Institutional framework

- Tax on incineration of household waste – 50 €/ton (July 06), reduction to 10 € possible (high $\eta_{el}$)

- 34 M€ in climate investment 2006, 40 % to biogas projects

- Green certificate – target 17 TWh 2016 (now 5 TWh), system extended until 2030.

- Compulsary to provide biofuels at filling stations, 5 &10 M€ 2006/2007 as 30 % investment help for biogas.
Institutional framework

- January - August 2006 13% of all new cars were Eco-cars (3 % last year).

- Reduced tax on new biogas cars in October 2006 (30%)

- Swedish Board of Agriculture look at validation methods according to EC 208/2006 to enable alternative hygienisation methods of ABP (January 2007).
Government policy on Environmental Targets - September 2006

- 35% of all governmental cars should be Eco friendly 2006. 75% of all new cars.

- Governmental commission for reduction of oil dependency – reduce oil for road transport with 40-50 % to 2020 (report June 2006)

- Investigation analysing Swedish agricultures potential to produce bioenergy (report February 2007)
R & D

- SNG-production from solid biomass
- Measurement of methane losses from landfill (IR)
- Software for optimizing of biogas process
- Analysis of methane emissions from post treatment of digestate
- Optimisation of gas production from sewage sludge
- Optimisation of biogas process (influence of nutrients)
- Biogas production from sugar beet
- Affects on soil after use of bio fertilizer
- Evaluation of LCNG filling stations (Liquefied to Compressed Natural Gas)
Other

- 10 year anniversary – Biogas to vehicle fuel in Trollhättan

Cheap vehicle fuel at the 10 year anniversary in Trollhättan.

0.1 €/Nm³
Development of gas vehicle market

NGV in Sweden
(Source: Swedish Gas Association)

Number of vehicles

<table>
<thead>
<tr>
<th>Year</th>
<th>HD vehicles</th>
<th>Buses</th>
<th>LD vehicles</th>
<th>Total</th>
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September 2006
Development of market for CNG/CBG

Delivered volumes of methane gas
(Source: Swedish Gas Association)

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<th>Year</th>
<th>Biogas</th>
<th>Natural gas</th>
<th>Total</th>
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Biogas and Landfill Gas - 2005

- Sweden only have national statistics of biogas from co-digestion and landfill
- Project started to gather national statistic of all biogas production
- Co-digestion plants
  - 15 plants in operation
  - 260,000 ton of organic material
  - 11% household waste, 28,000 ton
  - 98% of digestate used as fertilizer
  - 160 GWh biogas
- Landfill Gas
  - extracted at about 70 sites
  - 410 GWh

Source: The Swedish Association of Waste Management
September 2006

Selected news from SE biogas plants

- Norrköping - new biogas plant with raw material from ethanol plant, biogas used for vehicles
- Bjuv – new plant under construction (25 GWh/year) manure and organic industry waste, upgrading with PSA and injection into the gas grid
- Jönköping - co-digestion of OFMSW planned
- Trollhättan - new plant for plants studied
- Lidköping – new plant for organic waste from food industry studied
- Stockholm - 20 new garbage trucks on biogas, large scale biogas production (100 GWh/year) investigated by JTI
Selected news from SE biogas plants

- Laholm - upgrading plant reconstructed (water scrubber)
- Skellefteå - new upgrading plant (sewage)
- Kristianstad - new upgrading plant - 1,8 M€ - 600 m3/h
- Gothenburg - new upgrading plant - 1400 m3/h - CIRMAC - injection into LP grid - ready dec 2006
- Örebro, Östersund, Falköping, Lund, Helsingborg – new upgrading plants (sewage)
Relevant Q’s

- Transport costs - documentation of transport
- Possibilities to spread digestate
- European certification system for digestate
- Technologies for spreading of wet digestate
- Pretreatment of MSW
- Characterisation - digestion properties
- Hygienisation – alternative technologies
- Methodes for desinfection of transport vehicles
- Data on utilisation of digestate
- N2O from waste treatment
- GHG emissions from biogas systems
- Local biogas grid
- Voluntary agreement GHG emissions