CAPE-OPEN interface boosts your engineering workflow

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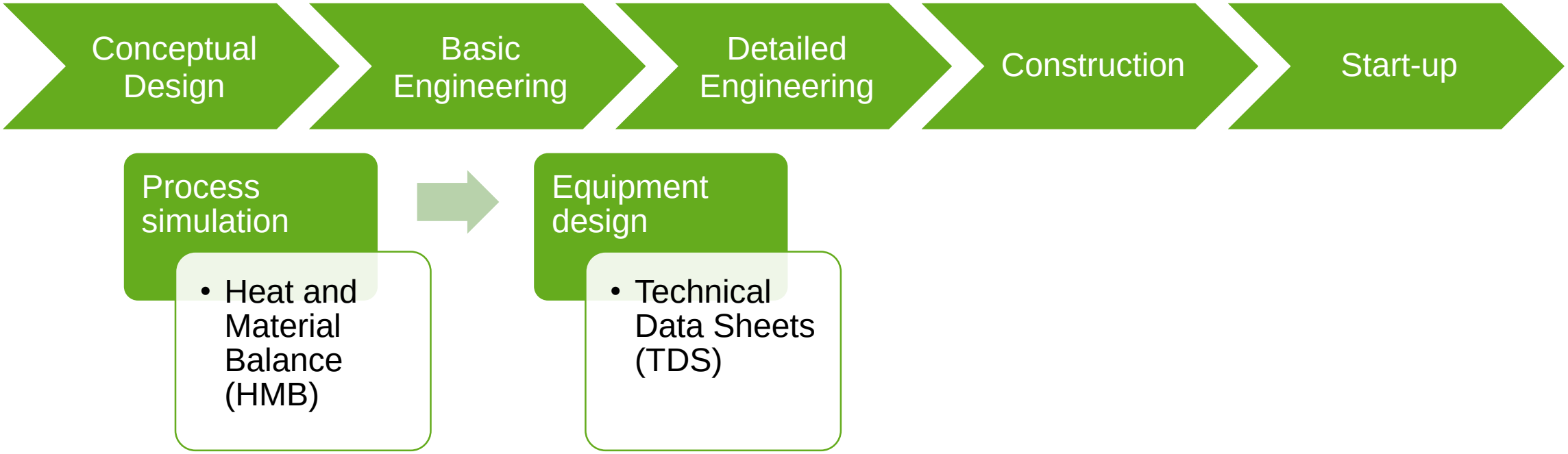
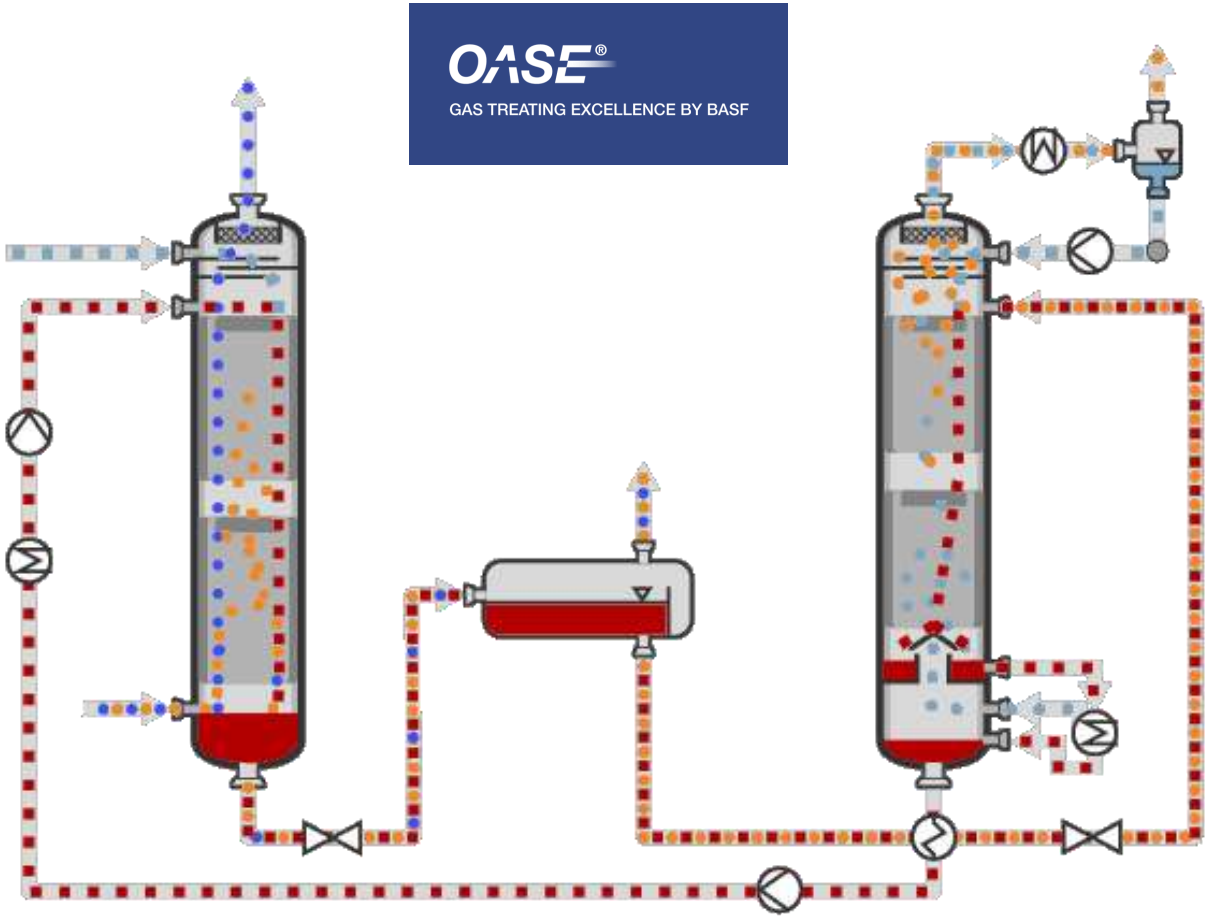
Motivation



