

Introduction to the biogas sector

When referring to “biogas” in infrastructure investments, we usually mean gas produced from an anaerobic digestion (AD) process, in which generally end-of-life organic materials, including animal slurries, agricultural, industrial and food waste, are fed into an AD plant. Bacteria break down this feedstock to generate biogas. Raw biogas can either be used to fuel combined heat and power (CHP) plants, which generate electricity or heat, or it can be upgraded to remove unwanted gases, such as CO₂, producing biomethane. This upgraded biomethane can often be sold directly to the gas grid or compressed/liquified to be used in the transportation sector; the separated CO₂ can also be captured for use or storage.

Many biogas plants initially established for CHP are now looking to invest capital expenditure for expansion and upgrading facilities, as the sale of biomethane can be significantly more profitable. Biomethane revenue is typically generated from the sale of gas, which may be supported by subsidies and green certificates, the latter of which can be quite valuable. Green certificates are granted for every megawatt-hour of gas injected into the grid.

Biogas is uniquely equipped to meet a variety of end-use applications, with new technologies enabling full circularity and carbon negativity. The importance of biogenic CO₂ and the potential for carbon capture and storage are increasingly being recognized. In the future, capturing and liquefying CO₂ are expected to further enhance the value of biogas.

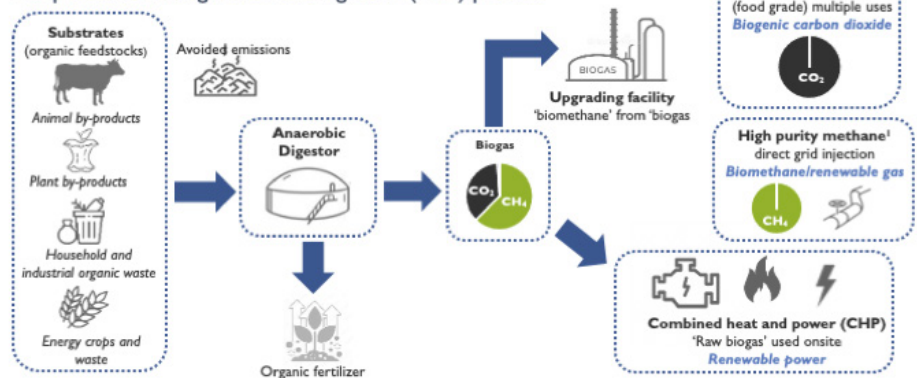
Supportive European market environment

The biogas sector in Europe is experiencing rapid growth with significant further investment forecast over the next few years. This growth is underpinned by strong regulatory and macro tailwinds, making the sector an attractive investment opportunity. These tailwinds stem from:

- **Energy security** – energy security requires structural changes in gas supply sources. The storability of biomethane also makes it a key complement to wind and solar energy.
- **Decarbonization** – biogas and biomethane reduce emissions by replacing fossil fuels and avoiding waste emitting methane emissions and can

Production process

Gas produced through anaerobic digestion ('AD') process



support the hard-to-abate sectors, such as heavy transportation, shipping and aviation, in decreasing their climate impact.

- **Circular economy** – biomethane production can process significant volumes of biogenic waste to produce renewable energy while also providing eco-friendly fertilizer at the same time.

As a result, many countries either already have robust subsidies to support further investments or are otherwise further developing the biogas sector.

Investment focus

Arjun considers several factors when investing in biomethane projects, including regulatory support, the scale of the plant, the type and availability of feedstock, and, more recently, the potential for growth in adjacent revenue streams. To this end, Arjun viewed the Danish biogas sector as an attractive opportunity given that the sector benefits from strong regulatory support in the form of long-term, government-backed inflation-linked subsidies. Also, production is primarily based on larger plants with direct grid injection capabilities. In contrast, most

production in the rest of Europe still relies on smaller, decentralized plants that often struggle with poor economics, typically sourcing feedstock from just one or two farms and frequently lacking grid connectivity. As a result, Denmark was seen as a prime investment opportunity as it offers a more sustainable and advanced model for biomethane production.

Future outlook

Active management of biogas will depend on an increasing diversification of revenue streams. Biogas is well-positioned to expand into other ancillary sectors in the near future. The EU is increasingly focused on supporting investments in carbon storage facilities (both onshore and offshore) as part of a permanent carbon removal initiative. This is bolstered by high carbon pricing in the voluntary carbon removal credit market. Biogas plants and upgraders are strategically positioned for this, creating capital expenditure opportunities for carbon liquefaction facilities. So far, only a handful of infrastructure funds have invested in the biogas segment; however, a significant increase in interest is anticipated over the next few years.

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CORPORATE OVERVIEW

Arjun Infrastructure Partners is a European infrastructure fund manager with €6 billion (\$6.8 billion) assets under management. Founded in 2015, Arjun provides direct access to European mid-market core-plus and core infrastructure through funds, as well as separately managed accounts. Arjun has an experienced, sector-specialist team of more than 40 professionals with decades of operational knowledge.

Many of Arjun's investors have recognized the carbon-reduction benefits of biogas as they progress to their 2050 net-zero targets and have to date invested more than \$500 million in this strongly growing sector.

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