

HOST GROUP

# Scaling-up trend in the biogas industry

*by HoSt Group*



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- Area Sales Manager at HoSt Biogas (part of HoSt Group)
- Area: Hungary, Romania, Benelux, UK, Ireland
- Enschede, NL



# Organisational overview HoSt Group

Company organised over four business units



## HOST GROUP

### OEM products



Biogas upgrading

CO2 liquefaction

Bio-LNG

CO2 flue gas capture

Hydrogen

### Turn-key projects



Anaerobic Digestion

Biomass combustions

### Service / maintenance



Service

Maintenance

### Energy as a service



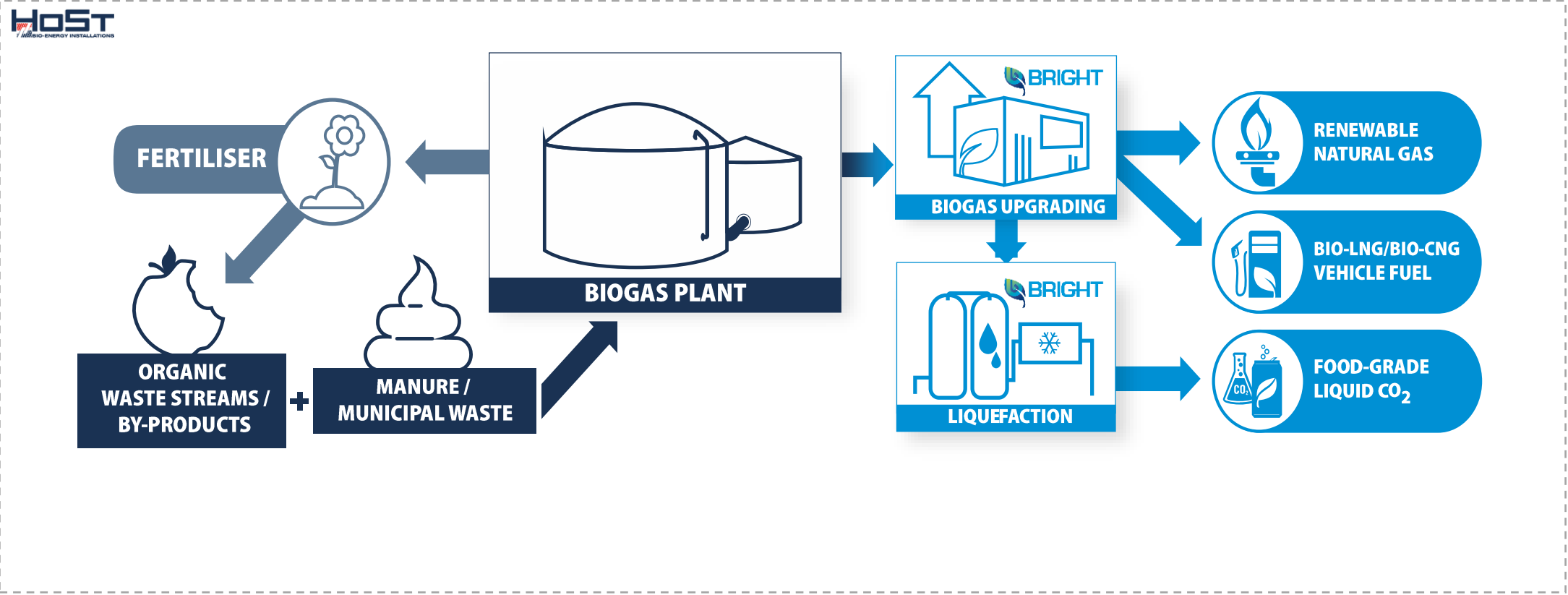
