



15 MW Fuel-Power Biomass Gasification Plant Villach

A regional Energy-Supply-Showcase

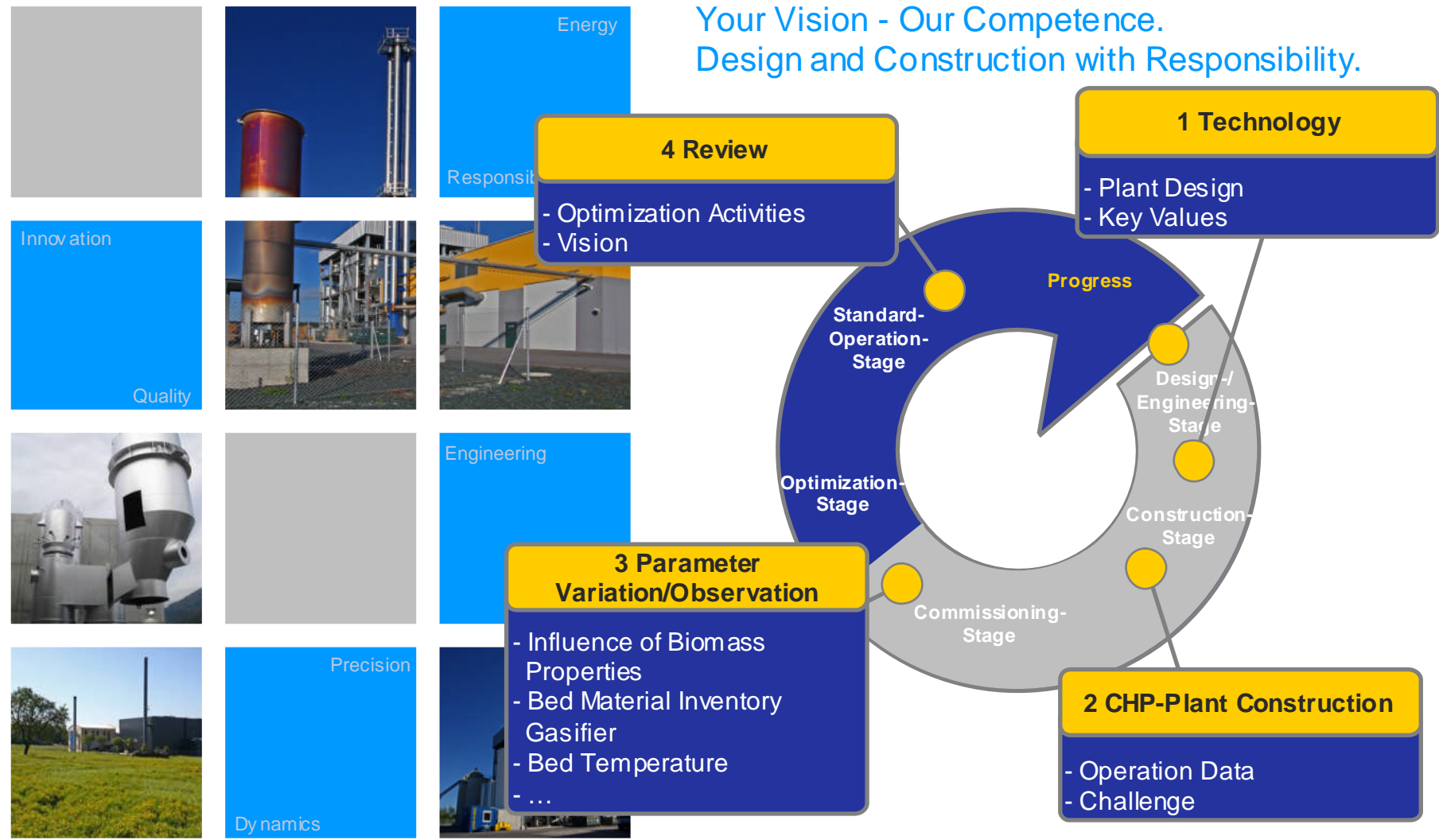
Thomas Klotz

Ortner GesmbH

Building Service & System Engineering ■
Heat ■ Climate Control ■ Sanitary ■
Industrial & Environmental Engineering ■

28.10.2010

Cycle of Progress



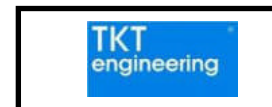
The ORTNER Group



Warsaw ●

Vienna ●

Innsbruck ●



50 %

ca. 30 %

Engineering and Construction Services



Pipelines	Environmental Plants	Industrial Plants	Power Plants
<ul style="list-style-type: none"> ▪ industrial pipelines ▪ pressure pipes ▪ long distance pipes ▪ gas pipes 	<ul style="list-style-type: none"> ▪ waste water treatment ▪ garbage treatment ▪ exhaust Air treatment 	<ul style="list-style-type: none"> ▪ pharmaceuticals ▪ chemicals ▪ food ▪ paper ▪ metal ▪ semiconductors 	<ul style="list-style-type: none"> ▪ heat supply ▪ biomass CHP plants



