



The World's first ISCC RFNBO PtX plant is here! The hard part is over – or is it?



PowerLBG aka E-LNG from Methanation of Hydrogen



GrønGas Hjørring A/S & Grøn Brint A/S
06.02.2025



GROUP STRUCTURE


**Group Management,
Finance & Development**

Rasmus H. Bang
Managing Director

gum
grøn vækst management

Jens Peter Lunden
Founder and Owner

Partners

 **Norwegian
Hydrogen**

e-on

50%

50%

50%

50%

AGRICULTURE



**Asdal
Hovedgaard**

ESTD. 1327

WIND POWER



POWER-2-X

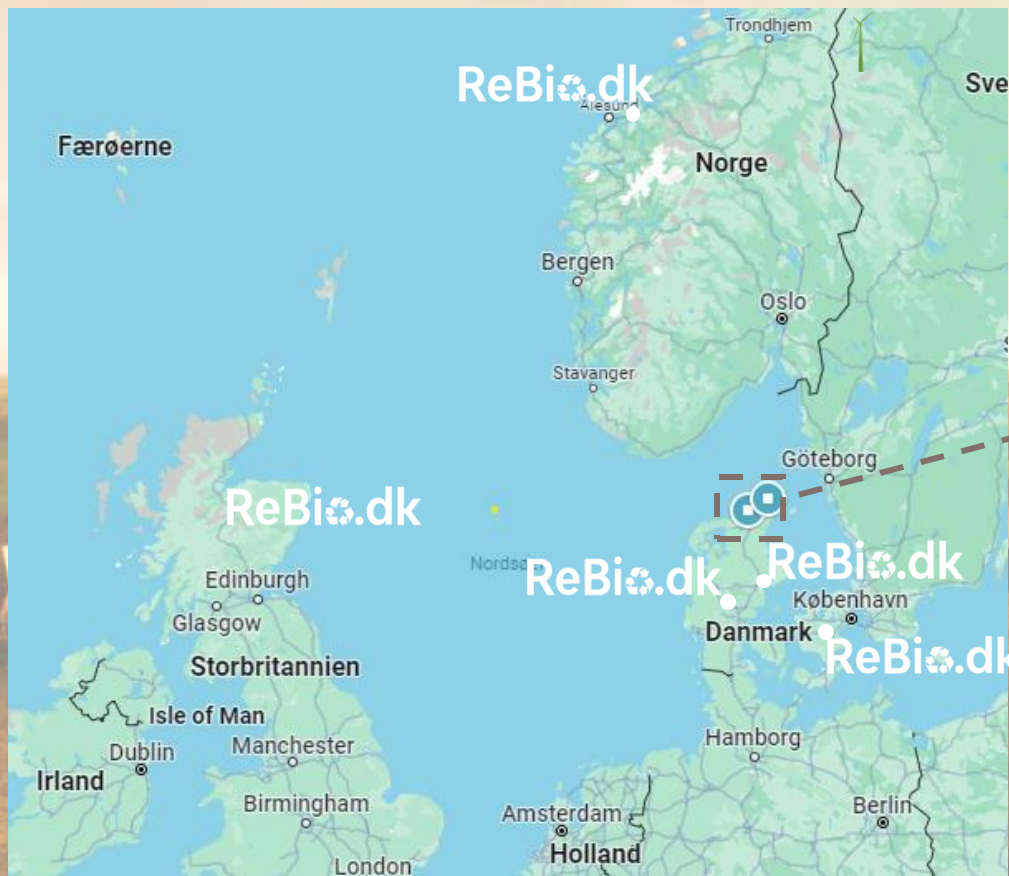


