CO2OLHEAT project

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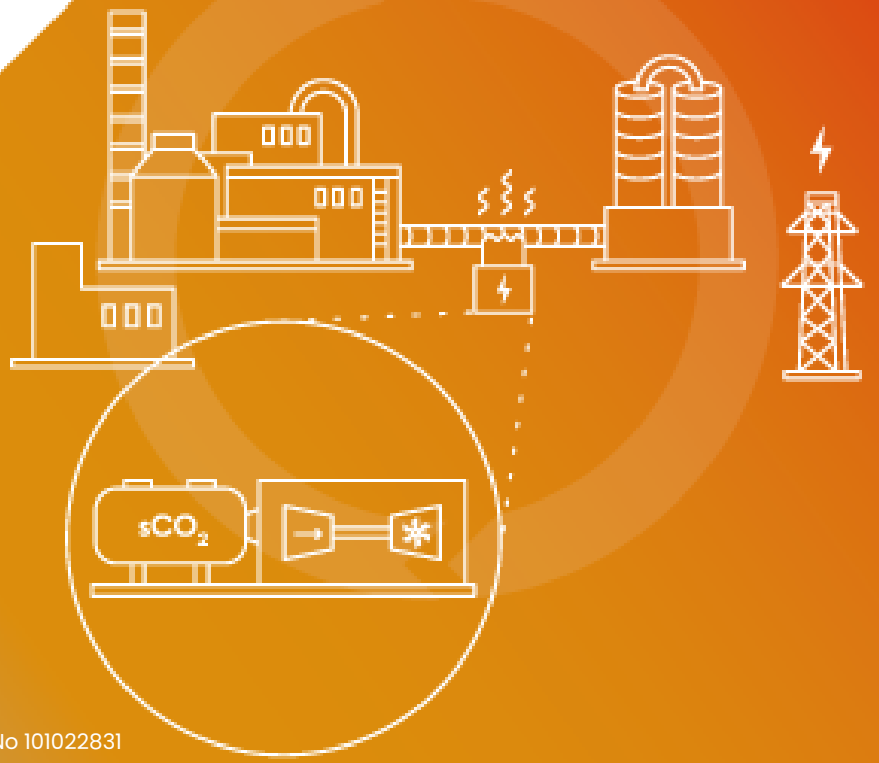
CO2OLHEAT

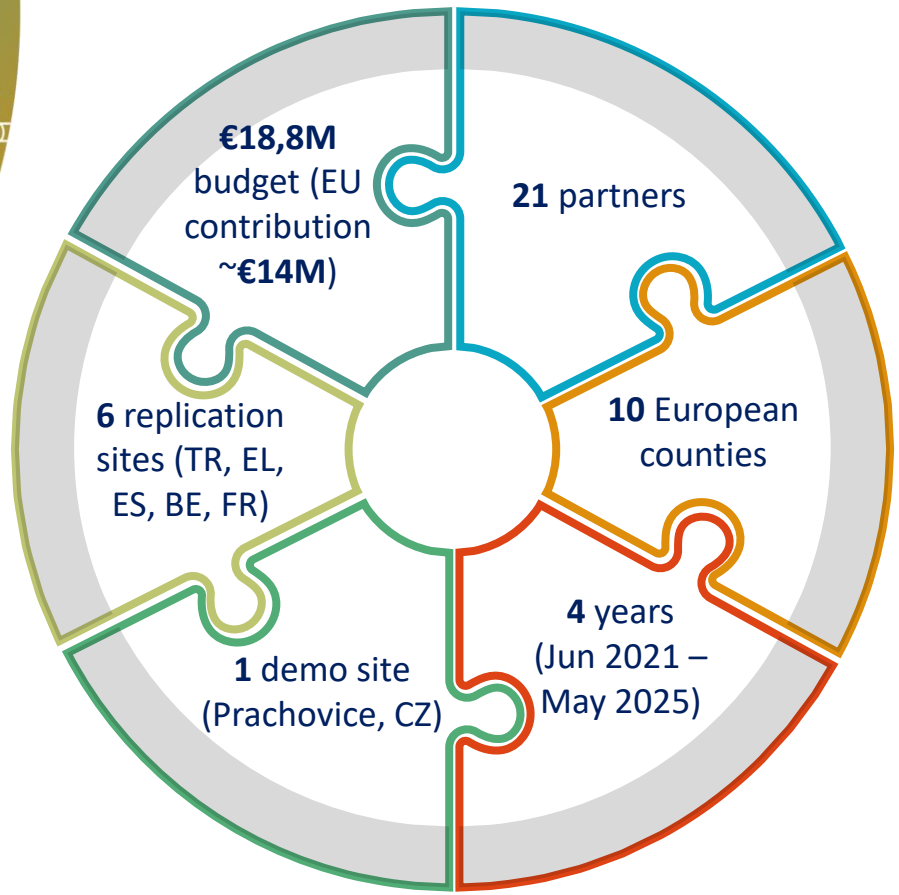
Supercritical **CO2** power cycles demonstration in **O**perational environment **L**ocally valorising industrial Waste **HEAT**

