



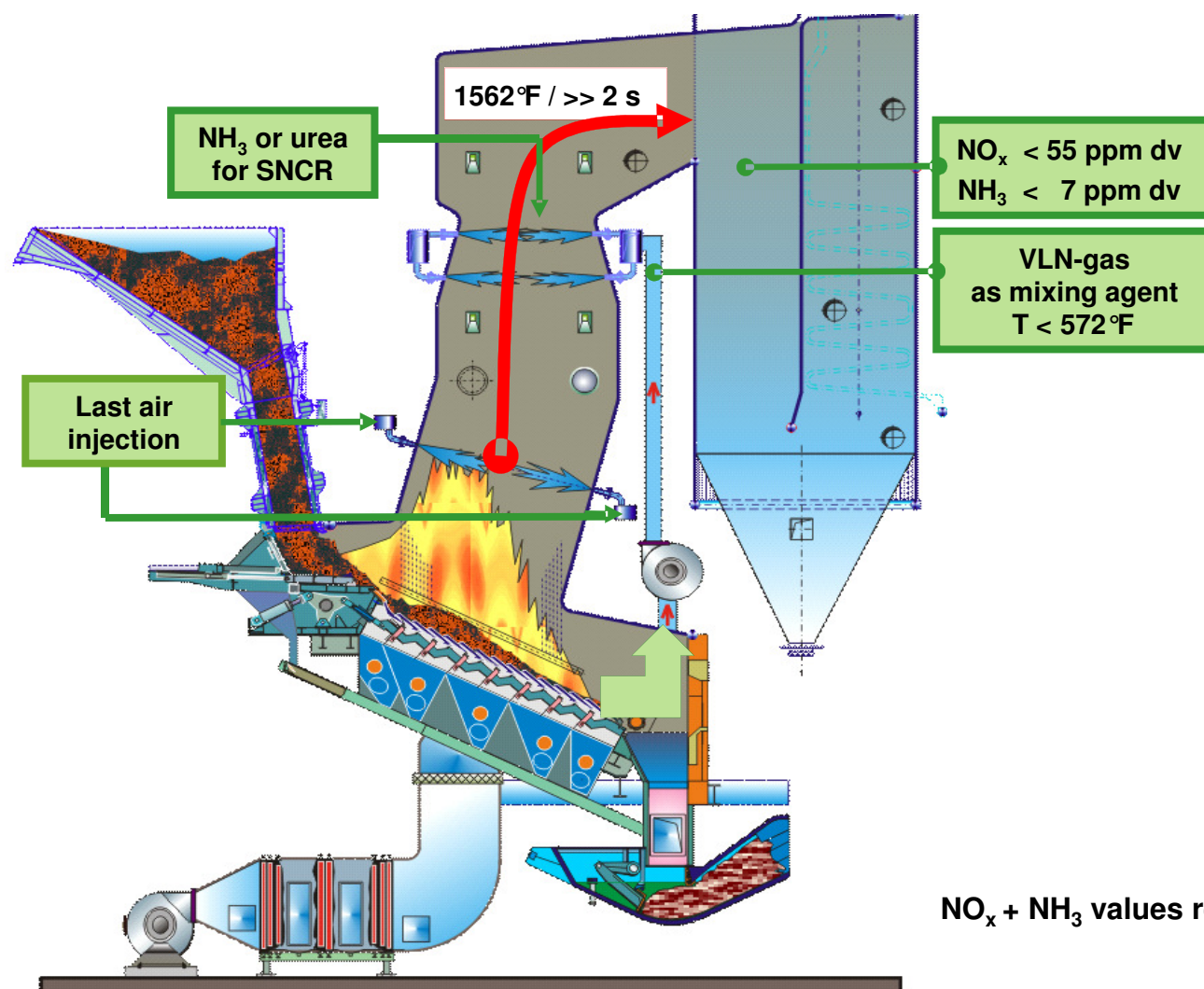
Industrial-scale innovations using the
MARTIN technology

Presented by: Ralf Koralewska

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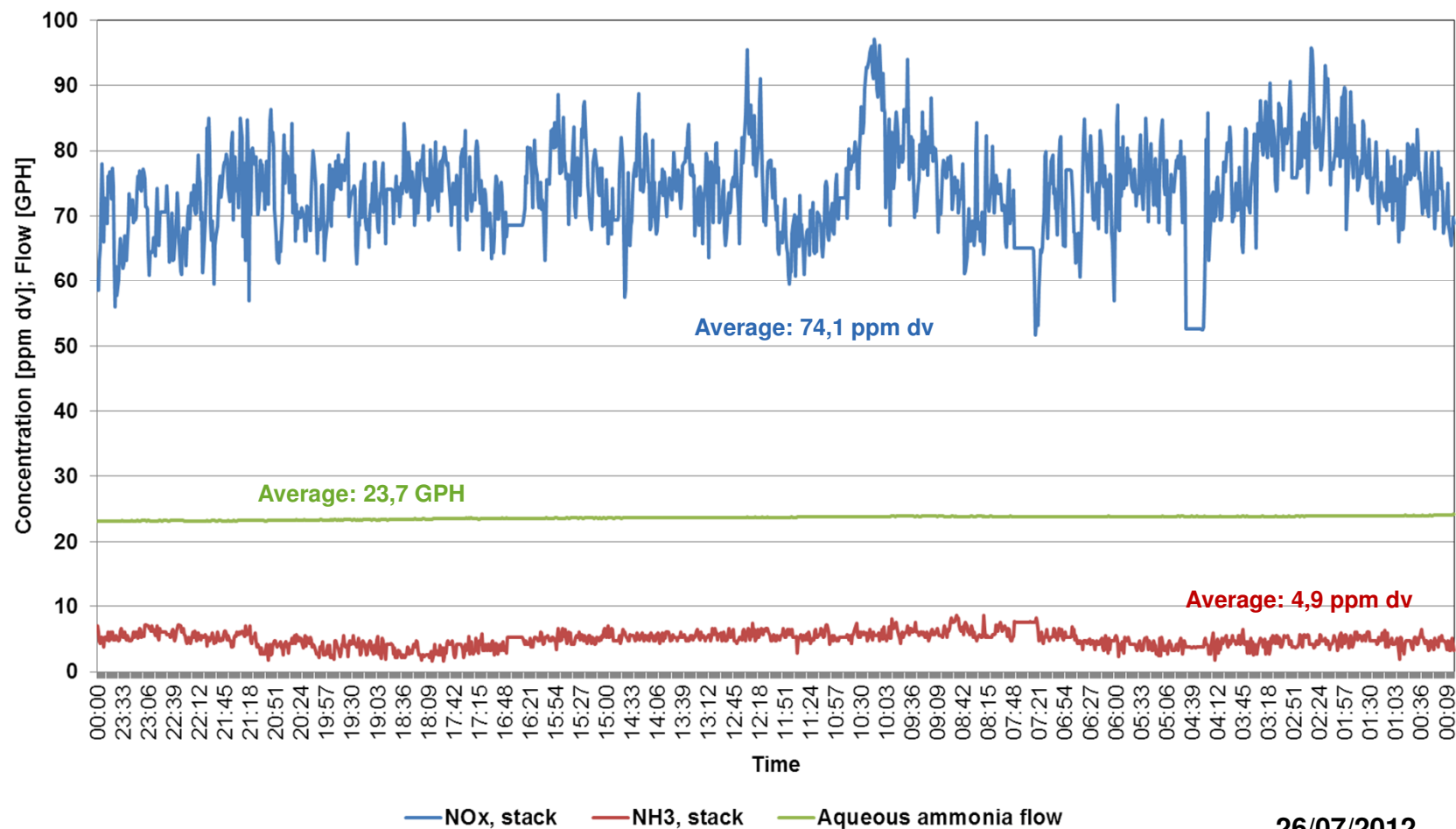
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Very Low NO_x - Concept



