



ThermBooster
Piston Compressor based steam production

Content

- **ThermBooster Heat pump**
- Project examples

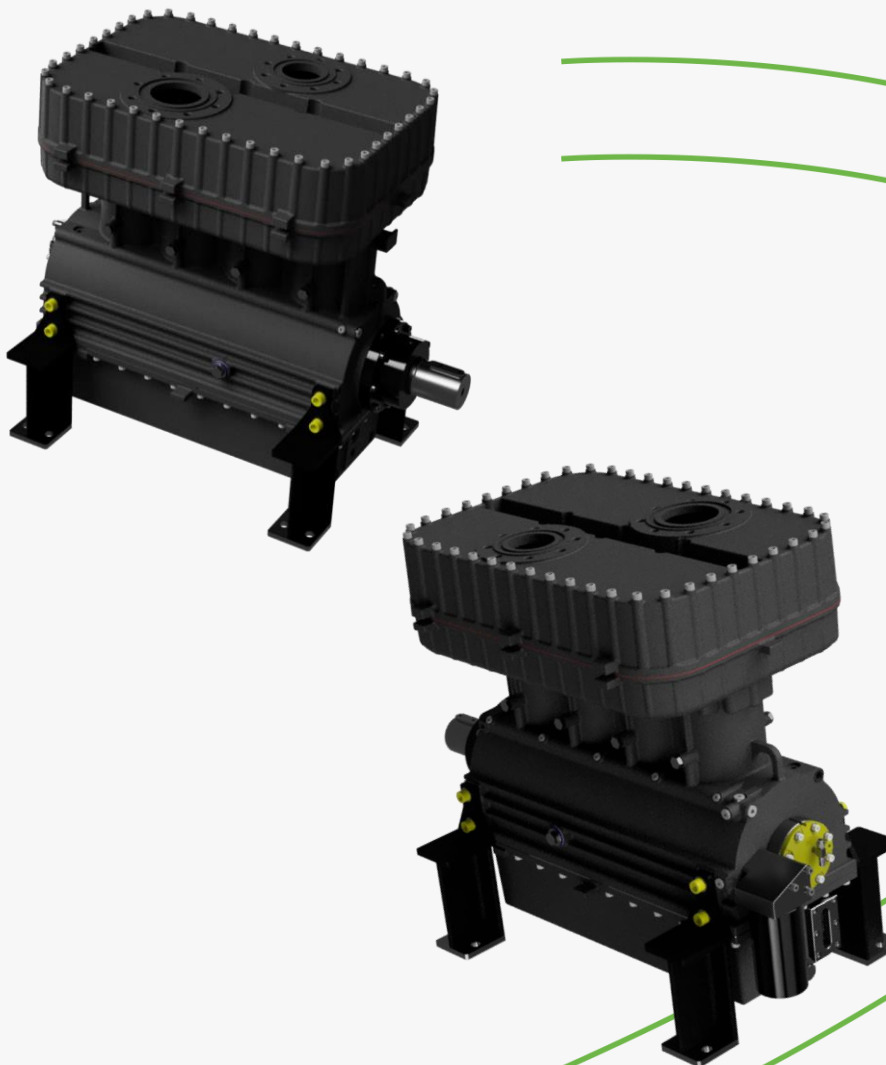


ThermBooster Compressor



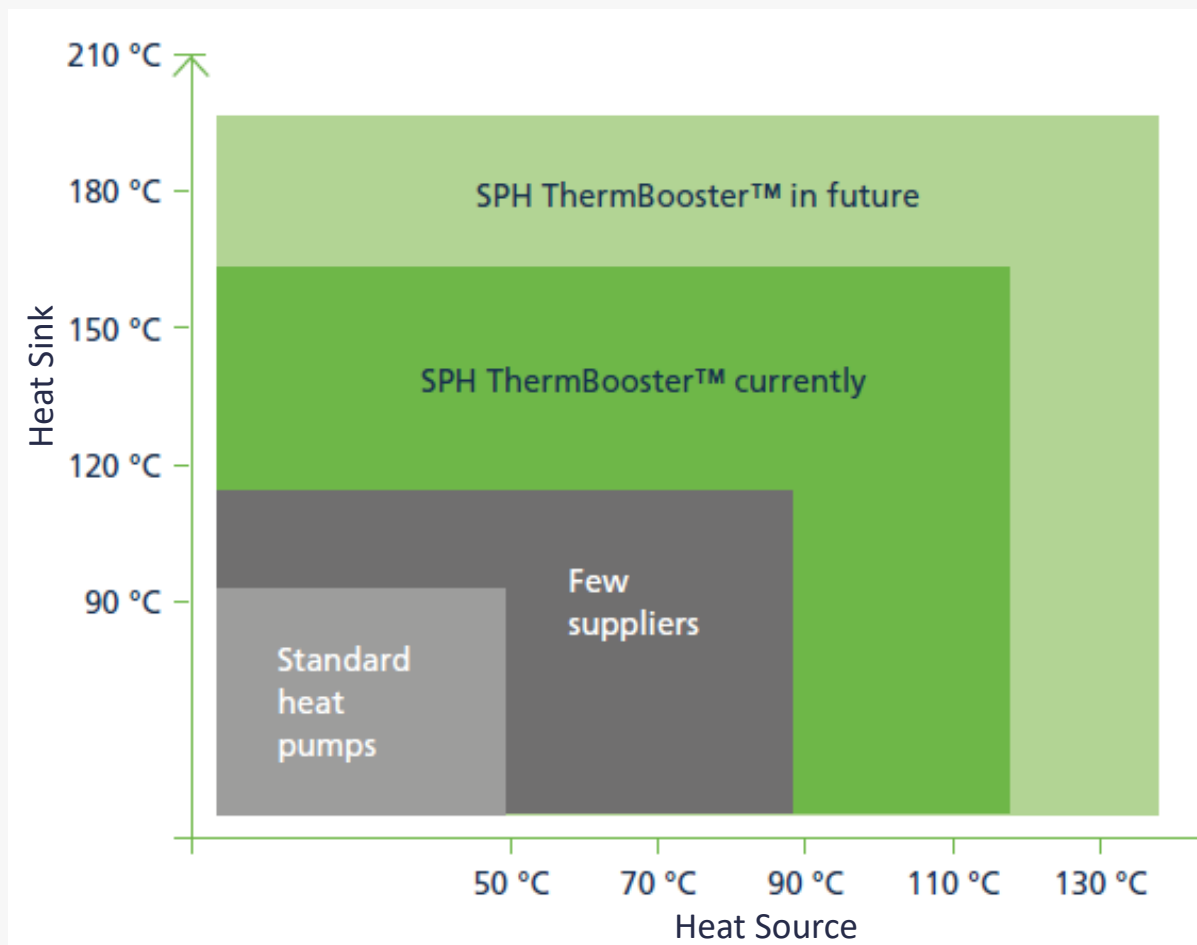
SPH – High temperature - Piston compressor

- Data
 - 4 Cylinders
 - 576 m³/h theoretical displacement
 - 35 bar/18 bar HD/ND
 - Open design
 - For engines from 110 kW to 200 kW
- Specifically developed for use in ultra-high temperature heat pumps
- Optimized for HFOs and HCs
- Optimized valve system and optimal temperature control ensures high efficiency
- Robust industrial design for a long service lifetime and low maintenance costs
- Integrated oil conditioning
- Very good partial load capability thanks to speed-controlled operation
- Use of premium efficiency motors (IE4) in combination with industrial inverter systems