CHP Biomass Gasification Oberwart



The CHP-plant in Oberwart is the first commercially operated dual-fluidized-bed Biomass gasification plant with combined cycle.

some details:

- two 12-cylinder-gasengines for gas-utilization
- two-circle thermal oil based heatcollection, ORC-module
- fuel drying using low-temperature-energy-streams
- 60 t of fuel provided per day
- heat supply for regional infrastructure

wood gasification

our services:

general contractor

construction time:

2006-2008

capacity:

2.400 (+400) kW_{el}, 4.100 kW_{th}

annual fossile CO₂ savings:

ca. 15.500 t



Austria



Innovation

CHP Biomass Gasification Villach



Ortner constructs the so far biggest dual-fluidized-bed biomass gasification plant with an annual fuel capacity of ca. 33.000 t Holz.

Some details:

- two 20-cylinder-gas engines for gas-utilization
- summer operation mode: gas engine flue gas (heat) is used for intermediate superheating a steam turbine's exhaust flow; the superheated steam is expanded in a condensing turbine
- 6,3 km piping (DN 6 bis 700)

wood gasification

our services:

General contractor

Construction time:

2009-2010

capacity:

3.900 kW_{el}, 6.700 kW_{th}

annual fossile CO₂ savings:

ca. 25.600 t

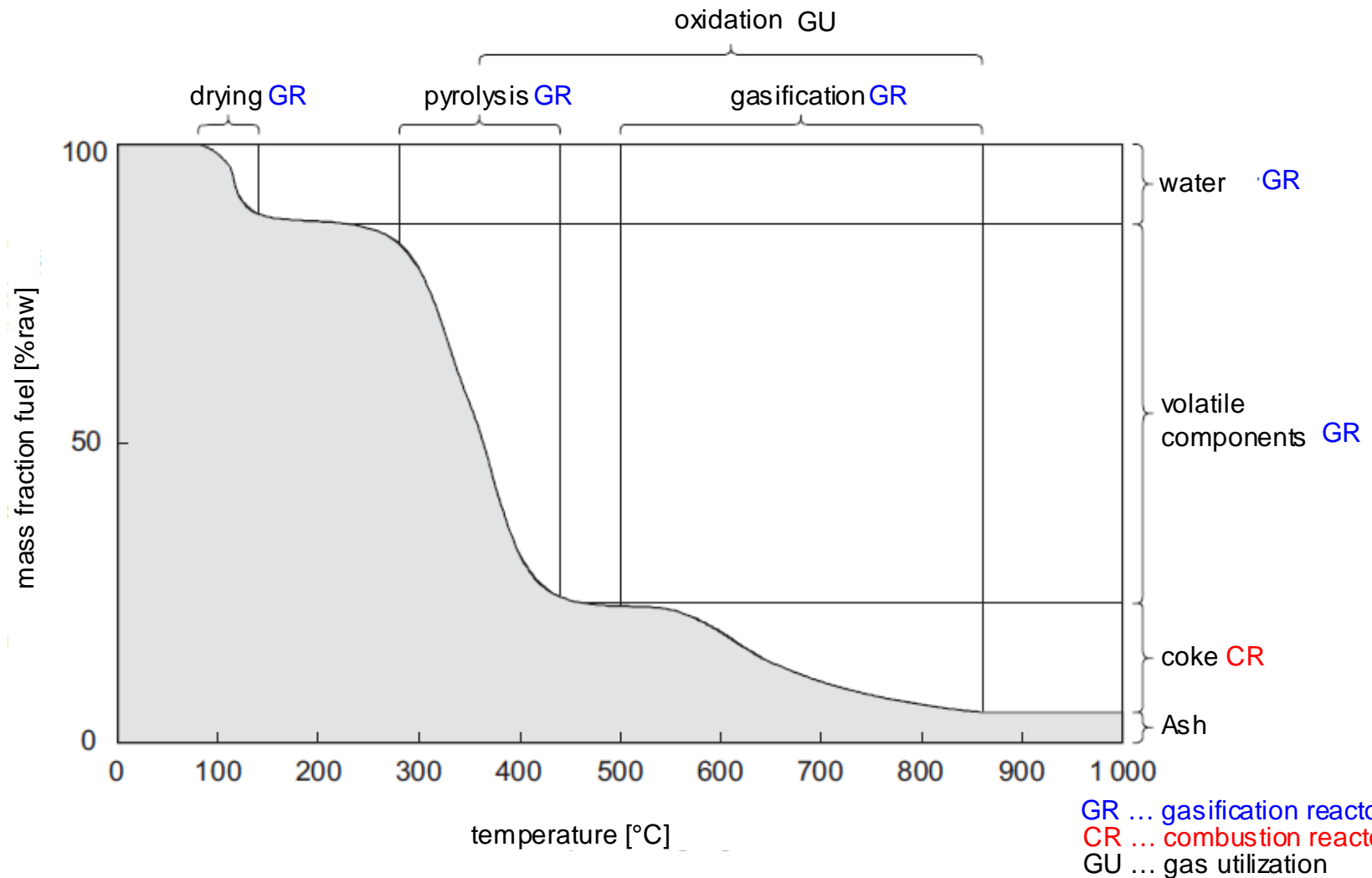


Austria



Progress

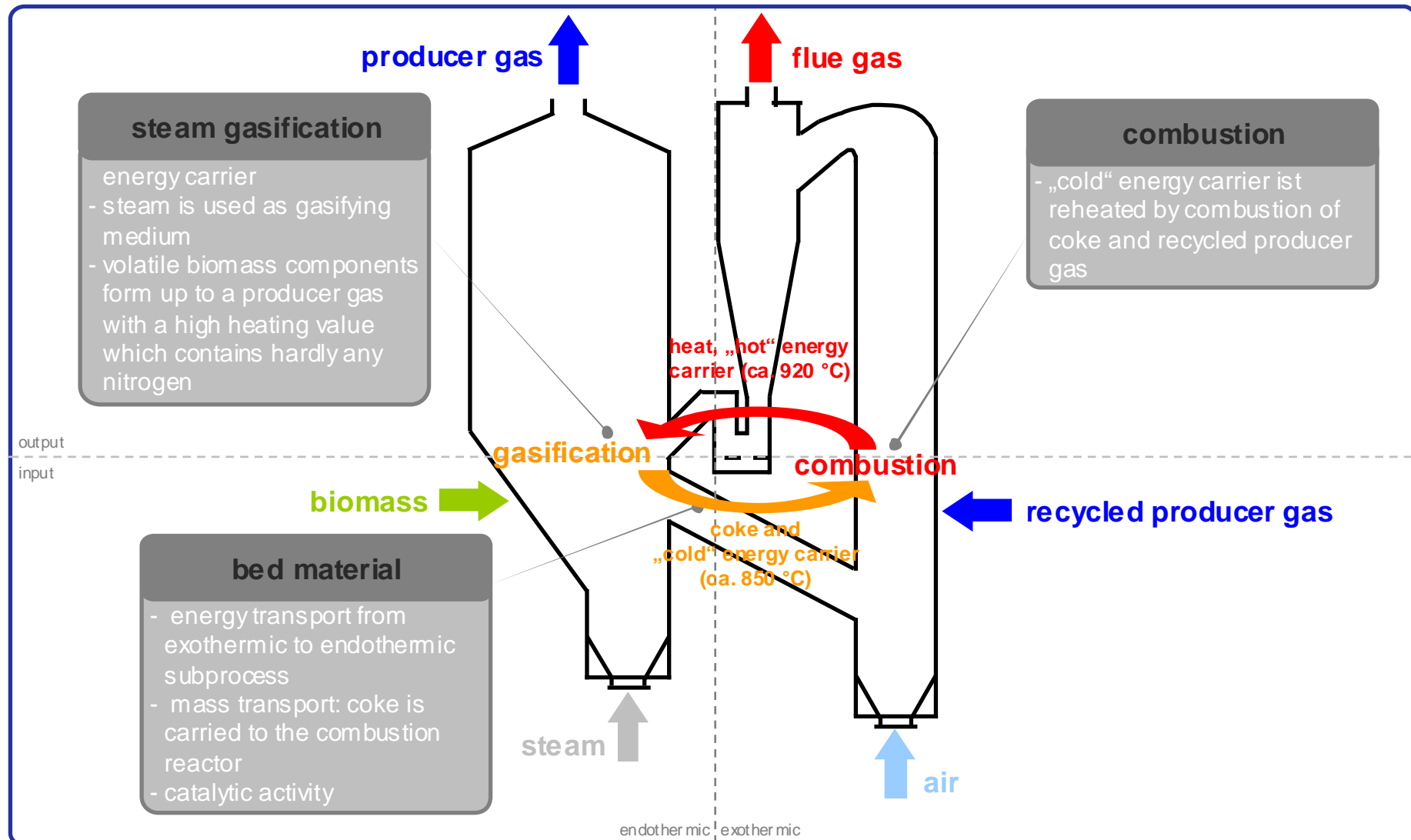
Thermochemical Conversion - Gasification





