



Advanced Indirectly Heated
Carbonate Looping Process



Integration of the IHCaL Process into Cement Plants

Dr.-Ing. Viktoria Erfurt (VDZ), 6. October 2021



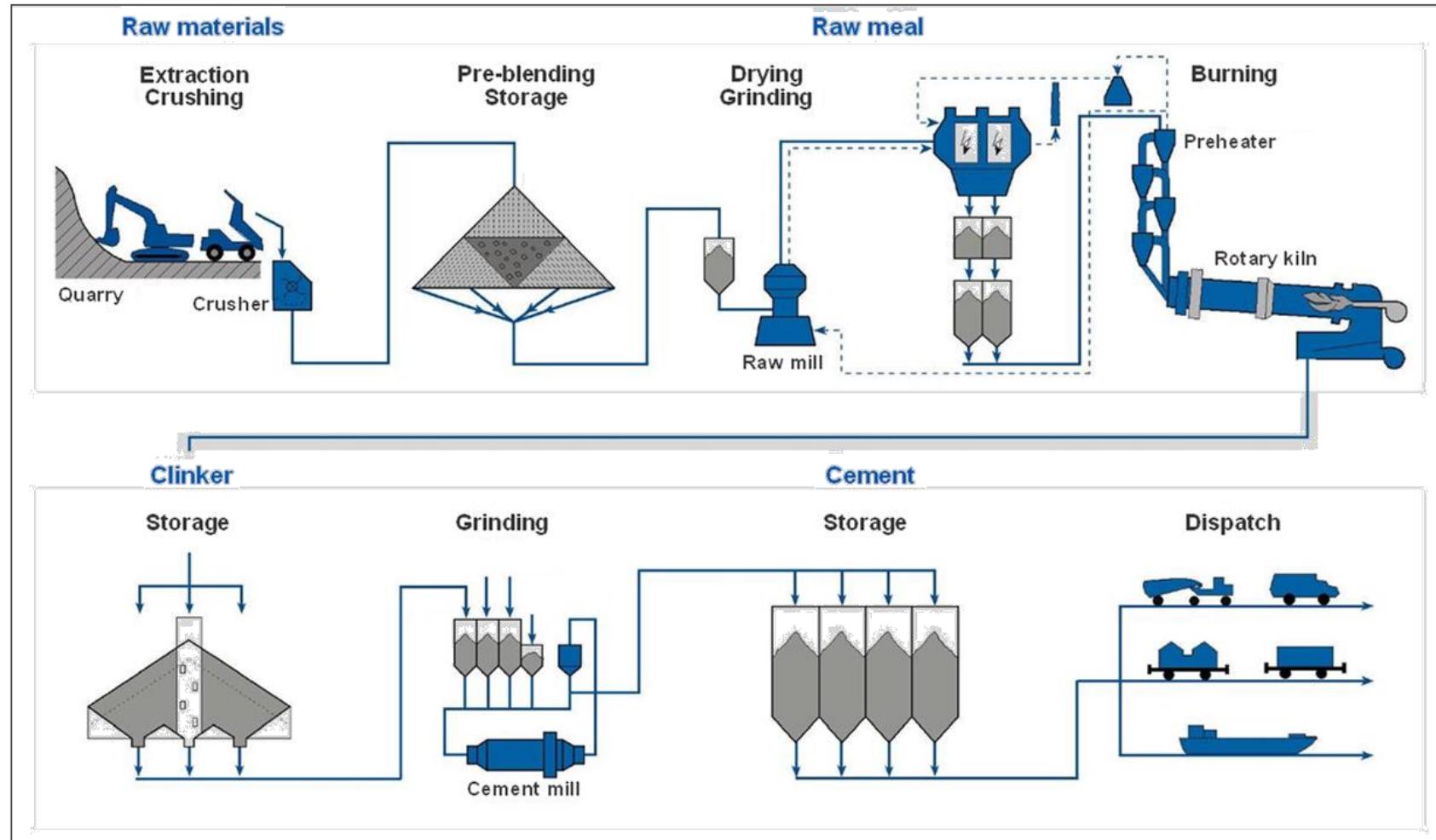
TECHNISCHE
UNIVERSITÄT
DARMSTADT



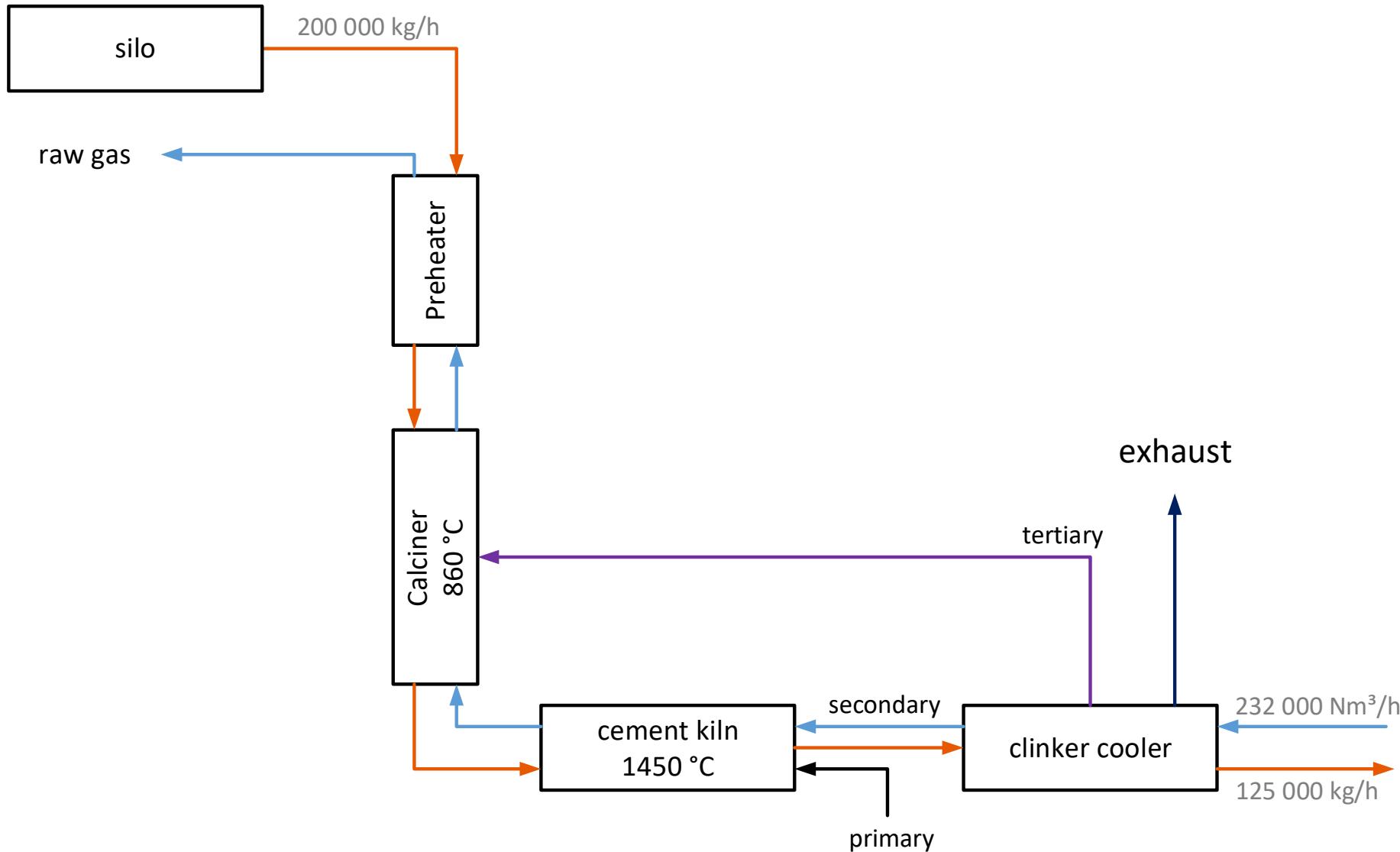
CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS

This project ANICA is funded through the ACT programme (Accelerating CCS Technologies, Horizon2020 Project No 294766). Financial contributions made from the German Federal Ministry of Economic Affairs and Energy, the Department for Business, Energy and Industrial Strategy of the United Kingdom and the Greek General Secretariat for Research and Technology.

