

# IEA Bioenergy Task 37

*Energy from Biogas*

## Swiss Country Report

Seoul – November 2013

**ENB**

*Energie Conseil Bachmann*

Nathalie BACHMANN

ENB | Ch. du Cerisier 9 | 1004 Lausanne - Switzerland

[enbachmann@gmail.com](mailto:enbachmann@gmail.com)

# Biogas Plant Inventory

*Number of plants*

## Number of plants (end of 2012)

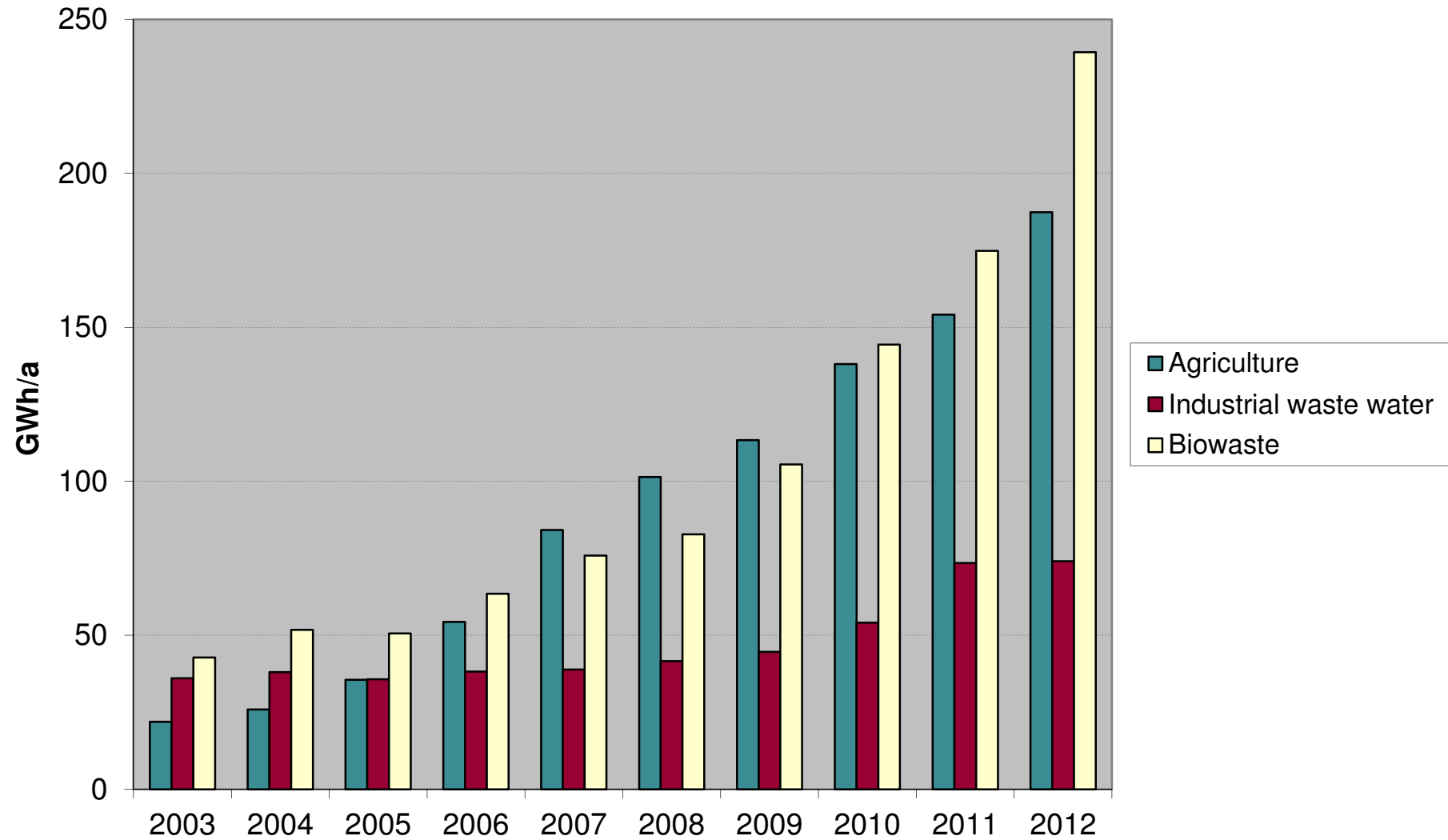
<b>Agriculture:</b>	89 plants
<b>Biowaste:</b>	26 plants
<b>Industrial waste water:</b>	22 plants
<b>Waste water treatment plants:</b>	~ 463 plants (282 with CHP)