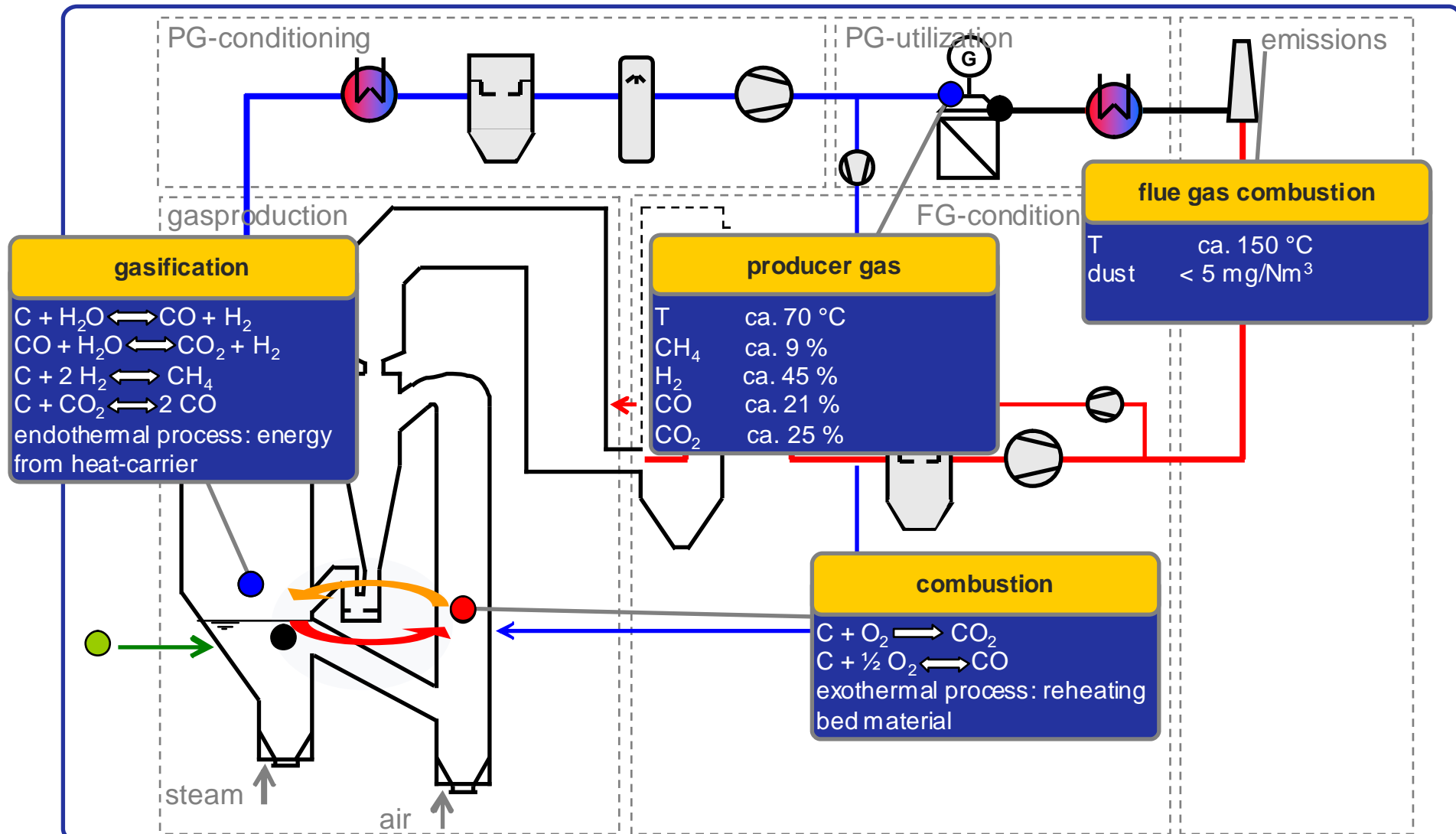
Dual Fluidized Bed Steam Gasification

Process Engineering Basics



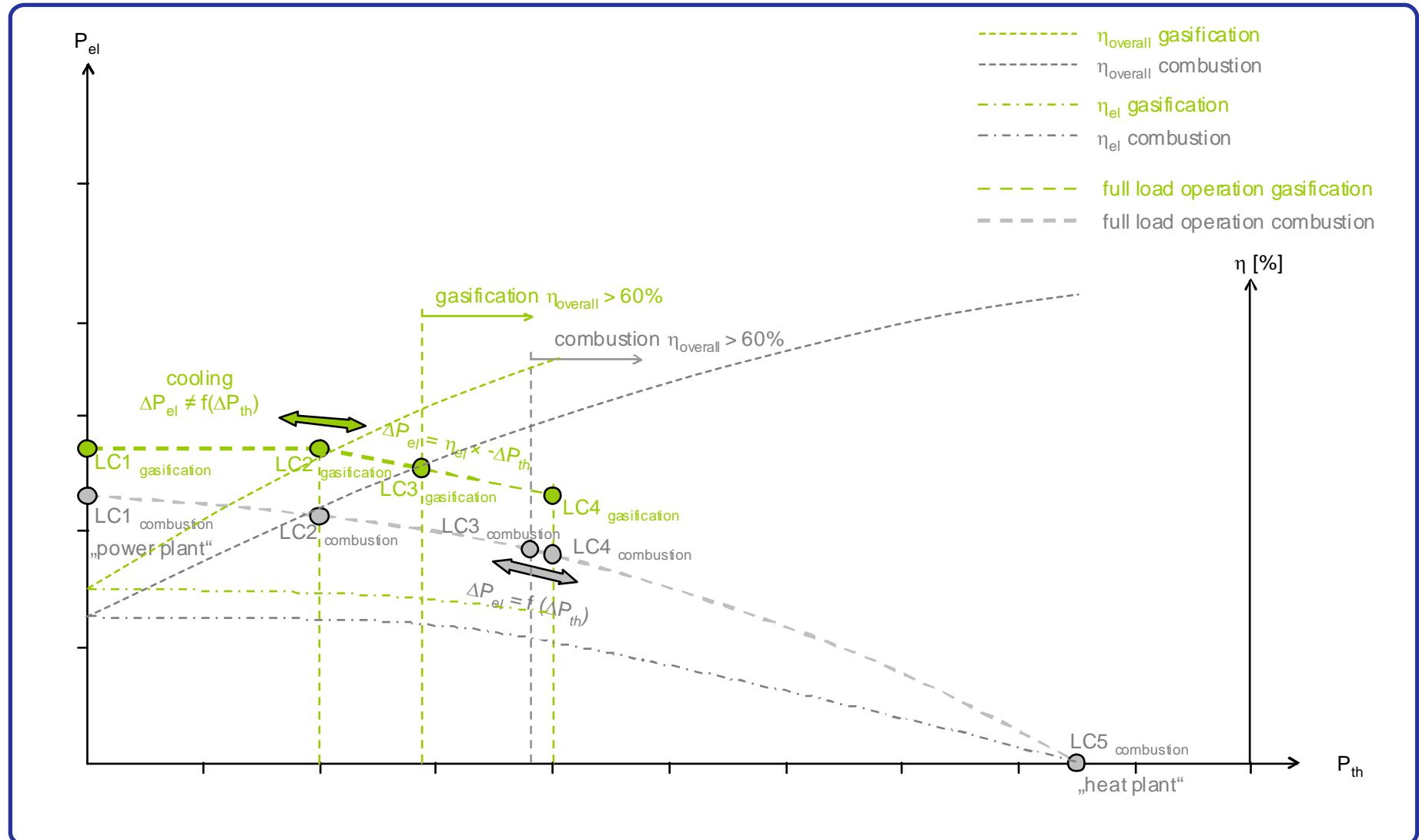
