Gemeente Amsterdam
Afval Energie Bedrijf

How to boost energy production from waste?

Amsterdam's Vision on the 4th-generation Waste-2-Energy

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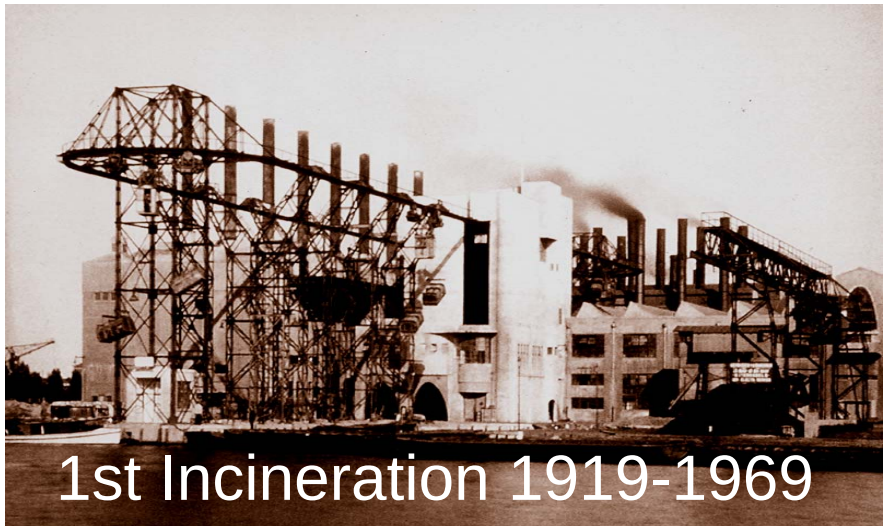
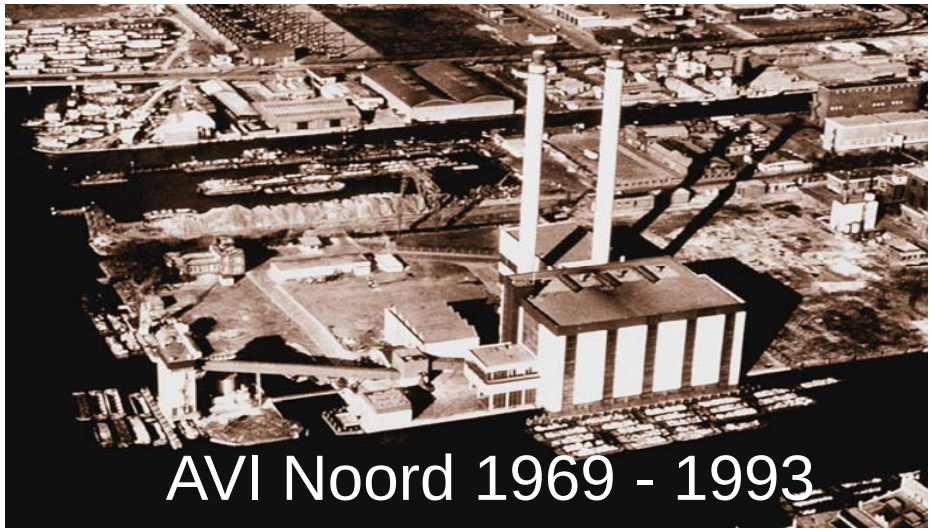
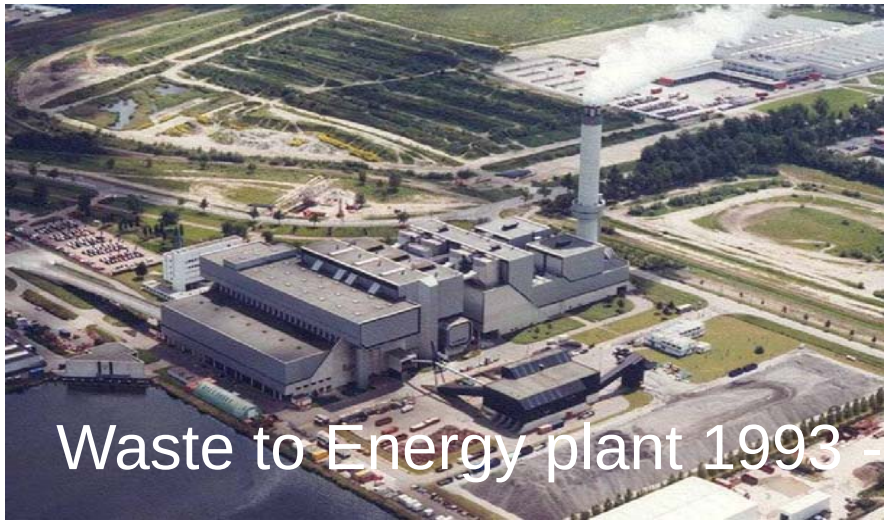
City of Amsterdam
Waste and Energy Company

