



Production of biomethane from biogenic residues

Demonstration plant to be built in Goldenstedt, Lower Saxony

Goldenstedt, 25.11.2021. The company New Power Pack, the German research centre Forschungszentrum Jülich, Fraunhofer UMSICHT and the transmission system operator OGE have teamed up for the research project BiRG (BioReststoffGas) to build a demonstration plant with capacity of 300 kg/h that will produce approx. 100 m³/h of synthesis gas to test the production of biomethane using biogenic residues. Alongside trialling a demonstration plant capable of continuous load conditions, the team also plans to develop alternative process conditions and variants for a wide selection of possible raw materials and raw material combinations. The plant is scheduled to go into operation in Goldenstedt in the first quarter of 2022.

The research project has three aims: Firstly, the biomethane is to be utilised for energy, for which it will be fed into the existing gas pipeline network and replace fossil-based natural gas. Secondly, the sole by-product resulting from the pyrolysis process is biochar. Biochar is a sought-after raw material, since the nutrients it contains boost soil fertility. In addition, it remains in the soil for a long time and, acting as a carbon store, has a negative carbon balance. Biochar is therefore used for the purpose of soil improvement. Thirdly, the project partners plan to develop an on-site solution for recycling biogenic residues for municipalities and agricultural enterprises as an alternative to the previous costly disposal method of shipping the residues into regions with nutrient-poor soils.

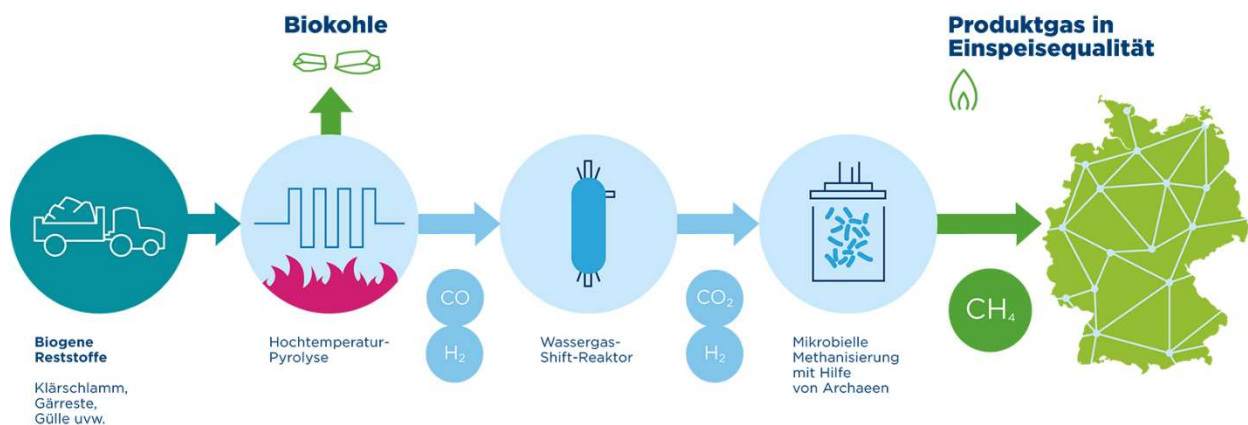
Biogenic residues as base material

In Germany, large quantities of biogenic residues accumulate every year from agriculture, municipalities and industry. These include sewage sludge, fermentation residues from biogas plants, liquid manure or even chicken droppings, straw, nutshells, and horse and turkey dung. The use and spreading of the first three abovementioned residues on agricultural land contribute to nitrate pollution of groundwater and are now subject to restrictions in most regions. Disposal is an expensive undertaking for local agricultural and industrial businesses and for municipalities.

An on-site solution is therefore required for local utilisation as an alternative to expensive transportation to regions whose soils lack nitrogen and other nutrients. This is where the energetic use of biogenic residues for generation of renewable energies comes in.

Operating principle of the demonstration plant

The biogenic residues are converted into biomethane through a pyrolysis process, a purification stage for the resulting raw gas, a water gas shift reactor and methanation. In the pyrolysis stage, the conversion of the biogenic residues into raw gas and biochar takes place at very high temperatures. Part of the raw gas is recycled and used to fuel the pyrolysis. In the purification stage and the water gas shift reactor, the raw gas is prepared in such a way that single-cell microorganisms, so-called archaea, convert carbon dioxide and hydrogen into methane in the microbial methanation process with the addition of hydrogen.



The project is being funded under the name BiRG as part of the Federal Government's 7th Energy Research Programme.

Gefördert durch:



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You can find more information here: <https://www.energetische-biomassenutzung.de/projekte-partner/details/project/show/Project/BiRG-655>

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About New Power Pack

NPP is a medium-sized enterprise and part of the Czwaluk Group of companies, which provides a range of services and products in the field of development, design, construction and maintenance of plants and machines not only for the oil and gas industry, but also for the chemical, agricultural and food industries. One of NPP's business objectives is to develop and market innovative and sustainable plants and commercially viable concepts for recycling biogenic residues. NPP's versatile set-up is designed to find cross-sector and interdisciplinary as well as sustainable solutions for future energy supply. Moreover, the perception and image as a corporation makes it easier to launch new products on the market.

About Forschungszentrum Jülich

As a member of the Helmholtz Association, the Jülich research centre employs around 6,400 people to explore options for the digitised society, a climate-friendly energy system, and resource-saving economies. We combine natural, life and technical sciences in the fields of information, energy and bioeconomy with specific expertise in supercomputing, and use unique scientific infrastructures. Our research is aimed at an energy system based on renewable energies that contributes to curbing climate change. At Jülich, we conduct multidisciplinary research in energy conversion and storage, energy transportation, and reconversion for the consumer. The work covers the entire supply chain – from the basic elements to energy system issues. It also covers the interplay of energy systems, air quality and climate.

About Fraunhofer UMSICHT

Fraunhofer UMSICHT is a pioneer for a sustainable world. With our research in the areas of climate-neutral energy systems, resource-efficient processes and circular products, we make concrete contributions to achieving the 17 Sustainable Development Goals (SDGs) of the United Nations. We develop innovative, industrially feasible technologies, products and services for the circular economy and bring them to application. The focus is on the balance of economically successful, socially equitable and sustainable developments.

The institute has sites in Oberhausen, Willich and Sulzbach-Rosenberg. In 2020, Fraunhofer UMSICHT generated a turnover of more than 53.9 million euros with a workforce of 577 employees. As one of the 75 institutes of the Fraunhofer-Gesellschaft, the world's leading applied research organisation, we are globally networked and promote international cooperation.

About OGE

OGE is one of Europe's leading gas transmission system operators. With our pipeline network spanning approximately 12,000 kilometres, we transport gas throughout Germany. Our geographic location makes us the central link for gas flows across the European single market. 1,450 OGE employees ensure security of supply. We make our network available to all market participants in a transparent and non-discriminatory way in line with market needs. We enable energy supply. Today and in the energy mix of the future.