Status Quo and Future Prospects for Biogas as a Transport Fuel in Europe

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European Biogas Association
26 countries – 37 National Organisations
56 Companies – representing >7,000 stakeholders

www.european-biogas.eu
Associated members (companies, universities, private persons)

Dr. Jörgen Held (RENEWTEC)

Lars Salling
Biogas and biomethane can do ... A lot!
Number of Biogas Plants in 2015

- Germany: 10,846
- Italy: 1,555
- France: 717
- Switzerland: 638
- Czech Rep.: 554
- United Kingdom: 523
- Austria: 444
- Sweden: 282
- Poland: 277
- Belgium: 268
- Denmark: 204
- Slovakia: 152
- Spain: 140
- Norway: 139
- Finland: 123
- Hungary: 84
- Portugal: 71
- Lithuania: 64
- Greece: 59
- Luxembourg: 36
- Ireland: 30
- Bulgaria: 29
- Romania: 28
- Serbia: 26
- Croatia: 23
- Estonia: 18
- Cyprus: 13
- Slovenia: 11
- Greece: 7
- Iceland: 4

* (data from previous year)
European Biomethane Industry

- Including Anaerobic digestion *followed by biogas upgrading*

- Including *Gasification of renewable organic matter followed by syngas conversion to biomethane*

- Including other technologies *producing methane fuel from biogenic carbon or utilizing biological pathways* (Power-to-Gas)
Biomethane Sustainability Elements

- Environment protection
- Air Quality
- Renewable Energy
- Local Value Creation
- Waste Utilisation
- Recycling of Nutrients
Distribution of the Biomethane Plants in 2015

- Germany: 185
- Sweden: 61
- United Kingdom: 47
- Switzerland: 35
- the Netherlands: 21
- France: 20
- Austria: 13
- Denmark: 12
- Finland: 10
- Norway: 8
- Italy: 6
- Luxembourg: 3
- Hungary: 2
- Iceland: 2
- Spain: 1
Evolution of the Number of Biomethane Plants in Europe

- **2011**: 187 existing plants
- **2012**: 187 existing plants, +24% new plants, total 45
- **2013**: 232 existing plants, +22% new plants, total 50
- **2014**: 282 existing plants, +30% new plants, total 85
- **2015**: 367 existing plants, +16% new plants, total 59

*Note: The chart shows the evolution of the number of biomethane plants in Europe from 2011 to 2015, with an increase in both existing and new plants each year.*
Biomethane as a transport fuel in Europe

- Biomethane produced by AD and used for transport in: Austria, Finland, France, Germany, Iceland, Netherlands, Norway, Sweden, Switzerland, UK
- Biomethane produced by gasification and used for transport in: Sweden
  - GoBiGas can supply 16,000 vehicles

- Political/legal support in the EU for biomethane’s transport use:
  - Targets for advanced biofuels
  - Reduce emissions in non-ETS sectors (including transport) by 30% by 2030 when compared to 2005
  - Clean power for transport – fight oil dependence
    - Directive on Alternative Fuels Infrastructure
    - (Clean Vehicles Directive)
### Status quo – biomethane as a transport fuel

<table>
<thead>
<tr>
<th>Country</th>
<th>Total annual biomethane production (AD) Mio Nm3</th>
<th>Biomethane used in transport (of all biomethane production)</th>
<th>Share of renewable gas of transport gas</th>
<th>Number of renewable gas filling stations (Compressed + Liquefied)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>10.3</td>
<td>23%</td>
<td>35%</td>
<td>26 + 1</td>
</tr>
<tr>
<td>Germany</td>
<td>897.7</td>
<td>7%</td>
<td>Approx. 20%</td>
<td>308 + n/a</td>
</tr>
<tr>
<td>Iceland</td>
<td>n/a</td>
<td>100%</td>
<td>100%</td>
<td>5 + 0</td>
</tr>
<tr>
<td>Sweden</td>
<td>13</td>
<td>93%</td>
<td>73%</td>
<td>167 + n/a</td>
</tr>
<tr>
<td>Switzerland</td>
<td>35</td>
<td>17%</td>
<td>Approx. 25%</td>
<td>n/a</td>
</tr>
</tbody>
</table>

