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Heat Recovery in E-metanol production

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SPAIN NATIONAL TEAM

CÁTEDRA DE TRANSICIÓN ENERGÉTICA | COMILLAS ICAI | REPSOL Fundación

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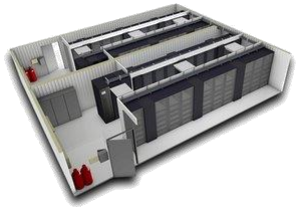
ARANER BUSINESS APPLICATIONS

DISTRICT ENERGY
District Heating
District Cooling
TES Systems



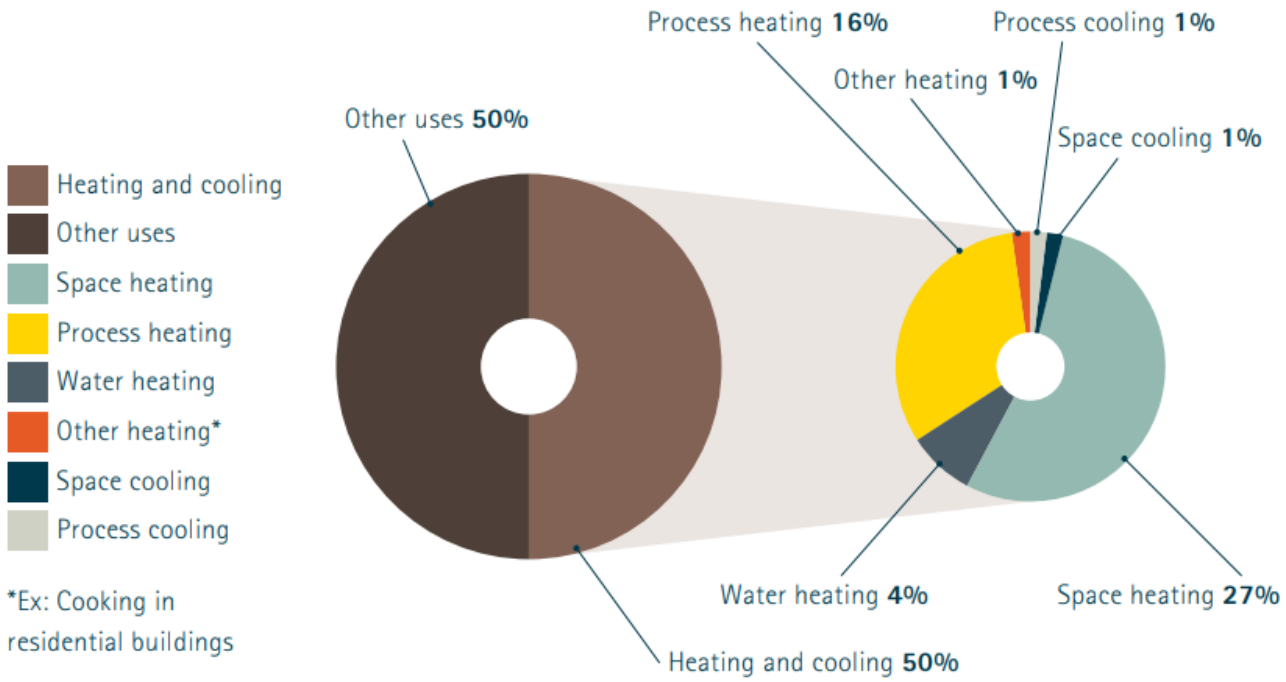
DATA CENTERS
Conventional Cooling
Immersion Cooling
Heat Recovery

POWER GENERATION
TIAC
TES TIAC
Thermal storage

BATTERY FACTORY
Cooling and Heating
Systems

Decarbonizing heat demand with heat pumps

- Half of the energy production is for heating and cooling uses.
- Process Heating and Cooling represents >17% of the total energy consumption
- Actually, that demand is covered mainly by fossil fuels
- Heat Pump is the most efficient way to decarbonize (electrify) the heat production

