

The world wants more biogas/biomethane, and it wants it fast. Antec outlines the benefits of standardisation, and strategies to achieving this

How to approach standardisation in the heterogeneous world of biogas production

A key prerequisite for bringing more biomethane to market is the standardisation of biogas plants and “plant-as-a-product”-thinking. Standardisation can address both time-to-market, and, just as important, the cost associated with erecting biogas plants.

At the same time, each plant is unique. Biological waste is different every time, the adjacent gas infrastructure is different every time, CSTR tanks are too big to be mass produced and every plot is different.

So how do we go about this paradox? How do we bridge the gap between project uniqueness and standardisation? *Bioenergy Insight* spoke with Antec, a Norwegian biogas operator that is on a mission to overcome this challenge.

An industrial “Cambrian explosion”

“In biology we have the term *Cambrian Explosion*,” said Espen Govasmark, PhD and chief biology officer at Antec. “For biogas we will look back at the next decade as the *Cambrian Explosion* for our industry – a period of rapid expansion and growth.”

The biogas industry is in the spotlight as an answer to the energy transition; as a distributed – and therefore resilient – means of energy production during a time of increased focus on energy security; and as an answer to treating bio-waste fractions in a way that contains their inherent greenhouse gases.



Antec was built on a new AD system that mimics the cow's digestion system

Thousands of plants will be built over the next decade. With RePowerEU, Europe is putting its force behind a tenfold increase of biomethane production, even before 2030. “We will not get there without a fundamentally different approach to building and operating biogas plants,” said Govasmark.

Plant-as-a-product

“The measure of standardisation is the absence of project-specific engineering hours,” said Kristian Lunde, chief technology officer at Antec. At the same time, the company said it is important to maintain flexibility, especially on the preprocessing side. We do not want to limit the high-calorific value feedstock we can digest, so we are building plants with standard preprocessing modules with specific tasks, the company added.

“This can be ammonium stripping, removal of plastics,

handling dry mass and wet fractions,” said Lunde. “We ensure that we are flexible on the input and optimise the substrate going into the anaerobic digestion (AD) process, after preprocessing. We also design our digester modules so they can be built with the plant, or added to the plant as new waste fractions are contracted, for example, household waste.”

The core of biogas production: The AD process

One fundamental challenge to industrially manufacturing biogas plants is the AD process. Because they are too big to be transported, CSTR tanks are erected as a building project, rather than being mass-produced.

Antec was built on a new AD system that mimics the cow's digestion system and is a combination of plug-flow technology and large surface area creating an optimal growth environment for bacteria.

“The fundamental difference between traditional technologies and Antec is twofold,” said Eirik Gundersen, Antec's CEO. “We digest more effectively, converting feedstock to biogas three times faster than conventional technologies, and our digestors can be industrially manufactured and transported by road. This is a step change for plant standardisation and speed of the plant construction.” Antec's digestors are the maximum size that can be transported by road.

Centralising biological production optimisation

A challenge for biogas plants is that optimising and sometimes even maintaining production can be a field where deep biological competence is needed. “From an operational point of view, biogas is definitely not hydropower,” said Govasmark.

Antec has a remote monitoring programme where biologists with PhDs in peculiar, but highly relevant, – fields such as microbiology and biowaste preprocessing, are monitoring the plants remotely.

“Any given plant could just dream about hiring such a team,” said Espen, “but since we are monitoring a portfolio of plants remotely, we have a combination of the technical demands and the economic rationale needed to build an exceptional biology team.”

Importantly, Antec is also standardising the sensor instrumentation and monitoring across plants to gather data and gain insights.

Partnering with local developers

“Biogas is a global opportunity, but a very local business,” said Petter Jacob Jacobsen, chief commercial officer. “Partnering with local developers is an absolute must for realising our goals, and we want to be the best partner possible for local developers wanting to realise projects,” he explained.

In the Norwegian town of Hornindal, Antec has partnered with local waste management company Haugen Maskin, and is currently building a plant with 100,000 tons per year of feedstock capacity. The plant will produce liquefied biomethane as its output. Antec and Haugen Maskin are co-owners of the plant, with Antec as majority owner and operator.

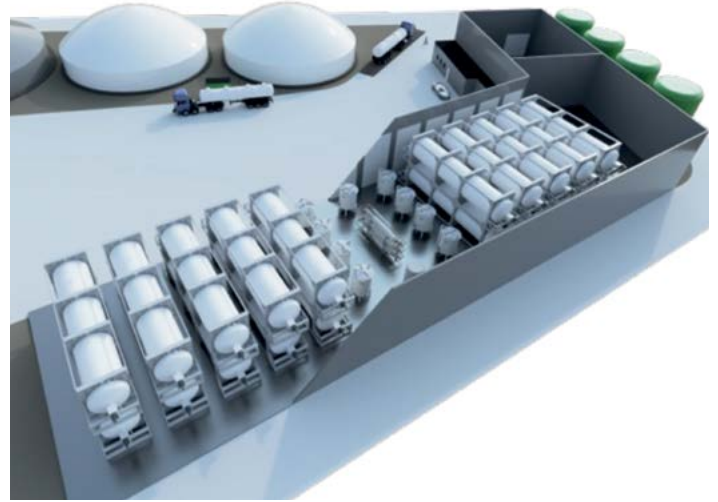
“I had been working [for] several years on bringing this

project to life,” said Ronny Haugen, general manager of Haugen Maskin. “I knew we had access to feedstock, but we needed a partner to build, bring in the necessary capital, and operate the plant. Antec has a competent and forward-leaning team, and after less than six months of bringing them into the project, we have already entered the build-phase.” That is the result of plant-as-a-product thinking and standardisation, added Antec.

Ambitious improvement programme

Chief technology officer Kristian Lunde concluded by telling *Bioenergy Insight* what is next for Antec:

“We are constantly improving our platform, and our ambition is to build the best biogas plants in



Antec's ambition is to build the best biogas plants in the world

the world. We are working relentlessly with the objective of reducing the LCOE, the ‘levelised cost of energy’, meaning producing more biogas, with lower capex and lower opex. Biogas as an energy source is here to

stay, and to maximise impact we need to think of the ‘plant-as-a-product!’ ●

For more information:

Contact Antec if you want a co-owner and operator on your biogas project: www.antecbiogas.com



A natural leap forward for biogas production

Partner with us to build your next biogas plant

Antec’s pioneering biogas technology mimics the cow’s digestive system. We combine plug-flow anaerobic digestion with high surface area biofilm to provide an ideal environment for bacteria to thrive.

Acid
Hydrolysis

Methane
Production



Biofilm &
Plugflow reactor
technology





Project
financing



Remote
monitoring



Biological
advisory

Our 10-reactor plant was highly commended at the AD and Biogas Industry Awards 2023 in the category “Best Biogas Plant Above 1MWe Equivalent.”



Antec builds owns and operates biogas plants in partnership with local developers. Antec is a turnkey partner through the entire waste-to-energy process. We know how to set up a project for success to ensure a long-term profitable partnership.

Do you have a biogas project?

Get in touch via antecbiogas.com





Standardized 20-reactor
Antec plant

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