

WABIO

Turning waste to bioenergy. A greener world here and now

WABIO Group is an international leader in biogas technology and biomethane production. The company designs, oversees construction, commissions and operates the currently most efficient biogas plants. WABIO processes its biogas into biomethane (RNG - renewable natural gas), technical CO₂ and/or electricity. WABIO's biomethane is used as injection to the gas grid, for cooking and heating in homes, and in compressed format (bio-CNG) for transport vehicles or industrial use, or in liquified form (bio-LNG) as biofuel for heavy duty transportation. Its by-products are organic fertiliser and technical CO₂ in the form of dry ice or liquid CO₂ for the beverage industry, for example. All from organic and animal waste sources, using WABIO's own energy for production, and in a circular manner. Clean energy at its best!

WABIO's biogas plants generate renewable green biogas to power industries, homes, and transport systems.

CONVERTING WASTE TO GREEN BIOGAS ENERGY

The agricultural, food and beverage sectors, and cities generate enormous quantities of organic solid waste, which is indiscriminately dumped or burnt by farmers with little to no knowledge of waste disposal practices. Global leaders are therefore prioritizing effective waste management regime initiatives with ever-increasing agricultural production to reduce human and environmental health stress while increasing farmers' awareness.

Farmers see an immense potential for agricultural waste in generating bioenergy. It



does not just reduce the health menace arising from open-field agricultural solid waste composting and fermenting, but it also aids in alternative energy production. Not to mention that energy costs for a biogas plant are limited to electricity and heat usage, which WABIO plants produce themselves. A fully circular model. WABIO is at the leading edge of offering biogas technologies to turn waste into (energy) wealth. It transforms any organic feedstock into electric power, biomethane, bio-compressed natural gas (bio-CNG), bio-liquified natural gas (bio-LNG), heat, green liquid CO₂, dry ice, and carbonised CO₂ and even green hydrogen!

"We have come a long way from starting as an R&D company in 1990 to constructing the world's biggest commercial biogas plant (of 30 MWth) in 2020. Our waste-to-green-energy technology is the culmination of years of experience and research applied directly into its plants," says Raphael Fitz, CEO of WABIO. Today, the WABIO plant designs reach up to 120 MWth and are still growing. WABIO's intense passion for making the world a better place is seen in its work and name, an abbreviation for "We Are Bioenergy." With its best-in-class biogas plant technology, WABIO does not simply solve waste management challenges, but WABIO makes waste profitable with practically unlimited plant sizes.

BIOENERGY OPERATIONS WITH BREAKTHROUGH TECHNOLOGY

Operations start with the trucks delivering agricultural and solid municipal waste to the plant. The waste is separated based on wet and dry fractions and taken to different

treatment areas. A pre-treatment process helps separate packaging material and sort inert inorganic materials like metals, glass, gravel and plastic.

Organic substrates are taken to pasteurising systems, where pathogens are eliminated by heating the substrate at min. 70 degrees Celsius for one hour. The next step is a hydrolysis tank as a separate treatment station tank to enable material (especially lignocellulosic material) to be digested efficiently. Thereafter it runs through three separate fermentation stations, each of them enhancing the efficient fermentation of different materials. This is where most of the biogas is produced, at about 40 degrees Celsius. It is then transported to the gas storage system.

Biogas is cleaned, compressed, and used to produce either biomethane or other CH₄ (methane) products, heat or electricity. WABIO's biogas technology stands out from the rest of conventional biogas practices as it can generate more than 4 times as much green energy from municipal solid organic waste as conventional refuse-derived fuel (RDF) plants.

WABIO® is also the only proprietary and patented methane fermentation operation – aka biogas technology – to efficiently process lignocellulose, the plant dry matter basic structural part of a plant cell wall. Such materials include rice husk, rice straw, wheat straw, palm and sugar cane waste, food and animal waste and many others.

WABIO has established partnerships with ambitious net-zero pledged players in the food and agricultural domain. They guarantee the feedstock and the offtake agree-



ment, while WABIO makes revenue from the sales of electric power, methane products, industrial gases, and its by-products, e.g. organic fertilisers. Through its endeavors, WABIO is helping the food & beverage and agricultural sectors get a step closer to achieving an ideal circular economy.

A COMBINATION OF NOT ONE BUT MANY ALTERNATIVES TO FOSSIL GAS

There are several sustainable alternatives to fossil gas that can be used to reduce greenhouse gas emissions and transition to a more sustainable energy system. Those are namely directly produced renewable electricity such as wind and solar power, green hydrogen from various sources and biogas. While each source is largely discussed, the place of biogas is still far below its potential. So why is biogas important in the context of climate change and energy source mix? The reality is that there is not one alternate source of energy but a mix of energies, depending on the geographical, environmental, and socio-political contexts. The solution to energy transition is in pro-

posing an energy mix that is adapted to the regional context with a combination of measures to improve energy usage – in other words, identifying the most sensible and effective solution for each specific context. Proposing only one source of energy is unrealistic due to the intermittency of renewable power (wind, sun, waves, etc.) and to the availability of raw material sources (such as mining and feedstock) required for operation.

PRESENCE IN THE APAC

WABIO's main market is Germany, its home base market, along with other EU countries. In the Asia Pacific region, WABIO has delivered a 30Mth plant in the Harbin area, China, that runs only on wheat straw as waste input, to deliver biomethane as Bio-CNG for transport vehicles. It also has an operational 12MWth plant in East Kalimantan, Indonesia, running on palm waste since 2010. WABIO plans to expand in the region, as the regulatory environment matures.



“We have come a long way from starting as an R&D company in 1990 to constructing the world's biggest biogas plant in 2020. Our waste-to-green-energy technology is the culmination of years of experience and research.” Rapahel Fitz, the CEO of WABIO Technologie GmbH

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