

**PROPOSALS FOR A 4.5 MWe GENERATION PLANT FIRING RDF
USING AN ORGANIC RANKINE CYCLE UNIT**

from

DGA Co Ltd

Refer to



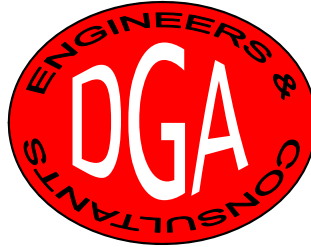
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Heater and Boiler Design

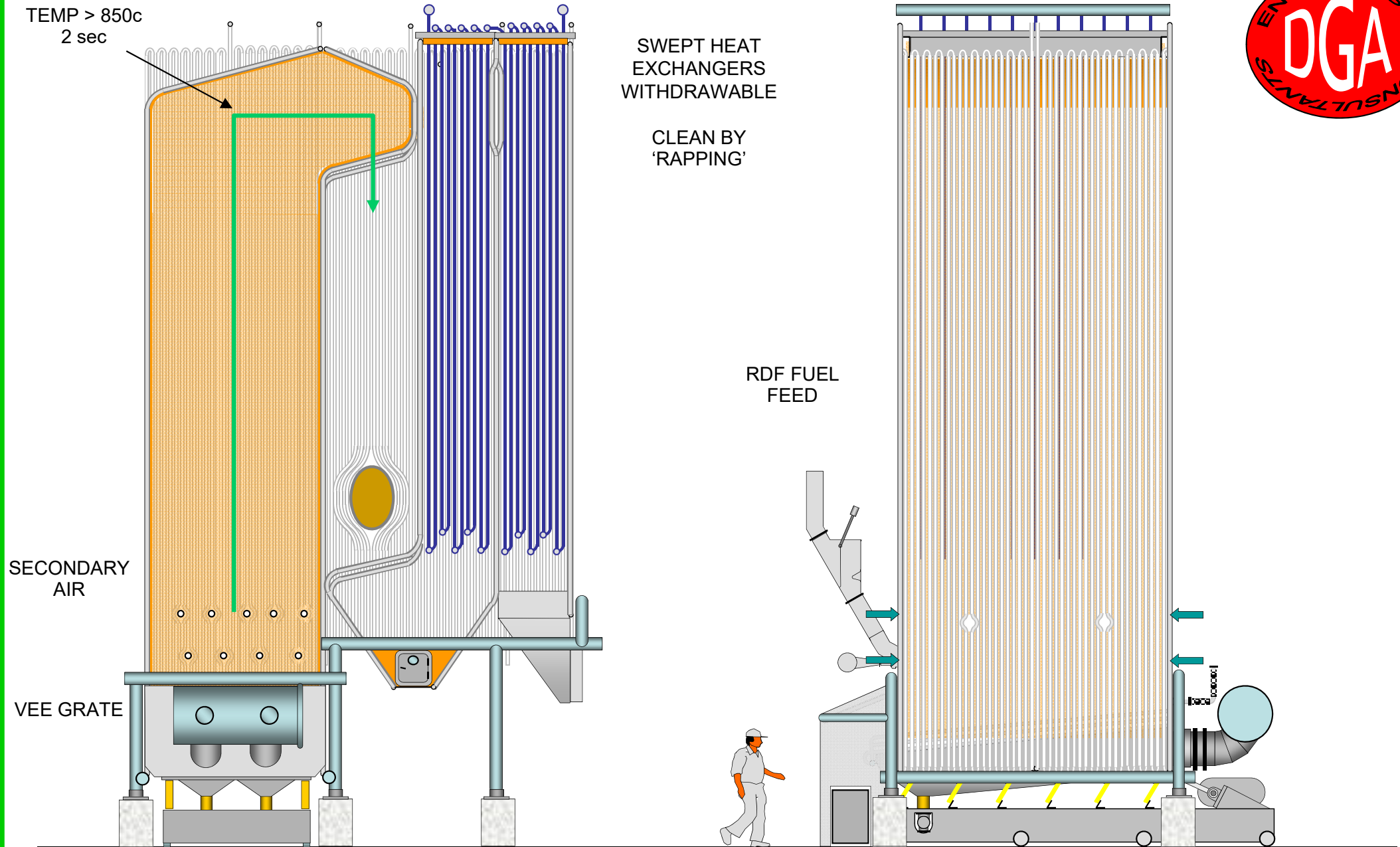
The ERK Ekrohrkessel boiler and heater range has been changed to accommodate the characteristics of waste based fuels such as Raw waste and RDF. Essentially the new design has been tested over the past 3 years on a small plant In Germany at Bamberg and has shown marked improvement in tube and panel longevity due to the lower impact of particulate and acid gases with the tube heat exchange surfaces.

In effect the heat transfer has been made less turbulent by changing the gas flows to an in line flow ie along the axis of the tube rather than cross flow. This has major benefits as it prevents particulate wearing the natural protective coating on the tubes from the oxidation which tends to be a barrier to the acid gas from HCl common on superheaters and called High Temperature Corrosion.