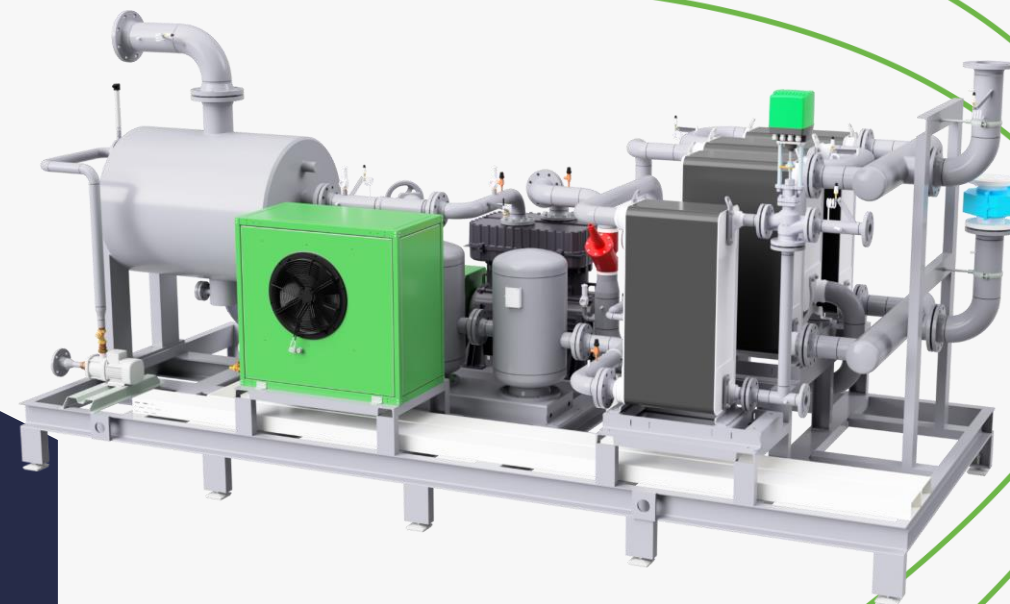
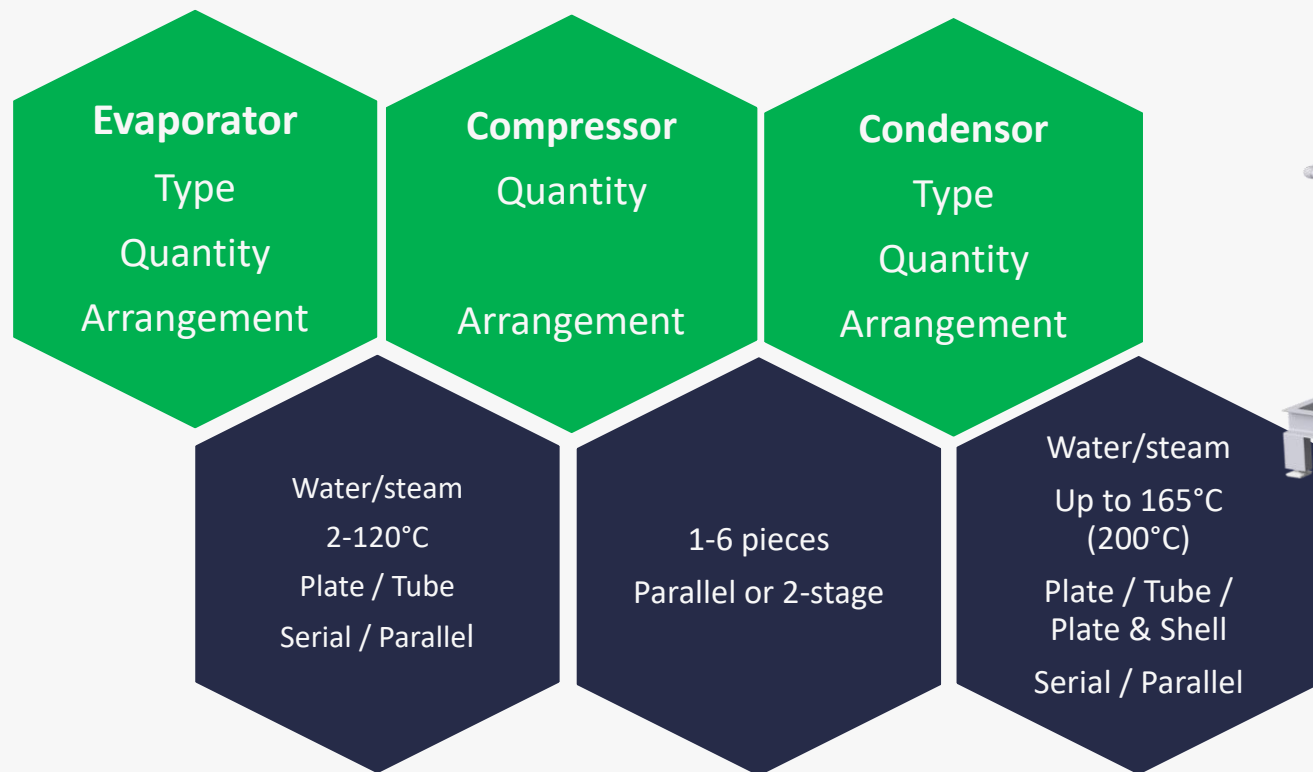