 **Grøn Brint**

BIOGAS



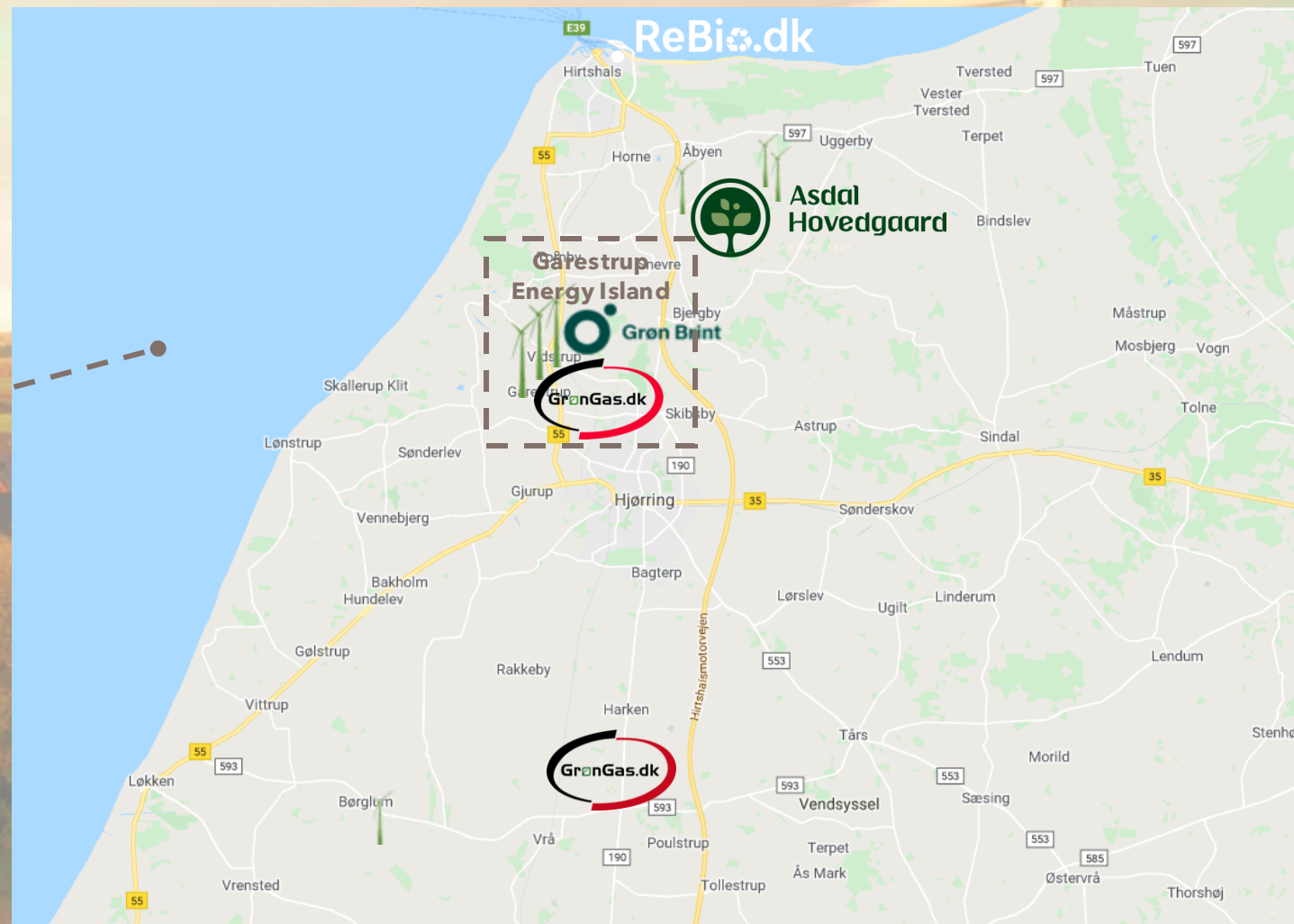
ReBio.dk



The ReBio.dk Group

Biomass.dk recycles biowaste feedstocks from food and feed industries to 50% of all Biogas plants in Denmark

Miljøservice recycles organic waste for fertilizer use



GrønGas own and operate 2 Biogas Plants, GrønGas Vrå and GrønGas Hjørring

Grøn Vind produces Wind Power from 7 WTGs, 3 at 'Gårstrup Energy Island'

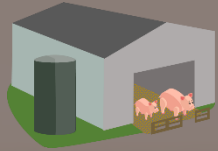
Grøn Brint produces RFNBO Hydrogen at 'Gårstrup Energy Island'