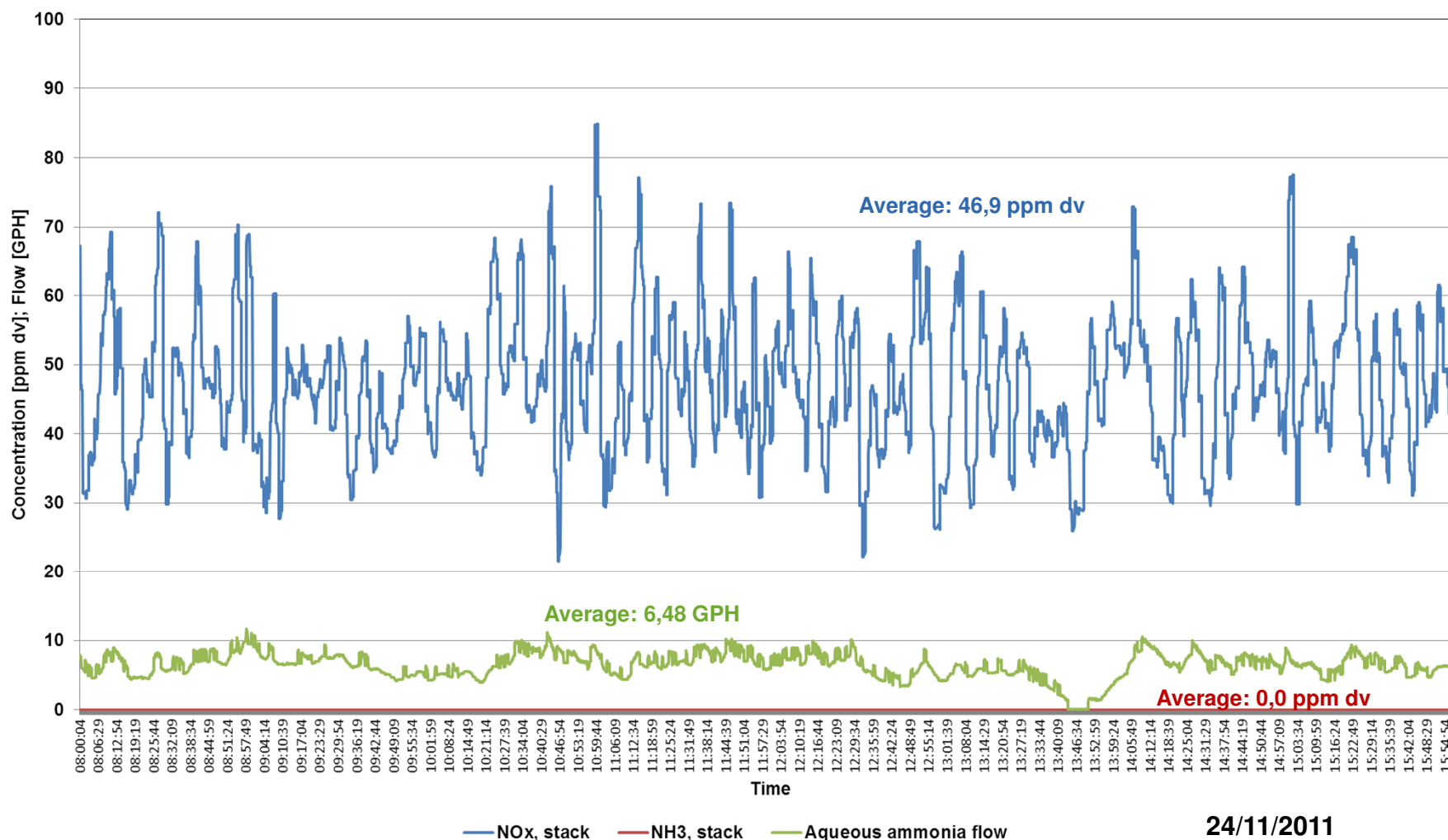
NO_x + NH₃ values referred to 7% O₂

Very Low NO_x - EfW plant Honolulu, USA



26/07/2012
NO_x + NH₃ values referred to 7% O₂

Very Low NO_x - EfW plant Coburg, DE



24/11/2011

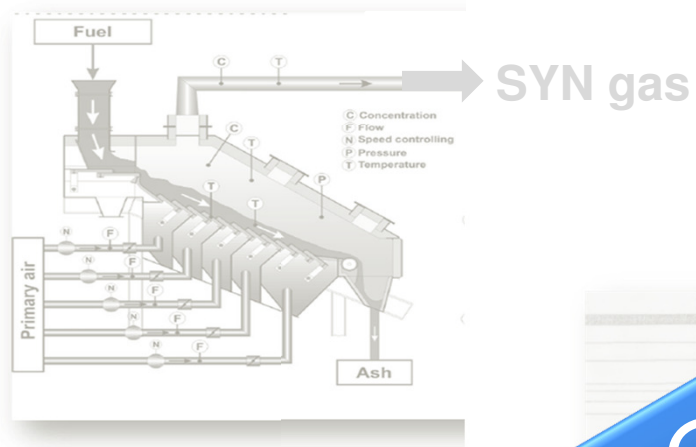
NO_x + NH₃ values referred to 7% O₂



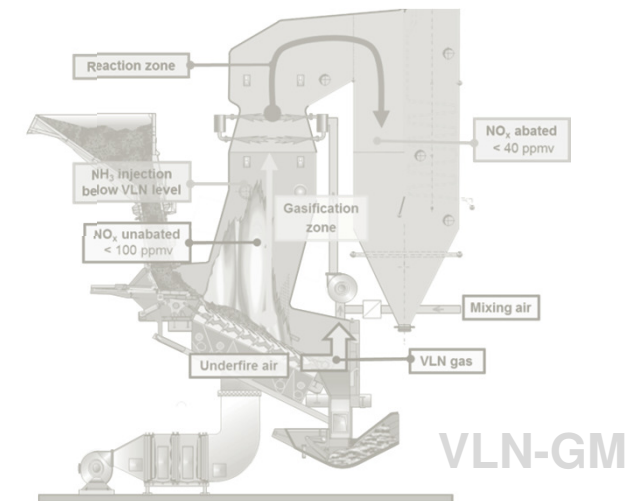
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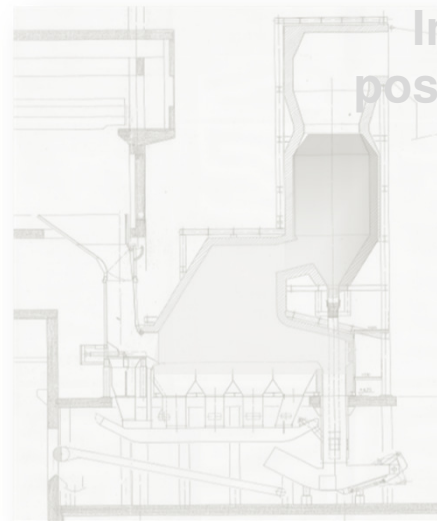
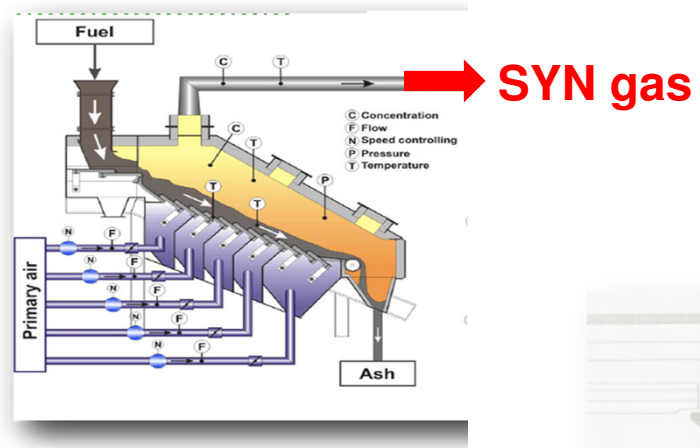
Conversion technology - Different technologies



