

26th World Gas Conference

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CURRENT BIOGAS PRODUCTION AND UTILISATION IN
THE MEMBER COUNTRIES OF IEA BIOENERGY TASK 37

Dr. Mattias Svensson
Energiforsk – Swedish Energy Research Centre



IEA Bioenergy comprises 10 tasks

- **Task 32: Biomass Combustion and Co-Firing**
- **Task 33: Thermal Gasification of Biomass**
- **Task 34: Pyrolysis of Biomass**
- **Task 36: Integrating Energy Recovery into Solid Waste Management**
- **Task 37: Energy from Biogas**
- **Task 38: Climate Change Impacts of Biomass and Bioenergy Systems**
- **Task 39: Commercialisation of Conventional and Advanced Liquid Biofuels from Biomass**
- **Task 40: Sustainable Bioenergy Markets and International Trade: Securing Supply and Demand**
- **Task 42: Biorefineries: Sustainable Processing of Biomass into a Spectrum of Marketable Biobased Products and Bioenergy**
- **Task 43: Biomass Feedstocks for Energy Markets**

Member countries of Task 37

- Austria
- Australia
- Brazil
- Denmark
- European Commission
- Finland
- France
- Germany
- Ireland
- Korea
- Netherlands
- Norway
- Sweden
- Switzerland
- United Kingdom

Current publications/work of IEA task 37

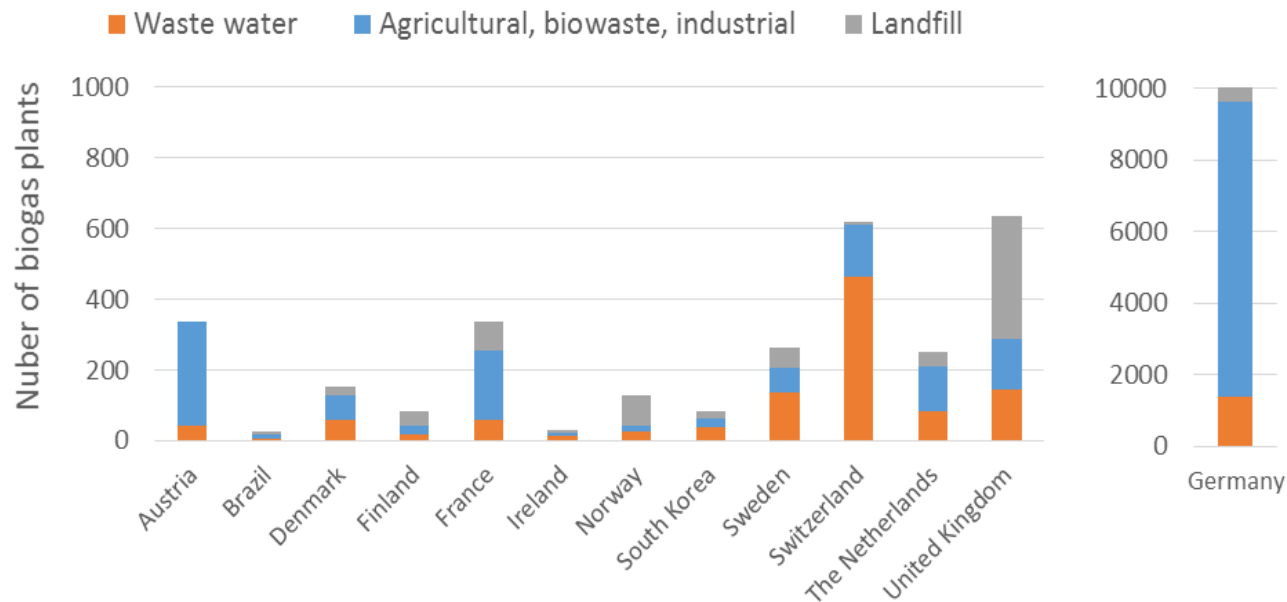
- Pre-treatments of feedstocks (published)
- AD process monitoring techniques (published)
- Economics of small-scale biogas production (2015)
- Source separation of food waste (published)
- Digestate upgrading techniques (2015)
- AD of algae (2015)
- The potential role of biogas in smart grids (published)
- Emissions monitoring and control (2015)
- AD of sewage sludge (2015)
- Success Stories and case studies

All publications can be downloaded at www.iea-biogas.net!

