined Contributions (NDCs) in line with the Paris Agreement, AD is increasingly recognised for its ability to provide deep decarbonisation, while supporting local energy and food
7. security, waste management and agricultural productivity. On the global stage, the UK is poised to become a centre of expertise, capable of exporting its knowledge and experience to emerging markets. It is crucial for the UK to remain at the cutting edge, developing innovative technology and policy to support the industry and enable it to reach its full potential. Globally, the industry can reduce emissions by over 12%, a huge number and clearly demonstrating its market potential⁸.

ADBA, along with the AD industry, created the Anaerobic Digestion Certification Scheme (ADCS)⁹ to ensure best practice in the AD Industry. The scheme was created for a range of reasons that would ensure professionalism across the industry and was developed with regulators, insurers, investors, and AD operators. The scheme was a response to regulators concerns of the industry and to ensure operators acknowledge how to increase their efficiencies; use quality feedstocks; apply data analysis to monitor the process, biology and outputs; carry out preventative maintenance of their equipment rather than react to issues as they arise; implement best health, safety and environmental practice and optimise the performance of their plant through the ADCS. So, ADBA urges plants to join this scheme to ensure they are acting professionally, in line with best practice and with the recognition of a third-party auditor.

Plants that achieve certification can share the criteria and confirmation of certification with managers, owners, employees, and the general public to show that the plant not only delivers the benefits mentioned in this letter but achieves them via best practice recognised by the AD industry and regulators.

Yours Sincerely,

Charlotte Morton

The Anaerobic Digestion and Bioresources Association (ADBA)

⁸ <https://www.worldbiogasassociation.org/global-potential-of-biogas/>

⁹ <https://www.adcertificationscheme.co.uk/>

5. Introduction

Stenergy is committed to helping The UK Government, Local Authorities and Gas Distribution Networks achieve Net Zero Carbon by 2050 and their associated environmental targets.

A joint Pre-Planning meeting with Worcester County Council Planning representatives was undertaken at the end of September 2020, where initial observations were very well received and understood. Stenergy's proposals have been significantly modified to accommodate those initial observations and we are pleased to confirm that our proposed Anaerobic Digestion Biomethane Plant Site is now located within a wholly owned Brownfield redevelopment site with existing B1 Planning approvals.

We have taken a holistic approach to Green Gas production and utilization, with a proposed privately funded investment of circa £30M, delivering a cutting-edge Waste Food to (2.8 MWe) Biomethane Gas Plant. Our proposal addresses the socially responsible conversion of Worcestershire's & Wychavon's food waste to Biomethane Green Gas for injection into Cadent's Local Transmission System, providing Heat for Homes and Industry.

Stenergy is keen to develop an outstanding working relationship with both Worcester City, County, Wychavon & Malvern Hills local authorities, their representatives and other key stakeholders. We are seeking to proactively assist both authorities meet with their environmental requirements and to develop a strategic partnership with potential for a Joint Venture that will significantly enhance and deliver Worcestershire's green credentials.

Stenergy is pleased to provide answers to initial observations regarding location and proximity to the Police Headquarters and offer the following assurances;

The standard design assessment for Biomethane Plants, of which there are over 100 now operational within the UK considers;

1. The proposed Biomethane Plant and volumes of methane concerned (2500 scmh @ 5°C) equates to 1385kg or 1.385 Tonnes in relation to the Control of Major Accident Hazards Regulations (COMAH) Lower Tier Threshold for Flammable Gases of >10 Tonnes. Therefore, this Biomethane Site is well below the Lower Tier and is not captured under COMAH.
2. All Hazardous Area Zones under the Dangerous Substances and Explosive Atmosphere Regulations 2002 (DSEAR) are calculated and contained within the Proposed Site curtilage. By design, all equipment and housings incorporate explosion relief.
3. A robust Hazardous Installation Assessment (HAZID & HAZOP) and Gas Quality Study (GQ8) and Layers of Protection (LOPA) study shall be undertaken, as required by Cadent.

This proposal accompanies and supports a full planning application on behalf of Stenergy (Worcester) Limited for the installation of a 2.8 MWe gas to grid anaerobic digestion (AD) plant. The AD plant will produce a vital source of renewable energy and provide a farm diversification project at Court Farm, which is located at Hindlip, Worcestershire. Gas to Grid technologies are proven to offer a more environmentally advantageous use of biogas; compared to conventional CHP plants which are typically only 35-40% efficient.

The application follows pre-application consultations with Worcester County Council. Following meetings, advice and further discussions with the local authority, Stenergy have revised and further improved elements of the layout, infrastructure, odour management, landscape visual and transport elements of the project.

The scheme is an excellent example of farmer/food business collaboration whereby all the agricultural feedstocks will come from close proximity to Court Farm and the vegetable / liquid food waste products will come from both local authority food waste, local food manufacturers and local businesses. The scheme therefore has high sustainability credentials providing local economic benefits, not only to the local authorities but also to a number of other farming and food businesses; and also has high environmental credentials and social benefits of helping to sustain a number of family farming / food enterprises.

The feedstock mixture has a variety of products which will be blended to generate maximum gas output. Anaerobic digestion rules now discourage plants which are fed purely on crops such as maize and the preferred technology providers favour a mixture of products which will also help to meet both the Renewable Heat Incentive sustainability rules and the UK waste hierarchy protocols.

The feedstock mix is set out in the main supporting statements which accompany the planning application. The total volume required is a maximum of 48,500 tonnes. This will be primarily sourced from Local Authority Domestic waste food collection and a number of other neighbouring landowners together with some supplementary imported feedstock so that the expected plant performance can be achieved. The feedstocks comprise 32,500 tonnes of food manufacturer waste products and 16,000 tonnes of domestic food waste, although these are maximum figures and if gas output is met on a lower volume of feedstock less products will need to be used.

As a bi-product, the AD plant will produce around 40,000 tonnes of digestate. This will be in both liquid and cake form to ensure that the most sustainable recycling options are available, including reducing the number of transport movements. There is also an option to dewater the digestate bio-fertiliser which would reduce the volume needing to be stored and water can be recycled back into the AD system.