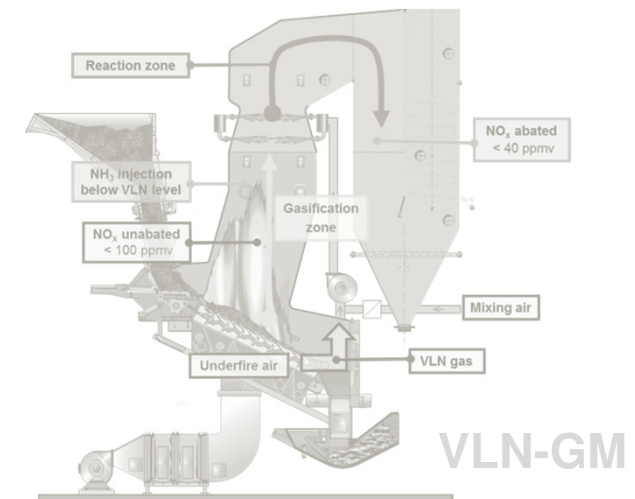
What is Conversion



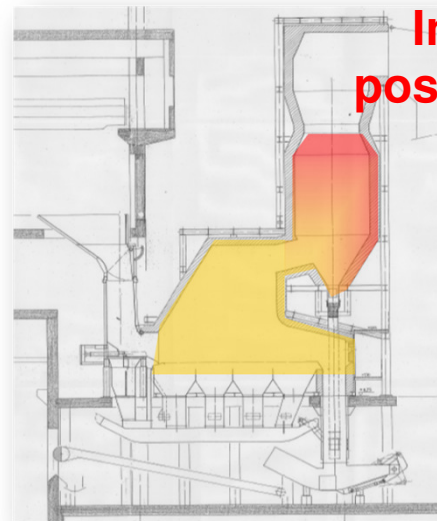
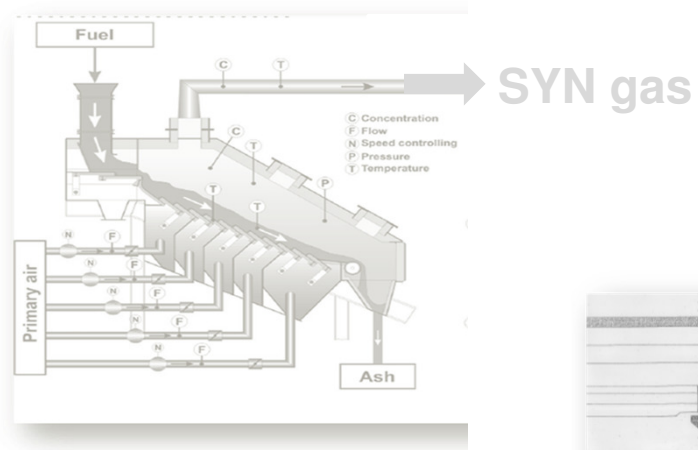
Conversion technology - Different technologies



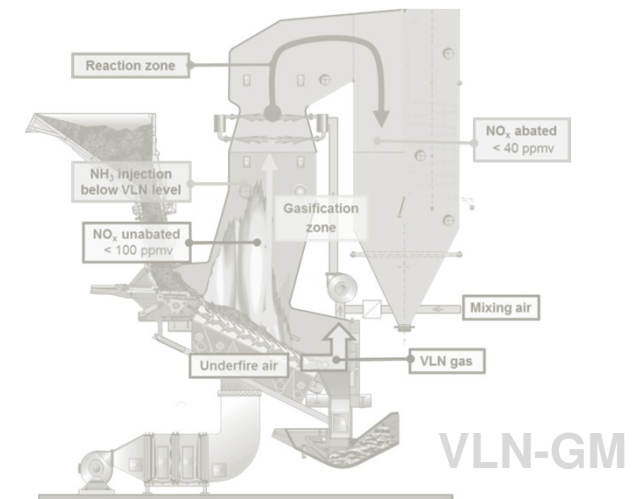
Independent
post-combustion



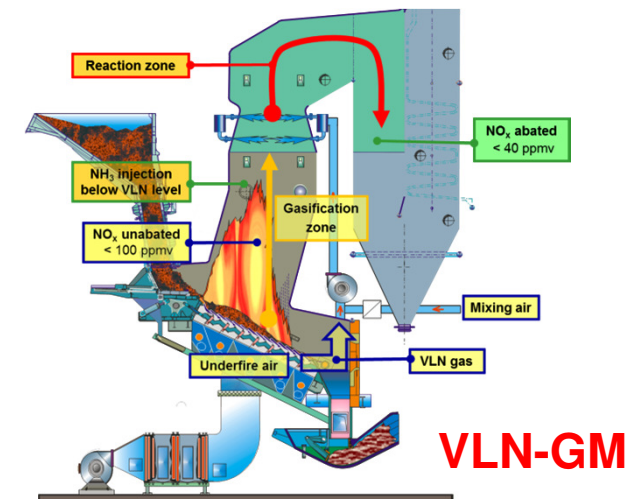
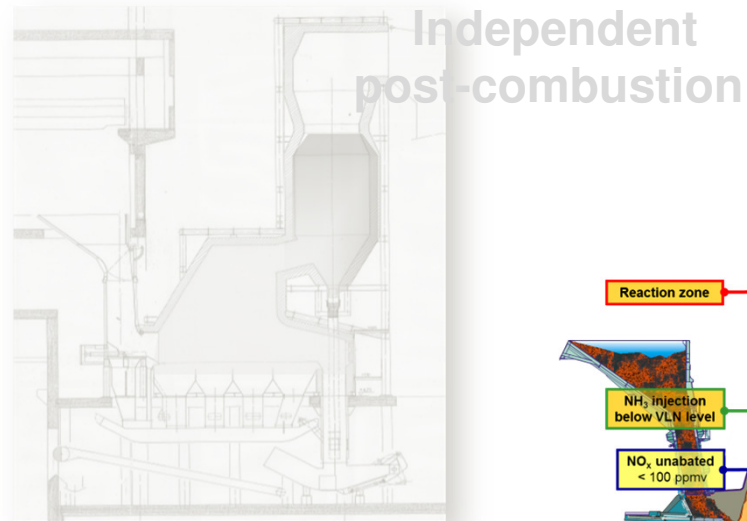
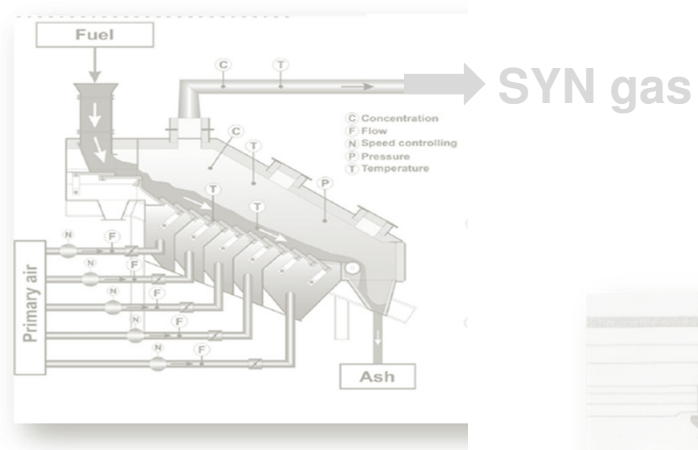
Conversion technology - Different technologies