New work programme topics 2016-18

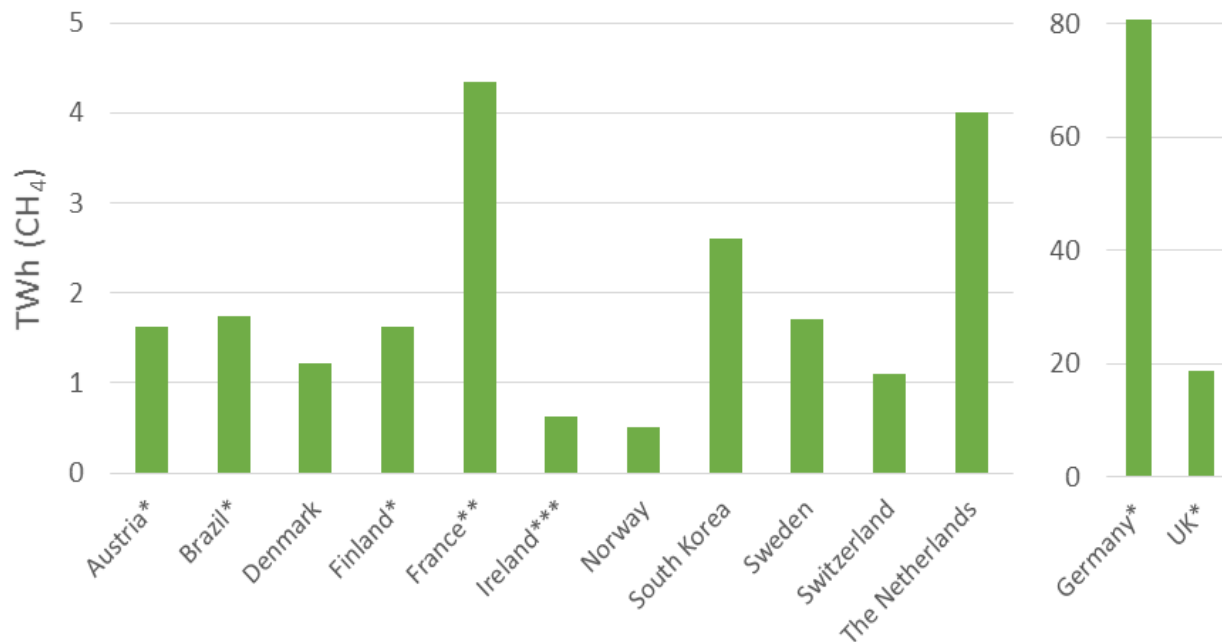
- Substrates and reactor configurations
- International approaches for local sustainable AD (without financial support)
- Grid injection, smart grid, greening of the gas grid and local grids
- Externalities (socio-economic aspects, etc)
- Best Practice Guidelines

Biogas plants in IEA member countries 2013



European Biogas Association (EBA) stats: In total around 15,000 biogas plant in Europe

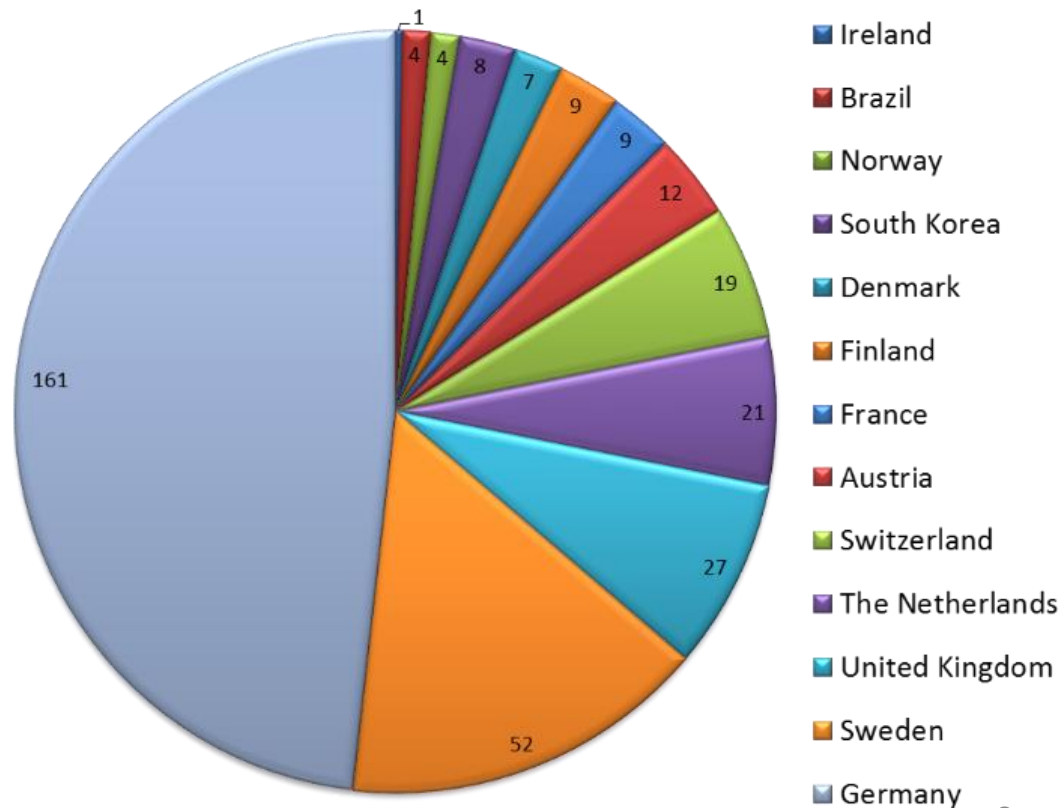
Biogas production in IEA member countries 2013