4th generation Waste-2-Energy







HR-AVI project = WFPP

Starting points

- Systematic approach to optimise recovery
- Using proven technologies in new combination
- Electrical efficiency > 30%
- New logistic concept
- Budget: 400 M€
- Construction start: Begin 2004
- Completion: End 2006

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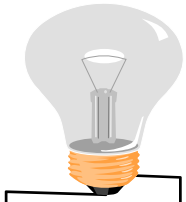
CONCEPT for RECOVERY



850 kWh/ton = 30 % of energy in waste

Chemicals 10 kg

Fluegass

Municipal Solid Waste

Incineration

Fluegass cleaning

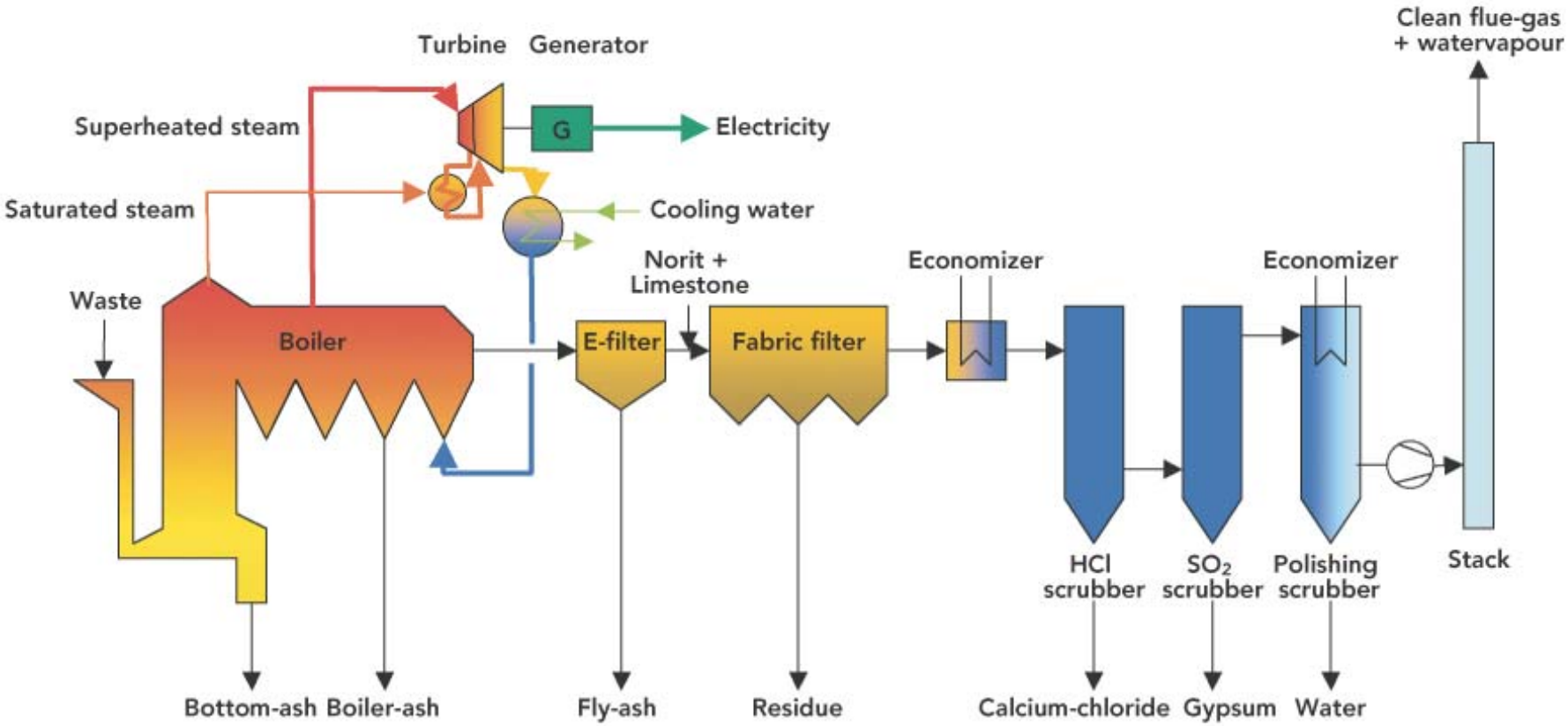
SAI

Output per ton of waste:

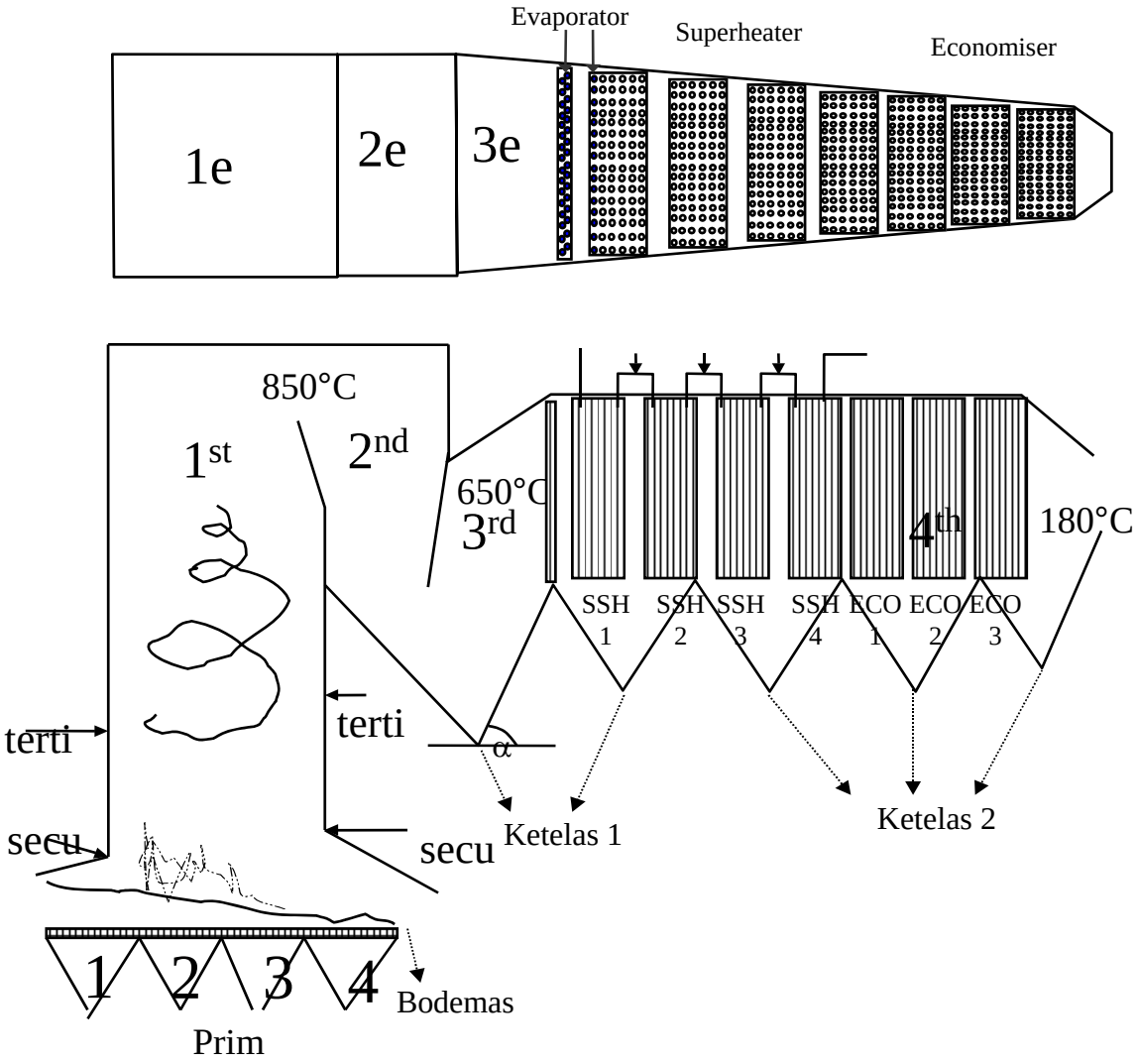
Non Ferro	**5**	**kg**
Iron	**25**	**kg**
Sand	**100**	**kg**
Granulate	**100**	**kg**
Fines	20	kg