The plant will produce biogas which will be cleaned and piped into the gas network, providing a vital source of biomethane for the national gas network and helping to meet local and national renewable energy targets. The resulting digestate is an important source of nutrients and a rich bio-fertiliser and soil improver, helping to reduce the reliance on synthetic artificial fertilisers which have a very high carbon footprint.

Injecting biomethane produced through anaerobic digestion directly into the gas grid has a wide array of environmental benefits. It is one of the most efficient uses of biomethane and reduces our reliance on imported fossil fuel gas, thus contributing towards the UK's renewable energy and climate change targets, whilst also improving our energy security. It has been calculated that through injection to the gas grid biomethane provides a sustainable, flexible and economic solution that could provide a significant contribution to the UK's heat demand by 2050.

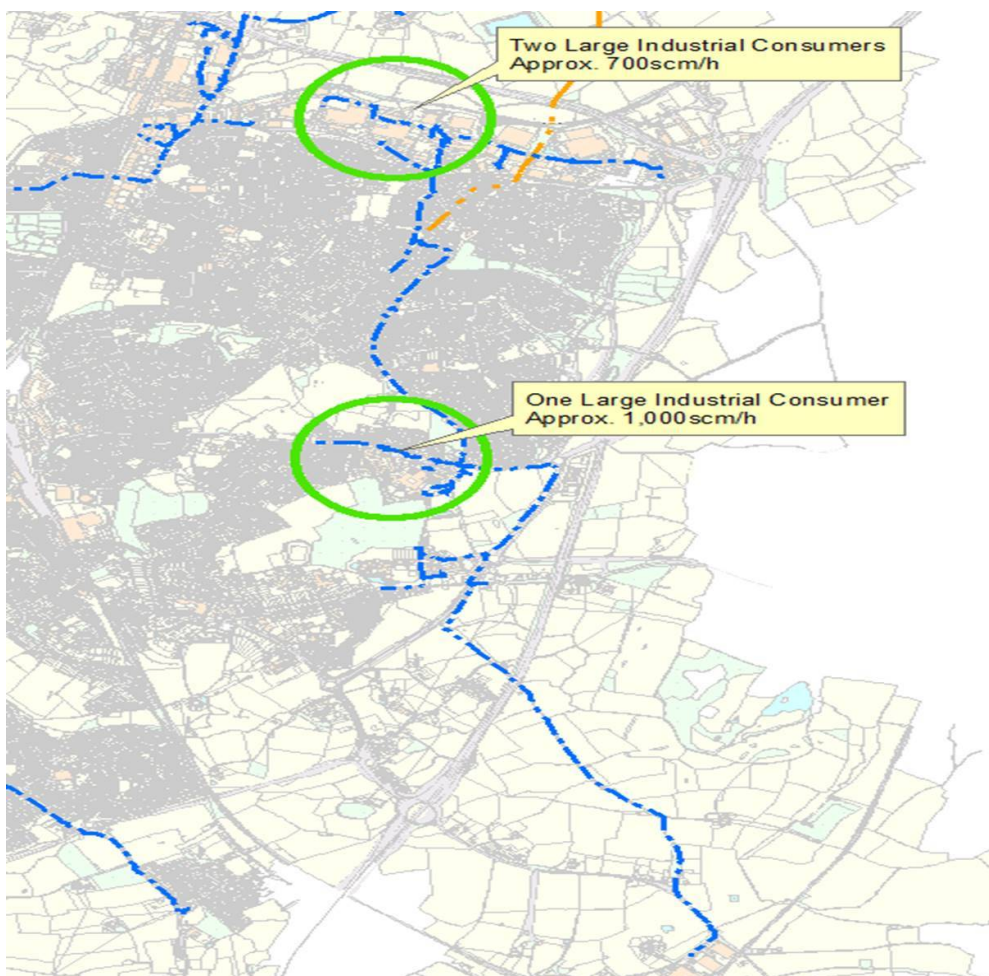
6. Confirmation of Cadent Local Transmission System Connection Offer

Stenergy have commissioned a Detailed Design Study with the Gas Distribution Network Cadent to identify 'Capacity' to permit our requisite green gas injection rates (injection capacity is driven by demand) and identify any constraints thereof.

We have engaged with Cadent to identify whether any potential alternative sites are located within their networks with the available capacity to meet Stenergy's requisite injection rates. The studies undertaken by Cadent of their network flows and capacity have been extensive and concluded that all other potential locations should be discounted, primarily due to the other regional input feeds being 'saturated' by the Ross- on-Wye higher pressure feed. Analysis of the 'Single Leg' Feed supplying the East of Worcester (Figure 1) upon which proposed connection is to be made has been identified as a very suitable location.

Importantly, there are three additional large industrial users with requirements for gas from this leg which are not currently considered by the Cadent Study. This additional demand further supports Stenergy's confidence to proceed with the scheme proposals.

Figure 1.



The Feasibility Studies for Connection to Cadent's Local Transmission System at 19 barg are now complete and Stenergy have progressed to Securing the Connection and achievable Injection Capacity with Cadent.

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The importance of the selected Site has been identified within our proposal, providing Stenergy with the maximum opportunity to inject the requisite gas injection rates and associated revenue income, to achieve our business model.

Stenergy envisage our proposed Biomethane Gas to Grid will process approximately 200-300 Tonnes of food waste per day, 365 Days per annum. The plant has four output revenue streams in the form of 'Gate Fees' (as an alternative to food waste going to either Landfill or Incineration), Gas to Grid and associated incentives, Carbon Dioxide Capture and liquification and the sale of Digestate (Fertilizer). Our vision for greening Worcester City and its surrounding conurbations will realise the equivalent of > 3000 domestic dwellings using green gas for heat and has further potential for Worcester County Council to deliver a Transport Strategy based on a zero-carbon green solution for Worcester's fleet of Buses, Local Authority HGV's and 'Grey' Vans.

The following extract is confirmation of Cadent's LTS Connection Offer;



Stenergy (Worcester) Ltd
The Porthouse
75 Lowesmoor
Worcester
Worcestershire
WR1 2RS

Rebecca Pratt
Senior Design Analyst
rebecca.pratt@cadentgas.com
07866 117292

For the attention of: - Keith Warburton

25th October 2021

Dear Keith,

RE: Quotation for the Design and Construction of Biomethane Gas to Grid Connection at Court Farm, Hindlip Lane, Hindlip, Worcester, WR3 8SS

We are pleased to provide you with a Quotation for Works in accordance with Cadent's current Trial Standard Conditions of Contract for the Design and Performance of Biomethane or similar Connection Works (the "SCCs"). The SCCs are attached and deemed to be incorporated into and form part of this Quotation.

