BPower

BY BITZER GROUP

www.bpower.cz

THE POWER OF HEAT FOR A SUSTAINABLE WORLD

WHO IS BPOWER?

BPOWER

- ✓ Established: **2009**
- ✓ Headquarters: **right in the centre of the Czech Republic – Havlíčkův Brod**
- ✓ Territory: **Europe, Asia, Africa**
- ✓ Core business: **HEAT UTILISATION**
- ✓ Technologies used:
  - **- ORC**
  - **- Absorption**
  - **- Heat exchangers**
  - **- Heat coolers**
- ✓ Member of: **BITZER Group**

WHO IS BITZER?

DAS HERZ DER FRISCHE

BITZER GROUP

- ✓ **Founded: 1934**
- ✓ **Headquarters: Sindelfingen, Germany**
- ✓ **Key features:**
  - **- cooling technology**
  - **- air conditioning**
- ✓ **represented: in more than 40 countries, with 75 branches and over 4,000 employees**
- ✓ **SCHAUFLER FOUNDATION: bringing knowledge and entrepreneurship together since 2005**
- ✓ **SCHAUFLER Academy: international training centre at the Rottenburg-Ergenzingen plant since 2016**

STRUCTURE DIAGRAM

Bitzer

- ✓ Parent company
- ✓ Manufacturer of expanders

Expanders for ORC

BPower
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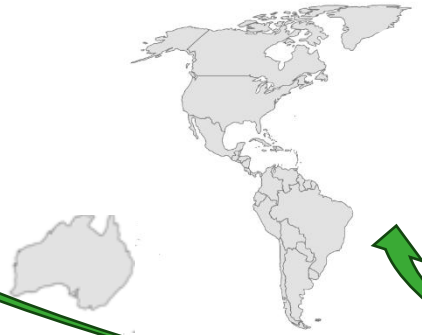
- ✓ Main independent integrator of the BITZER Group
- ✓ Management of ORC distribution to other countries

Territory: Europe, Asia, Africa



ElectraTherm
BY BITZER GROUP

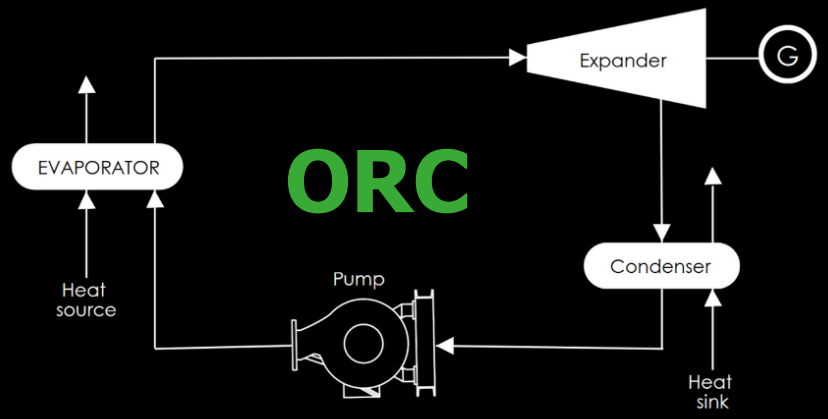
- ✓ ORC manufacturer

Territory: America, Australia

ORC with BITZER expanders

Production of ORC units for BPOWER is located in Germany.

HOW DOES BPOWER WORK?



✓ Analysis

measurement of all key variables directly on site anywhere in the world: temperatures, flow rates, pressures

✓ Synthesis

Data processing and creation of a customised study according to customer needs

✓ Implementation

project

delivery

installation

commissioning

✓ Service

24/7 hotline, remote access

TWO MAIN IMPLEMENTATION DIRECTIONS

WASTE HEAT UTILISATION

Objective: maximisation of electricity production

Application:

- ✓ Combustion gases (CHP exhaust, paint shops, etc.)
- ✓ Water (jacket water – engine cooling circuit, boiler rooms, power plants, geothermal)
- ✓ Steam (caulking, power plants, etc.)