- Challenge in **engineering workflow** for designing of production plants:
  - In case of a **special model of unit operation** is required, which
  - is only **available in inhouse tool or in proprietary simulation tool**

Example

- BASF's OASE® gas treatment technology for removal of acid gases
- Acid gas removal unit (AGRU) is part of large production plants
  - LNG plants / natural gas processing plants
  - Ammonia plants / synthesis gas plants
  - Others
- Proprietary simulation tool OASE connect:
  - Allows rigorous calculation of BASF's OASE® gas treatment technology
  - Is provided as server client application



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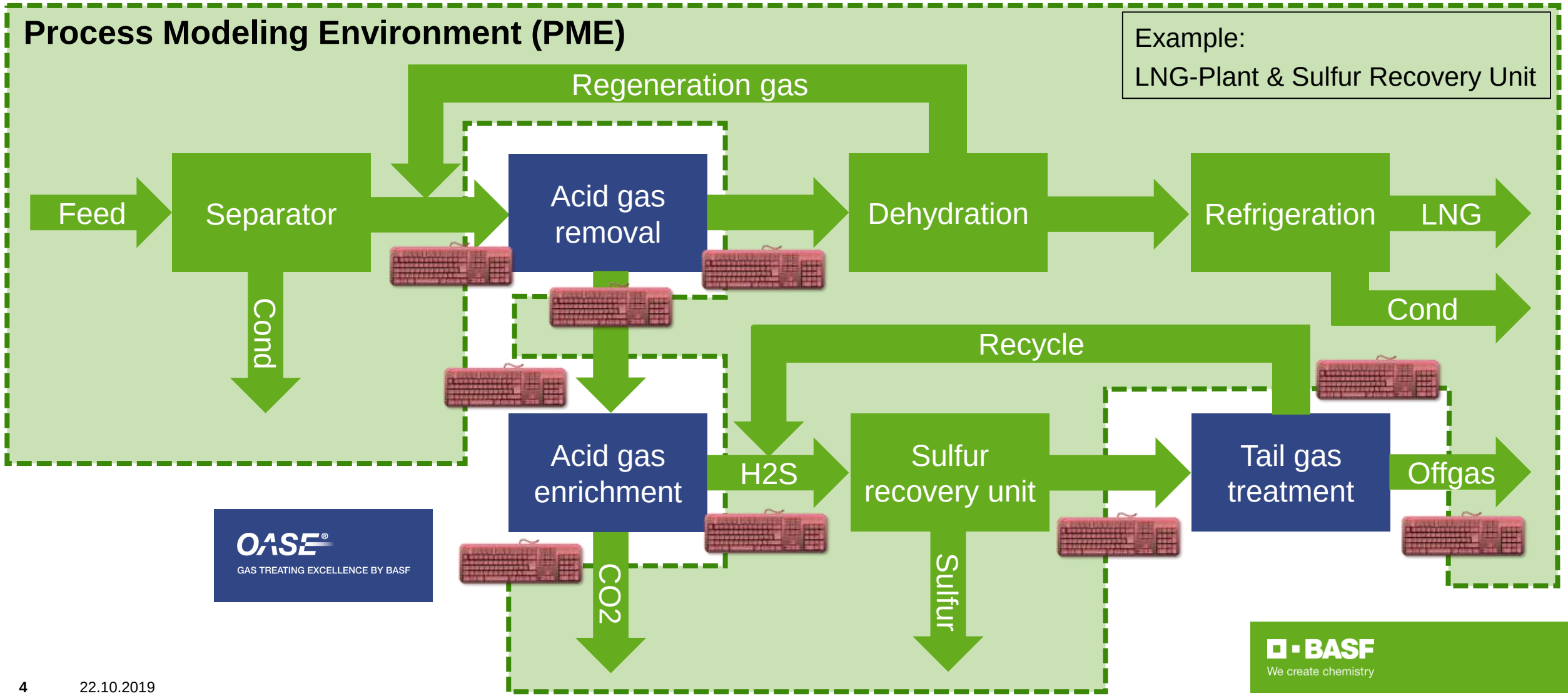
Workflow with standalone OASE connect simulation tool: Manual transfer of input and output data required



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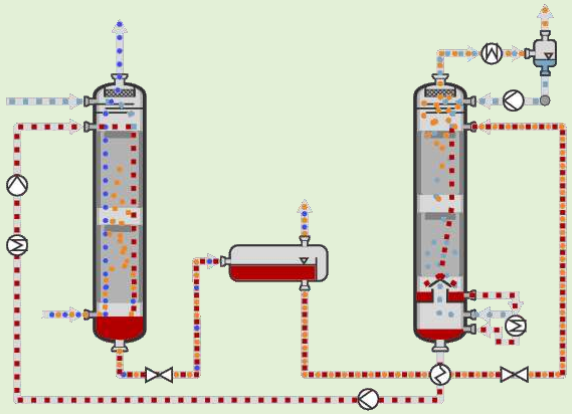
Disadvantages of manual data transfer in current workflow

- Engineering workflow interrupted
- Time and resource consuming
- Prone to errors and inconsistencies
  - During creation of heat and material balance
  - When processing change requests
- Complicates collaboration as a global team, if e.g.
  - Heat and material balance
  - Technical data sheets