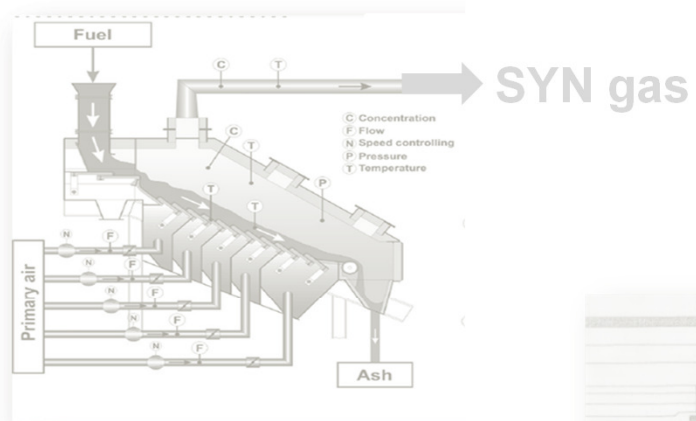
**Independent
post-combustion**



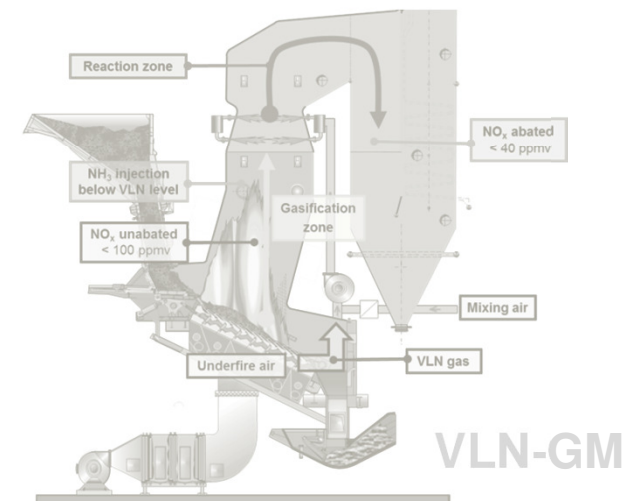
Conversion technology - Different technologies



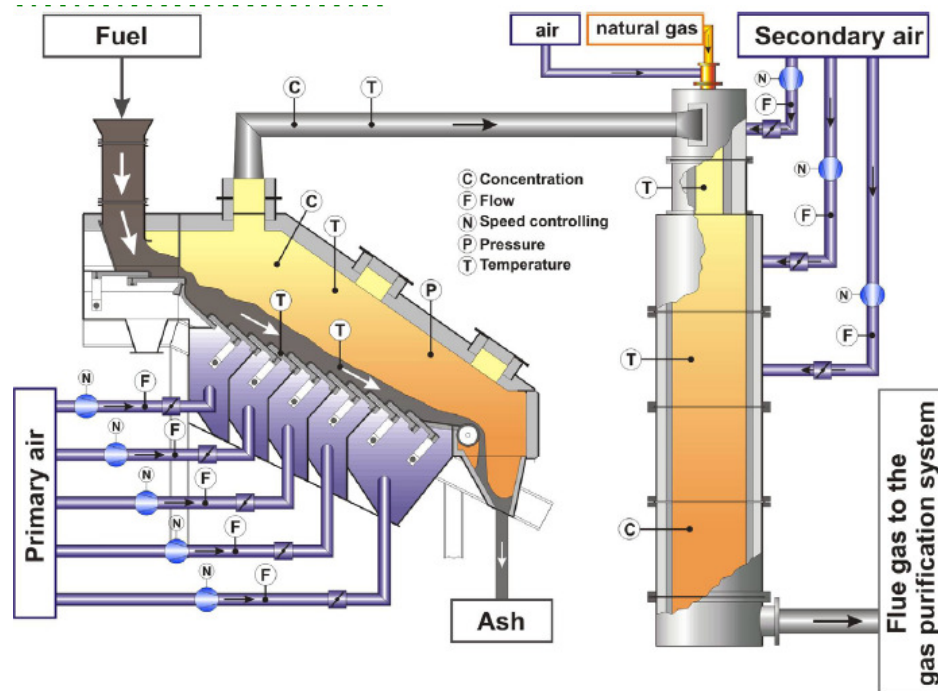
Conversion technology - Different technologies



Conversion is followed by combustion !

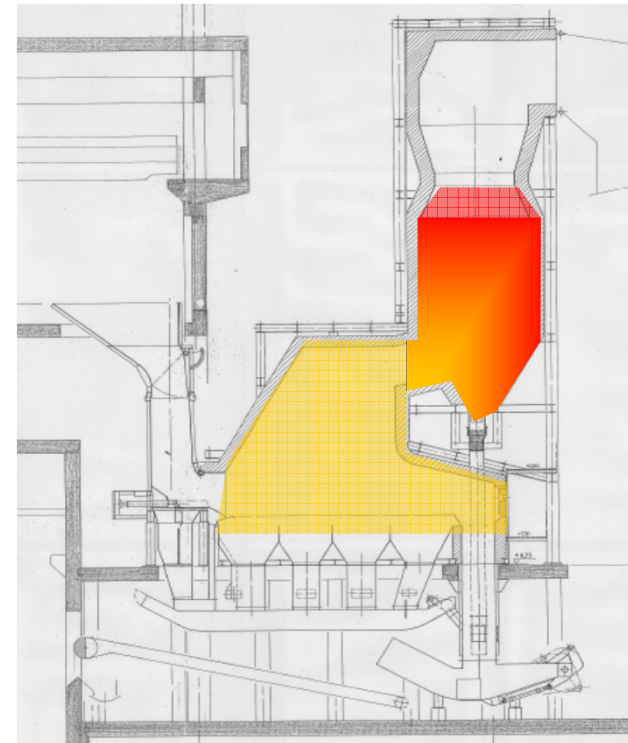


Conversion technology - Experiences



T3 Vortex, EfW plants, IT

Cagliari 2x168 t/d; 1995
Porto Marghera 1x173 t/d; 1998
Trieste 2x204 t/d; 1999/2000
Busto Arsizio 2x252 t/d; 2000
MARTIN horizontal grate