- Future markets with significant potential: Italy, France, UK
Challenges and opportunities in transport

• Opportunities
  ➢ Biomethane can be produced sustainably anywhere in Europe
    ➔ security of supply
    ➔ GHG emissions savings up to 206%
  ➢ No blending restrictions with natural gas
  ➢ Mature technology + existing infrastructure
  ➢ Suitable to different types of vehicles + maritime sector
  ➢ Lack of alternative fuels in the transport sector
Biogas/Biomethane Potential (Anaerobic Digestion + Gasification)

Biogas/Biomethane* potential
*upgraded biogas and gasification  **projected potential share of total biogas upgraded to biomethane

- 0.3 Billion Nm³/year upgraded**  2% upgraded**
- 12 Billion Nm³/year  26% upgraded**
- 18 Billion Nm³/year  6.5 Billion Nm³/year
- 30 Billion Nm³/year  37.5% upgraded**

Grid, fuel
Electricity, heating and cooling

Source: GreenGasGrids, 2014
Challenges and opportunities in transport

- Challenges
  - European mass-balancing rules restricting cross-border trade
  - Insufficient number of gas vehicles + filling stations in many countries
  - Full political focus on e-mobility – where is the European technology neutrality??
  - Production costs vs. support schemes
  - Low public (positive) awareness – black and white thinking about biofuels
A solution:
EUROPEAN RENEWABLE GAS REGISTRY

The European natural gas network recognised as a single logistical facility regarding the injected biomethane

Mass balancing of biomethane consignment in professional, neutral and transparent manner

Transfer of sustainability characteristics of the individual biomethane consignments
Vision and Mission

MISSION

Building on national renewable gas registries to establish an independent, transparent and trustworthy documentation scheme for cross border transfer and mass balancing of renewable gas injected into the European natural gas network securing the exclusion of double sale and double counting.

VISION

Renewable gas will be increasingly produced and traded cross border in an integrated European market through the natural grids network reaching all end customer segments.

GOAL

To be recognized by the European Commission as a voluntary scheme under the Renewable Energy Directive 2009/28/EC.
ERGaR members

AT – AGCS Gas Clearing & Settlement AG
BE – European Biogas Association (EBA)
DE – German Energy Agency (dena)
  Landwärme GmbH
DK – Energinet.dk
  NGF Nature Energy
FR – Gas Réseau Distribution France (GrDF)
IT – Consorzio Italiano Biogas (CIB)
NL – STX Services B.V.
UK – Renewable Energy Assurance Ltd. (REAL)
CH – Swiss Association of Gas Industry (VSG)
• **Improved opportunities** for biomethane in general:

  - Measures and obligations to increase the use of renewables introduced for all energy sectors including transport
  - The transport sector:
    - Low-carbon fuels obligation from 1.5 % in 2021 to 6.8 % in 2030
    - Minimum sub-target for advanced biofuels from 0.5% in 2021 to 3.6% in 2030
  - Waste and residues recognised as feedstock for advanced biofuels
  - Mass-balancing for injection of biomethane into the natural gas grid
  - Guarantees of origin extended to renewable gas
Challenges

- High sustainability criteria for biogas and biomethane (capacity 0.5 MW el or higher): 70% GHG emissions reduction in transport; 80-85% in power & heat
- Soft treatment of fossil fuels; fossil-based fuels even included in the advanced biofuels obligation target!
- No long-term policies or measures (2030-2050)
- Vague wordings:
  - How to ensure the enforcement of obligations for fuel suppliers?
  - Further clarification needed for mass-balancing and guarantees of origin
• A general support from the EU for biomethane as a sustainable and alternative fuel
• The recognition of biogas/biomethane has significantly increased in the EU institutions over the past few years → improved policies and legislation
• Only a minority of produced biomethane used yet in the transport sector – however lots of potential and interest
• Primary (short-term) political challenges faced by EBA:
  ➢ European biomethane market
  ➢ Acknowledgement of biogas/biomethane’s sustainability + public acceptance
  ➢ Acknowledgement of the unique variety of benefits from biogas/biomethane industry

Conclusions
Thank you!

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