EU-Project SOLINDARITY

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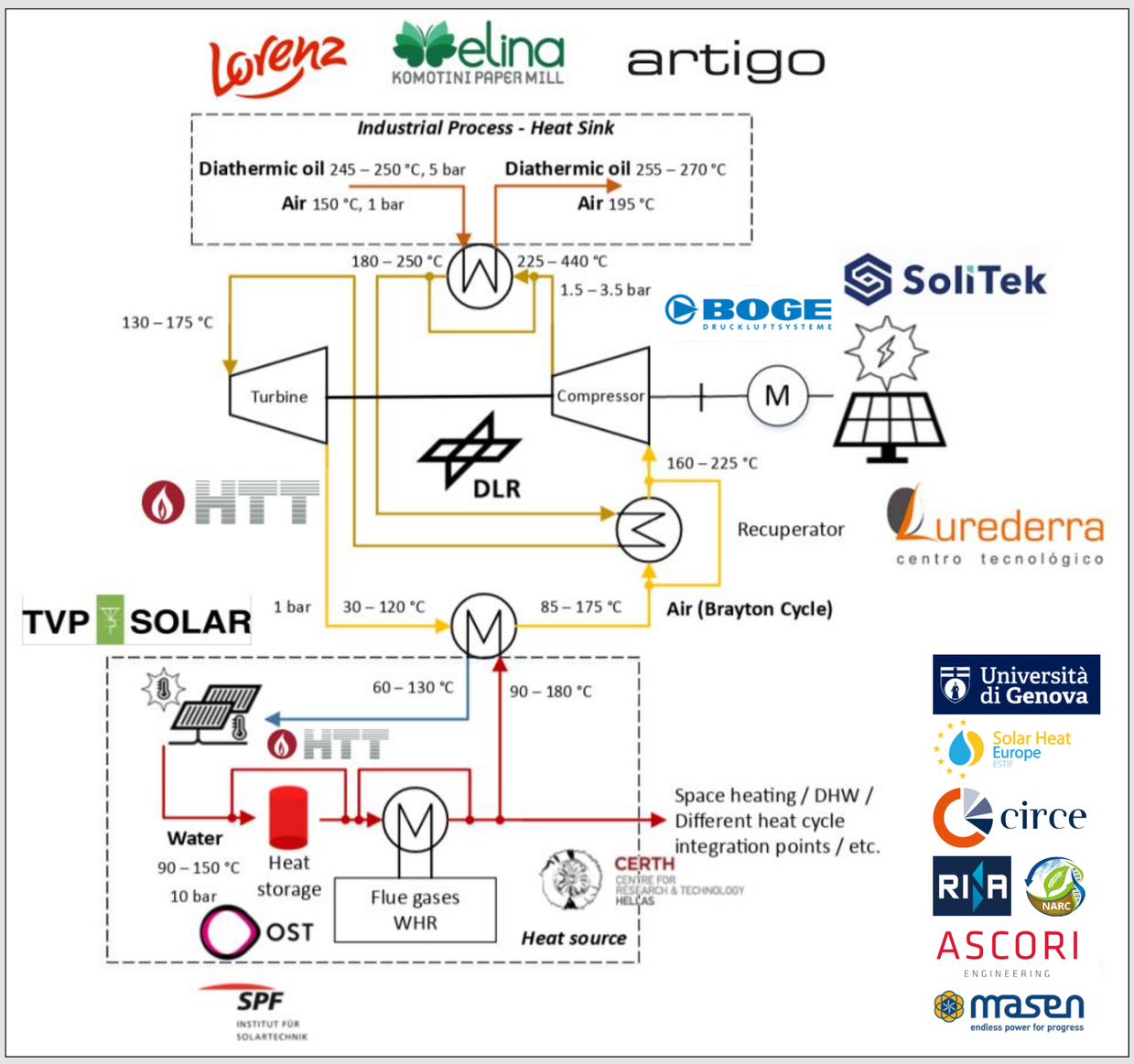
SOLINDARITY - SOLAR-DRIVEN INDUSTRIAL POWER AND HEAT UPGRADED WITH HIGH-TEMPERATURE HEAT PUMPS FOR ENHANCED INTEGRATED PROCESS EFFICIENCY

Main goal

Develop, demonstrate and validate an integrated Solar Energy based Heat Upgrade System (SEHUS) that couples solar energy (heat and electricity), a high temperature heat pump (HTHP) with air as working medium, thermal energy storage (TES) and waste heat recovery (WHR) for deep decarbonisation of industrial processes.

Objectives

- Develop and deploy a non-concentrated solar thermal module delivering pressurized water at temperatures between 100-180°C
- Integrate dedicated TES to enable efficient heat upgrade from HTHP, while utilizing PV-supplied electricity.
- Develop and integrate a reverse Brayton cycle-based HTHP powered by solar energy in configurations suitable for different industrial processes.
- Develop and deploy an improved PV solution with increased efficiency and total cost of ownership enabling the cost-effective utilization of solar energy even in space-constrained industrial sites.
- To model, simulate and twin the SEHUS system digitally and optimise the system's operation under the constraints of the specific industrial processes, RES volatility and system component state.
- To integrate the SEHUS with 3 industrial plants (paper and pulp, food and rubber) of different characteristics and demonstrate its capability to achieve better overall efficiency.



SOLINDARITY conceptual diagram with associated partners

Funded by the European Union

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Project: 101136148 - SOLINDARITY - HORIZON-CL5-2023-D3-01

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