POLYTECHNIK®

Biomass Energy

AUSTRIA, 2564 Weissenbach

STAATLICH AUSGEZEICHNETES UNTERNEHMEN

Utilising Biomass for Energy Generation

Local, district and space heating systems – Thermal energy for industries – Power generation

In the beginning there was fire

Energy generation from renewable energy sources is our expertise

POLYTECHNIK is one of the world's leading suppliers of advanced combustion solutions, heat and power plants and emission control systems. It has an excellent reputation and track record as a reliable provider of plants and services from engineering to the installation and commissioning of turn-key plants (e.g. as EPC contractor).

The POLYTECHNIK group has its head office in Weissenbach/Triesting (Austria) with 90% of its business activity occurring in other countries. It employs around 450 people worldwide with subsidiaries in Switzerland, France, Russia, Hungary, Poland, Romania, Byelorussia, New Zealand and Australia. By carrying out continuous research and development and the monitoring of its more than 2,500 energy plant installations, POLYTECHNIK is able to provide its costumers with state-of-the-art technology for the utilisation of biomass for energy generation.

POLYTECHNIK engineers, supplies and installs biomass fired boilers with a thermal output ranging from 300 kW to 30,000 kW (single unit output). Depending on the available fuel (type, calorific value, water content, etc.) various combustion systems and combinations can be employed (primarily water-cooled reciprocating grates or underfeed stokers).

Hot water, superheated water, saturated and superheated steam or thermal oil are used to transfer the energy. The generated heat in our power and co-generation plants drives either a steam turbine or, via a thermal oil system, an ORC turbine (Organic Rankine Cycle) with a standard electrical output from 200 kW to 20,000 kW per turbine generator.

POLYTECHNIK's CHP - combined heat and power - plants provide both heat and power and are well known for high availability and efficiency.

POLYTECHNIK's low emission energy plants are in service in many industries such as Forestry and Timber, Energy (domestic, industrial and district heating, power generation, etc.), Food and Dairy, etc. Via its worldwide subsidiaries and representations POLYTECHNIK's experts provide a fast and efficient customer service and tailored solutions.

Head office in Weissenbach - Austria

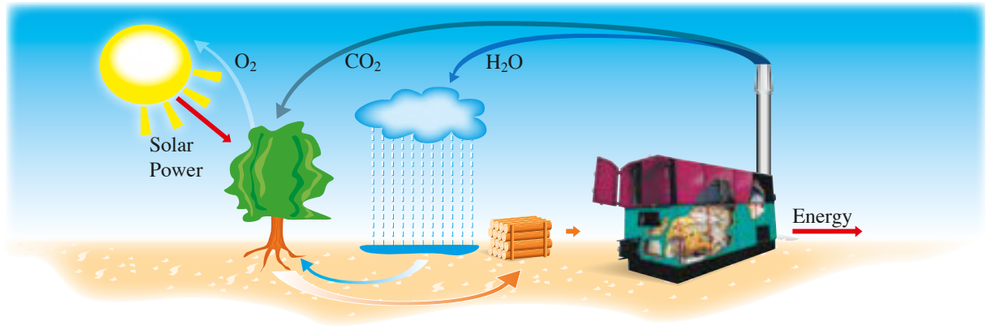
POLYTECHNIK Biomass Energy

Biomass

Our renewable and carbon neutral energy source

BIOMASS – A renewable, endless and natural fuel resource from our solar energy store.

In times of rising costs for energy and with oil and gas reserves diminishing, alternative energy forms are becoming increasingly important. Hence it makes sense to use energy resources that are readily available, are plentiful, and which are renewable and sustainable too.
Bioenergy provides us with one of the most environmentally friendly energy sources, with the carbon dioxide released during the combustion of the biomass getting converted into carbohydrates and oxygen (photosynthesis) when plants and trees grow.



With POLYTECHNIK's sophisticated furnace design and highly developed control system, most forms of biomass are utilisable for combustion such as short rotation trees, herbaceous plants and forest and timber residues.

