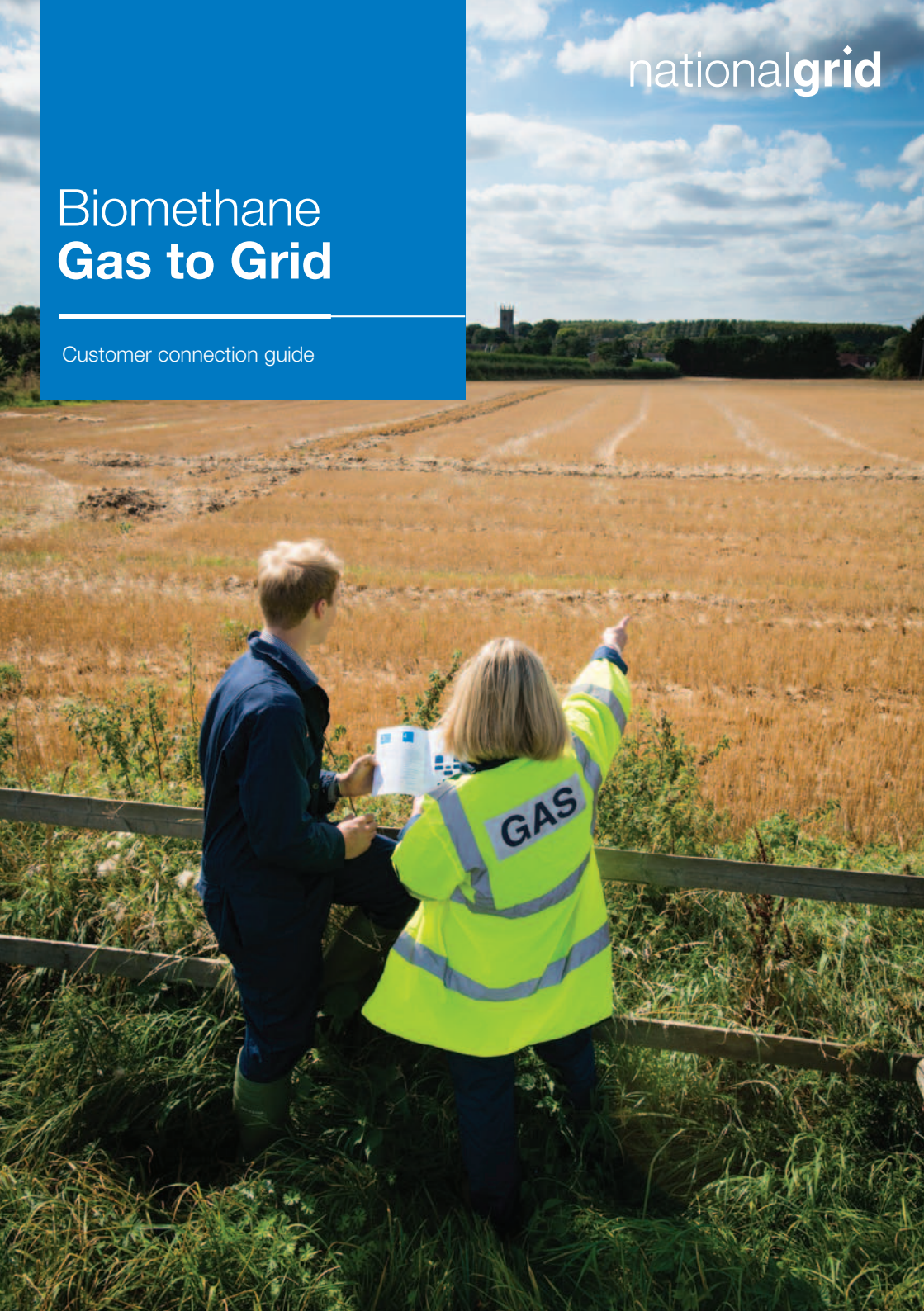


# Biomethane Gas to Grid

Customer connection guide



National Grid is focusing on innovative solutions for a sustainable energy future



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**Our Aim** is to facilitate new connections to our gas distribution network that will enable biomethane producers to inject their renewable gas into the grid.

The addition of biomethane into the grid will help the UK minimise its carbon footprint and avert from unsustainable fossil fuels, whilst increasing the security and diversity of energy supplies.

## NATIONAL GRID – A COMPANY OVERVIEW

National Grid is an international electricity and gas company.