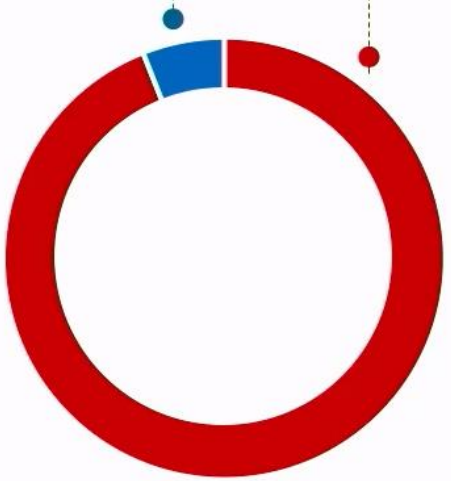


Decarbonizing heat demand with heat pumps

Thermal Energy Demand & Sources

2275 TWh
heating energy demand
96 % fossil fuelled

145 TWh
refrigeration energy
86 % electrified



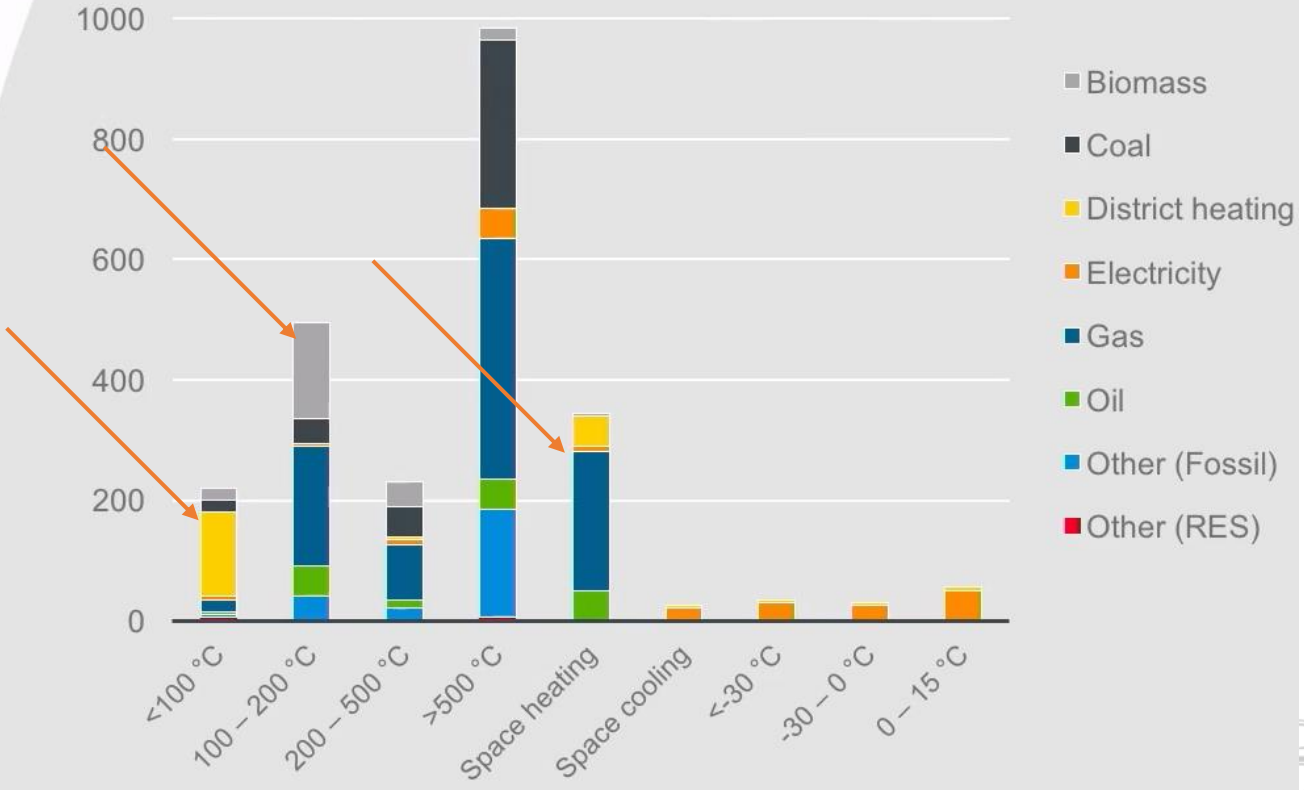


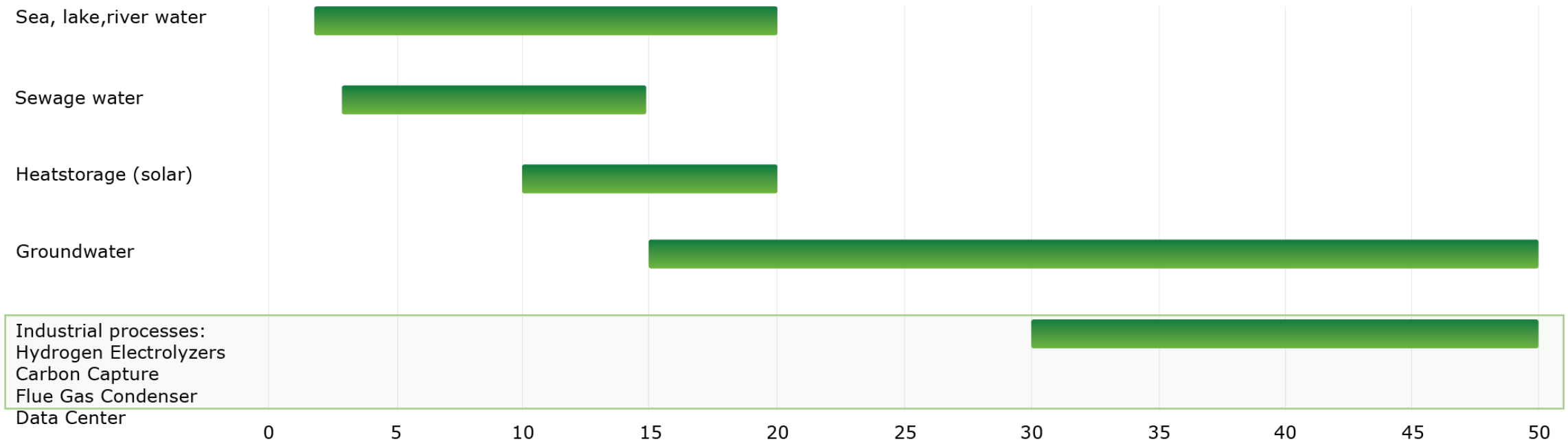
Figure: Industry end-use and energy carrier (EU28, 2015)

ARANER HEAT PUMPS TECHNOLOGIES

- MW th duty from 10 MW th up to 25 MW th each HP
- Fully assembled and tested on factory, no site welding
- Transported in one piece, reduced installation time
- HFOs refrigerants: **R1234ze** with GWP<1 & **R1233zd** with GWP<1
- Most reliable for lower maintenance stop and long term operation mode
- Max. temperature hot water supply:

	From	To
R1234ze	2.5 ºC	92 ºC
R1233zd	2.5 ºC	115 ºC
R717	2.5 ºC	87 ºC
Hydrocarbons	2.5ºC	115 ºC