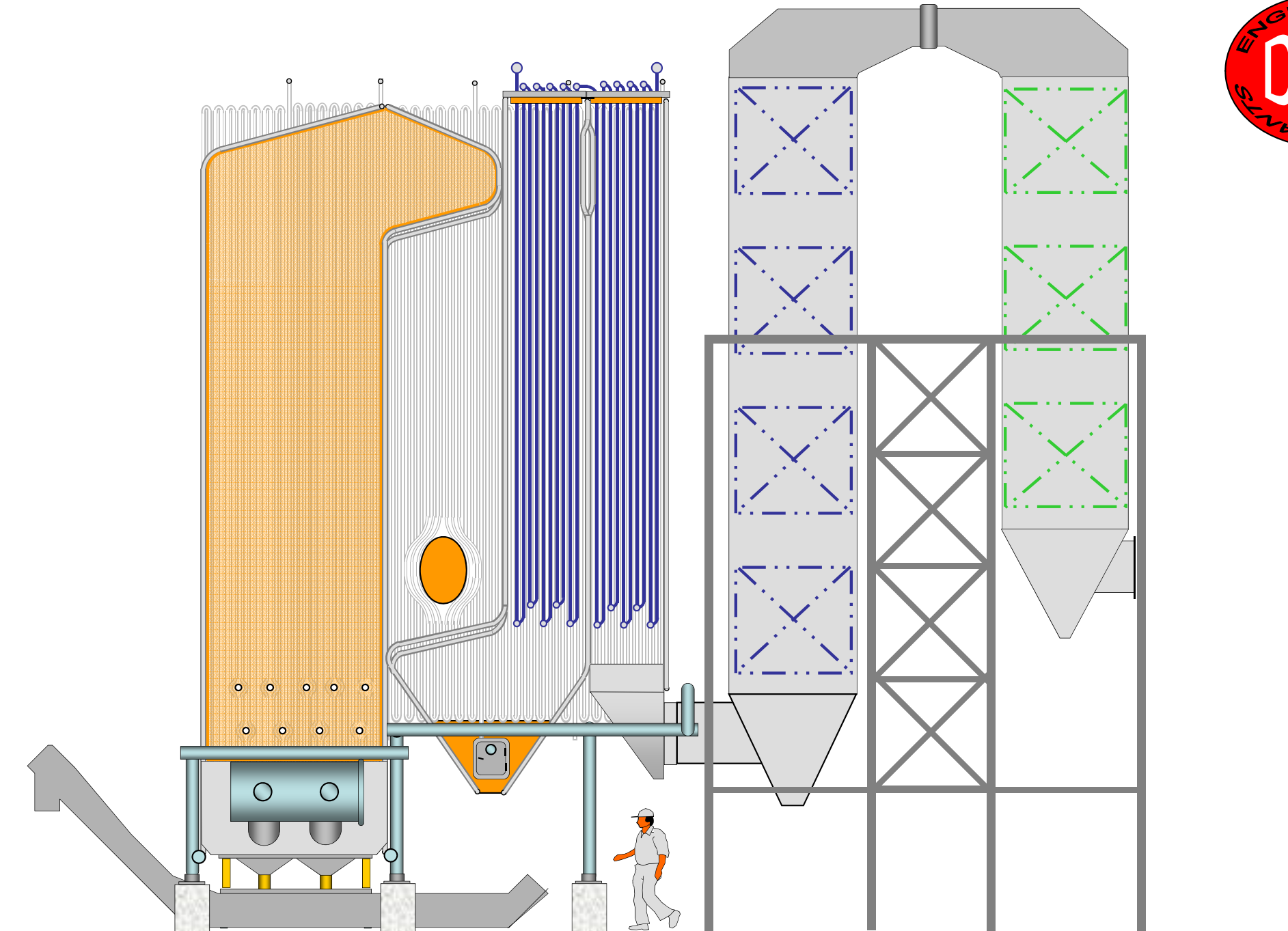
The only negative feature of this design is the marginal increase in the boiler surfaces to compensate for the lower heat transfer coefficients, which adds a cost to the client. The difference is probably covered by a reduction in repair and maintenance costs on the first years operation.

This Bamberg design was installed by replacing an original boiler with the new 'Bamberg' design and the effective test was over a period of 3 years in which hardly any corrosion was measured on the superheaters. This marks a major change in ERK waste boiler design philosophy. As a boiler designer particularly for difficult fuels, ERK has a reference base of 6000 Boilers firing a variety of fuels, and with more than 600 firing waste or waste derived fuels. This gives their licensees yet another benefit to pas to their own clients.