Typical fuels:


Bark


Wood chips


Forest residues


Pellets


Sawdust


Fines and sander dust


Construction and demolition wood


Compost rejects


Sunflower seed shells


Rice husk

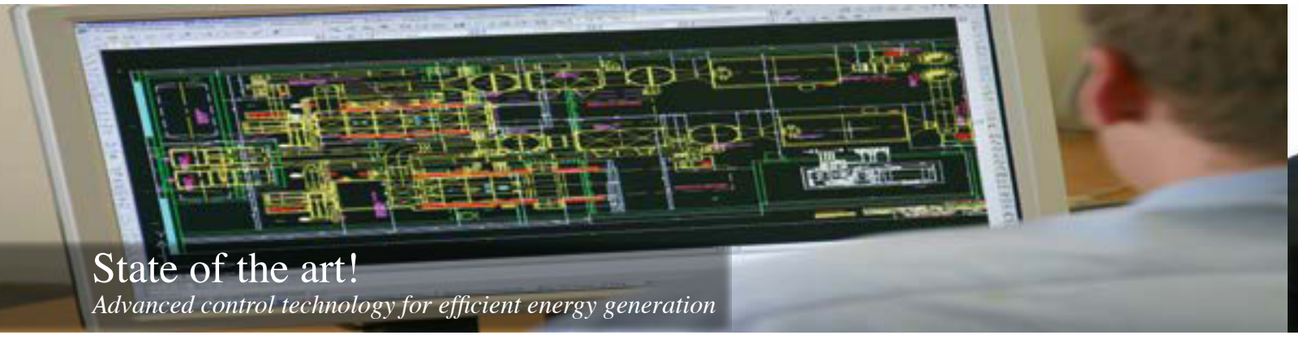

Maize


Crop / Triticale


Palm kernel shells


Short rotation plants / Miscanthus


Poultry litter / Horse manure

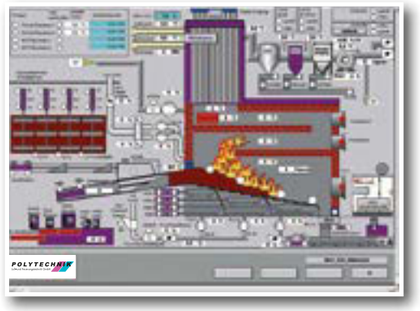


State of the art!

Advanced control technology for efficient energy generation

Know-how and experience

… based on more than 2,500 installations worldwide

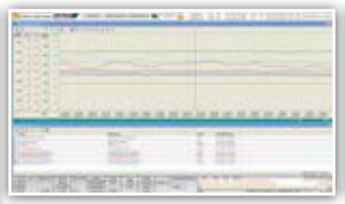


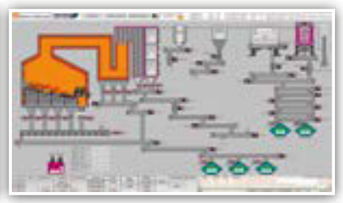
Fully automated control and operation of POLYTECHNIK's biomass boiler plant is carried out from POLYTECHNIK's unique PLC System (programmable logic controller).

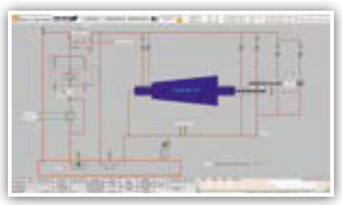
In using POLYTECHNIK's SCADA and control system, customers get all relevant plant data to ensure that they can monitor and control the plant according to their needs, anytime and from anywhere (remote service via Internet).

Load and Lambda control systems monitor, analyse and control all relevant parameter like residual oxygen, furnace temperature, flue gas recirculation, gas and combustion air temperatures, fuel feed rates, moisture content, flow and return temperature heat transfer medium and load requirements.

The boiler operation is fully automated and the supplied systems control all relevant plant components like fuel and ash handling systems, furnace and fans, emission control system, boiler feed pumps and energy output.







With more than 40 years of experience in engineering, manufacturing, installing and commissioning of biomass fired heat and power plants we have become experts in generating energy from renewable biomass.
POLYTECHNIK is proud of its achievements and would welcome the opportunity to share its world leading technology with those who may be considering such a plant.
Such is POLYTECHNIK's capability that solutions especially tailored to meet each customer´s requirements with a highly competitive and economical price/performance ratio are available on short delivery times.

Reference plants:

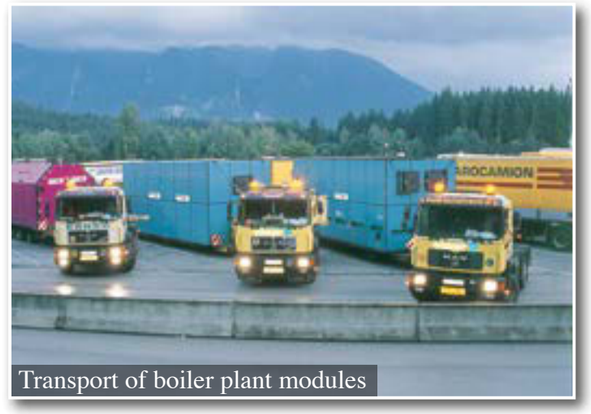
Local heat supply, range starting at 300 kW, hot water 95°C

