



Feasibility study: biogas production Jokkmokk

Jokkmokk municipality has about 5000 inhabitants on an area of 19 334 km². About 2800 inhabitants live in the Jokkmokk village itself. The municipal administration is in charge for the collection of household waste and for waste water treatment. Food waste is collected separately. Waste water is treated in the municipal plant, but no use is made of the biogas potential today. Due to its harsh climate, there is, besides reindeer herding, only one farm with less than 100 animal units in the municipality, it is situated about 40 km from the main village away. Beyond climate protection, another incentive for a biogas production is the reduction of the sludge volume and even the smell of aerobic treated sludge.

Feasibility study small-scale biogas production in Jokkmokk

A compilation of potential feedstock material shows, that the amount of produced sludge in average is 840 m³/yr, collected food waste about 100 t/yr. There might be a future potential of 190 t slaughterhouse offal as well as a theoretical potential of manure from the only farm in Jokkmokk of about 1000 MWh. In total, a biogas production of 60.000—100.000 m³ biogas (Methan 65%) would be possible, which adds up to about 400—650 MWh / yr (6,5 kWh/m³).

Investment and payback time

A very first calculation shows that a plant with a volume of about 300m³ would be necessary. Investment cost for this cogeneration plants would be at least 5,5 Mio SEK, plus staff costs, while income is about 75 000 SEK/year. This gives a pay-back of about 75 years.

Energy
 efficiency

Asset owner: Jokkmokk municipality, Sweden

Used assets: Waste water treatment station

Cost saving potential: 7 500 €/year

CO2 reduction potential: 3 ton / yr

Investment costs: 550 000 €

Payback time: about 75 years

Economy: Could a biogas plant become profitable in Jokkmokk?

Plants in this size are pretty rare in Sweden, and they are mainly existing in the context of farms which are digesting manure. The plant in Jokkmokk would be an individual solution with a high need of adaptation and development which will lead to high costs. How economic a co-digester is depends of course not only on cost but also on income. Therefore, an upgrading to fuel for transport (biofuel) with help of a new innovative technology which uses ashes from the district heating plant has been discussed. There are about 400 t wet ashes, which is about 260 t dry ashes. Probably, about 200-350 ton to upgrade all biogas which would result into ca 40 000 Nm³/year what would be enough for 60 modern biogas cars with 20.000 km a year driving. Income from selling would be about 550 000 SEK/year.

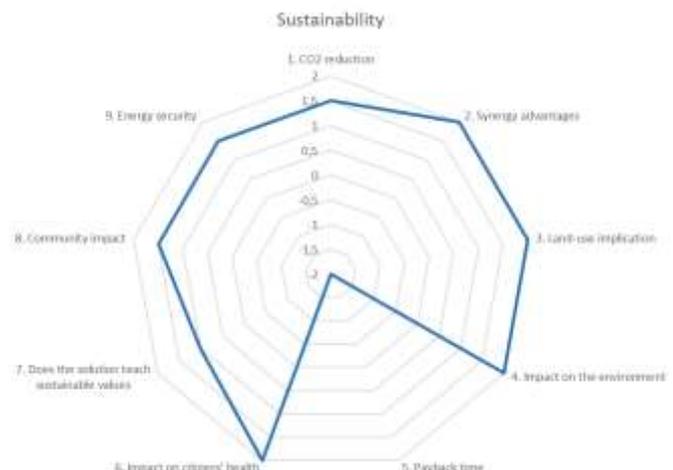
This would be an innovative project which would possibly be eligible for project funding. Another option of getting funding would be the funding programme "Klimatklivet" as well as different types of regional funding. However, a significant administration is necessary for such a project which also results in costs, and there is no guarantee for getting funded when drafting an application. In addition, an application would only be accepted if there is a significant potential for the research results to lead to a market introduction of a new technology.

Biogas for transport is an interesting option as the transport sector is still very much depended on fossil fuels, the transport needs in a large municipality in a sparsely populated area are high and electric cars are still not enough developed to be used in cold winter and long distances without restriction. However, there is not yet any infrastructure for biogas fuels in Jokkmokk and it is also underdeveloped in the whole region. Therefore, it is unlikely that private people will buy a biogas car if biogas fuel is produced in Jokkmokk only. The only mayor customer would be the municipality. Even here, there is a need to change at least parts of the fleet which is causing significant costs itself. Here, both a political decision is needed and an own feasibility study on costs and manageability.

Sustainability

Jokkmokk is a Swedish Eco-Municipality and a signatory of the EU Covenant of Mayors. It has developed its Sustainable Energy Action Plan and is committed to reduce its GHG emissions by at least 20% until 2020..

A small-scale biogas plant would fit into EU circular economy concept. However, more research and a changed legal framework is needed to realize an innovative project which could open up for more rural communities in sparsely populated regions to switch from fossil fuels to biofuels in transport using waste products.



<http://www.recentnpa.eu>



@recent_eu



<https://www.facebook.com/recenteu/>



www.linkedin.com/in/recenteu



Action Renewables
The Future of energy, today