EBA: In total around 150 TWh in Europe
DBFZ: Total potential in EU27 1,500 – 2,500 TWh

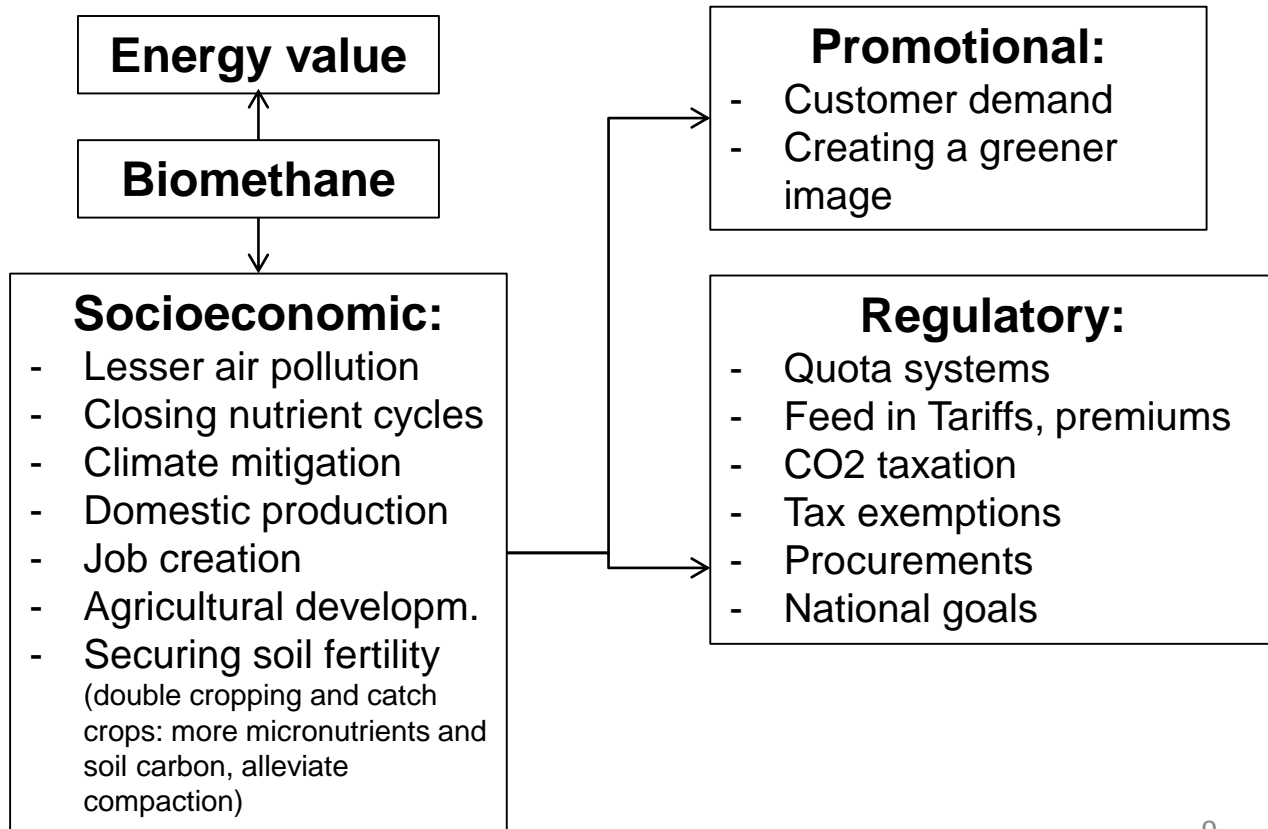
Biogas upgrading plants in IEA task 37 countries

