

The HZI Build Own Operate biogas project in Jönköping, Sweden

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Hitachi Zosen Inova (HZI)

«Waste is our Energy»



Hitachi Zosen Locations

- HZI is a subsidiary of the Hitachi Zosen group with HQ's in Osaka, Japan
- Zurich-based HZI is a global leader in Energy from Waste and Renewable Gas solutions
- I Thermal treatment of solid waste, Anaerobic digestion of biowaste and biogas upgrade
- Operation, maintenance & service business
- Proprietary technology and complete turnkey plant and system solutions
- More than 80 years experience
- 800+ employees
- More than 600 reference projects worldwide
 - > 500 thermal Energy from Waste plants
 - > 130 Biogas production & upgrading plants



The new dry AD biogas plant in Jönköping

Content:

- 1. Short background to the project
- 2. Presentation of the new Biogas production plant

Background of the HZI Jönköping Project

- Jönköping an expanding region
 - Jönköping City ~125,000 inhabitants
 - Jönköping Region: ~360'000 inhabitants
- Local waste management company early adopters of separation of waste streams for recycling
- Two waste bins with collection of 10 waste streams at people's homes
- Kitchen/food waste is collected in brown paper bags in a separate compartment of the bin
- So it is simple for citizens to sort their waste!
- The region's "climate strategy" is supporting growth of biogas production & utilization
- A municipal owned biogas production plant in operation since 2006





Effective collection of all biowaste streams is crucial to reach volumes for large-scale biogas production

Biogas (CBG) utilization in Jönköping





Transport companies







Private cars

Jönköping's Challenges in ~2016

- Unprofitable and aging 16'000 t/a organic waste pretreatment and wet AD plant
- Obligation to increase recycling goals, incl. organic waste
- Obligation to de-carbonize economy, in particular the transport sector
- No political "will" to finance and operate a new AD plant in a municipal owned company
- The municipality decided to invite private investors to take over the biogas activities and build a new plant



Jönköping's challenges represented an opportunity for HZI to enter the scene!

Result of HZI project development effort 2017-2019

- ✓ Take over existing wet AD plant and operate for another ~2 years
- Establish contractual framework, land and necessary permits to build a new plant
- Secure technical capability to construct and operate a dry AD & upgrading plant including CBG distribution infrastructure (public fast filling stations & city bus slow filling station)
- ✓ Mobilization of 100% funding (equity, debt & Klimatklivet grant) ~ 30 MEUR in total
- Strategic move by HZI to enter the Renewable Gas market in Sweden



The result of an intensive two year project development time

Background of the HZI Jönköping Project

- Long term receival & supply agreements necessary to make the project "bankable"
- On top of the agreements below, landlease agreement and all permits need to be secured





The Jönköping Kompogas plant in final commissioning

Content:

- 1. Short background to the project
- 2. Presentation of the new Biogas production plant

Jönköping - Lay-out of plant



Jönköping – Pictures from the plant



HZ1 Presentation- Nils Lannetors, May 2021 11



HZI Jönköping Biogas – Technical Process





A complete turn-key project with HZI both as EPC supplier and owner & operator

Generate Biogas from **any Biowaste** with Kompogas[®] Dry AD solutions

Hitachi Zosen INOVA



HZI Jönköping Biogas - Process



Converting mixed food and green waste into Biogas, compost and liquid fertilizer

HZI Jönköping Biogas – Rest Product handling

Recirculation & extraction of rest product



Liquid-solid separation



Storing liquid fertilizer



Liquid fertilizer for farming



Post rotting and sieving of solid rest product



Not part of HZI activity

I Organic solid compost excellent for gardening etc



Biogas upgrading using BioMethan[®] membrane separation

Hitachi Zosen INOVA



- Membranes retain the methane while the carbon dioxide physically permeates through the membrane
- Very low Methane slippage < 0.2% (using off gas flow for landfill gas burner)
- Biomethane purity > 97%
- I Outlet pressure 6 − 16 bar

Compressed Biogas in tank racks transported by truck to filling stations



Below the new fast filling station for waste trucks and public market vehicles at Torsvik (250 m from E4)





The new slow filling biogas infrastructure for the 52 citybuses in Jönköping



Compressed biogas on racks can be transported to any gas offtake point in the region

Time Schedule Jönköping Biogas Plant

- ✓ March 2019 NTP & Start Site Construction
 - July 2019 Start of Heavy Steel Construction (Digester)
- ✓ December 2019 Finalizing Digesters (Tightness Test)
- ✓ February 2020 Finalizing Civil Works
- June 2020 Start Commissioning
 - 2020 1st Biogas Production
- December

September

2020 Take Over and start of Commercial Operation



HZI Jönköping Biogas -Socio-economic benefits of the project

Aspect	Benefit	Illustration
Organic waste recycling within the region	Short transport distances, local ownership	
Anaerobic digestion of food + green + other wastes	Tapping full greenhouse gas reduction potential from waste	
Production of Bio-CNG within the region	Short transport distances, local ownership	
Production of compost	Storable and tradable soil conditioner & nutrient supplier	
High-quality liquid fertilizer	Transporting less water with higher nutrient content	
Employment	Job creation during construction and operation	

The new Biogas plant will contribute to the **local circular economy** & **reduce fossil CO2** with about 15000 ton CO2 per year

Jönköping Kompogas® Dry AD Project: A Platform for the Future



Future possibilities to establish a "CO2 sink" by utilizing the separated CO2 from the upgrader



Thank you very much for your attention