

October 17th, 2019 – Excursion to two selected, regional biomethane projects

These projects will introduce you to innovative and established biogas upgrading and biomethane-mobility concepts. This excursion is guided by expert IBBK-staff as well as the plant operator or technology provider.

Language: GERMAN/ENGLISCH

First stop

Biogas plant with biogas upgrading and a decentralized biomethane filling station

“Bioenergiehof Weitenau”, situated South-West of Stuttgart, is a truly unique biogas plant. Like all biogas plants, the initial construction was designed to produce gas and run an internal combustion engine which burns the gas to produce heat and electricity.

With the expiration of the feed-in tariff in 2024, the operators Juliane and Winfried Vees will lose their bonus on each sold kWh electricity. As many other farmers and plant operators, they have to look for further possibilities to make use of their product. One possible way is direct marketing, which the operators of Bioenergiehof Weitenau realized in the shape of a GREEN-CNG gas station installed in September 2015.

To upgrade the biogas into CNG-quality gas, purification processes are necessary. The most important cleaning process is the CO₂-stripping through the so called “membrane contact method”. It is a both sophisticated and simple technological process developed by a German engineering company called “BUSE”. This method doesn't need any chemicals and is realized with comparably little energy costs.

Only about 7 % of the produced biogas is upgraded to CNG-quality – an amount that will surely increase in the future. Nowadays, about 15 m³ CNG is produced per hour, making a total of 120 kg per day. This is enough to fuel roughly 6 cars per day.

The investment costs for the upgrading unit including the gas station were roughly 335,000 €, of which 25 % were paid by the federal state Baden-Wuerttemberg.

As all other CNG/Biogas gas stations, the operators have to advertise the advantages of a local, conflict- and fossil-free fuel. CNG has a higher energy density compared to Diesel (about 1,3 times) and burns much cleaner. CNG-powered cars are only slightly more expensive compared to their fossil-fuelled counter parts. But with reduced taxes and lower fuel prices, the amortisation time of a CNG-car is reached quickly.

Second stop

Söhnergy biogas plant with gas upgrading and grid injection – Schwaigern

Originally built in 2008 as a source of renewable energy, this biogas plant in Schwaigern was built right next to the Söhnergy production facility where electromechanical assemblies of plastic and plastic-metal compounds are produced.

With an initial digesting volume of 3,600 m³, a post-digester with a volume of 3,300 m³ as well as an end storage with a capacity of 4,400 m³, the size of this plant was extended in 2010.

This enabled the plant to now process 28,000 tons of feedstock annually, which produces around 700 m³ of raw biogas per hour. These substrates are contractually delivered by 44 different farmers of the region around the biogas plant.

After upgrading the raw biogas to biomethane, an hourly biomethane production of 350 m³ is now achieved which can be fed into the local gas grid. This production is sufficient to supply around 8,000 individual households per year.

The off-heat of the 1021 kW_e engine is transported through a 950 m long heat pipe to the neighboring factory where it is used to cool down coolants necessary for the production process.

Another interesting specialty of this plant is the fact, that the upgrading unit is not owned and operated by the biogas plant operator but by local energy supplier and waste disposal company EnBW.

Sources:

<https://www.stimme.de/archiv/leintal/sonstige-Biogasanlage-wird-erweitert:art1906.1879635>

http://www.gruene-schwaigern.de/mediapool/11/115878/data/Regenerative_Energie/100319_Soehnergy_Artikel_DE.pdf

As of July 2019 – program subject to change