Basic Design

Basic Process and main Components



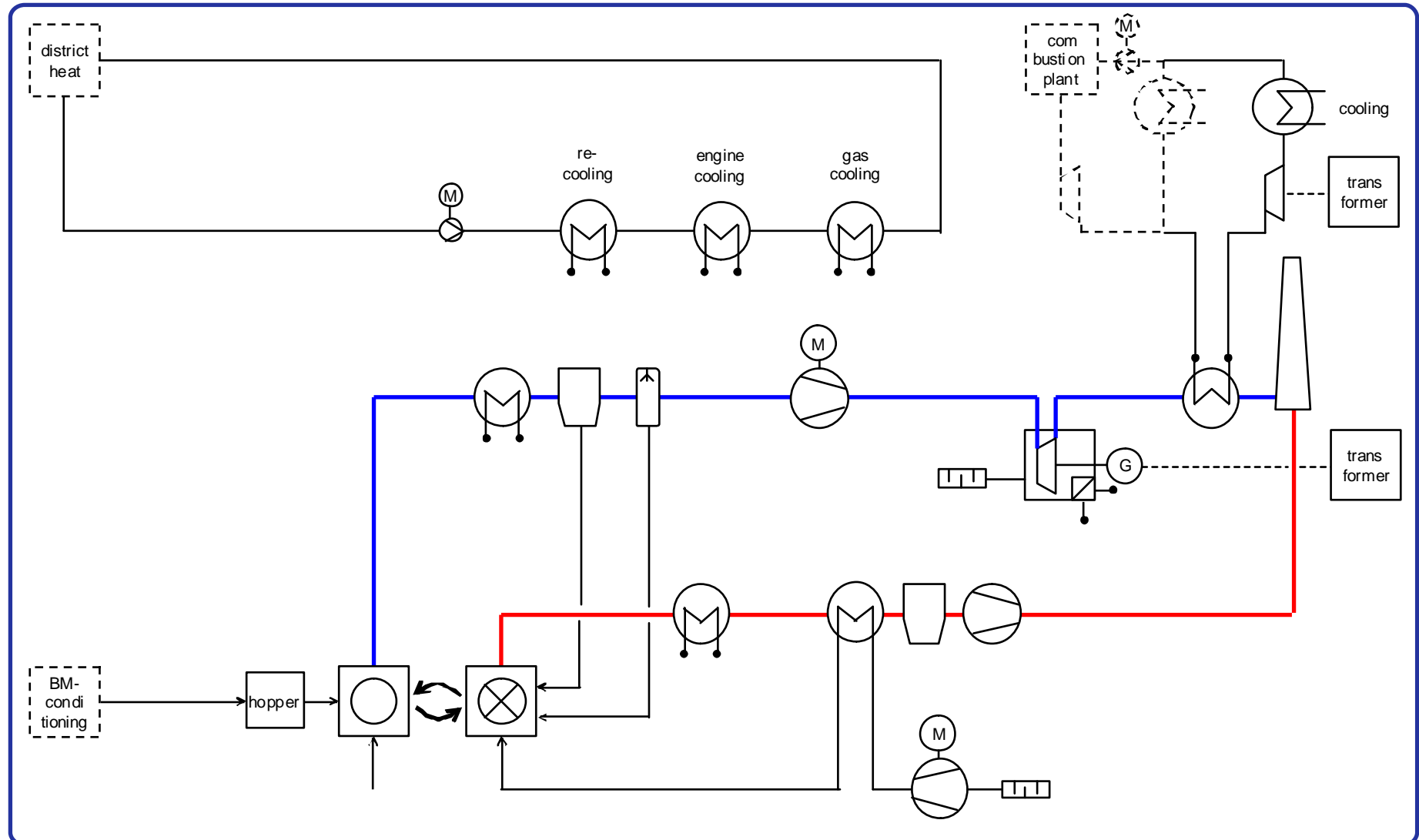
DFB Gasification vs Standard Combustion

