Biogas Liquefaction Technology Workshop
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Samsø Energy Academy

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Maximizing output from the biogas circuit
Local bioenergy solutions from Nærenergi

- Local focus: Bioenergy plants, nordic market.
- Offices in Copenhagen, Haugesund and Stavanger
- More than 10 years biogas experience
- 22 dedicated employees
- Strong track record and positive financial development
• Business segments:
  • Biogas plants and equipment
  • Biogas upgrading plants
  • Liquification of biogas
  • Refuelling stations CNG, CBG
  • LPG distribution and –systems
  • District heating plants and –operation
  • Biofuelled heating and cogeneration
Liquid Biomethane - LBM
Overview LBM – Liquid Biomethane

- Biomethane
- Conditioning
- Cryobox
  - Electricity
  - CNG
- LNG tank
- Consumer
  - Boil-off
How it works?
Cryobox – Small scale LBM production and storage
Cryobox – Advantages

**Containerised design**
Easy to install and relocate. From order to commissioning in only 6-7 months.

**Fast startup, without energy losses or inefficiencies,** the maximum production level is reached in only 10 minutes. A clear advantage when compared to medium or large-sized plants which require 12 to 18 hours to start production.

**Boil-off gas is captured and recirculated within the Cryobox**
## LBM Production

<table>
<thead>
<tr>
<th></th>
<th>Cryobox 500/600</th>
<th>Cryobox 200</th>
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</thead>
<tbody>
<tr>
<td><strong>Inlet pressure</strong></td>
<td>4-15</td>
<td>12-15</td>
</tr>
<tr>
<td><strong>LBM output</strong></td>
<td>520-660</td>
<td>170-200</td>
</tr>
<tr>
<td></td>
<td>12-16</td>
<td>4-4,5</td>
</tr>
<tr>
<td><strong>Installed power</strong></td>
<td>450-550</td>
<td>132</td>
</tr>
<tr>
<td><strong>Driver</strong></td>
<td>Electric Motor</td>
<td>Electric Motor</td>
</tr>
<tr>
<td><strong>Relative power consumption</strong> (Depending on inlet pressure)</td>
<td>0,66 – 0,85</td>
<td>kWh/Kg LBM</td>
</tr>
</tbody>
</table>
# LBM Storage

<table>
<thead>
<tr>
<th></th>
<th>CNX 1500</th>
<th>CNX 2000</th>
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<tbody>
<tr>
<td>LCNG production Capacity</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>LNG Pumping Capacity</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Storage Capacity (Internal)</td>
<td>5500</td>
<td>8500</td>
</tr>
<tr>
<td>Driver</td>
<td>Electric Motor</td>
<td>Electric Motor</td>
</tr>
<tr>
<td>Installed Power</td>
<td>37</td>
<td>37</td>
</tr>
</tbody>
</table>
Success Cases Galileo

Cryobox® Nano LNG-Station bringing LNG to the service of transport

Galileo have created Cryobox®, the first Nano LNG-Station that has brought LNG to the transport industry. Seven Cryobox® units supply LNG to the "Francisco", the first high-speed ferry powered by LNG fueled turbines.

Transforming the problem of flaring into an opportunity

In Bakken, North Dakota, Galileo integrated flare gas capture and liquefied natural gas LNG production right at the wellhead. Thus, LNG can be transported and consumed as a fuel for drill-rig power generation and frac-water heating.
GALILEO Cryobox references

More than 25 plants put into operation worldwide over last 4 years
Virtual Pipeline simulation
Nordic opportunities?

• Looking to establish first reference in Scandinavia
• Open for discussion about ownership of station
  • Galileo Rental would be interested in supply of station under fixed rental agreement/liquefaction agreement
• Please do not hesitate to contact us for more information
• Thanks for your interest!

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