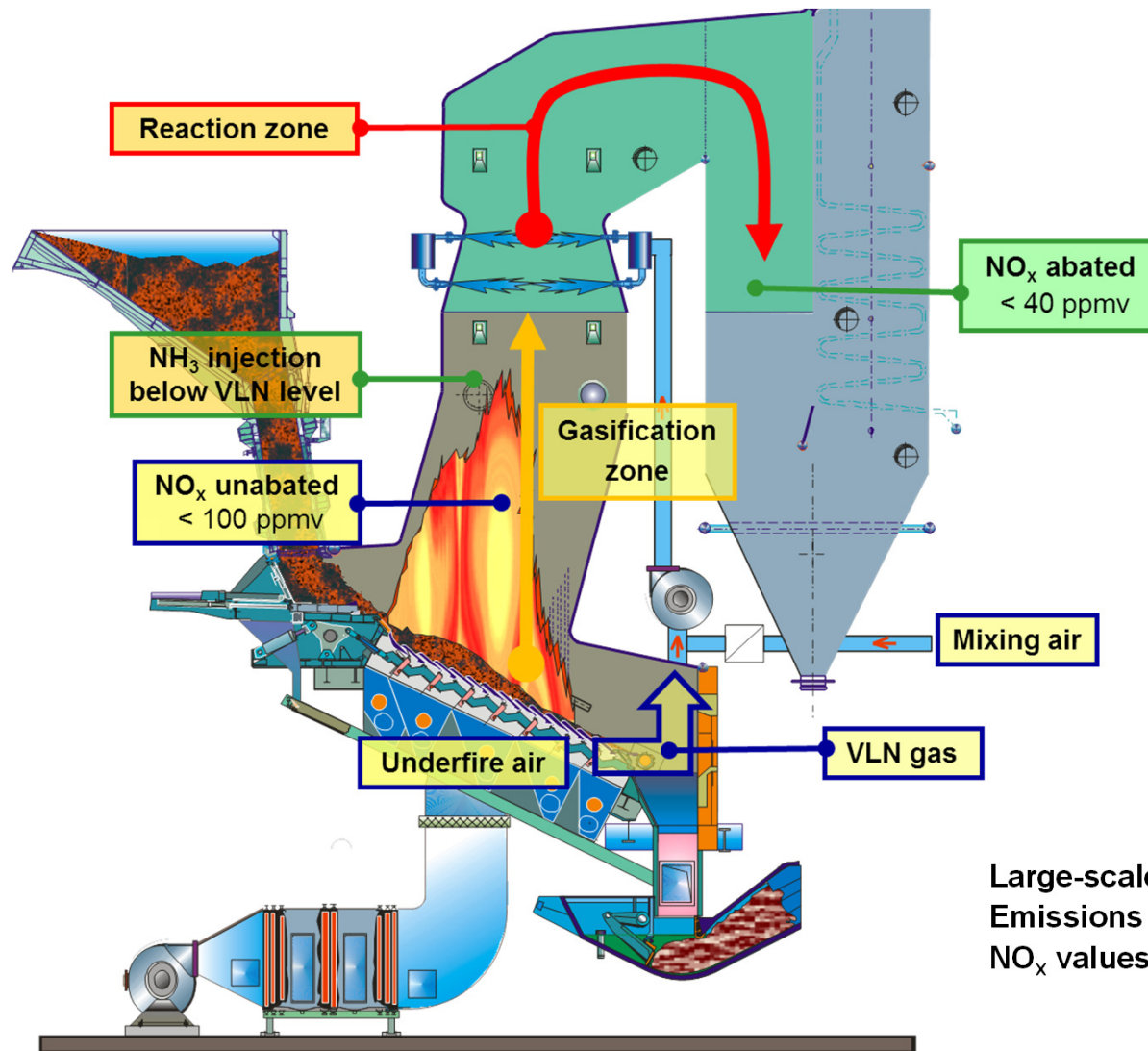


CUTEC pilot facility, DE

1x7.2 t/d; 1998

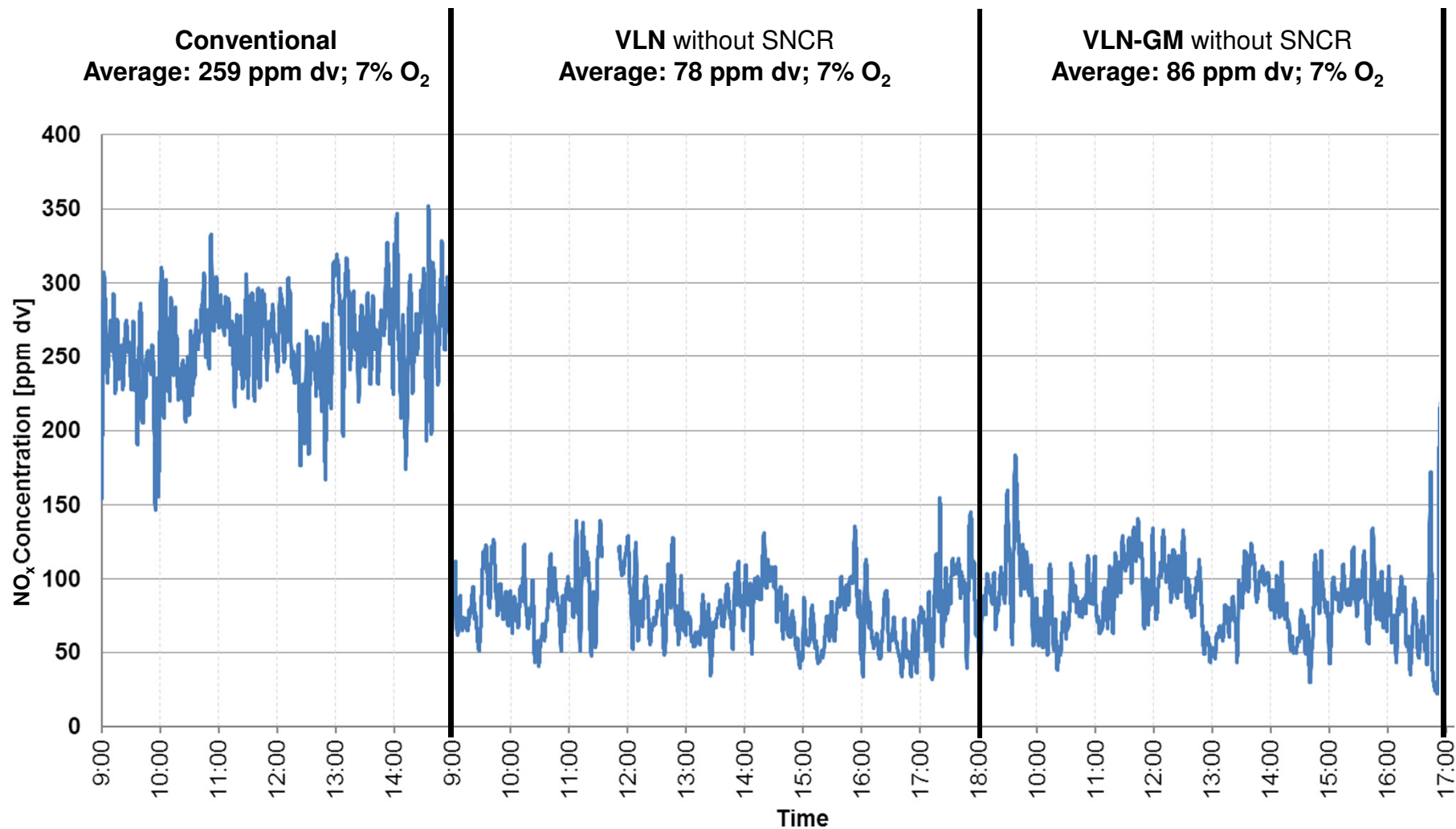
MARTIN reverse-acting grate

Conversion technology - Very Low NO_x - gasification mode (VLN-GM)