**Detailed statistic data:**

[http://www.bfe.admin.ch/themen/00526/00541/00543/?dossier\\_id=00772&lang=de](http://www.bfe.admin.ch/themen/00526/00541/00543/?dossier_id=00772&lang=de)

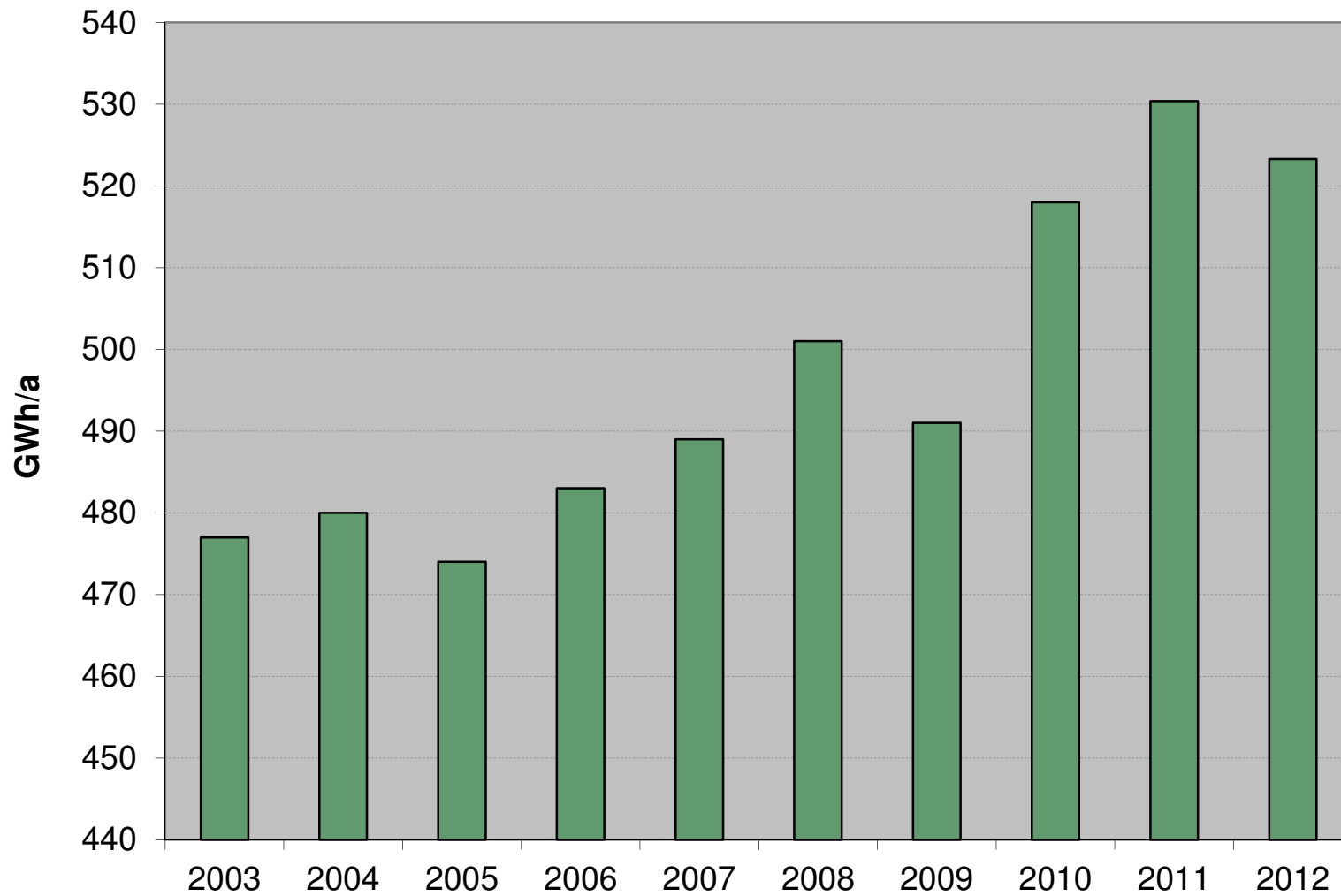
# Biogas Plant Inventory

*Gross gas production*



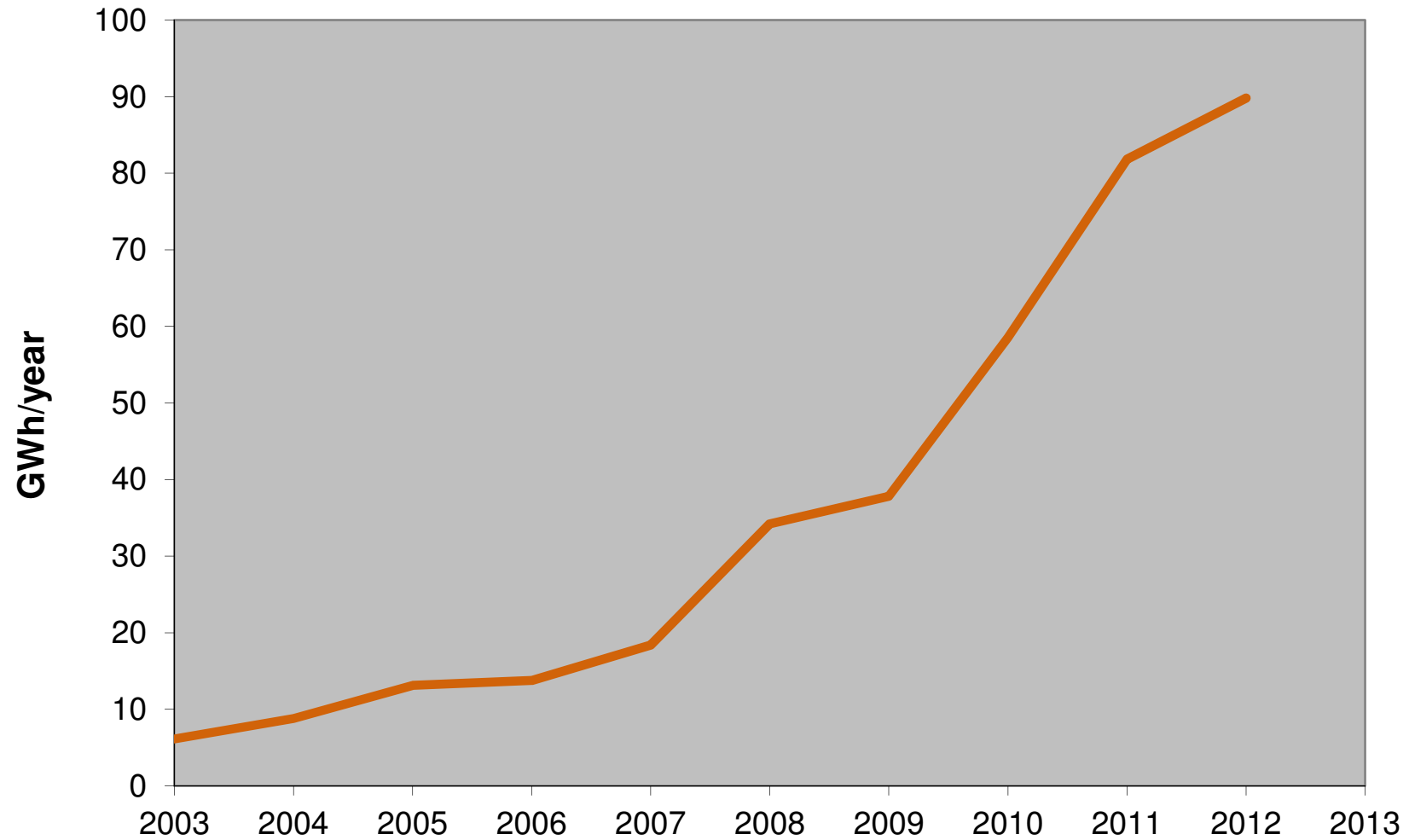
# Biogas Plant Inventory

*WWTP – gross gas production*



# Biogas Plant Inventory

*Upgrading plants*



# New biogas plants (2013)

## Agriculture

- **Bure** Feb 2013, CHP 360 kW
- **Gutenswil** Mai 2013, CHP 75 kW
- **Einsiedeln** June 2013, CHP
- **Seigneux** Aug 2013, CHP 150 kW
- **Densbüren** Aug 2013, CHP 120 kW
- **Seedorf** Sept 2013, CHP

