



# PREVIEW Biogas and Biomethane Report

**Market Intelligence**

July 2024

# UK

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# Table of Contents

|           |                                           |           |                                                        |
|-----------|-------------------------------------------|-----------|--------------------------------------------------------|
| <b>04</b> | Current Market Overview                   | <b>13</b> | Biomethane Potential of UK Subregions                  |
| <b>06</b> | Upgrading Snapshot                        | <b>17</b> | Appendix 1. Project Developers in the UK               |
| <b>09</b> | Green Gas Support Scheme (GGSS)           | <b>19</b> | Appendix 2. Biogas Investors and Investments in the UK |
| <b>10</b> | Biomethane and Biogas Potential in the UK | <b>21</b> | Appendix 3. Grid Operators in the UK                   |

## Current Market Overview

There are over [REDACTED] anaerobic digestion facilities across the UK, producing [REDACTED] of energy. Of this total, over [REDACTED] are upgrading to biomethane, with a total installed capacity of around [REDACTED].

The Green Gas Support Scheme (GGSS) is expected to increase output to [REDACTED] of biomethane within British gas grids by 2030. Further, the Biomass Strategy predicts that output can realistically increase to [REDACTED] of biomethane from anaerobic digestion and landfill gas by 2050.

The largest gas distributor in the UK, [REDACTED], operates [REDACTED] biomethane facilities, with another [REDACTED] identified for development. A number of these projects ([REDACTED]) are in collaboration with major wastewater operator [REDACTED].

[REDACTED] and the [REDACTED] ([REDACTED]) have put forward much more ambitious estimates, with [REDACTED] estimating that municipal, commercial, and WWTP feedstocks could produce between [REDACTED] and [REDACTED] of renewable gases. [REDACTED] further estimates that the UK has the potential to produce up to [REDACTED] of biomethane ([REDACTED]) per year by 2030.

[REDACTED] estimates that the full potential of the UK biomethane sector could reduce approximately [REDACTED] of the UK's total emissions. These potential reductions are beginning to be experienced by the industry, where in 2023, a new facility was commissioned at a pharmaceutical manufacturing site processing waste solvents. The success of the project will have a sizeable impact on future commercial projects.

For more in-depth analyses of the UK markets, please review the European Biogas Association's [2023 Statistical Report](#) or ADBA's [Policy Market Report, 2024](#).



## Evolution of the UK Market

Many of the anaerobic digesters across the UK developed on accelerated timelines to ensure policy deadlines were met and feedstocks could be secured before competitors. As a result, many facilities followed a standardized plan, and occasionally sited sub-optimally or using suboptimal feedstocks. The renewed interest in sector growth allows developers to correct past shortcomings with facility planning.

More recently, the British market has experienced an increase of consolidation within the market, and new business strategies have led to a portfolio approach to facility management.

## Revenue Streams

Revenue streams for biomethane in the UK include:

- GGSS
- Renewable Transport Fuel Obligation (RTFO)
- CO<sub>2</sub> – Carbon Capture, Utilisation and Storage/Bioenergy with Carbon Capture and Storage
- Gate Fees

■ of the UK's biomethane facilities use a [CO<sub>2</sub> collection system](#), storing and selling it to the food industry rather than venting it. The collection and use or sequestration of gas has become a submarket of great interest within the UK.

## Cost of Biomethane in the UK

The UK government estimates based on evidence from the GGSS, the average ■ AD facility has a CAPEX of approximately ■ and an OPEX of approximately ■.

The [2022 Green Gas Report](#) estimates that if the UK's energy crop potential was more fully realised, feedstocks would cost approximately ■/hectare, and cost approximately ■ per ■.

## Upgrading Snapshot

is the most used upgrading technology in the UK, being used in plants.