ThermBooster

Heat pump



ThermBooster Building kit

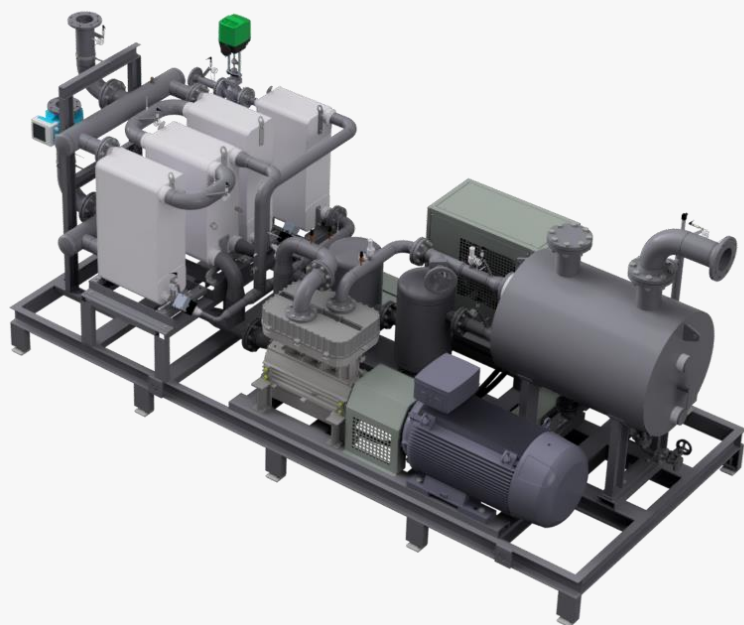


Content

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- **Project examples**



Project Gelatine



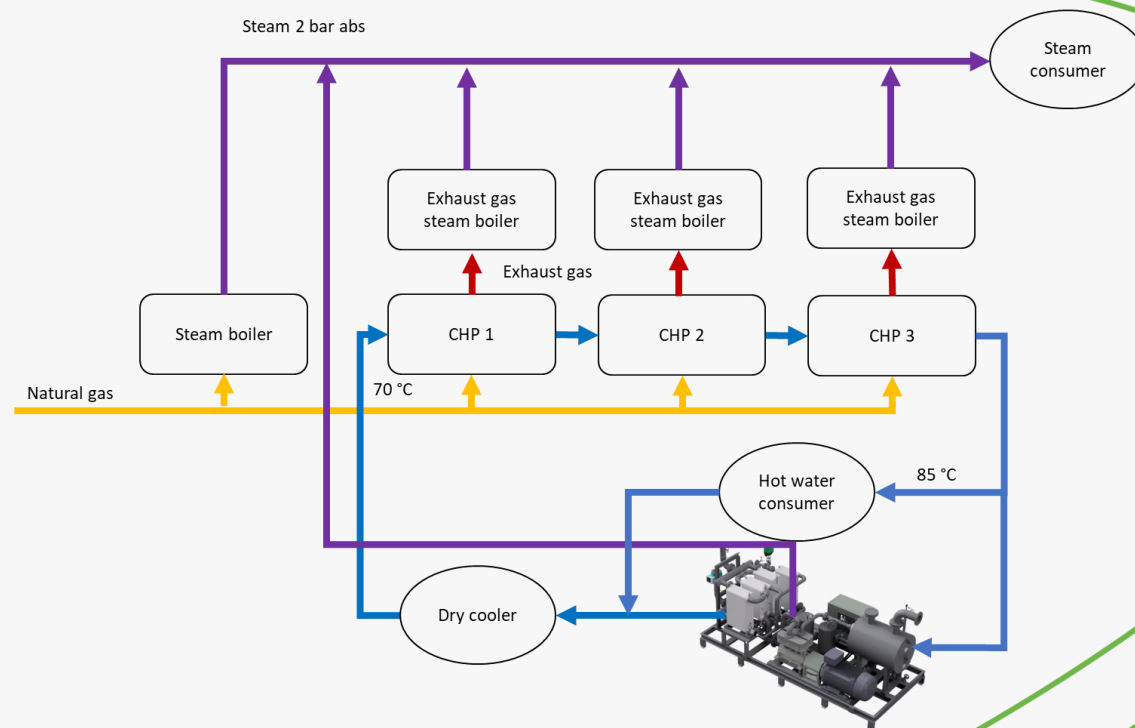
- Installation Q2 2023
- ThermBooster
 - Single Compressor
 - Heat Source:
 - Water
 - 85/70°C
 - Cooling water from CHP
 - Heat Sink:
 - Saturated Steam
 - 2 bar abs, 120°C
 - Feed in existing steam network
- Heat Pump performance:

• Heating capacity:	514 kW (812 kg/h)
• Cooling capacity:	407 kW
• Electrical consumption:	118 kW
• COP:	4,4
- 4,1 GWh thermal power production per year
- 550 t CO2 emissions per year will be avoided by this solution