ORC AS A COGENERATION UNIT

Objective: production of electricity and heat, or cooling

Application:

- ✓ Heating
- ✓ Biomass energy block (wood processing plants)
- ✓ Cogeneration (trigeneration) from waste heat (paint shops, metallurgy)

EXHAUST GASES

DUBAI

- ✓ Utilisation of exhaust gases from diesel generators

Connection method: direct use of exhaust gases in ORC

- ✓ Technology: ORC Triogen
- ✓ Input heat: 990 kWth
- ✓ ORC output: 180 kWel

Project objective: to increase the efficiency of electricity production from diesel generators

CREMATORIUM

- ✓ Utilisation of exhaust gases from diesel generators

Connection method: separation via exhaust gas/water exchanger

- ✓ Technology: ORC ElectraTherm
- ✓ Input heat: 300-500 kWth
- ✓ ORC output: 35 kWel

Project objective: production of electricity for crematorium operation

WATER

POHNPEI

- ✓ Heat recovery from diesel generators
- ✓ Technology: ORC Electratherm
- ✓ Input heat: 2000 kWth
- ✓ ORC output: 140 kWel + 120 kWel savings on engine cooling

Project objective: to increase the efficiency of electricity production from diesel generators and ensure higher engine cooling efficiency

bCOOLER

- ✓ bCooler = highly efficient cooling with integrated ORC technology
- ✓ Technology: BITZER Dry Cooler
- ✓ Savings: average 14 kWel/h

Project objective: to reduce the power consumption of the existing cooling system for the engine block and mixture circuit.

WATER

LEVICE

- ✓ Utilisation of excess heat from the Levice power plant (50 MW). Cascade connection of units – variable power modulation.
- ✓ Technology: 10 Electratherm ORC units
- ✓ Input heat: 50 MW
- ✓ ORC output: up to 250 kWel

Project objective: to increase the efficiency of the power plant

JAPAN - geothermal

- ✓ Small geothermal source
- ✓ Technology: Electratherm ORC
- ✓ Input heat: water at a temperature of 90°C
- ✓ ORC output: up to 75 kWel

Project objective: maximising electricity production from a small geothermal source

WATER – SMALL INCINERATORS

LIPTOVSKÝ MIKULÁŠ

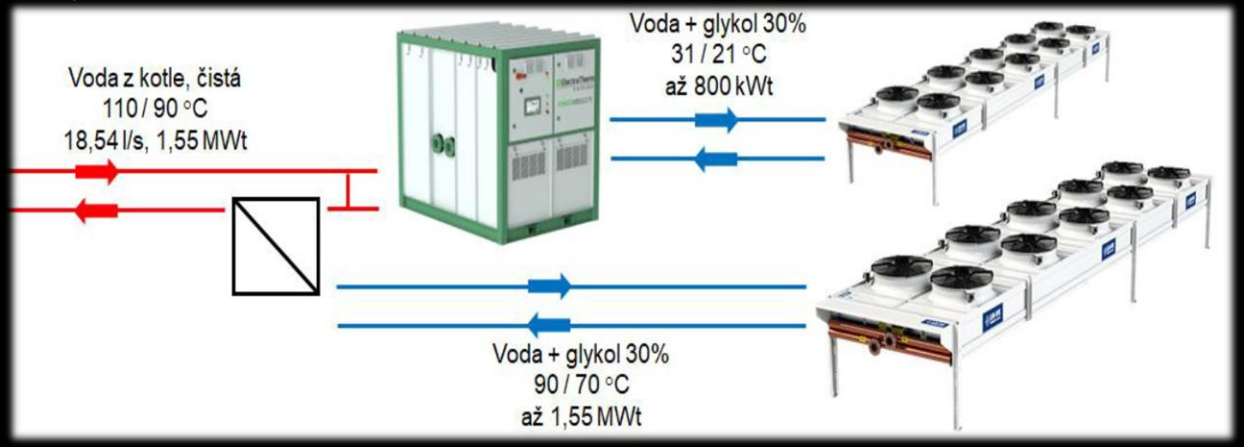
- ✓ Utilisation of excess heat
- ✓ Technology: ORC Electratherm
- ✓ Input heat: water 92°C
- ✓ ORC output: 48.6 kWel

Project objective: to increase the efficiency of the incinerator and use electricity for own consumption

JABLONEC N.N.

- ✓ Utilisation of excess heat
- ✓ Technology: ORC Electratherm
- ✓ Input heat: water 110°C
- ✓ ORC output: 75 kWel

Project objective: to increase the efficiency of the incinerator and use electricity for own consumption and to ensure the cooling of heating water even in the event of an ORC unit failure so that a constant return temperature to the boiler (90 °C) is maintained



WATER - BOILER ROOMS

ŽDÁR NAD SÁZAVOU

- ✓ Installation of an ORC unit on a biomass boiler
- ✓ Technology: ORC Electratherm, PM75
- ✓ Input heat: water 92°C
- ✓ ORC output: 30 kWel

Project objective: production of electricity for the operation of the premises

ZNOJMO

- ✓ Installation of an ORC unit on a biomass boiler
- ✓ Technology: ORC Electratherm, PM75
- ✓ Input heat: water 95°C
- ✓ ORC output: 36 kWel

Project objective: production of electricity for the operation of the premises

STEAM

ISRAEL

- ✓ Utilisation of excess steam at the ALON TAVOR CO-GENERATION POWER PLANT.