At National Grid our job is to connect people to the energy they use, whether that's to heat and light homes, or to keep factories, shops and businesses going.

We rely on having energy at our fingertips: our society is built on it.

That puts us at the heart of one of the greatest challenges the UK faces – how the country will meet its ambitious low carbon energy targets and connect that new energy supply to communities.

Our Gas Distribution business owns and operates four networks which distribute gas to approximately 11 million businesses, schools and homes and supplies the largest cities in England.

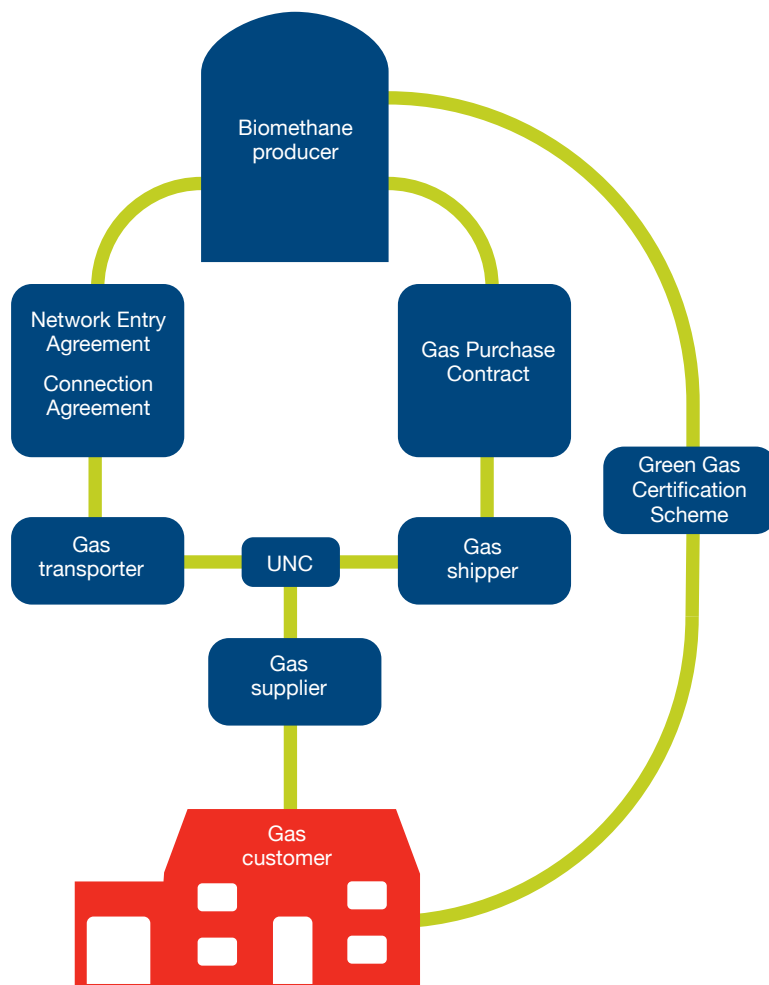
## NATIONAL GRID DISTRIBUTION

- we manage 127,000 kilometers of gas distribution pipelines
- operate 24/7 emergency response service and repair teams
- deliver connections to our networks
- carry out repair and maintenance of our assets.

Our networks distribute gas to approximately 11 million businesses, schools and homes in England



## Commercial and contractual relationships



## HOW DOES THE GAS MARKET WORK?

There are many different groups involved in the biomethane process. The commercial and contractual relationship model shows the flows between the parties.

**Producers** – are responsible for producing the gas. The gas produced must meet the quality requirements set out in the GS(M)R 1996. The producers must secure sales of their gas with a shipper before it can be injected into the grid.

**Gas shippers** – convey gas in the pipeline network by contracting with gas transporters, such as National Grid. Gas shippers must have a Gas Shippers Licence before taking part in any gas shipping actions.

**Gas transporters** – own and operate the gas distribution network, using the infrastructure to transport the gas from producer to end consumer. Transporters may take responsibility for quality testing and gas metering.

**Suppliers** – are responsible for customer interaction and provide an interface for consumers to purchase their gas. Suppliers must have a Gas Retailer Licence before engaging in any consumer contracts.

**Customers** – purchase gas for residential, commercial or industrial use. They contract directly with gas suppliers to secure their gas.