Renewable gas

Renewable heat

Renewable electricity

# Anaerobic digestion | Biogas plants

Renewable gas & high-quality raw materials

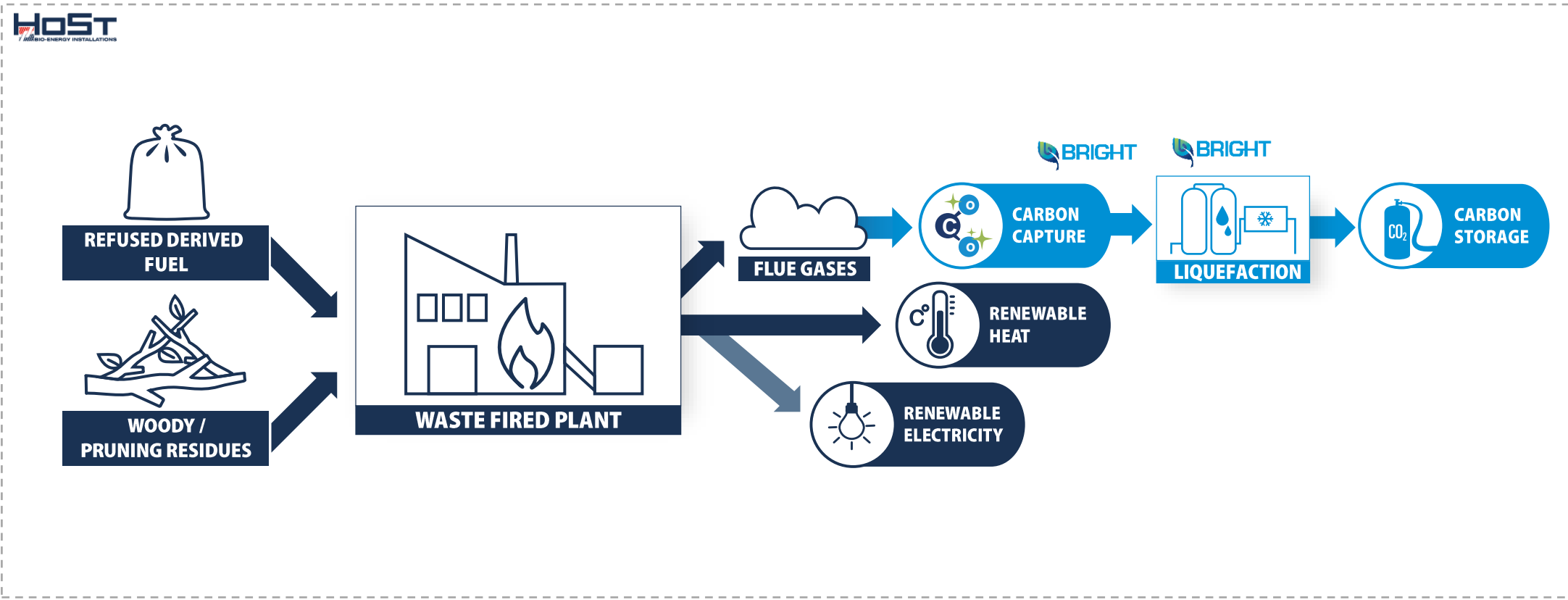


1) Renewable gas, LNG and CO<sub>2</sub>

# Industrial biomass/waste-fired heat & power plants

With NO-NOx-technology for lowest emissions

2) Renewable heat, electricity and CO<sub>2</sub>



# Scaling-up trend in the Biogas Industry

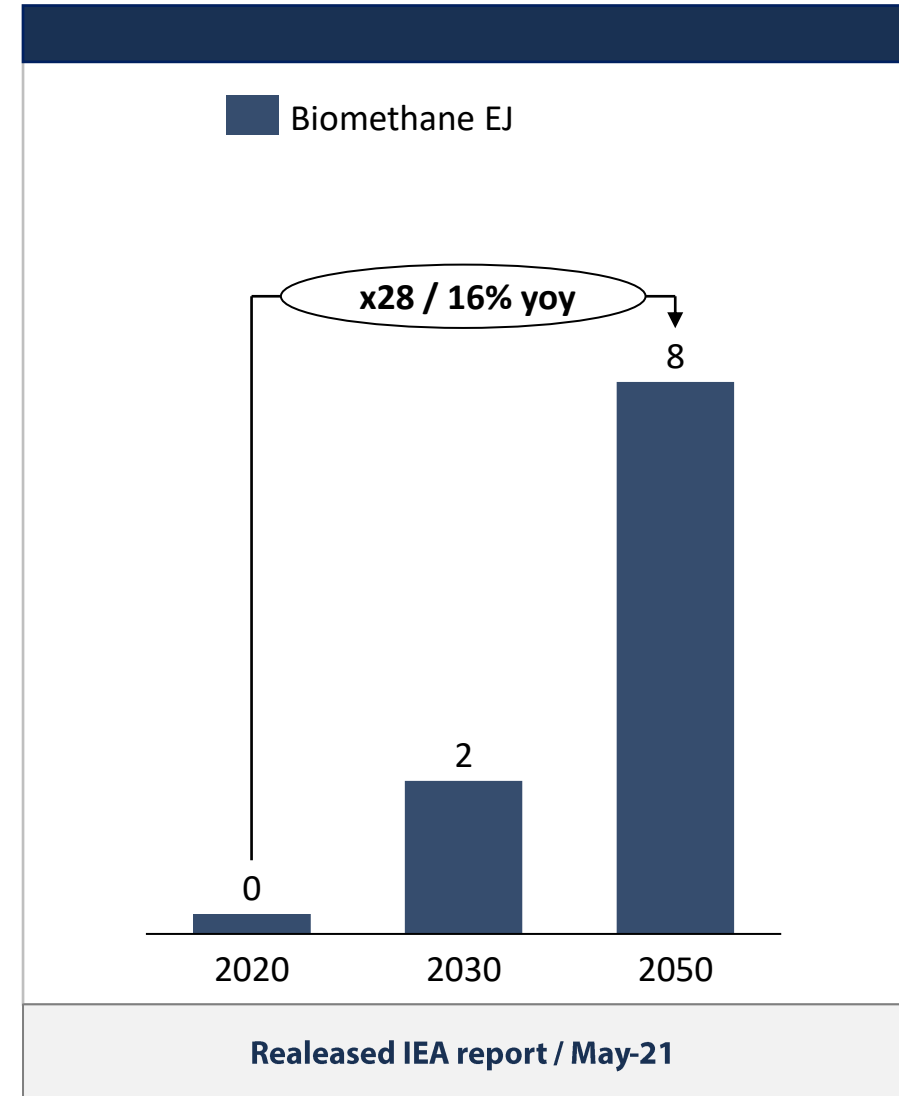
## Topics

- Demand for natural gas
- Decreasing trading barriers
- Technology development
- Changing developer landscape