Cogeneration Efficiency



Plant Design

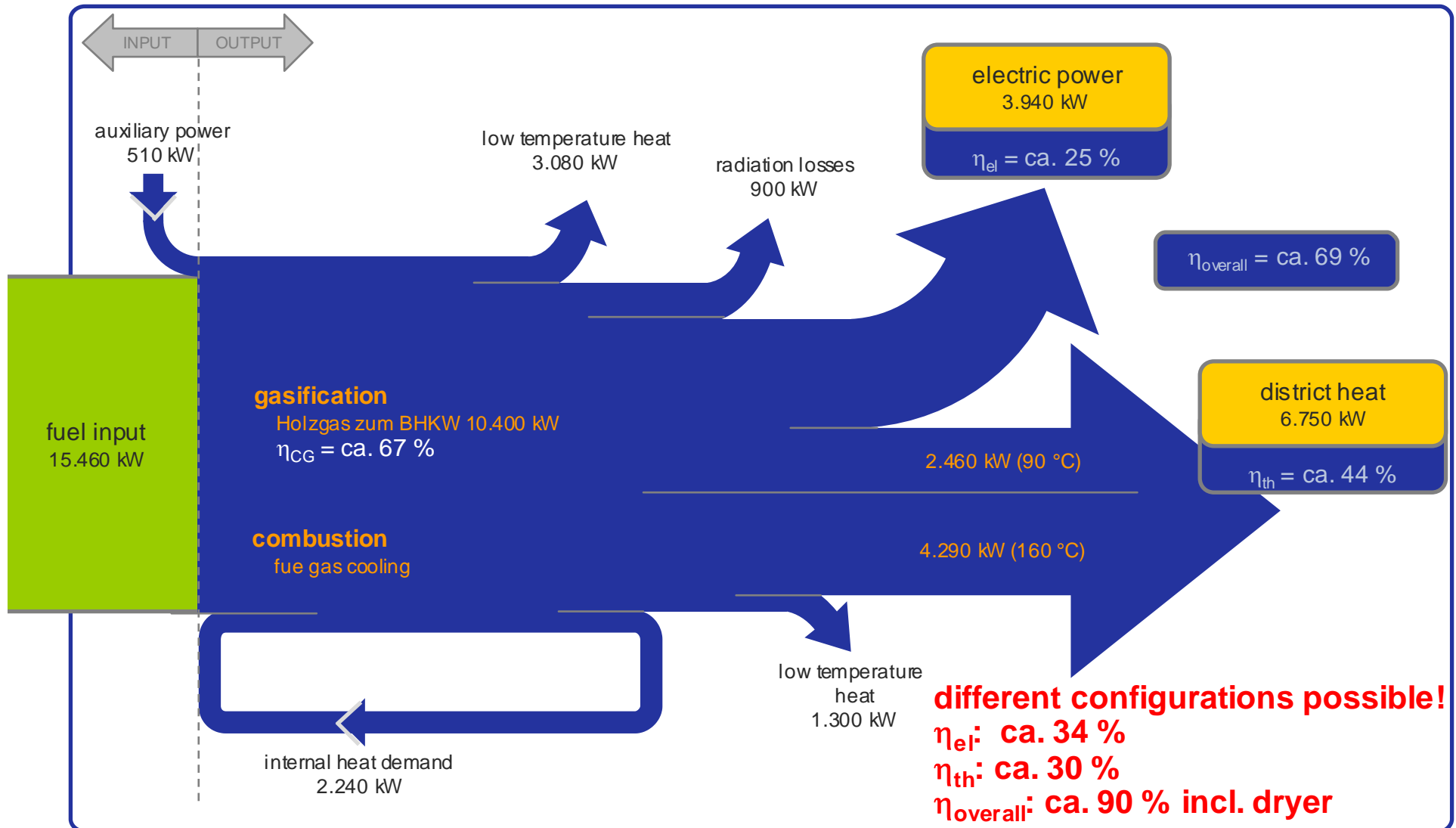
Combination Gasification and Combustion Plant