### WHAT ARE THE ECONOMIC BENEFITS?

The government is supporting the generation of renewable heat using the new Renewable Heat Incentive (RHI) tariffs. As the producer of biomethane, you will receive payments based on your heat output. This is currently 7.1p per kWh. Once you start injecting into the grid, this tariff payment is guaranteed for 20 years.

The government has allocated a significant budget to fund the RHI until 2014/15. This is being funded by the treasury and will be paid out by Ofgem, the scheme administrator.

On a national scale, the use of biomethane injection allows the existing gas infrastructure to help meet carbon targets. By contrast, a move to complete dependence on electricity for heating would require very significant investment in flexible generation and network reinforcement.

It also requires no household changes to existing appliances, allowing customers to benefit from this renewable energy without the cost and disruptions of replacing existing appliances.

### WHAT ARE THE ENVIRONMENTAL BENEFITS?

Under new EU legislation the UK must reduce its carbon emissions by 34% by 2020.

National Grid is striving to reach its target of an 80% reduction in carbon emissions by 2050.

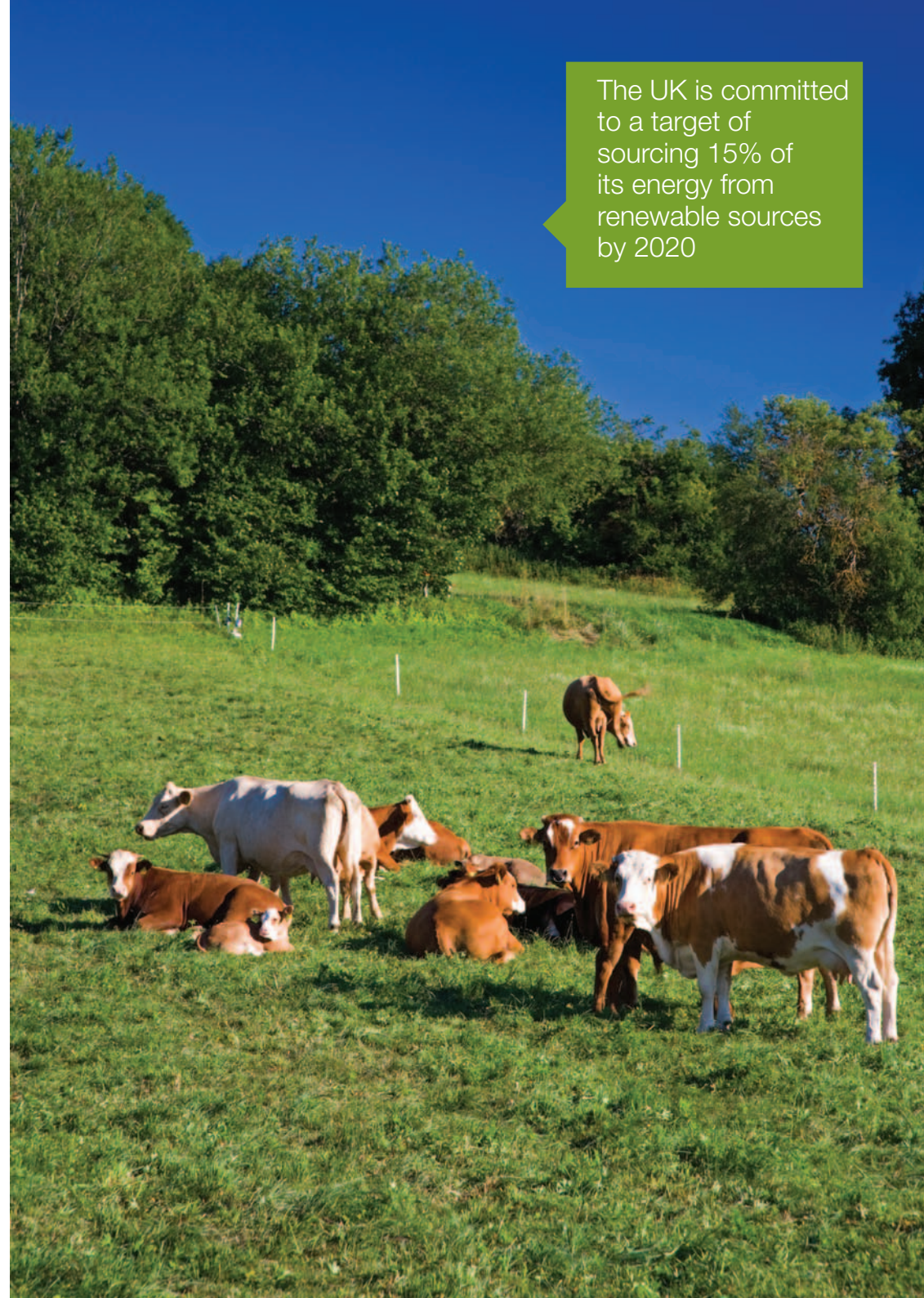
Analysis has shown that biomethane is one of the most prominent routes of providing an economical, secure energy supply whilst reaching these targets.