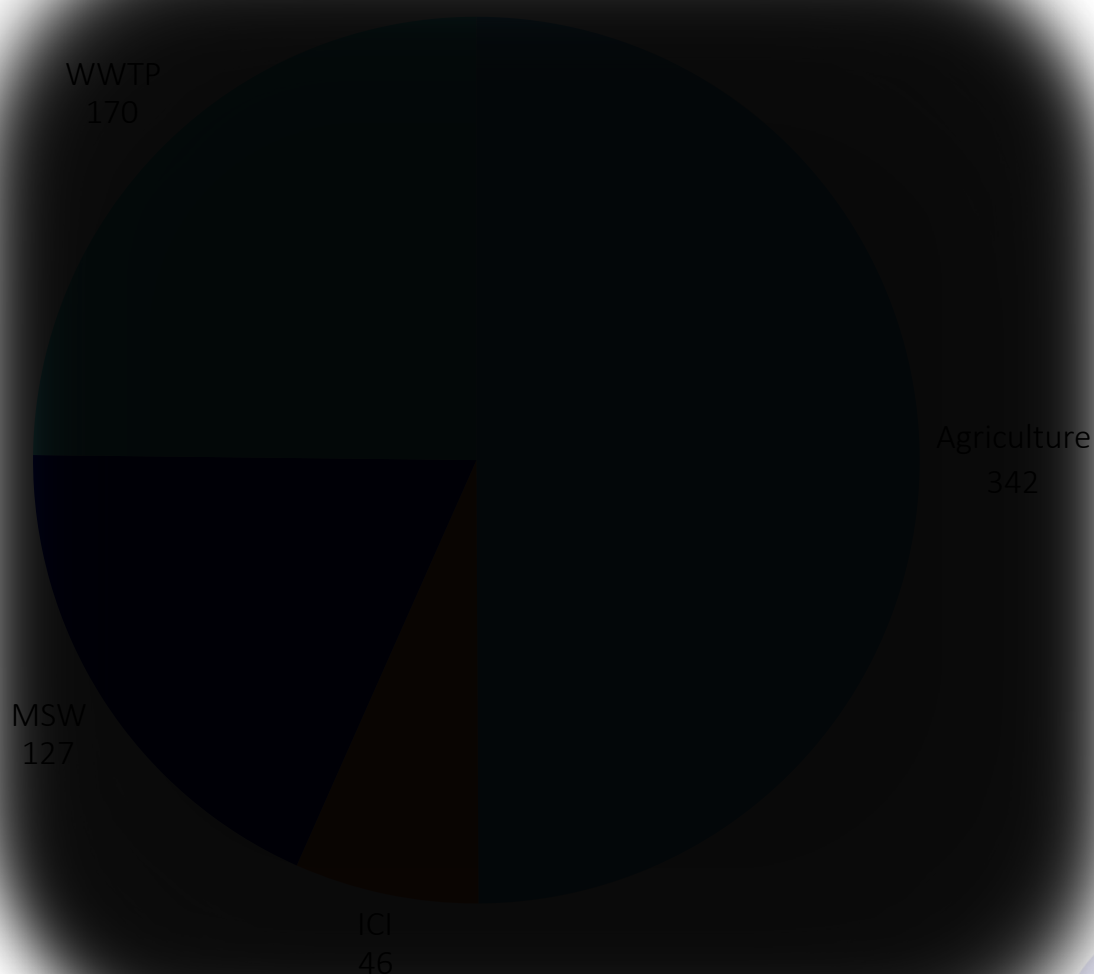
The upgrading suppliers present in this market are [REDACTED],  
[REDACTED], [REDACTED].

**Figure 1. Biogas Upgrading in UK, Number of Plants**

## Biogas Facilities by Type

About 70% of biogas facilities across the UK process agricultural feedstock. Wastewater treatment plants and municipal solid waste sites account for a little under 20% each. Industrial, institutional, and commercial sites account for 10%.

Figure 2. Biogas Facilities in the UK, by Facility Type



Source: [IEA Bioenergy Task 37 – A Perspective on the State of the Biogas Industry From Selected Member Countries](#)

## Facilities by Biogas Use

Over 70% of facilities across the UK burn process biogas for electricity. The number of facilities processing biogas into biomethane has steadily increased over recent years, taking advantage of emissions trading systems and programs such as the Green Gas Support Scheme.

