

Flue gas condensation

Advancing Efficiency and Reducing Emissions in Waste-to-Energy

WTE PLANT



BRESCIA WASTE TO ENERGY PLANT

History

1998

Start-up of Line 1 and 2

2004

Start-up of Line 3

2006-2012

Installation of catalytic system
deNOx – High Dust

2009-2010

Upgrade of the fabric filters

2009-2010

Efficiency of boilers and steam turbine

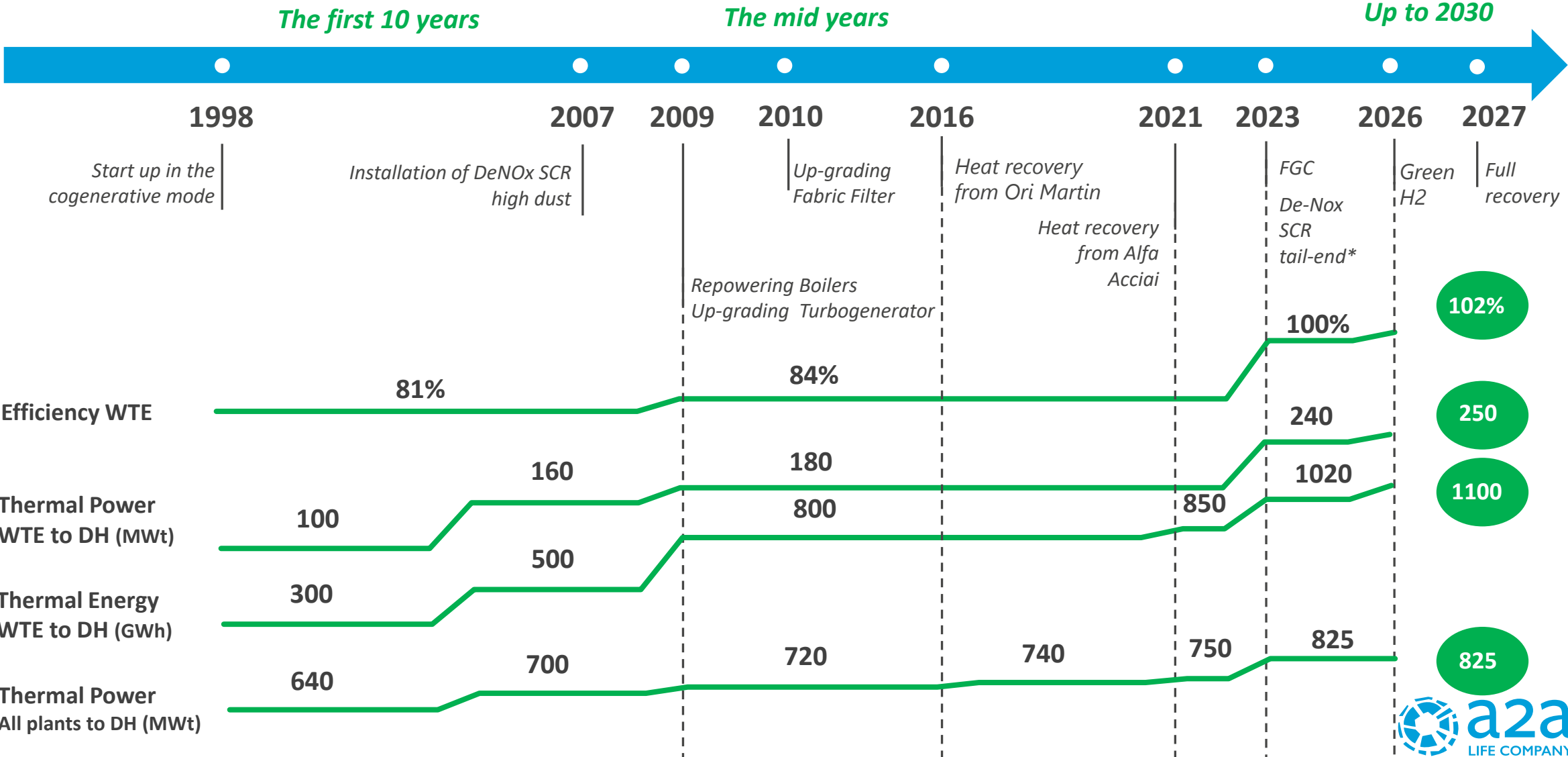
2020-2023

Revamping of flue gas treatment with
recovery of energy



BRESCIA WASTE TO ENERGY PLANT


Development over the years





BRESCIA WASTE TO ENERGY PLANT

Numbers

 **730.000** tons of non-recyclable waste per year from which electrical and thermal energy are recovered.

 **500.000** megawatt-hours of electrical energy produced annually (equivalent to the energy needs of approximately 200,000 households).

 **900.000** megawatt-hours of thermal energy produced annually, connected to the district heating network of the city, becoming the primary source of heat generation for the city of Brescia.