Large-scale implementation done
Emissions as daily averages
NO_x values referred to 7% O₂

Conversion technology - EfW plant St. Gallen, CH



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High-efficient energy recovery - Concepts

- MSW is particularly suitable for the generation of heat / power
- High-efficient production and use of energy (electricity, district heating / cooling, process steam)

Improvements of energy efficiency of EfW plants

- Energy optimized process (steam parameters, flue gas losses, in-plant consumption)
- Intermediate steam reheating (Amsterdam concept) or external superheating
- Overall combined heat and power concepts

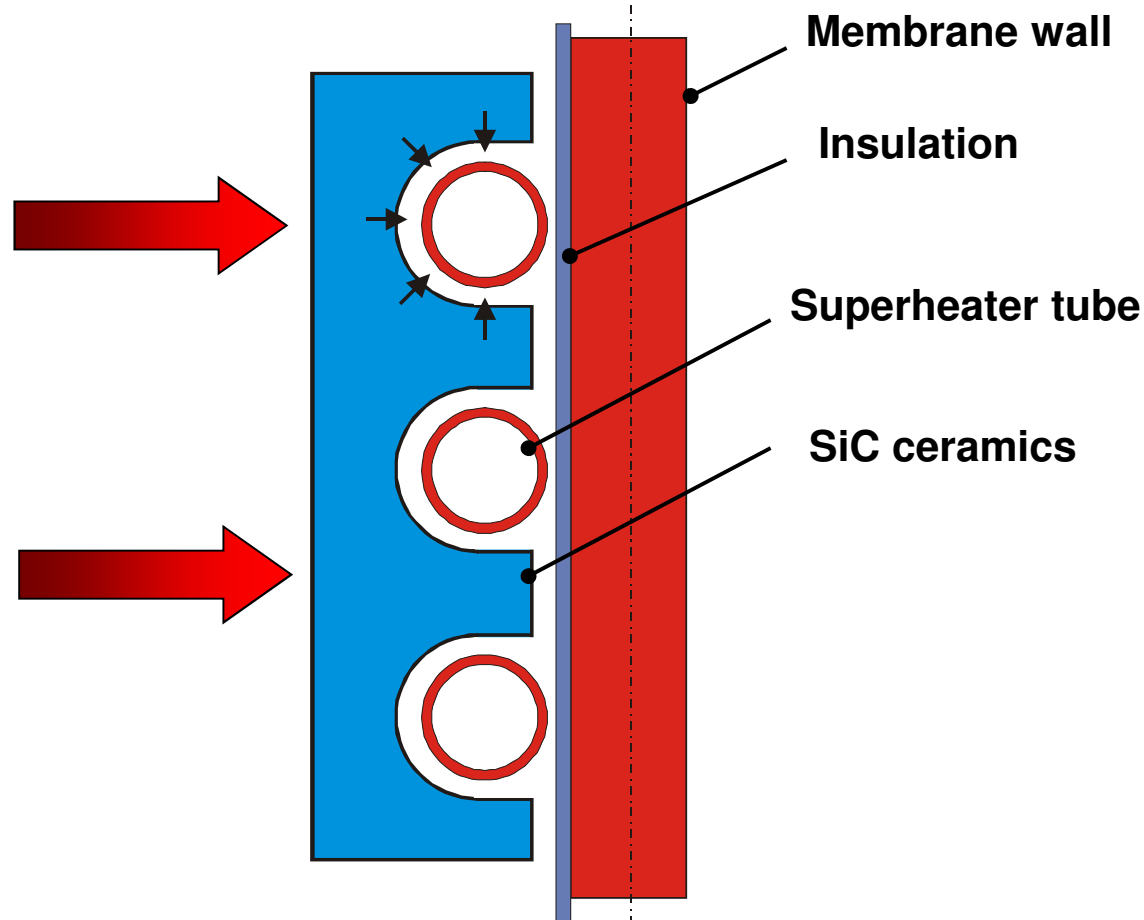
$\eta_{el., net} > 25 \%$

$\eta_{el., net} > 30 \%$

$\eta_{overall} > 90 \%$

Next generation of EfW plants
Steam parameters $> 1450 \text{ psi} / > 850^\circ\text{F}$