This is due to biomethane being considered a 'carbon neutral' energy source, as the carbon released originates from organic materials, which have offset emissions during their lifetime.

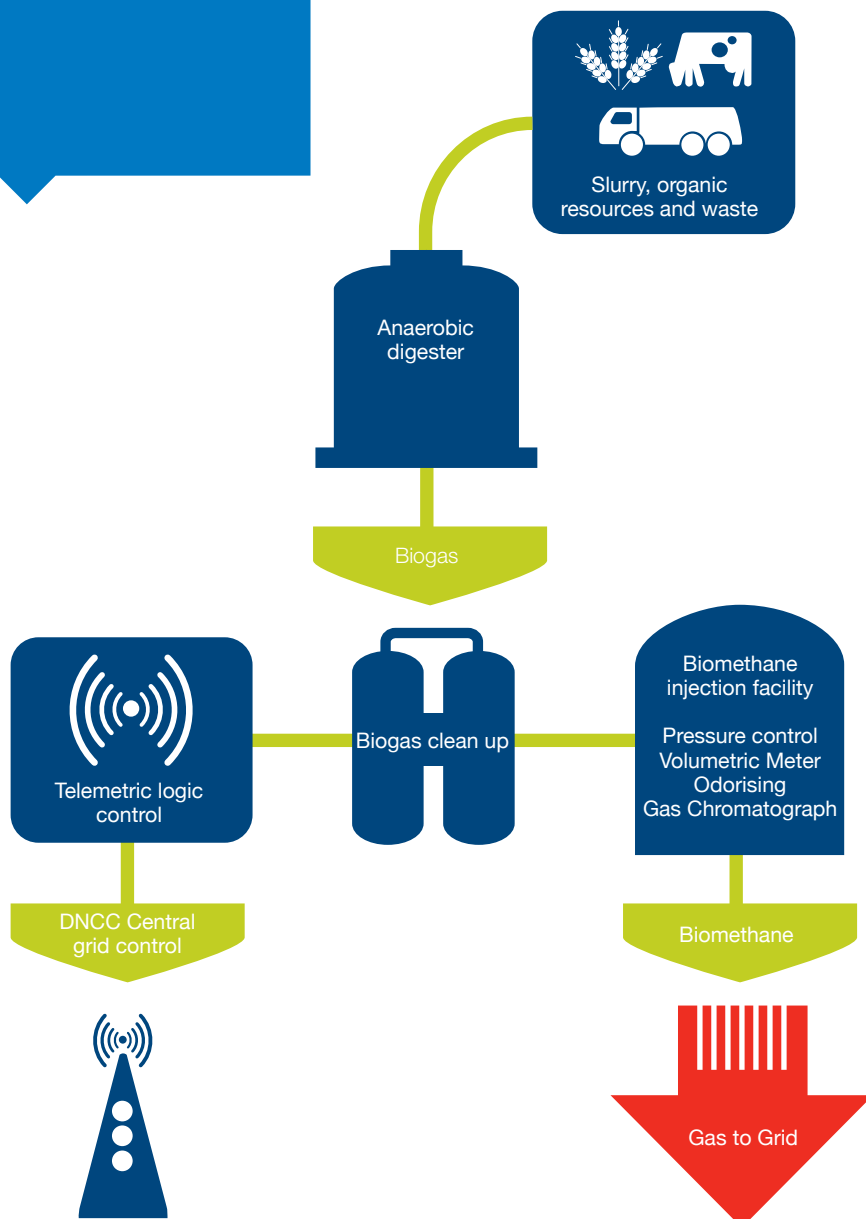
By injecting your biomethane into the grid you are greatly increasing the efficiency of the energy source. Using the gas directly for electrical applications harnesses only 30-35% of the available energy. Whereas used directly in gas applications benefits from 90% or greater efficiencies.

