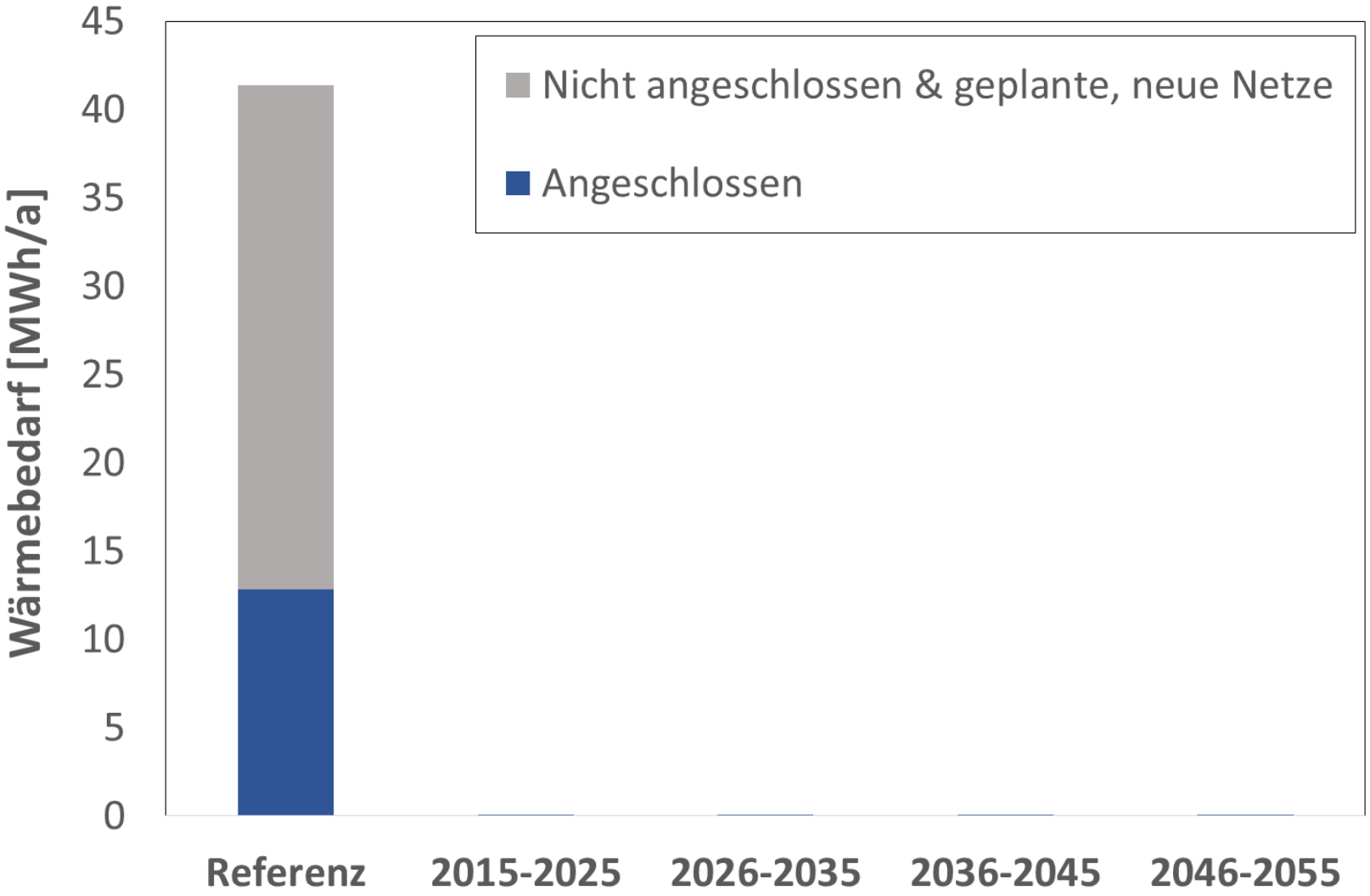
Lucerne University of
Applied Sciences and Arts
HOCHSCHULE
LUZERN
Technik & Architektur

Dynamische Prozess-Simulation neue Energiezentrale Baden-Dättwil

Schweizer ORC-Symposium 2018

Adrian Rettig, Ulf Christian Müller

KSB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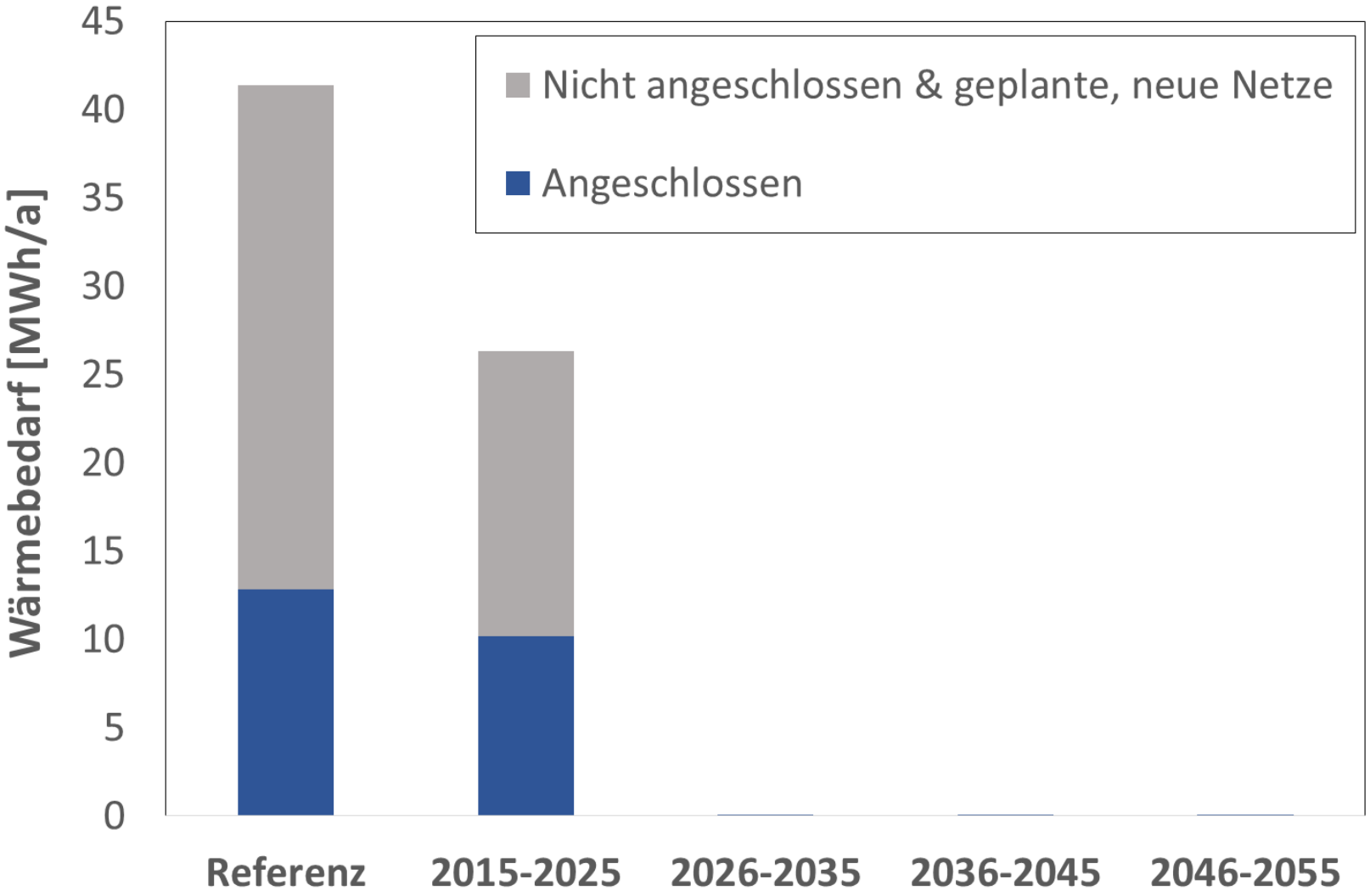
45
40
35
30
25
20
15
10
5
0
Nicht angeschlossen & geplante, neue Netze
Angeschlossen
Referenz
2015-2025
2026-2035
2036-2045
2046-2055


Wärmebedarf [MWh/a]
45
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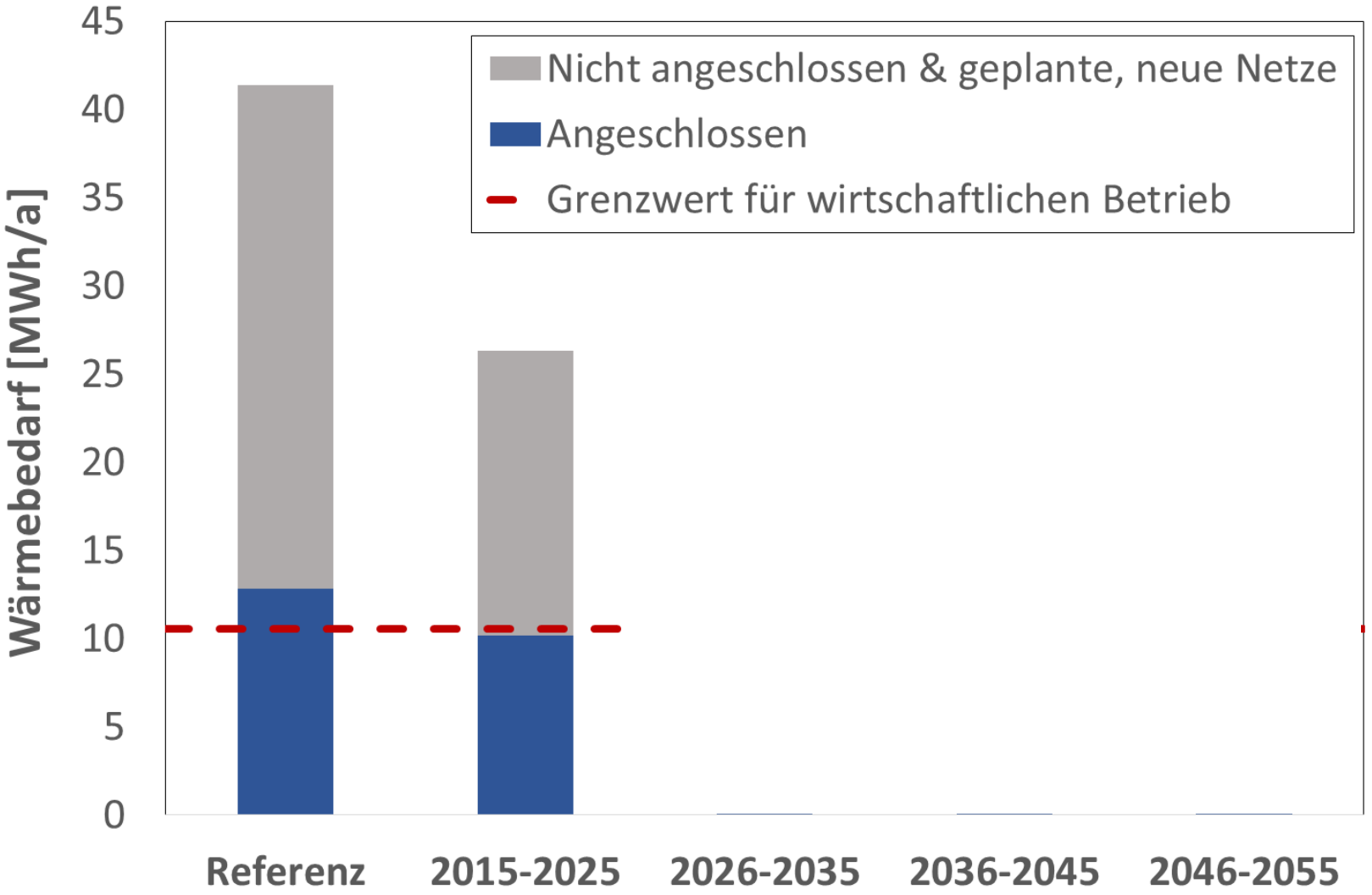
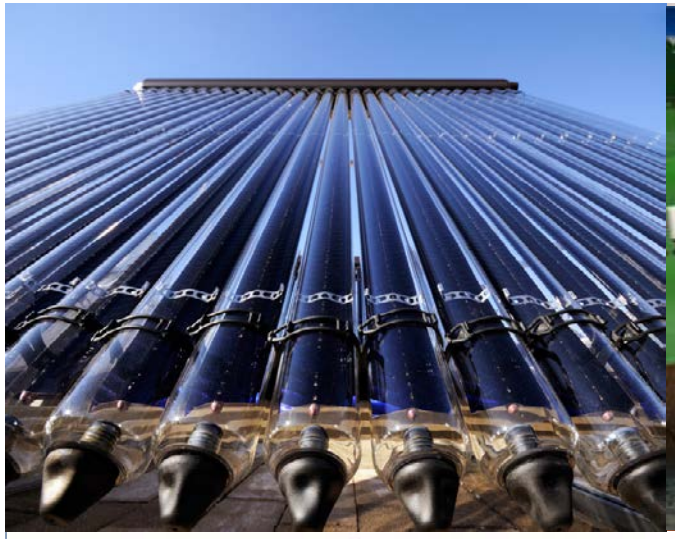
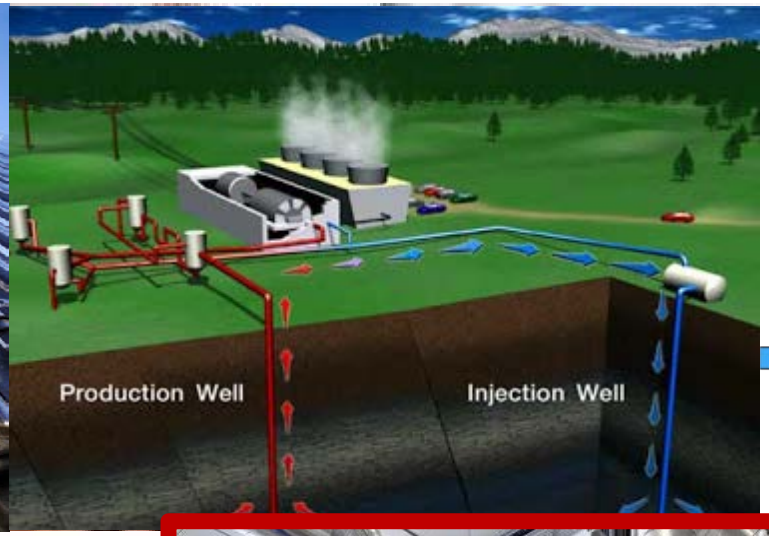
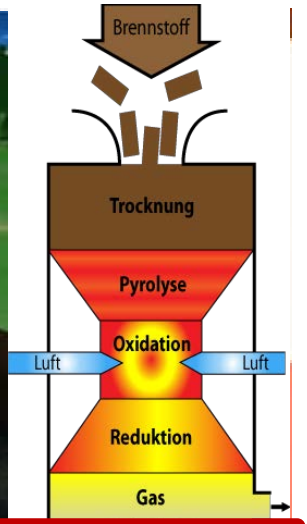