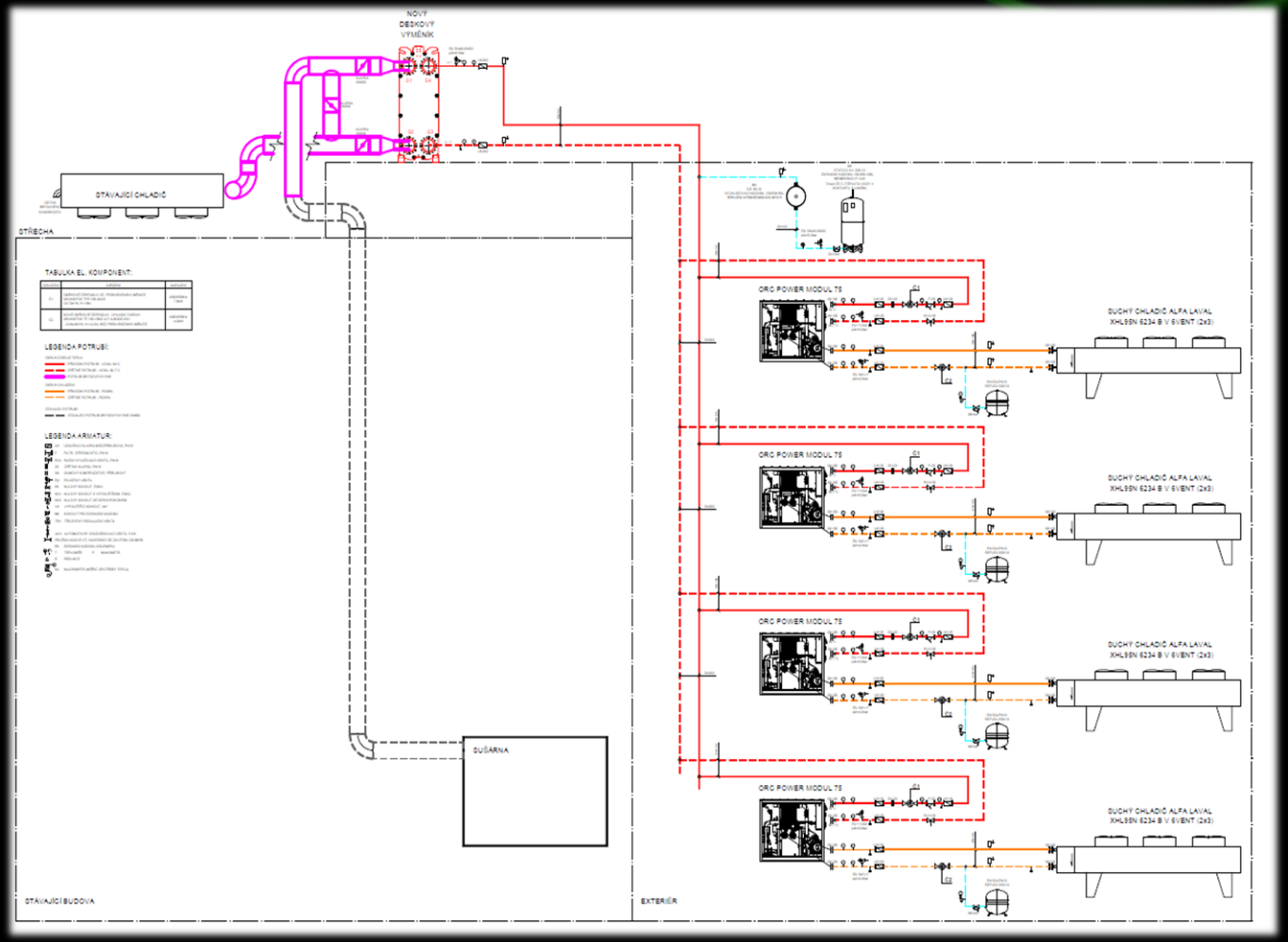
Connection method: Installation of a steam/water exchanger