Salt	**7**	**kg**
Gypsum	**5**	**kg**
Fly-ash	**10**	**kg**
Residue	5	kg

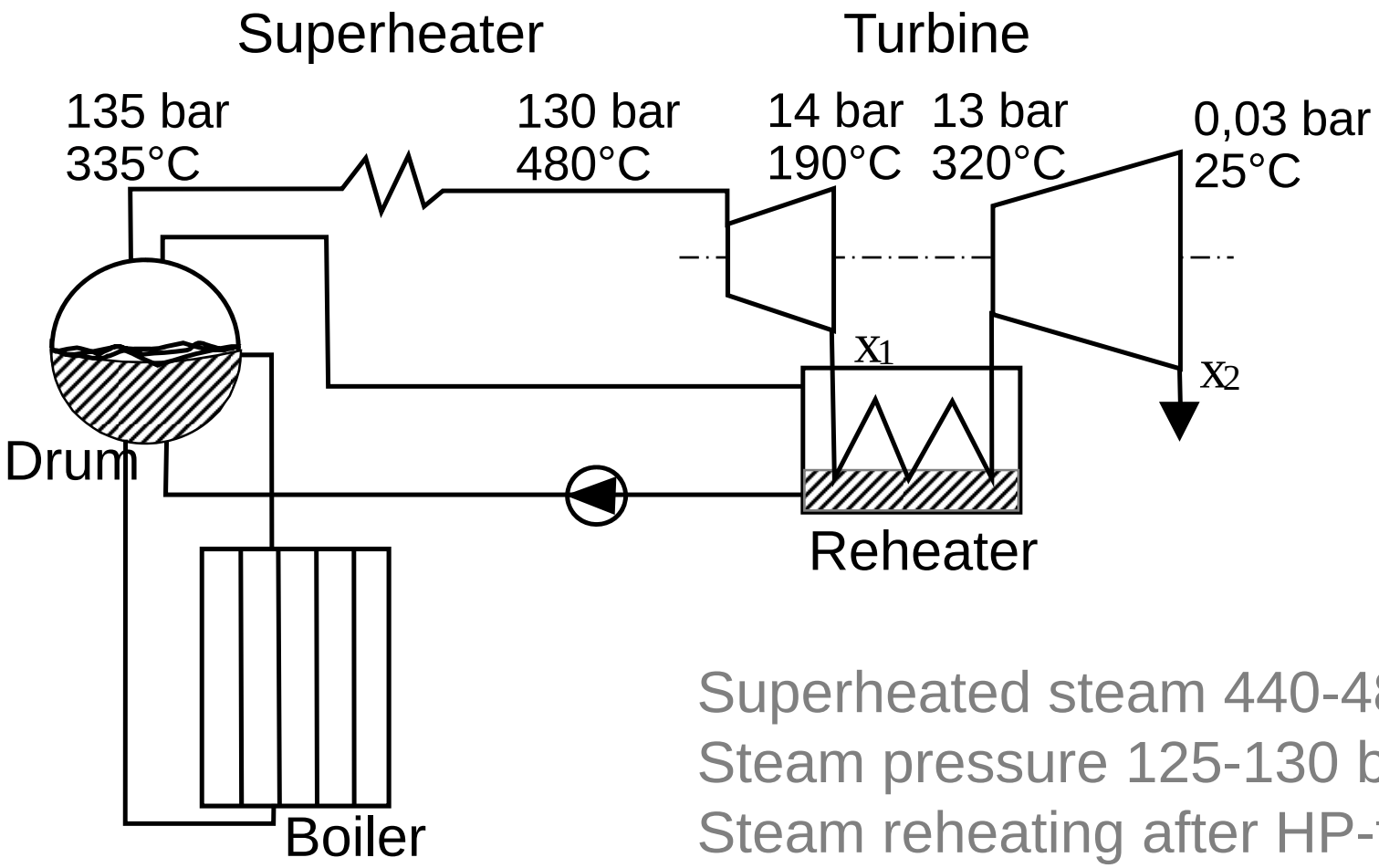
High Efficiency concept WFPP®



Sketch boiler design