Asdal Hovedgaard farming with 1,000 ha, 1,000 sows and 100,000 pigs per year

Gårestrup Energy Island



Asdal
Hovedgaard



Gårestrup Vestergaard (est. 1938+2007);
Pig production



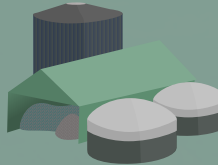
GRØN VIND



Gårestrup Vindmøllepark (est. 2016);
Wind Farm



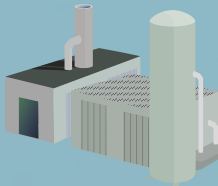
GrønGas.dk



GrønGas Hjørring A/S (est. 2001);
Biogas Plant



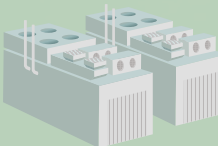
GrønGas.dk



GrønGas Hjørring LBG-plant (est. 2023);
Upgradering- & Liquefaction Plant



Grøn Brint



Grøn Brint A/S (est. 2024);
Hydrogen Production for PtX Plant



Power-to-X Plant with CO₂-Capture commissioned in 2024

Green Hydrogen

- Renewable electricity from Direct line and 'Grid-Battery'

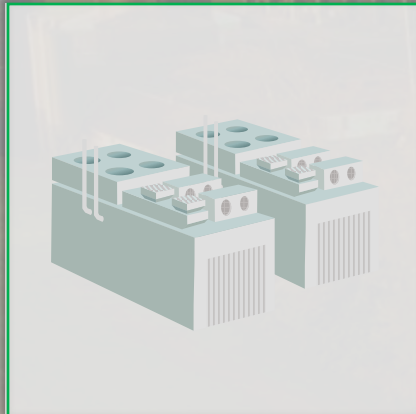


K/S Gårestrup Vind



Wind Turbines

3 x 3,45 MW ~ 42.300 MWh per year



Electrolyzers

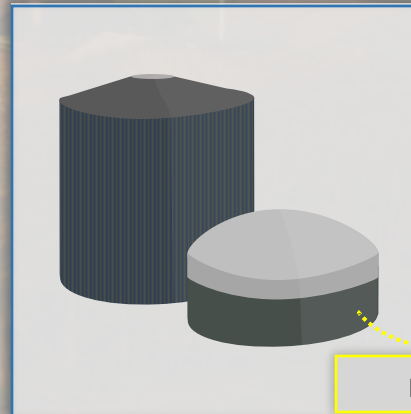
2 (+3) x 1 MW ~ 2x450 kg H₂ per day

Since 2023:

Biogas Plant with LBG production

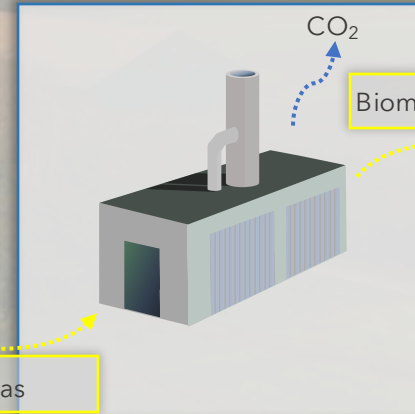


LBG



Biogas Digester

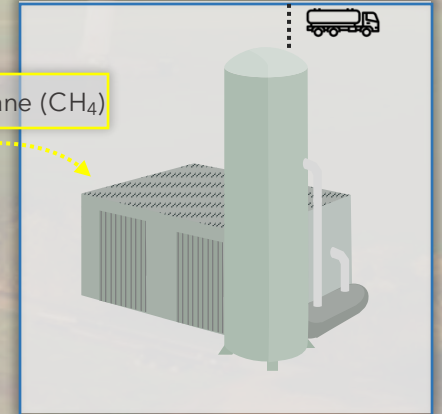
2001 Biogas plant with new (2023)
9,600 m³ digester



Biomethane (CH₄)

LBG Plant (Upgrading and Liquefaction)

Up to 17 t. LBG per day.



Power-to-X Plant with CO₂-Capture commissioned in 2024

Green Hydrogen

- Renewable electricity from Direct line and 'Grid-Battery'



K/S Gårestrup Vind



Power Substation

H₂ Pipeline

Wind Turbines

3 x 3,45 MW ~ 42.300 MWh per year

Electrolyzers

2 (+3) x 1 MW ~ 2x450 kg H₂ per day

Since 2024:

PowerLBG (e-LNG)

- with CO₂-capture from methanation



LBG + e-LNG

Methanation

Biomethane (CH₄)

e-Methane (e-CH₄)

Biogas + e-CH₄

Biogas Digester

2001 Biogas plant with new (2023)
9,600 m³ digester with gasmix-system

LBG Plant (Upgrading and Liquefaction)