- ✓ Technology: ORC ElectraTherm
- ✓ Heat source: condensate 110/93.9°C - 3650kW
- ✓ ORC output: 125 kWel

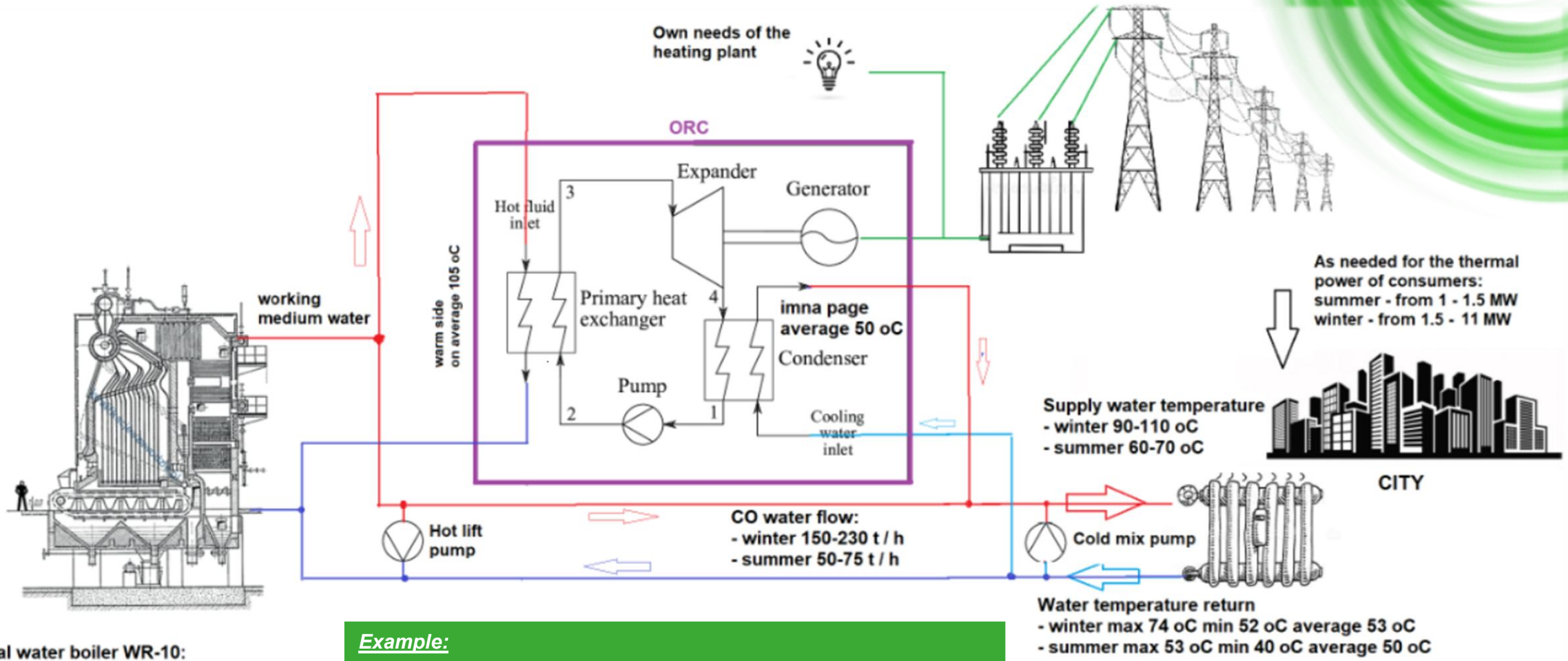
Project objective: to reduce the steam temperature from the power plant steam turbine block below the condensation limit.

KAFILERIE

- ✓ Technology: ORC Electraterm



HEATING PLANTS



Coal water boiler WR-10:
Working medium water
Pressure 1.6 MPa
Temperature max 150 oC

Example:

- ✓ ***Input:*** ***10 MWth solid fuel boiler***
- ✓ ***Input heat for ORC:*** ***approx. 1.6 MWth***
- ✓ ***ORC electrical output:*** ***up to 125 kWel***
- ✓ ***ORC heat output:*** ***1.45 MWth***
- ✓ ***Hot water:*** ***up to 45-60/60-80°C (inlet/outlet) for heating circuit***

HEATING PLANTS

POLAND - heating plant

- ✓ Integration of ORC into the central heating system.
- ✓ Technology: ORC ElectraTherm
- ✓ Input heat: depends on electricity production requirements.
- ✓ ORC output: production up to 125 kWel, 80°C water approx. up to 1.5 MWth

Project objective: electricity for own consumption, heat for central heating.

