

IEA Bioenergy

IEA Bioenergy Task 37

Country Report Austria

Rudolf Braun
26. 5. 2010



IEA Task 37 „Energy from Biogas and Landfill Gas“



Biogas Plant Inventory

Summary of AD Plants in Austria:

| | |
|------------------------|------|
| - Agriculture | ~350 |
| - Industrial | ~ 25 |
| - Sewage sludge | 134 |
| - Municipal (biowaste) | ~30 |
| - Landfill | 62 |

Note: a full plant list for the country will be needed in order to up-date the plant list on the website

Biogas Plant Inventory

Summary of Up-grading Plants in Austria:

| Plant / Location | In operation | Technique | Capacity (raw biogas) |
|-------------------------|--------------|--|--------------------------------------|
| Bruck / Leitha | Since 2007 | Gas permeation | 180 Nm ³ / hr |
| Pucking | Since 2005 | PSA | 10 Nm ³ / hr |
| Leoben | Since 2009 | Amine | 140 Nm ³ / hr |
| Linz | planning | | |
| St. Margarethen am Moos | Since 2007 | Membrane | 25 kg CH ₄ / hr (300 bar) |
| Eugendorf | Since 2008 | Blend of Methane (80 %) and biogas (20%) | 22 Nm ³ / hr |

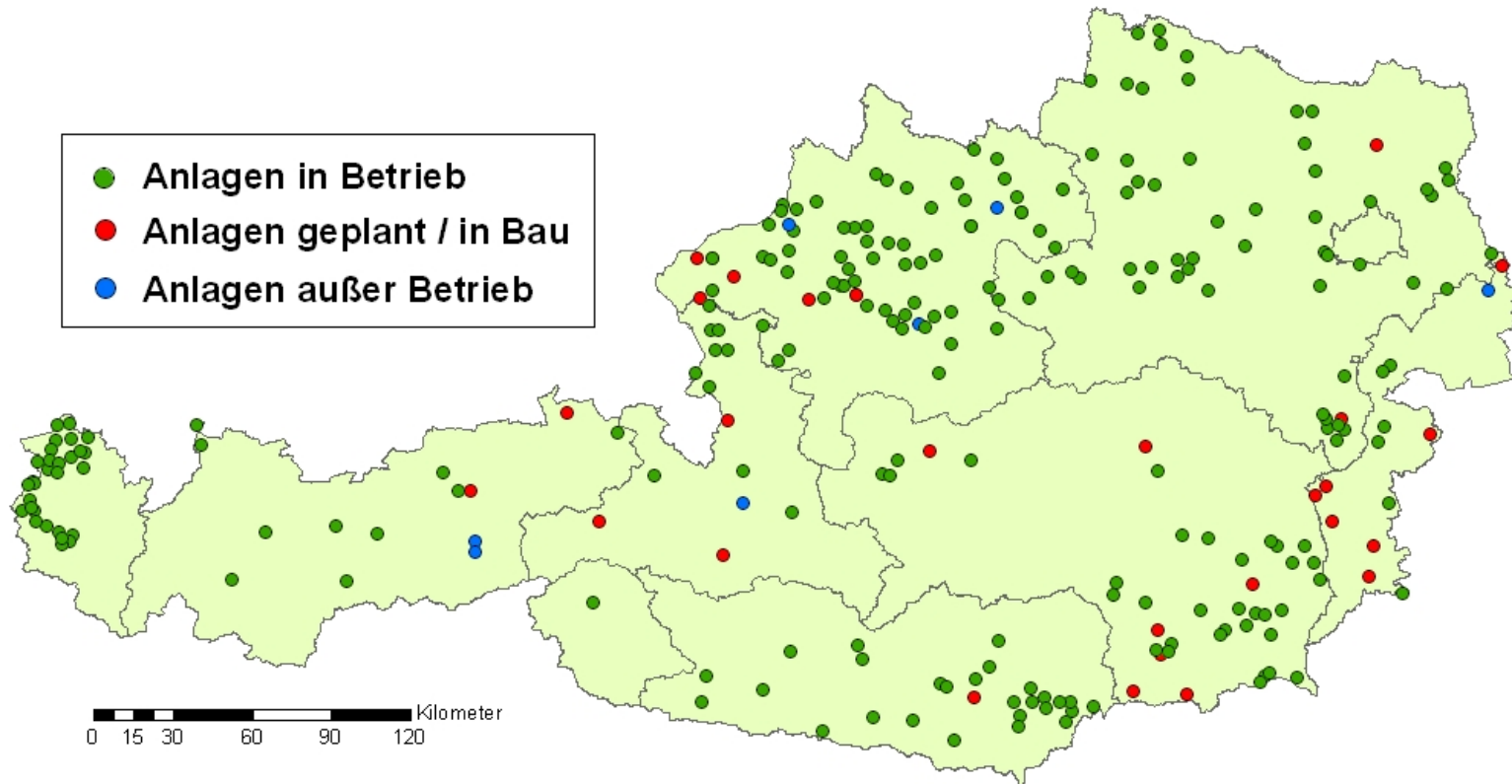
Note: a full up-grading plant list for the country will be needed in order to up-date the plant list on the website

