Country report Sweden
## The Swedish biogas situation (2009)

<table>
<thead>
<tr>
<th>Type of plant</th>
<th>Number</th>
<th>Production (TWh/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal sewage treatment plants</td>
<td>136</td>
<td>0.605</td>
</tr>
<tr>
<td>Landfills</td>
<td>57</td>
<td>0.335</td>
</tr>
<tr>
<td>Co-digestion plants</td>
<td>21</td>
<td>0.299</td>
</tr>
<tr>
<td>Farm plants</td>
<td>12</td>
<td>0.018</td>
</tr>
<tr>
<td>Industrial wastewater treatment plants</td>
<td>4</td>
<td>0.106</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td><strong>230</strong></td>
<td><strong>1.363</strong></td>
</tr>
</tbody>
</table>
Biogas upgrading in Sweden

• In Sweden today:
  – Water scrubber (33)
  – PSA (8)
  – Chemical absorption (6)
  – Cryogenic (1)
Utilization of biogas in Sweden (2009)
Sold amounts of vehicle gas
Factors affecting the market I

- Taxes
  - Energy tax
  - Carbon dioxide tax
  - Carbon dioxide differentiated vehicle tax
  - Reduced fringe benefits tax for cars
- Market-based mechanisms
  - Carbon emission trading
  - Electricity certificates
Factors affecting the market II

• Support systems
  Investment grants (100 million SEK)
  LIP KLIMP
  Support for filling stations
  Investment grant within agriculture (300 million SEK)
  Green car premium
  Discount on vehicle tax
  Free parking and local support

• Regulations
  Law about renewable fuel at filling stations
Biogas strategy

- Presented 31st of August 2010
- Some conclusions:
  - Biogas from waste gives unique benefits
  - Biogas from manure gives large environmental benefits; manure bonus
  - The potential is 3-4 TWh annually
  - Continued research and development; gasification
Manure bonus

• Suggested in the Biogas Strategy
• 0.20 kr /kWh produced energy from manure = 2 Eurocents/kWh
• Is given due to avoidance of methane emissions from manure
• Not decided yet
News and plans

• First public filling station with LMG (Oct. 2010)
• LNG –terminal in Nynäshamn (close to Stockholm) will open (May 2011)
• First upgrading plant for landfillgas (2012)
Research and Developement, some ongoing SGC-projects

- Impurities in biogas
- Biogas from lignocellulose
- Kitchen waste disposers for biogas production
- Development of siloxane analysis
- Dry digestion of waste streams from food waste pretreatment
- Handbook for methane potential measurements
- Two-stage digestion of sewage sludge
- Increased biogas production by more efficient treatment of sewage sludge
- Technical and economical evaluation of vehicle gas production on farms
- Evaluation and development of measurements of methane emissions
- Evaluation of the Swedish standard for upgraded biogas
Research and Development, some recently finished SGC-projects

**SGC Report Biogas folder 2011**
Anneli Petersson 2011

**SGC Rapport 225 Market potential for metan-diesel engines for machinery, trains and boats**
Staffan Johanesson, Lotta Göthe 2011

**SGC Rapport 226 Demonstration of collection of foodwaste from restaurants**
Mimmi Bissmont 2011

**SGC Rapport 227 Handbook methane measurements**
Magnus Andreas Holmgren 2011

**SGC Rapport 223 ComfortPower Design, construction and evaluation of a combined fuel-cell and heat pump system.**
Fredrik Silversand, Catator AB 2010

**SGC Rapport 222 Green LPG**
Christian Hulteberg, Jan Brandin, Andreas Leveau 2010

**SGC Rapport 221 Digestate treatment – technologies and suppliers**
Carl Dahlberg 2010
Thank you for your attention!

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