Wärmebedarf [MWh/a]
45
40
35
30
25
20
15
10
5
0
Nicht angeschlossen & geplante, neue Netze
Angeschlossen
Grenzwert für wirtschaftlichen Betrieb
Referenz
2015-2025
2026-2035
2036-2045
2046-2055

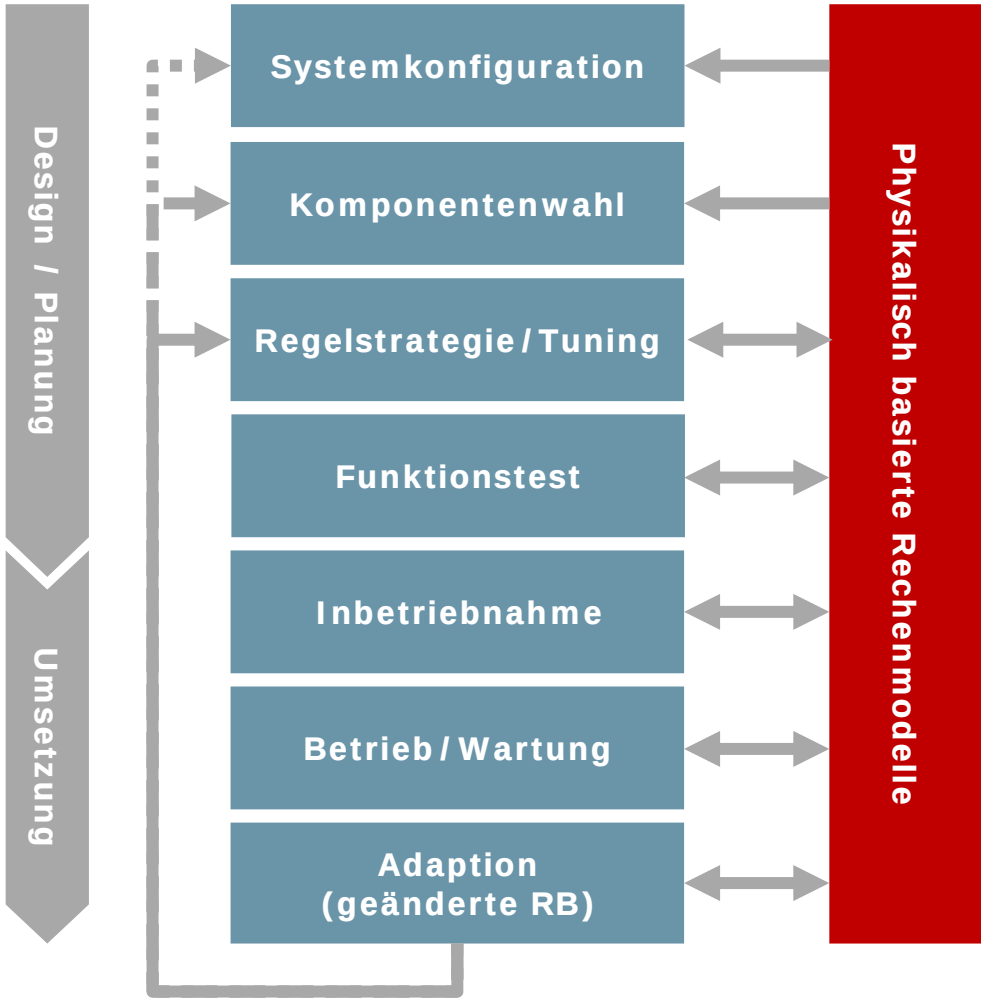



Production Well
Injection Well

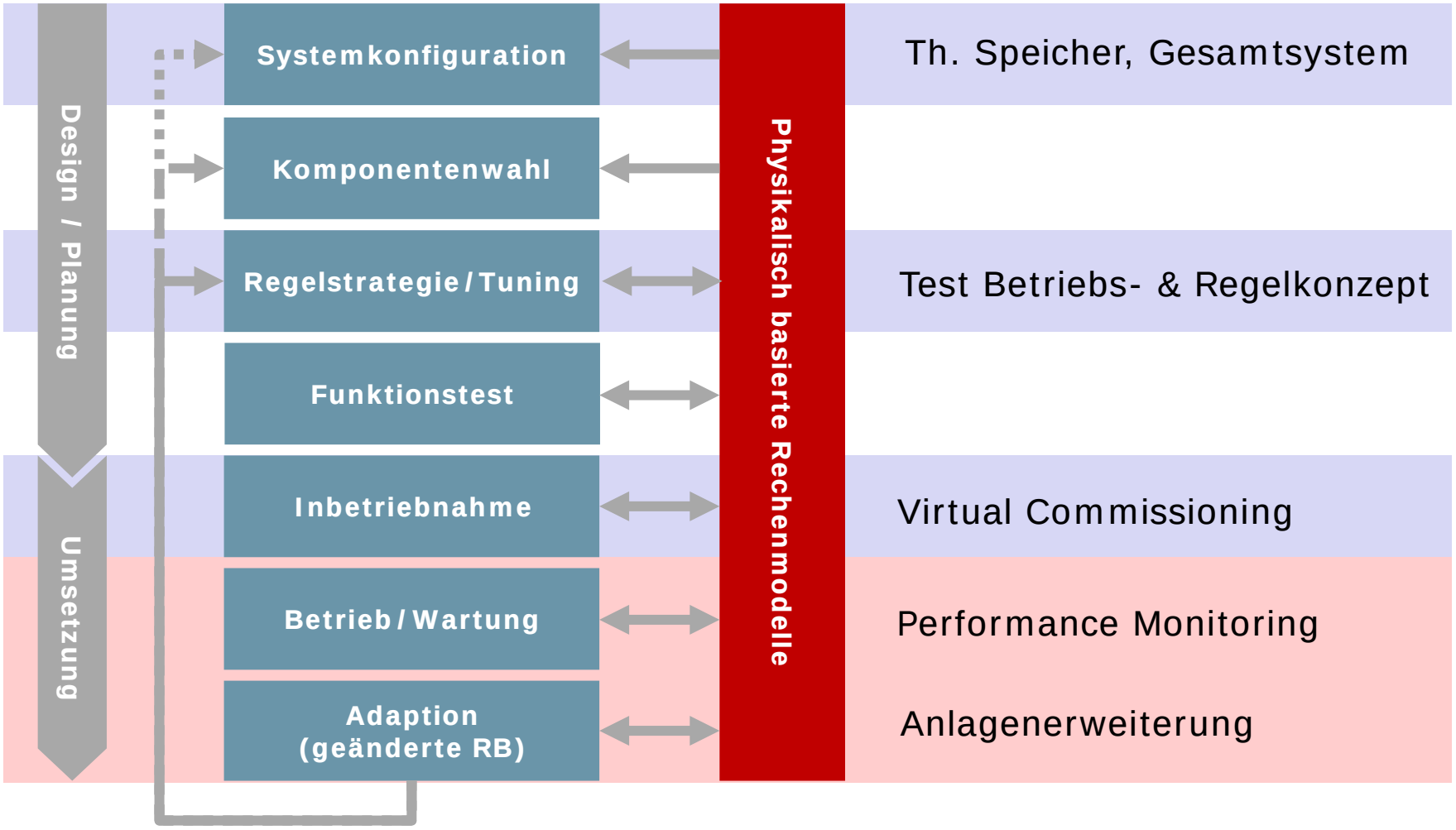

Brennstoff
Trocknung
Pyrolyse
Oxidation
Luft
Luft
Reduktion
Gas

Wozu dynamische Prozess-Simulationen?

