



TECHNISCHE
UNIVERSITÄT
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IEA FORSCHUNGS
KOOPERATION

Country Report Austria

IEA Bioenergy Task33 Meeting

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Lucerne, Switzerland

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Institute of Chemical Engineering

Working Group Zero Emission Technology

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Participation in IEA Bioenergy Task 33 is financed by

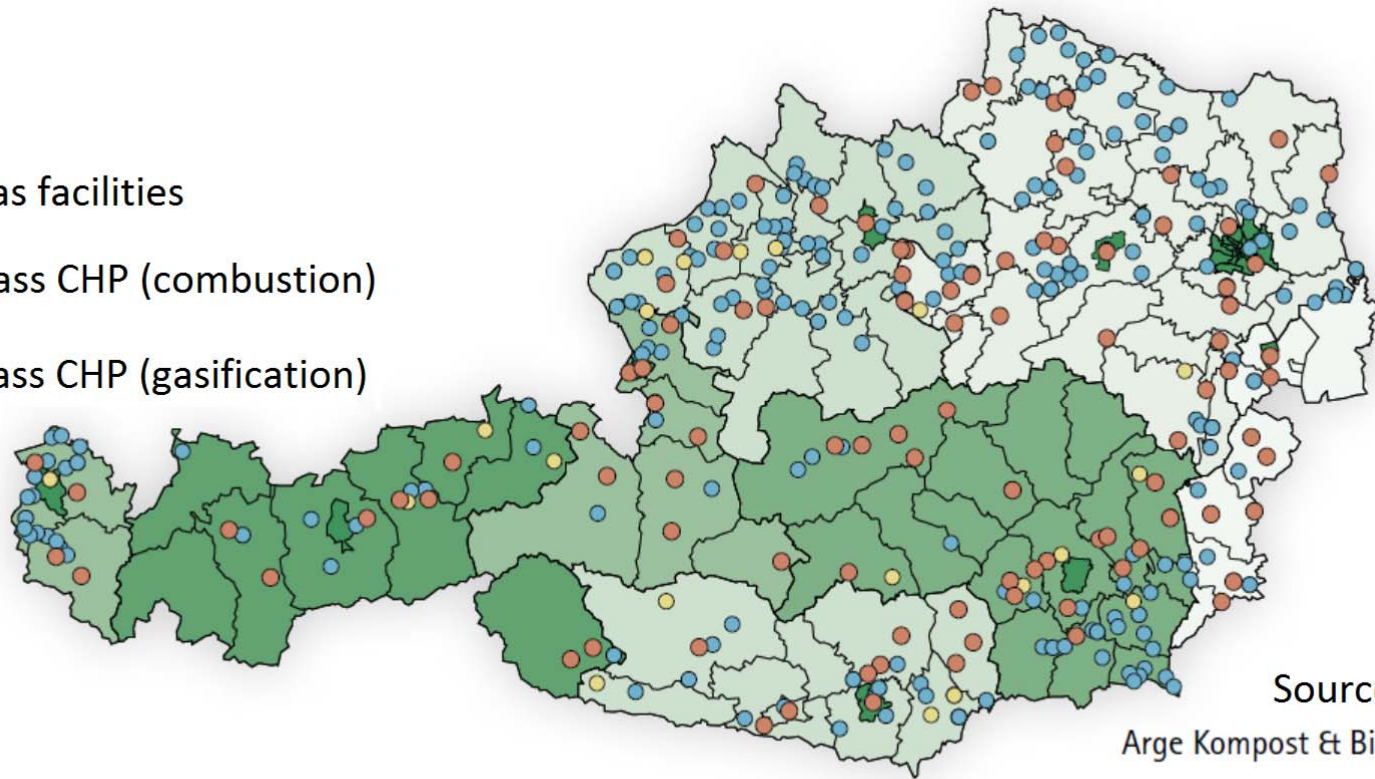


Content

- Statistics
- Research organisations
- Companies
- Implementations

Bio-gas and biomass CHP facilities (Status 2015)