 **18 million** tons of waste not sent to landfill (equivalent to the area of 200 football fields).

 **865.000** tons of CO₂ emissions avoided annually.

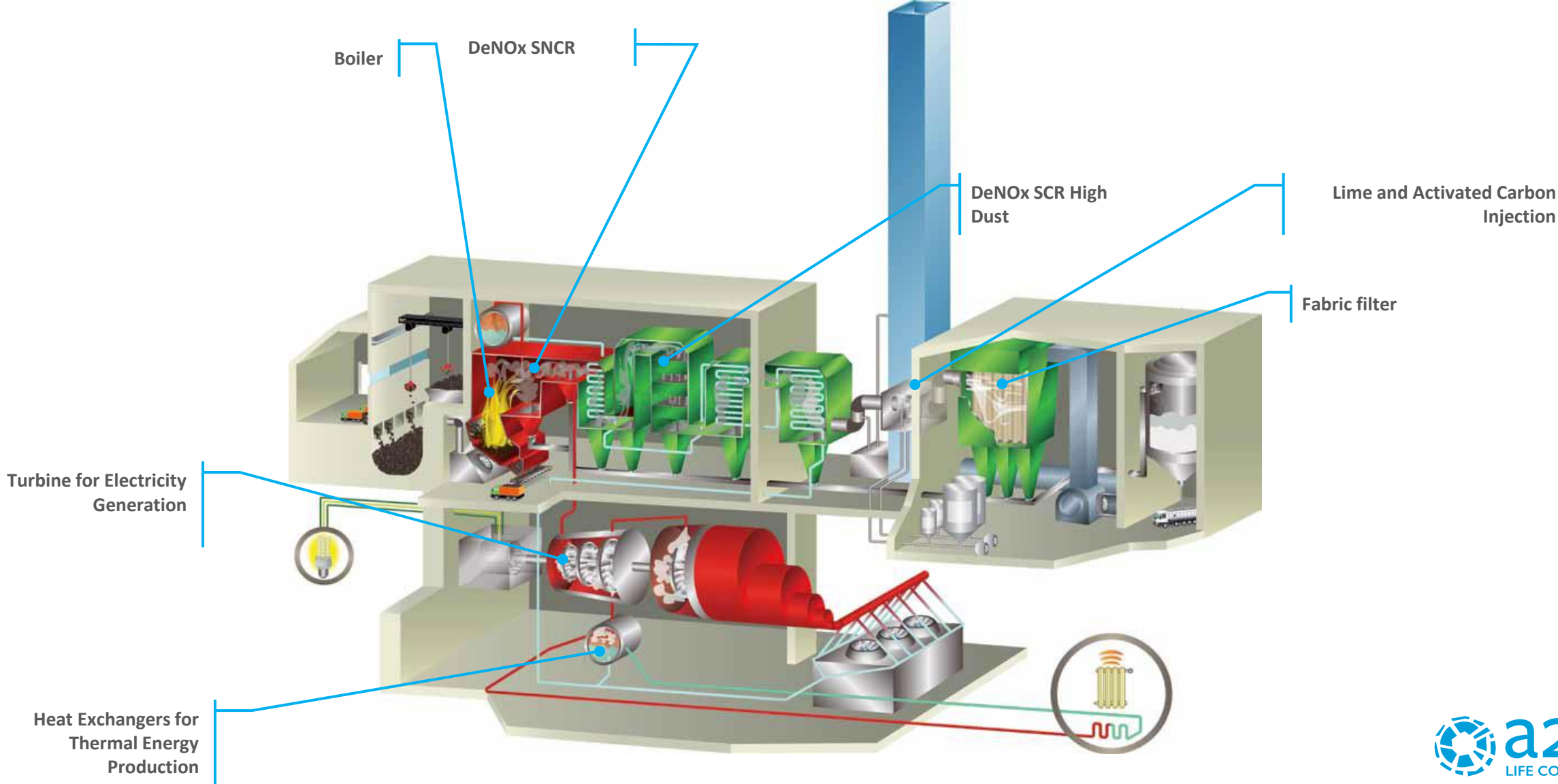


THE PROJECT



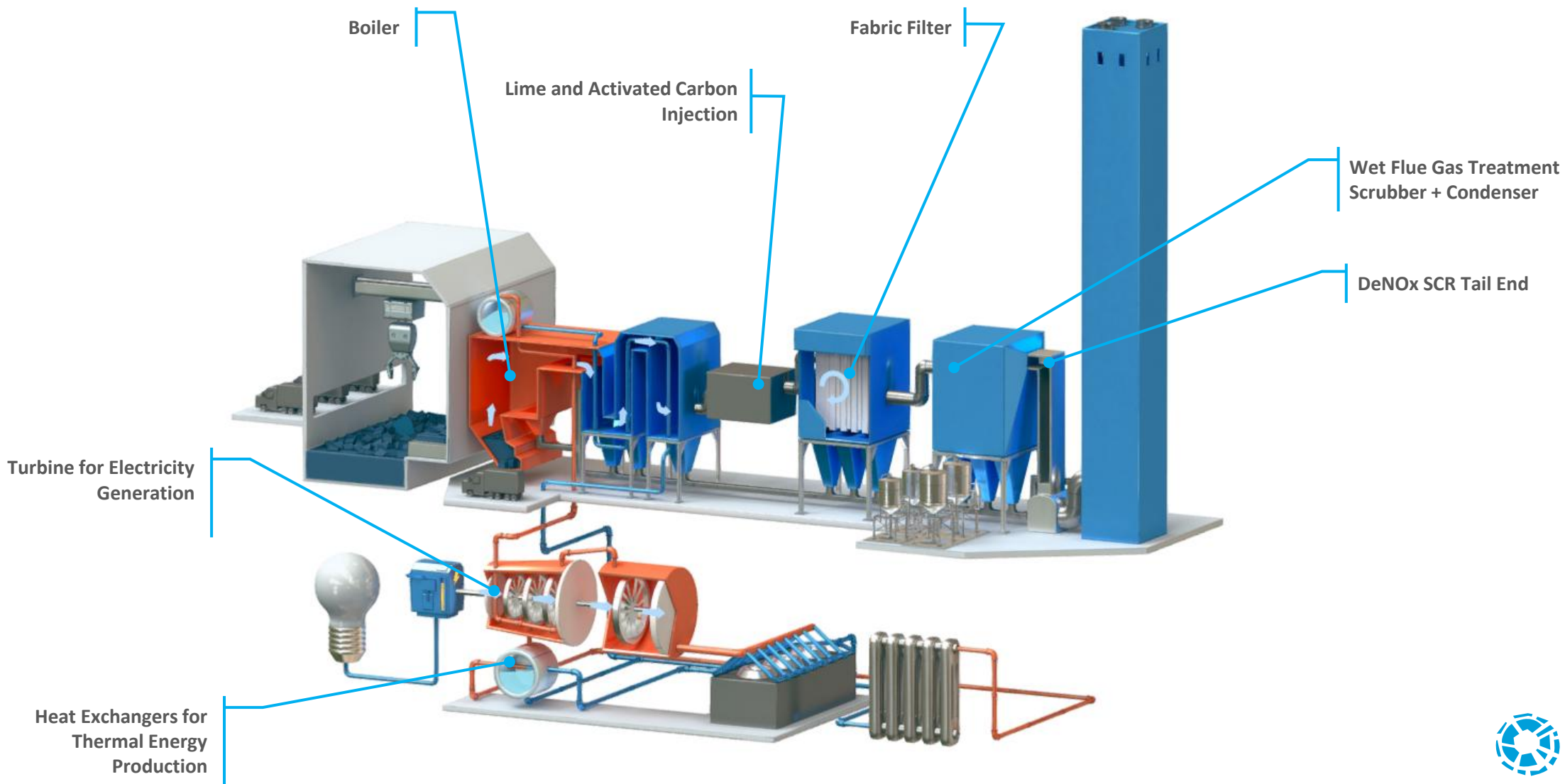
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Plant layout before revamping