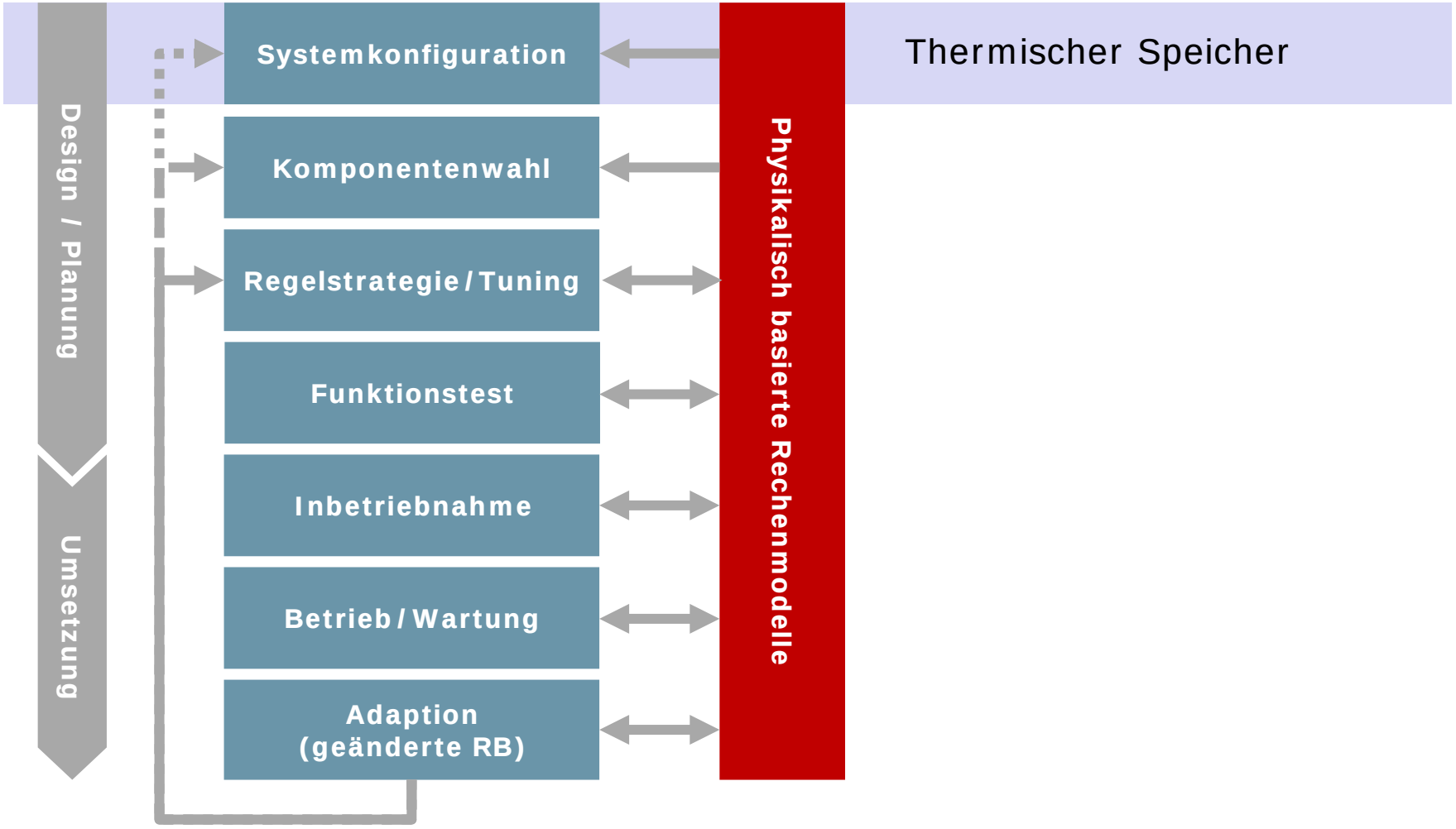
Einsatz der Simulationsumgebung



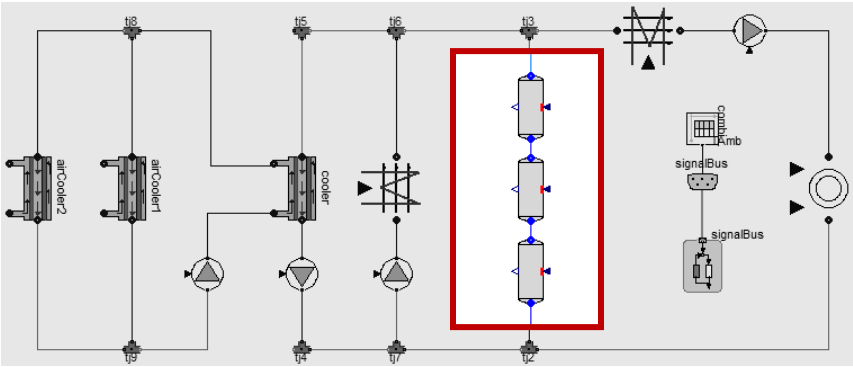
Einsatz der Simulationsumgebung

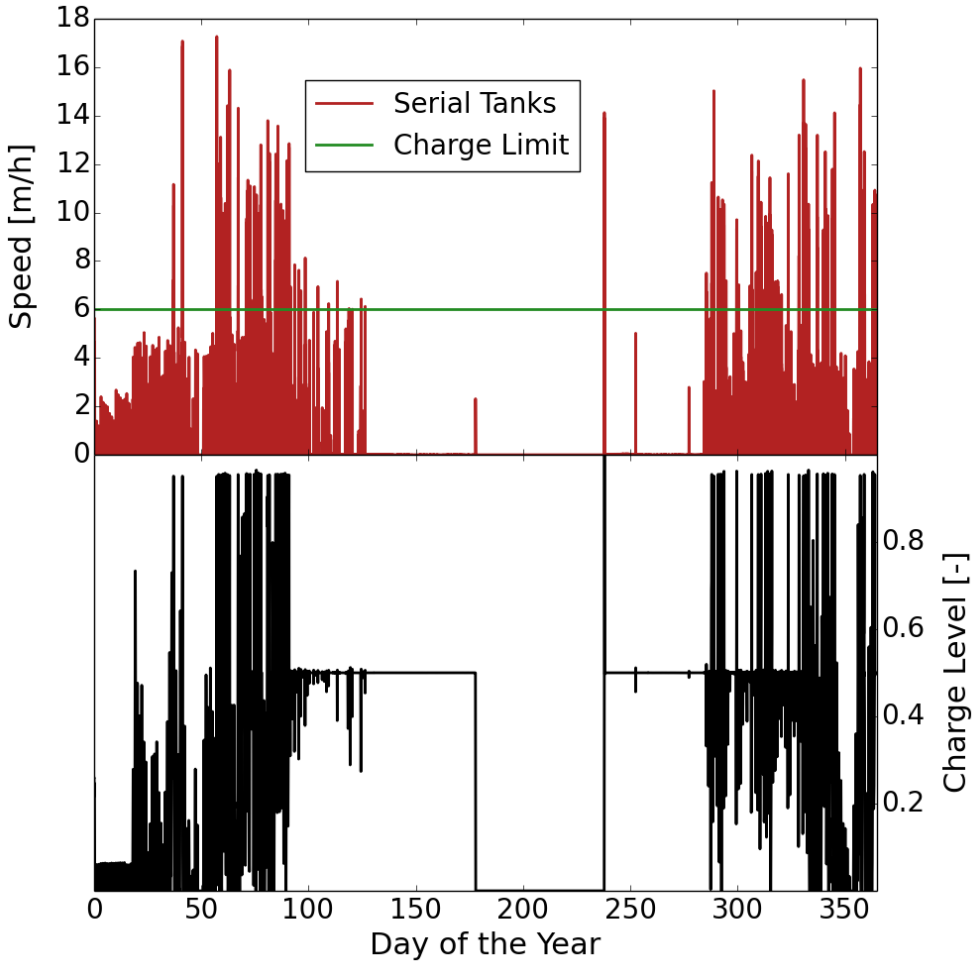


Einsatz der Simulationsumgebung

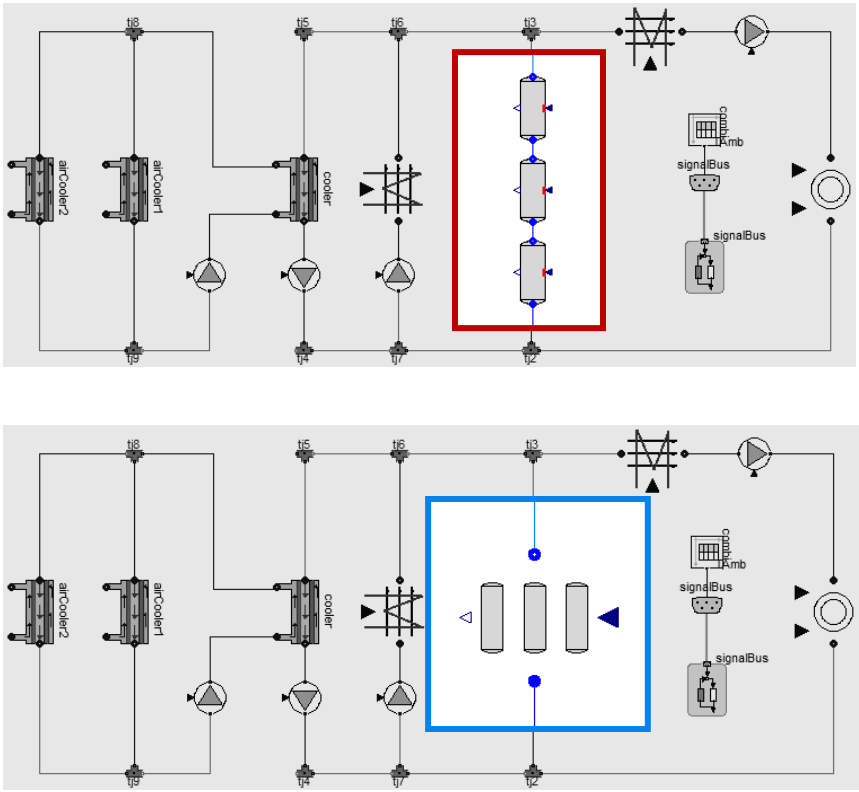


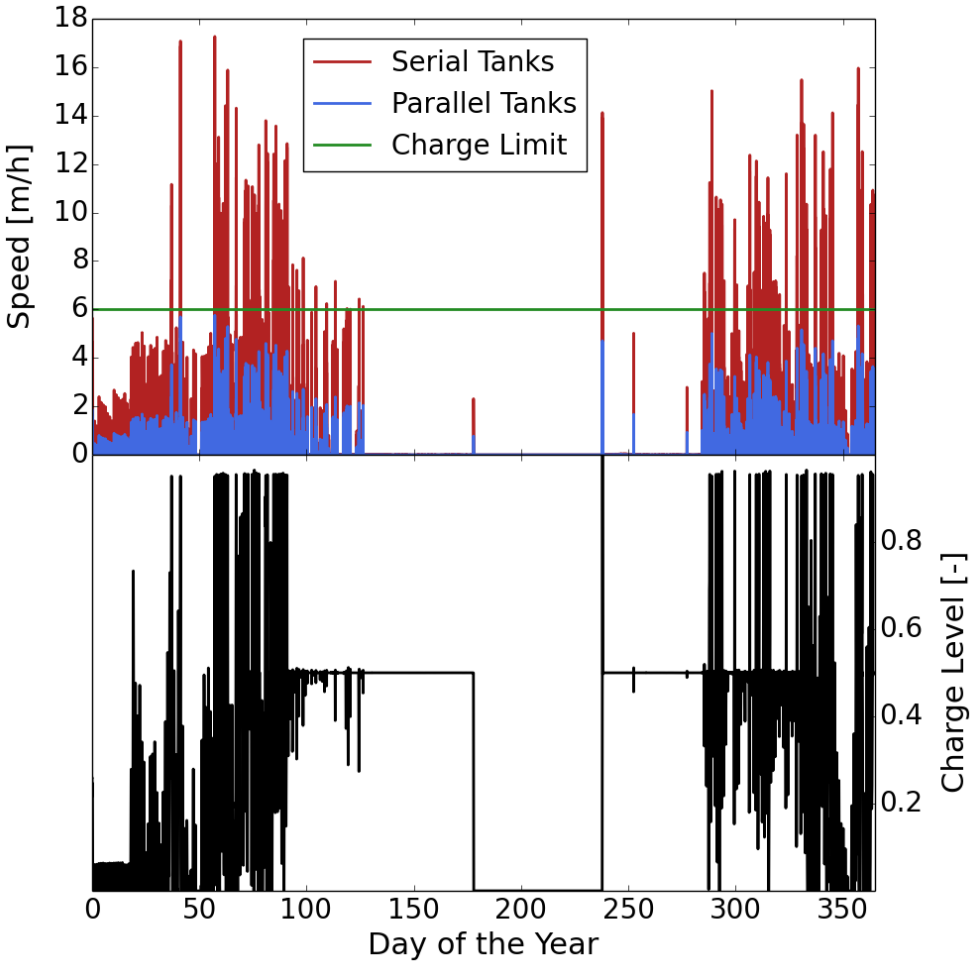
Therm. Speicher – Anordnung seriell vs. parallel