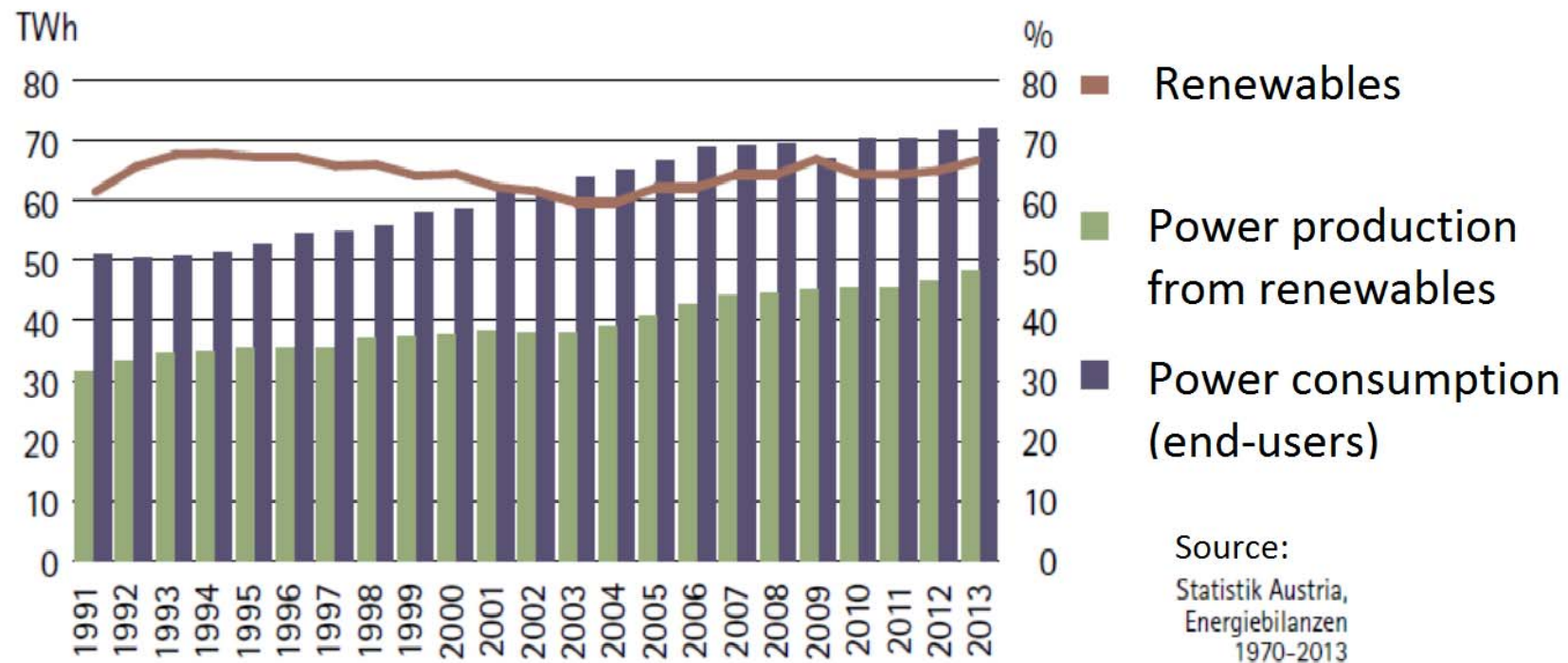
- Bio-gas facilities
- Biomass CHP (combustion)
- Biomass CHP (gasification)



Source:

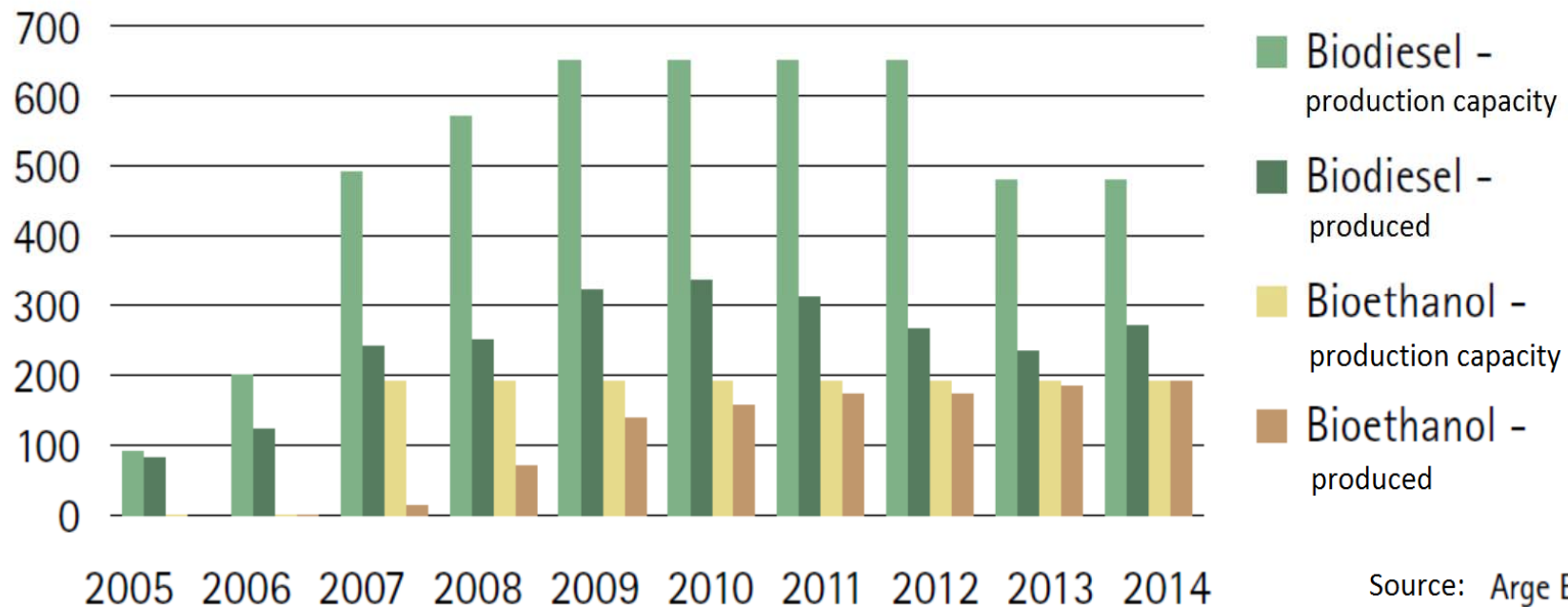
Arge Kompost & Biogas, ÖBMV

Absolute and relative power production from renewables (1991-2013)



Biofuels production 2005-2014

Thousand tons



Source: Arge Biokraft,
Umweltbundesamt

Austrian Research Organisations

Graz University of Technology – Institute of Thermal Engineering

- Combustion and gasification
- Energetic utilization of biomass
- CFD-simulations
- reactive fluid flows
- solar thermal processes
- extrusion and injection molding (polymers)
- Thermal Management
- Thermo dynamical process simulation
- Fluidized bed combustion
- Second Generation Fuels and fuel cells
- CO₂-free gas- and coal-burning power plant

Joanneum Research Graz - Department of Energy Research

- Life Cycle Assessment
- Microchannel FT technology

Austrian Research Organisations

MCI – University of Applied Sciences for Environmental-, Process- and Biotechnology, Innsbruck

- Multi-staged fixed bed gasification systems

Bioenergy 2020+ (location Wieselburg)

- 1st and 2nd generation biofuels
- Representative of Austria in IEA Bioenergy Task 39 liquid biofuels
- Secretary of IEA Advanced Motor Fuels
- ExCo member in IEA Bioenergy (Manfred Wörgetter)

Austrian Research Organisations

Bioenergy 2020+ (location Güssing) together with TU Vienna

- Production of FT liquids
- Upscaling of the FT synthesis to 1 barrel/day – facility in operation
- Production of Hydrogen
- Mixed alcohols
- BioSNG
- Waste gasification in FICFB gasifier
- Fundamental R&D on ashes and bed materials

Vienna University of Technology, Institute of Chemical Engineering

- R&D in dual fluidised bed steam gasification (G-volution)
- Production of Fischer Tropsch fuels
- Production of hydrogen for refineries
- Scientific Partner in Bioenergy 2020+
- Representative of Austria in IEA Bioenergy Task 33 Thermal Gasification of Biomass

Austrian companies

- **Andritz including AE&E** (Andritz Energy & Environment)
 - No activities with FICFB, has still patent
 - Involved in Skive (over Carbona)
 - Active in UK gasification projects
 - www.andritz.com

- **GE Jenbacher**
 - <http://www.jenbacher.com>

- **Güssing Renewable Energy (GREG)**
 - FICFB gasifiers for CHP, BioSNG and other synthesis (sister company of the biomass CHP Güssing)
 - <http://www.gussingrenewable.com/>

Austrian companies

- **Repotec**
 - Engineering of FICFB gasifiers for CHP, BioSNG and other synthesis (Güssing, Ulm, Göteborg)
 - <http://www.repotec.at>