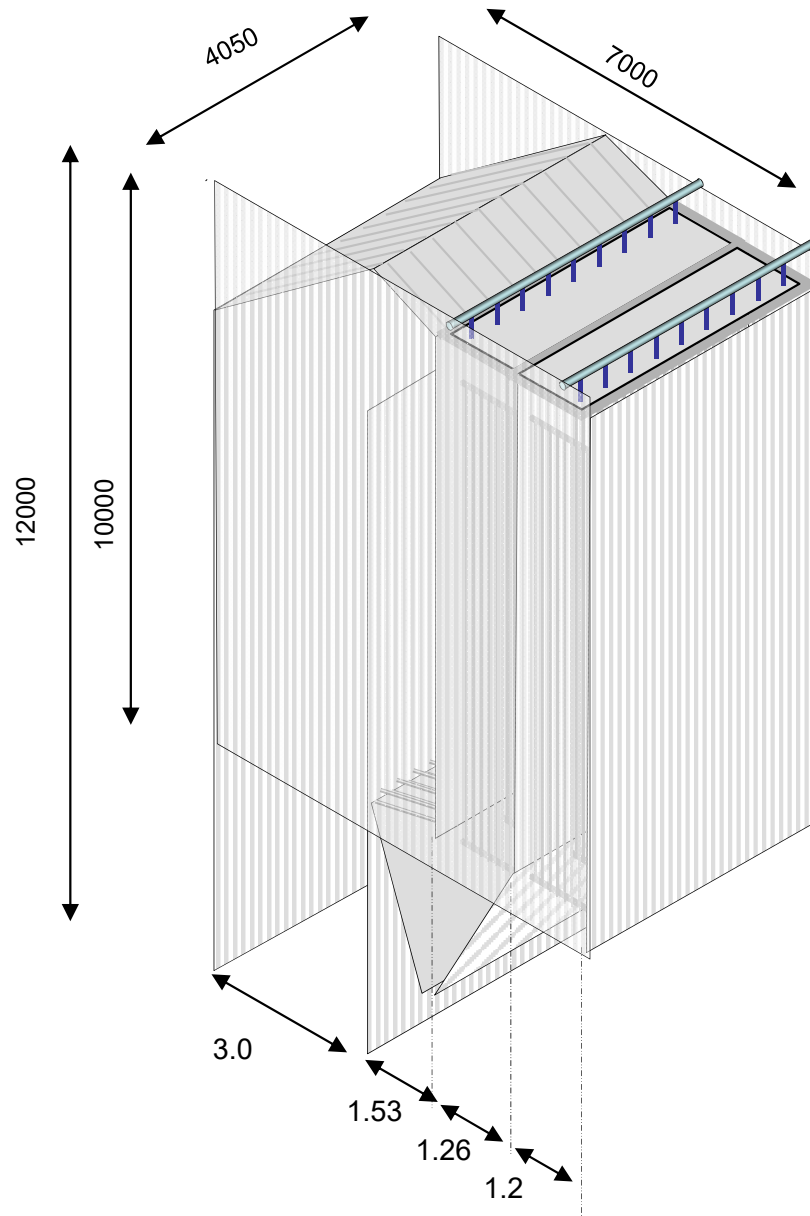
Oil heaters operate at lower oil temperature in the tubes (300 C) than a steam cycle plants which usually have a maximum of 400 to 430 C superheat temperature which keeps the metal near the critical temperature where corrosion occurs.