DEMO site ETN workshop dd 12-13/10/22



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101022831

CO2OLHEAT in a nutshell



- **CO2OLHEAT** aims to unlock the potential of industrial **waste heat** and **transform it into power** (WH2P) via **supercritical CO_2 cycles** (sCO_2)
- **CO2OLHEAT** will develop and demonstrate a 2 MW **sCO_2 power block able to valorise** the unused **waste heat**
- **CO2OLHEAT** targets WH2P as a key enabler in fostering
  - Resource **efficiency** and the **competitiveness** of the EU's Energy Intensive Industries
  - EU industrial sector **decarbonisation**
- **CO2OLHEAT** is the **first-of-its-kind** EU MW scale WH2P sCO_2 plant
- This **CO2OLHEAT** plant will be installed in the **real industrial environment** of CEMEX cement plant in Prachovice (CZ)

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Technological development

- Shorter **ramp-up** time
- Good accommodation of **load changes**

Flexible

- Unparalleled WH2P **technology**
- No GHG **emissions**

Innovative

- Competitive **LCOE**
- **Payback** period of max. **6 years**

Economic. viable

- **Smaller size**
- **Modular**
- **Material savings**

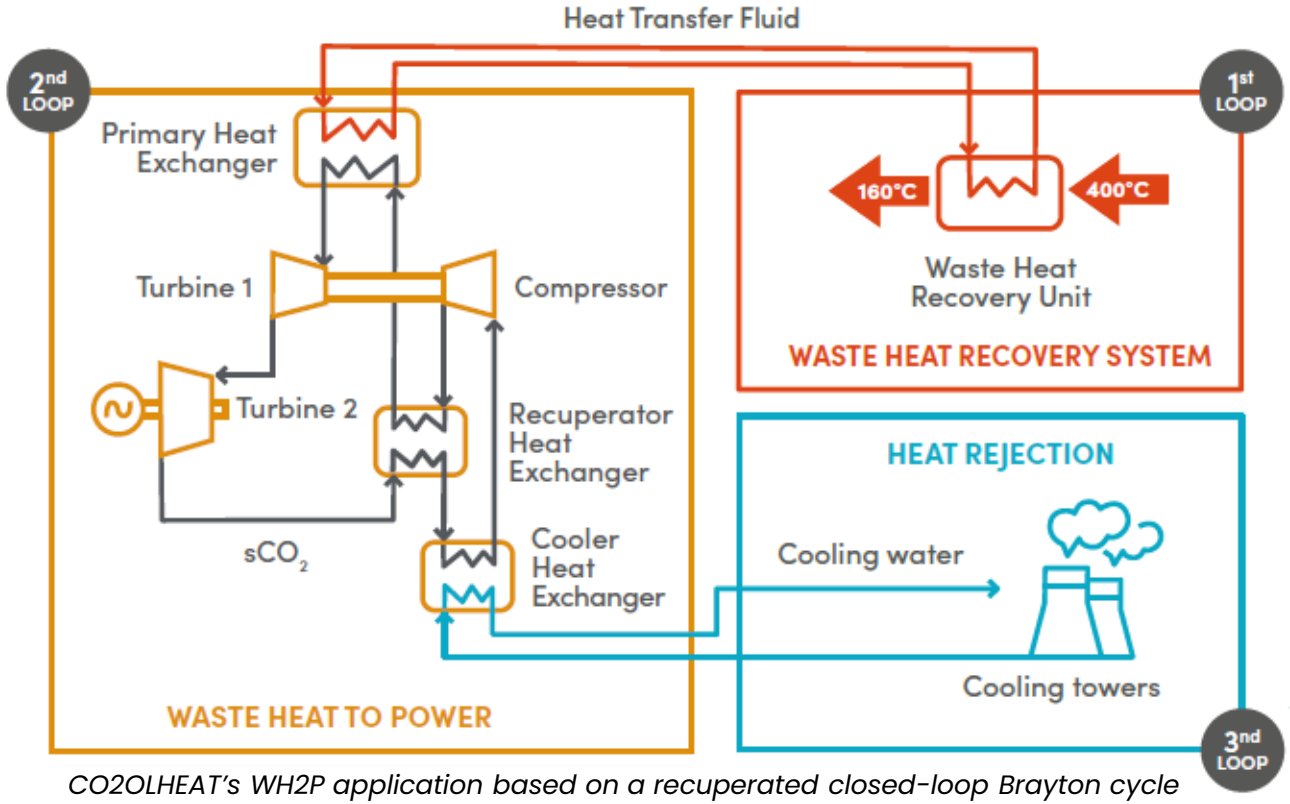
Compact

- Comparable or even **higher efficiency** than steam cycles/ORC

Efficient

- **6 replications sites** already part of the project
- Others are **ready to follow**

Replicable



