Weissenbach, 22nd of June 2023

POLYTECHNIK Biomass Energy

World Bioenergy Association Webinar

Technologies for efficient conversion of biomass to power and heat

POLYTECHNIK
Biomass Energy

Quality with tradition

A two-man operation has become a global player.

Since 1965, Polytechnik has built over 3,300 reference systems worldwide. Today, around 240 employees work in over 15 offices and agencies worldwide.

ISO 9001
TÜV SÜD
ISO 14001
ISO 45001

POLYTECHNIK
Biomass Energy

ISO 9001, ISO 14001, ISO 45001

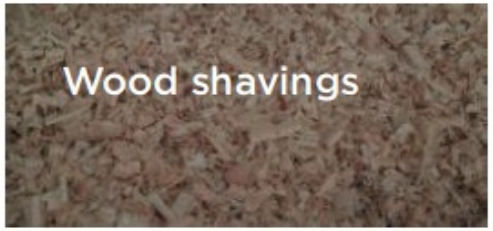
Certified Integrated Quality, Environmental and Occupational Health & Safety Management System

POLYTECHNIK®
Biomass Energy

- *Biomass combustion, gasification and carbonisation solutions*
- *Carbonisation / biochar plants 3,000 to 12,000 tonnes p.a. biochar*
- *Torrefaction plant up to 60.000t/a*

POLYTECHNIK®
Biomass Energy

Flexible use of feedstock



Efficient use of biomass to heat and power

- thermal output of our boilers ranges from **1000 kW to 30 MW** per unit
- power plants ranging from **200 kW to 20 MW electric**
- advanced emssion control and heat recovery for **highest efficiencies and minimum environmental impact.**

POLYTECHNIK Biomass Energy

POLYHELD

HIGH EFFICIENCY LOW DUST

- use a variety of fuels: residual materials from the wood and forestry industries and most woody fuels (with a water content of up to M45)
- efficiency: >92% (+5% compared to traditional burners)
- **dust: <20mg/Nm3; 11% O2**
  > without additional emission purification)
- power range: 400 kW – 3,000 kW
- modulating between 25-100% load
- low maintenance costs
- **CHP option with direct gas ORC available**

POLYTECHNIK
Biomass Energy

POLYHELD

HIGH EFFICIENCY LOW DUST

USE A VARIETY OF FUELS

The innovative technology allows for the use of residual materials from the wood and forestry industries and most woody fuels with a water content of up to M45, as well as agricultural waste.

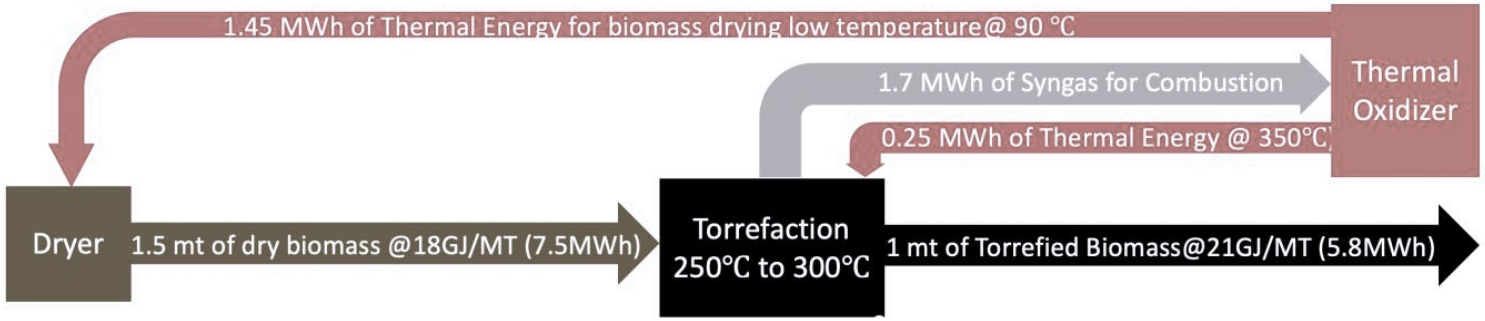
RegaWatt Gasification Technology

- high efficient clean biomass gasification technology
- producing electricity, heat, cold, steam, synthesis gas or bio-oil
- power plants ranging **from 2.000 to 10,000 kW thermal** and **250 to 2,000 kW electric**
- modular and easy to scale
- fuel flexibility **up to 60% water content**