District heating, range starting at 500 kW, superheated water 110°C

Cogeneration (CHP) via superheated steam, e.g. with 450°C, 70 bar and 20 MW_{el} per steam turbine generator

Cogeneration (CHP) via thermal oil, e.g. with 310°C and ORC with up to 3 MW_{el} per ORC turbine generator

Installation of 3 x 6,000 kW superheated water boilers (120°C)
with water-cooled reciprocating grate at Lesobalt/Kaliningrad (RUS)



Transport of boiler plant modules


Loading of boiler and refractory lined furnace


Complete heat plant with stack


Installation and assembly

REFERENCE PROJECTS

1,000 / 4,000 kW Biowärme | Weyer (A)




Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips, forest residues and bark • Commissioned in 2002

4,000 kW Naturwärme | Reit im Winkl (D)



Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips, forest residues and bark • Commissioned in 2000

600 kW High School | Wertheim (D)


Ram stoker


Moving floor


Hydraulic cylinder

Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips and forest residues • Commissioned in 2001

1,450 and 2,500 kW District heating | DOKW | Aschach (A)


Combustion system: Water-cooled reciprocating grate • Fuel: Drift wood, bark and wood shavings
Commissioned in 1990

2 x 1,500 kW District heating | Mank (A)


Combustion system: Water-cooled reciprocating grate • Fuel: Bark, wood chips and forest residues • Commissioned in 1994

REFERENCE PROJECTS

500 kW Holzhof | Arnbach (A)

Type of firing: Underfeed stoker • Fuel: Wood chips, shavings and sawmill residues • Commissioned in 2001

21,000 kW District heating | Pisz (PL)

Installed capacities: 3 x 6,000 kW and 1 x 3,000 kW • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips, bark and sawmill residues • Commissioned in 2003

700 and 1,800 kW Neoplan | Pilsting (D)

Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips, pallets and packing material
Commissioned in 1999 and 2001

30,000 kW OOO | Sovetsklesprom (RUS)

Combustion system: Water-cooled reciprocating grate • Fuel: Sawmill residues • Commissioned in 2003

230 kW Local heating system | Zeillern (A)

Combustion system: Underfeed stoker • Fuel: Wood chips • Commissioned in 2000

REFERENCE PROJECTS

4,500 kW_{th} / 700 kW_{el} Biomasse Oberallgäu (D)

Cogeneration (CHP)

Superheated steam boiler, 32 bar / 450°C, steam extraction for district heating
Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips and bark • Commissioned in 2005

10,500 kW_{th} / 1,100 kW_{el} District heating | TIWAG | Längenfeld (A)

Cogeneration (CHP)

6,500 kW thermal oil boiler (300°C) and 4,000 kW superheated water boiler (110° C)
Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips and bark • Commissioned in 2004

1,000 kW Local heating system | Gut Ising (D)

Combustion system: Water-cooled reciprocating grate • Fuel: Horse manure with shavings, sawdust and straw
Commissioned in 2003

8,000 kW_{th} / 1,370 kW_{el} NUON (NL)

Cogeneration (CHP)

10 t/h superheated steam boiler, 32 bar • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips, bark and landscaping residues • Commissioned in 1998

800, 5,000 and 7,000 kW Finnforest | BACO (RO)

Combustion system: Water-cooled reciprocating grate • Fuel: Wood processing residues and fines • Commissioned in 2000

REFERENCE PROJECTS

5,500 kW SALM (F)

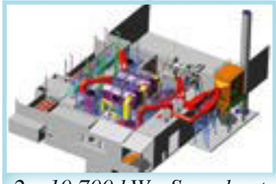


Combustion system: Underfeed stoker with water-cooled reciprocating grate • Fuel: Wood chips from particle board
Commissioned in 2008

21,400 kW_{th} / 5,000 kW_{el} Alpine Mayreder | Rastenfeld (A)

Cogeneration (CHP)



2 x 10,700 kW - Superheated steam boiler plant, 23 bar / 420°C • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips, bark and saw dust • Commissioned in 2007

7,800 kW_{th} / 1,600 kW_{el} Bio Energy | Twente (NL)

Cogeneration (CHP)



11.5 t/h superheated steam boiler, 29 bar / 250°C • Combustion system: Water-cooled reciprocating grate
Fuel: Bark and construction and demolition wood • Commissioned in 2005

6,000 kW Dairy Plant | Tirol Milch | Wörgl (A)




Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips, bark and saw dust • Commissioned in 2007

14,000 kW_{th} / 2,000 kW_{el} Ziegler | Plössberg (D)

ORC Plant - Cogeneration (CHP)

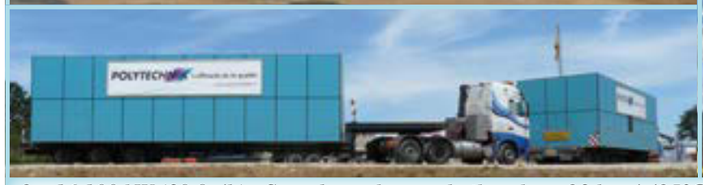



Thermal oil boiler plant with ORC turbine generator • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips, bark, saw dust and roots • Commissioned in 2007

REFERENCE PROJECTS

32,200 kW_{th} / 7,500 kW_{el} and 10,000 kW_{th} Bio Energy Lozère | Mende (F)

Cogeneration (CHP)



2 x 16,100 kW (39.8 t/h) - Superheated steam boiler plant, 23 bar / 425°C and one superheated water boiler • Combustion system: Water-cooled reciprocating grate • Fuel: Forest residues, wood chips and bark • Commissioned in 2009

21,400 kW_{th} / 5,000 kW_{el} Alpine Mayreder | Altweitra (A)

Cogeneration (CHP)

2 x 10,700 kW - Superheated steam boiler plant, 23 bar / 420°C • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips, bark and saw dust • Commissioned in 2007

15,000 kW_{th} / 2,200 kW_{el} Lesozavod 25 (RUS)

Cogeneration (CHP)

2 x 7,500 kW - Superheated steam boiler plant, 32 bar / 450°C • Combustion system: Water-cooled reciprocating grate
Fuel: Sawmill residues • Commissioned in 2008

10,000 kW_{th} / 1,500 kW_{el} Tartak Olczyk (PL)

ORC Plant - Cogeneration (CHP)

Thermal oil boiler plant with ORC turbine generator • Combustion system: Water-cooled reciprocating grate
Fuel: Bark, wood chips and saw dust • Commissioned in 2009

21,400 kW_{th} / 5,000 kW_{el} Alpine Mayreder | Göpfritz (A)

Cogeneration (CHP)

2 x 10,700 kW - Superheated steam boiler plant, 52 bar / 450° C • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips, bark and saw dust • Commissioned in 2007

REFERENCE PROJECTS

12,150 kW_{th} / 3,145 kW_{el} Biostrom | Oberhausen (D)

Cogeneration (CHP)

Superheated steam boiler, 60 bar / 430°C, steam extraction for district heating • Combustion system: Water-cooled reciprocating grate • Fuel: Compost rejects, wood chips and bark • Commissioned in 2011

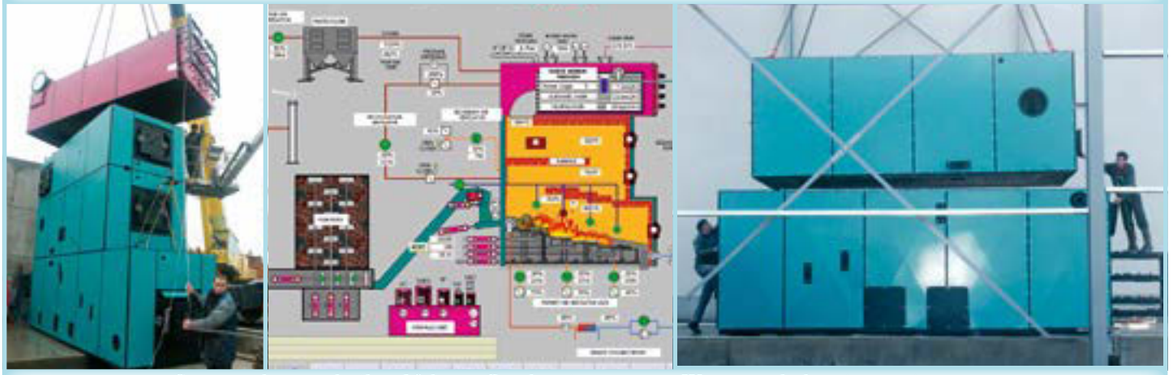
2,000 kW District heating | Hämeenkoski (FIN)

Superheated water boiler, 10 bar / 120°C • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips, bark and peat • Commissioned in 2011

12,000 kW UAB Biofuture | Šilutė (LT)

Saturated steam boiler, 12 bar / 190°C / 18t/h • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips and bark • Commissioned in 2009