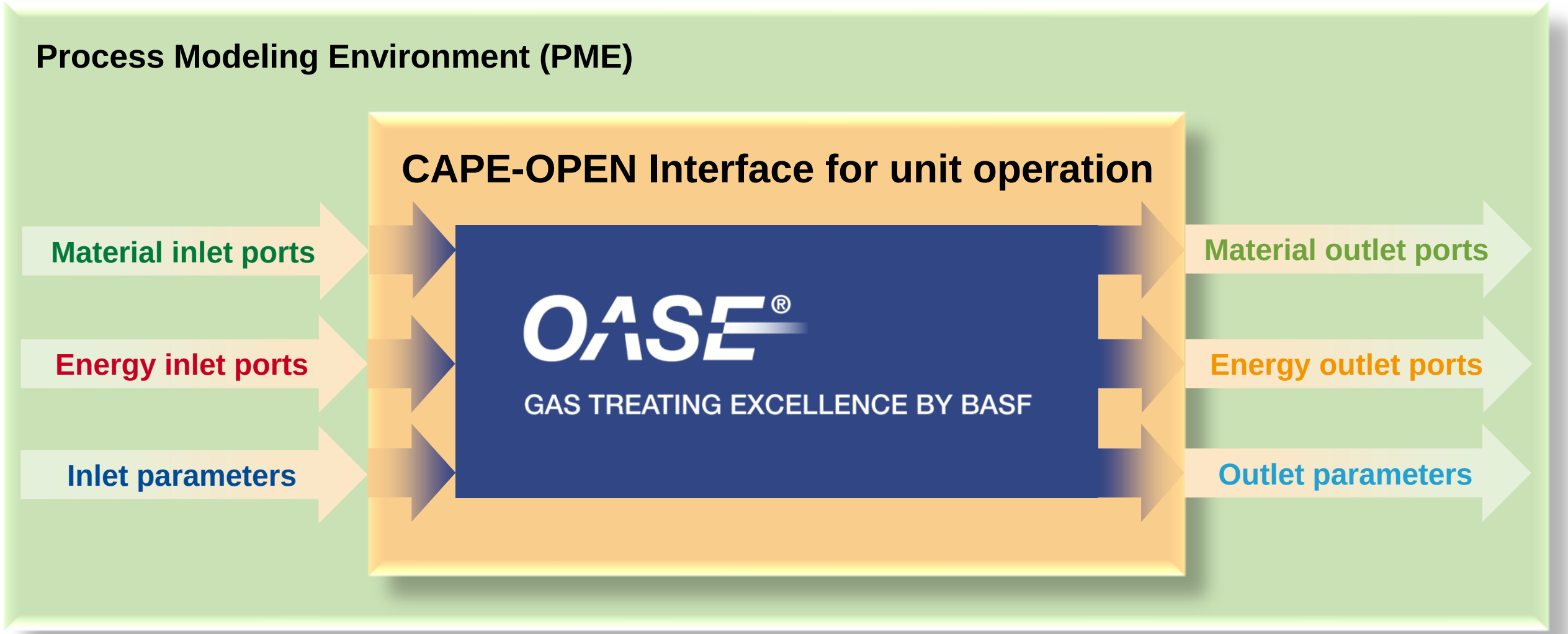
  are generated in different office locations

CAPE-OPEN interface – What are we talking about?

- **CAPE** = **C**omputer **A**ided **P**rocess **E**ngineering

Process Modelling Environment (PME)	CAPE-OPEN Standard	Process Modelling Component (PMC)
Flow sheet simulator, e.g. • Aspen Plus® • Aspen HYSYS® • COFE • ProMax® • Pro/II • UniSim® Design • …	• Defines rules and an interface to allow communication between CAPE applications • CAPE-OPEN interface available for thermodynamic models and for unit operations	Special model of unit operation: 

CAPE-OPEN interface allows communication between PME and PMC



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Realization of CAPE-OPEN interface

Specification

- Material Ports
- Energy Ports
- Parameter
- Component mapping
- Visualization of simulation progress
- Authentication procedure
- …