HEAT PUMPS TECHNOLOGIES - Heat sources

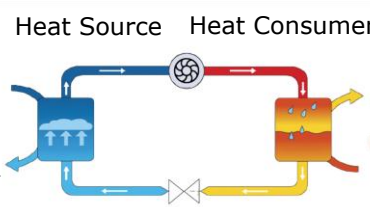



Sewage water


Carbon capture


Flue gas condenser


Data center



Heat Pump


Floor heating


Tap water


Process water


Air conditioning

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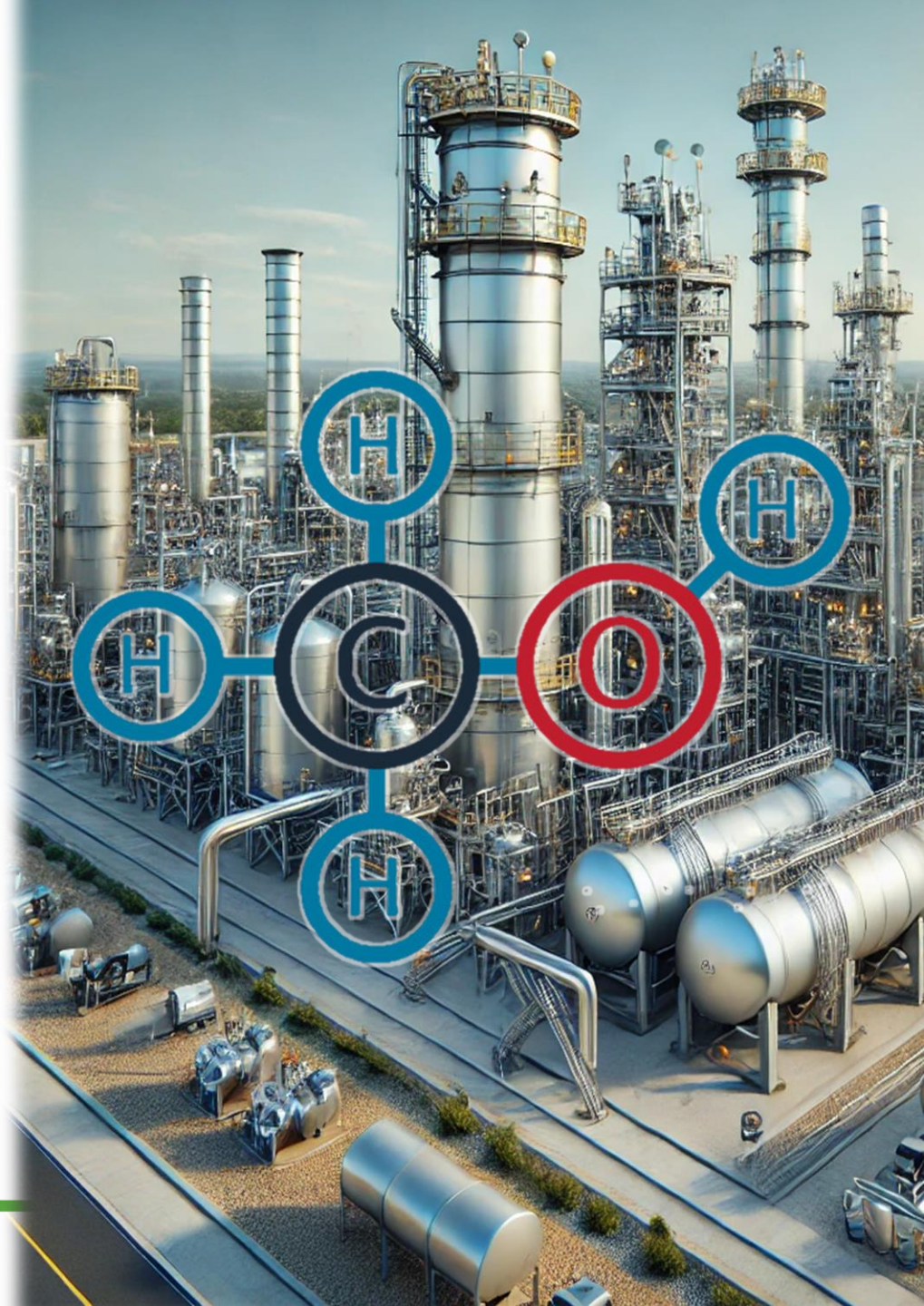
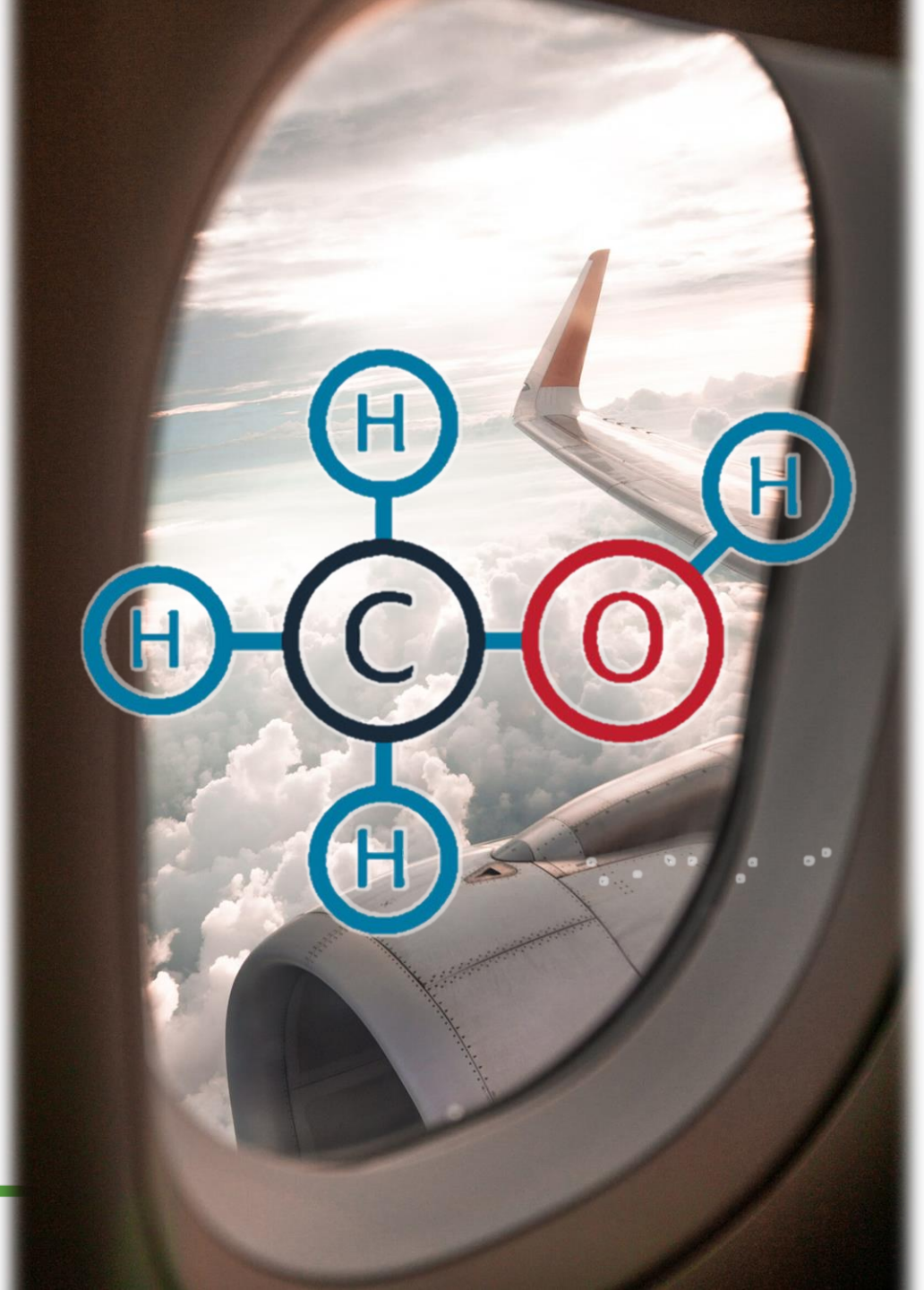
E-Methanol: What is it?