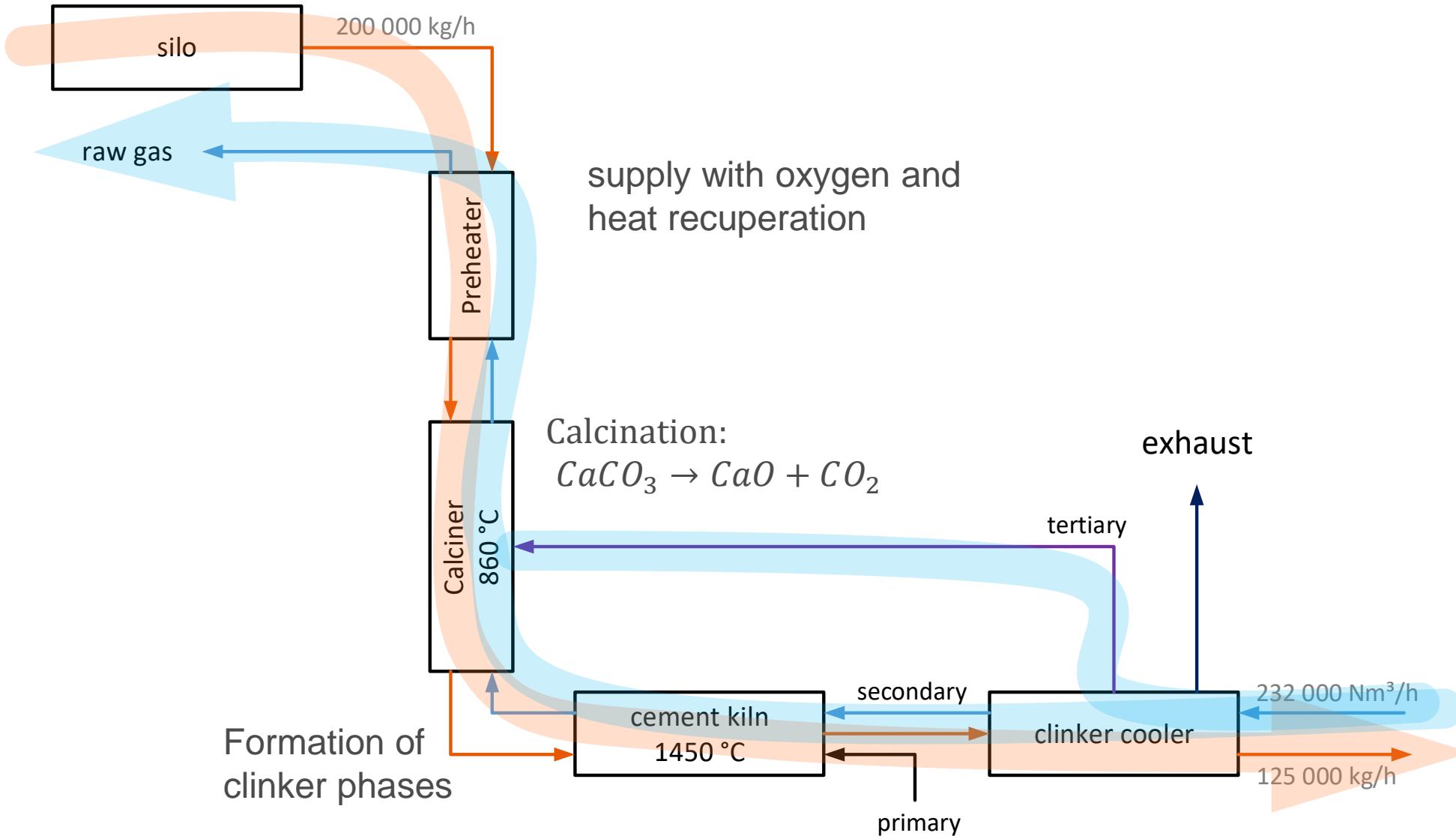
Cement process



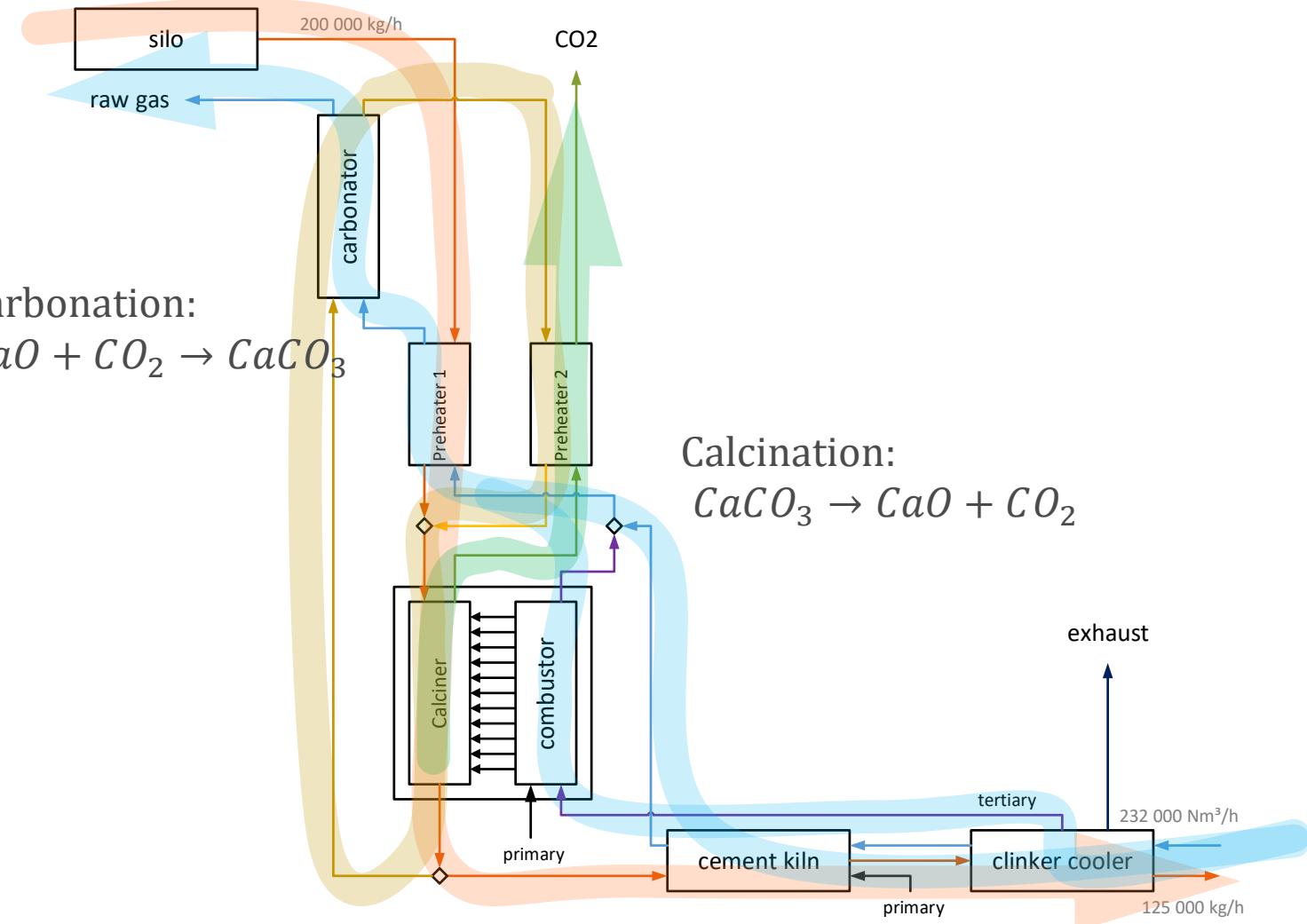
Reference plant (BAT)