**Figure 3. Biogas Facilities in the UK, by Biogas Use**



Source: [IEA Bioenergy Task 37 – A Perspective on the State of the Biogas Industry From Selected Member Countries](#)



## Green Gas Support Scheme (GGSS) - UK

- Annual budget of [REDACTED]
- Removes incentives for CHP production, supporting only biomethane produced from anaerobic digestion (AD) of biomass feedstocks and injected into the gas grid.
- Opened November 2021, and replaced the Non-Domestic Renewable Heat Incentive (RHI).
  - Since its opening, only one participant has registered for the program.
- In October 2023, the deadline to apply for GGSS subsidies was extended by 2 years, until March 31, 2028.
- The scheme has two associated caps:
  - The Applications Budget Cap (ABC), where applications are checked against the budget to ensure funds are available;
  - The Overall Scheme Expenditure Budget Cap (OSEB), which is set above the ABC and relates directly to the levy collection.
- The tariff is tiered to reflect the cost of producing biomethane at different scales. The opening tariffs are:
  - Tier 1: First [REDACTED] of eligible biomethane – tariff amount: [REDACTED]
  - Tier 2: Next [REDACTED] of eligible biomethane – tariff amount: [REDACTED]
  - Tier 3: Remaining (above [REDACTED]) eligible biomethane – tariff amount: [REDACTED]
  - Tariff payments will be available to participants for [REDACTED] years.
- The GGSS is financed by the Green Gas Levy, a levy on fossil fuel gas suppliers, which was introduced in April of 2022.

## What's next for the GGSS?

In January of 2024, the mid-program review was released for the GGSS scheme. In the review, it was established that in addition to the deadline extension, amendments would be introduced to encourage heat pump use during the production of biomethane. Further, restrictions on the use of CHP and requirements for proper digestate management were maintained. Looking toward the future, the program is considering additional steps for monitoring and mitigating rogue methane emissions during biomethane production.

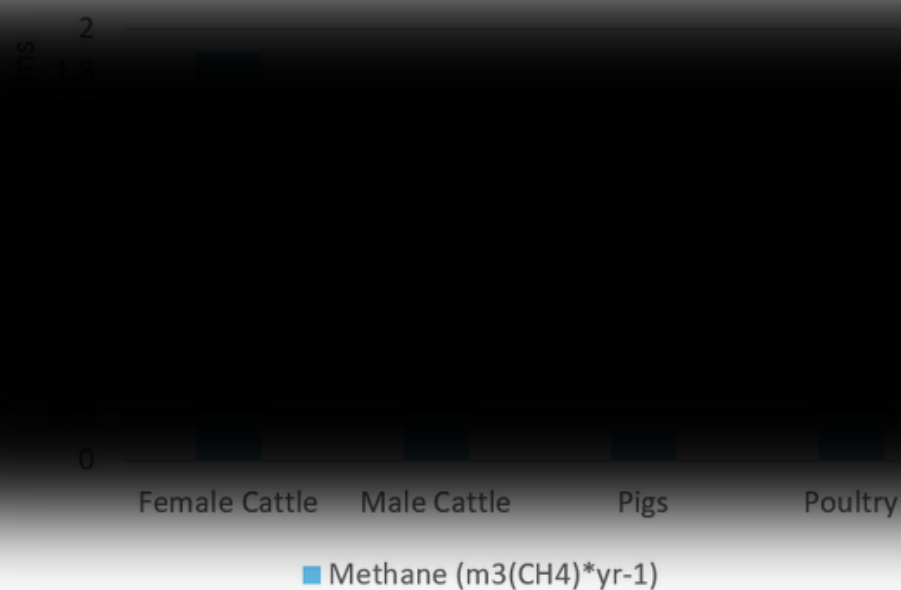
## Barriers to Development

A number of barriers persist within the UK market, inhibiting growth. These barriers include issues relating to site planning and permitting, as well as access and connection restrictions for connecting to the gas grid. Groups such as the Association for Renewable Energy & Clean Technology (REA) are advocating on behalf of the industry to the UK government to alleviate some of these issues. The Future Biomethane Framework's recent call for evidence is one such piece of advocacy.