Furthermore, by diverting the waste from landfill, methane, a large contributor to greenhouse gases, is also prevented from being released into the atmosphere.

The UK is committed to a target of sourcing 15% of its energy from renewable sources by 2020



The biomethane production process



WHAT'S INVOLVED?

The production of biogas is performed by the producer, using either the Anaerobic Digestion or Gasification processes. The biogas is then upgraded to a higher quality of biomethane for gas injection.

Propane may be required to be added by the producer to raise the energy content of the gas.

The biomethane must then be sold to a shipper before it is injected into the grid. Ofgem can provide a list of licensed shippers.

Once the biogas has been upgraded to biomethane it will be transferred to National Grid's Network Entry Facility. From here the gas will be metered and the quality monitored. Odorant will also be injected to give the characteristic 'gas' smell.

Once these stages have been completed the gas can be injected into the distribution network for transportation.

WHAT ABOUT THE LEGAL ISSUES?

As part of National Grid's obligations as a Gas Transporter, National Grid must offer conditions for gas entry points under section D12 of the Gas Transporter License.

Biomethane is considered a safe source of energy, providing it meets all of the Gas Safety (Management) Regulations (GS(M)R)

1996, which stipulate the quality of the gas that is acceptable. The regulations also state biomethane must be enriched with propane so that target calorific values are met where appropriate. This will be site specific, based on the feedstock and equipment being used. As with natural gas, the supply must be odorised so that leakages can be detected.

There are a number of governmental bodies, who have responsibilities in the gas sector:

The Department of Energy and Climate Change, (DECC) accountable for primary legislation of gas, such as the 1986 and 1995 Gas Act, the Completion Act 1998, the Gas Calculation of Thermal Energy Regulations 1996 and the GS(M)R 1996 mentioned above.

The Office of Gas and Electricity Markets (Ofgem), responsible for economic regulation of the gas market.

The Health and Safety Executive (HSE), responsible for the health and safety of the gas sector.

The Uniform Network Code (UNC) a set of guidelines for all gas industry members that allows for market competitiveness, states that the Biomethane producer must enter into a Local Transmission System (LTS), Network Entry Agreement (NEA) before gas may be injected into the grid.

For more information please see the useful references page at the back of this booklet.

How do we  
get you connected?

STEP

1

### INITIAL ENQUIRY

You complete a simple questionnaire providing the following key information:

- site location
- postcode
- estimated flow rate – standard cubic meters per hour (scm/h) of Biomethane for Injection into the Grid.

We perform a high level network analysis and mapping to assess whether a connection is possible.

There is no charge to you for this activity.

**TIMESCALE** 2 - 5 days

STEP

2

### DETAILED ANALYSIS STUDY (DAS)

We issue a Detailed Analysis Study agreement to you within seven days of your request.

Following receipt of a signed agreement, the study is delivered within 28 days.

The study will provide you with the following:

- network entry connection options
- indication of costs to connect
- plant and equipment required to be provided by the customer
- details of proposed site and pipeline route
- network capacity flows, and constraints.

You are invoiced.

You review the study and provide any feedback to the Sustainable Gas Contract Manager.

**TIMESCALE** 35 days

STEP  
**3**

**CUSTOMER APPLICATION TO CONNECT**

If you want to proceed to connection simply complete and submit an application to connect (within three months from the date of the Detailed Analysis Study).

You will find the application form at the back of the Detailed Analysis Study.

We acknowledge receipt of your application within five days of receipt.

We will organise a meeting with yourselves and our Technical Specialist to discuss next steps and your project in more detail.

**TIMESCALE** 13 weeks maximum

STEP  
**4**

**CONTRACTUAL AGREEMENTS**

Dependent upon the scope complexity of the connection we will need to undertake a Conceptual Design Study (projects >7bar) therefore we will issue you with an agreement for your review and signature to undertake this study.

A Conceptual Design Study will provide you with an engineering line diagram showing connection technology, scope of connection related works, and a Quotation from National Grid to undertake the requirements of the design works.

On receipt of a signed agreement, we will commence the study.

You are then invoiced and the study findings are issued.

For all entry connections we will draft a Connection Agreement that sets out both parties' obligations for the on site works associated with the physical entry connection onto the Gas Network.

We will issue the Connection Agreement to you (valid for 45 days).