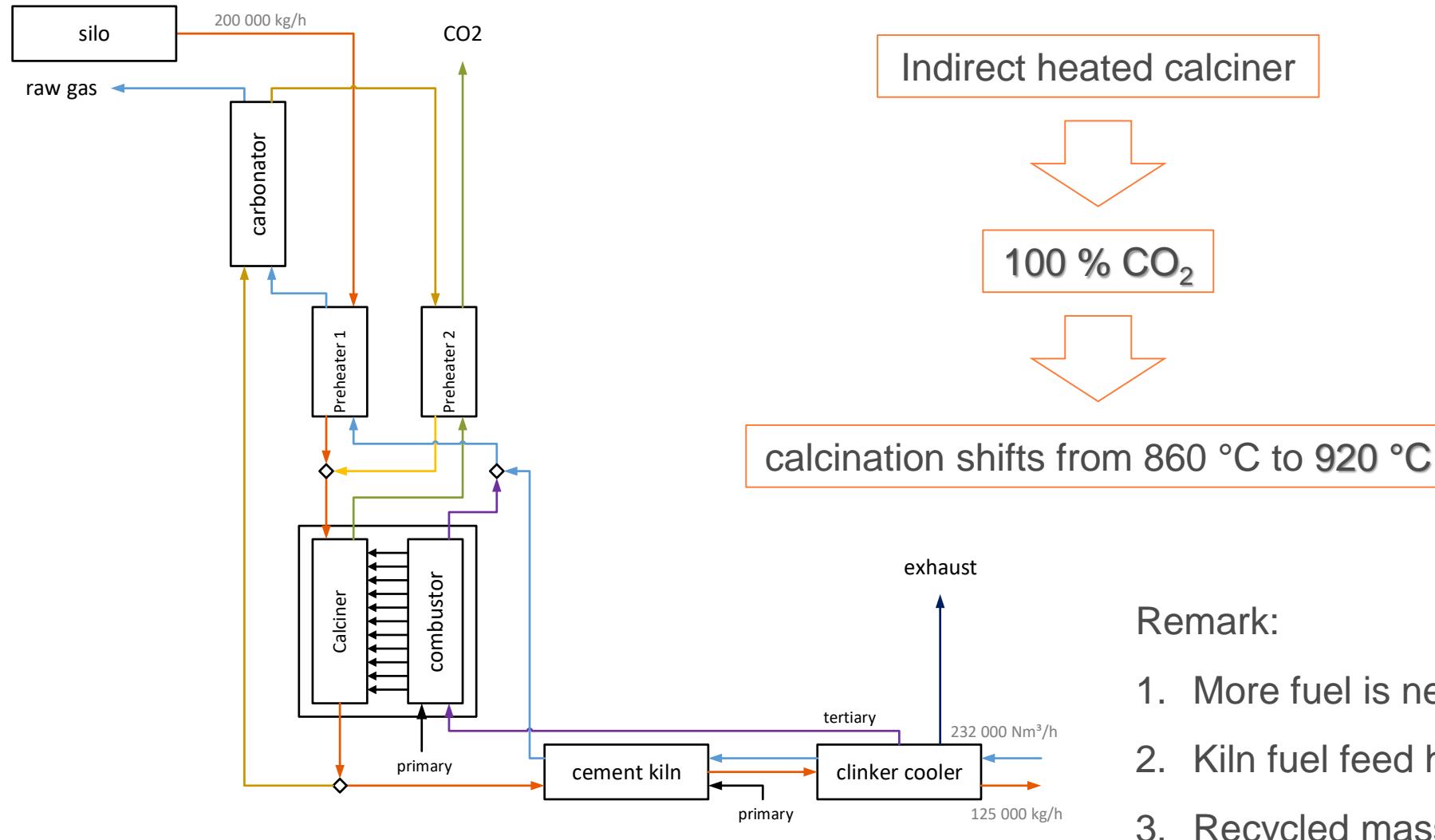
Reference plant (BAT)