## Biogas Potential of Manure Feedstocks

The UK possesses sizable potential for manure digester systems. Dividing the main livestock, female cattle present the most significant potential for continued development.

**Figure 4. Methane Potential of Various Manure Feedstock in the UK**



Source: [IEA Bioenergy Task 37 – Potential and Utilization of Manure to Generate Biogas in Seven Countries](#)

## Biogas Potential of Manure Feedstocks

Dividing the UK into its four main regions presents a clearer picture of the types of systems that are likely to appear. England, the most densely populated of the UK regions, also has the largest livestock supply across all categories. Scotland and Wales, while tending a considerable sheep population, are unlikely to realize this manure potential due to herds kept out in pastures. Northern Ireland, which has received considerable notice over the past year, is the next likely contender for development due to its relatively smaller land area and considerable livestock numbers.

**Figure 5. Livestock Across the UK, Number of Head**



\*Poultry numbers in England are approximately 138 million.

Source: [Northern Ireland Assembly - Anaerobic Digestion in Northern Ireland](#)

## Grass & Wastewater Feedstocks

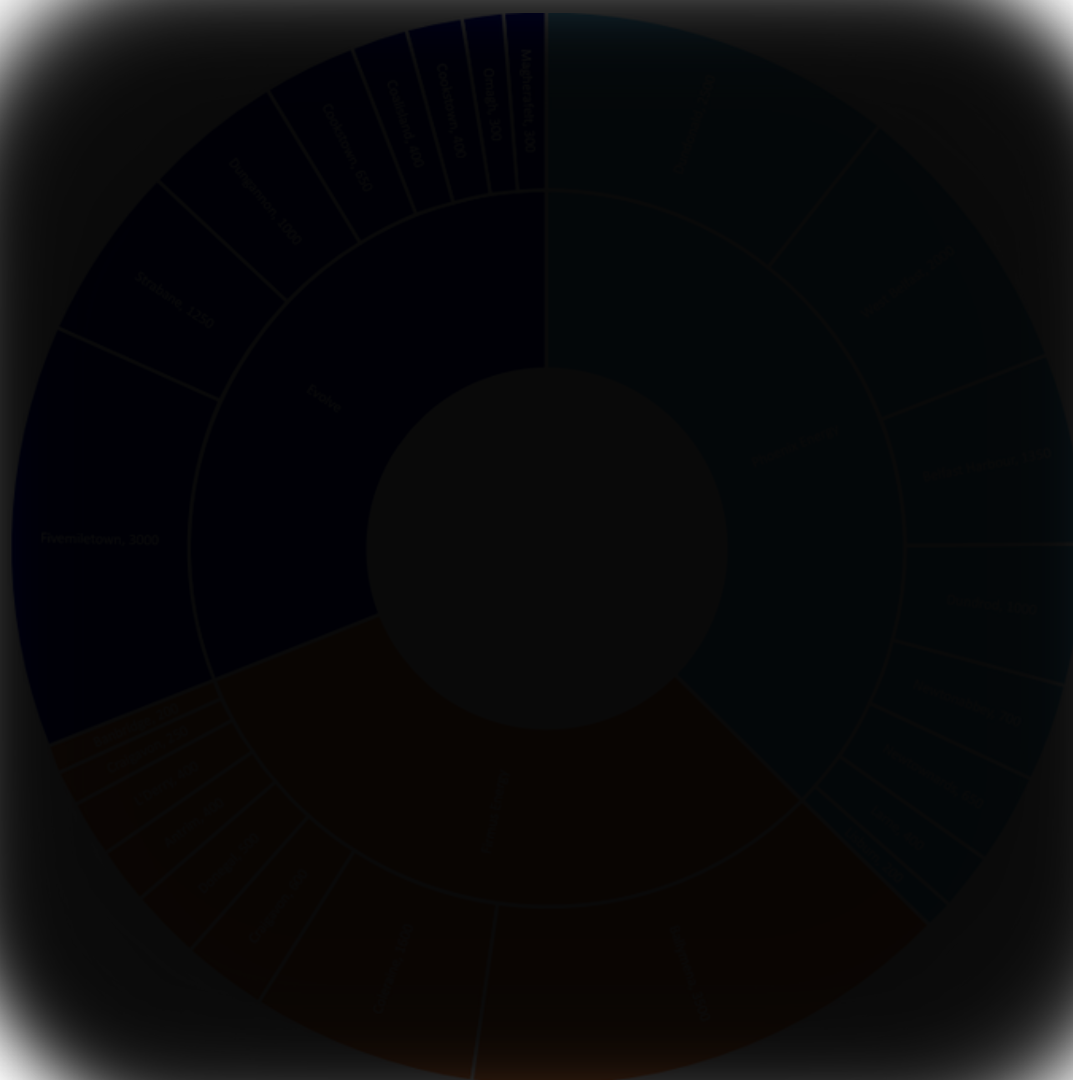
As demonstrated in the above graph, there is a growing interest in using perennial energy crops across the UK, particularly as seasonal cover crops. [Recent studies](#) have proposed utilizing perennial energy crops during off-seasons, specifically herbal leys, which can sequester carbon back into the soils.