Biogas Plant Inventory

Trends in numbers of AD Plants in Austria:
unchanged, ~ 350 Biogas plants (Agriculture)

Trends in numbers of Up-grading Plants in Austria:
**some few new plants,
in total 5 Biogas upgrading plants at work**

Plants at work (●), planned (●) and closed down (●)



Biogas Plant Inventory

Summary of Austrian Gas Production Data:

- Raw biogas production ~265-414 Mio m³/year
- Electricity production ~90 MW_{el}
- Amount of heat recovered unknown
- Up-graded to biomethane
 - **amount injected to natural gas pipeline:**
Bruck/Leitha: 800,000 m³ / year
 - **amount used as vehicle fuel:**
Margarethen am Moos: 215,000 kg CH₄ / year (300 bar)

Biogas Plant Inventory

Performance Data of representative Austrian biogas plants

| | |
|---------------------------|----------------------|
| - electrical efficiency | 31.8 % ¹⁾ |
| - total energy efficiency | 46.9 % ²⁾ |
| - emissions | no data |

1) Mean value from 40 plants investigated

2) Referred to the total energy contained in the produced biogas

Biogas Plant Inventory

Economic Data (if available):

- Investment costs
 - AD plant
 - Up-grading

- Operating Costs

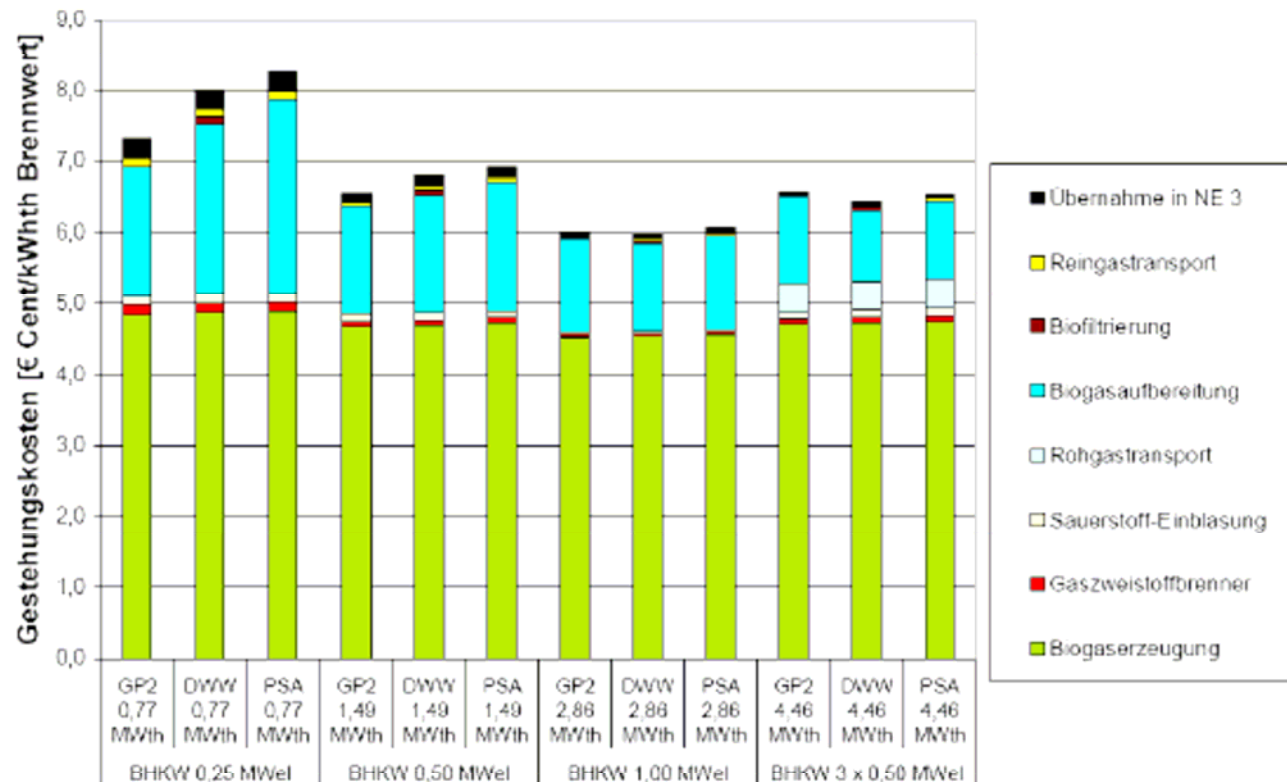
Distribution of the investment costs of a biogas plant