Concept for the integration of the IHCaL process

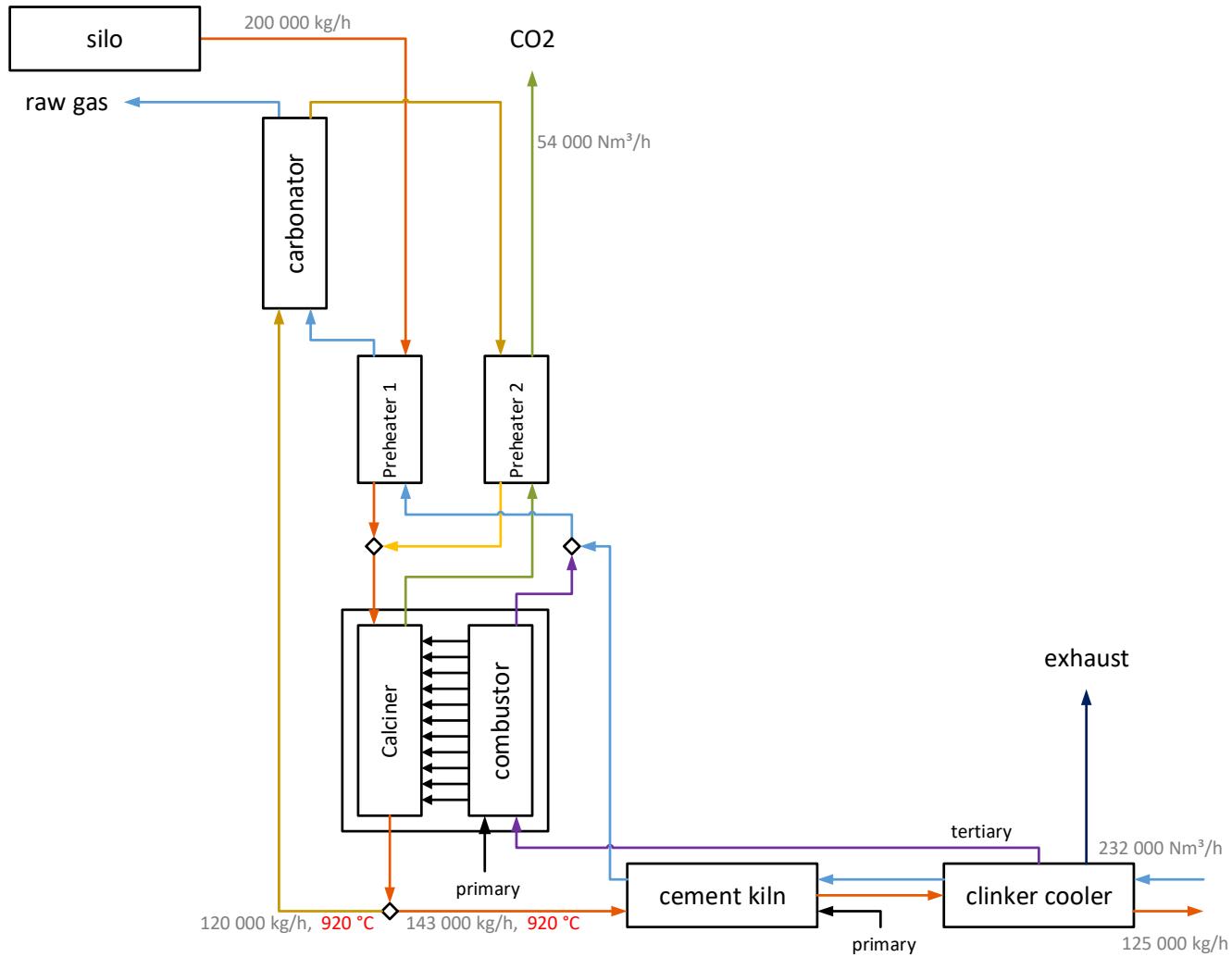


Concept for the integration of the IHCaL process



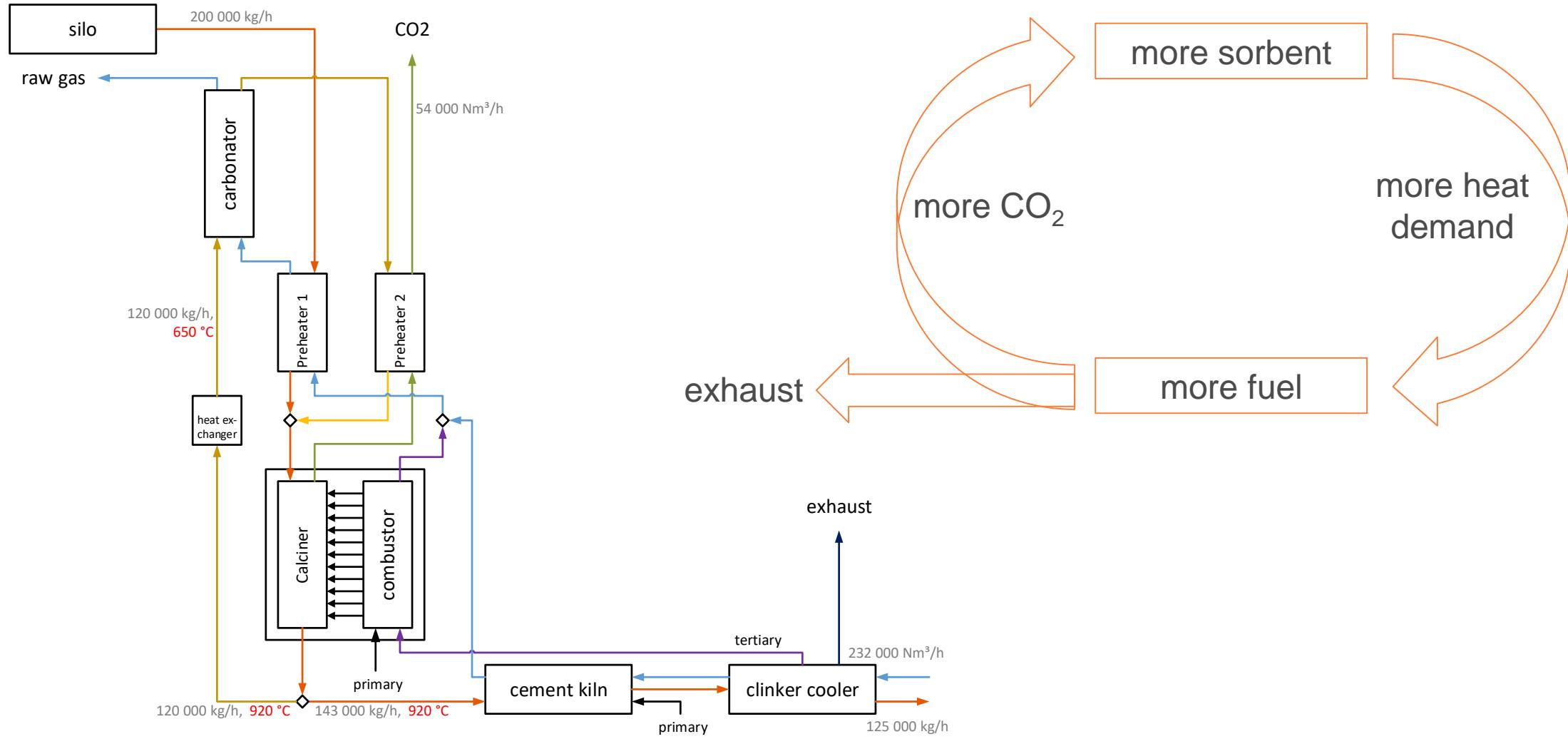