- More than 300, across the world at least 100 more...
- Competitive market → investment and operational costs of all suppliers decreasing



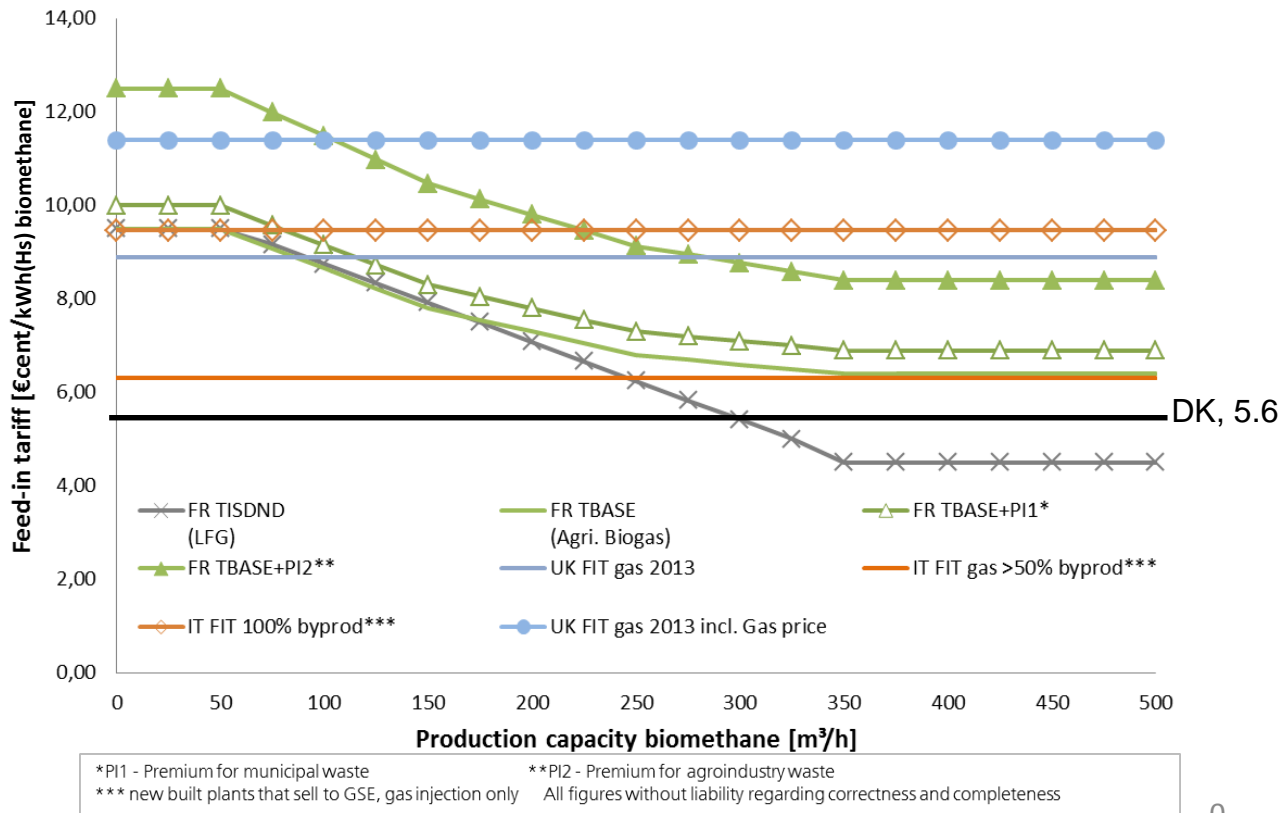
Drivers spelled out: Biomethane positive externalities

- To consider the wider picture is important in order for biomethane production to be worthwhile



Biomethane Feed-in Tariffs in UK, FR, IT, DK 2013

- Policy driven markets: Market expansion if policies are beneficial
- Break-even points probably lower (UK market is exploding)
- But maybe correct if considering positive externalities?