- E-methanol (electro) is a renewable fuel obtained from energies that do not generate any type of polluting emission into the atmosphere.
- It is generated from **CO2** and **H2** as **CH3OH**, and it is the base for further products such DME, Olefines, and sintetics fuels such gasoline, kerosene, …
- The **H2** is obtained from electrolyzers, that consumes energy and generates HEAT.
- The **CO2** is captured after fuel combustion process, usually in a combined heat and power plant. The process generates excess heat.
- Flue gas condenser system is a prior requirement in the CCS, a process that generates excess heat.

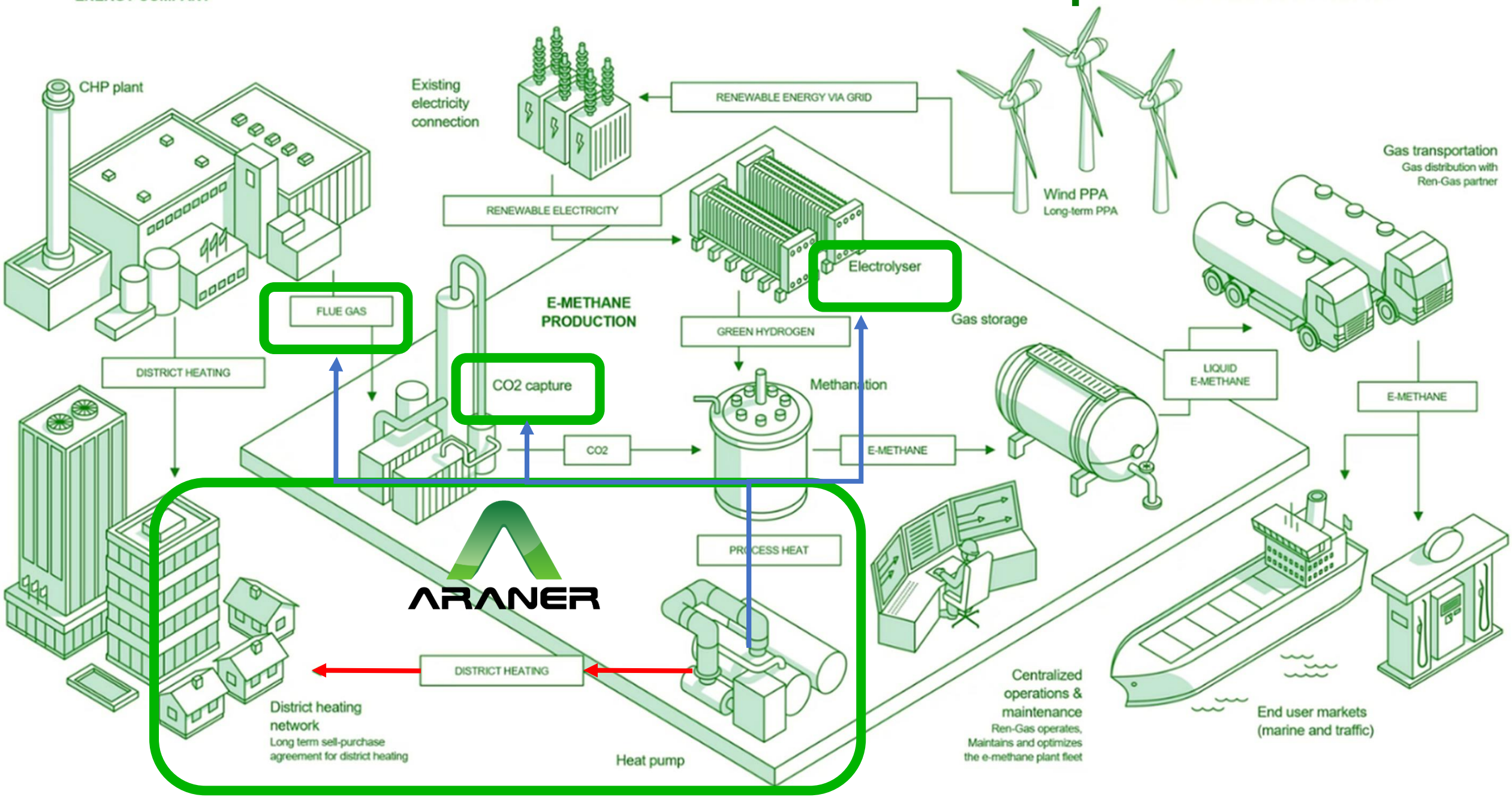


E-Methanol: Why it is important?