| | |
|--------------------------------|--------------------|
| Fermenter | 407.080 € |
| CHP (500 kW _{el}) | 316.070 € |
| Electrical installation | 287.750 € |
| Planning and commissioning | 184.600 € |
| Gasholder | 160.500 € |
| Substrate preparation & dosage | 107.330 € |
| Pumping equipment | 94.890 € |
| Heat exchanger | 86.900 € |
| Substrate storage & handling | 78.400 € |
| Miscellaneous | 217.180 € |
| Total | 1.940.700 € |

Production costs of biogas

Reinigung

Biogas



Quelle: Österreichische Energieagentur, Studie Erdgas und Bio-Methan als Kraftstoffoption(en) aus dem Erdgasnetz (2007)

Biogas Plant Inventory

Economic Support Data:

- Feed-in tariffs in Austria

From 2010 onwards just 3 instead of formerly 5 categories

18,5 Cent / kWh up to 250 kW_{el},

16,5 Cent / kWh from 250- 500 kW_{el}

13 Cent / kWh above 500 kW_{el}.

+ 2 Cent / kWh if biogas is upgraded

+ 2 Cent / kWh if heat is used properly

- Investment grants in Austria

Depend on local conditions

Biogas Plant Inventory

National Strategy/Support for Exploitation of Biogas in Austria:

- **renewable energy programmes according to EC guidelines**
- **no specific support for biogas**

Biogas Plant Inventory

Challenges:

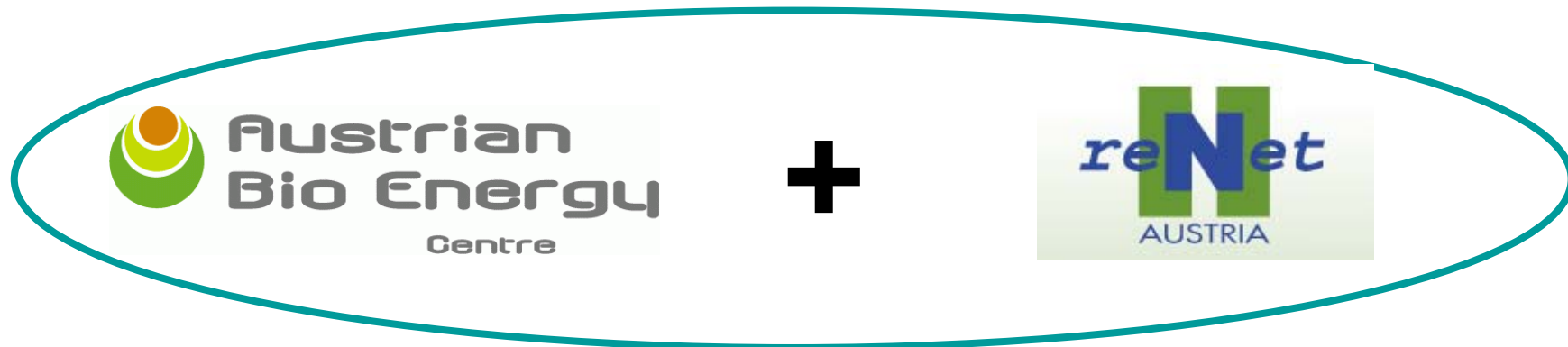
- AD plant permitting
Environmental protection (emissions, acceptance)
- Environmental licenses
- Grid connections (electricity, heat, gas pipeline)
Insufficient heat use
Refusal of some biogases by grid operators
- Digestate utilisation
Treatment / use in large AD plants
- Raw material costs
Interdependence on market prices

Biogas Plant Inventory

Research Activities:

- Main national and international projects

Competence centre Bio-energy 2020+



- **Kplus** centre of Competence
- pre-competitive research and industrial development in the field of “energetic utilisation of solid biomass”
- 70 company and 18 scientific partners
- 46 full time employees