18 MWth OIL HEATER TO FIRE RDF.

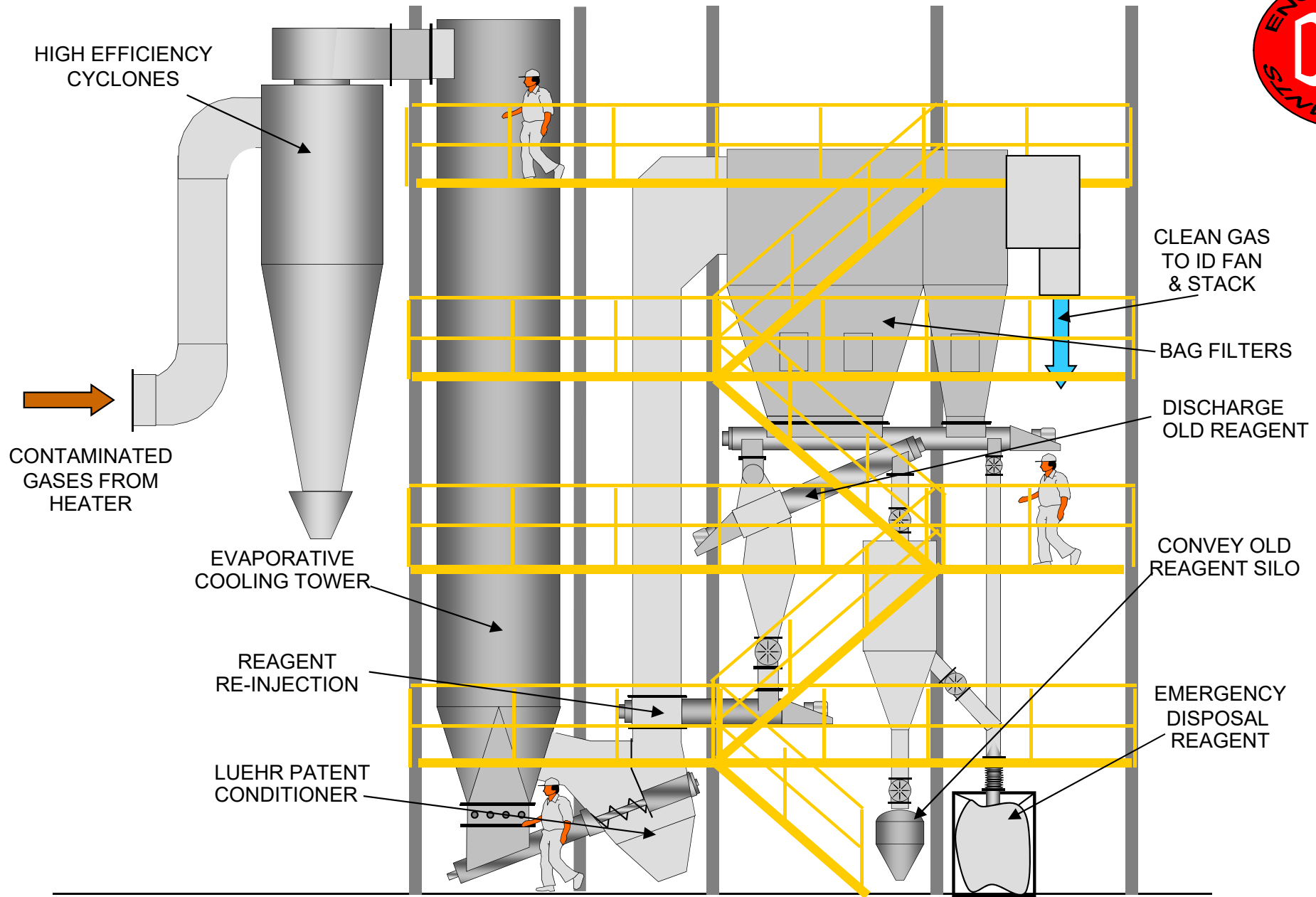


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