POLYTECHNIK Biomass Energy

TORREFACTION

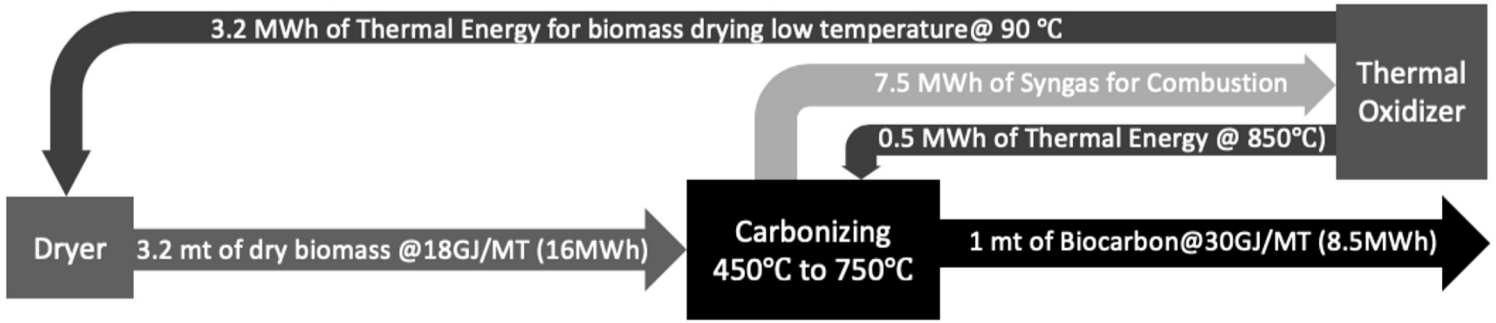
To produce 1 metric ton of torrefied biomass with an energy content of **>21 GJ/mt**
we require **~ 1.5 metric tons of dry biomass** @18GJ/metric ton (30% mass reduction)



AUTOTHERMAL PROCESS

CARBONIZATION

To produce high energy Biocarbon with an energy content of **>30 GJ/mt**
we require **3.2 metric tons of dry biomass** @18GJ/metric ton



AUTOTHERMAL + 7 MWh of Thermal Energy for production of 1.4 MWh of Electricity

Source: Michael Wild, Wild & Partner LLC

Large scale client

Producer

Investor

POLYTECHNIK® Biomass Energy

Collaborative Business Model

Pilot torrefaction plant
operating since 2013 in Austria
8,000 t/a of briquettes

Carbonisation demonstration plant
operating since 2016 in Germany
3,000 to 12,000 t/a of biochar

Industrial Torrefaction plant
construction 2023 in Finnland
up to 60.000 t/a of briquettes

Biomass Carbonisation

30,000 t/a
green waste

5,000 to 7,000 t/a
logs and wood

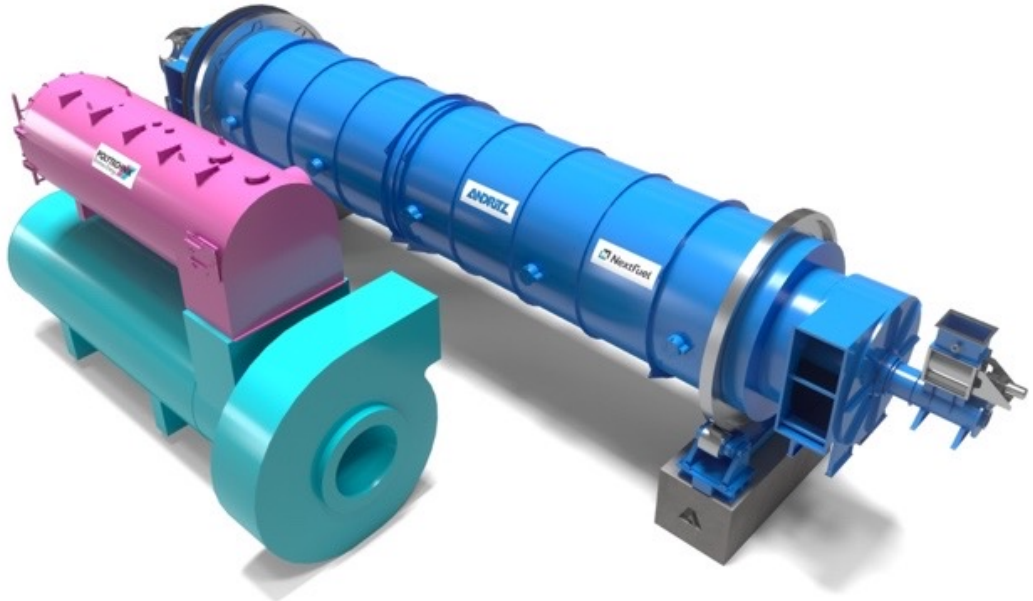
20,000 t/a
Terra Preta soil

3,000 t/a
biochar and char and feed coal

Char coal sizes from
25µm to >200mm

Biomass Torrefaction

- bio-industrial plant in Finland, planned commissioning late 2024, largest of its kind in Europe
- 60,000 tons of biocoal briquettes per year which will replace fossil coal in various industrial processes
- utilysing sustainably sourced by-products of local forestry (bark and low-grade biomass)
- enormous potential for CO2 savings for large-scale defossilisationn



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THANK YOU FOR YOUR ATTENTION

POLYTECHNIK Luft- und Feuerungstechnik GmbH

HEADOFFICE Hainfelderstraße 69, 2564 Weissenbach, Austria
E-MAIL office@polytechnik.at **TEL. AT** +43 (0) 2672 890-0 **TEL. DE** +49 (0) 7191 911 525-0

www.polytechnik.com