## Biogas Plant Inventory

*Number of Plants*

### Number of plants (2011)

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>80 plants</td>
</tr>
<tr>
<td>Biowaste</td>
<td>28 plants</td>
</tr>
<tr>
<td>Industrial waste water</td>
<td>22 plants</td>
</tr>
<tr>
<td>Waste water treatment plants</td>
<td>~463 plants (about 60 with codigestion)</td>
</tr>
</tbody>
</table>
Biogas Plant Inventory

Gross gas production

![Graph showing gross gas production from 2001 to 2011 for different categories: Agriculture, Industrial waste water, Biowaste. The production has increased significantly over the years.]
Biogas Plant Inventory

*WWTP – gross gas production*

![Bar chart showing gross gas production from 2001 to 2011.](chart.png)
Biogas Plant Inventory

Upgrading plants

Gross gas production for upgrading [GWh/year]
New biogas plants (2012)

Agriculture

• **Bellechasse**  
  March 2012, 16,000 tpy, CHP

• **Düdingen**  
  February 2012, 35,000 tpy, CHP

• **Chézard St. Martin**  
  January 2012, 7,500 tpy, CHP

• **Zwillikon**  
  July 2012, CHP (60 kW)

• **Cernier**  
  August 2012, CHP (120 kW)

• **Ferpicioz Le Mouret**  
  September 2012, CHP (250 kW)

WWTP

• **Satigny**  
  June 2012, 25,000 tpy, CHP

• **Frutigen**  
  June 2012, codigestion, CHP
Biogas plants under construction/revision

**Agricultural installations**
Bure, Cournillens, Meiringen, Gutenswil (all CHP)

**Biowaste**
Vétroz (CHP)

**WWTP**
Revision of gas transformation:
- Geneva / Aïre: gas upgrading planned for 2013
- Zurich / Werdhölzli: separated digestion of sludge and biowaste, biggest upgrading unit in CH planned
03.11.2012: Fire in a biogas plant

Green Power Uri

- Fire in hall for substrate and digestate storage
- Digester and gas storage not affected
- Cause of the fire unknown (at time of this report)
- Severe damage, if and when operation continues is not clear
Financial support systems

Feed-in tariff for electricity

<table>
<thead>
<tr>
<th>Power class</th>
<th>≤ 50 kW</th>
<th>≤ 100 kW</th>
<th>≤ 500 kW</th>
<th>≤ 5 MW</th>
<th>&gt; 5 MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic tariff [CHF/kWh]</td>
<td>0.28</td>
<td>0.25</td>
<td>0.22</td>
<td>0.185</td>
<td>0.175</td>
</tr>
<tr>
<td>Agricultural bonus [CHF/kWh]</td>
<td>0.18</td>
<td>0.16</td>
<td>0.13</td>
<td>0.045</td>
<td>0</td>
</tr>
<tr>
<td>Heat bonus [CHF/kWh]</td>
<td>0.025</td>
<td>0.025</td>
<td>0.025</td>
<td>0.025</td>
<td>0.025</td>
</tr>
<tr>
<td>Maximum [CHF/kWh]</td>
<td>0.485</td>
<td>0.435</td>
<td>0.375</td>
<td>0.255</td>
<td>0.20</td>
</tr>
</tbody>
</table>

In Swiss currency! 1 Euro ≈ 1.2 CHF

Found for biomethane injection
- Voluntary support programme by the Swiss Gas Association
- Objective: injection of 300 GWh biomethane within 6 years

http://www.erdgas.ch/biogas/foerderung-der-biogas-einspeisung/

Certificates for emission compensation
Projects reducing GHG emissions can get financial support

Current studies and research projects

**MBR II : Digestion of manure and co-substrates**
Efficiency improvement for economic and space savings. 2007 - 2012
J.L. Hersener/ Hersener Ingenieurbüro, U. Maier/MERITEC, U. Baier et al./ ZHAW

**Sources of odour emissions on biogas plants**
Identification and quantification of odour emissions on agricultural biogas plants. 2009 – 2012
R. Zah/EMPA

**Post-treatment of digestate**
Evaluation of energy consumption, emissions, nutrients and hygienic aspects. 2011 – 2013
H. Engeli/ Engeli Engineering
Current studies and research projects

**Mini-Biogas**
Identification and evaluation of technologies for small-scale digestion. 2012 – 2013
Y. Membrez/ EREP

**Development of a model for odour emissions of biogas plants**
The model for odour emissions should serve to planners, investors and authorities to foresee possible problems. 2009 – 2011

**Methane losses at biogas plants**
Identification of the main sources of methane losses. 2009 – 2011
M. Schick/ ART
Studies and research projects

Published reports 2012

- Measures for optimisation of AD through preatments, technology- and process engineering and other additives. Hersener / (Ger)
- LCA for biomass recovery. F. Dinkel /Carbotech (Ger)
- Energy self sufficient wast water treatment plant. Gabathuler H./ Abwasserverband Vorderes Prättigau (Ger)
- Improvement of standardised digestion tests in batch reactors. C. Holliger /EPFL (F)
- LCA: utilisation of catch crops for biogas production. Hayer et al. (Ger)
- LCA : Biogas production from different substrates. N. Jungbluth/ ESU-services (EN)

Link to publications:
QM Biogas

Quality Management for Biogas Plants

Folder with checklists

Objectif:
Improve quality of existing and future biogas plants over their whole lifecycle

Scope:
• Construction and operation of biogas plants
• Planners, constuctors, operators and controllers
• Broad information
• Checklists

Languages:
German & French
Energy strategy 2050

Main direction

• Abandonment of nuclear energy production
• Focus on energy efficiency and renewable energies
• If necessary, additional fossil energy sources and imports
• Development of the energy grid
• Reinforcement of energy research