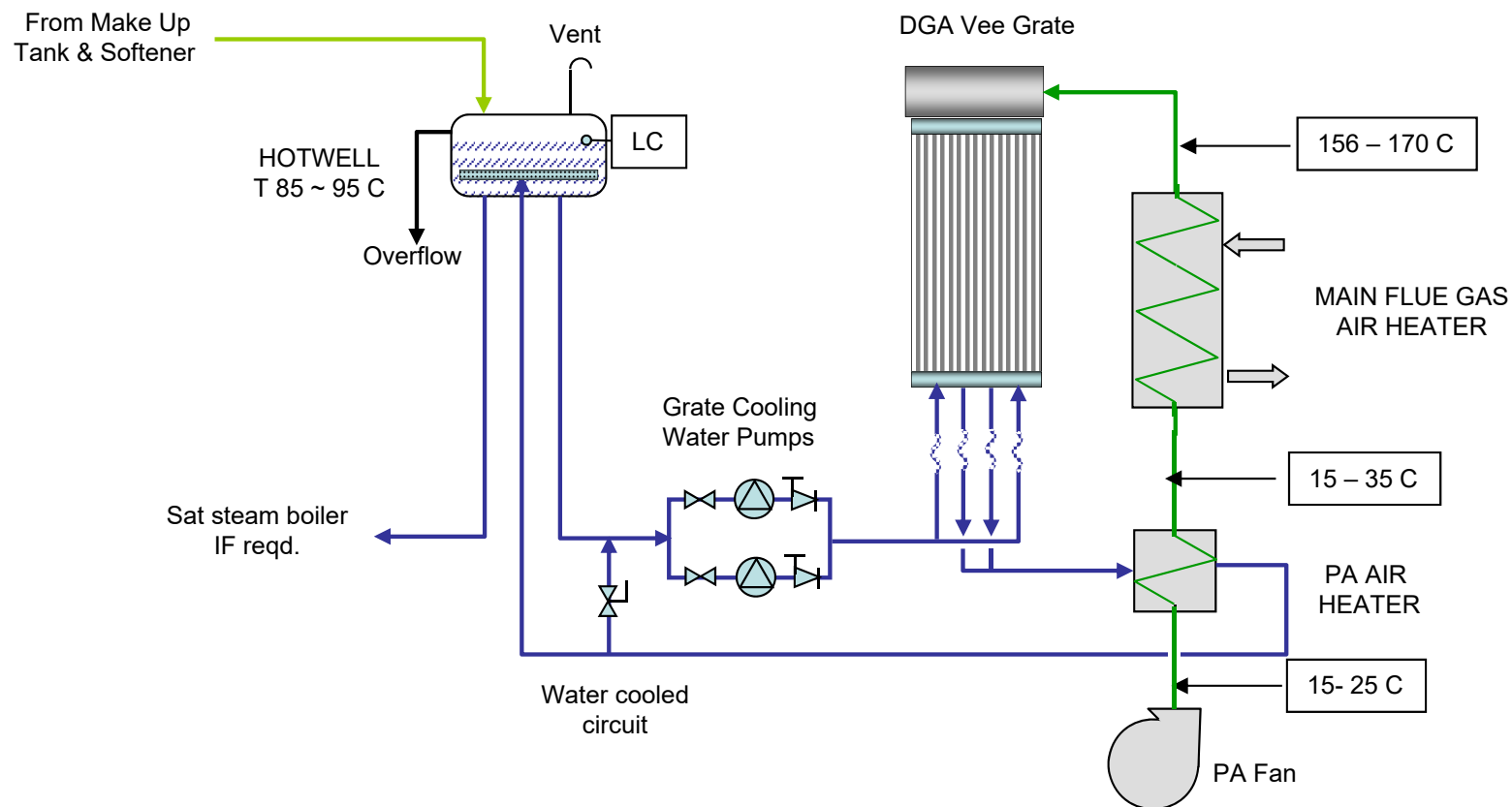
Approximate overall dimensions 18 MWth unit. Total weight of pressure parts is approx 75 tn and Non pp 48 tn