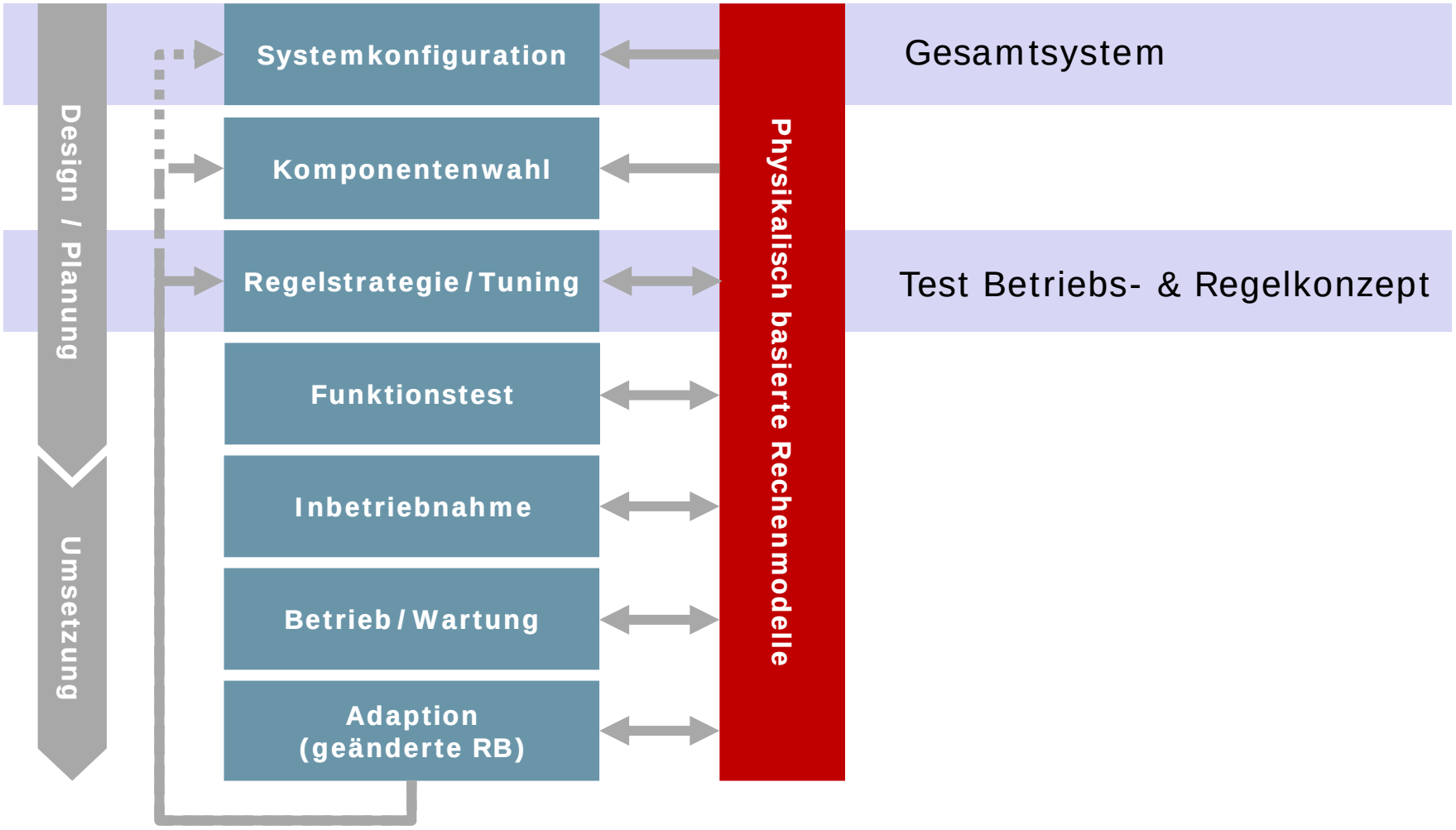


Therm. Speicher – Anordnung seriell vs. parallel

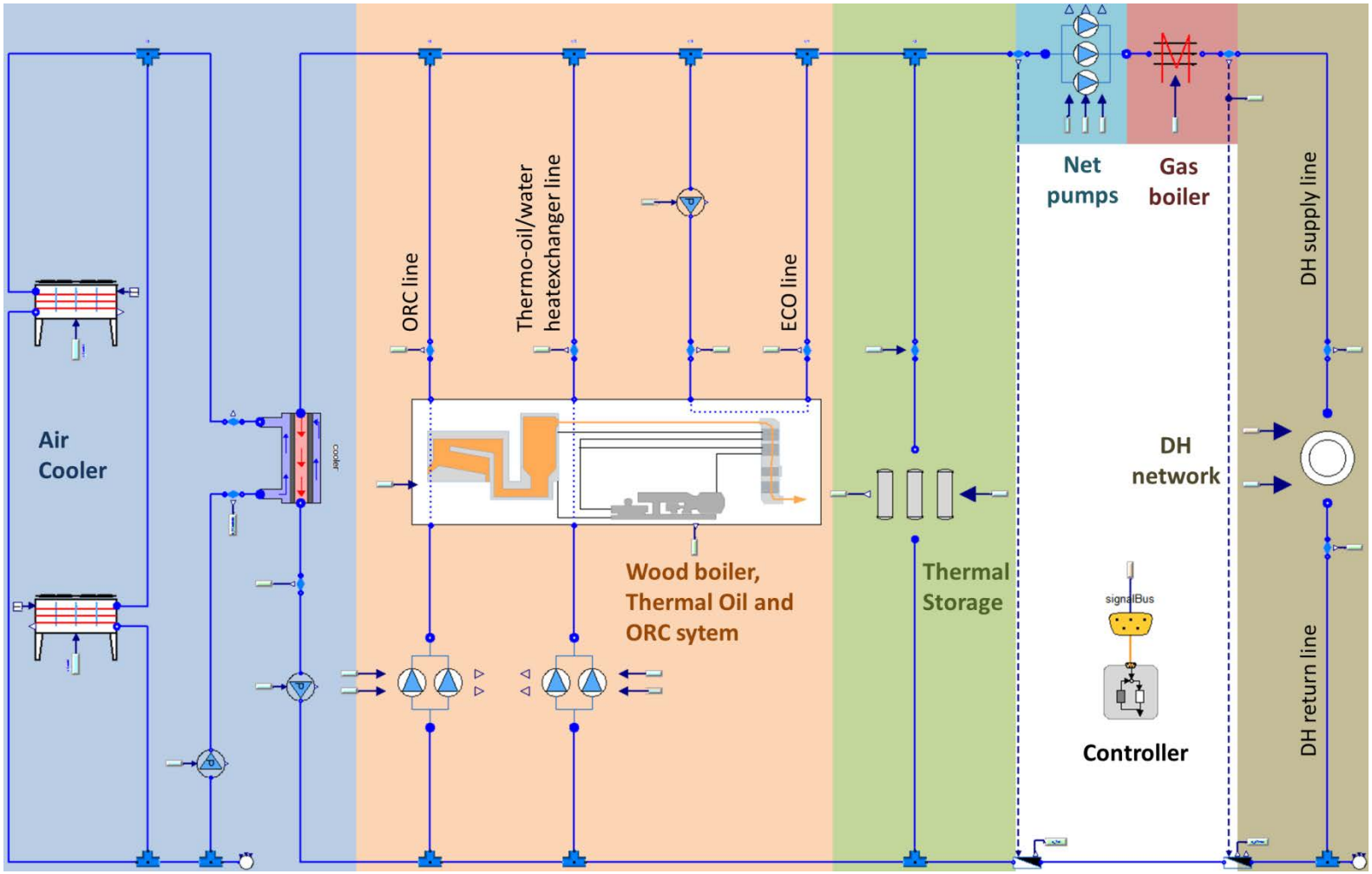




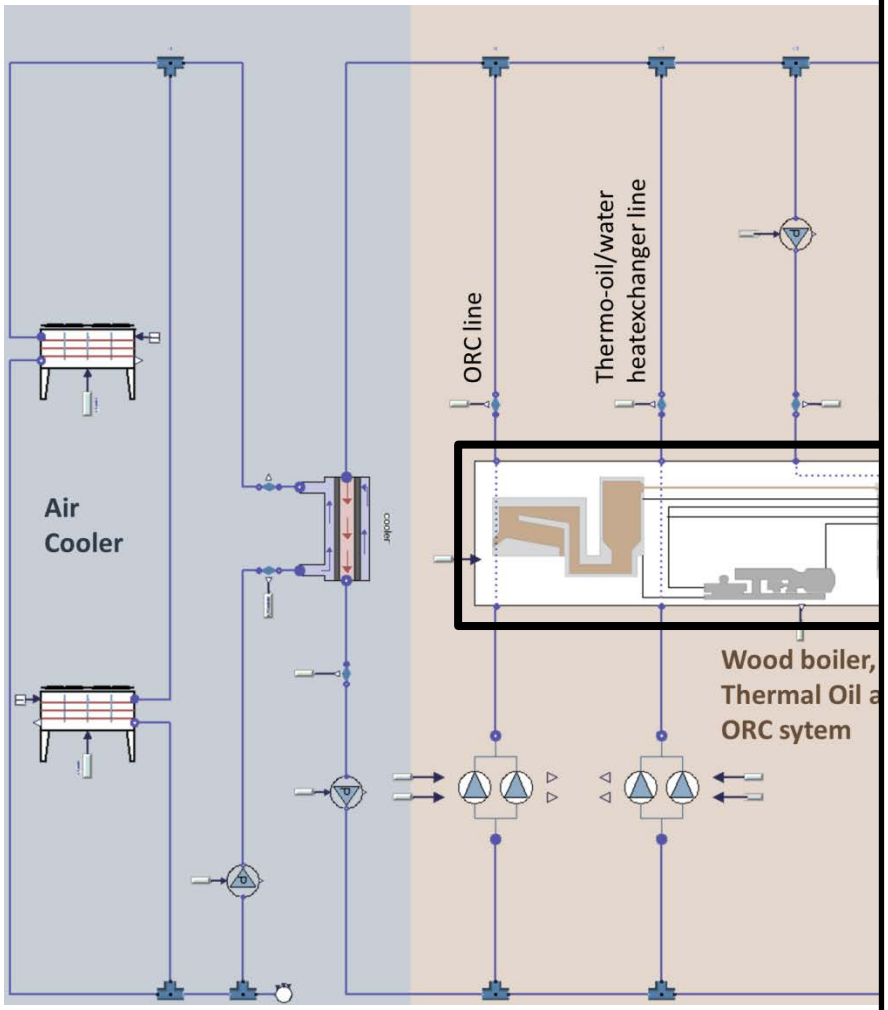
Einsatz der Simulationsumgebung

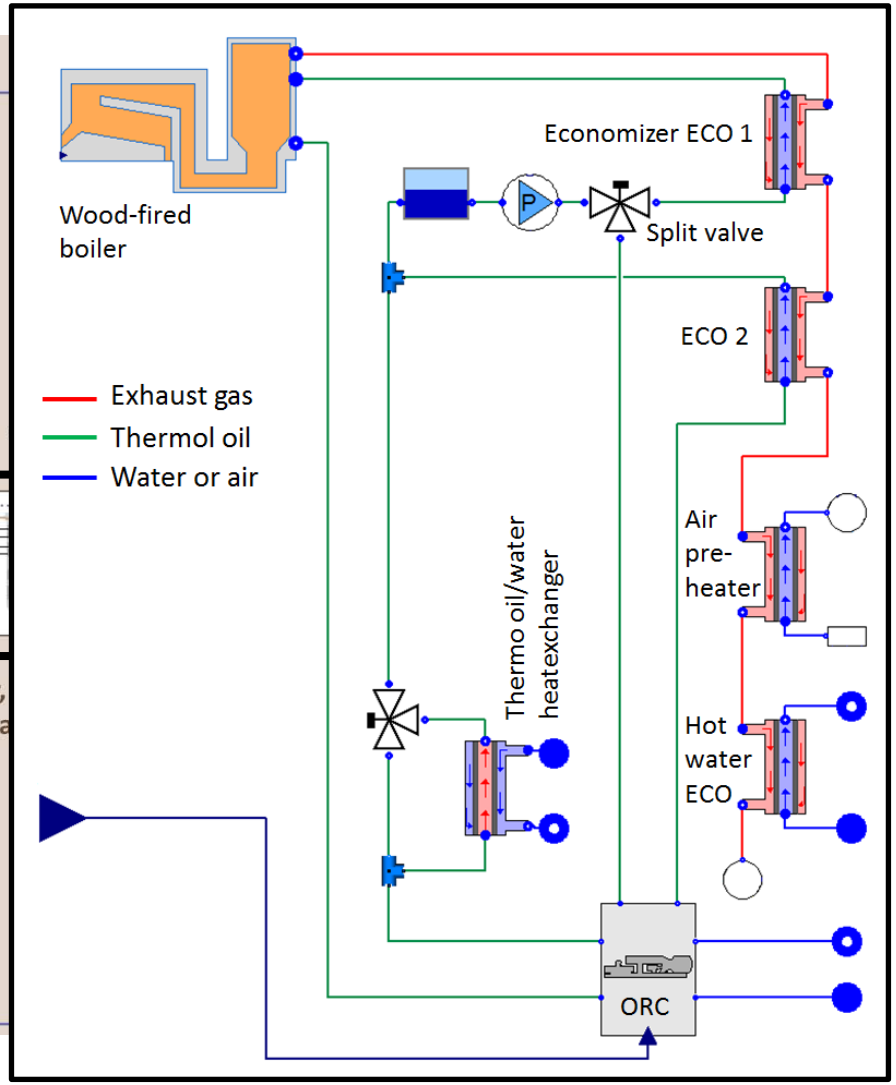


Gesamtsystem – Simulationsmodell

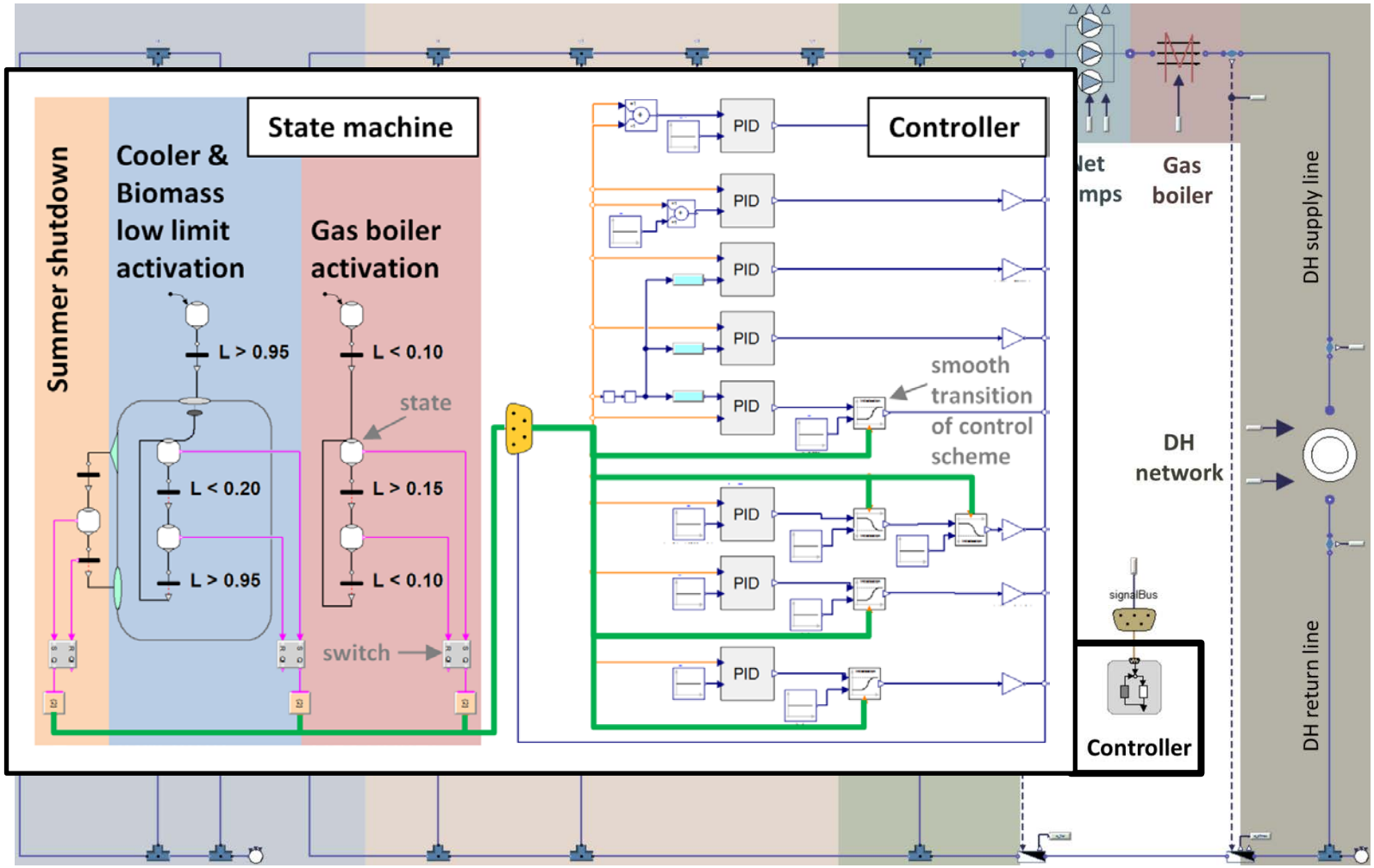


Gesamtsystem – Simulationsmodell

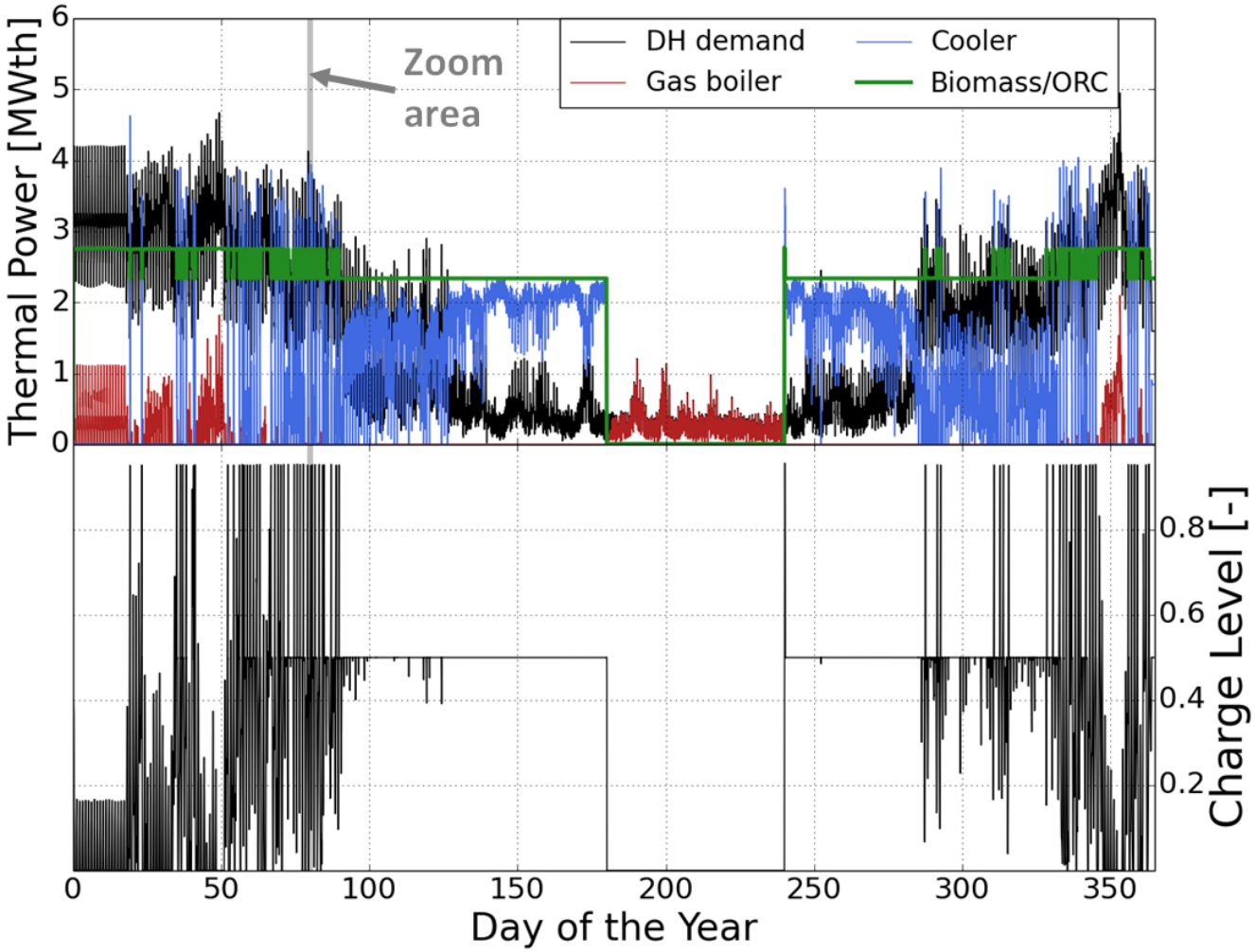