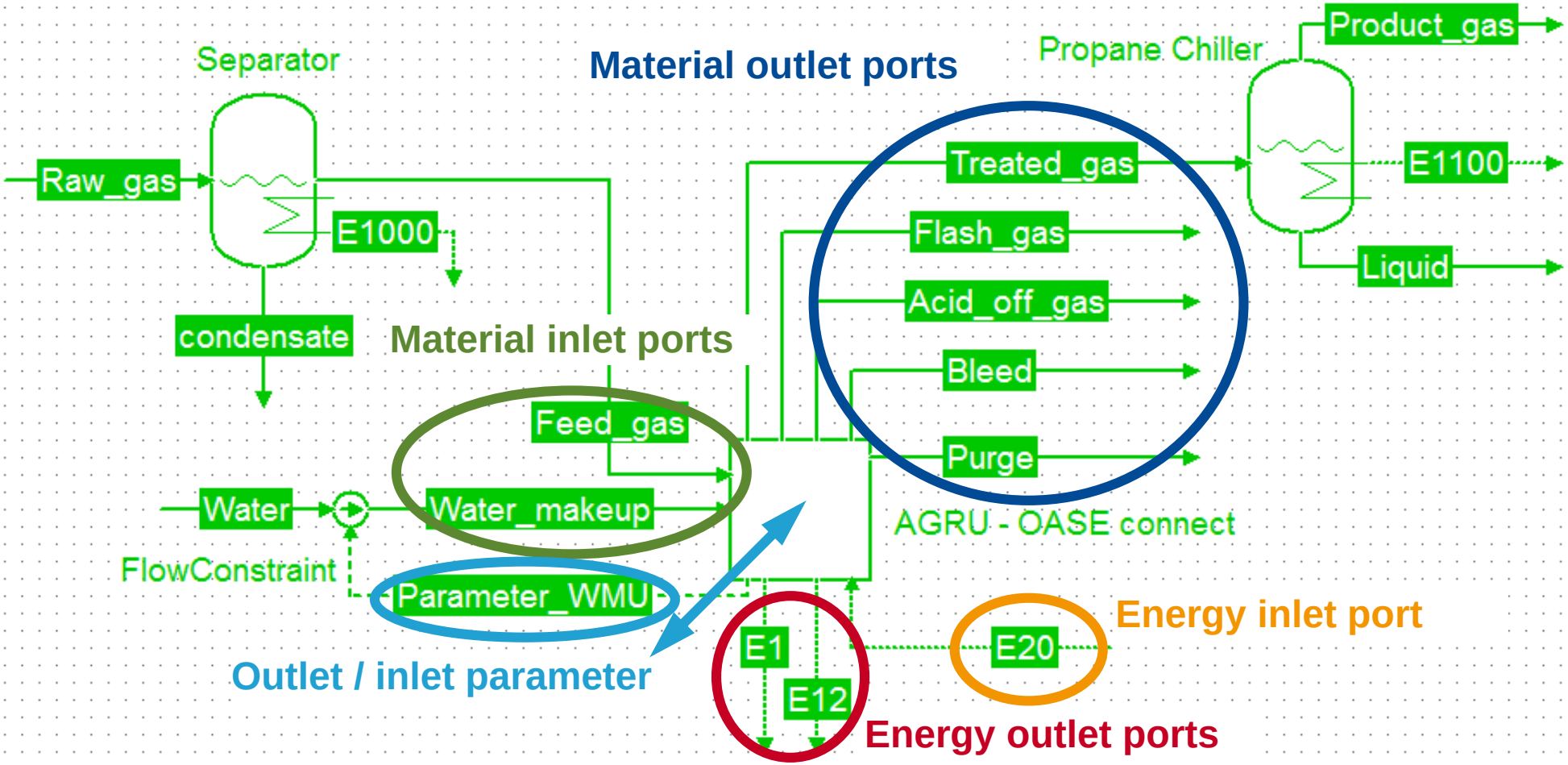
Implementation

- CAPE-OPEN interface
- PMC: Interaction with interface

Testing

- Several PME’s
- Connection of material streams, energy streams, parameter
- Application of parameters in control blocks
- Display of report information
- …