Heater fabricated in sections designed to fit into 12 m standard containers to be erected on site

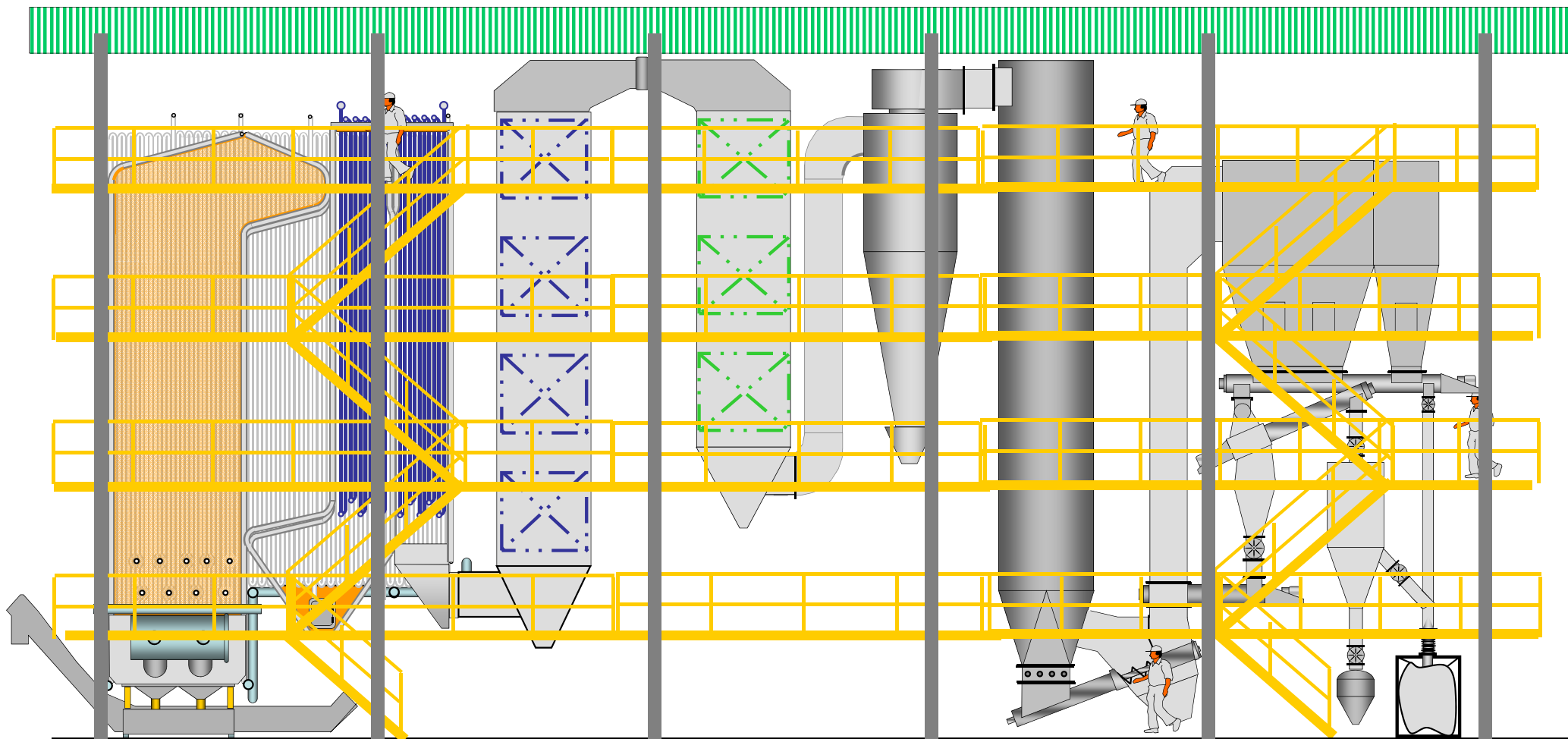


EU WID COMPLIANT GAS CLEANING FROM LUEHR

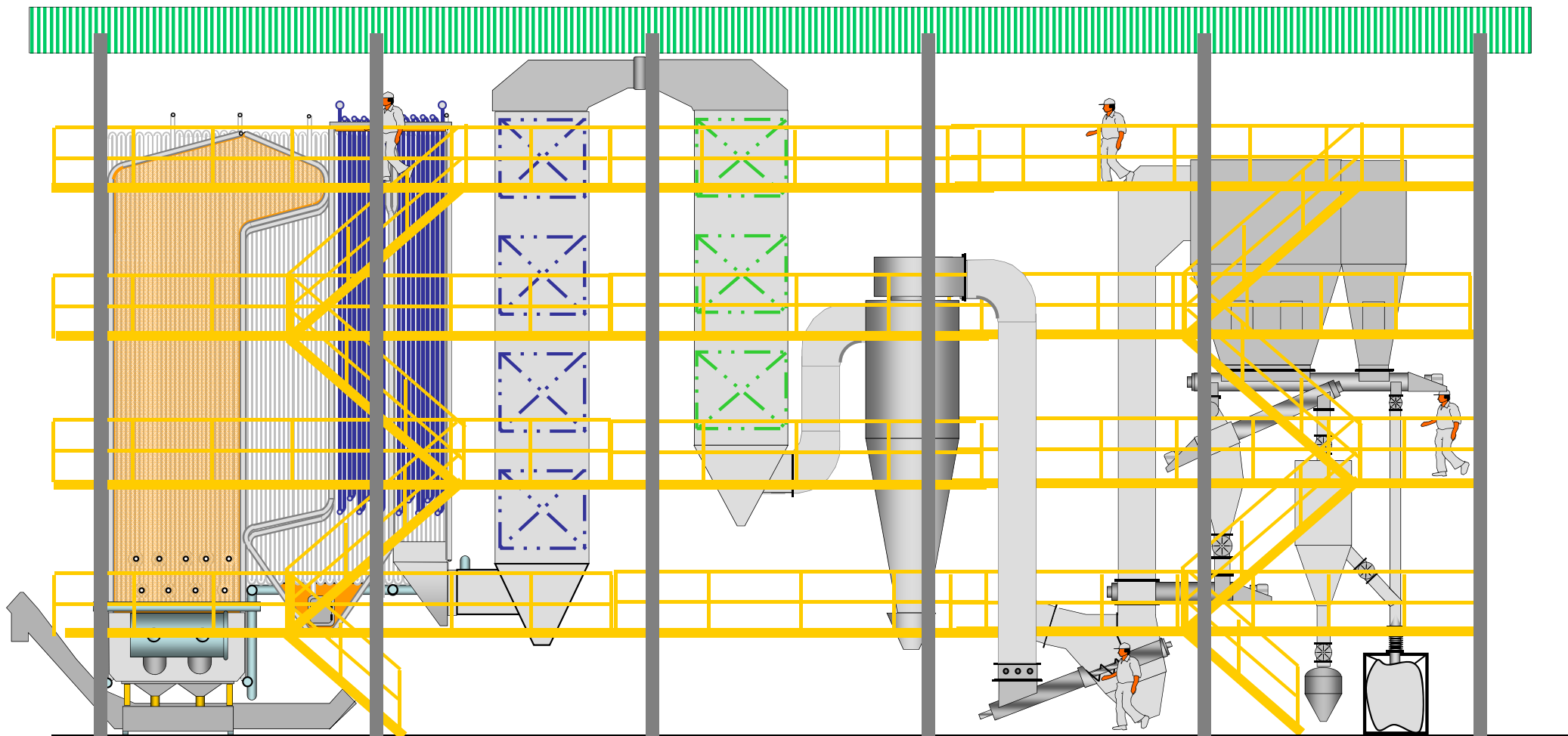
Note ! Shown with Evap Cooling Tower to control input gas temp. Same effect can be achieved if heater outlet temp is < 160 C by humidification of reagent tower not required.