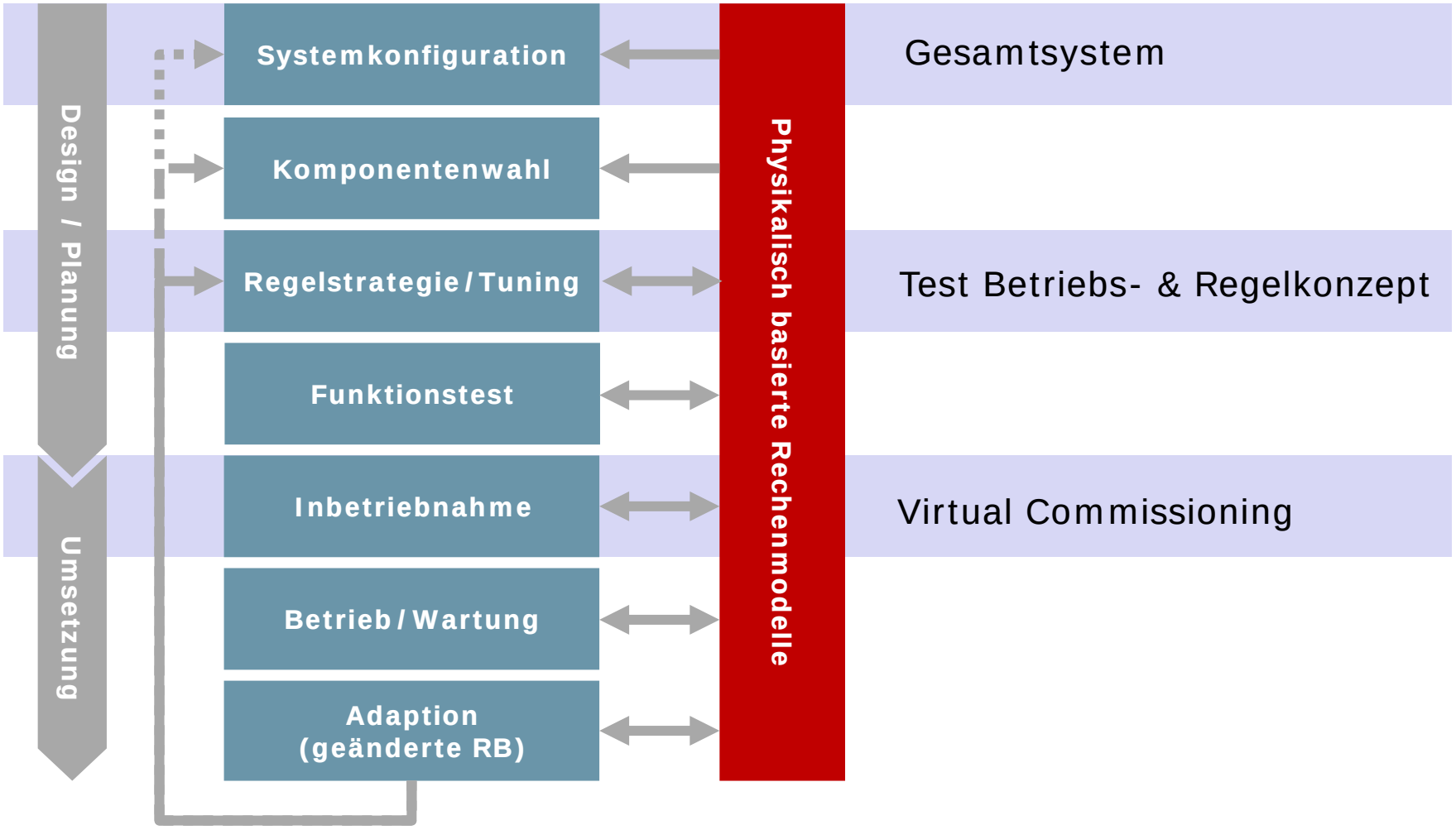
Gesamtsystem – Simulationsmodell



Test Betriebs- und Regelkonzept



Einsatz der Simulationsumgebung



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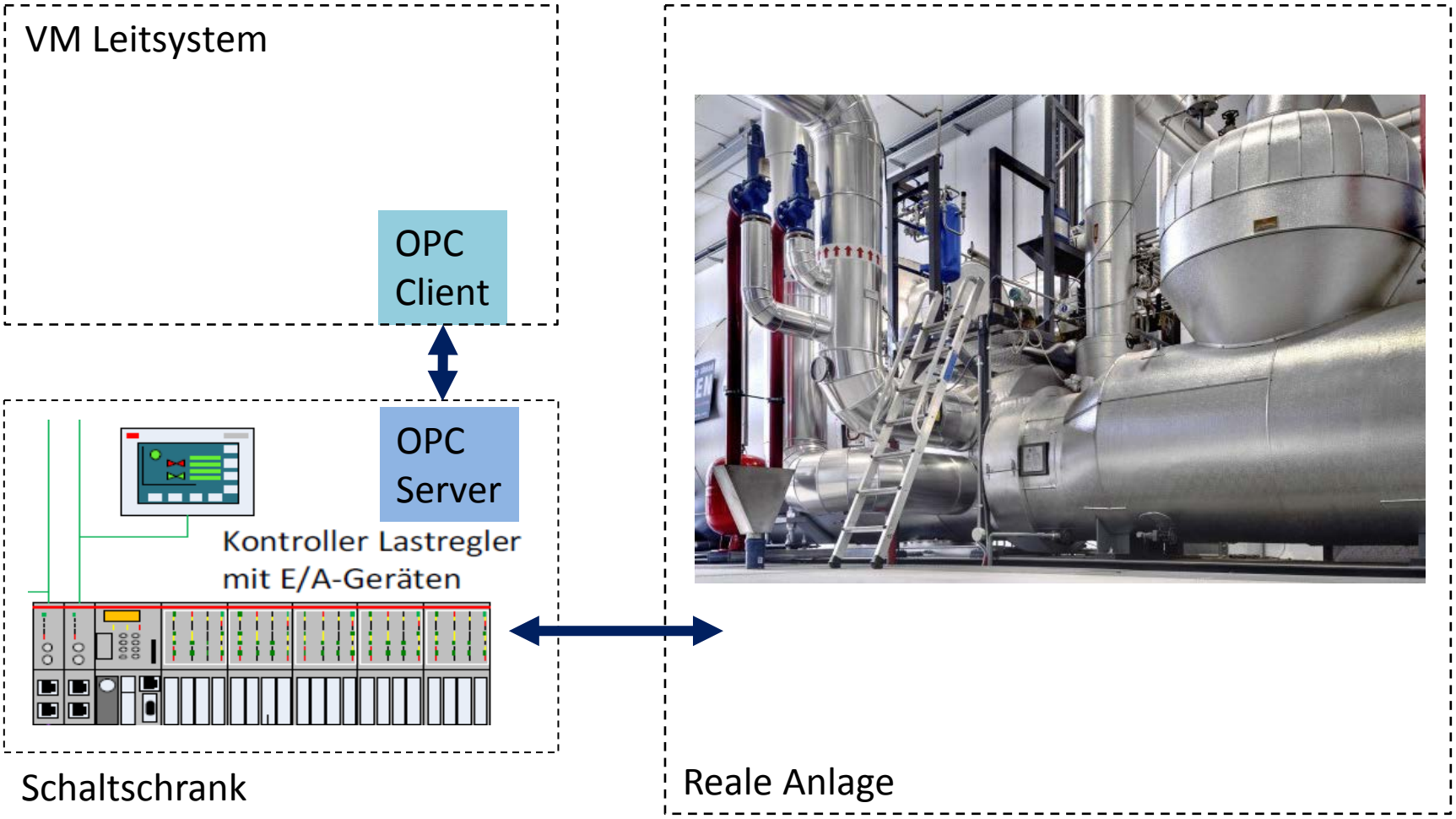

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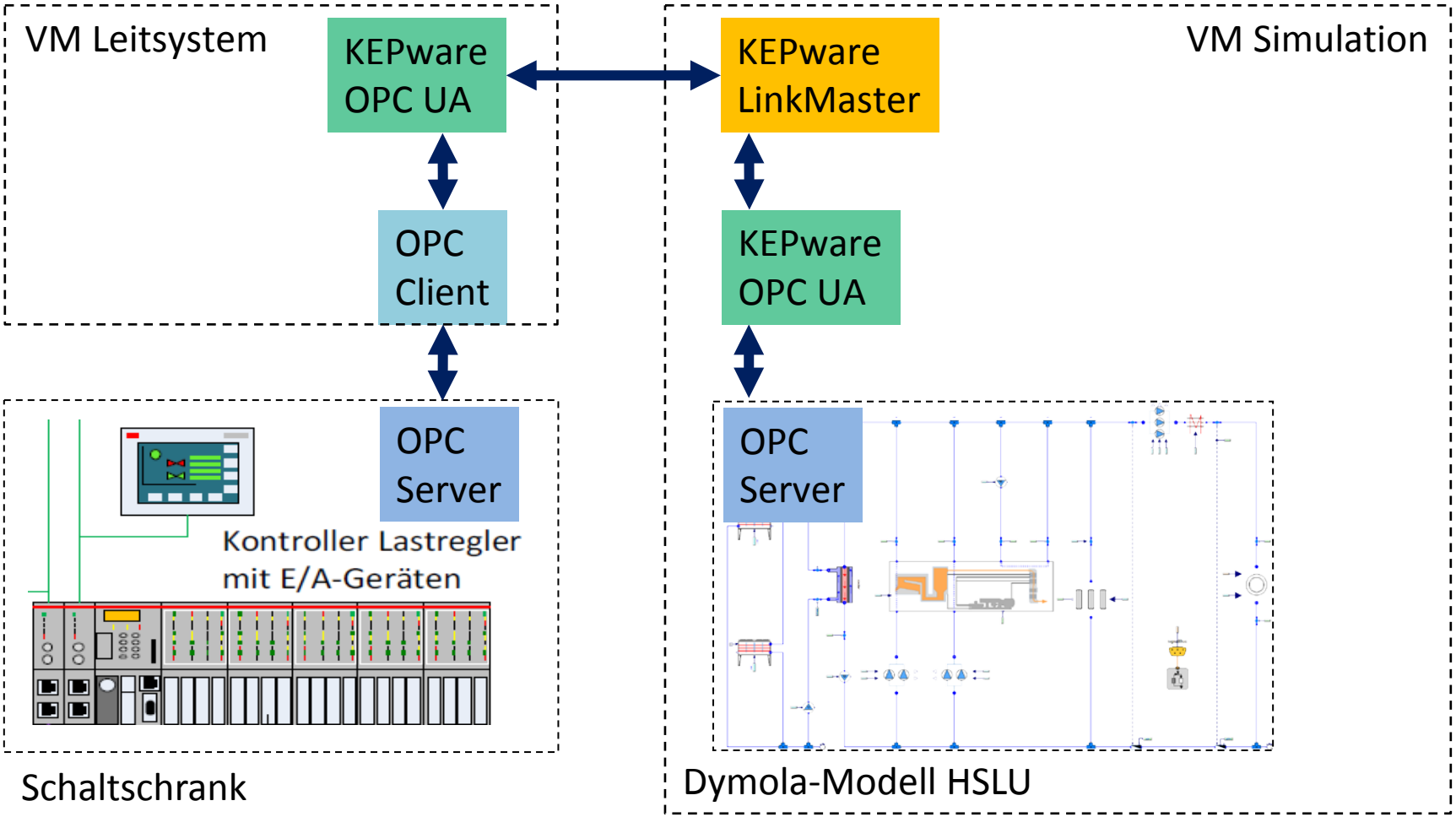

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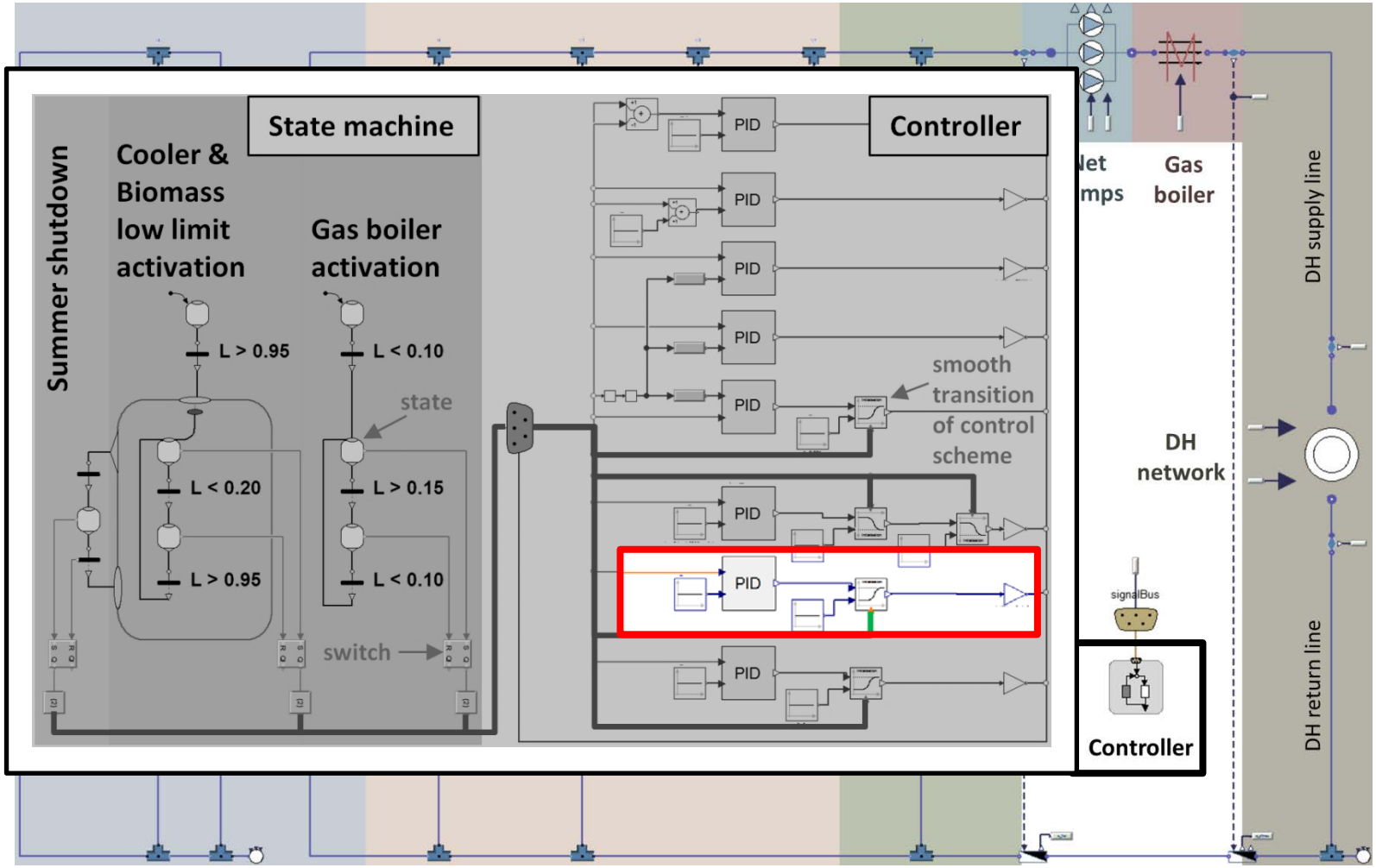