Words and phrases used in this Quotation shall have the meaning given to them in the SCCs, unless expressly provided otherwise.



6. **"Company's Specific Obligations"** shall mean the obligations set out in Schedule 3 attached hereto.
7. **"Company's System"** shall mean those facilities (other than any part of the Cadent System), whether or not belonging or to belong to the Company, which are connected to the Cadent Facilities and through which Biomethane is intended to flow to the Cadent System from the Biomethane Plant including but not limited to any gas pipeline, metering and pressure reduction apparatus.
8. **"Connection Works"** shall have the meaning given in Schedule 10
9. The **"Date of Substantial Completion"** shall be the 13th September 2023 or thirty (30) days after the date the Works are adopted by Cadent, whichever is the later. Cadent shall reserve the right to amend the Date of Substantial Completion as required and shall provide adequate notice in writing to the Company of any revised date.
10. **"Emergency Shut Down Condition"** shall mean any condition requiring Cadent acting reasonably and prudently, in accordance with the relevant emergency procedures, to cease forthwith to accept gas at the Entry Facility in the interest of preventing possible damage to the System or the injury or death of any person including cessation where gas delivered to the Entry Facility is not compliant with the Biomethane Delivery Conditions;
11. **"Gas Plant"** shall mean the plant to monitor and control the pressure and quality of gas to be put into the Cadent system.
12. **"GQ8 Risk Assessment"** shall mean Gas Quality Risk Assessment
13. **"Information Cut-off Date"** shall mean the dates detailed in Schedule 9a or such other dates as agreed between the Parties.
14. **"Cadent Facilities"** shall mean the equipment necessary to provide a physical connection between the Company's System and the Cadent System;
15. **"Cadent Specific Obligations"** shall mean the obligations set out in Schedule 2 hereto.
16. **"Cadent Telemetry Testing"** shall mean the testing required to enable the Signals as outlined in clauses 1.1 of Schedule 1 and 8 of Schedule 3 to be transmitted between Cadent and the Company..
17. **"Maximum Permitted Flow Rate"** shall mean subject to network demand in respect of any Gas Day, the maximum instantaneous volumetric estimated flow rate of Two Thousand Five Hundred Hundred **(2500)** Standard Cubic Metres per hour (scmh);

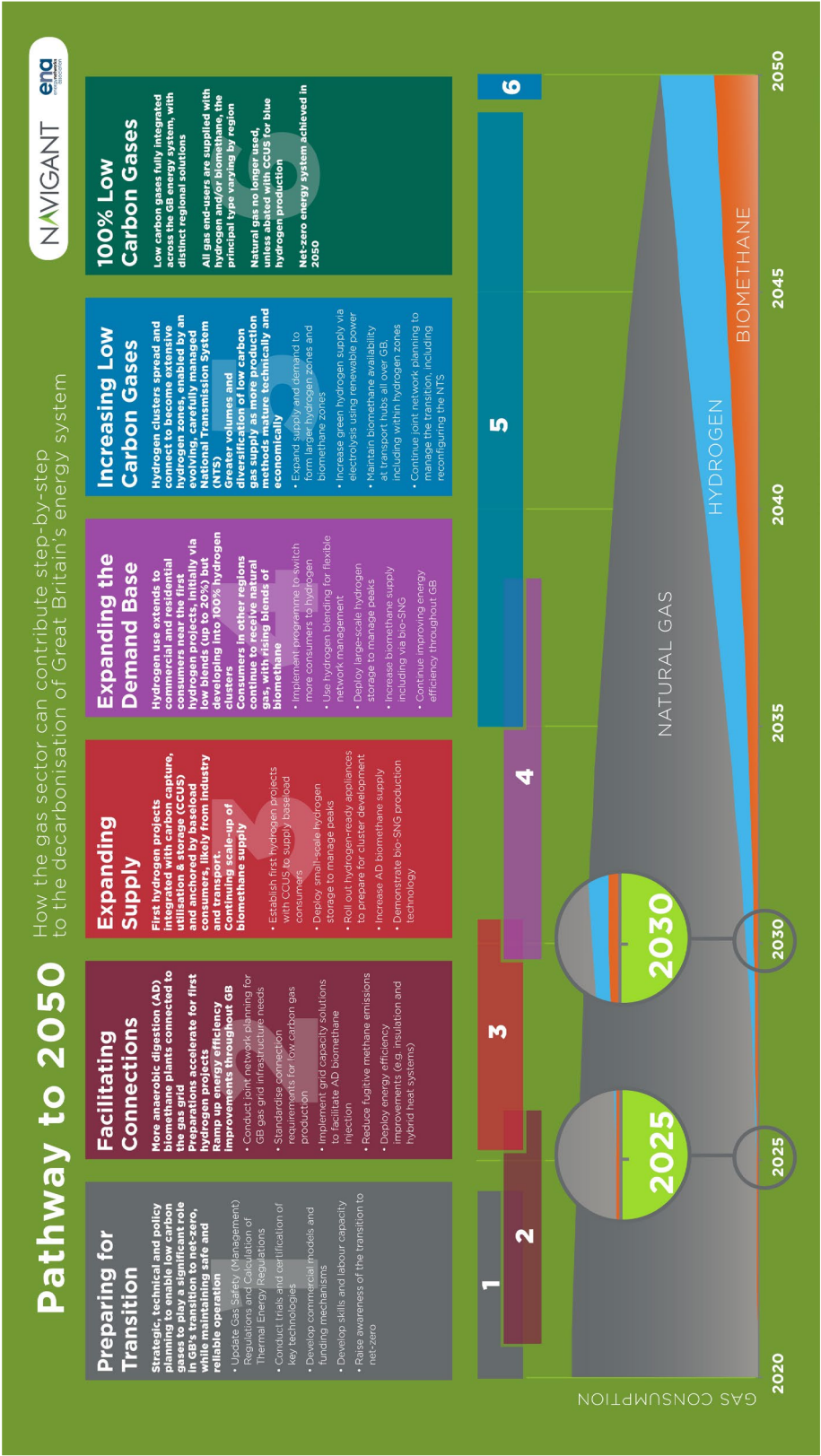
7. Background - Climate Change Context

The Climate Change Act 2008 forms the legal basis for the UK's approach to dealing with climate change. The Act also established the Committee on Climate Change (CCC) must ensure that emissions targets are evidence-based and independently assessed. Originally, the Act committed the UK government to greenhouse gas (GHG) emission reductions of at least 80% by 2050, compared to 1990 levels.