In cooperation with

2G[®]
Energy AG

Project Gelatine

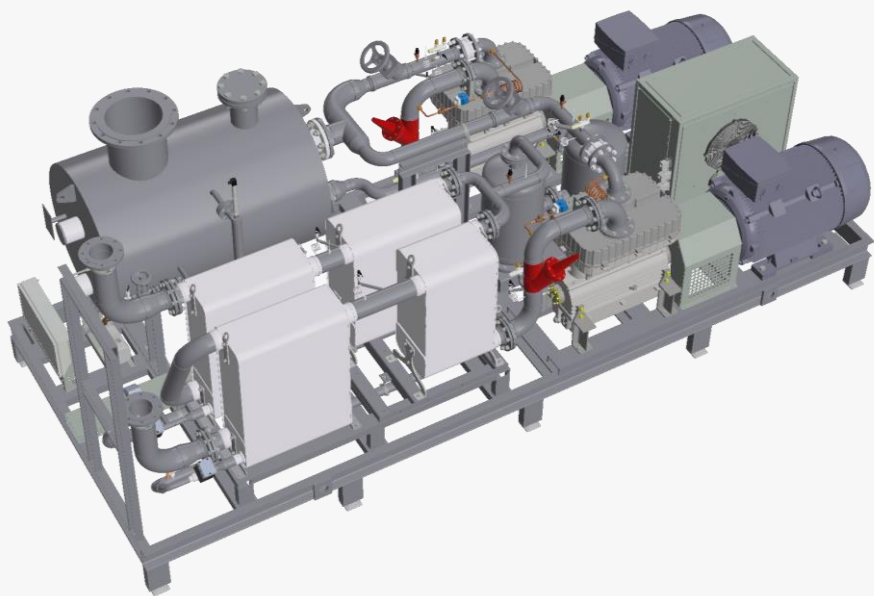


Project

Industrial Bakery



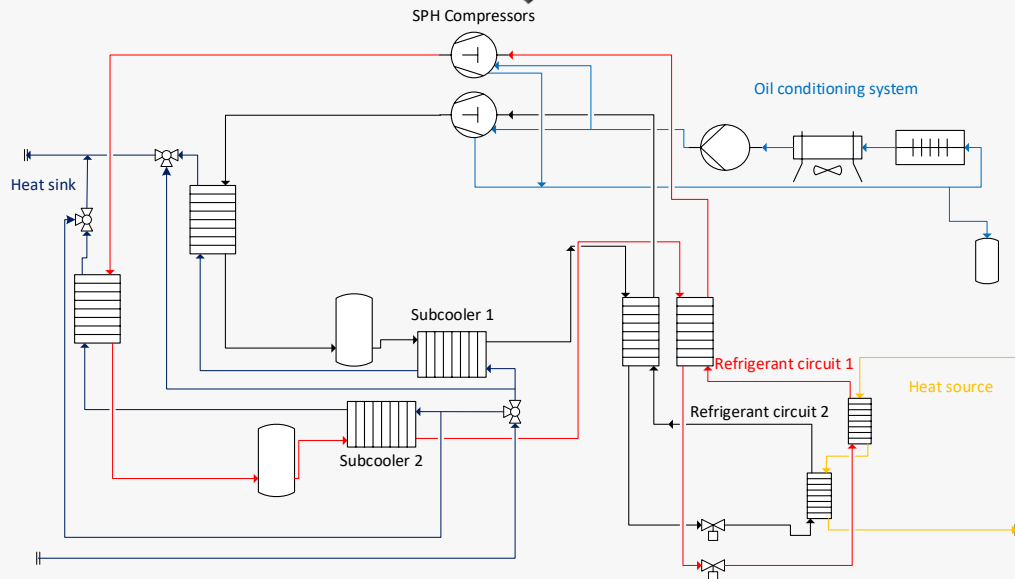
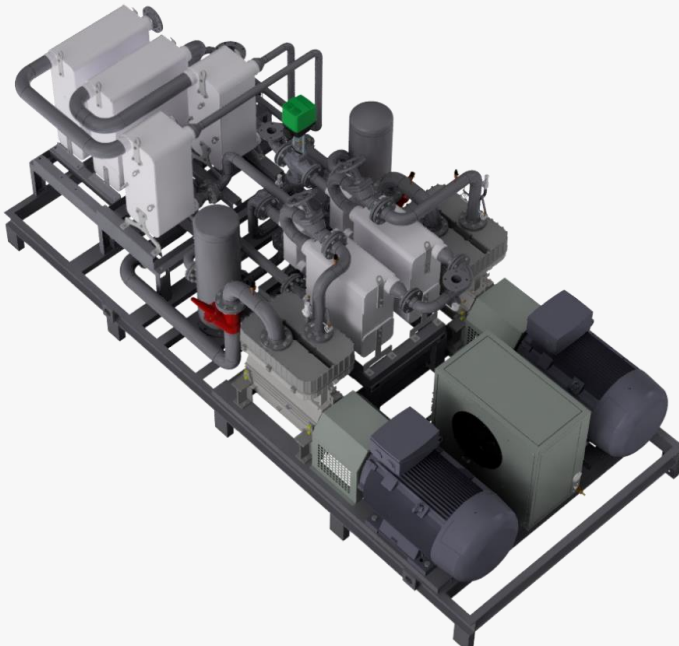
- Installation Q4 2023
- Heat Source: 92/72°C
- Heat Sink: Steam at 1,5 bar
- Heat Pump Performance:
 - Heating capacity: 1230 kW (1968 kg/h)
 - Cooling capacity: 1029 kW
 - Electrical consumption: 225 kW
 - COP: 5,5
- ~ 1700 t/a CO₂ Emissions avoided compared to natural gas