## Biowaste

- **Zürich** Aug 2013, Upgrading

# Biogas plants under construction

## Agricultural installations

Cournillens (CHP)

## Biowaste

Vétroz (Kompogas, upgrading)

Winterthur (Kompogas, upgrading)

# Financial support systems

## Feed-in tariff for electricity from biogas

Power class	≤ 50 kW	≤ 100 kW	≤ 500 kW	≤ 5 MW	> 5 MW
Basic tariff [CHF/kWh]	0.28	0.25	0.22	0.185	0.175
Agricultural bonus [CHF/kWh]	0.18	0.16	0.13	0.045	0
Heat bonus [CHF/kWh]	0.025	0.025	0.025	0.025	0.025
<b>Maximum</b> [CHF/kWh]	<b>0.485</b>	<b>0.435</b>	<b>0.375</b>	<b>0.255</b>	<b>0.20</b>

## Fund for biomethane injection

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

[www.erdgas.ch/biogas/foerderung-der-biogas-einspeisung/](http://www.erdgas.ch/biogas/foerderung-der-biogas-einspeisung/)

## Certificates for emission compensation

Projects reducing GHG emissions can get financial support

[www.bafu.admin.ch/publikationen/publikation/00101/index.html?lang=de](http://www.bafu.admin.ch/publikationen/publikation/00101/index.html?lang=de)



# News and developments

## Blue BONSAI: in pilot stage

- Project: small scale biogas upgrading plant
- Capacities: 1 and 15 Nm<sup>3</sup>/h of upgraded gas
- Technology: membrane separation
- Markets: decentralized biogas filling station or injection into the gas grid
- Goals: pilot plants shall demonstrate the economic feasibility and reliability of plants smaller than 50 Nm<sup>3</sup>/h of upgraded gas



Blue BONSAI BB15, installed at an industrial biogas plant

### Contacts:

U. Oester, Apex AG, Däniken, Switzerland, [info@apex.eu.com](mailto:info@apex.eu.com) or  
S. Duttwiler, Duttwiler Energietechnik, Flurlingen, Switzerland, [info@reg-en.ch](mailto:info@reg-en.ch)

# News and developments

## **Biomethane import – administrative and tax barriers**

An important step towards eased import of biomethane through the natural gas grid has been made. National Council has voted in favour of a tax relief.

# Current studies and research projects

## Determination of methane production in laboratory

NB1

Comparison of laboratory BMP test results and real methane production in full-scale plants (2012 – 2014)

C. Holliger, EPFL (<http://lbe.epfl.ch/page-83701.html>)

## ORION – Organic waste management by automated small-scale AD

Development of an on-site organic waste treatment for SME ([www.project-orion.eu](http://www.project-orion.eu)). 7<sup>th</sup> framework programme



Source: [www.project-orion.eu](http://www.project-orion.eu)

## Mini-Biogas

Identification and evaluation of technologies for small-scale digestion (2012 – 2013). Y. Membrez / EREP

**Slide 11**

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**NB1**

Nathalie Bachmann, 26/09/2013

# Current studies and research projects

## Agricultural dry batch digestion

Pilot plant of a dry batch digester, fed with dry manure (2012 – 2014).

C. Morrier

## Hygiene of digestate

Tracking of pathogens in substrates from digester feeding until digestate spreading on agricultural fields (2012 – 2014). J. Fuchs / FIBL

## Membrane separation

Establishment of a pilot plant for small-scale biogas upgrading (2012 – 2014). U. Oester / Apex AG

## Post-treatment of digestate

Evaluation of energy consumption, emissions, nutrients and hygienic aspects (2011 – 2013). H. Engeli / Engeli Engineering

# Studies and research projects

## Published reports 2013

- Measurement of odour emissions and development of a odour-emission-model for biogas plants. Holger F. et al. / Ernst Basel & Partner
- Digestion of manure and Co-Substrates in a Membrane Bioreactor. Meier U. et al. / Meritec

***Link to publications:***

<http://www.bfe.admin.ch/forschungbiomasse/02390/02720/03176/index.html?lang=de>