BIOMASS ENERGY BLOCKS

BLATNO - sawmill

- ✓ energy block for highly efficient combined heat and power generation from biomass

- ✓ Technology: ORC ElectraTherm
- ✓ Input heat: flue gas from biomass burner, 900 kWth
- ✓ ORC output: up to 180 kWel, heat up to 750 kWth, 80°C

Project objective: Use of electricity and heat for own consumption and operation at a wood processing plant.

COGENERATION (TRIGENERATION)

STŘÍŽOVICE - paint shop

- ✓ Utilisation of exhaust gases from paint shops (4 lines) for the production of electricity, heat and cooling = Trigeneration
- ✓ Technology ORC ElectraTherm + Thermax absorption
- ✓ Input heat: exhaust gases from 4 paint shops, total approx. 1.6 MWth
- ✓ ORC output: 70/90 kWel, 1.4 MWth of heat and 1.2 MWth of cooling

Project objective: Production of electricity for own consumption on site, production of heat for heating, or production of cooling for cooling production halls

COGENERATION (TRIGENERATION)

STŘÍŽOVICE - paint shop

ORC operation in two modes:
1. CW side to heating/ absorber
2. Production mode – CW only to the cooler

HEX line 210 645,9 kW
HEX line 211 375,8 kW
HEX linka 212 276,0 kW
HEX linka 216 195,2 kW

140 °C
1,6 MW
114,2 °C / cooling in the cooler 87,7 °C
flow 15,7 l/s, 140/114,2 °C
flow 7,7 l/s 140/87,7 °C

Flow 26 l/s = 79,2 °C
Flow 26 l/s = 36/22 °C
65 °C
1,4 MW
80 °C
65 °C
AC heating 80 / 67 °C až 1,4 MW
38 °C
23 °C
Hall heating 80 / 65 °C max. cca 300 kW

30 °C
35 °C

12 °C
18 °C
AC cooling 12 / 18 °C až 1,2 MW

PHOTOS OF THE PROJECTS

Heating plant Poland

BPS Bulgaria

BPS Czech Republic

BPS Czech Republic

BPS Czech Republic

Diesel POHNPEI

SUMMARY

328

- ✓ How much heat do we use per year?

  > 1.9 TWth

- ✓ How much electricity do we generate annually?

  > 88 Gwel

- ✓ How much CO_2 do we save annually?

  > 193,000 kg

OUR VISION?

CONTRIBUTE TO THE LONG-TERM REDUCTION OF CO_2 PRODUCTION

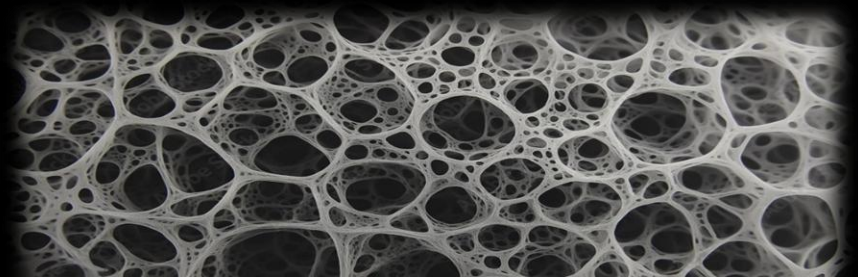
BIOCHAR
WHAT IS IT?

- ✓ What is biochar?

A highly porous, carbonaceous material produced by the pyrolysis of biomass.

- ✓ Why is it produced – what is it used for?