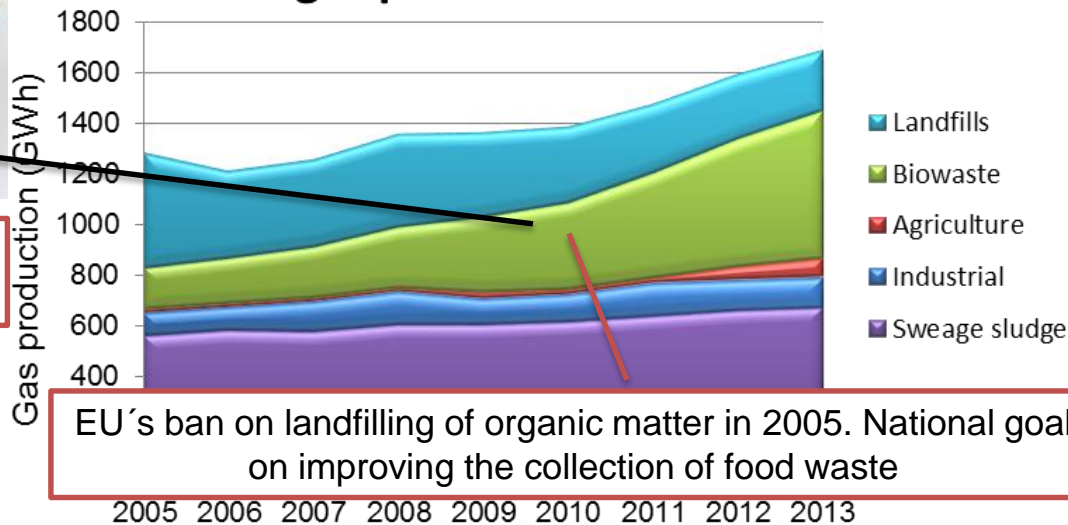
Biogas production Sweden 2005-2013

264 biogas plants → 1.7 TWh biogas (2012)