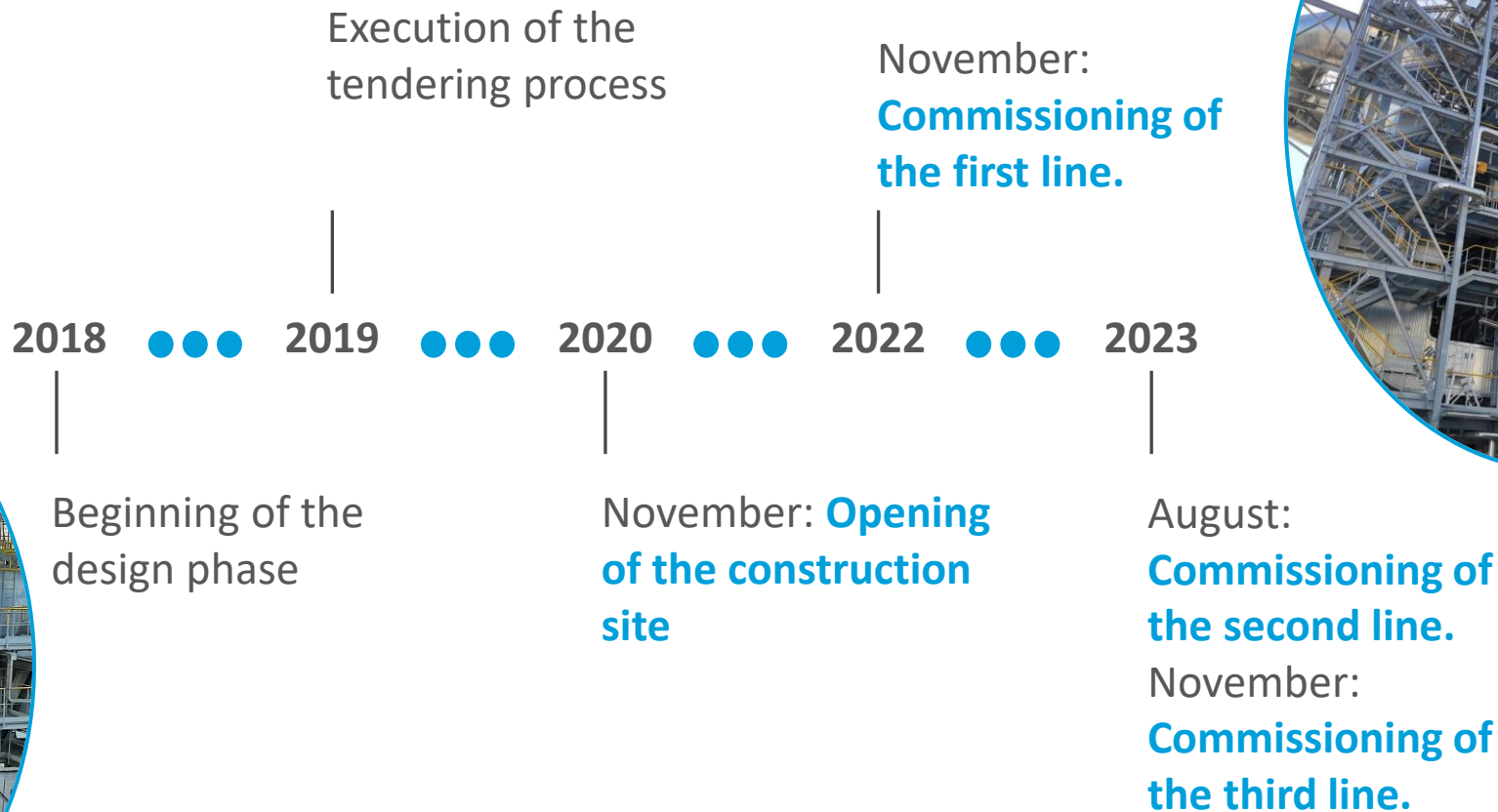
BRESCIA WASTE TO ENERGY PLANT

Plant layout after revamping



FLUE GAS CONDENSATION – THE PROJECT

Timeline



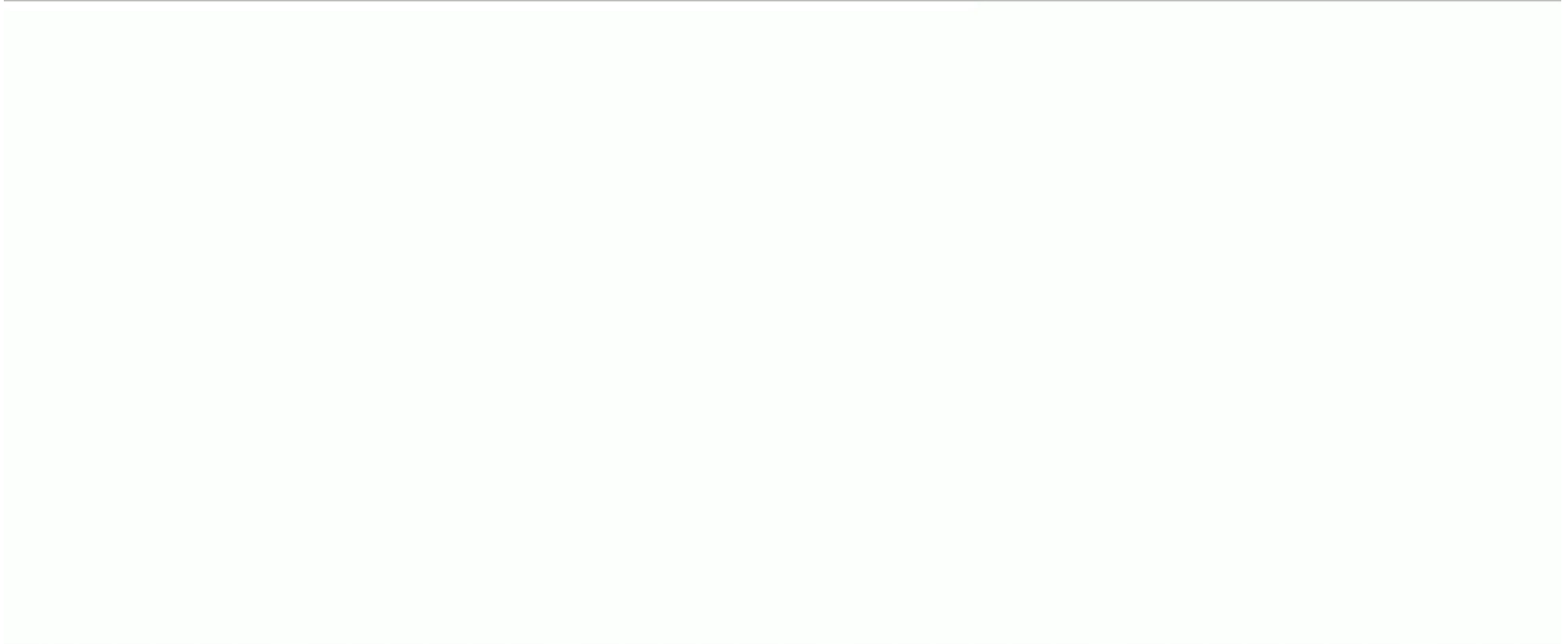