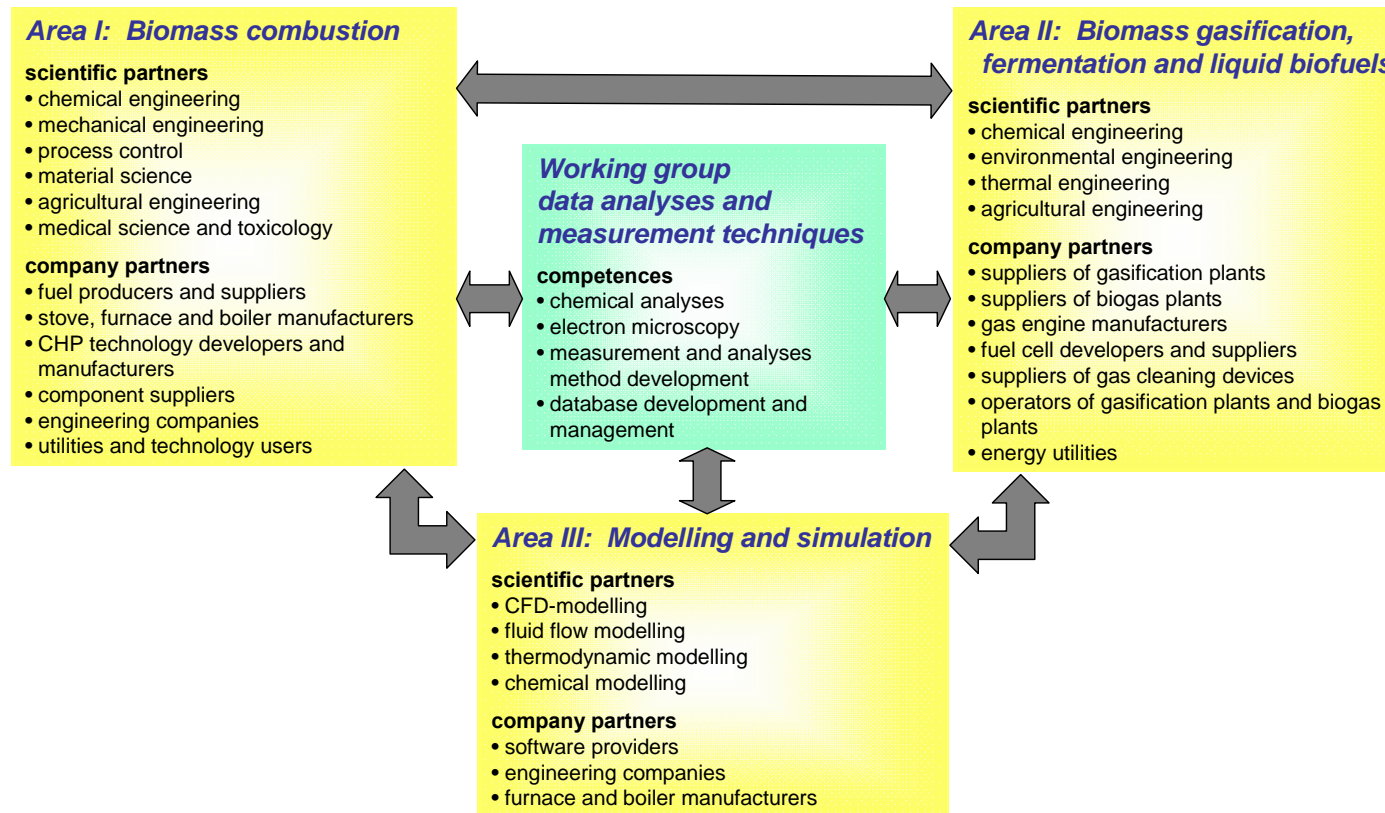
- **Knet** network of Competence
- biomass gasification, combined heat and power production based on gasification technologies as well as **biogas production and utilisation**
- 10 industrial and 3 scientific members and several co-operation partners from industry (3) as well as from science (6).
- 30 full time employees

Duration: 2008-2011 and after mid term evaluation 2012-2015

- **Co-funding provinces will be Burgenland, Lower Austria and Styria**
- **Scientific partners: 5%, company partners: 45% contribution**

| Funding | 2008 | 2009 | 2010 | 2011 | Total |
|----------------------------|------------------|------------------|------------------|------------------|-------------------|
| Federal | 666,667 | 875,000 | 1,500,000 | 1,500,000 | 4,541,667 |
| Provincial | 333,333 | 437,500 | 750,000 | 750,000 | 2,270,833 |
| Burgenland | 111,111 | 145,833 | 250,000 | 250,000 | 756,944 |
| Lower Austria | 111,111 | 145,833 | 250,000 | 250,000 | 756,944 |
| Styria | 111,111 | 145,833 | 250,000 | 250,000 | 756,944 |
| Scientific partners | 100,000 | 131,250 | 225,000 | 225,000 | 681,250 |
| Other public | | | | | 0 |
| Company partners | 900,000 | 1,181,250 | 2,025,000 | 2,025,000 | 6,131,250 |
| Cash Contribution | 450,000 | 590,625 | 1,012,500 | 1,012,500 | 3,065,625 |
| In-Kind Contribution | 450,000 | 590,625 | 1,012,500 | 1,012,500 | 3,065,625 |
| Total Funding | 2,000,000 | 2,625,000 | 4,500,000 | 4,500,000 | 13,625,000 |

- **BIOENERGY 2020+** covers three closely interlinked areas I, II & III.
- **BIOENERGY 2020+** will operate at Graz, Güssing and Wieselburg, the headquarters will be in Graz.



- The scientific consortium consists of 7 scientific and 35 company partners.
- The legal form of BIOENERGY 2020+ is a limited liability company.