- **SynCraft Engineering GmbH**
 - <http://www.syncraft.at>

- **Urbas**
 - fixed bed gasification
 - <http://www.urbas.at>

- **ZT Lettner**
 - <http://www.zt-lettner.at>

Implementations



Commercial FICFB gasifiers

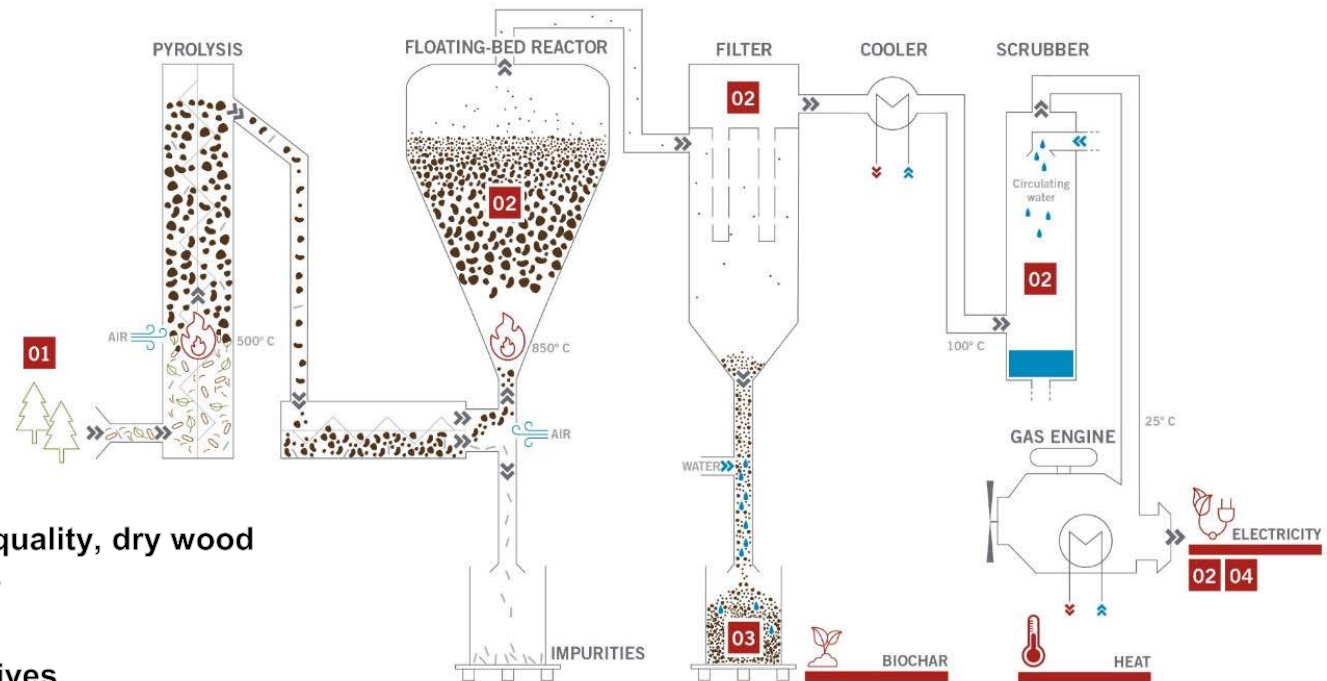
| Location | endn | Fuel / Product MW, MW | Start up | Supplier | Status |
|---------------------|--------------------------------------|---|----------|----------------------|-----------------------|
| Güssing, AT | Gas engine | 8.0 _{fuel} / 2.0 _{el} | 2002 | AE&E, Repotec | Operational* |
| Oberwart, AT | Gas engine / ORC / H ₂ | 8.5 _{fuel} / 2.8 _{el} | 2008 | Ortner Anlagenbau | Maintenance |
| Villach, AT | Gas engine | 15 _{fuel} / 3.7 _{el} | 2010 | Ortner Anlagenbau | On hold |
| Senden/Ulm, DE | Gas engine / ORC | 14 _{fuel} / 5 _{el} | 2011 | Repotec | Operational |
| Burgeis, IT | Gas engine | 2 _{fuel} / 0.5 _{el} | 2012 | Repotec, RevoGas | On hold |
| Göteborg, Sweden | BioSNG | 32 _{fuel} / 20 _{BioSNG} | 2013 | Repotec/ Valmet | Operational |
| California | R&D | 1 MW _{fuel} | 2013 | GREG | Operational |
| Gaya, France | BioSNG R&D | 0,5 MW _{fuel} | 2016 | Repotec | Commissioning |
| Thailand | Gas engine | 4 _{fuel} / 1 _{el} | 2016 | GREG | Under construction |

* After ~100,000 hours of operation Güssing will be shut down by end of 2016 due to ending of the feed in tarif