**TIMESCALE** < 7 bar - 10 weeks maximum  
> 7 bar - 36 weeks maximum

Our contract delivery team will make sure you are kept fully informed at every step of the process







**TECHNICAL ASSESSMENT AND DESIGN**

Following receipt of your signed connection agreement, our Technical Team will conduct a technical project assessment (Risk Assessment of Gas Quality).

Detailed network investigations are undertaken and the connection route and compound facility location is reviewed.

The biomethane injection facility scope of requirements is issued to our approved suppliers and a mini tender process takes place.

Hazard on site operability study is performed by our technical personnel.

Biomethane injection facility detailed design and order placed for the injection facility with one of the approved suppliers.



**BUILD AND INSTALLATION**

We will draft and issue a Network Entry Agreement (NEA), which sets out the technical and operational conditions for the connection. This is required by the Uniform Network Code and will cover responsibilities for the maintenance and operation of the connection and injection facility.

You accept or reject the offer.

Commence civil works on site Installation of the Injection facility.



**TESTING AND COMMISSION**

We will Commence an on site testing programme of the Injection Facility and associated equipment to ensure it meets Gas Safety Management Regulations 1996 (GS(M)R).

Commission and validation of the injection facility.

The injection facility will then be ready to inject gas onto our network.



**PROJECT CLOSE OUT**

Project Financial reconciliation.

Where appropriate Project Document Records registration and handover.

Project Close out meeting.

Customer feedback and satisfaction survey.

**TIMESCALE** Steps 5-7 - dependent on project complexity,  
12 - 18 months from customer acceptance of Connection Agreement

**TIMESCALE** 6 weeks

## CASE HISTORY ADNAMS BREWERY, SOUTHWOLD

We are committed to safeguarding future generations, and in support of this, our first biomethane gas to grid injection project at Adnams Brewery, in Southwold Suffolk, was delivered.

We received support and funding from the Innovation Funding Incentive (IFI), which is a mechanism introduced by OFGEM to encourage distribution network operators (DNOs) to invest in appropriate research and development activities, that focus on the technical aspects of network design, operation and maintenance. Using the brewery and local food waste the Adnams site can produce 60m<sup>3</sup>/h of biomethane, which diverts 50,000 tonnes of CO<sub>2</sub> per year from landfill.

The Adnams site uses three digesters, which break down a total of 12,500 tonnes of organic material each year.

This project was successfully delivered and confirmed the technical capability for biomethane gas to grid injection.

By optimising the design of the biomethane gas to grid injection facilities, and working closely with the market place, to innovate and develop a cost effective solution, we have led the industry driving down capital costs and reducing lead times for the installation.

We have been proactive in sharing our learning and experiences from these initial projects with key industry stakeholders.

The Adnams project has also demonstrated National Grid's excellence in customer service, working in synergy with Adnams to develop and deliver the project with a sharp focus on the customer's needs.



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## Useful references

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### National Grid

Gas to Grid connection enquiries renewables [ukd@uk.ngrid.com](mailto:ukd@uk.ngrid.com)

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### Governmental Bodies

Department of Energy and Climate

[www.decc.gov.uk](http://www.decc.gov.uk)

Ofgem

[www.ofgem.gov.uk](http://www.ofgem.gov.uk)

Health and Safety Executive

[www.hse.gov.uk](http://www.hse.gov.uk)

Department for Environment,  
Food and Rural Affairs

[www.defra.gov.uk](http://www.defra.gov.uk)

Ofgem Fact Sheet

[www.ofgem.gov.uk/Media/FactSheets/  
Documents1/biomethanerenewablegas  
sourceFS.pdf](http://www.ofgem.gov.uk/Media/FactSheets/Documents1/biomethanerenewablegas/sourceFS.pdf)

DECC nonconventional sources of gas webpage

[www.decc.gov.uk/en/content/cms/  
meeting\\_energy/markets/gas\\_markets/  
nonconvention.aspx](http://www.decc.gov.uk/en/content/cms/meeting_energy/markets/gas_markets/nonconvention.aspx)

Gas Law Legislation

[www.legislation.gov.uk/ukpga](http://www.legislation.gov.uk/ukpga)

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### Other

AD portal (NNFCC)

[www.biogas-info.co.uk](http://www.biogas-info.co.uk)

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If you would like any further information about the Biomethane to Grid process or have any questions please feel free to contact one of our team below.

### Commercial/Contractual Customer Care Queries and Support

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Sustainable Gas Contract Manager

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### Technical Customer Care Queries and Support

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