Concept for the integration of the IHCaL process

ANiCa



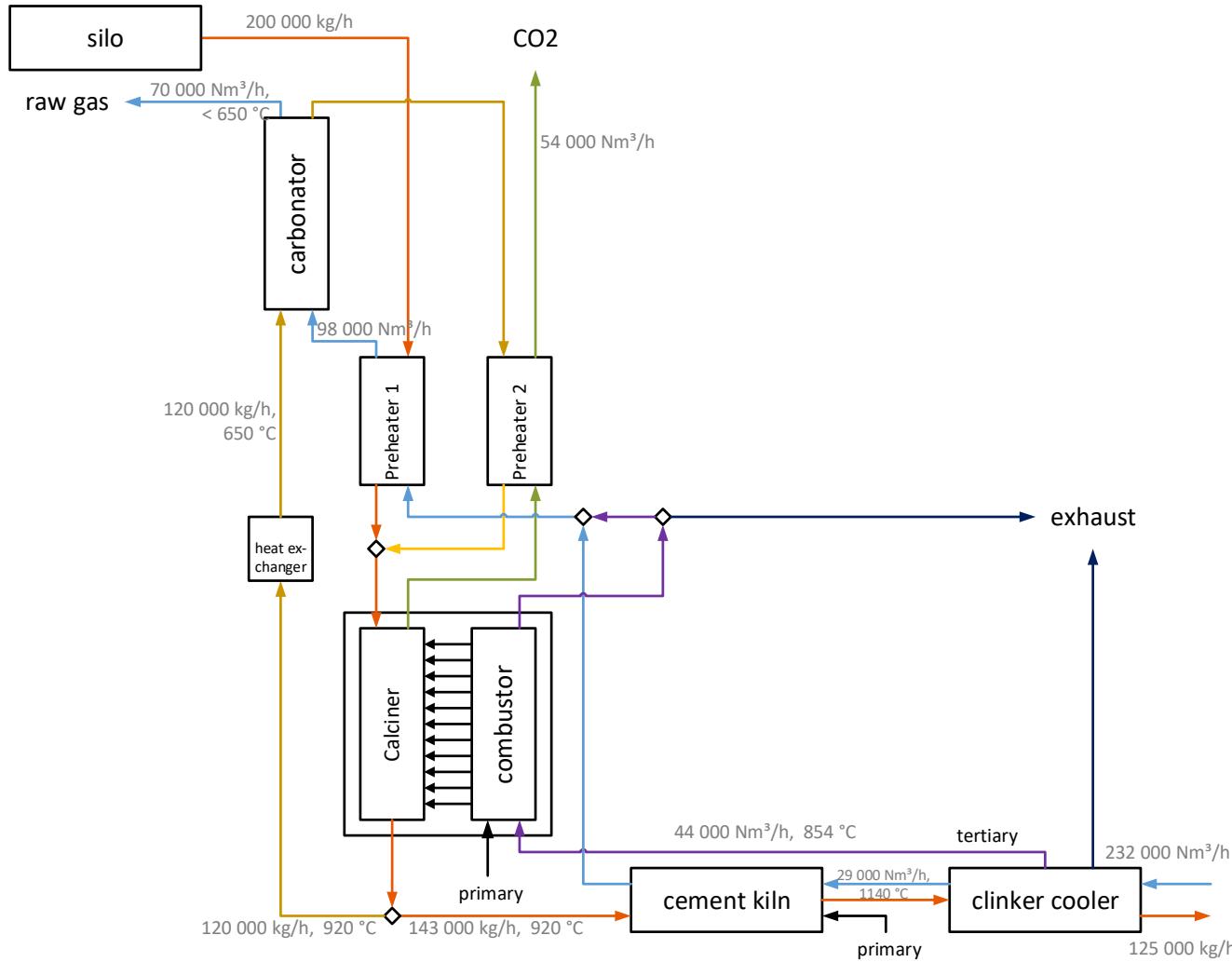
Concept for the integration of the IHCaL process