References

| | Project | Start up | Contact | Output | Application | Feedstock | |
|----|---|------------------------|---|---|--------------------------------------|------------|------------|
| | | | | | | Wood chips | Off - cuts |
| 1 | Demonstrationsanlagen URBAS A - 9113 Ruden | Development since 2001 | Ing. Peter Urbas DI Wolfgang Felsberger | 150 kWel + 300 kWth + Kessel | CHP - Process heating for own supply | x | x |
| 2 | Fernwärme Neumarkt Ges.m.b.H. & Co KG A - 8820 Neumarkt | August 08 | BM Herbert Ofner fernwaerme8820@gmail.com + 43 664 4501564 | 2 x 120 kWel + 580 kWth | CHP - District heating | x | |
| 3 | Friedrich Wahl GmbH & Co. KG D - 74429 Sulzbach Laufen | October 09 | GF Sabine Mertzluft s.mertzluft@wahl-holzwerk.de +49 7976 9858 40 | 1 x 130 kWel + 280 kWth | CHP - Process heating for own supply | | x |
| 4 | Holzstrom GmbH A - 5145 Neukirchen an der Enknach | July 11 | GF Johann Wurhofer johann.wurhofer@aon.at + 43 664 2425408 | 2 x 175 kWel + 600 kWth | CHP - District heating | x | |
| 5 | Stadtwerke Konstanz GmbH D - 78467 Konstanz | December 11 | DI Olaf Westerhoff +49 7531 803 266 | 1 x 140 kWel + 300 kWth | CHP - District heating | x | |
| 6 | Biowärme Mallnitz GmbH A - 9822 Mallnitz | November 13 | Hr. Anton Glantschnig glantschnig.anton@peak.at + 43 664 156 78 58 | 1 x 250 kWel + 540 kWth | CHP - District heating | x | |
| 7 | Rau GmbH D - 72336 Balingen | December 13 | GF Joahim Rau linda.rau@rau-gmbh.de + 49 7433 9882 14 | 1 x 150 kWel + 280 kWth | CHP - Process heating | x | x |
| 8 | Energieversorgung Vals GmbH I - 39037 Mühlbach | December 14 | Kurt Bacher + 39 0472 979042 | 1 x 296 kWel + 550 kWth | CHP - District heating | x | |
| 9 | Biowärme Eberndorf A - 9141 Eberndorf | March 15 | Ing. Peter Urbas p.urbas@urbas.at + 43 664 1235923 | 1 x 130 kWel + 250 kWth; 1 x 300 kWel + 600 kWth | CHP - District heating | x | |
| 10 | green Power GmbH A - 8230 Hartberg | July 15 | Andreas Windhaber andreas.windhaber@gat-solar.at +43 3176 8127 0 | 1 x 200 kWel + 320 kWth | CHP - District heating | x | |
| 11 | Energia Uno I - 05100 Terni | August 15 | Marco Cinaglia +39 3408191329 | 1 x 199 kWel + 340 kWth | CHP - Process heating | x | |
| 12 | Lamprecht GmbH I - 3902 Kastelbell | November 15 | Hr. Oskar Pfeifer info@lamprecht-holz.com + 39 0473 624131 | 1 x 199 kWel + 320 kWth | CHP - Process heating | x | |
| 13 | Azienda. Agri. S.A.B.I I - 47010 Galeata | December 15 | Luca Zannotti luca1407@gmail.com + 39 0543 981793 | 1 x 199 kWel + 320 kWth | CHP - District heating | x | |
| 14 | Prijedor BIH - 79101 Prijedor | December 15 | Zoran Knezevic knezevic.zoran@toplana.pd.com +38 765 845 232 | 1 x 250 kWel + 530 kWth | CHP - District heating | x | |
| 15 | FW Mals I - 39024 Mals | December 15 | Dr.Mag. Ulrich Veith ulrich.veith@gemeinde.mals.bz.it + 39 349 5707 171 | 2 x 149 kWel + 280 kWth | CHP - District heating | x | |
| 16 | Azienda Agricola Isca di Calvello | January 15 | Gianfranco Misuriello +39 3334711383 | 1 x 199 kWel + 340 kWth | CHP - Process heating | x | |
| 17 | Chetra SK s.r.o. SK - 06801 Medzilaborce | January 16 | Olga Hethy +49 1637227525 | 3 x 150 kWel + 840 kWth | CHP - Process heating | x | |

Technology



- 1 Operates on low quality, dry wood chips including bark and fines
- 2 No need for additives.
Still the condensate is as clear as water and free of tar
- 3 By-product premium quality charcoal
- 4 30% overall electric efficiency due to high-tech gas engines

References:

- CraftWERK / Dornbirn / AT (2014)
- CraftWERK / Stadl / AT (2016)
- CraftWERK / Innsbruck / AT (2016)
- CraftWERK / Vierschach / IT (2012)
- CraftWERK / Schwaz / AT (2009)