Fully valorizing wastewater sludge for biogas production has gained traction in the UK over recent months. Major wastewater operators such as Thames Water and Yorkshire Water have announced plans to develop systems at their facilities

## Biomethane Potential of UK Subregions

There is a strong interest in developing biomethane across Northern Ireland, with 100% of the local grid operators interested in developing 100% facilities each within their respective ranges.

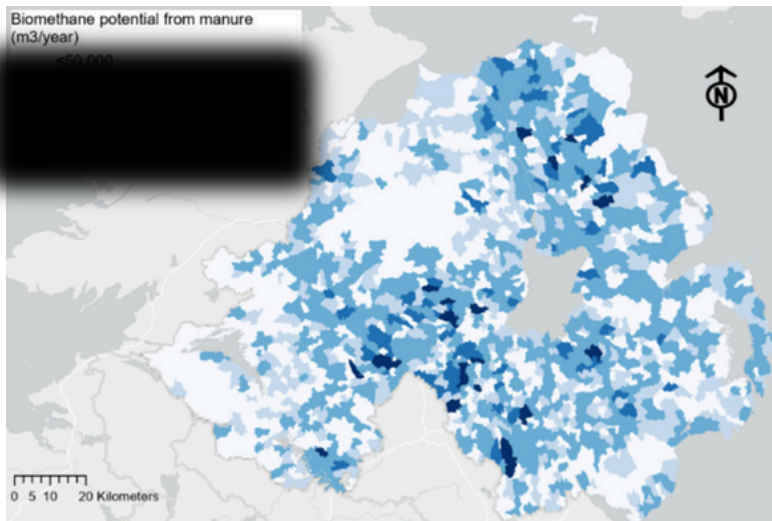
**Figure 6. Total Proposed Injection Potential in NI (m3/h)**



Source: [Utility Regulator - Biomethane Industry Briefing](#)

## Biomethane Potential of UK Subregions

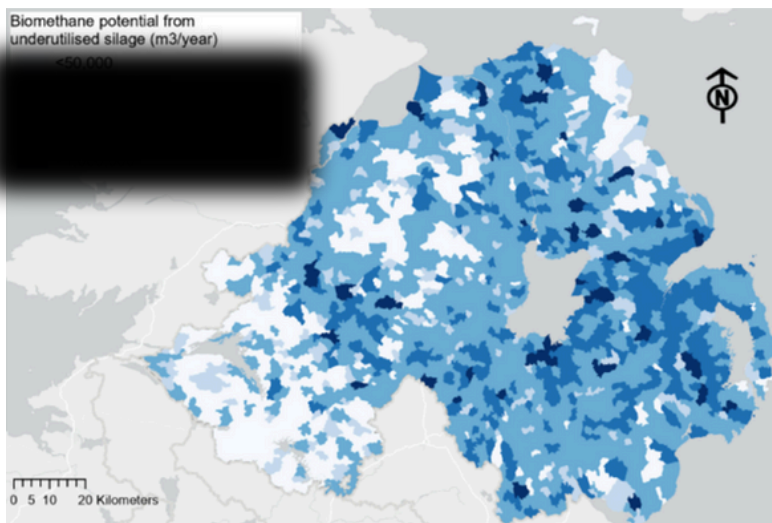
**Figure 7. Biomethane Potential from Manure (m3/year)**