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Project UBQ



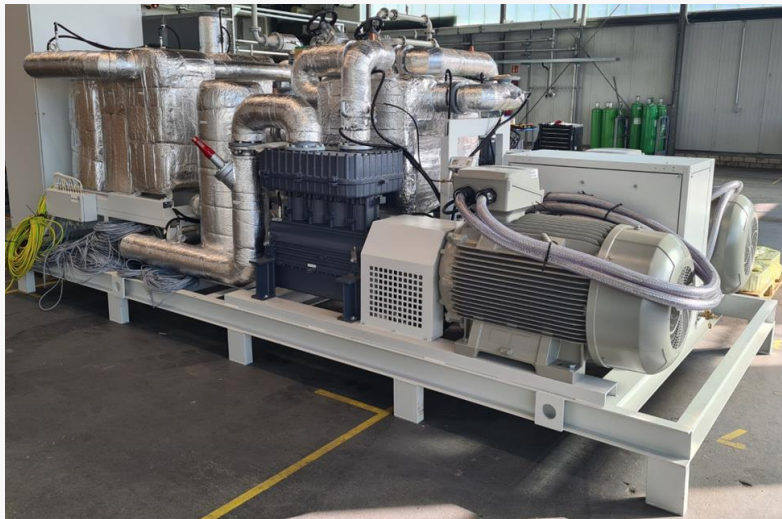
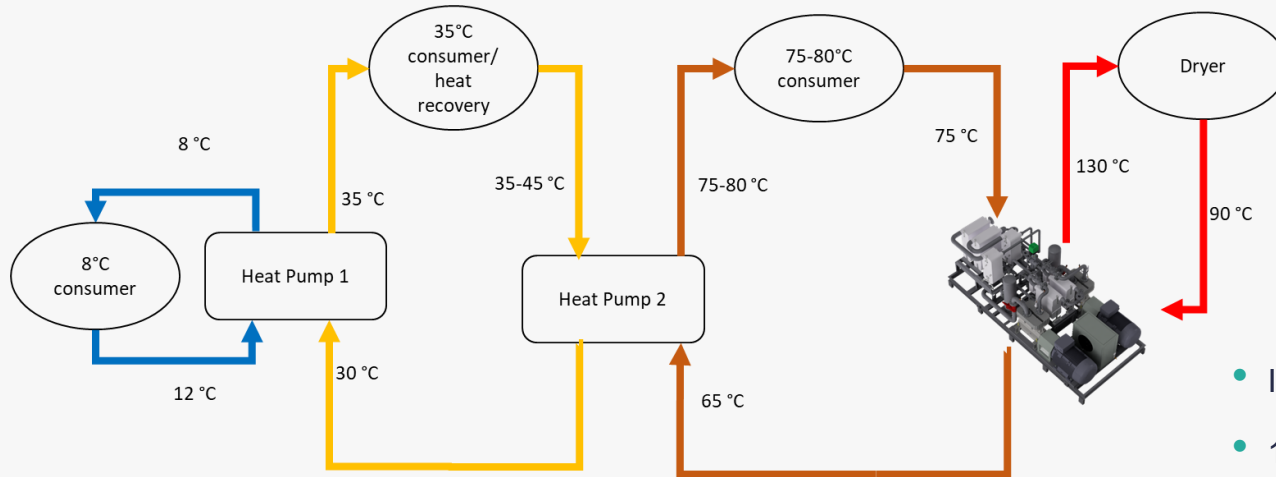
- ThermBooster
 - Dual-circuit, two compressors
 - Heat Source:
 - Water at 75/65°C
 - Waste heat from cooling process and chillers
 - Heat Sink:
 - Pressurized hot water at 90°C/130°C
 - For drying process
- Heat Pump performance:

• Heating capacity:	1017 kW
• Cooling capacity:	809 kW
• Electrical consumption:	229 kW
• COP:	4,4