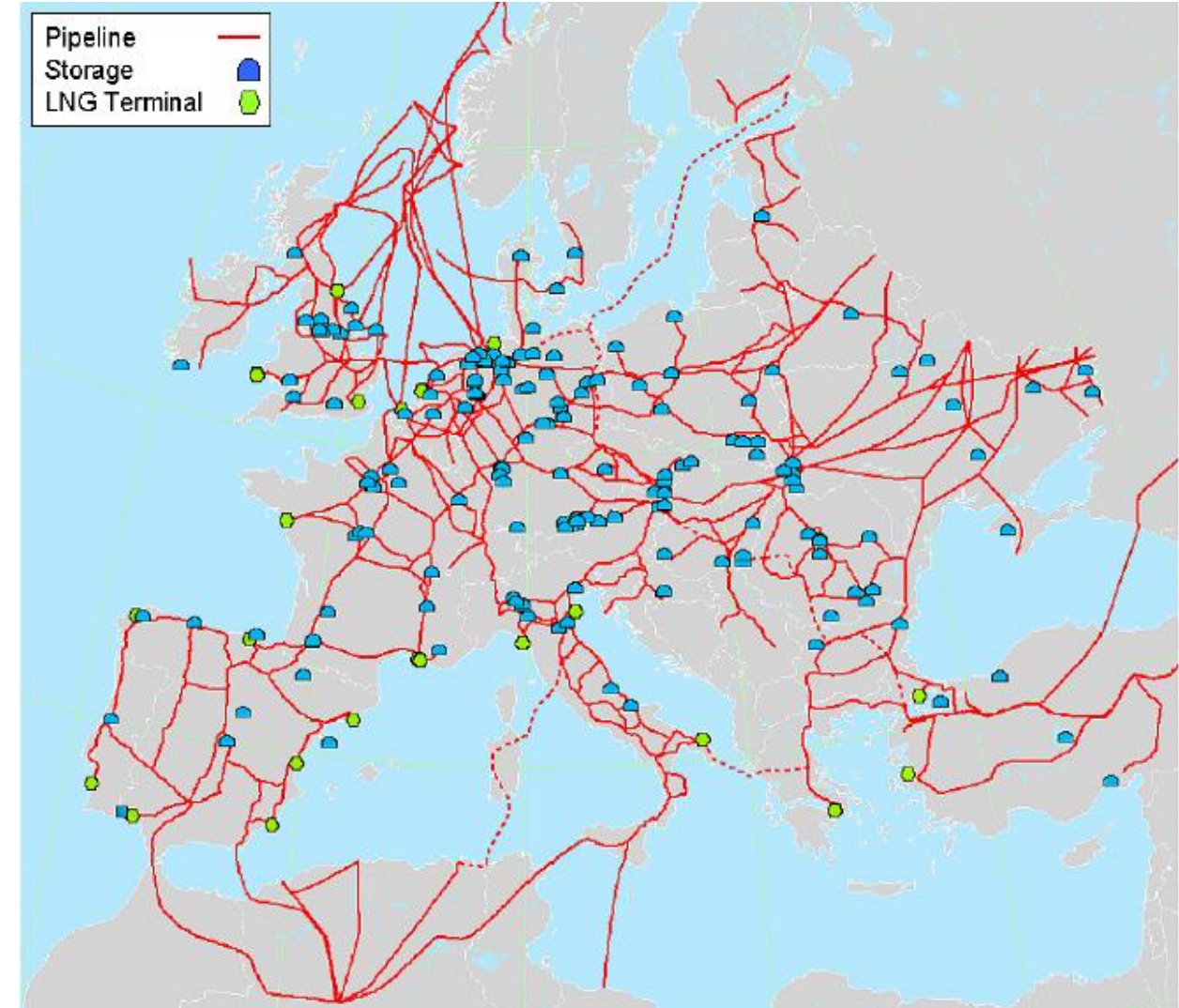


## Increasing demand for Renewable Gas

- **The blending obligation under the Renewable Energy Directive (EU) is ramping up towards 2030**
  - This increases demand from the EU transport sector annually
- **Introduction of ETS2 – CO2 Tax on for households and smaller industrial users (<20MW) creates more demand for renewable gas in EU**
  - Green gas blending obligation for household heating (NL, DE, P, A, etc)
- **Increasing amount of governmental support schemes for renewable energy**
- **Increasing number of companies voluntarily decarbonize due to market pressures**
- **compete the above trading options will compete each other and drive prices up**



- **EU-gas grid is recognized as one interconnected system**
  - all countries in EU shall be able to trade biomethane more easily
- **Union Database introduction (2023) makes trading across nations within the EU quicker and simpler.**
  - Here guarantees of origin and proof of sustainability are registered to avoid double counting
- **No longer needed to trade the physical gas to another country, now you can trade the certificates separately**