In May 2019, the CCC published its "Net-Zero" report in which it stated that the UK should "set and vigorously review an ambitious target to reduce GHGs to zero by 2050". The report identified that much of the policy foundations are in place to meet the new targets, but they need strengthening to deliver action and "delivery must progress with far greater urgency". A key point made in the report is that moving to net-zero emissions makes carbon capture and storage a necessity not an option, and that there is a significant role for hydrogen. Shortly after the release of the CCC report, on 27 June 2019, the UK became the first major economy to commit by law to reducing GHG emissions to net-zero by 2050.

Gas is fundamentally important to the current UK energy system, but it is a significant GHG emitter. A net-zero emissions target leaves little or no role for unabated natural gas consumption in the future energy mix. However, if the country's highly developed gas network infrastructure can be repurposed to accept, transport and deliver low carbon and renewable gases such as biomethane and hydrogen, gas can make a valuable contribution to the decarbonisation of the UK energy supply.

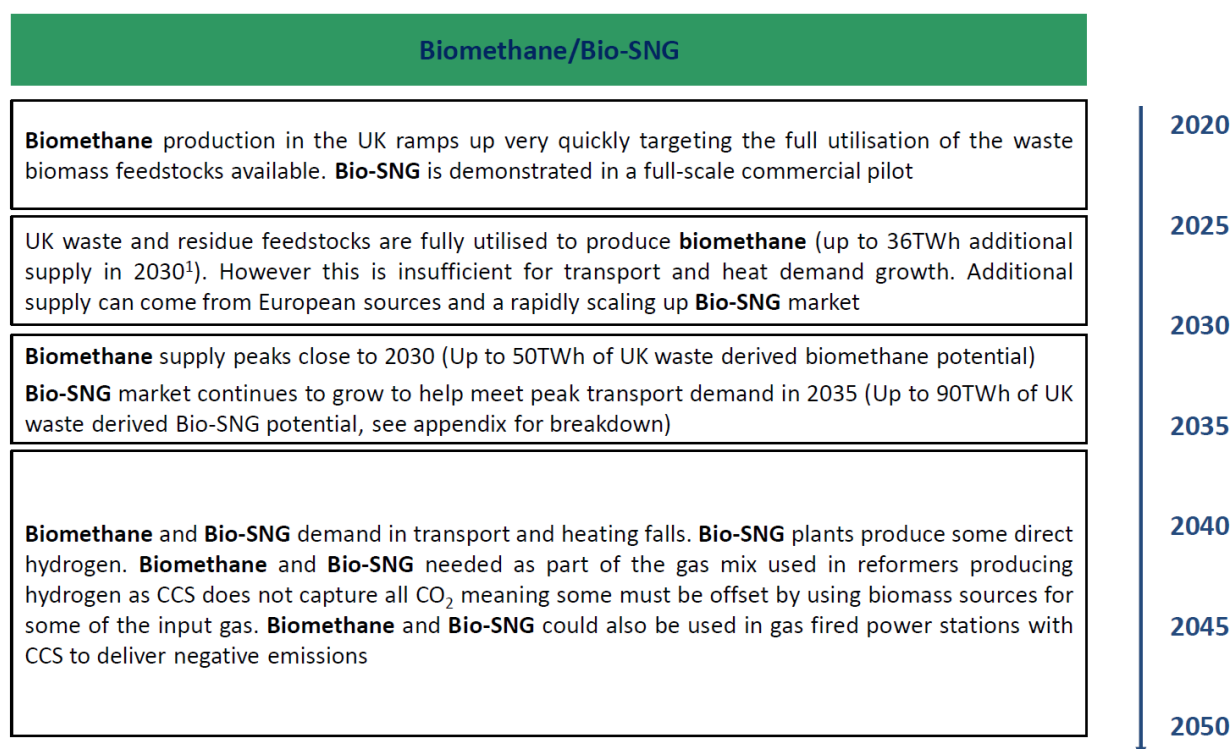
8. The Pathway to 2050



9. Action required during RIIO2 Period 2021-2028



10. The Importance of Biomethane 2020 through 2040



11. The Case for Very Special Circumstances

The site lies within the West Midlands Green Belt. The fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open. The essential characteristics of Green Belts are their openness and their permanence.

Green Belts serve five purposes:

- to check the unrestricted sprawl of large built-up areas.
- to prevent neighbouring towns merging into one another.
- to assist in safeguarding the countryside from encroachment.
- to preserve the setting and special character of historic towns; and
- to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

The National Planning Policy Framework (NPPF) (2021) states:

Inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances (paragraph 147).

When considering any planning application, local planning authorities should ensure that substantial weight is given to any harm to the Green Belt. 'Very special circumstances will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm resulting from the proposal, is clearly outweighed by other considerations (paragraph 148).

A local planning authority should regard the construction of new buildings as inappropriate in the Green Belt (paragraph 149).

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Stenergy's original proposed development at Cummins Farm, Hindlip, is not one of the exceptions outlined in paragraph 145 and is therefore considered to be inappropriate development in the Green Belt. Taking into account comments from our pre-planning meeting in September 2020 we have discounted our initial proposal to develop at Cummins Farm and we have now identified and propose to development a nearby Brownfield Site with an existing B1 planning approval.

Paragraph 149 states that the complete redevelopment of previously developed land would not be inappropriate development in the Green Belt if it has not greater impact on the openness of the Green Belt than the existing development.

The extant planning permission for the new business park (13/01593/PN and 17/02458/RM) is a realistic fallback position should this proposal not be permitted.



The approved business park includes 6699sqm of Class B1 (now Class E) floorspace and 474sqm of Class D1 (now Class F1) floorspace with a combined volume of 27,971m³.