ANiCA

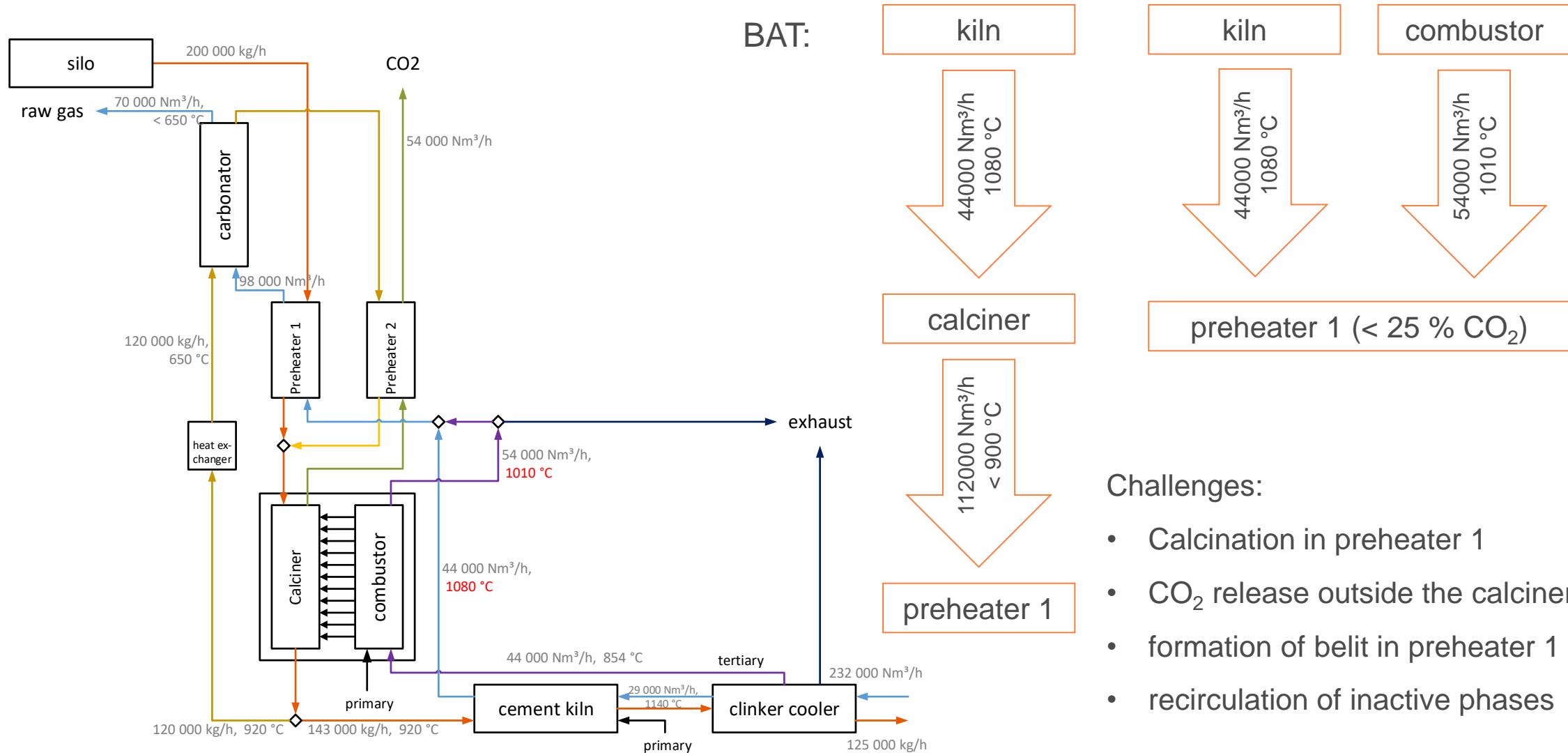


Concept for the integration of the IHCaL process

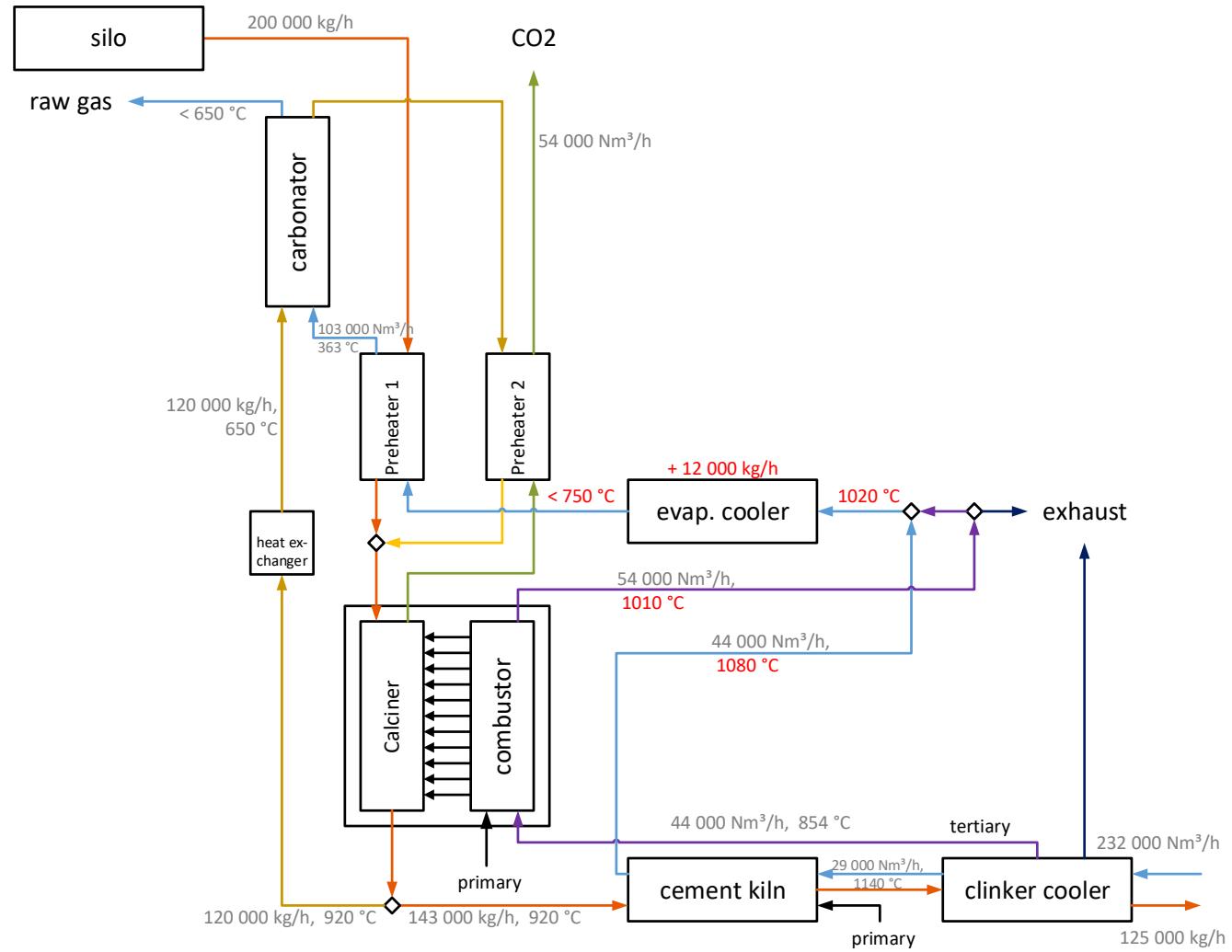
ANiCA



Concept for the integration of the IHCaL process