FLUE GAS CONDENSATION

2020 - The construction site



FLUE GAS CONDENSATION

2021 – The project



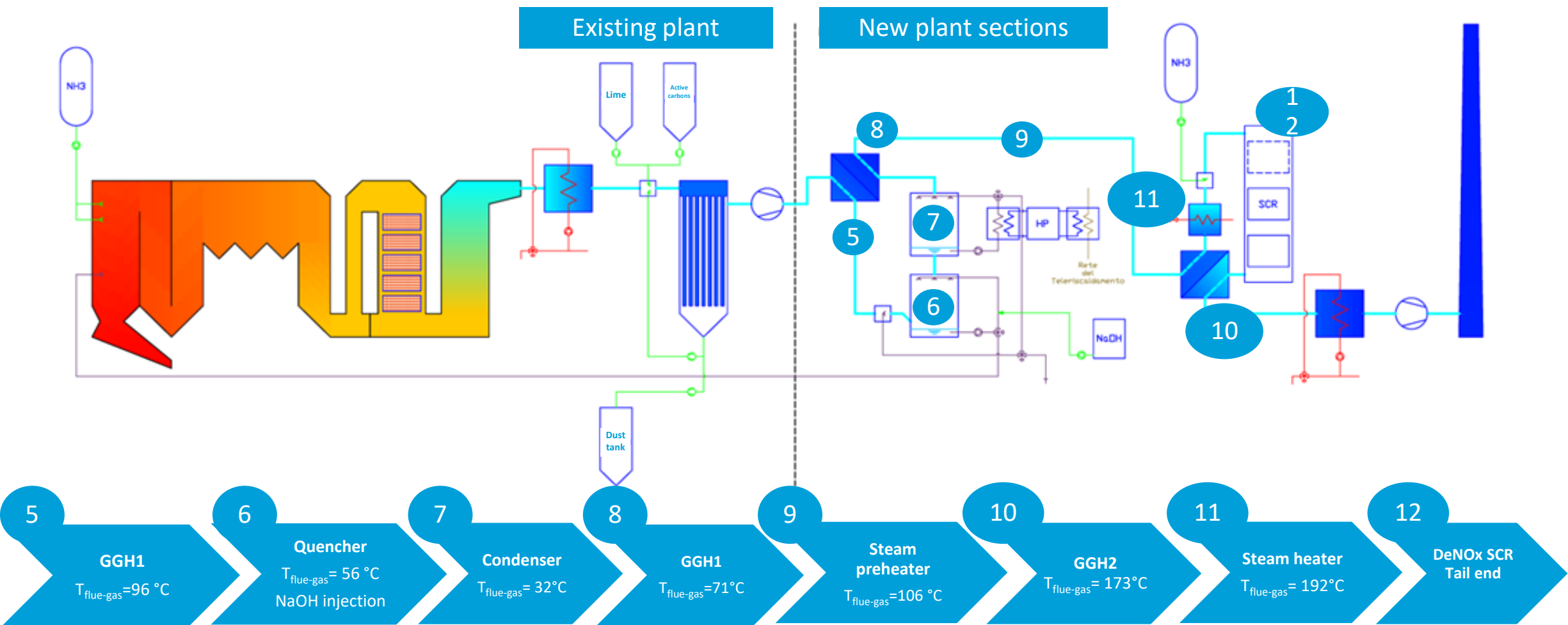
FLUE GAS CONDENSATION