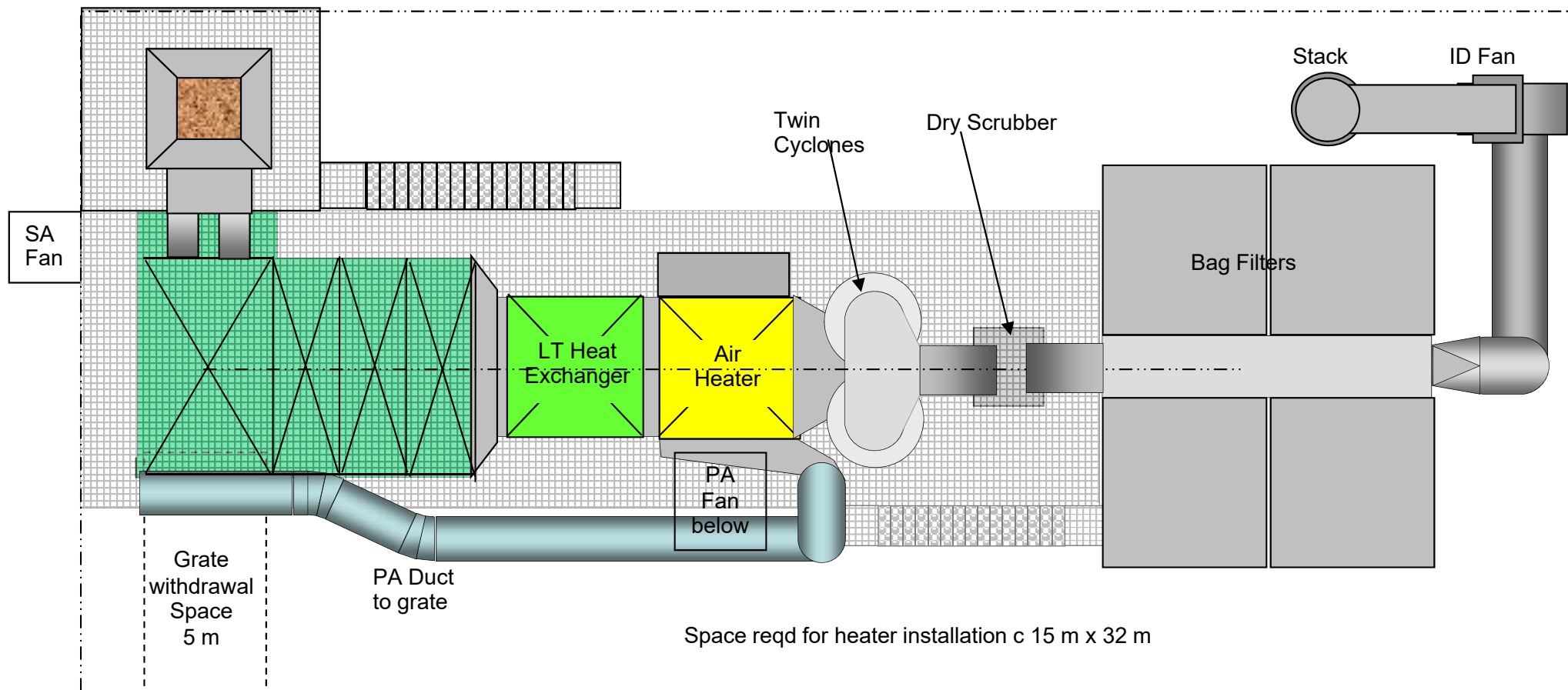
GRATE COOLING WATER SYSTEM



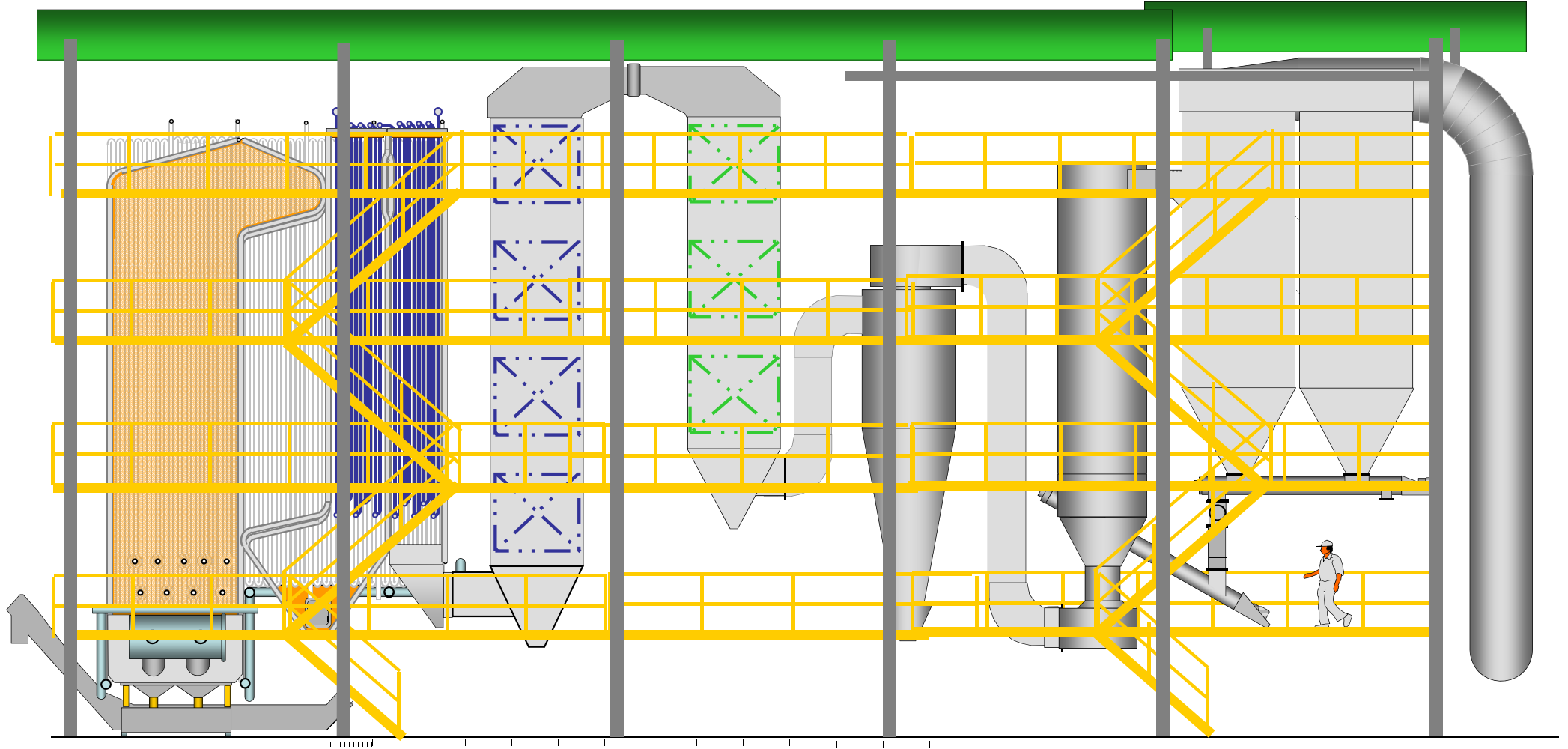
The whole plant will generate 4.5 MWe



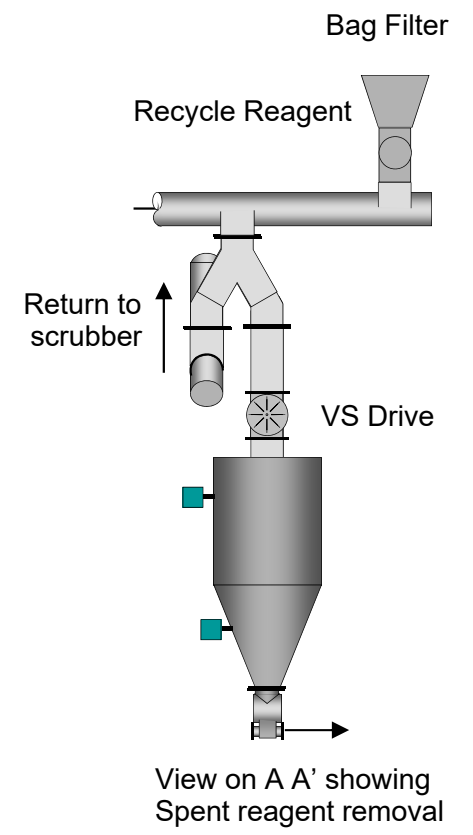
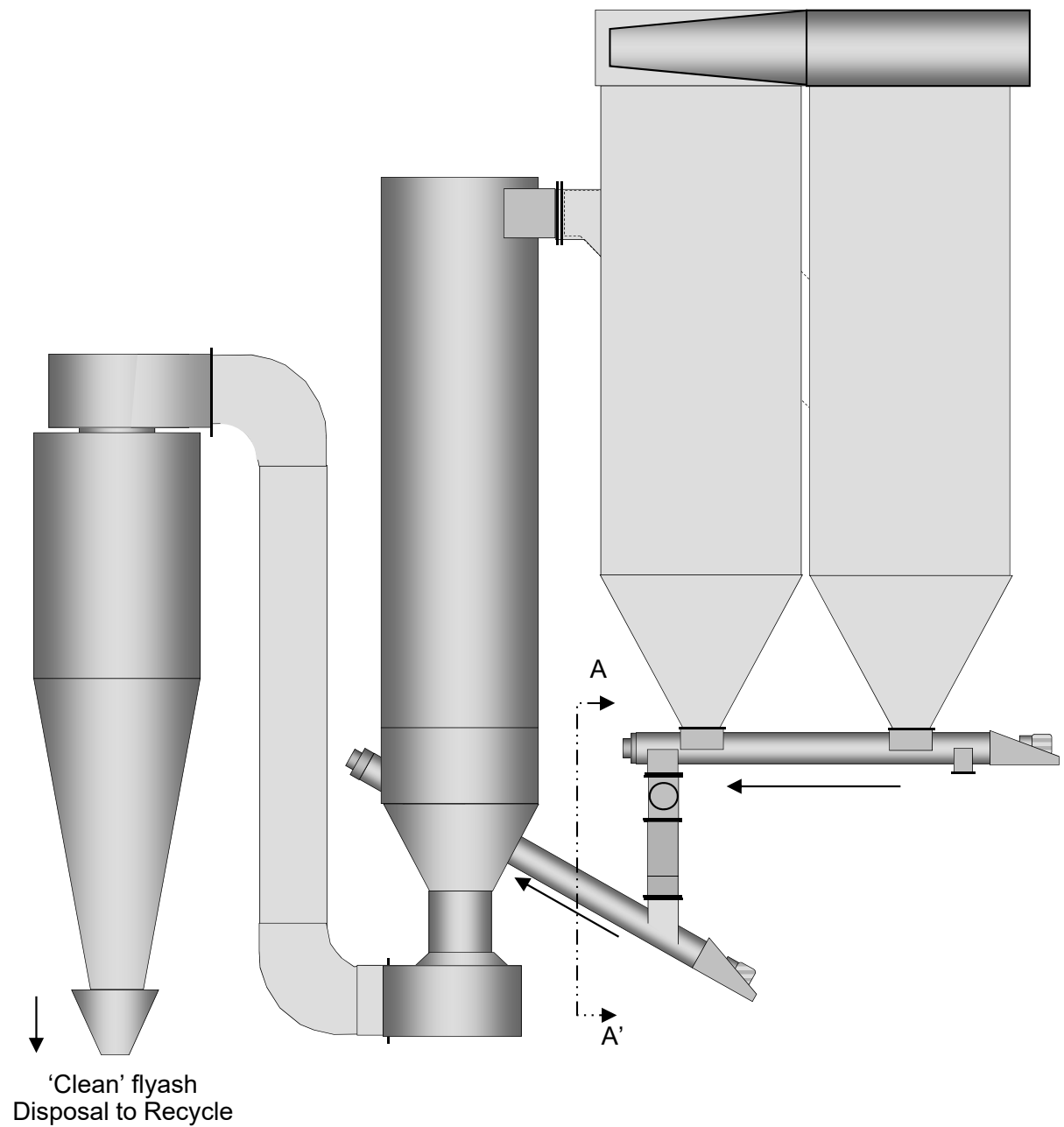
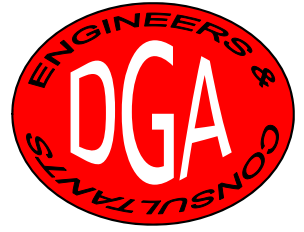
The whole plant will generate 4.5MWe from RDF



TYPICAL LAYOUT FOR 18 MW THERMAL OIL HEATER FOR RDF WITH LUEHR GAS CLEANING



Alternative Gas Cleaning system by DGA



DGA GAS CLEANING SYSTEM