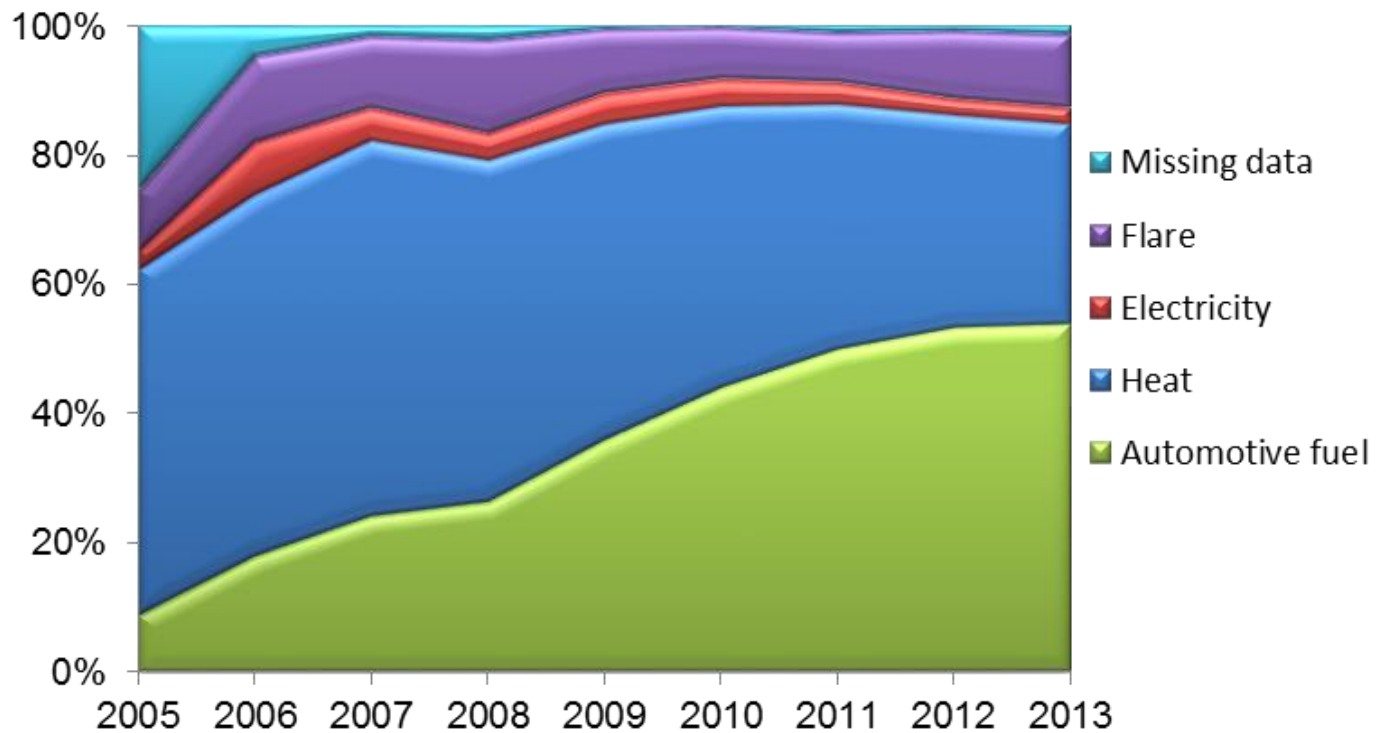
30 000 ton 2005 –
307 000 ton 2013

Biogas production 2005-2013

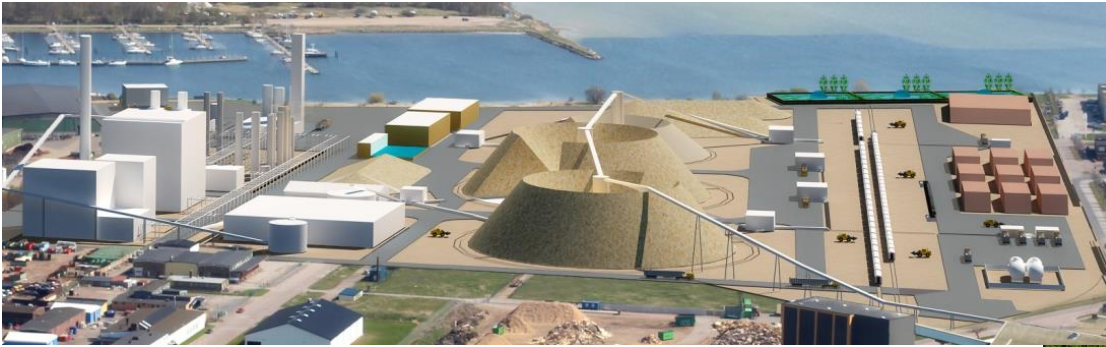


Food waste collection in 190 of Sweden's 290 municipalities

Biogas utilisation in Sweden 2005-2013



Large industrial plants/projects in Sweden



GoBiGas – Bio-SNG plant in Gothenburg

Producing biomethane by gasification
Injection into the transmission gas grid (30 bars)
Feed stock: Forest residues

Phase 1 - Demonstration

20 MW_{bio-SNG} (160 GWh/yr) + heat
Cost: 160 M€
(24 M€ from Swedish Energy Agency)

Phase 2 – Full scale

80 - 100 MW_{bio-SNG} (640 - 800 GWh/yr) + heat
Cost: 325 M€
(NER300 support 59 M€ available)



Status

Injection into the transmission grid since December 2014
Decision for initializing phase 2 will be taken when phase 1 is proven successful

Bio2G – possible future bio-SNG plant

Production capacity: 200 MW_{bio-SNG} (1,6 TWh/yr) + heat & electricity

Feed stock: forest residues

Project owner: E.ON

Investment cost: 450 M€, (NER300 support 203 M€ available)



Project is awaiting decision on the long-term policy instruments for biofuels

Lidköping Biogas – 1st LBG plant in Sweden

Production capacity: 60 GWh/yr

Energy for condensation:
≈ 1 kWh per Nm³ biomethane
(Reverse Nitrogen Brayton Cycle)

Investment cost:
160 M SEK (~ 17-18 M€)

Feed stock:
Residues from local food industry
and grain handling

Operational since: April 2012

Project owner:
Swedish Biogas International,
Göteborg Energi AB and the
municipality of Lidköping



For more information,
<http://www.lidkopingbiogas.se/>

Thank you for your attention!

- More information about Task 37 Energy for biogas: www.iea.biogas.net
- More information about Energiforsk – Swedish Energy research Centre:
www.energiforsk.se
www.sgc.se
www.conference.sgc.se