Corrosion-protected wall superheater - EfW plant Schwandorf, DE



Steam parameters 1015 psi / up to 896°F
EfW plant Schwandorf , 1st pass

Corrosion-protected radiant superheater- EfW plant Rosenheim, DE

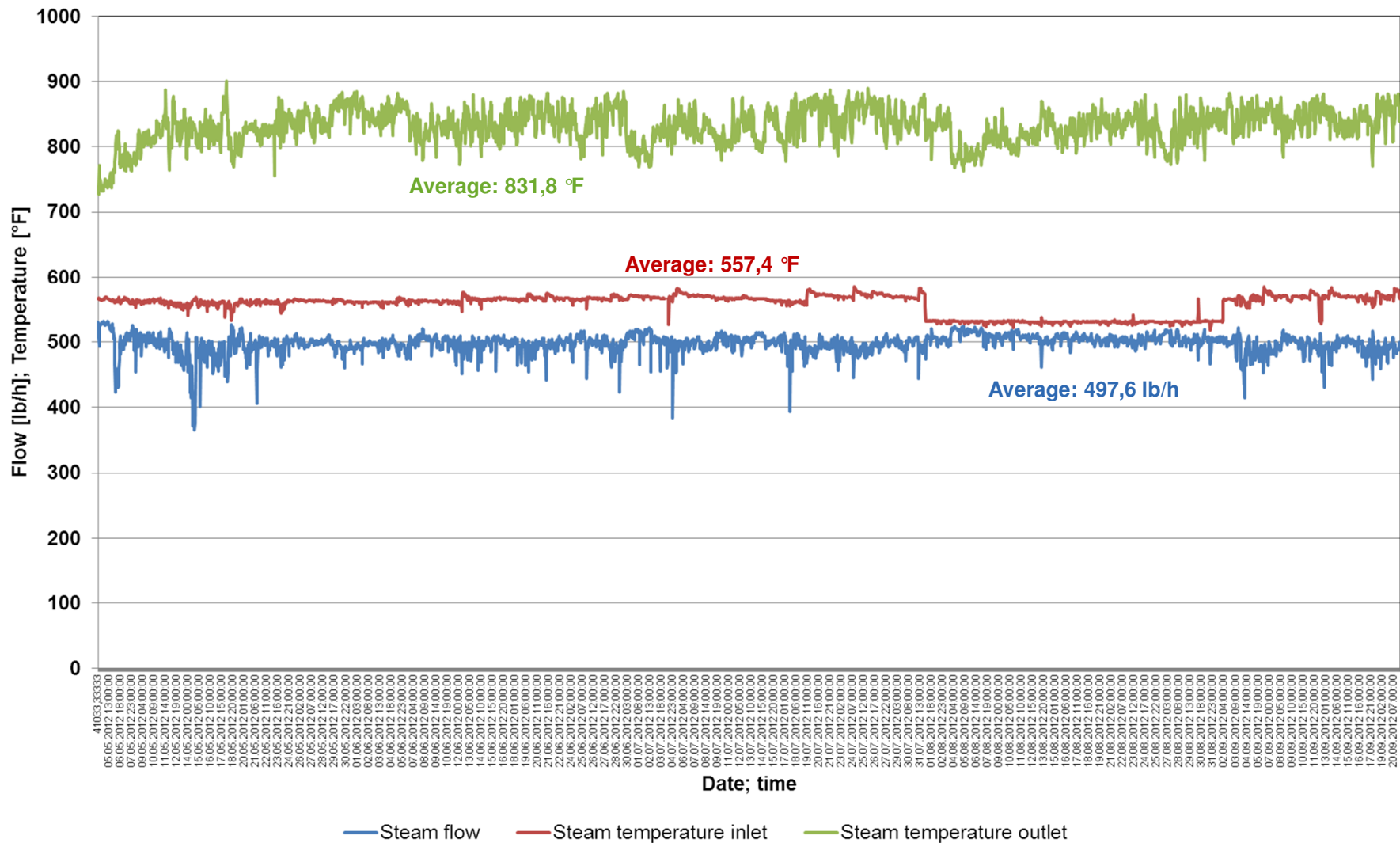


Steam parameters

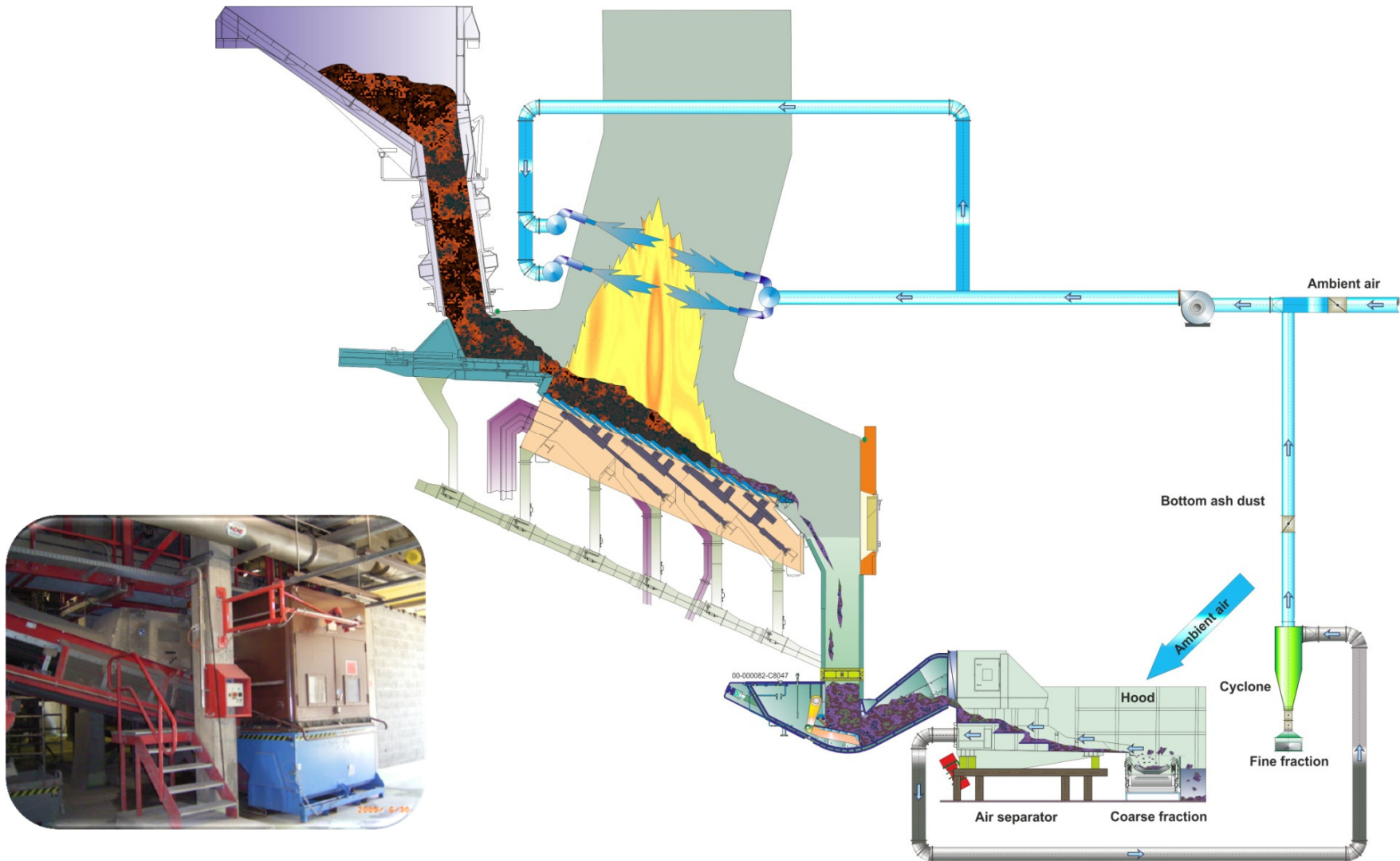
725 psi / 824 °F - 896 °F

EfW plant Rosenheim, 1st pass

Corrosion-protected radiant superheater- EfW plant Rosenheim, DE



Recovery of recyclables - MARTIN dry bottom ash discharge system EfW plant Monthey, CH



Recovery of recyclables - Dry-discharged bottom ash fractions EfW plant Monthey, CH