- **The increasing prices of certificates under the REDIII and ETS blending obligation are resulting in a level playing field across EU nations**
- **This opens up markets with limited regulations or support schemes like Hungary and Romania**





# Technology development

## Bigger size membrane upgraders

### Biogas upgrading size (membrane technology)

- Over the years Membrane size and capacity has evolved, starting at 2-inch membranes and now at 11-inch membranes
- Benefit: The maximum capacity in a single upgrading unit increased to 3500 Nm<sup>3</sup>/h (previously: 2500 Nm<sup>3</sup>/h)
- Benefit: Lower CAPEX
- Benefit: Less space requirements on site

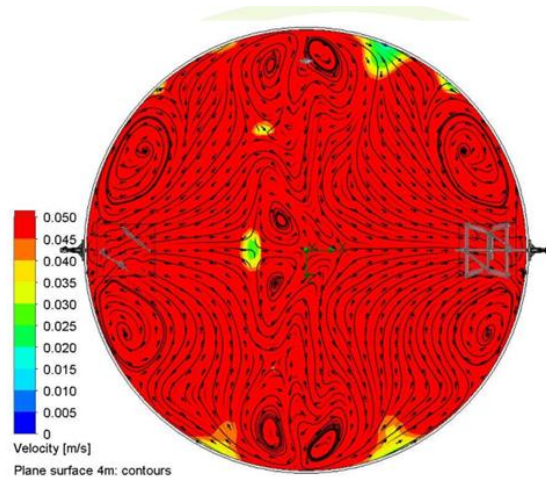


# Technology development

## Mixing systems for double membrane roof tanks

### Mixing systems for double membrane roof tanks

- **2015:** 26x8 was considered a large reactor
- **2024:** HoSt is constructing multiple plants with 40x9 meter tanks
- Benefit: Lower CAPEX compared to volume
- Benefit: Less space requirements on site