In this case, the proposed development would represent a very significant reduction in the volume of buildings on the site which would have a much lower impact on the openness of the Green Belt than the fallback position.

Furthermore, the reuse of buildings provided the buildings are of a permanent and substantial construction is appropriate development in the Green Belt. There are two traditional brick build buildings on the site which were to be reused in the business park proposals. It is our intention to retained and reuse these as part of the administration and educational operation of the site.

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Paragraph 151 of the NPPF states:

When located in the Green Belt, elements of many renewable energy projects will comprise inappropriate development. In such cases developers will need to demonstrate very special circumstances if projects

are to proceed. Such very special circumstances may include the wider environmental benefits associated with increased production of energy from renewable sources.

Based on the existing use and extant planning permission is submitted that the proposed development can be considered appropriate development in the Green Belt because it represents the redevelopment of previously developed site with a development which would have a significantly lower impact on openness of the Green Belt.

However, if the Council considers that the proposed development constitutes inappropriate development in the Green Belt then it is necessary to demonstrate very special circumstances in order to outweigh any harm to the Green Belt by reason of inappropriateness (the definitional harm) and any other harm resulting from the proposal.

The application will demonstrate the following very special circumstances:

- The reuse of a previously developed site with a development which has a significantly lower impact on the openness of the Green Belt than the permitted fallback development;
- The fact that the proposed development can only be sited in the Green Belt having regard to the need to be located adjacent to the high-pressure gas line and in close proximity to Worcester City for efficient energy transfer;
- The significant environmental benefits of the energy from waste process; and
- The significant economic and educational benefits to the County and District through direct and indirect job creation and opportunities for learning with links to local schools and colleges.

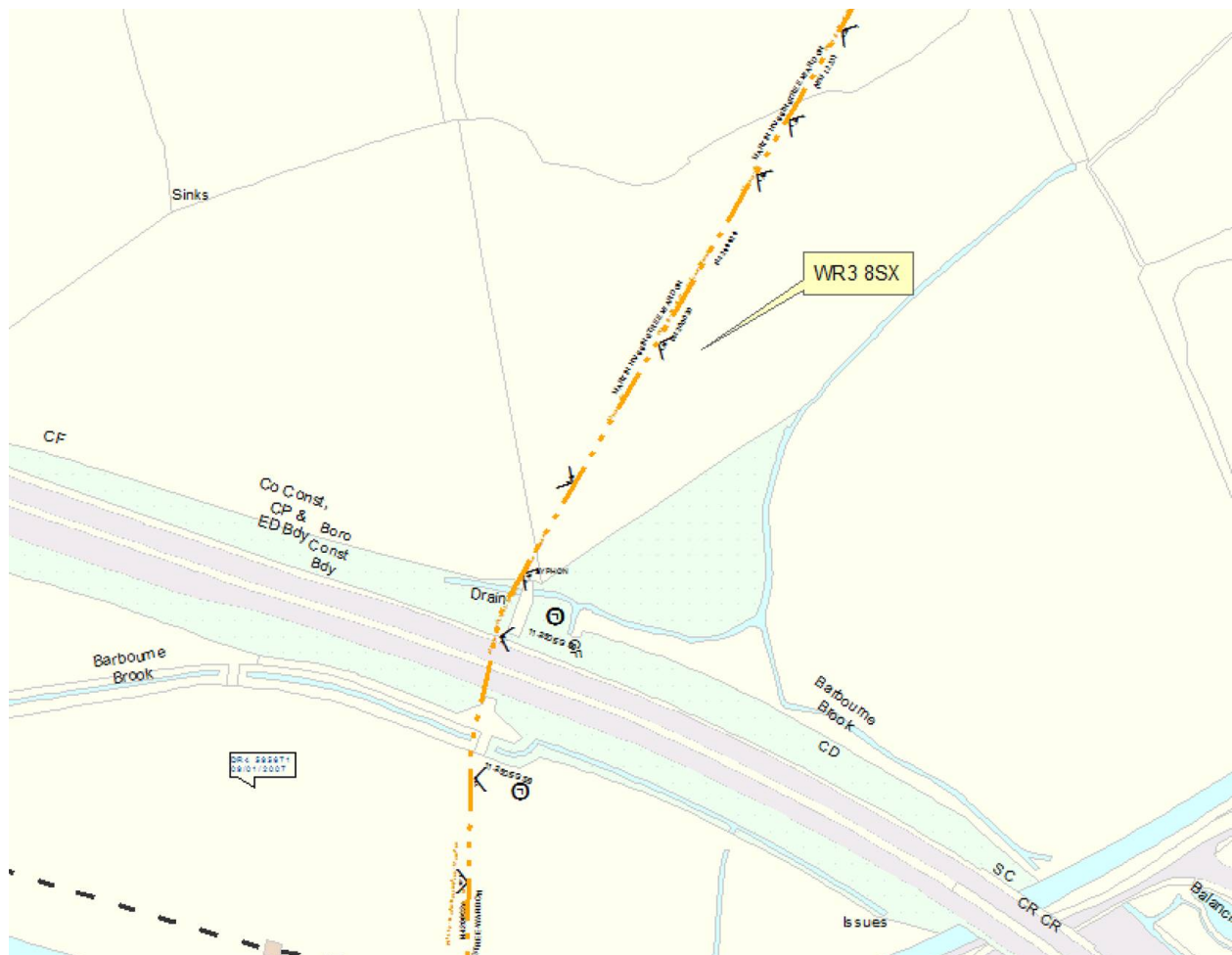
These will be examined and presented in more detail during pre-application presentations and the planning application process.

12. 'Put and Take' Minimum Gas Natural Gas Network Connections utilising a Blending Tee

The proposed Biomethane Plant location offers superb connectivity to ancillary utilities and transport. More importantly, the site is unique from a gas engineering perspective. Stenergy intend to make a Minimum Connection to Cadent's Intermediate Pressure Main (<19 barg).

Biomethane is weak in calorific value, having a calorific value of 36 mj/scmh and has traditionally required propane enrichment to meet with the Gas Safety (Management) Regulations 1996 requirements of (+/- 0.5) 39 mj/scmh.

Cadent's gas pipeline characteristics afford Stenergy the requisite gas injection volumes of 2000–2500 scmh (due to the compressibility of Biomethane/natural gas) and a unique opportunity to introduce a Blending Tee at our injection point.