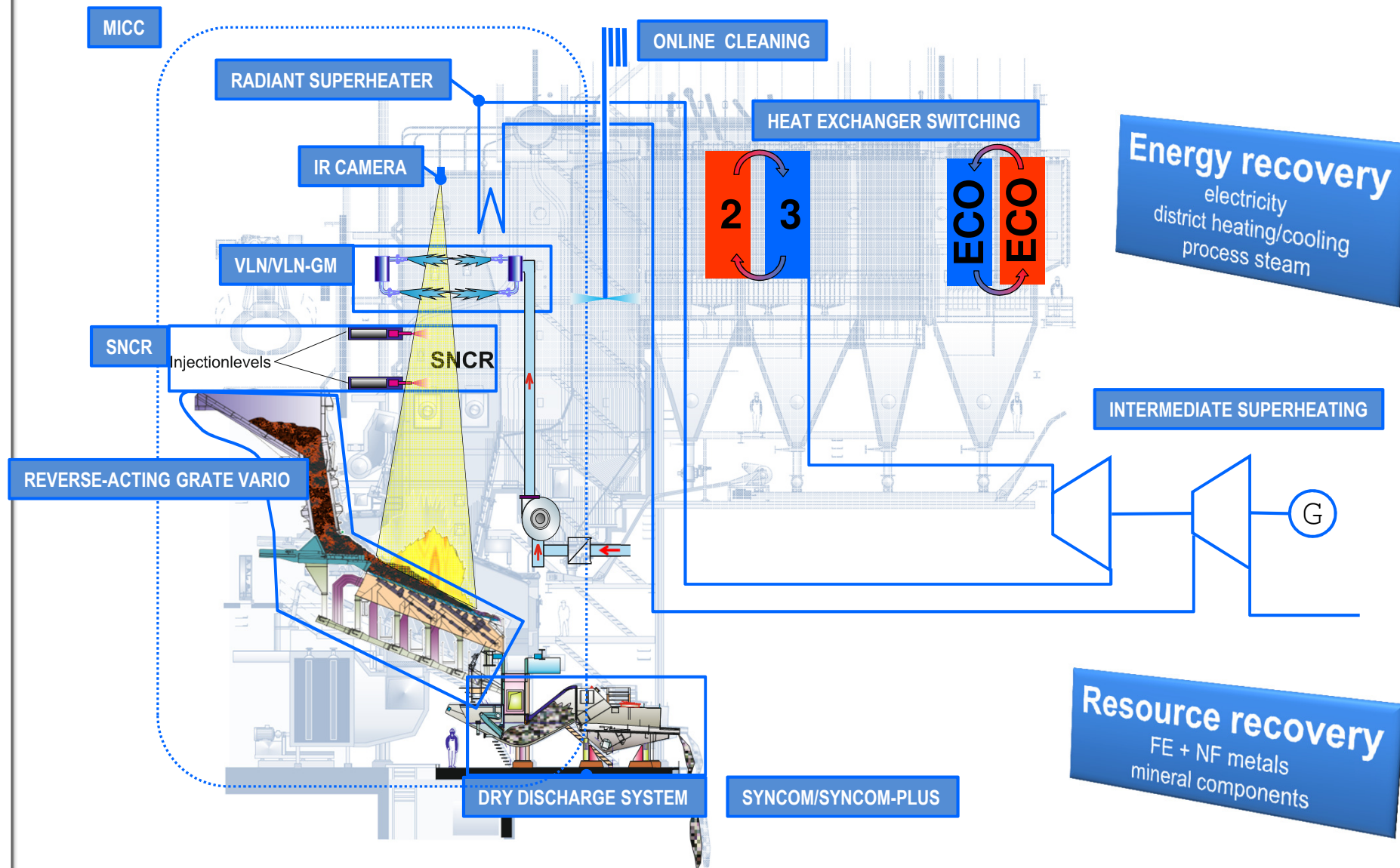
Coarse fraction > 1 mm
metal enriched

Fine fraction < 1 mm

nearly metal-free
material recovery (cement substitute)
high mineral content



Next generation of EfW plants



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Conclusions / Future prospects

- MARTIN dry bottom ash discharge system guarantees
 - a cool to the furnace
 - no control by bottom ash discharge
 - safe
- MARTIN dry bottom ash discharge system guarantees
 - efficient treatment of bottom ash
 - qualitatively high-grade recovery of metals + minerals
 - highest metal recovery rates
 - best market price for clean recovered metals (Fe, Al + many others)

Next generation of high efficient EfW plants -
Energy recovery + integrated material recovery

Conclusions / Future prospects

- High technological standard of EfW plants guarantees safe reduction of NO_x / NH₃ emissions (VLN, VLN-GM) and other pollutants
 - MAFF moving grate system can be combined with con
 - Modern EfW plants for high-efficient energy recovery
 - Corrosion-protected wall or radiant superheater efficiency significantly
- Next generation of high efficient EfW plants -
Lowest emissions + highest energy recovery**
- MARTIN will continue to reliably ensure thermal treatment of waste using most advanced innovations + guarantee proven process engineering technology

Contacts

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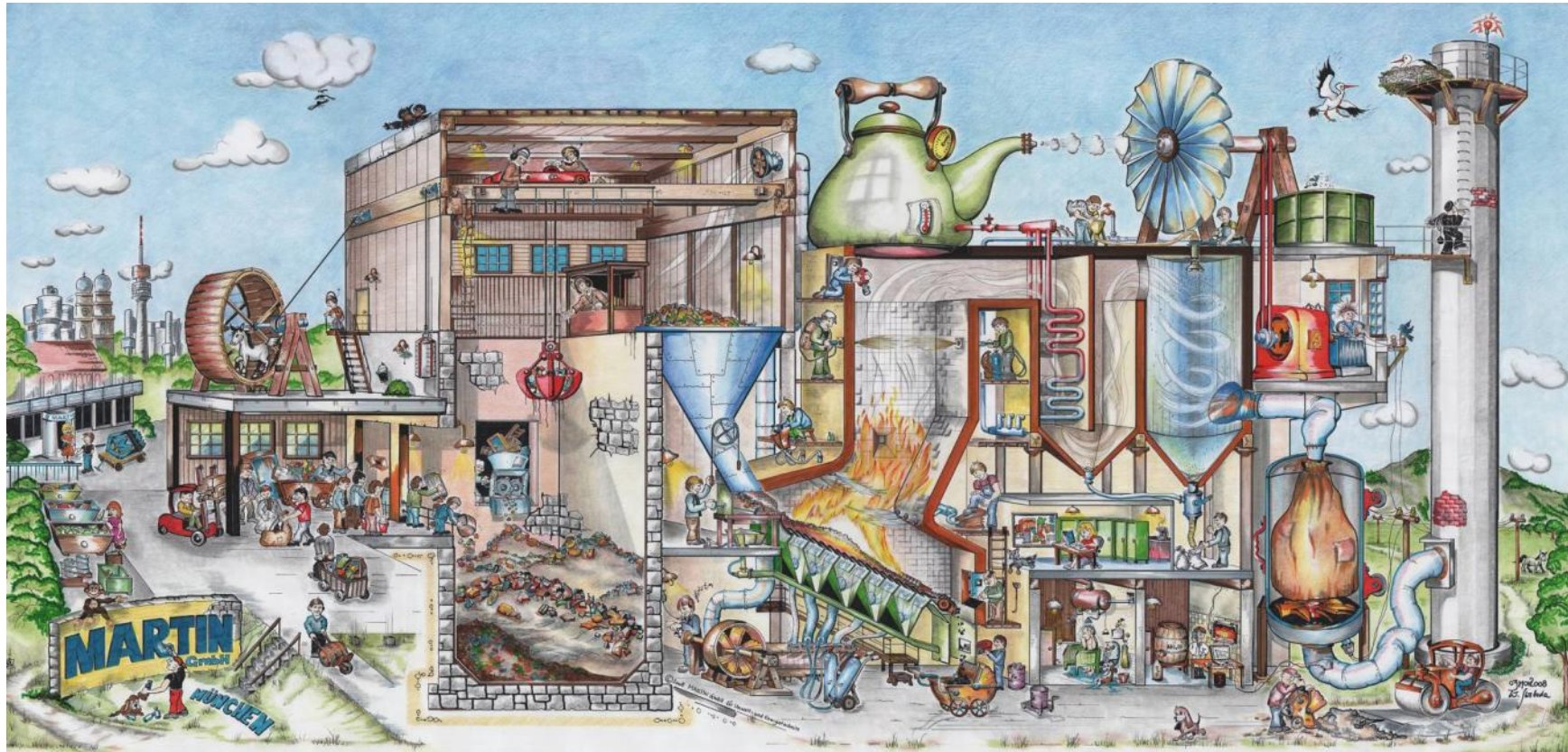
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Thank you very much for your kind attention



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