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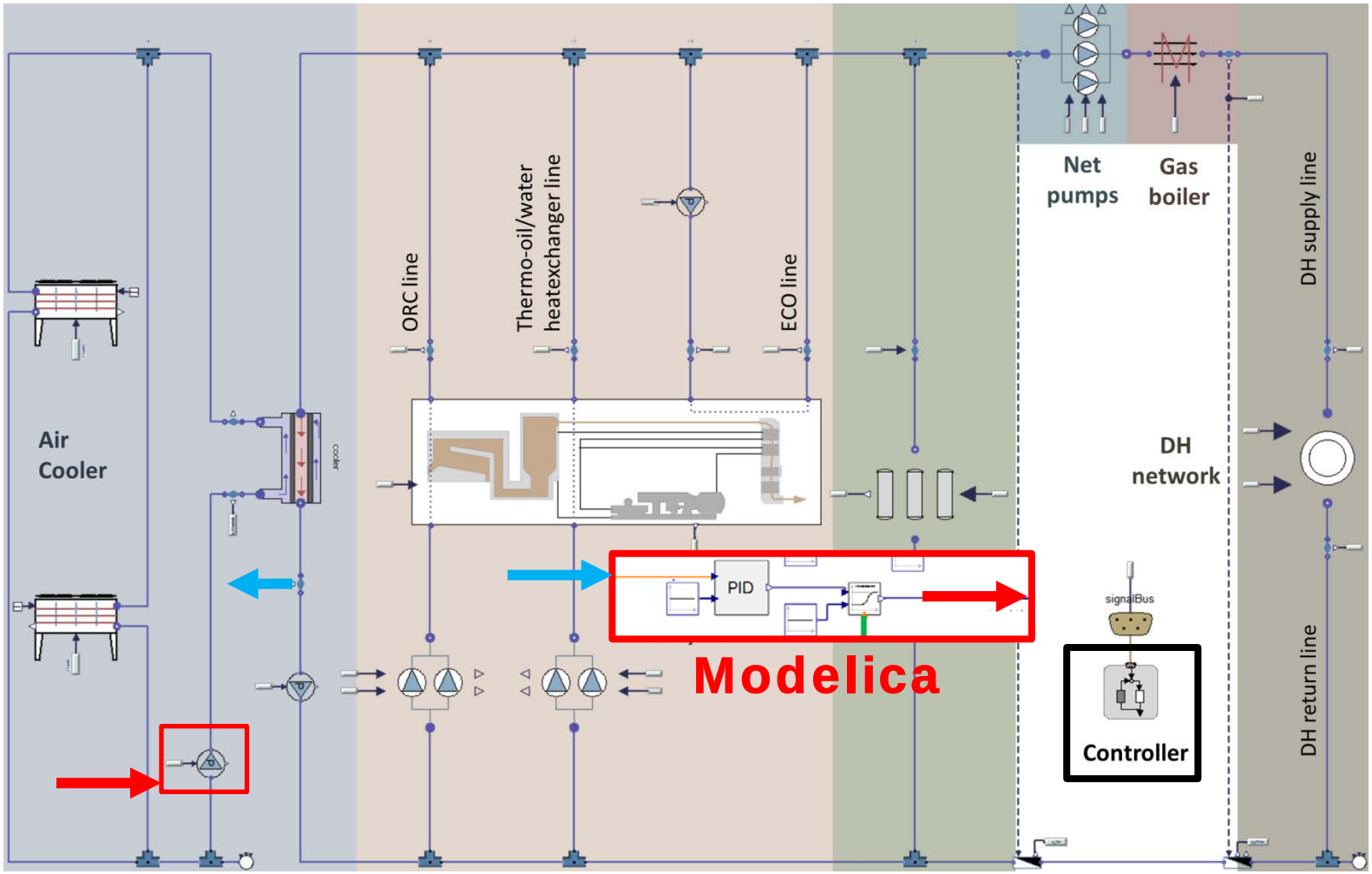

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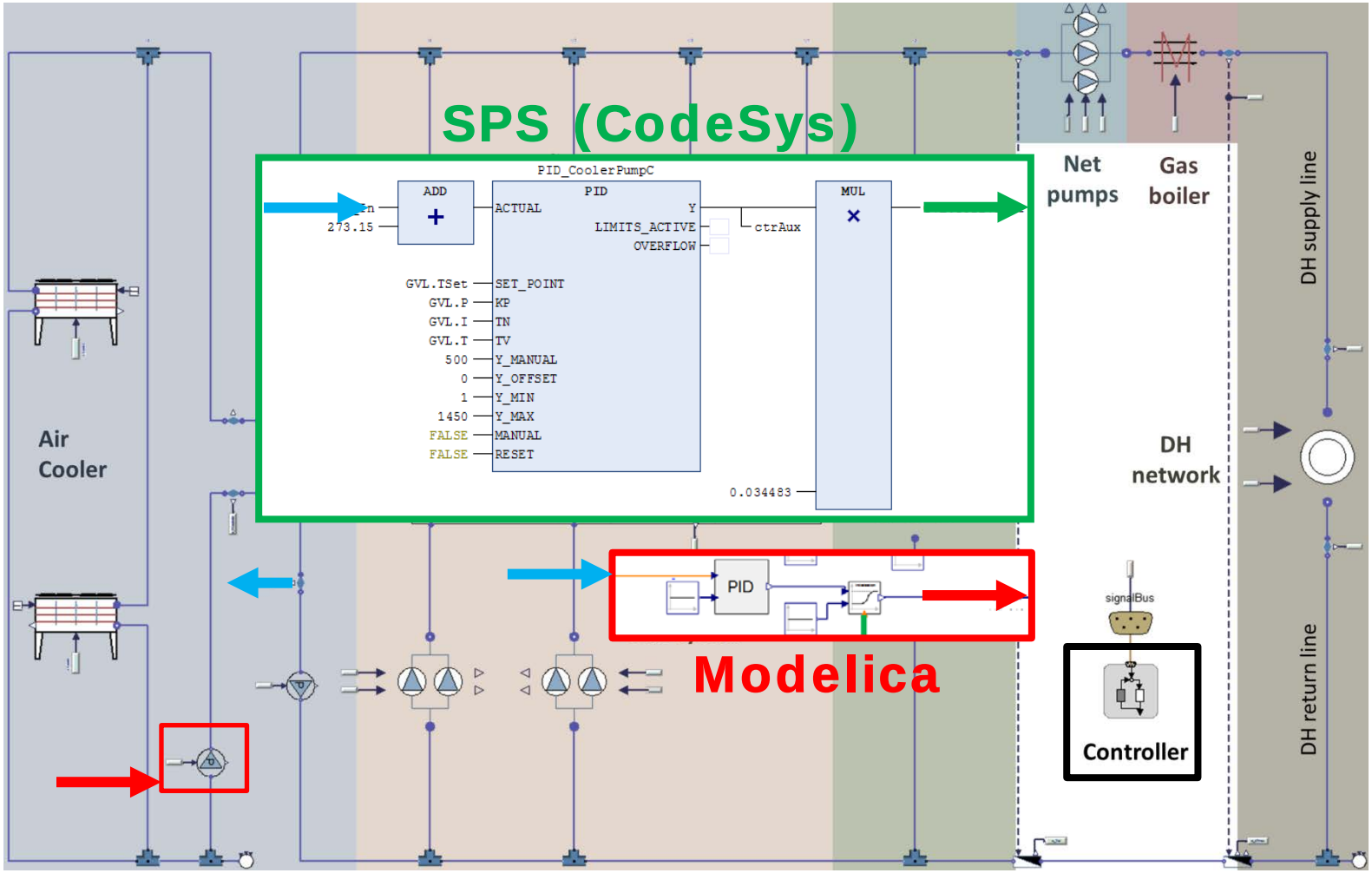

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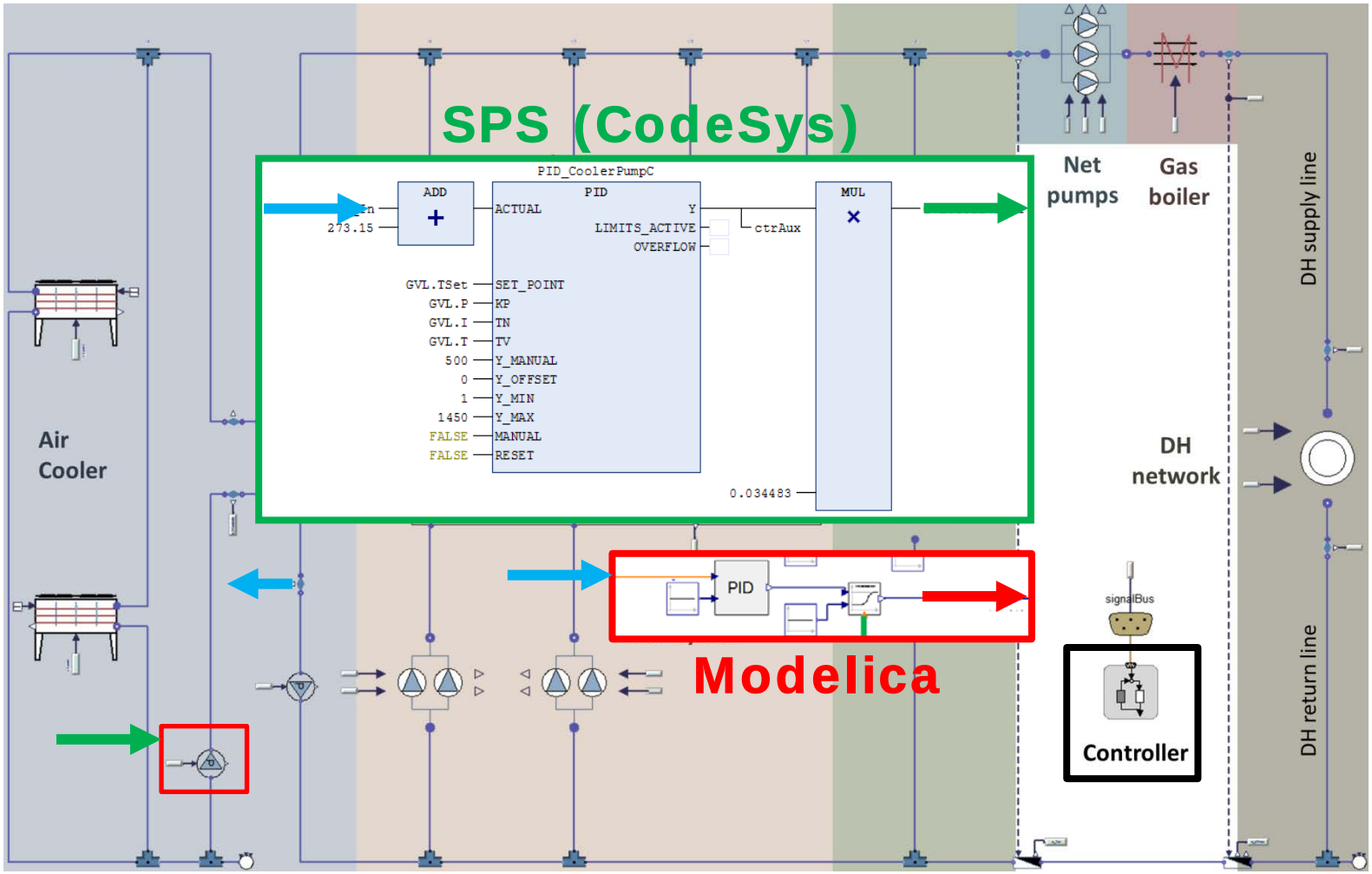

