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UNIVERSITÄT  
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# Country Report Austria

IEA Bioenergy Task33 Meeting

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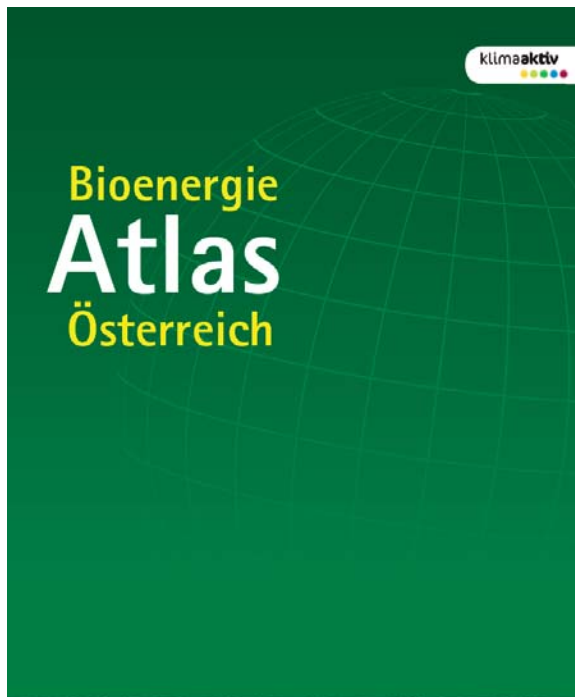
Participation in IEA Bioenergy Task 33 is financed by



# Content

- Statistics
- Research organisations
- Companies
- Implementations

# Bioenergy atlas Austria



- Effects of bioenergy in Austria
- Flows of energy, biomass and wood
- Comparison of provinces
- Bioenergy in practice
- Unfortunately just in German

# Actual energy strategy and programs

Presentation tomorrow

by FFG (Austrian research promotion agency)

# 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
- CO<sub>2</sub>-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)***

- 1<sup>st</sup> and 2<sup>nd</sup> 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

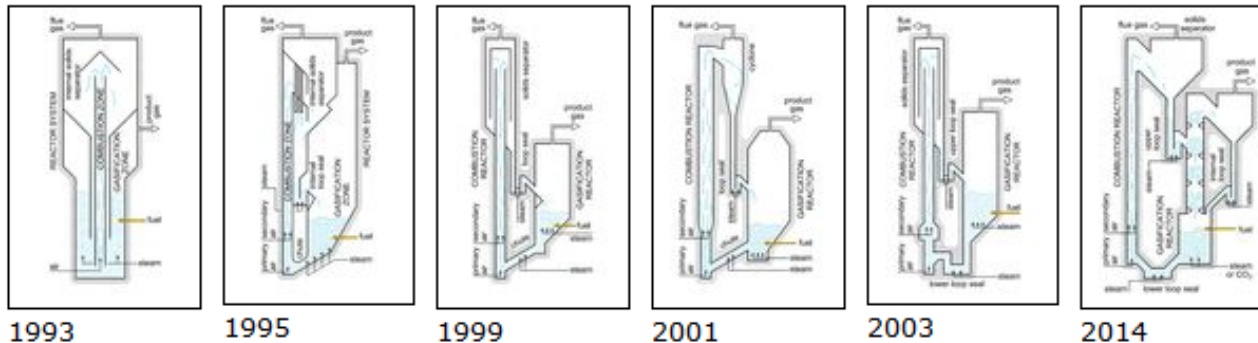
## Austrian companies

- **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](http://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>



Figures: Development of Dual Fluidized Bed Steam Gasification at the Vienna University of Technology (Schmid J.C. 2016)

## Current projects (Gasification and Gas Cleaning group)

- FuelFlexDFB -
- RenewableSteelGases - Integration of renewable energy in the steel production in order to increase energy efficiency and to reduce CO<sub>2</sub> emissions
- VergRestWert — Thermal gasification of low-grade residues for the production of reusable materials and energy
- ERBA II — Optimization of „Sorption Enhanced Reforming“ for an improved CO<sub>2</sub>-balance of a raw iron production by the use of biomass
- PHENOLIVE