Concept for the integration of the IHCaL process



solution: cooling the combustion gas from 1020°C to $< 750^{\circ}\text{C}$

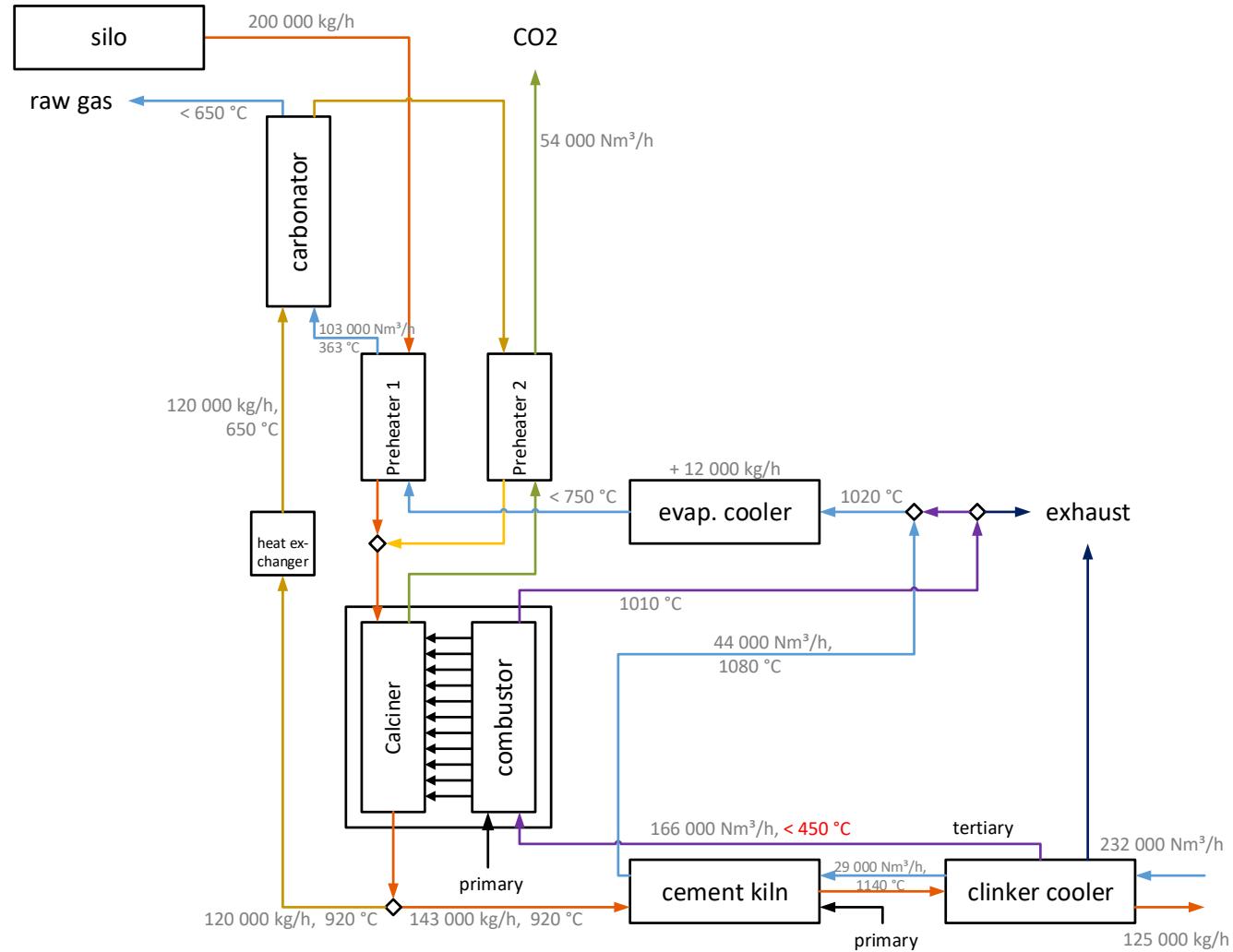
technical limitations due to high temperature and erosive dust load