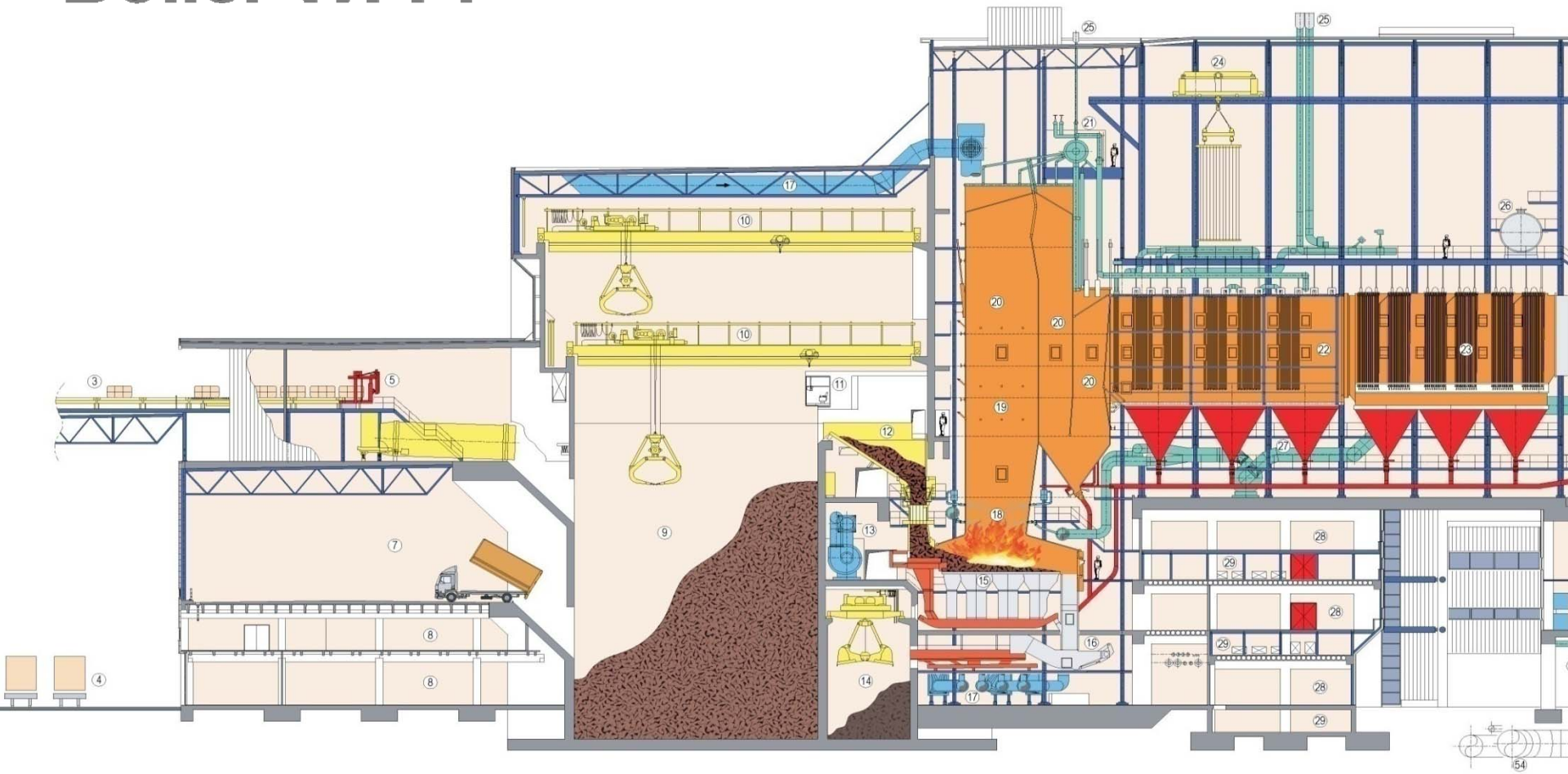


Sketch steam reheating



Superheated steam 440-480°C
Steam pressure 125-130 bar
Steam reheating after HP-turbine
Extra economiser

