

# BEST PRACTICE



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## Local cooperative for biogas

**Kehlen, Luxembourg – 5 000 inhabitants**

**Biogas – Cooperative - Bio-waste**

The project was launched by an agricultural cooperative called “Naturgas Kehlen” created in 2004 at the initiative of the municipality of Kehlen. It is the largest facility in the country that also uses bio-waste to produce biogas. It is associated with a gas injection system in the natural gas network.



### Project in a Nutshell

By its technical design, the plant is able to process both liquid and solids substrates. Bio-waste and organic industrial waste are first subjected to fully automatic treatment and sanitized for at least one hour at a temperature of at least 70 °C, in accordance with European Regulation No. 1069/2009 on hygiene, before being integrated into the process. After the methanization process, the fermented substrate is divided into two parts, the liquid part and the solid part. The digestate is then fully spread on agricultural surfaces. In this way, the natural recycling loop is complete.

During the process of anaerobic digestion (without oxygen), the microorganisms break down the organic part - this is what appears to be called biogas. It is then converted into high quality natural gas (> 98% methane) as part of a wet scrubbing and then injected into the natural gas network. Biogas has the same qualities as natural gas. Its injection into the network guarantees maximum energy efficiency.

### Impact & Next steps

The biogas plant allows the energy recovery of about 50 000 tonnes of organic matter per year via a wet methanization process. Energy sources such as agricultural residues (e.g. slurry, manure), various energy plants (e.g. silages, sunflowers), as well as biowaste (e.g. unsaleable food such as fruits, vegetables) and waste organic products (e.g. foods whose expiration date has expired and can no longer be sold) are used to produce biogas. The amount of natural gas produced at Kehlen can heat about 3 500 low-energy homes or 7 200 passive homes for a year, all for a neutral CO<sub>2</sub> balance.

### Replicability: Challenges & Success Factors

Over 30 biogas plants already exist in Luxembourg, but the plant in Kehlen is unique as the biogas feeds into the natural gas grid, a technique that is already widely used in Scandinavian countries with great success. Indeed, the cooperative was inspired by this practice.



A feasibility study confirmed the feasibility of such a project in Luxembourg. The advantages of this method are that the biogas can be converted into the three forms of energy (electrical, thermal and kinetic energy) compared to the conventional type of electricity generation with or without coupled heat utilisation.

Another success factor is that the municipality found a suitable area between two villages, so that the plant does not increase nor divert the traffic in the villages. Since the beginning, the cooperative wanted to be as resource efficient as possible.

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