currently no appropriate heat exchangers and turbines available

Solution: evaporation cooler

- efficiency loss
- + positive influence of water vapour on carbonation

Concept for the integration of the IHCaL process



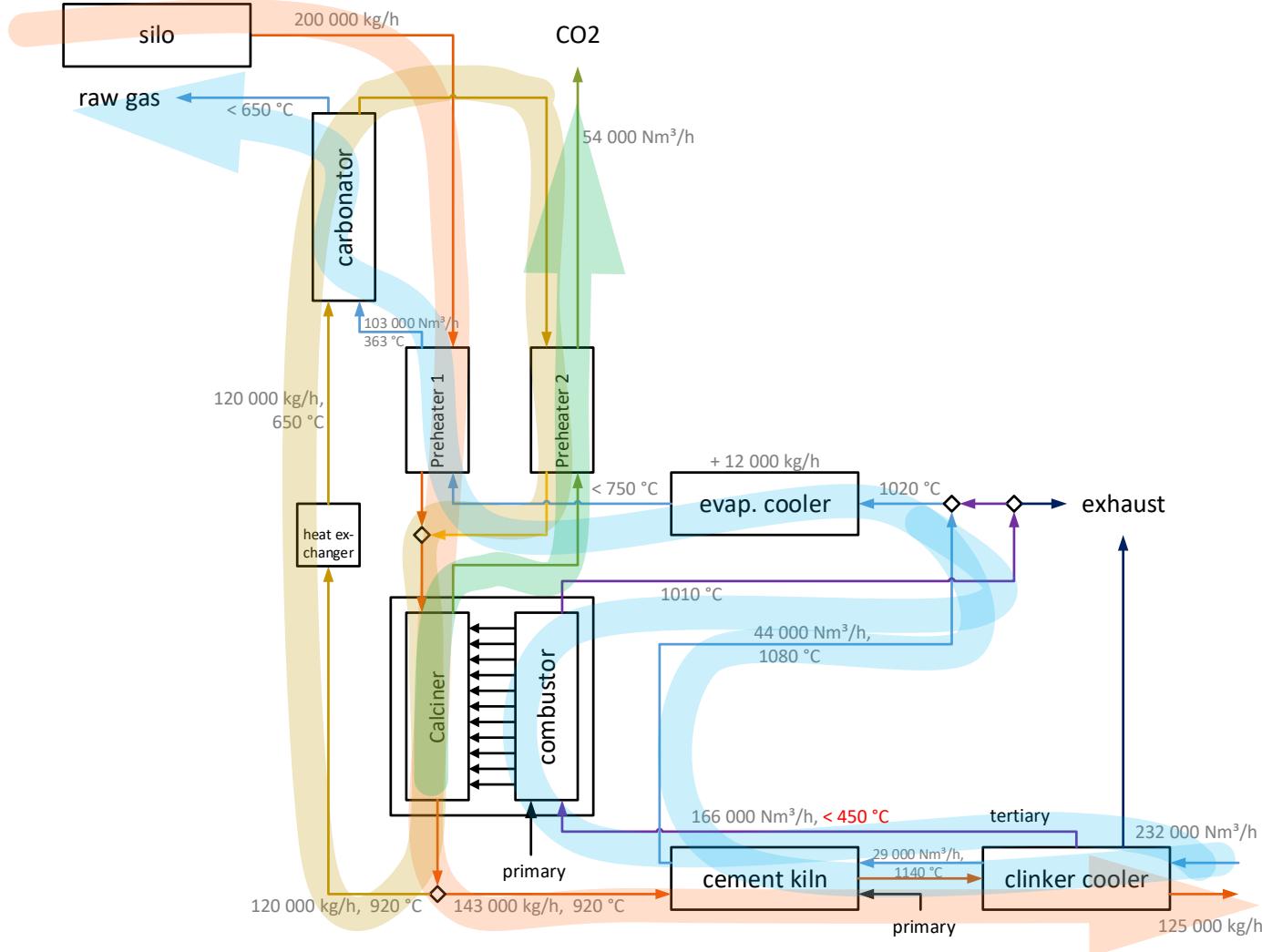
Because of erosive dust load a filter is needed between clinker cooler and the combustor.
 → tertiary air < 450 °C !

+ enough oxygen
 + no need of an additional oxygen input

- more air to heat up in the combustor
 - need of a preheating zone in the lower part of combustor

Concept for the integration of the IHCaL process

ANiCa



Thank you for your attention!

ANICA



CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS



ESTRA



TECHNISCHE
UNIVERSITÄT
DARMSTADT



vdz.



www.act-anica.eu

Viktoria Erfurt, ANICA Workshop, October 2021