Presented visually, we can see the biomethane potential of manure (top) and from under-utilized silage (bottom). While there is a high potential for manure digesters across Northern Ireland, two main regions with high potential exist across the North and South of the region.

Comparatively, the development of biomethane systems for underutilized silage has potential widely across the region, with several pockets of higher potential.

**Figure 8. Biomethane Potential from Underutilised Silage (m3/year)**

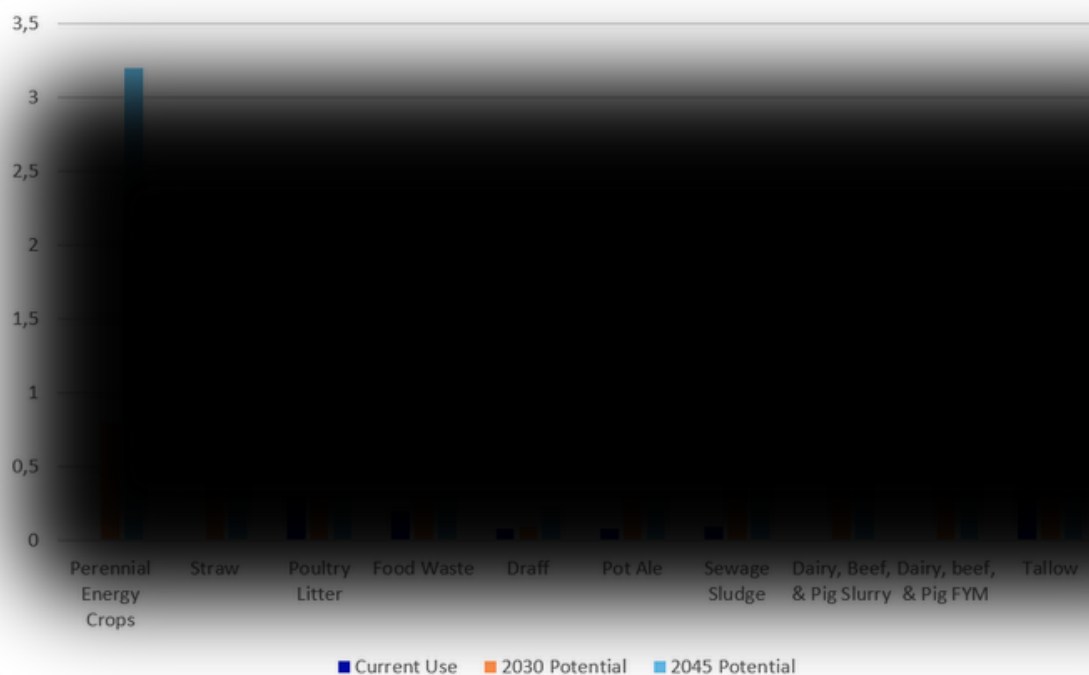


Source: [ELSEVIER - Evaluating the Opportunity for Utilising Anaerobic Digestion And Pyrolysis of Livestock Manure and Grass Silage to Decarbonise Gas Infrastructure: A Northern Ireland Case Study](#)

## Biomethane Potential of UK Subregions

In Scotland, Climate Exchange conducted a review of the bioresource potential of the region out to 2045. The results found that [REDACTED] of the total [REDACTED] is currently being utilized, and the total potential could be increased to [REDACTED] by 2030 and [REDACTED] by 2045. These feedstocks were broken down into wet and dry categories; the feedstocks pertaining to anaerobic digestion are presented below.