CO2OLHEAT's WH2P application based on a recuperated closed-loop Brayton cycle with sCO_2 as a working fluid

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Project status 01092022

- Completed conceptual design
  - Thermodynamic design
  - Risk analyses
  - Initial scoping

- Finalization of FEED
  - Material balance/PFD/P&ID
  - Finalise scope, project plan and costing

FEED study revealed that high integration costs exceed the project budget. Need for other demo sites in the energy intensive industry (Cement, Glass, Steel, Aluminium, Power) for easy integration and additional funding

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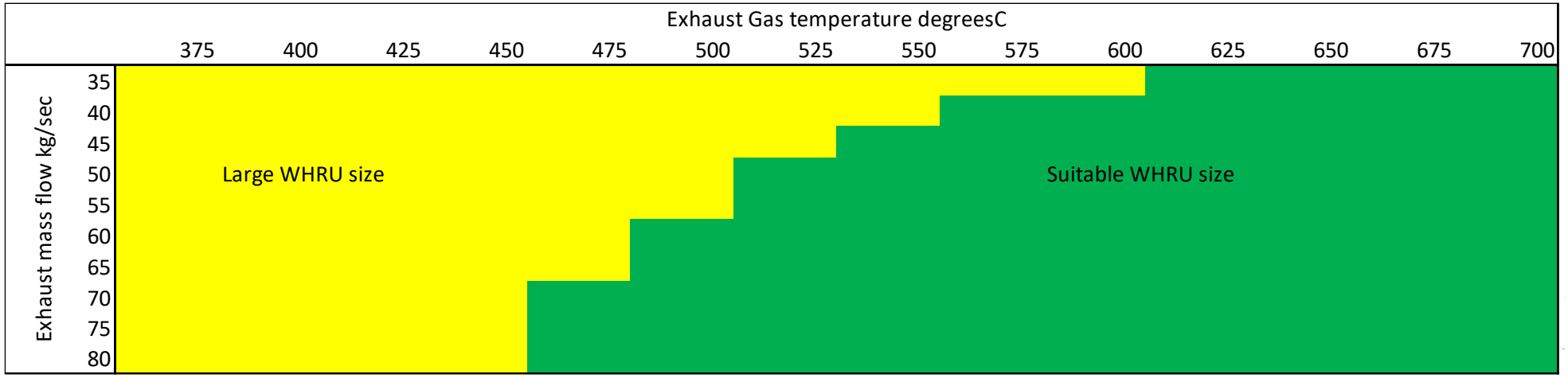
What do we need

- Easy accessible side
- Enough footprint
- Full auxiliaries: electricity, cooling, compressed air
- Enclosure
- Additional funding
- “Clean” and sufficient exhaust gas to reduce the size and costs of the WHRU



WHRU size as a function of mass flow and exhaust gas temperature

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What do we offer

- Strong consortium
- Robust thermodynamic cycle
- Best in class turbo machinery manufacturers
- 2 MW WH2P cycle
- Integration within existing infrastructure
- Full technical and operational experience of a sCO_2 cycle
- Exploitation of a 2 MW power plant after the DEMO has ended

2 MW power cycle, able to produce 17,000 MWh electrical power per year and a revenue/saving exceeding 2 MEURO

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