# Implementations



## Commercial FICFB gasifiers

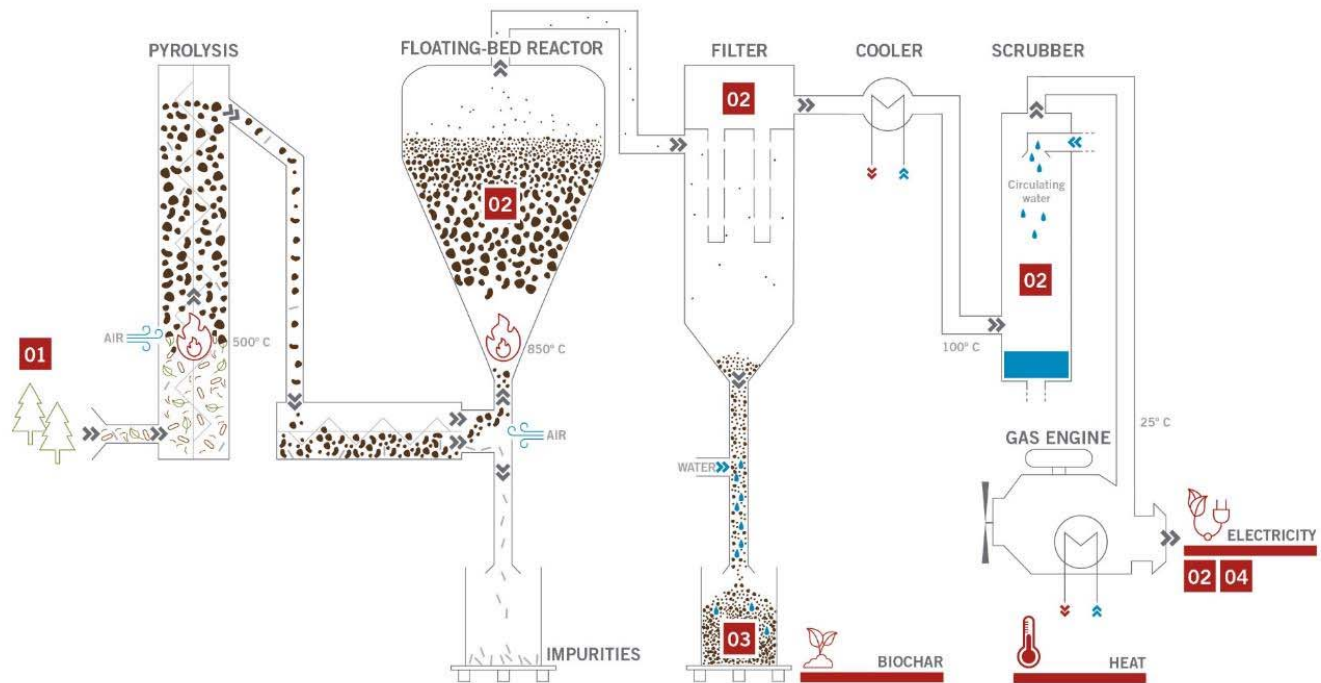
Location	endn	Fuel / Product MW, MW	Start up	Supplier	Status
Güssing, AT	Gas engine	8.0 <sub>fuel</sub> / 2.0 <sub>el</sub>	2002	AE&E, Repotec	On hold
Oberwart, AT	Gas engine / ORC / H <sub>2</sub>	8.5 <sub>fuel</sub> / 2.8 <sub>el</sub>	2008	Ortner Anlagenbau	Maintenance
Villach, AT	Gas engine	15 <sub>fuel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

\* After ~100,000 hours of operation Güssing was shut down by end of 2016 due to ending of the feed in tariff

## Presentation tomorrow

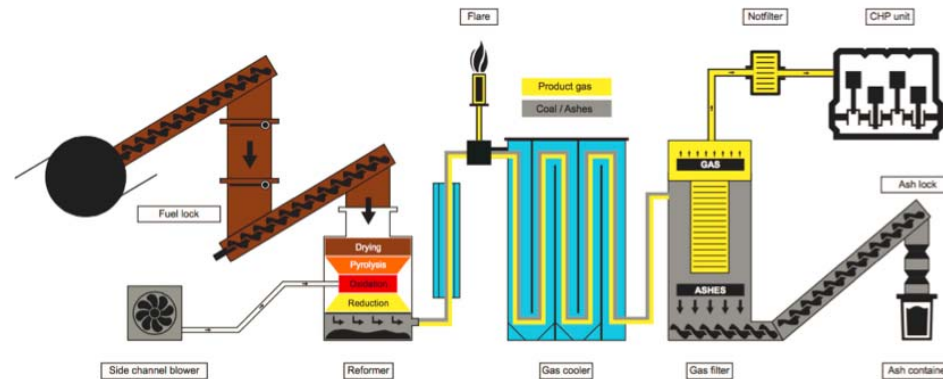


## Presentation tomorrow





# Fixed bed gasifier CHP 50

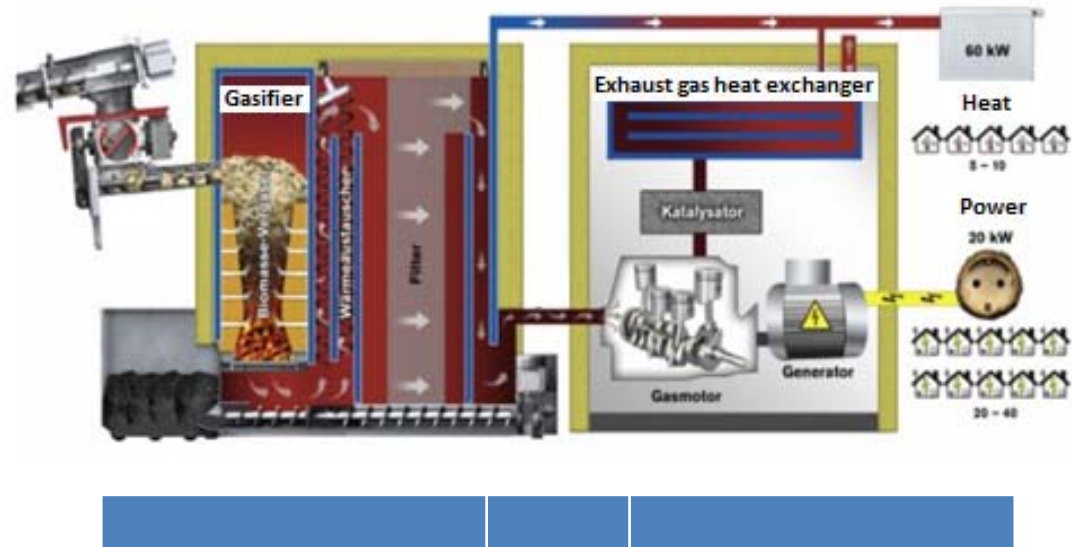


Technical data		CHP50
Power output	kW	49/51
Heat output	kW	~107
Feedstock (wood chips) consumption by 6000 op.hours	t	300
Overall efficiency	%	~83
Power efficiency	%	~27





www.hargassner.at



Technical data		
Power output	kW	20
Heat output	kW	61
Overall efficiency	%	95,3
Feedstock (wood chips) consumption by 5000 op. hours	m <sup>3</sup>	500