2023 – Final plant setup



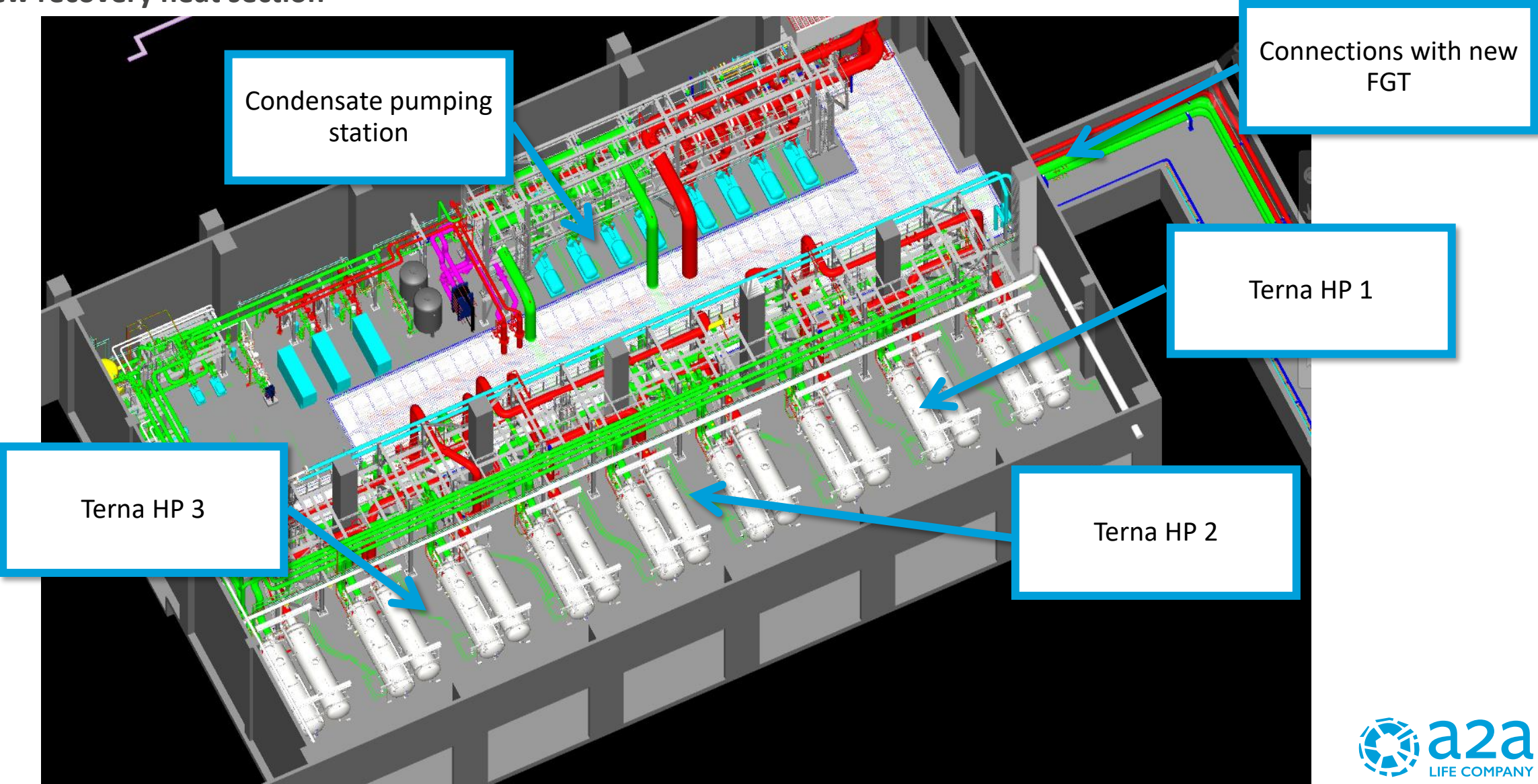
FLUE GAS CONDENSATION – TECHNOLOGY

Flue gas cleaning project



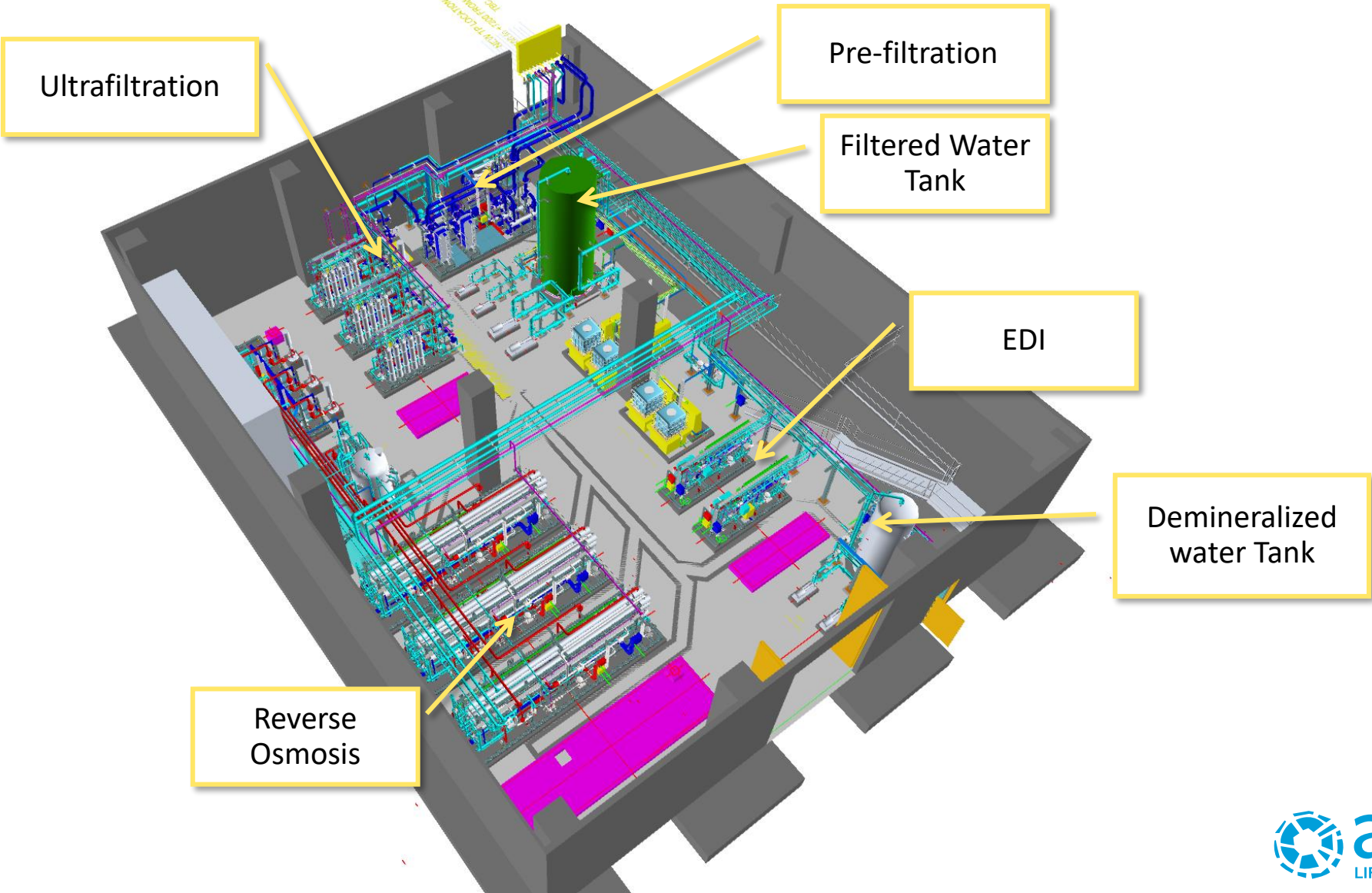
