

# Organization of Hitachi Zosen Corporation



- Energy-from-Waste plants
- Material recycling systems
- Methane fermentation systems
- Eco-agriculture systems
- Water treatment systems
- AOM business (after-sales service, operation control, and chemical supply)
- Long-term operations and management
- System of producing fuel from sewage sludge

<b>Japan</b> 2 Head Offices 10 Domestic Offices	<b>Japan</b> 9 Factories	<b>Japan</b> 70 Subsidiaries
---	-----------------------------	---------------------------------

Total 12 Overseas Offices, i.e.

Total 25 Overseas Subsidiaries and Affiliates, i.e.

<b>Abu Dhabi</b> Overseas Office	<b>Taiwan</b> Overseas Office	<b>China</b> Overseas Subsidiary	<b>UK</b> Overseas Subsidiary
<b>China</b> Overseas Office	<b>Thailand</b> Overseas Office	<b>India</b> Overseas Subsidiary	<b>USA</b> Overseas Subsidiary
<b>Korea</b> Overseas Office	<b>Vietnam</b> Overseas Office	<b>Thailand</b> Overseas Subsidiary	<b>Switzerland</b> Overseas Subsidiary
<b>Singapore</b> Overseas Office	<b>USA</b> Overseas Office	<b>Malaysia</b> Overseas Subsidiary	<b>Vietnam</b> Overseas Subsidiary
<b>India</b> Overseas Office		<b>Korea</b> Overseas Subsidiary	

Total 76 consolidated subsidiaries, 9,039 employees

# Company Profile



- | HZI BioMethan is specialized in biogas upgrading and other gas related technologies
- | More than 65 employees in Germany, Switzerland & France
- | More than 60 European reference projects

# Organization of HZI BioMethan

## Biogas Upgrading



## Carbon Capture



## Stainless Steel Gas Equipment



## Gas Grid Injection



## CNG



Planning & Engineering

Biogas Pre-treatment

Chemical Process -  
Amine

Physical Process -  
Membrane

Service & Maintenance  
(after-sales service,  
remote control, and  
consumable supply)