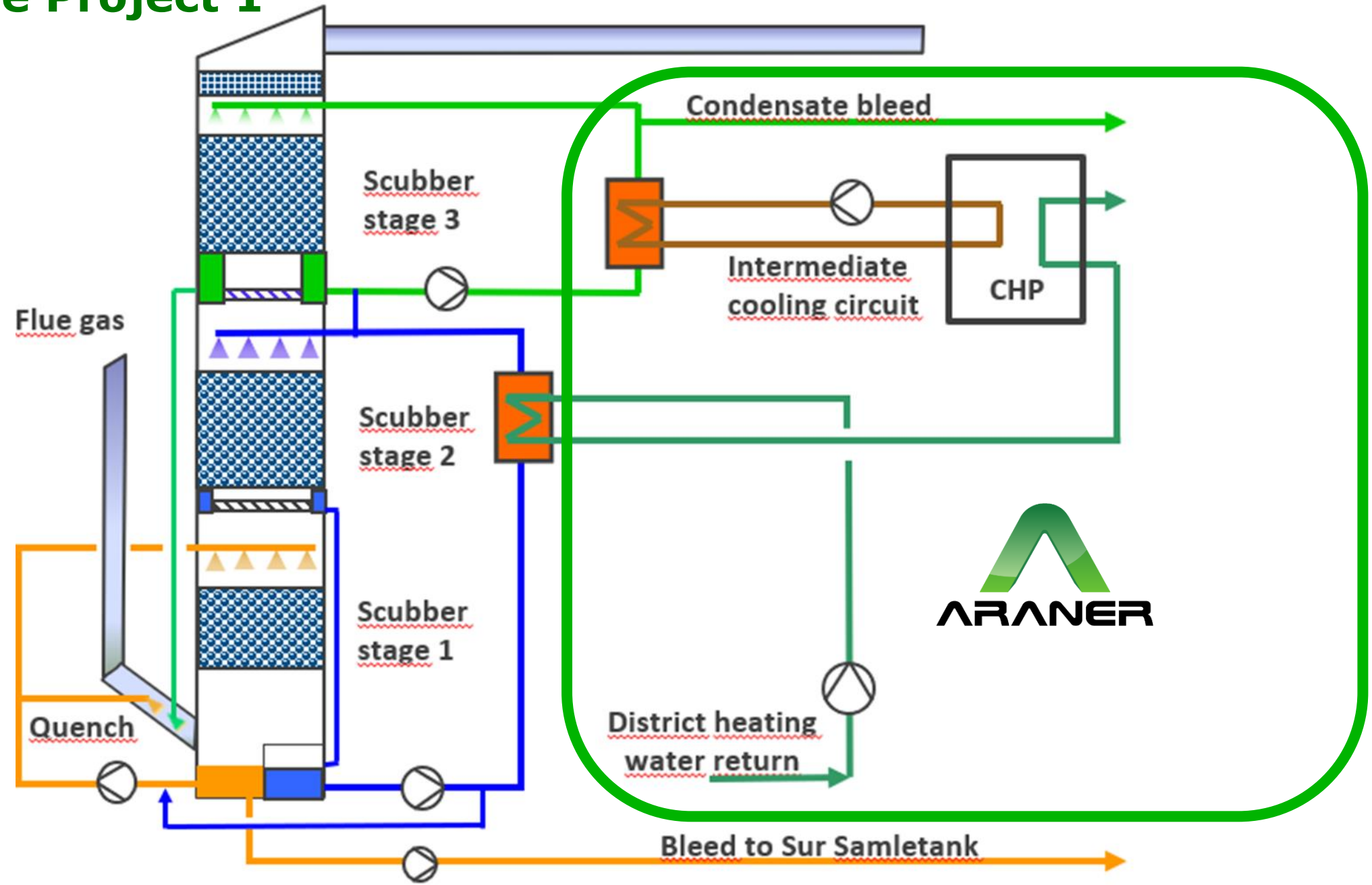
- E-methanol will play an essential role in the decarbonisation of different sectors.
- E-methanol is a fuel in a liquid state. Easier to transport and storage (vs H2)
- Higher energy density (by volume) than H2.
- Carbon neutral: reuses CO2 emissions, cleaner burn (reduced Nox, Sox)
- It is a direct replacement fuel in combustion engines, maritime transportation, aviation, road transportation.
- Blending with other fuels: Can be combined to reduce the carbon intensity for a cleaner fuels.