FLUE GAS CONDENSATION – TECHNOLOGY

New recovery heat section



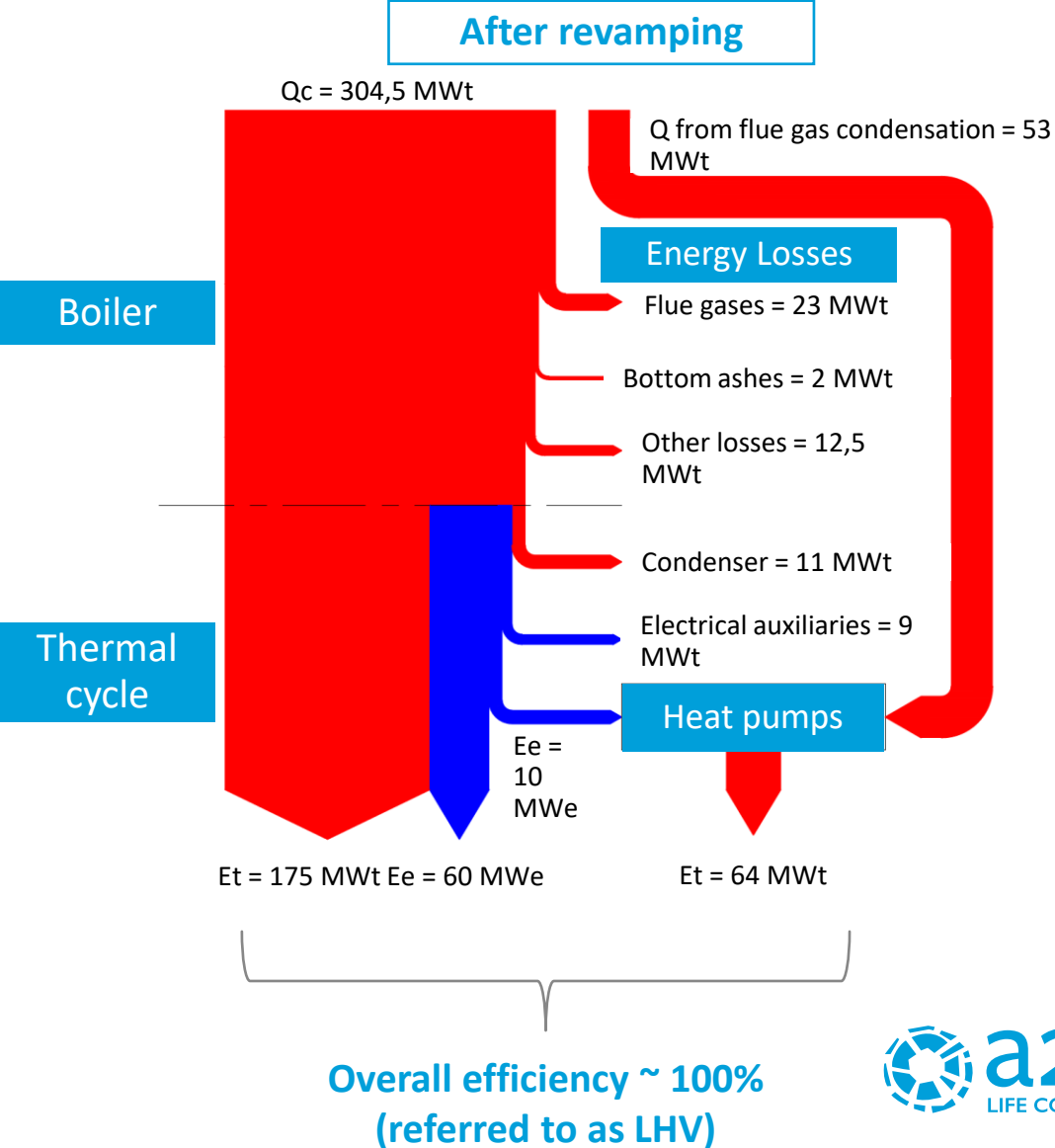
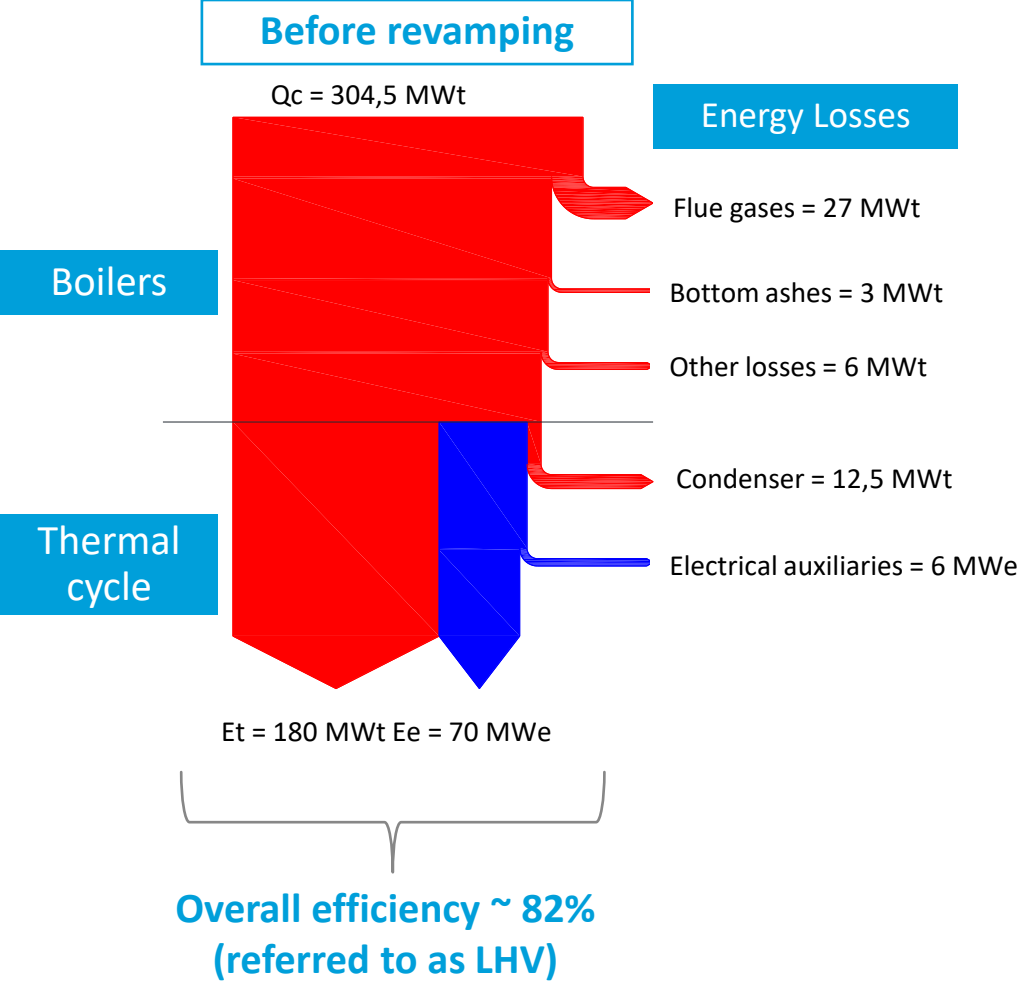
FLUE GAS CONDENSATION – TECHNOLOGY