**Figure 9. Output Potential of Various Feedstocks Available in Scotland (TWh)**



**Source:** [Climate Change - Comparing Scottish Bioenergy Supply and Demand in the Context of Net-Zero Targets](#)



# Appendices





## Appendix 1: Project Developers in the UK

\*Note: This list is not exhaustive and is based off of information collected by BiogasWorld using mainly public sources of information.

| Developer                          | Websites                                                                                            | Commitment                                                          |
|------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| FutureBiogas                       | <a href="https://www.futurebiogas.com/">https://www.futurebiogas.com/</a>                           | Partnering with AstraZenica for 100 GWh annually (GBP 100 million). |
| Severn Trent                       | <a href="https://www.stwater.co.uk/">https://www.stwater.co.uk/</a>                                 | GBP 15 million for 3 sites.                                         |
| Engie                              | <a href="https://www.engie.co.uk/">https://www.engie.co.uk/</a>                                     |                                                                     |
| Cadent                             | <a href="https://cadentgas.com/">https://cadentgas.com/</a>                                         |                                                                     |
| Thames Water                       | <a href="https://www.thameswater.co.uk/">https://www.thameswater.co.uk/</a>                         | 2 facilities.                                                       |
| Cycle0                             | <a href="https://www.cycle0.com/">https://www.cycle0.com/</a>                                       |                                                                     |
| Copenhagen Infrastructure Partners | <a href="https://www.cip.com/">https://www.cip.com/</a>                                             |                                                                     |
| Arjun Infrastructure Partners      | <a href="https://www.arjuninfrastructure.com/">https://www.arjuninfrastructure.com/</a>             |                                                                     |
| Yorkshire Water                    | <a href="https://www.yorkshirewater.com/">https://www.yorkshirewater.com/</a>                       |                                                                     |
| Acorn Bioenergy                    | <a href="https://www.acornbioenergy.com/">https://www.acornbioenergy.com/</a>                       |                                                                     |
| Vorn Bioenergy                     | <a href="https://www.vornbioenergy.com/">https://www.vornbioenergy.com/</a>                         |                                                                     |
| Perpetual Next Conversations       | <a href="https://perpetualnextconversations.com/en/">https://perpetualnextconversations.com/en/</a> |                                                                     |

## Appendix 1: Project Developers in the UK (continued)

| Developer  | Websites                                                        | Commitment |
|------------|-----------------------------------------------------------------|------------|
| RAW Energy | <a href="https://rawenergy.co.uk/">https://rawenergy.co.uk/</a> |            |
|            |                                                                 |            |
|            |                                                                 |            |
|            |                                                                 |            |

## Appendix 2: Biogas Investors/Investments in the UK

\*Note: This list is not exhaustive and is based off of information collected by BiogasWorld using mainly public sources of information.

| Investors/Investments                                                        | Websites                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AstraZenica (see Above)                                                      | <a href="https://www.astrazeneca.com/">https://www.astrazeneca.com/</a>                                                                                                                                                                               |
| Engie (completed second major acquisition of UK biogas assets in March 2024) | <a href="https://www.engie.com/en">https://www.engie.com/en</a>                                                                                                                                                                                       |
| Yorkshire Water + Centrica + SGN Commercial Services                         | <a href="https://www.yorkshirewater.com/">https://www.yorkshirewater.com/</a><br><a href="https://www.centrica.com/">https://www.centrica.com/</a><br><a href="https://www.sgncommercialservices.co.uk/">https://www.sgncommercialservices.co.uk/</a> |
| Macquarie Asset Management (investment in National Gas)                      | <a href="https://www.macquarie.com/au/en.html">https://www.macquarie.com/au/en.html</a>                                                                                                                                                               |
| Extantia Capital                                                             | <a href="https://extantia.com/">https://extantia.com/</a>                                                                                                                                                                                             |
| Hitachi Ventures                                                             | <a href="https://www.hitachi-ventures.com/">https://www.hitachi-ventures.com/</a>                                                                                                                                                                     |
| WEPA Ventures                                                                | <a href="https://www.wepa.eu/en/">https://www.wepa.eu/en/</a>                                                                                                                                                                                         |
| Engie New Ventures                                                           | <a href="https://www.engieventures.com/">https://www.engieventures.com/</a>                                                                                                                                                                           |
| Elbow Beach Capital                                                          | <a href="https://elbowbeachcapital.com/">https://elbowbeachcapital.com/</a>                                                                                                                                                                           |
| Empirical Ventures                                                           | <a href="https://www.empiricalventures.vc/">https://www.empiricalventures.vc/</a>                                                                                                                                                                     |
| Iona Capital                                                                 | <a href="https://ionacapital.co.uk/">https://ionacapital.co.uk/</a>                                                                                                                                                                                   |