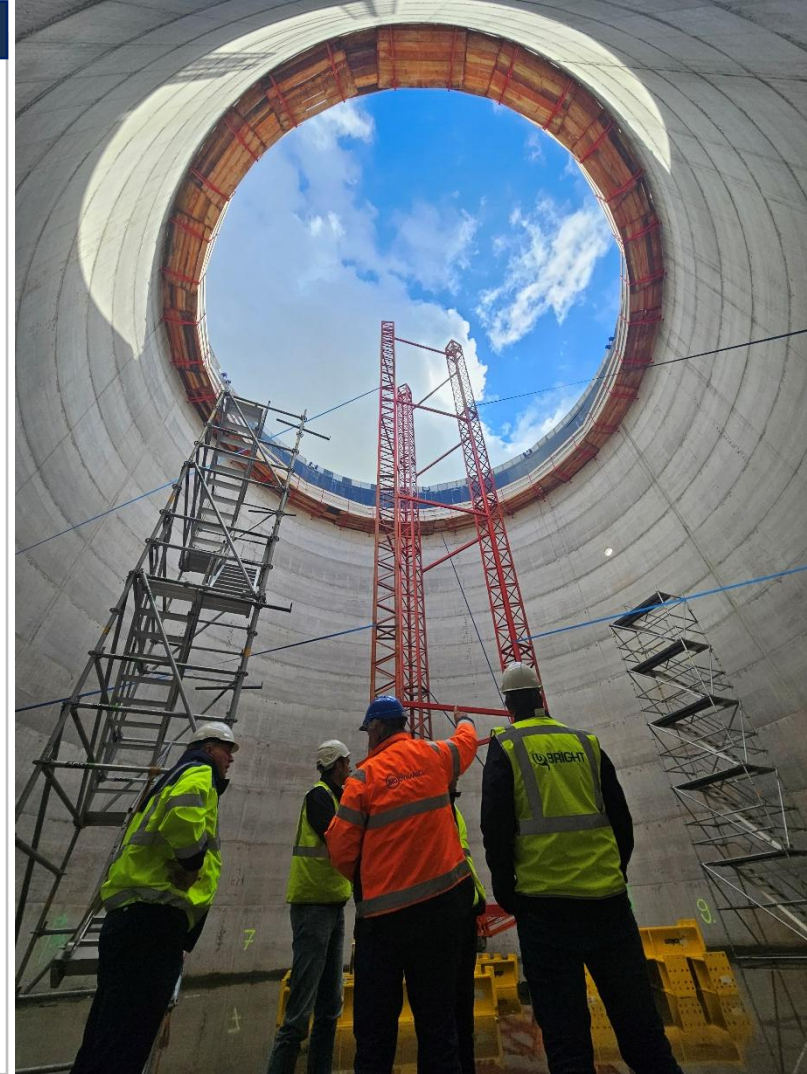


# Technology development



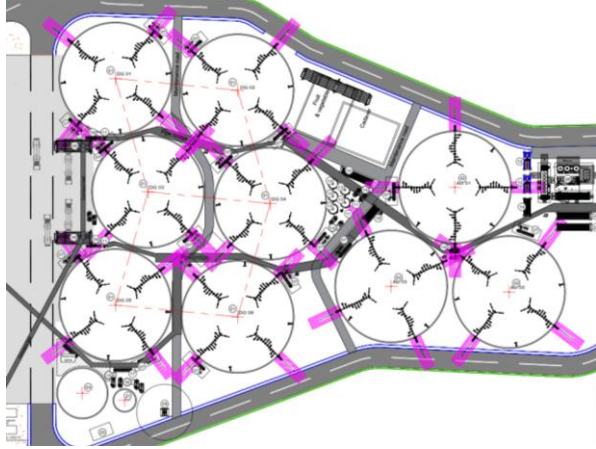
## Increasing size digesters

### Increasing size digesters

- Concrete tank-builders are innovating through post-tensioning concrete and are able to build bigger tanks
- Benefit: Maximizing reactor volume on a small footprint.
- Benefit: Energy efficient
- Drawback: Higher in CAPEX compared to conventional design