New condensate water treatment



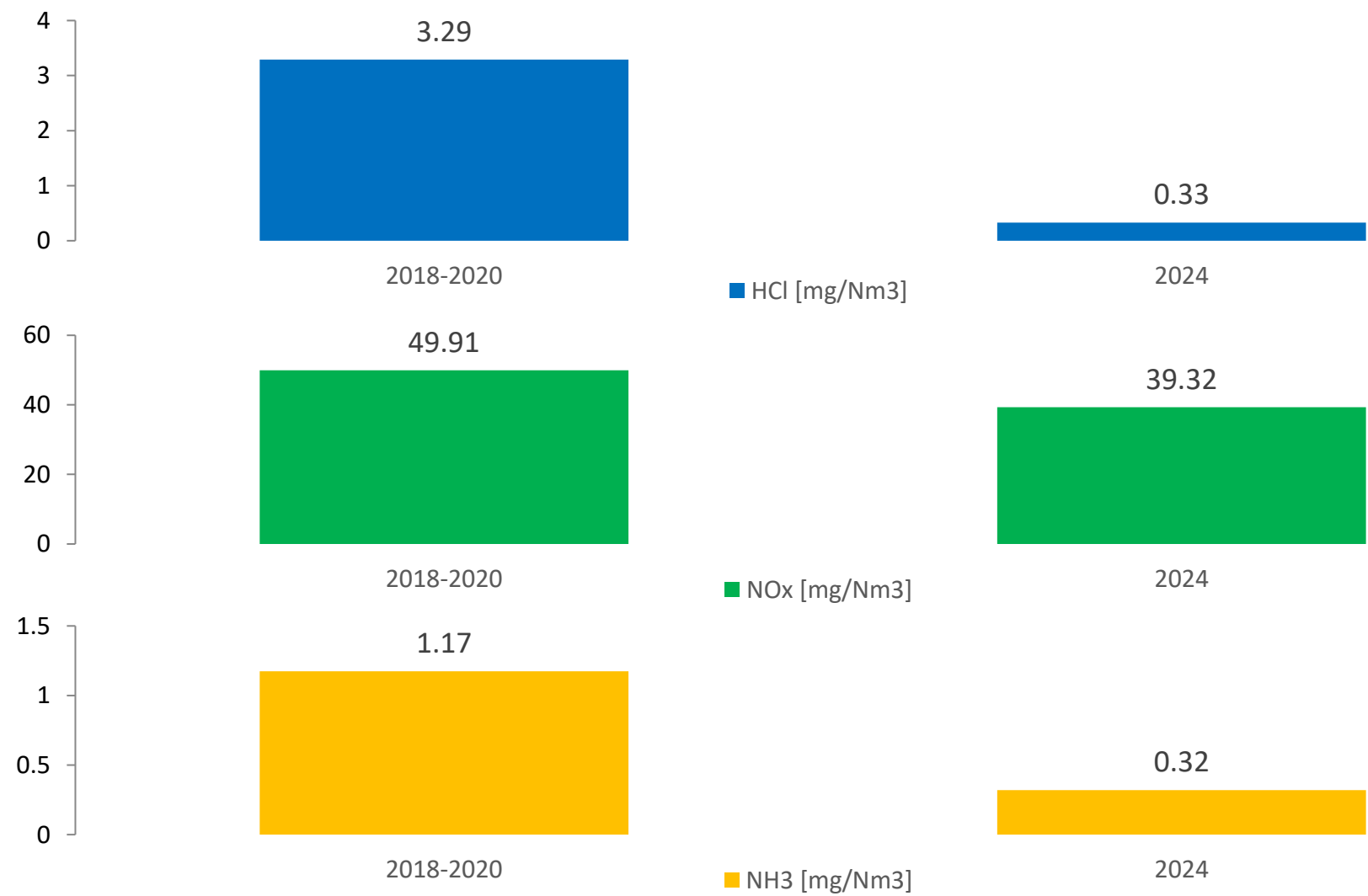
FLUE GAS CONDENSATION – NUMBERS

Energy balance



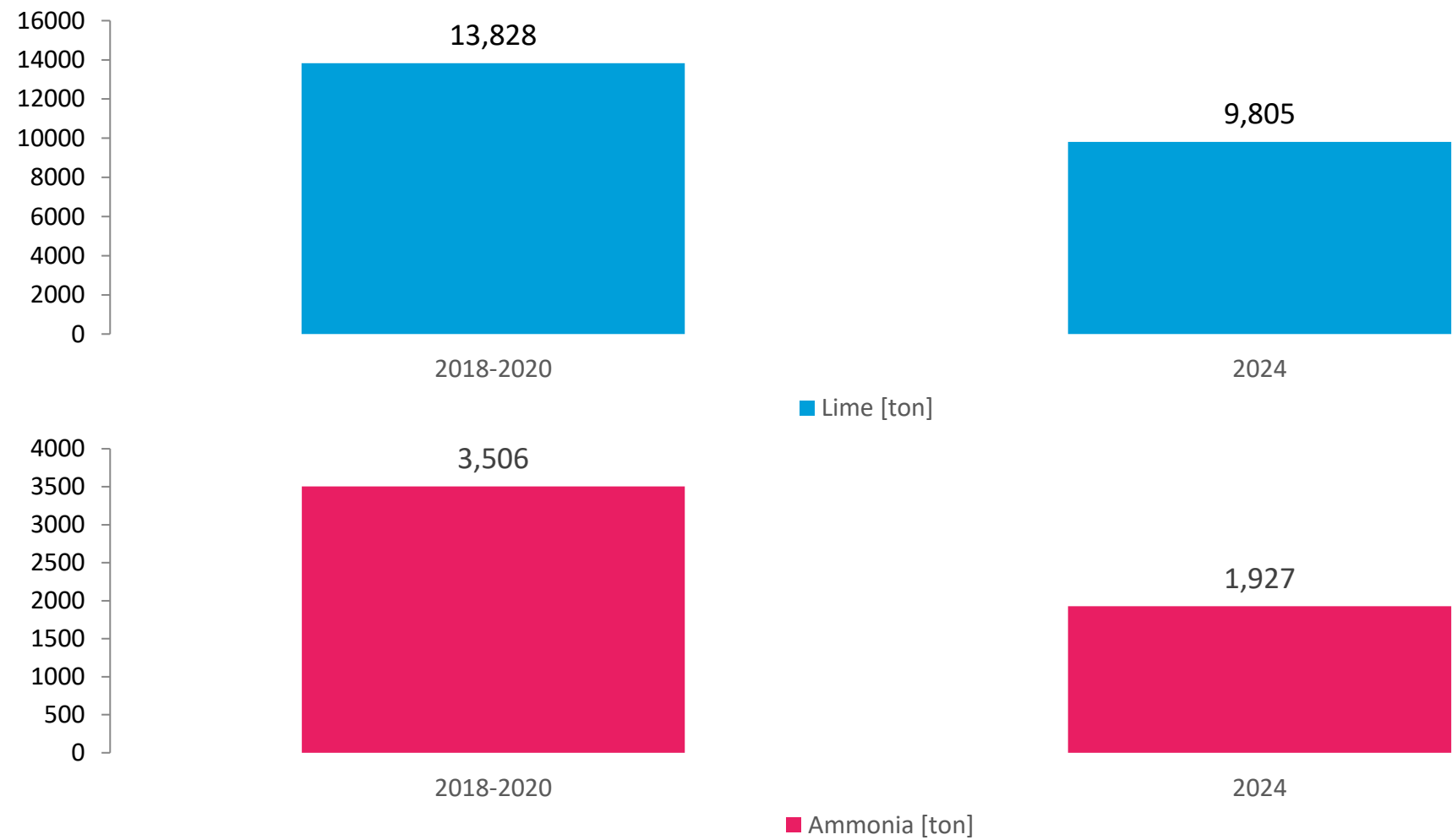
FLUE GAS CONDENSATION – NUMBERS

Reduction of emissions



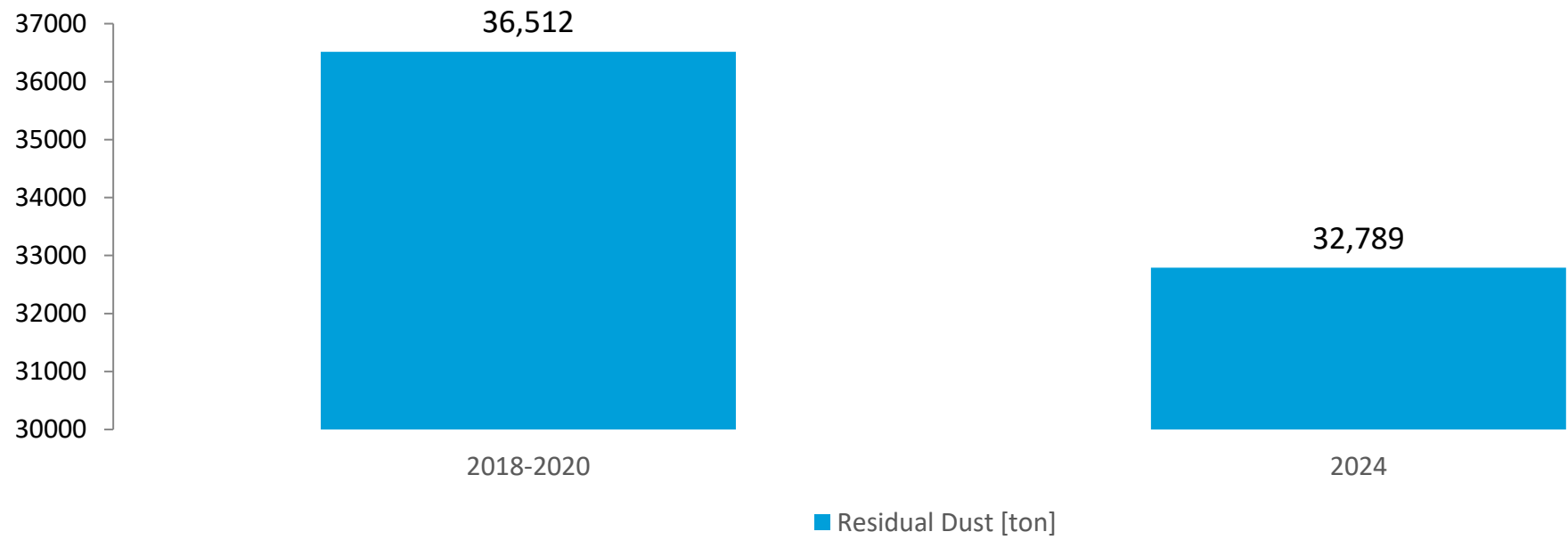
FLUE GAS CONDENSATION – NUMBERS

Reagents



FLUE GAS CONDENSATION – NUMBERS

Residual dust production



FLUE GAS CONDENSATION – CONCLUSIONS

Objective and Results



Objectives:

- **Reduction of NOx emissions**
- **Recovery** of further **heat** to be transferred to the district heating network
- **Replacement of fossil sources** with renewable sources for heat production.



Results:

- **Increase in thermal energy** (+200 GWh)
- **Reduction of emissions** (- 40%)
- **Efficiency +16%** (from 84% to 100%)
- **Reduction of residual dust production** from filtration (- 5000 t/year)
- **Total investment: €112 million**, €47 million for the emission reduction intervention (42%) and €65 million for the heat recovery intervention (58%).



**Thank you for the
attention**