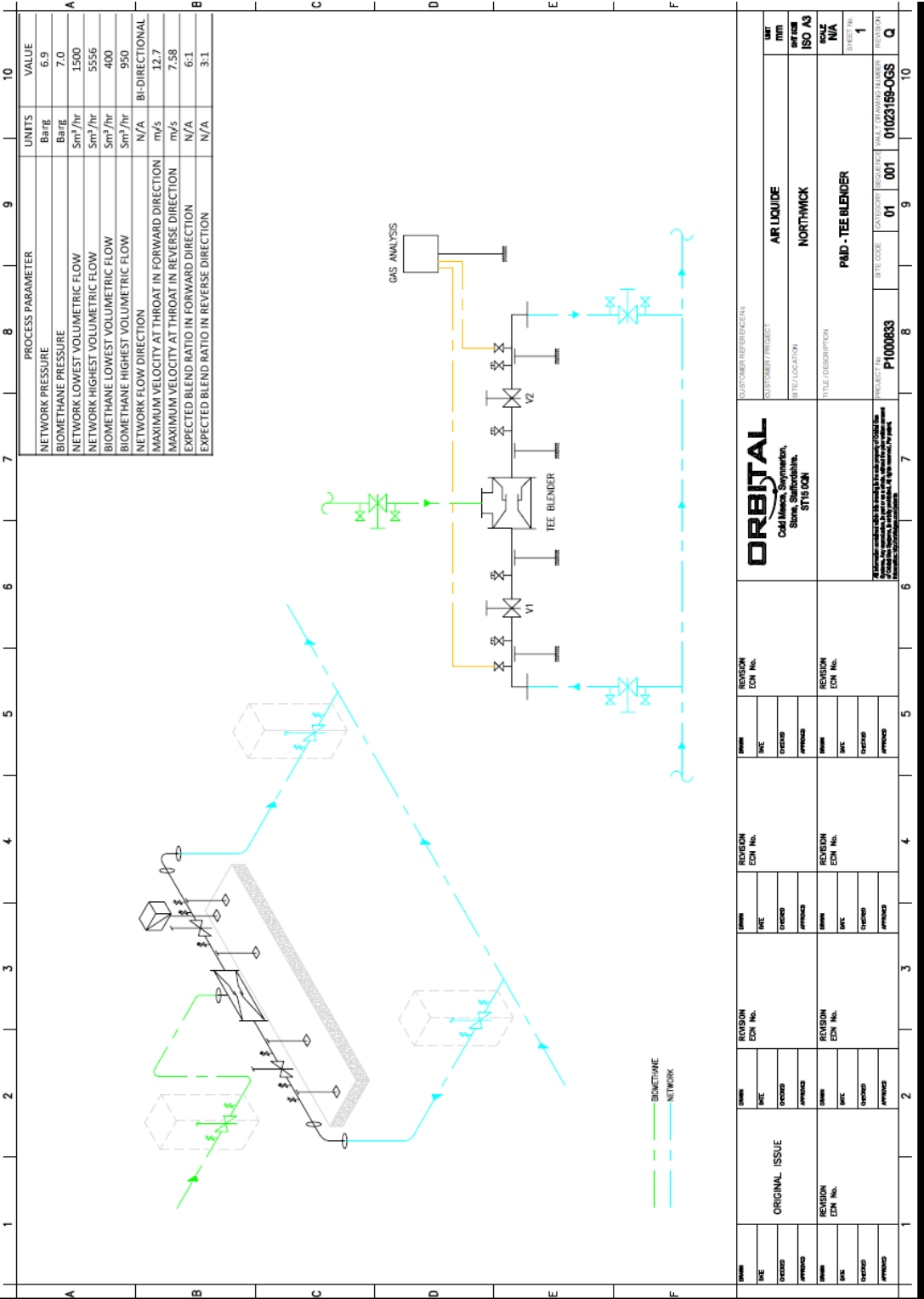


The blending tee creates a venturi within the gas stream, co-mingling un-propanated biomethane with natural gas from the 'parent' main, diluting the weaker biomethane. The process is controlled by an Ofgem approved gas analyser installed downstream of the connection which will instruct the Plant when propanation is required. This arrangement will reduce the Opex of the Plant by circa £200,000 per annum in respect of Propane costs and further reduce the Plants Carbon footprint.

13. Court Farm Gas Main Proposal Overview Schematic



14. Blending Tee P&ID



15. Examples of other anaerobic digestion plants allowed in green belt locations

Ridge Road Farm, Micklefield, Leeds

Aberford and District Parish Council: Ref No. 15/04960/FU

The site provides a facility which accepts up to 52,000 tonnes of waste manures, chicken litter, farm crops and sugar beet.

Built by BTS Biogas the site is located within the Green Belt but was carefully designed to sit down in the landscape and does not affect the openness of the location.

The local planning authority considered that very special circumstances existed to outweigh any harm. These included the renewable energy benefits, the advantages of replacing artificial fertilisers with digestate, and the ability to use digestate on local farmland.

The project is also a gas to grid plant and has good road connections.

Coursers Farm, Hertfordshire

Hertfordshire County Council: Ref No.PL\0405\12

Hertfordshire County Council approved plans for an anaerobic digestion (AD) facility at Coursers Farm near St. Albans. Although within the metropolitan green belt, HCC accepted that there were very special circumstances to justify the development.

The development comprises an AD facility to process up to 48,500 tpa of food waste serving commercial and municipal markets in Hertfordshire. The site will initially accept mainly commercial food waste from local restaurants, supermarkets, hospitals and food manufacturing companies. Agrivert the applicant also hopes to treat some of Hertfordshire's municipal food waste at the plant.

The development includes a new building for waste reception together with eight tanks for digestion of waste and storage of digestate product. Waste will be delivered to the enclosed reception building where it will be cleaned and macerated before being pumped into the digester tanks. Waste will be digested for up to 100 days to produce biogas and a quality digestate fertiliser. The digestate will be pasteurised and spread to local farmland. The digestate will reduce fertiliser expenditure of local farmers and will offset the greenhouse gases associated with the production of chemical fertilisers. The facility will also generate up to 3MW of renewable energy, enough for over 4,500 homes.

