Country report
Sweden
Tobias Persson, 18th of April 2012, Moss Norway
## Existing biogas plants (2010)

<table>
<thead>
<tr>
<th>Biogas plants</th>
<th>Number</th>
<th>Energy production [GWh/year]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater treatment plants</td>
<td>135</td>
<td>614</td>
</tr>
<tr>
<td>Co-digestion plants</td>
<td>18</td>
<td>344</td>
</tr>
<tr>
<td>Farm plants</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Industrial wastewater</td>
<td>5</td>
<td>114</td>
</tr>
<tr>
<td>Landfills</td>
<td>57</td>
<td>298</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td><strong>229</strong></td>
<td><strong>1 387</strong></td>
</tr>
</tbody>
</table>
## Estimated potential

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Potential biogas production with limitations* [TWh]</th>
<th>Total biogas potential [TWh]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food wastes</td>
<td>0.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Wastes from parks and gardens</td>
<td>0</td>
<td>0.4</td>
</tr>
<tr>
<td>Industrial waste and residues (including food industry)</td>
<td>1.1</td>
<td>2.0</td>
</tr>
<tr>
<td>Sludge from wastewater treatment plants</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Agricultural residues and manure **</td>
<td>8.1</td>
<td>10.8</td>
</tr>
<tr>
<td><strong>Total potential</strong></td>
<td><strong>10.6</strong></td>
<td><strong>15.2</strong></td>
</tr>
</tbody>
</table>
Current situation

• Little financial support from the government
  (Electricity certificates (2-3 cent/kWh electricity), some investment support for agricultural AD)

• Only few new project will be initiated

• Digestate has to get a value

• Upcoming question: Increased import of biogas from other countries?
Digestate certification

• REVAQ for digestate from wastewater treatment plants, 45% was certified 2012
• The certification of digestate from waste is described in SPCR120, 92% was spread on arable land in 2010
• Similar demands for heavy metals
Upgrading plats

• Around 50 plants
• New plants, Amine- and Water scrubber
• Some older PSA units
• Two cryogenic upgrading plants, not working yet
• New cryogenic plant 2013, 130 GWh (also landfill gas)
• A new plant will soon be producing 60 GWh LBG. Upgrading with water scrubbing
Vehicle gas consumption

Total energy consumption in Sweden

- Oil: 183 TWh
- Bio: 127 TWh
- Hydro: 66 TWh
- Nuclear: 149 TWh

Why is biogas used as vehicle gas in Sweden (1)?
Electricity production in Sweden

Why is biogas used as vehicle gas in Sweden (2)?
Sustainability criteria

• May not have destroyed areas of high biological value
• May not have given rise to excessive emissions of greenhouse gases
  • 35% lower than a fossil alternative
  • 50% lower 2017
  • 60% lower 2018

• Sustainable fuel = no carbon dioxide or energy tax
Thank you!

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