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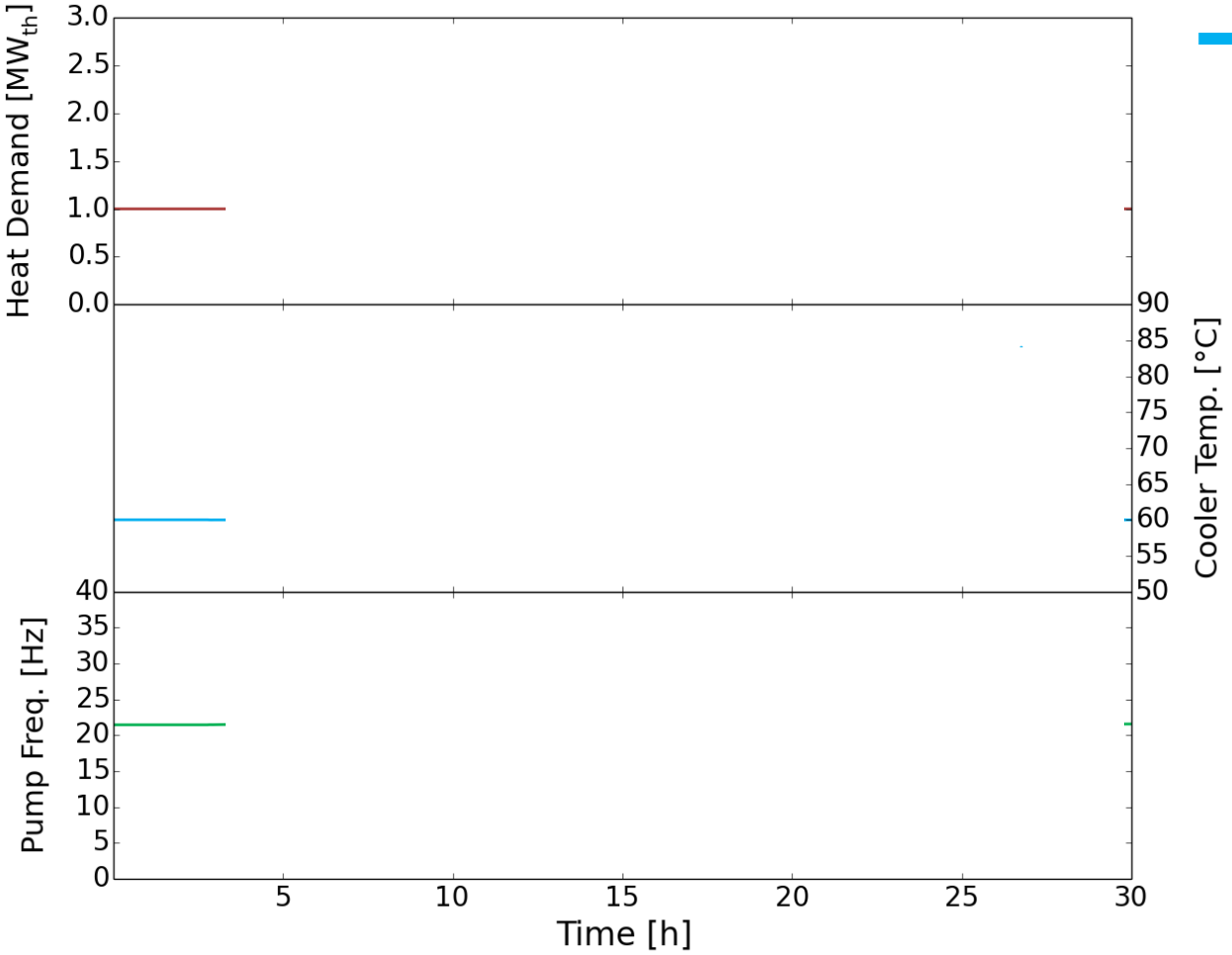

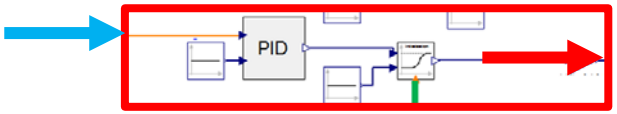

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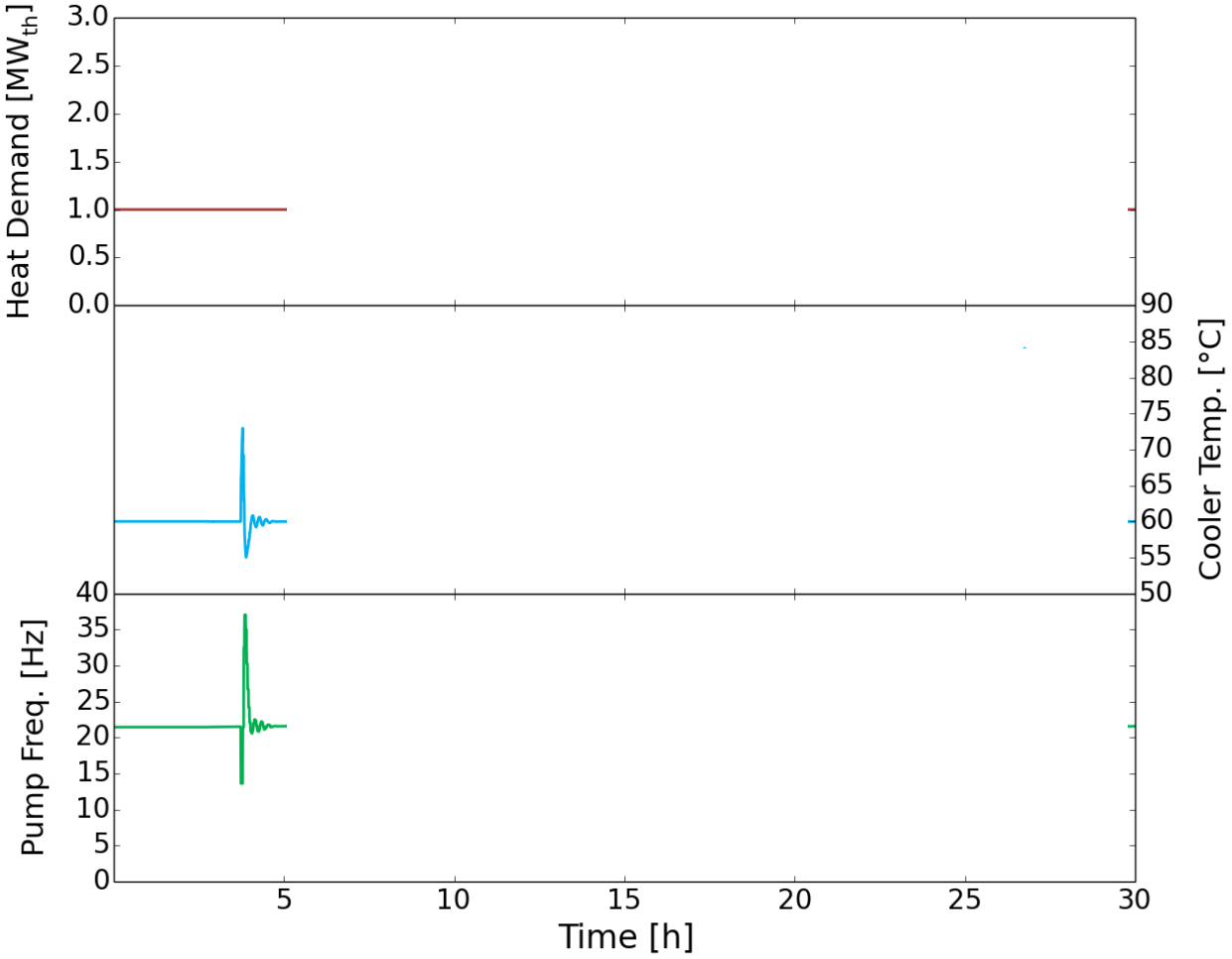
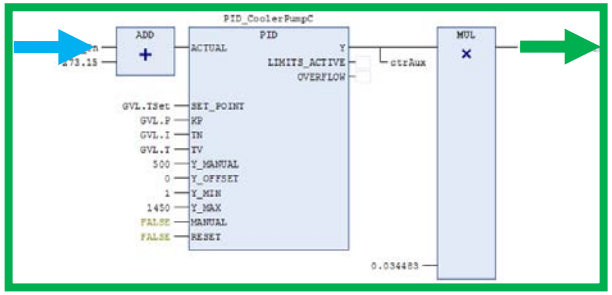
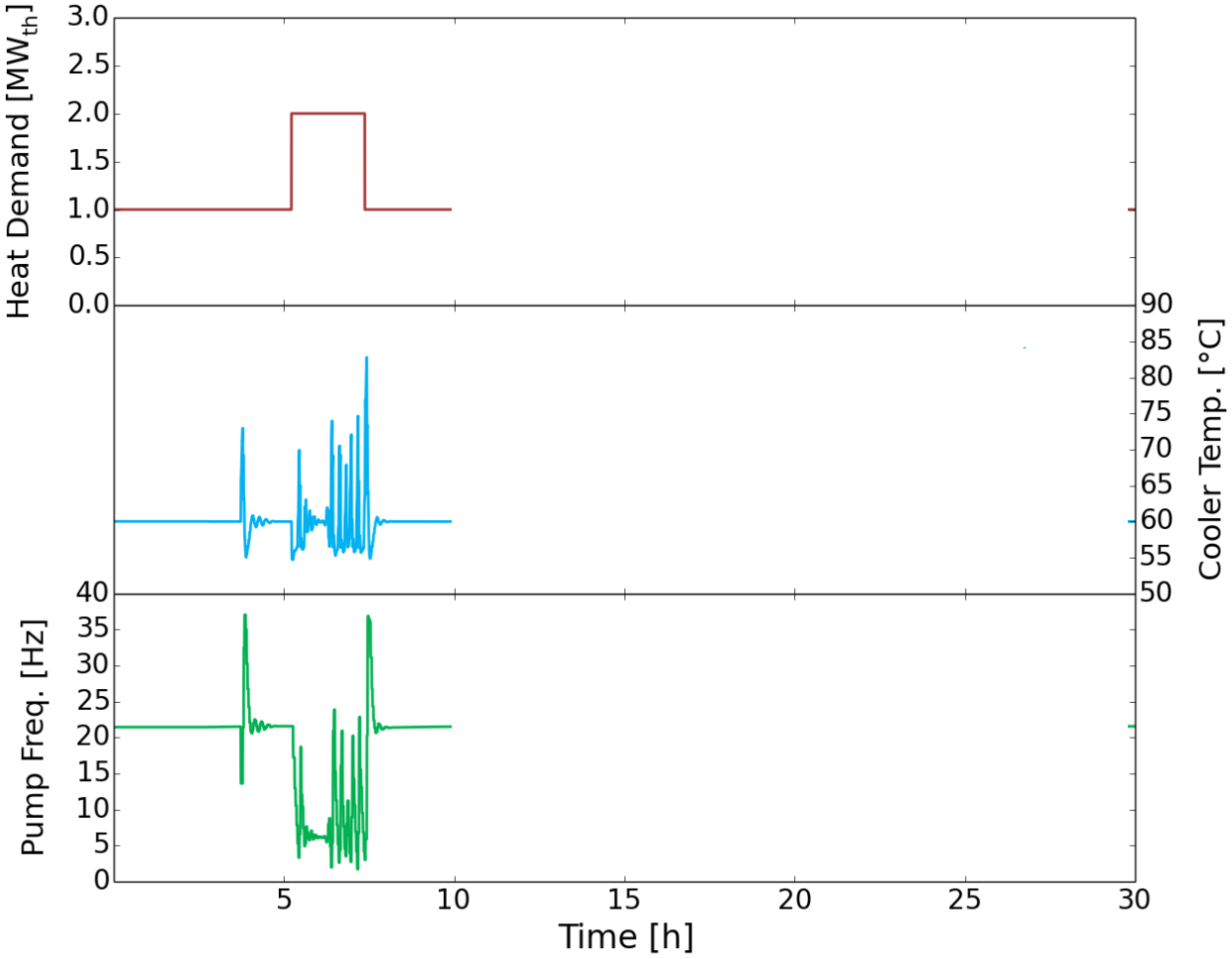
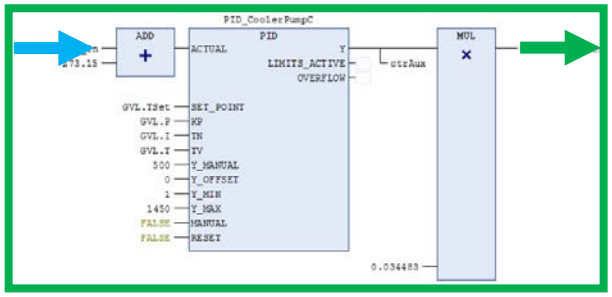





```
VAR_GLOBAL
    ein,aus:REAL;
    internal_ctrl_pumpCoolerC:BOOL:=TRUE;
    TCooler_In:REAL;
    TSet:REAL:=60+273.15;
    CtrlValue:REAL;
    P:REAL:=-30;
    I:REAL:=5;
    T:REAL:=0.0005;
END_VAR
```