Hertfordshire County Council recognised the locational benefits of the site and that these contributed to very special circumstances enabling the grant of planning permission in this location in line with National planning policy.

Cattlegate Farm, Cattlegate Road, Northaw and Cuffley

Hertfordshire County Council: Ref No. PL\0712\15

This scheme involved a farm site for a 1 MW anaerobic digestion plant using imported food waste as feedstock.

Although the facility was located in the greenbelt it was considered that there was not any significant environmental impacts associated with the proposal.

It was acknowledged that the proposal would be considered inappropriate development but it was considered that very special circumstances exist to outweigh any harm. These included the renewable energy benefits, the advantages of replacing artificial fertilisers with digestate, and the ability to use digestate on local farmland.

**Swancote Farm, Swancote, Bridgnorth, Shropshire
Shropshire County Council Ref No. 10/03881/MAW**

This project is located in the West Midlands greenbelt and is a farm site east of Bridgnorth. The anaerobic digestion plant was approved as a 1.1 MW plant utilising 20,000 tonnes of maize, potato waste, wheat and imported chicken manure. A subsequent application allowed additional food waste products to be used raising the output to over 2 MWe.

The local planning authority acknowledged that whilst the proposals include a significant agricultural component it is considered that they would fall outside the strict classification of 'agricultural development' for the purposes of PPG2 and policy S3 of the 24 Bridgnorth Local Plan. Accordingly, the application would technically be viewed as 'inappropriate development' under a strict interpretation of PPG2. The application also involves built development with the potential to affect the openness of the Green Belt.

However, it was considered that the detailed design of the scheme and the associated landscaping measures would allow any visual impacts and any associated effects on the sense of openness within the Green Belt to be mitigated to an appropriate extent. Given the classification of the development as 'inappropriate development' it was necessary to establish whether very special circumstances would apply which would justify development within the Green Belt. It is considered that the renewable energy and climate change benefits of the proposals would qualify as very special circumstances and that PPS22 provided additional support for this conclusion. Having regard also to the essentially agricultural nature of the proposals and the available landscaping measures noted above it was considered that the proposals were capable of being accepted in relation to Green Belt policy.

**Wingmoor Farm (East) Development of an Anaerobic Digestion Plant
Gloucestershire County Council: Ref. No: 14/0083/TWMAJW**

Key Elements of the proposal were:

Processes up to 34,000 tonnes of food waste

Produces electricity

Also produces liquid fertiliser to be stored in underground lagoons

14-16 lorry movements per day

24 hour process

Up to 9 new employees

Confidential & Without Prejudice

The waste will be sourced from commercial and industrial outlets.

Further food wastes would be sourced from the grocery trade, restaurants and hotels and from food producers and processors in the local area.

The process will generate 1.8mw of electricity, 1,6mw of which will be fed into the electricity distribution grid

Liquid (bio) fertiliser from the AD process would be retained in sealed lagoons constructed below ground level into the underlying clay. The bio-fertiliser would then be spread on farm-land as an organic fertiliser and soil improver.

The proposed operation would entail the delivery of food waste feedstock by heavy goods vehicles with an average carrying capacity of 17 tonnes. Delivery frequency would amount to 7 to 8 deliveries per day, six days per week.

It was considered that the proposal represents inappropriate development in the Green Belt which is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances. However, it is considered that in this case due to the location of the site, its temporary life, and the provision of renewable energy that very special circumstances have been proven to outweigh harm to the Green Belt.

16. Introducing Stenergy People

Keith Warburton, Director – Delivery & Operations

Stennard Harrison, Director – Lead Developer

Kate Walton, Director – Legal & Personnel

Keith Warburton, Director – Delivery & Operations



Wales & West Utilities appointed industry expert Keith Warburton as Decarbonisation Development Manager in 2019, where in April 2021, Keith has subsequently moved to focus solely upon the Stenergy business as Director for Operations and Delivery.

Keith, 57 and from Tenbury Wells in Worcestershire, has significant management and technical experience in delivering complex infrastructure projects and has previously held roles within National Grid, Northern Gas Networks, Scottish & Southern Energy and, more recently, Lagoni Engineering Ltd.

A member of the Institution of Gas Engineers and Managers and former Director of The Gas Industry Safety Group (GISG), Keith worked alongside industry, academia, stakeholders and customers to deliver a Net Zero ready, low-cost gas network across Wales and south-west England.

Speaking during his former role, Keith said:

“We must make sure that the energy system of the future delivers what customers want and need: energy that is affordable, secure and green, while minimising costs to homes and communities.

“So, I have focussed on increasing the number of green gas connections to our network, supporting the safe transition to hydrogen, and advocating the uptake of smart hybrid heating systems.

Keith is a leading expert in the delivery of UK Biomethane projects, having developed the systems and interfaces between producers, financiers and gas distribution network operators for Northern Gas Networks (NGN) as their Key Account Manager for Biomethane to Grid, and as Decarbonisation Development Manager for Wales and West Utilities (WWU) who currently have 19 Biomethane sites in Wiltshire, Somerset, Devon and Cornwall injecting green gas into WWU networks.

Northern Gas Network, United Kingdom

NGN Biomethane Key Account & Diversion Programme Manager (2014 to 2015)

Managed NGN Network Entry Connections process <85 barg, serving as the single point-of-contact for producers of bio-methane gas with schemes within the NGN territory and delivering effective governance of the NGN Biomethane methods. Analysed connection and management processes, and developed initiatives to promote NGN strategic, lobbying government, regulatory, and trade associations.

- Maintained biomethane data to ensure delivery of regulatory reporting requirements.
- Oversaw all NGN pipeline diversions including a high-pressure steel transmission pipeline with large-diameter polyethylene schemes with project values of approximately £4.2 million.

INFORMATION FROM



For Immediate Release: January 2011

AWE'S EMPLOYEE GETS INDUSTRY RECOGNITION

AWE's Keith Warburton (Lead Engineer for natural gas) enjoyed a double celebration recently – being nominated for a top award and securing a new role within the gas industry.

Keith, a member of the Institution of Gas Engineers and Managers and the Emergency Planning Society's Southern branch, was short-listed for the Gas Industry Safety Group (GISG) 'Decade of Excellence' Individual Contribution to Safety Award.