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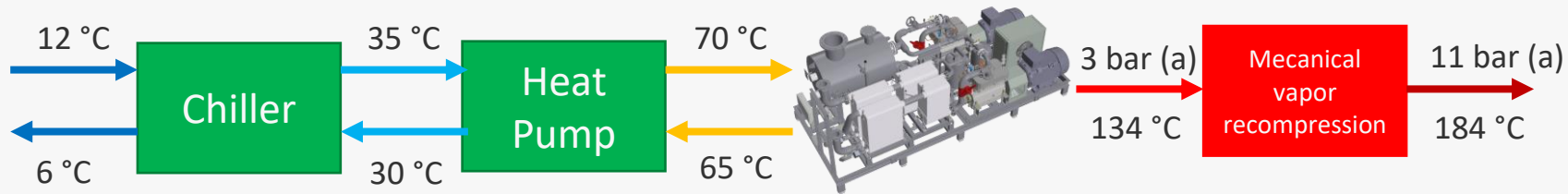
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Project UBQ



- Installation of 2 systems in April 2023
- 1,5 MW continuous need
- ~7200 h/a running time
- ~10,8 GWh ~ 39 TJ of heat will be produced per year
- Usage of 1,25 Mm³ of natural gas will be avoided per year
- By using green electricity, ~2400 t CO₂ emissions will be avoided every year

Project AHEAD



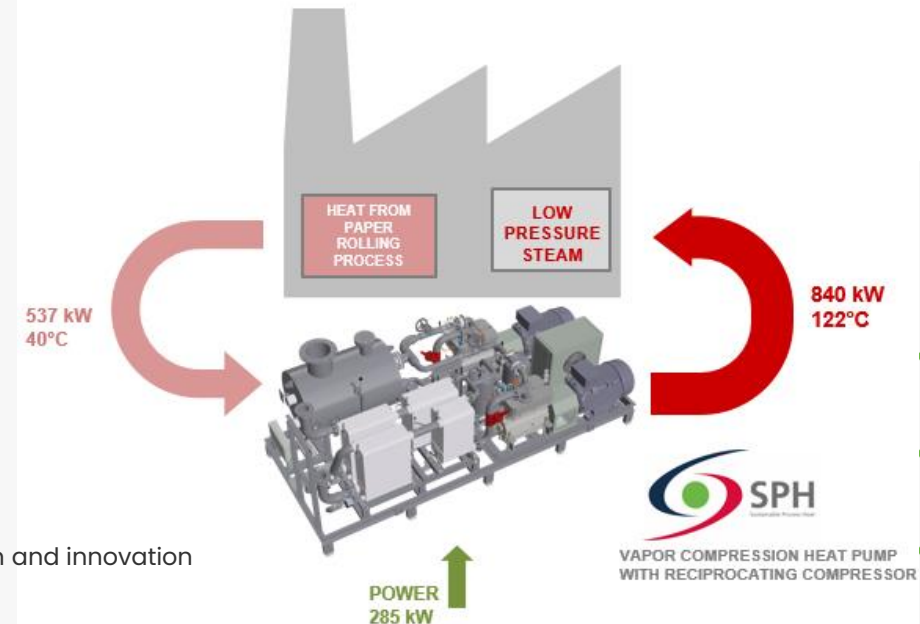
- Project start: 1.12.2022
- Planned Installation: late 2024
- All systems based on natural refrigerants (ThermBooster Butane)
- 0% CO₂ emissions for 7 month a year (no use of fossile fuels)
- 90% CO₂ reduction for manufacturing side



DEMO 1: Paper industry

Felix Shoeller Group (Germany)

Location	Weissenborn, Germany
Sector	Paper industry
Plant owner	Felix Shoeller Group
Technology	HTHP with reciprocating piston compressor (by SPH)
Waste heat source	Exhaust heat from the paper machine dryer: water glycol circuit from the exhaust humid air heat recovery circuit (30-50°C)
Heat supply	Low pressure steam at 1,8-2,2 bar(a) (117-123°C)
HTHP Unit	840 kW; expected COP: 2.3-2.6



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101069689 (PUSH2HEAT).

THANK YOU



Hot, Efficient, Green

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