The ownership of BIOENERGY 2020+ is as follows:

| | |
|---------------------------------|--------------|
| Graz University of Technology | 17.0% |
| Joanneum Research | 10.0% |
| Vienna University of Technology | 13.5% |
| FH Burgenland GmbH | 13.5% |
| BOKU University | 13.5% |
| Republic of Austria (FJ/BLT) | 13.5% |
| Association of company partners | 19.0% |

| | | | |
|--------|---|--------------------|-----------------|
| II-2-1 | Pretreatment - Improvement of Substrate Utilization Effectivity in Anaerobic Digestion | € 582,000 | UT IFA-Tulln |
| II-2-2 | Nitrogen Removal and Recovery | € 324,000 | |
| II-2-3 | Optimisation and Simulation – Kinetics of Anaerobic Digestion | € 294,000 | |
| II-2-4 | Integrated Biogas Upgrading with Enhanced Process Control | € 373,334 | |
| II-2-5 | Optimisation of biogas production from maize, sorghum, sugar beet and rye under dry climatic conditions | € 320,000 | ILT NA |
| II-2-6 | Biogas Upgrading by Using a Novel TSA-Process | € 380,000 | TU-Wien |
| II-2-7 | BIOGAS – polygeneration for small scale applications | € 533,000 | FH-Pinkafeld |
| II-2-8 | Not defined yet | € 1,193,666 | |
| | | € 4,000,000 | |

Forthcoming publication from IFA Tulln:

IFA-Tulln
Institut für Umweltbiotechnologie



»AD+PLUS«

Technologiebewertung von Gärrestbehandlungs- und
Verwertungskonzepten

Erstellt von:
A.o. Univ. Prof. DI Dr. Werner Fuchs
DI Bernhard Drosig

Tulln, Mai 2010

IEA Bioenergy

Gärresttagung 30.09.2010 IFA Tulln

| | |
|-------|--|
| 09:00 | Begrüßung W. Fuchs, B. Drosig, BOKU IFA-Tulln |
| 09:25 | Flaschenhals Gärrestverwertung P. Weiland, vll |
| 09:50 | Überblick über die Studie AD+Plus B. Drosig, BOKU IFA-Tulln |
| 10:15 | Trocknung/Vermarktung org. Dünger R. Baumann, Thermo Solar AG |
| 10:40 | Kaffeepause |
| 11:10 | Gärreste - Ausgangsmaterial für Qualitätskompost? E. Binzer, ABF-BOKU |
| 11:35 | Gärrestaufbereitung mit Membrantechnik L. Solinger, VP-Hottinger AG |
| 12:00 | Einsatzmöglichkeiten des ANASTrip-Verfahrens zur Gärrestaufbereitung U. Bauermeister, GNS mbH |
| 12:25 | Mittagspause |
| 13:25 | Erfahrungsbericht aus 2 Jahren ENBAAIR- Gärrestbehandlung M. Grassmug, Enbasys GmbH |
| 13:50 | Themische Behandlung von Gärresten einer Biogasanlage durch Vakuumindampfung B. Heider, C. Högström, ProBN GmbH |
| 14:15 | Rechtliche Bestimmungen der landwirtschaftlichen Verwertung von Biogasgülle und Gärückständen E. Pfundner, AGES GmbH |
| 14:40 | Technologievergleich und Kosten der Gärrestaufbereitung W. Fuchs, BOKU IFA-Tulln |
| 15:05 | Biologischer Aufschluss fester Gärreste zur Rückführung in den Biogas-Prozess H. Lindorfer, Schaumann Bioenergy GmbH |
| 15:30 | Kaffeepause |
| 16:00 | Retrospektive und Perspektive der Biogastechnologie R. Braun, BOKU IFA-Tulln |
| 16:30 | Schlussworte A. Wellinger, Nova Energie GmbH |
| 17:00 | Abendprogramm/Bufet |



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Thank you for your attention!

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