## Germany Head Office



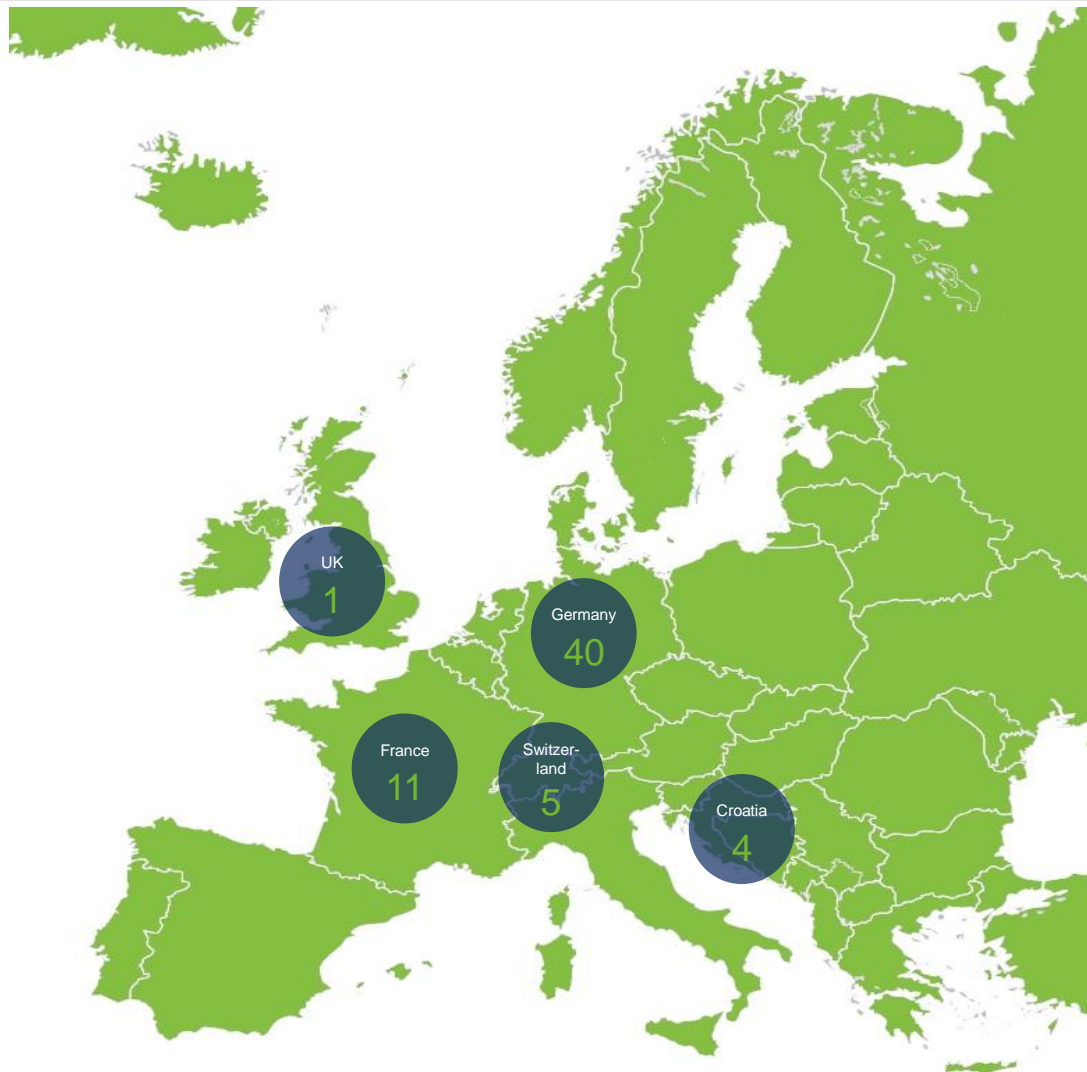
## Germany Manufacturing facility



## European Service Network



# HZI BioMethan – Reference Projects



# History

2008

- | Pilot plant with amine upgrading technology

2009

- | 1<sup>st</sup> industrial amine based upgrading plant in operation

2010

- | Start of serial production for amine upgrading system

2012

- | 1<sup>st</sup> upgrading system using membrane technology

2013

- | Start of international expansion

2015

- | Integration into Hitachi Zosen Inova AG

2016

- | Upgrading plants in operation for all sources of biogas



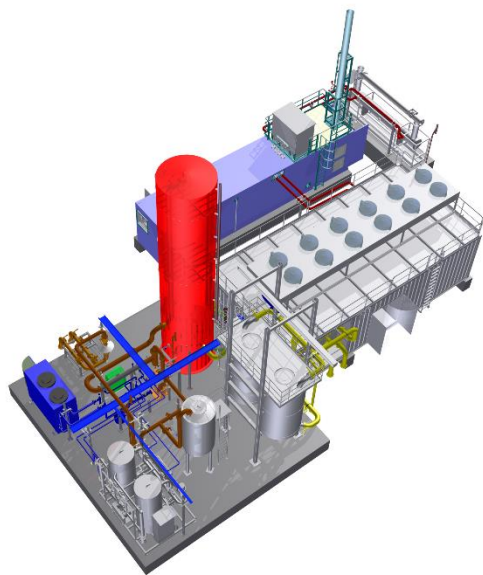
Hitachi Zosen  
INOVA

## Biogas Upgrading Systems by

Hitachi Zosen Inova BioMethan

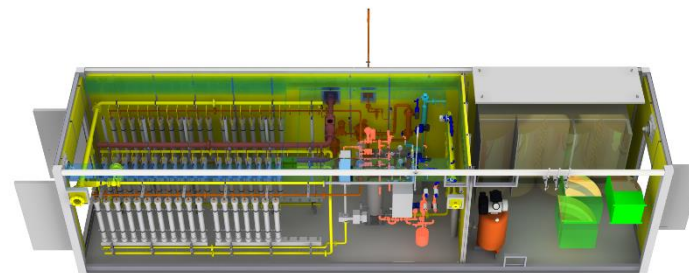
# HZI BioMethan - Upgrading Technologies

## The A-Series



Amine Scrubbing

## The M-Series



Membrane Separation



# HZI BioMethan - Upgrading Technologies

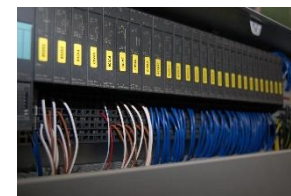
	A-Series	M-Series
<b>Process</b>	Chemical Adsorption (Amine)	Physical Permeation (Membrane)
<b>Electrical Demand</b>	0.1 kWh <sub>e</sub> /Nm <sup>3</sup>	0.24 kWh <sub>e</sub> /Nm <sup>3</sup>
<b>Heat Demand</b>	0.6 kWh <sub>tr</sub> /Nm <sup>3</sup>	-
<b>Purity of Biomethane</b>	> 99%	> 97%
<b>Methane Slip</b>	< 0.1%	< 0.5%
<b>Outlet Pressure after Upgrading process</b>	0.1 – 0.15 bar	< 16 bar
<b>Standard Sizes (Nm<sup>3</sup>/h biogas)</b>	From 250 to 2.500	From 30 to 2.000
<b>Decision Factors for Technology Choice</b>	<ul style="list-style-type: none"> <li>• Availability of inexpensive heat source</li> <li>• Requirement of high biomethane or CO<sub>2</sub> purity</li> <li>• Very low methane slip</li> </ul>	<ul style="list-style-type: none"> <li>• Low &amp; predicable electricity costs</li> <li>• Small and fluctuating biogas flow</li> <li>• Requirement of high outlet pressure</li> <li>• Easy to operate</li> </ul>
<b>Additional System Modules for further CH<sub>4</sub> Use</b>	+GRID- and +CNG-Module	
<b>Additional System Modules for further CO<sub>2</sub> Use</b>	+CO <sub>2</sub> -Module, Methanation	



# HZI BioMethan - Upgrading Technology

**What can you expect from us when planning an upgrading plant:**

- Competent consultancy for the right choice of technology
- Quality components for low life-cycle costs
- In-house manufacturing & engineering
- Strong track record of references
- Sound and solid corporate background



Thank you for your attention

[Jan.Ludeloff@hz-inova.com](mailto:Jan.Ludeloff@hz-inova.com)