The nominations were judged by a panel which included members of the All Party Parliamentary Gas Safety Group, GISG and other leading gas safety specialists, including Judith Hackitt, chairwoman of the Health and Safety Executive.

Working as the Lead Engineer for natural gas at AWE, Keith's name was put forward for the accolade in recognition of his dedication, diligence and leadership of the natural gas process at AWE.

After taking up his post in May 2006, he has subsequently led the development and implementation of a fully encompassing suite of in-house documentation that successfully integrates the UK's natural gas industry standards and requirements within AWE's nuclear site licence requirements.

The policies and procedures deliver a high level of assurance to AWE and provide effective governance for the design, construction, commissioning, operation and maintenance of their natural gas networks and ancillary natural gas plant and equipment.

Despite just missing out on winning the award, Keith did not walk away empty handed as he has been invited to sit as a Board Director of the GISG.

Steve Fussey, AWE's Acting Director Site, said: "This appointment reflects Keith's professionalism, his level of expertise and the high regard to which Keith is held within the UK's natural gas industry."

Keith said: "It is a great honour to represent the UK Gas Industry on a European platform and I look forward very much to meeting the many challenges along the way."

ENDS

Caption:

Notes to Editors:

1. AWE plc manages and operates the Atomic Weapons Establishment on behalf of the Ministry of Defence, manufacturing and maintaining the warheads for the UK's nuclear deterrent.
2. All AWE press releases are available on our website: www.awe.co.uk

Contact:

AWE PRESS OFFICE 0118 985 5888

Rachel Whybrow, External Communications, 0118 985 6414 or Valerie Hincks on 0118 985 6410.

PR35.2010

Stennard Harrison, Director – Lead Developer

Stennard Harrison (Junior) has over 30 years' experience in both commercial and residential property development and construction in Worcestershire. Stennard has led teams in the successful delivery of various complex, large-scale projects enabling him to gain in-depth knowledge of all aspects of the construction and development process. His strategic awareness, and extensive local knowledge of the Worcester area, has enabled him to deliver projects to an exceptionally high standard.

Stennard possesses the ability to identify, and create opportunity, from often disused and tired property. During his lengthy career Stennard has taken a holistic approach to development; from identifying a site and reviewing its merits, to orchestrating the planning process and organising professional teams, to securing corporate finance and managing the eventual construction. Stennard has undertaken a diverse range of projects including award-winning executive residential developments, high-specification business parks and regeneration of mansion houses and estates.

Stennard has since 2011 acted as CEO of various Worcester-based property development companies. His work has focused on supervising existing property portfolios located on sites within Worcester city centre, together with developing and leading a strong team of professional third-parties to achieve the successful regeneration of a range of sites. Stennard has been fundamental in securing the largest re-generation scheme in Worcester city-centre, successfully obtaining detailed planning permission, drawing together a diverse and experienced professional team, and supervising the day-to-day running of the schemes. On account of his involvement with such complex inner-city schemes, Stennard has been an active contributor to the development of the Worcester City Masterplan.

Simultaneously, Stennard acts as Managing Director of Norton Parkway Developments Limited, a company incorporated to facilitate the development of 20 acres of land adjacent to the Worcester Parkway Train Station. This has included Stennard managing the construction of the existing access road into the site, together with the development of a transport yard and workshop to government VOSA standards. In addition, a live application is currently pending at Wychavon Planning, for the erection of 40,000 square foot office building over four floors, and a further application to develop an additional 18 acres consisting of a commercial mixed-use scheme.

With an arsenal of wide experience, developed over the course of his lengthy career, Stennard is well equipped to realise Stenergy's vision of Worcester becoming an internationally recognised green city.

Kate Walton, Director – Legal & Personnel

LL.B (Hons.), BA (Hons.) MSc. (Oxon)

Kate is a Birmingham trained solicitor, with 15 years of experience in corporate, and commercial property, law. Having read for degrees in both history and law at Oxford and Coventry Universities, Kate initially trained as a criminal solicitor in a high-ranking law firm in Birmingham before deciding to focus her practice on commercial and corporate law.

For the past 6 years, Kate practiced at a local Worcester Law firm acting as head of commercial services, managing a team of assistant solicitors, legal executives and support staff. Having been made a partner in 2016, Kate also functioned as the firm's anti money laundering officer, responsible for various aspects of compliance and financial reporting. She acted for a broad range of clients including developers, financial institutions, local Worcester owner-managed businesses, limited companies and PLCs, financial institutions and charities.

Since October 2020 Kate moved from private practice to focus her energy on working in conjunction with Stennard. Her practice is now 'in-house' advising Stennard, and his group of companies, on a range of legal issues, as well as acting as company secretary for a range of limited companies.

Kate has a wide range of expertise including advising on mergers and acquisitions, site acquisitions and disposals, development work, property and corporate finance, and option/preemption agreements. She also has acquired a broad knowledge of Landlord and Tenant Work.

17. Appendix A – Confirmation of Principal Delivery Partner



Established in 1888, Arcadis is the leading design & consultancy business for natural and built assets, with more than 28,000 staff working from over 350 offices in 40 countries across the globe, delivering projects in more than 70 different countries.

Our capabilities include programme management, cost management, engineering, digital innovation, environmental solutions, business advisory, master planning and sustainable urban development, architecture and water solutions.



To support the delivery of the Stenergy project in Worcester Arcadis will draw on experienced staff from its' multi-disciplinary service lines, providing the range of core and specialist skills necessary for the delivery of this integrated project. This is not just an engineering or a construction project it is a combination of a multitude of inputs that requires careful coordination and management and strong project management.

The Arcadis team will be led by David Robertson, a **Commercial Director within our Birmingham office**. **David has over 35 years' experience in the construction industry and has extensive experience within the full range of development sectors. David has led teams in the successful delivery of some of the region's largest high profile and complex construction projects. Key skills include developing strong client relationships, supporting clients in the articulation of project briefs, stakeholder management, the ability to support teams in working to their full potential and engineering a culture of team cooperation rather than conflict or blame. David has experience in all aspects of project appraisal, project budgeting, procurement and delivery across a range of contract types.** David will be supported by the local resources from the Birmingham office which is home to over 400 staff across a range of disciplines and skill sets. In addition, the local team will be able to draw on the resources and experience of the global business workforce to ensure a successful outcome.