Virtual Commissioning



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VAR_GLOBAL
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    P:REAL:=-30;
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    T:REAL:=0.0005;
END_VAR
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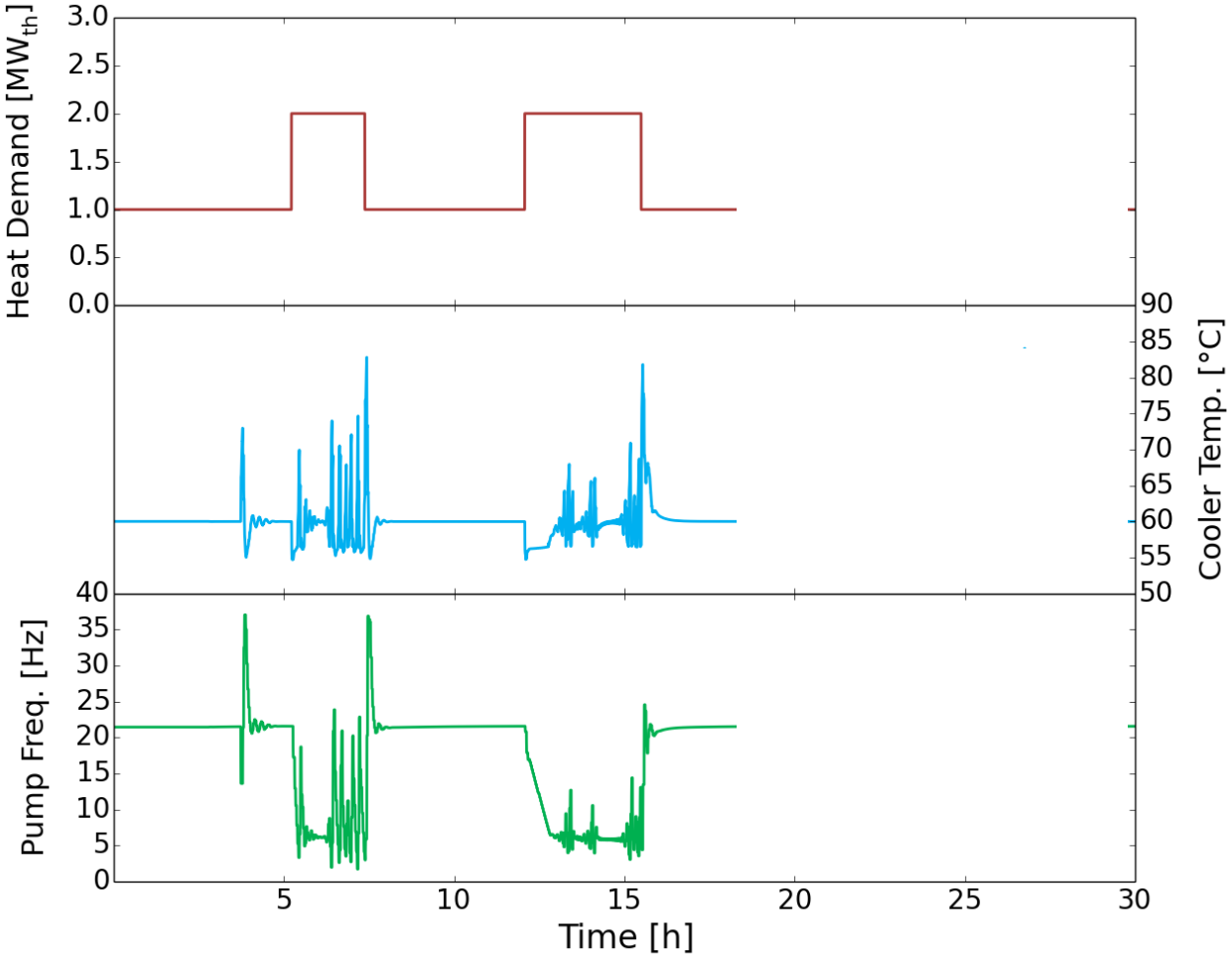
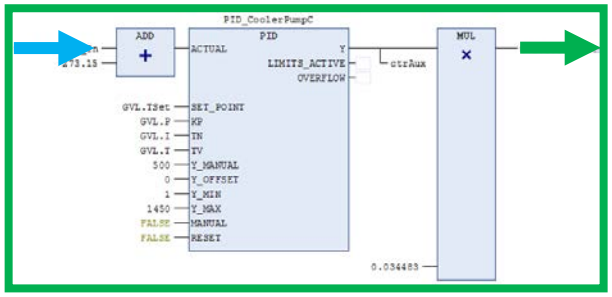
Virtual Commissioning






```
VAR_GLOBAL
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    TCooler_In:REAL;
    TSet:REAL:=60+273.15;
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END_VAR
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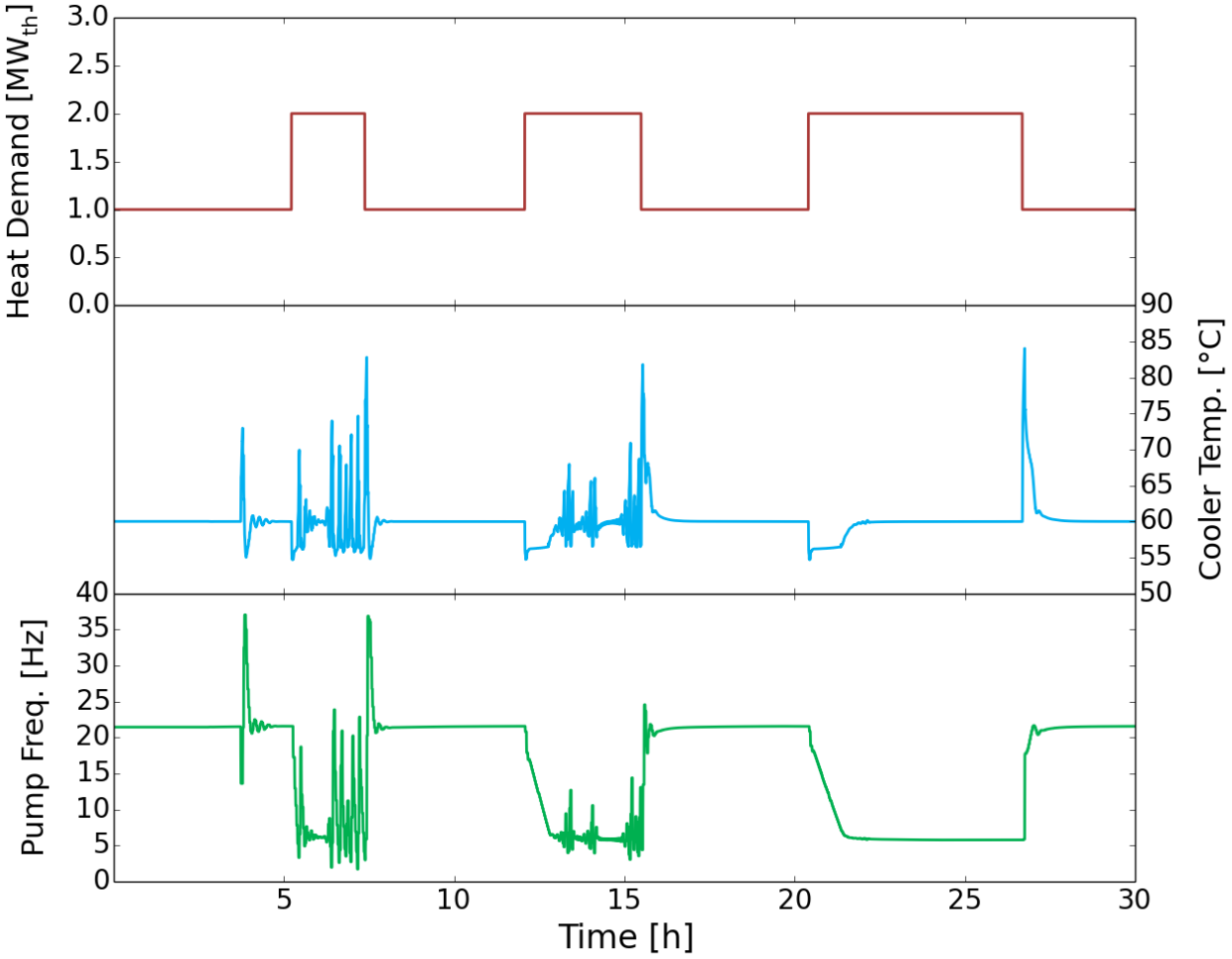
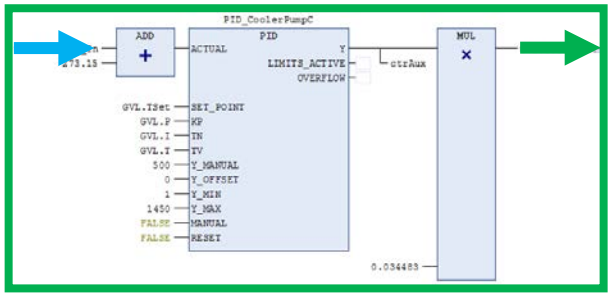
Virtual Commissioning



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    TCooler_In:REAL;
    TSet:REAL:=60+273.15;
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    T:REAL:=0.0005;
END_VAR
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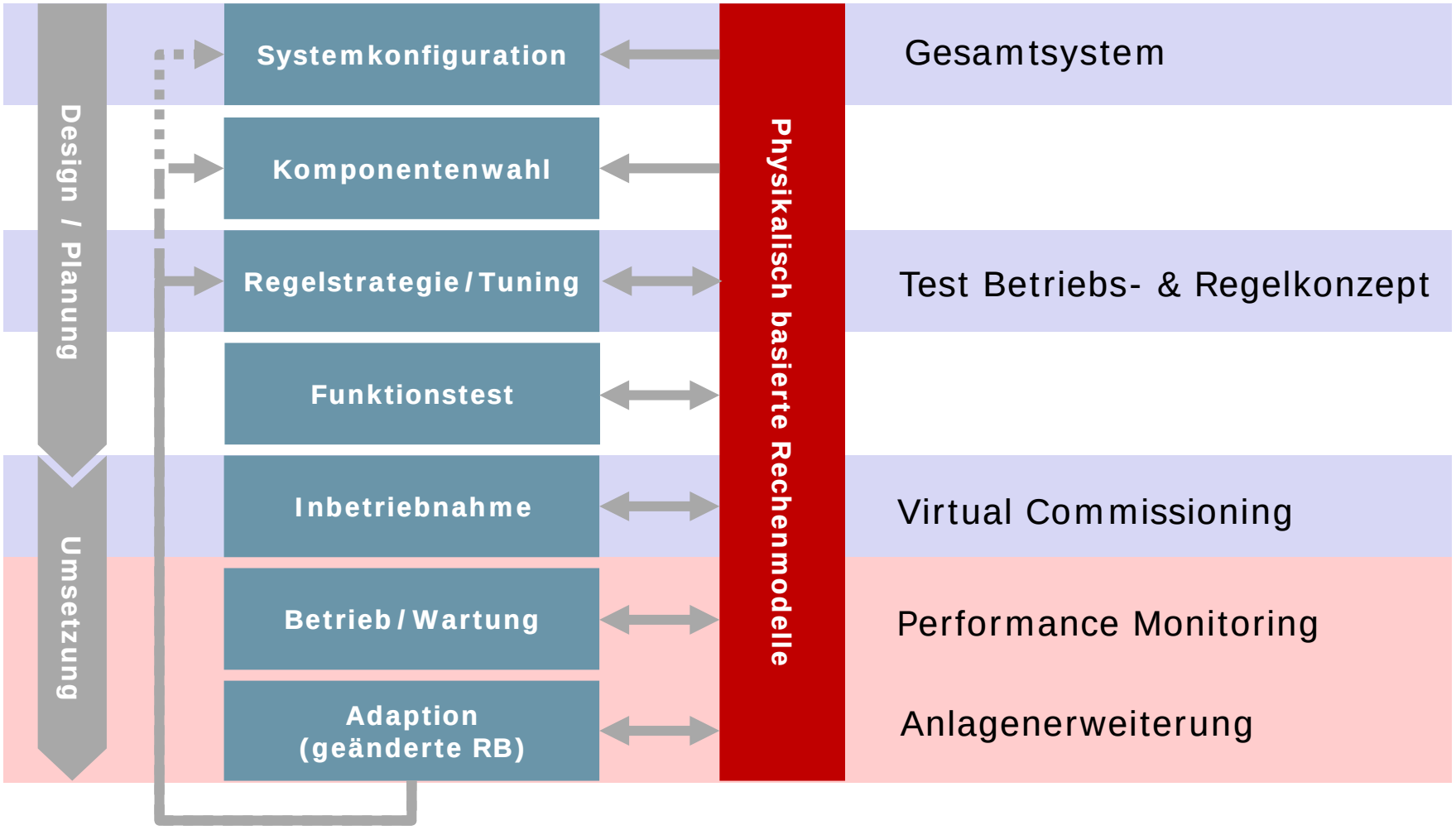
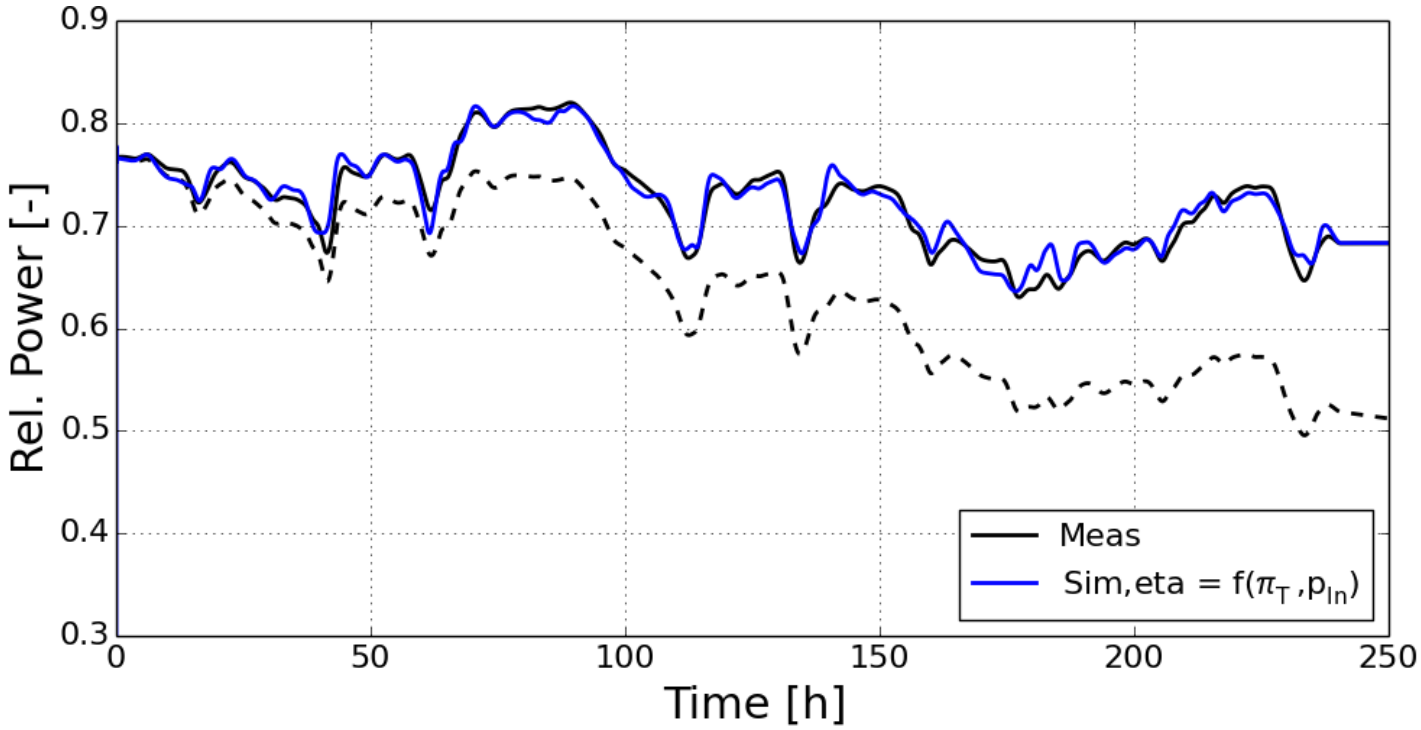
Einsatz der Simulationsumgebung



Performance Monitoring



Schlussfolgerungen

- Dynamische Simulationen
  - Tieferes Verständnis über Anlagenverhalten
  - Unterstützt Finden eines geeigneten Regelkonzepts
  - Hilfe beim Programmieren des Leitsystems
  - Support bei der Inbetriebnahme
  - Anlagenmodell ermöglicht Performance Monitoring
  - Gute Basis für die Planung möglicher Erweiterungen

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