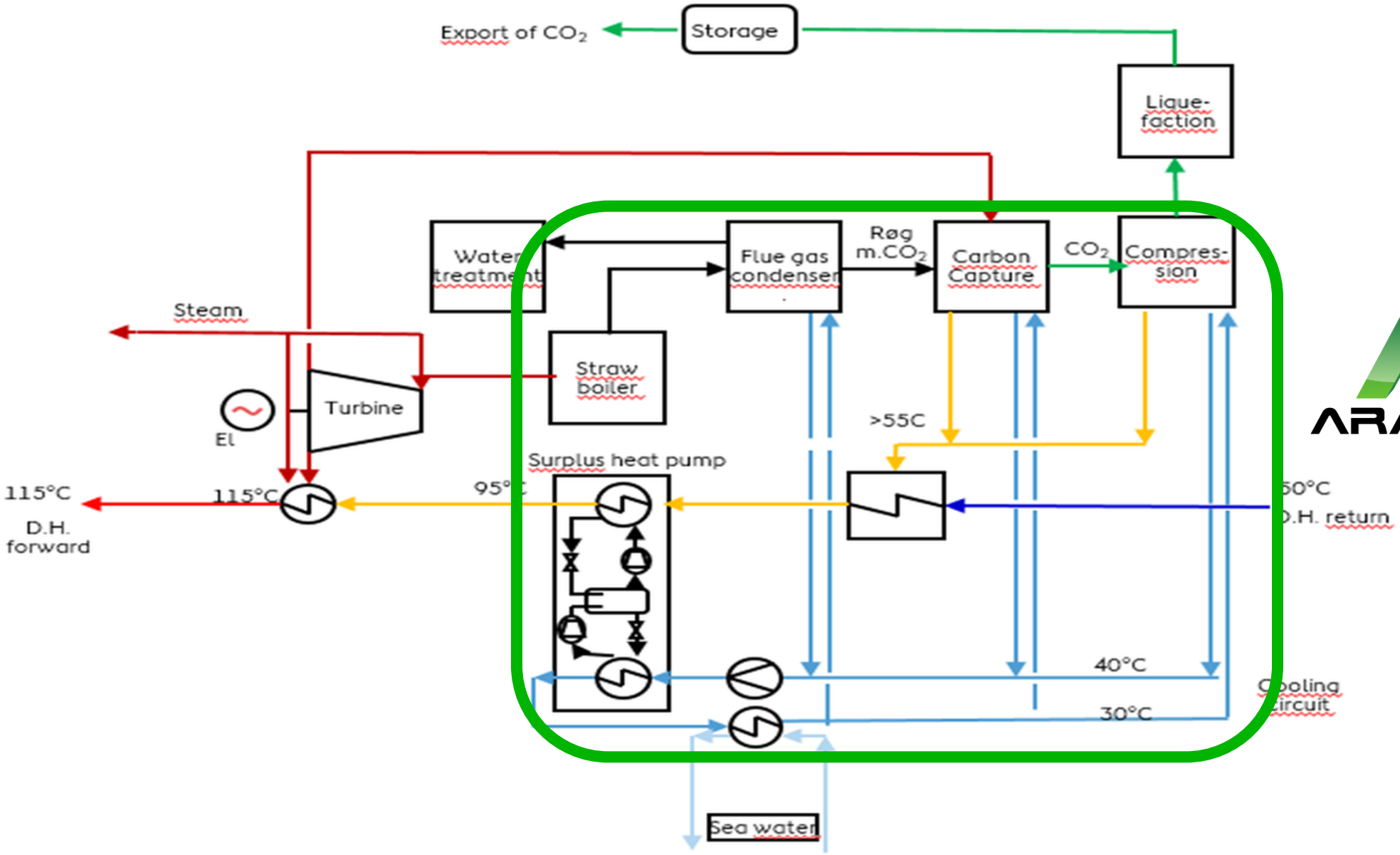
E-Methanol + LS Industrial Heat Pumps



Sample Project 1



Sample Project 2



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Please feel free to contact us if there are any additional questions, more information is needed, or potential collaboration opportunities are to be explored in the future.

We are available to assist and look forward to working together soon.