## Appendix 2: Biogas Investors/Investments in the UK (continued)

| Investors/Investments                                                                                  | Websites                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3i Infrastructure                                                                                      | <a href="https://www.3i-infrastructure.com/">https://www.3i-infrastructure.com/</a>                                                                                                                                                                                                                                                                         |
| Eqtec                                                                                                  | <a href="https://eqtec.com/">https://eqtec.com/</a>                                                                                                                                                                                                                                                                                                         |
| SWEN Capital Partners                                                                                  | <a href="https://www.swen-cp.fr/en/">https://www.swen-cp.fr/en/</a>                                                                                                                                                                                                                                                                                         |
| Qualitas Energy (EUR 9 billion in renewable energy projects)                                           | <a href="https://qualitasenergy.com/en/">https://qualitasenergy.com/en/</a>                                                                                                                                                                                                                                                                                 |
| Shell                                                                                                  | <a href="https://www.shell.ca/">https://www.shell.ca/</a>                                                                                                                                                                                                                                                                                                   |
| BP                                                                                                     | <a href="https://www.bp.com/">https://www.bp.com/</a>                                                                                                                                                                                                                                                                                                       |
| Total Energies                                                                                         | <a href="https://totalenergies.com/">https://totalenergies.com/</a>                                                                                                                                                                                                                                                                                         |
| EUR 3.3 billion from the EU to scale-up biomethane in non-EU territories, including the UK and Ukraine | <a href="https://www.europeanbiogas.eu/e18-billion-investments-to-scale-up-biomethane-production-already-in-the-pipeline-according-to-1st-eba-investment-outlook-on-biomethane/">https://www.europeanbiogas.eu/e18-billion-investments-to-scale-up-biomethane-production-already-in-the-pipeline-according-to-1st-eba-investment-outlook-on-biomethane/</a> |

## Appendix 3: Grid Operators in the UK

\*Note: This list is not exhaustive and is based off of information collected by BiogasWorld using mainly public sources of information.

| Grid Operators           | Websites                                                                                    |
|--------------------------|---------------------------------------------------------------------------------------------|
| Northern Gas Networks    | <a href="https://www.northerngasnetworks.co.uk/">https://www.northerngasnetworks.co.uk/</a> |
| Cadent                   | <a href="https://cadentgas.com/">https://cadentgas.com/</a>                                 |
| Wales and West Utilities | <a href="https://www.wwutilities.co.uk/">https://www.wwutilities.co.uk/</a>                 |
| SGN                      | <a href="https://www.sgn.co.uk/">https://www.sgn.co.uk/</a>                                 |
| Phoenix Energy           | <a href="https://phoenixenergyvni.com/">https://phoenixenergyvni.com/</a>                   |
| Firmus Energy            | <a href="https://www.firmusenergy.co.uk/">https://www.firmusenergy.co.uk/</a>               |
| Evolve                   | <a href="https://evolvenetwork.co.uk/">https://evolvenetwork.co.uk/</a>                     |
| Mutual Energy            | <a href="https://www.mutual-energy.com/">https://www.mutual-energy.com/</a>                 |
| Gas Networks Ireland     | <a href="https://www.gasnetworks.ie/">https://www.gasnetworks.ie/</a>                       |

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