# Biogas plants over the years

2018 Netherlands	2021 United Kingdom	2024 Lithuania	2025
			
112,000 T/A	56,000 T/A	357,000 T/A	200,000 T/A
Cow manure	Foodwaste	Agricultural waste	Agricultural waste
Solid Cow/Chicken manure	(Liquid) organic waste	Manure	Slaughterhouse waste
300 Nm <sup>3</sup> /h biomethane	700 Nm <sup>3</sup> /h biomethane	2000 Nm <sup>3</sup> /h biomethane	5000 Nm <sup>3</sup> /h biomethane

# Platform developers and backing funds

## Changing developer landscape

### 2018:

- Typically single projects at feedstock producers; Farmers and agricultural industry
- Converting CHP plants to Biomethane
- Financed by local (agricultural) banks

### 2025

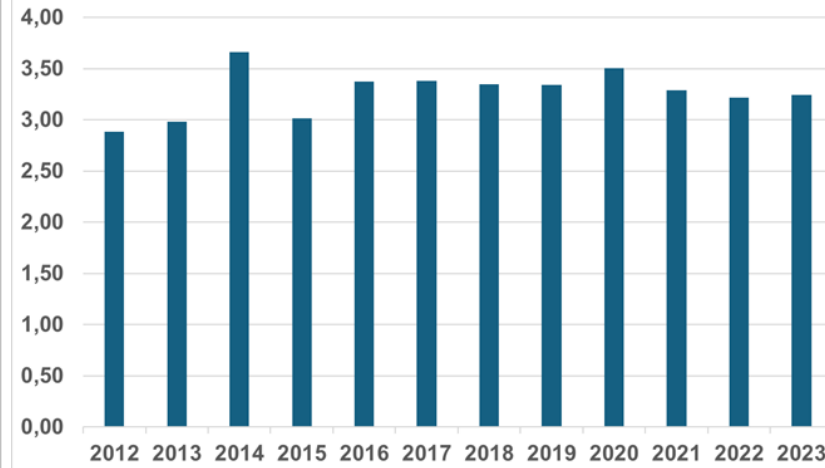
- Platform developers with multiple projects in the pipeline, sometimes more than 1 geography
- Backed by professional industry funds looking to spread investment across geographies

### Limitations

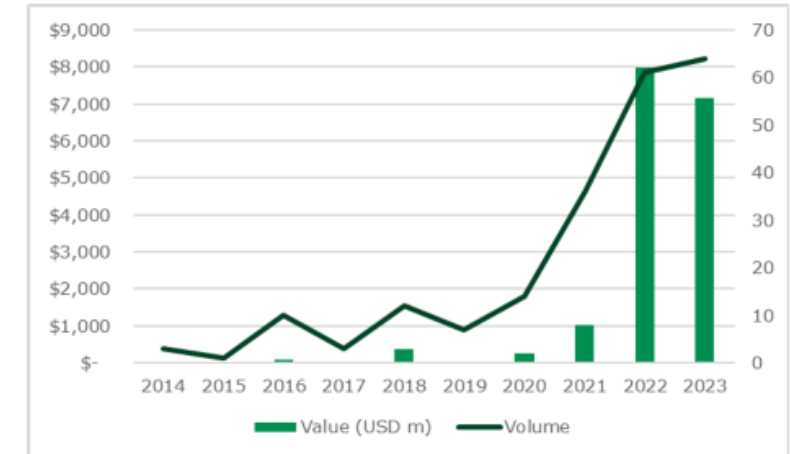
- Economies of scale are not endless
- Increasing transport costs
- Disposal of digestate
- Permitting procedures
- Grid connections (power supply and gas oftake)

Source graph (L): Statistical report of EBA  
Source graph (R): Infraclog

Yearly average biomethane production in Europe, million m<sup>3</sup>/plant



Global Biogas Investments



# Conclusion

## Scaling-up trend in the biogas sector

<b>DEMAND</b>	<b>More demand</b> for renewable gas leading to higher prices
<b>TRADING OPTIONS</b>	<b>Less trading barriers</b> leading to investment opportunities in new markets
<b>TECHNOLOGY DEVELOPMENT</b>	<b>Technology is scaling up</b> which leads to increased plant size, CAPEX optimization and operational benefits
<b>LIMITATIONS</b>	<b>Transport</b> costs for feedstock and digestate <b>Economy</b> of scale has a limit <b>Political</b> support is key to success
<b>CONCLUSION</b>	<b>The market is growing</b> towards bigger projects in locations where limitations can be addressed, supported by professional biomethane investors