Boiler WFPP



Flue-gas cleaning WFPP

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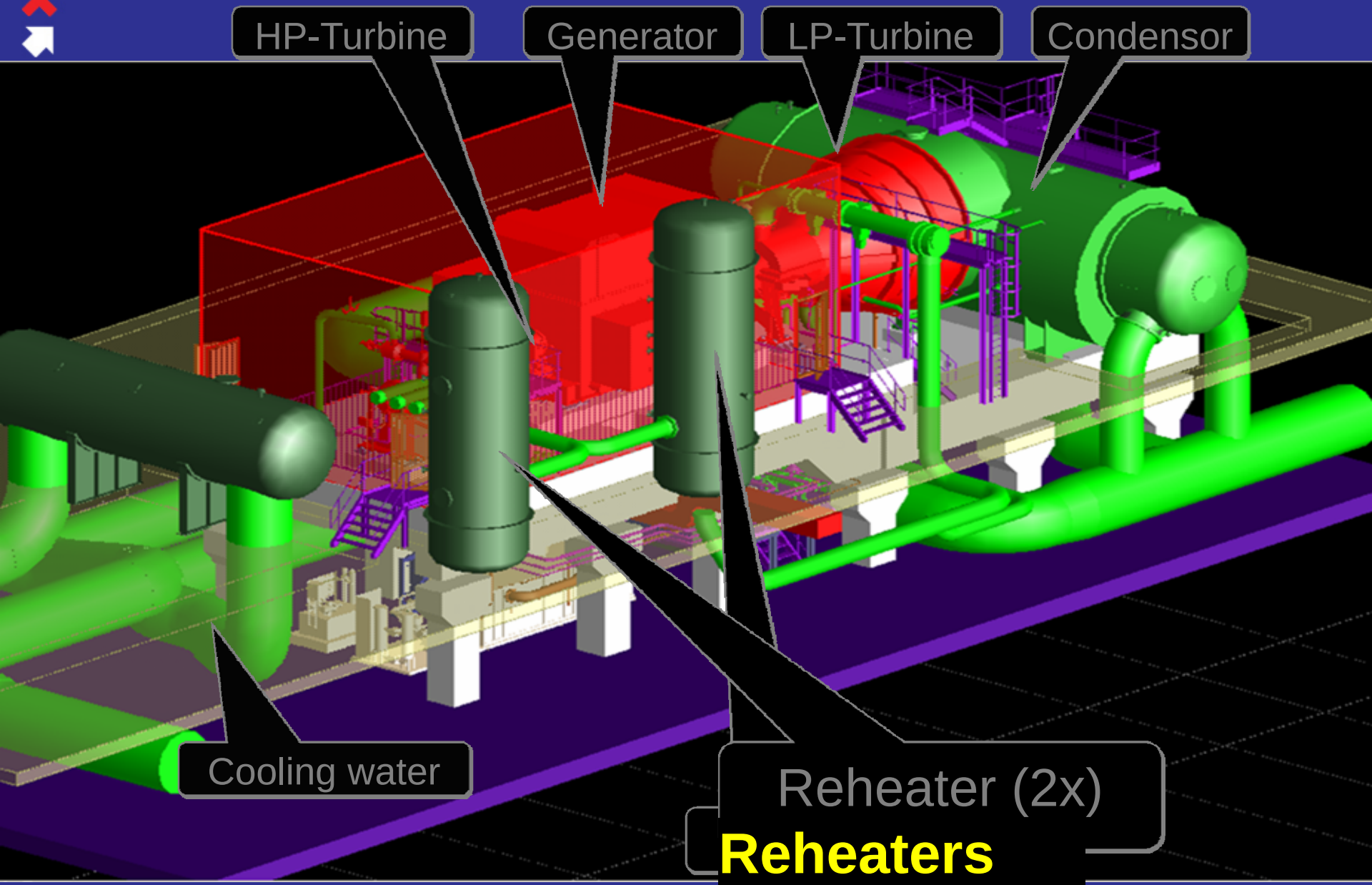