Energy Balance

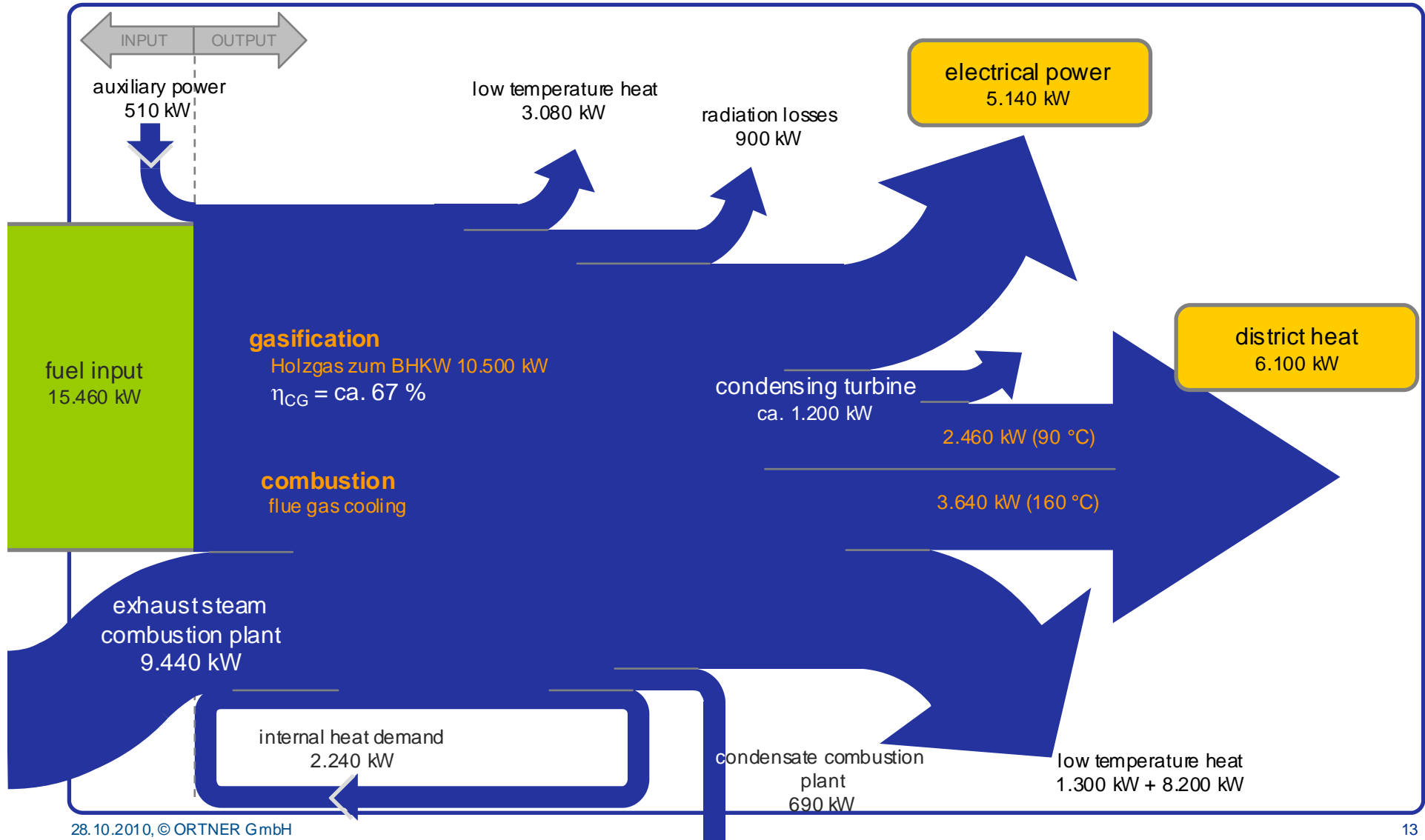
In- and Output





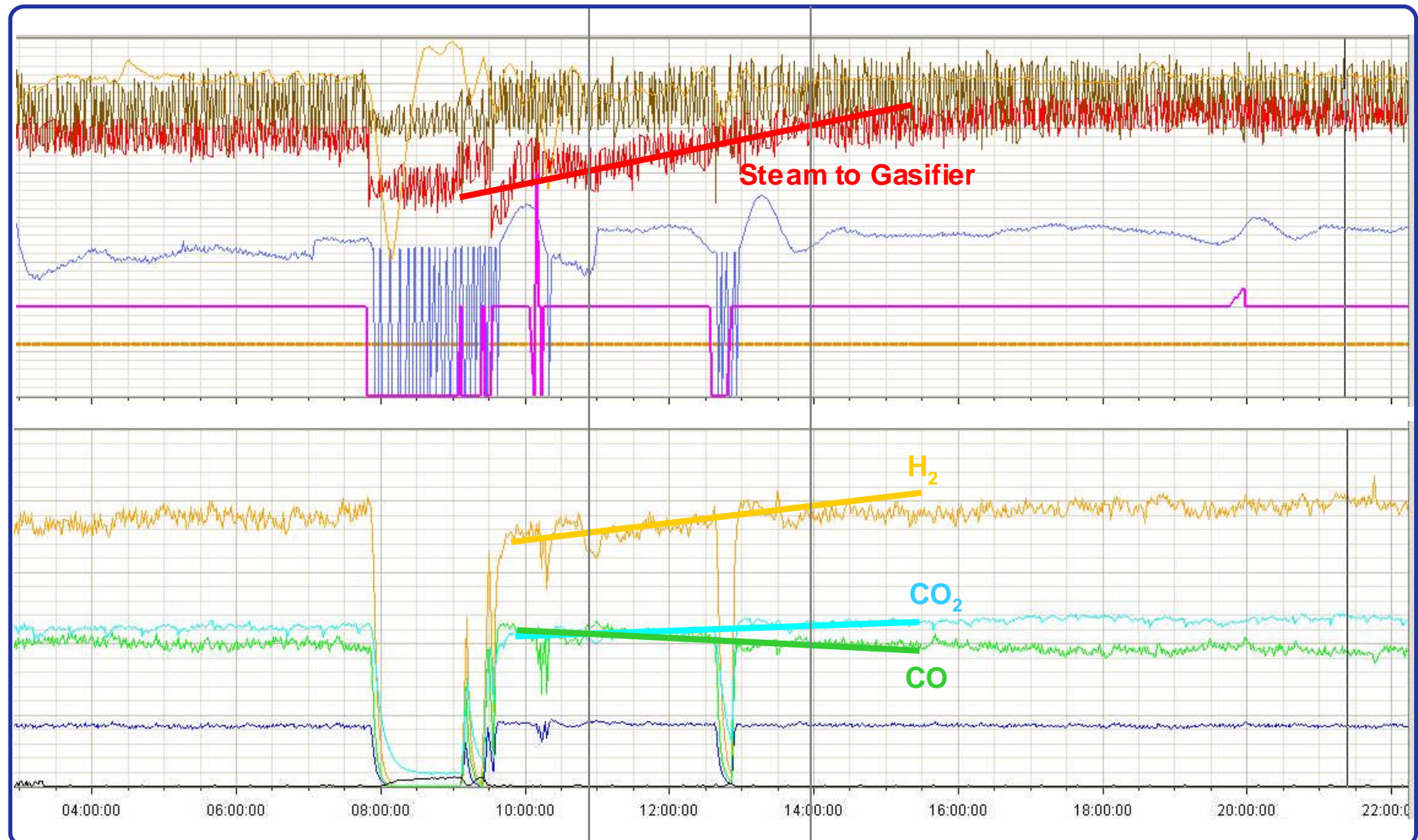
Energy Balance

In- und Output „Summer Operation“



Observation Example

Gasquality and Steam to Gasifier



Main Research Issues

Optimization of Fuel-, Process- and Product-Flexibility



- reactor geometry – cold flow model
- gas engine optimization for CHP
- optimization of operation costs and flexibility
- alternative energy-carrier-material
- SNG-module/polygeneration
- RDF-gasification