4,000 kW Sumitomo | Marusen (J)



Saturated steam boiler, 10 bar • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips and bark • Commissioned in 2007

10,000 kW District Heating | Bansko (BG)

2 x 5,000 kW - Superheated water boiler plant, 110°C • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips and bark • Commissioned in 2007

REFERENCE PROJECTS

24,000 kW_{th} / 4,228 kW_{el} RECHICA | GOMELENERGO (BY)

ORC Plant - Cogeneration (CHP)

2 x 12,000 kW - Thermal oil boiler plant with 2 x 2,114 kW ORC turbine generators incl. district heating
Combustion system: Water-cooled reciprocating grate • Fuel: Peat briquettes, wood chips and bark • Commissioned in 2011

20,000 kW ARKAIM | VANINO (RUS)

2 x 10,000 kW - Superheated water boiler plant, 115°C, process heat • Combustion system: Water-cooled reciprocating grate
Fuel: Wood chips and bark • Commissioned in 2009

1,000 kW R&D Facility | Polytechnik | Weissenbach (A)

Boiler plant with dual fuel feeding system to run trials on different fuels
Emission control system with additive dosing, scrubber and bag house

2 x 8,700 kW_{th} / 2 x 750 kW_{el} and 3 x 7,000 kW_{th} DAEGU (ROK)

Cogeneration (CHP)

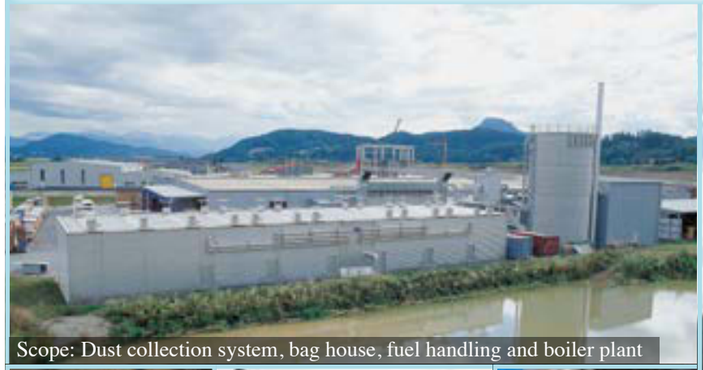
2 x 8,700 kW - Superheated steam boiler plant, 28 bar / 430°C with two 750 kW steam turbine generators and 3 x 7,000 kW saturated steam boilers, 8 bar / 180°C • Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips • Commissioned in 2005

1,000 kW Viveiros do Foral | Messines (P)

Hot water boiler • Combustion system: Water-cooled reciprocating grate • Fuel: Wood chips, bark and roots
Commissioned in 2010

REFERENCE PROJECTS

3,000 kW Vito Parkett | St.Veit/Glan (A)



Scope: Dust collection system, bag house, fuel handling and boiler plant

Combustion system: Underfeed stoker • Fuel: Wood processing residues like fines, saw dust and wood chips
Commissioned in 2000

28,500 kW_{th} / 8,600 kW_{el} OIE AG/HS-Energieanlagen GmbH (D)

Superheated steam boiler, 63bar / 450°C • Combustion system: BFB bubbling fluidised bed boiler • Fuel: Construction and demolition wood, recycling residues • Emissions guarantees in accordance with 17. BImSchV • Commissioned in 2003

R&D - Research and Development

Leading through innovation and technology

In cooperation with:

- **Technical University of Munich / Polytechnik**
  Heat pipe reformer: New method to generate hydrogen-containing gas from biomass – patented technology.
- **Vienna University of Technology / Polytechnik**
  Design and calculation of heat exchanger surfaces
- **ÖFI Austrian Research Institute for chemistry and technology / Polytechnik**
  Combustion technologies, fuel analysis, fuel characteristics, etc.

Technology & Manufacturing

Highest quality and safety standards

Our high quality and safety standards as well as procedures in accordance with international standards (PED, DIN, TRD, EN, ÖNORM, etc.) are recognized and appreciated in the whole industry. Design and boiler verification in accordance with TÜV, UDT, ISCIR, GOST, ASME, AS/NZ, etc. POLYTECHNIK's Quality Management System: ISO-9001

Turn-key Energy Plants

POLYTECHNIK's Know-how – Our expertise – Your benefit

- **Research and Development**
- **Engineering and Design**
- **Project Management**
- **Manufacturing**
- **Construction and Installation**
- **Commissioning**
- **Turn-key Plants**
- **EPC and EPCM Contracts**

POLYTECHNIK®
Biomass Energy

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