Reheaters

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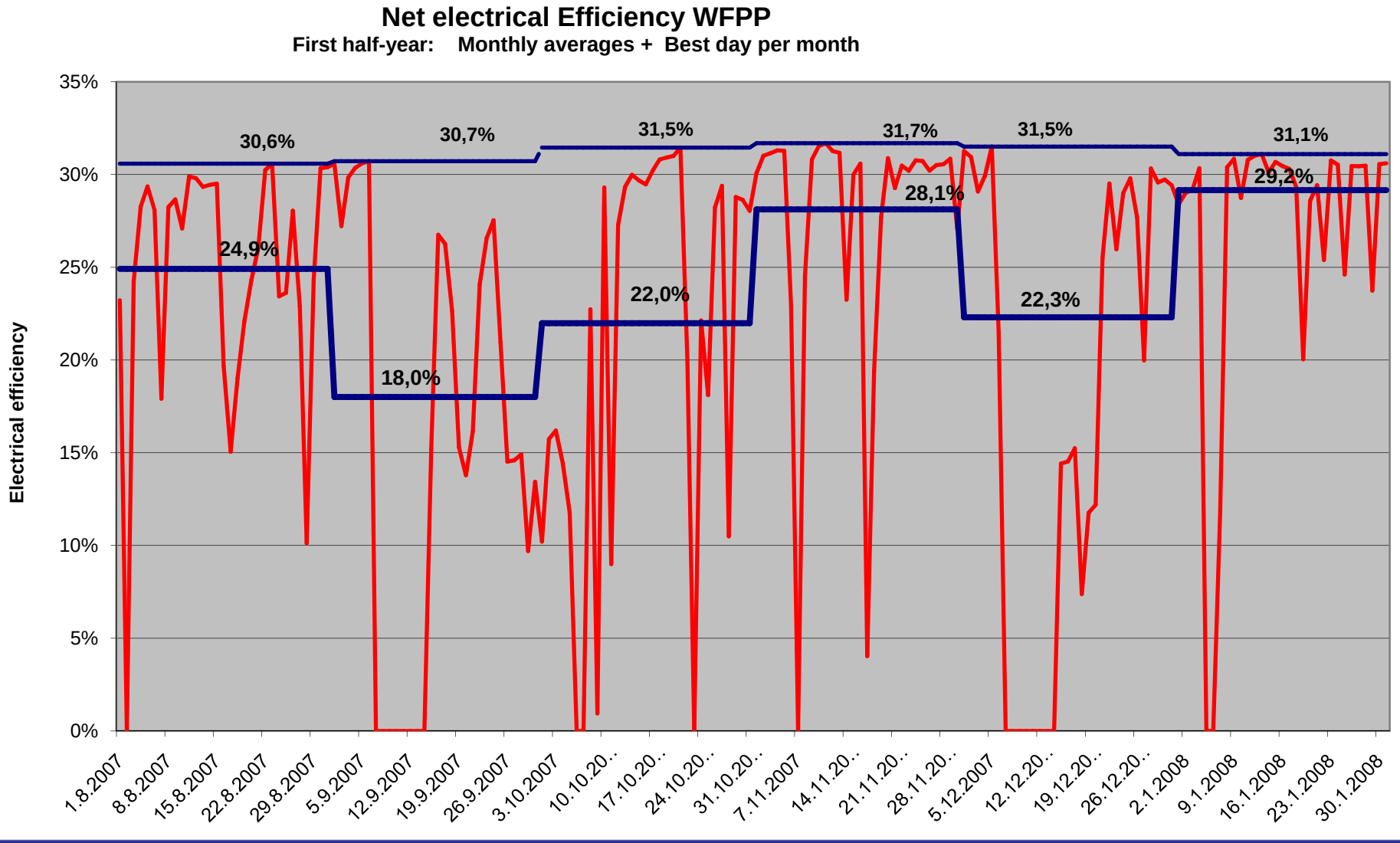
Construction of WFPP in Amsterdam

Operational results



Summary

- 1st year of operation.
- Operation is good: input from experience of Amsterdam worked out well.
- Boiler & Flue gas cleaning perform better than expected.
- Optimisation for material recovery from flue gas
- New project for wet bottem ash cleaning in 2010.

- Net Energy efficiency of **>30% Proven**.