Up to 17 t. LBG per day. Through methanation, we expect to lower (Carbon Capture)
the CO₂-content in the raw biogas (before upgrading) from 40 % to approx. 15 %



Site overview and equipment

Site overview

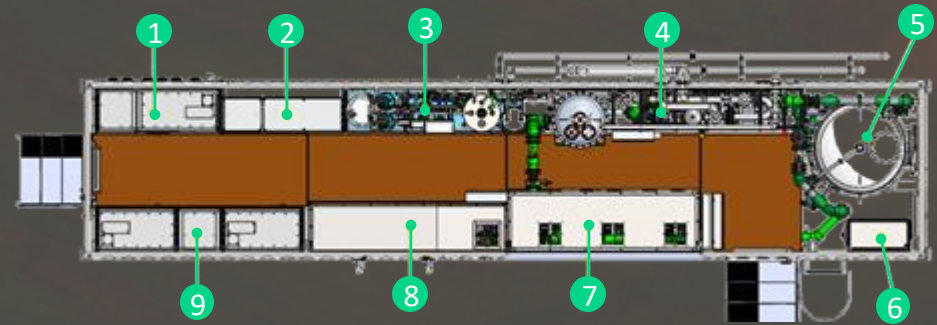


Description - Grøn Brint site

- | | | |
|-------------------------|---------------------|--------------------------|
| 1 Wind turbines | 4 Transformers | 7 Liquefaction plant |
| 2 Sub-station | 5 Hydrogen pipeline | 8 Filling station |
| 3 Phase I electrolyzers | 6 Biogas reactor | 9 Phase II electrolyzers |

Description - Electrolyzers

- | | | |
|-------------------------|---------------------------|-----------------------|
| 1 Power supply 1 | 4 Process water loop | 7 Stack area |
| 2 Control system | 5 Process water treatment | 8 Module H2 treatment |
| 3 Fresh water treatment | 6 Instrument air supply | 9 Power supply 2 |



The timeline

Bringing the World's first ISCC RFNBO plant to life

Q3 2021
Initial plans and discussions btw Grøn Brint, GrønGas and Norwegian Hydrogen regarding a possible co-operation for production of green hydrogen



Q1 2023
FID on the first 2 MW (phase I) of the Grøn Brint project



Aug. 2023
GrønGas first LBG Production and delivery to Germany

Q1 2024
First H₂ molecules produced and hot commissioning completed

Jun. 6, 2024
ISCC RFNBO **Pilot-audit** with Baltic Control carried out ☒ 

Sep. 11, 2024
ISCC RFNBO **Audit** with Baltic Control carried out ☒  

Nov. 28, 2024
Umwelt Bundes Amt (UBA) pre-recognition  

Q1 2025
Expected UBA recognition of Baltic Control(?)  

2021 // 2022

2023 **FID**


2024

2025

// 2030



Q1 2022
GrønGas FID on expansion of Biogas plant and new LBG plant.

Q1 2023
Established Grøn Brint A/S - a 50/50 joint venture company between Jens Peter Lunden (50% owner of GrønGas) and Norwegian Hydrogen AS.

June 2023
EC Delegated Regulation 2023/1184 and /1185 Publicized 

Q3 2023
Electrolyzers arrive on site and installation begins...




July 2024
Danish Energy Agency pre-recognition of ISCC RFNBO scheme  

Nov. 20, 2024
Received the very first RED II certificate for an RFNBO product in European green energy sector 



19. Dec. 2024
EC recognition of ISCC EU RFNBO Scheme  

Q1 2025
First H₂ molecules delivered to GrønGas
→ e-LNG produced 

The Certification Proces

Bringing the World's first ISCC RFNBO plant to life



- Jan. 28: ISCC RFNBO Training
- Q1-Q2: Development and adaption of our QMS
- New Mass Balancing system and GHG Calculations according to DR (EU) 2023/1185.

- Jun. 6: Pilot Audit with Baltic Control Certification
- Jul. 8: Danish Energy Agency pre-reconizes ISCC → Planning of RFNBO Audit with Baltic Control
- Sep. 11: ISCC RFNBO Audit by Baltic Control

- Sep-Nov: Extensive checks and controls by ISCC
- Nov. 20 & 26: Issuance of the World's first ISCC RFNBO certificates...
- Q1 2025: Approval proces with the UBA in DE.
- Q1 2025: RFNBO e-LNG route-to-market