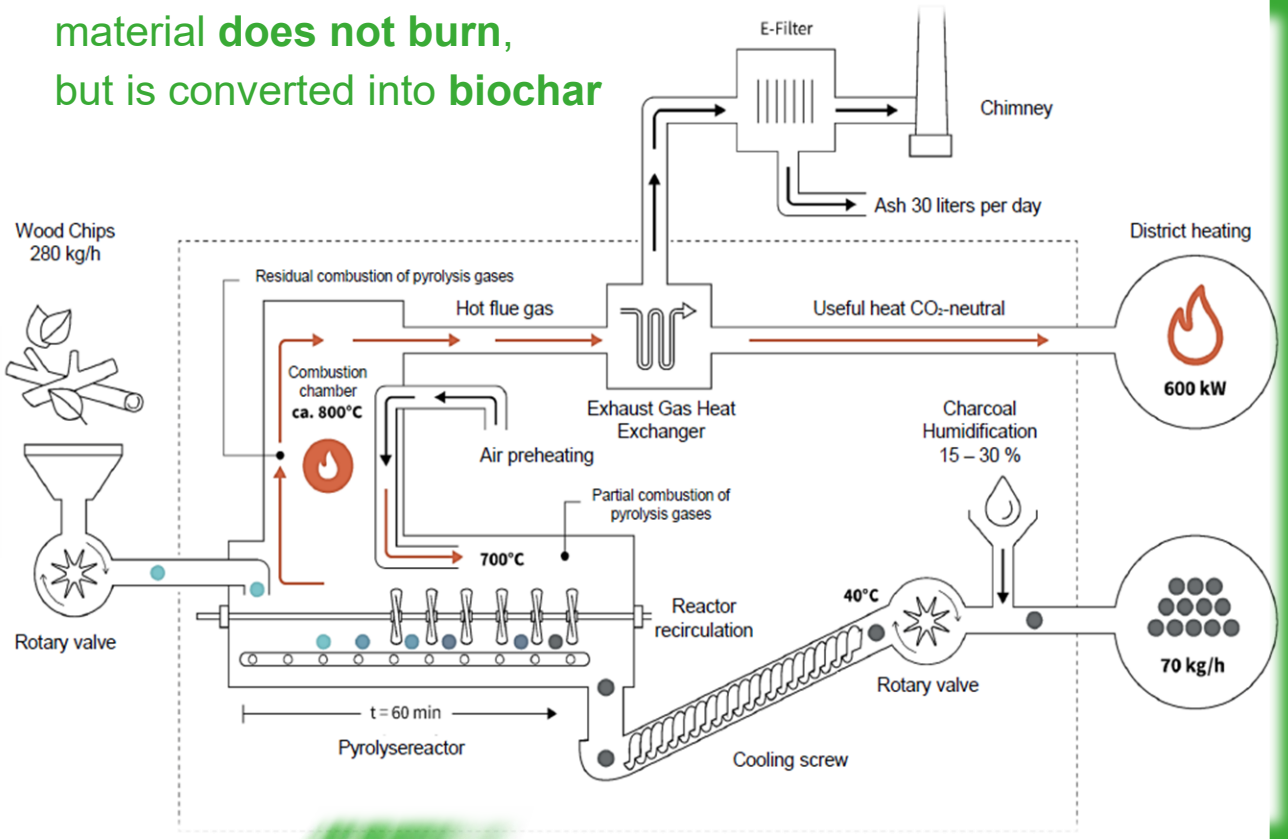
- ✓ It increases agricultural yields – improves soil fertility
- ✓ Helps retain water in the landscape
- ✓ Processes waste biomass
- ✓ Permanently fixes carbon – helps reduce CO_2 emissions
- ✓ Produces thermal energy and carbon credits



BIOCHAR
HOW IS IT PRODUCED?

✓ **Pyrolysis**

Biomass is heated in a reactor to 500–900 °C. The material **does not burn**, but is converted into **biochar**



CF 250 unit from Carbo-Force

PRODUCTION POTENTIAL:

- ✓ **Wood processing and furniture industry** (wood residues)
- ✓ **Municipalities** (green waste)
- ✓ **Food and agricultural entities** (residues from plant production)

BIOCHAR ADVANTAGES

- ✓ Key benefits for manufacturers at a glance:
- ✓ **Economic:**
  A new source of income and heat from wood residues
- ✓ **Cost savings:**
  No more waste disposal and storage costs
- ✓ **Reduced carbon footprint:**
  Helps build a sustainable image, decarbonisation

CF250 Unit – Outputs and Return on Investment

Parameter	Value
Biomass processing	**up to 250 kg/hod**
Biochar production	**approx. 70 kg/h**
Generated heat	**up to 600 kW/h** (suitable for heating / water heating)
CO_2 credits	**2–3 tons CO_2 / t of biochar** (depending on quality and certification)
Return on investment	**3–6 years** (depending on volume and use of outputs)

WHAT CAN BPOWER DO FOR YOU?

- ✓ General contractor – from feasibility studies to service
- ✓ ensuring sales of the biochar produced
- ✓ support with certification (e.g. EBC) and registration for CO2 credits

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WE ARE READY TO HELP YOU

LET'S DISCUSS IT!

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