PRODUCTION OF WOOD-BASED BIOGAS IN JOUTSENO

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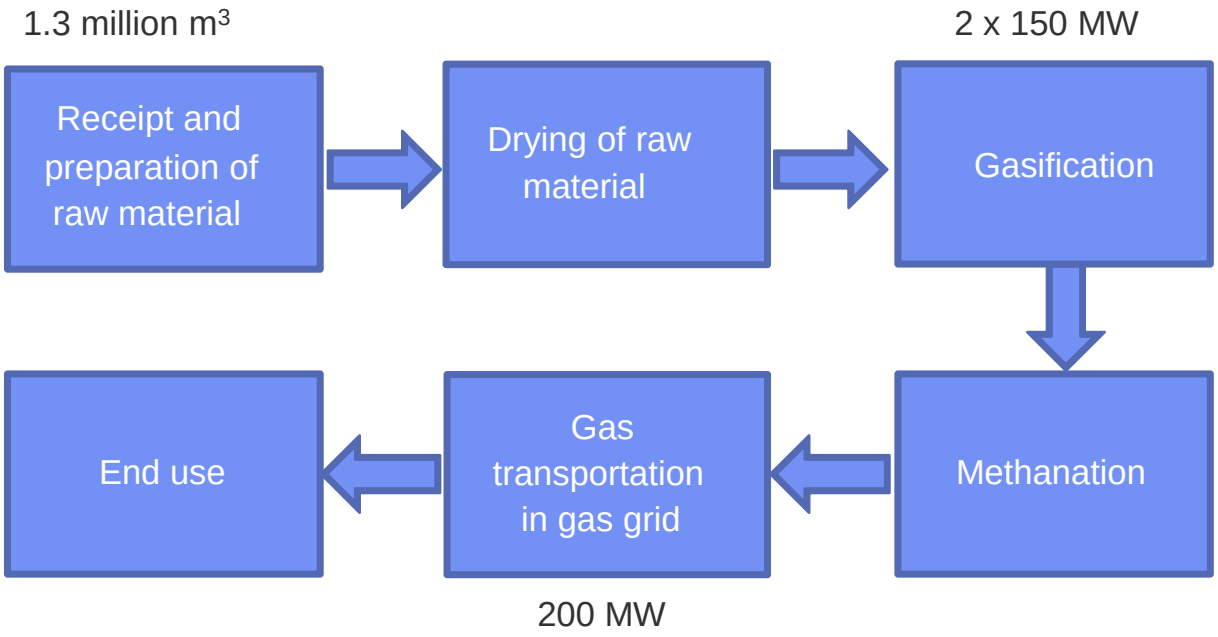
Joutseno biorefinery would be a forerunner in wood-based biogas production

- Helsingin Energia, Metsä Fibre and Gasum are studying the possibility of constructing a biorefinery producing biogas in Joutseno.
- The production capacity of the planned biorefinery in Joutseno would be as high as 200 MW.
- The raw-material will be forest residue and by-products of pulp mill like bark and saw dust.
- The biorefinery would gasify wood chips and refine them into at least 95% methane.
- The composition of the end product would correspond to that of natural gas so it could be injected into the natural gas network and transmitted to usage sites.

Simplified production process of bio-SNG



The project consortium of Joutseno project is unique

- Consortium's operations cover the whole value chain from the forest to the end use of bio-SNG.

- According to the preliminary plan, **Metsä Fibre** and its parent company, the **Metsä Group**, would be responsible for the wood raw material procurement and biorefinery operation.
- **Gasum** would take care of the biogas injection into the gas network and the distribution to gas users.
- **Helsingin Energia** is one of the biggest gas consumers in Finland and could use bio-SNG in its CCGT power plants in Helsinki

Gasum’s gas network links Finland’s forest resources to its largest energy usage sites

- Gasum owns and operates the natural gas transmission network in Finland
- There is an existing natural gas transmission pipeline in Joutseno.
- Gasum’s objective is to become the leading supplier of domestic and renewable biogas.
- The underground natural gas network is the most energy-efficient and environmentally friendly way to transmit large amounts of energy to the densely populated areas of southern Finland without the adverse effects caused by traffic.
- Bio-SNG produced in Joutseno is an indigenous fuel that increases the security of supply in the gas system.

Planned layout of the biorefinery at the Joutseno site

Conclusions 1/2

- Finland's existing natural gas network together with the biorefinery producing bio-SNG could work as an interconnector between the supply of biomass and the high demand for energy in southern Finland.
- The quality of bio-SNG only differs a little from that of natural gas, and the existing gas network is therefore capable of transmitting bio-SNG to gas consumers connected to the natural gas grid.
- The gas network also serves as a gas storage facility, and natural gas can be used flexibly as a back-up fuel for bio-SNG.
- Bio-SNG can be used in all the same applications as natural gas. No investment would therefore be needed in the transportation logistics of the bio-SNG or gas-fuelled power plants or other appliances.
- The only new investment needed would be in the bio-SNG production plant to be built in Joutseno.

Conclusions 2/2

- The construction and operation of the production plant as well as sourcing of biomass would have a considerable positive impact on employment generation. It is estimated that about 300 new jobs would be created.
- As a fuel, bio-SNG has high energy efficiency and clean combustion
- As renewable biomass is used as a raw material in bio-SNG production, it is a carbon neutral fuel. During the methanation process, the biomass-based CO_2 could also be captured, which would make the CO_2 emissions of bio-SNG negative.

  - Wood-based biogas therefore provides an interesting option to contribute to meeting the targets to increase the share of renewable energy, reduce CO_2 emissions and improve energy efficiency and, at same time, improve the security of supply of the Finnish energy system.

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