Example: OASE connect embedded into COFE



from COFE (CAPE-OPEN Flowsheeting environment) © 2018

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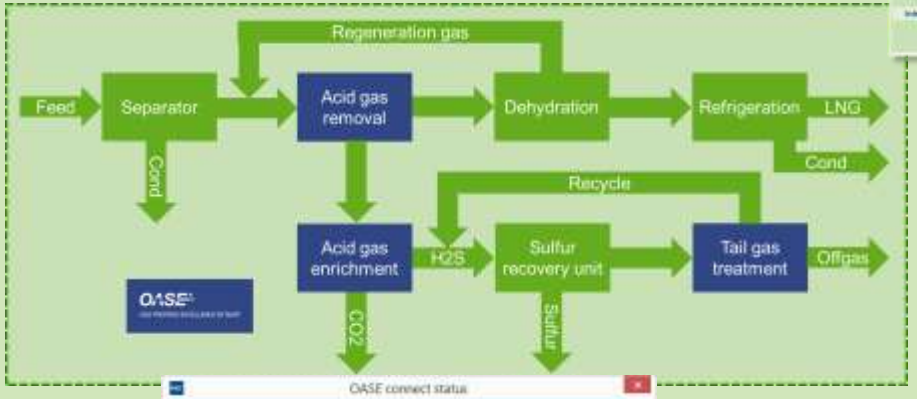
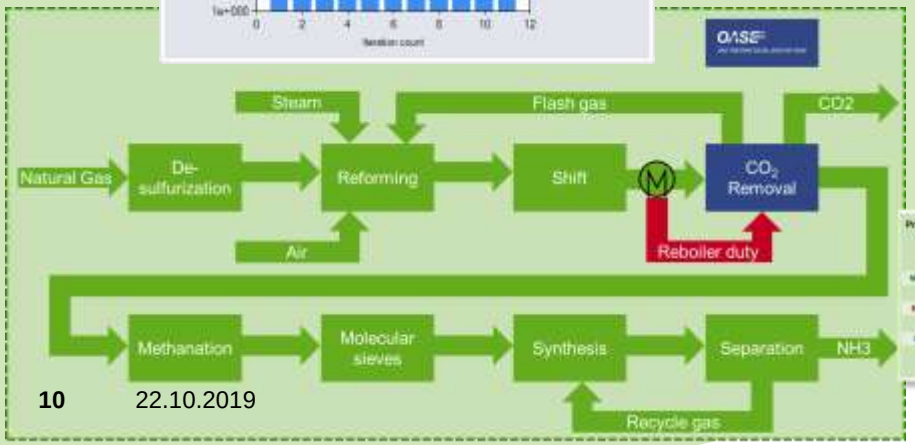
Interaction between PME and OASE connect via CAPE-OPEN interface

Process Modeling Environment (PME)





CAPE-OPEN interface

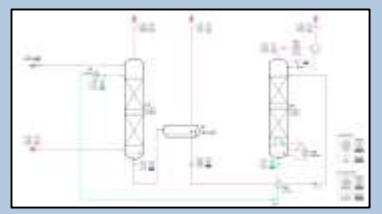
OASE connect input

Calculation in PME

Calculation in OASE connect

CAPE-OPEN interface

OASE connect output



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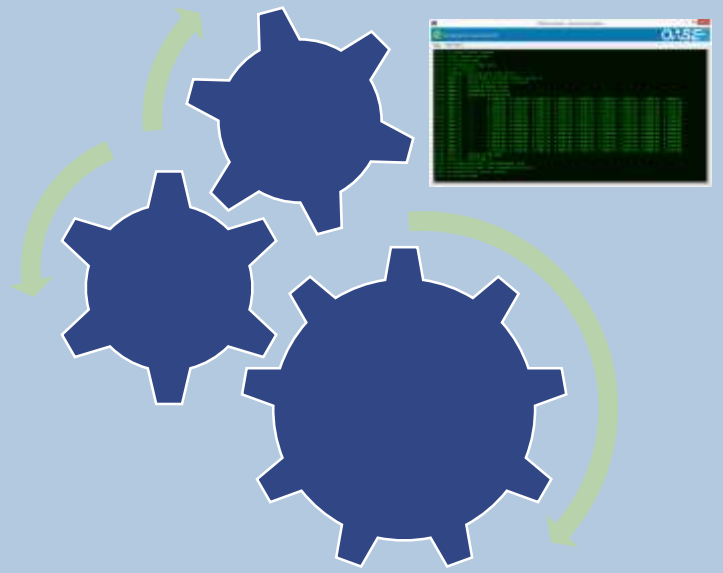

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Testing Experience and Feedback

- **Main observations from testing with several PME's**
  - Some PME's do not allow connection of energy streams
  - Some persistence issues when loading a saved PME input file
  - Issues with update of PME status information when editing CAPE-OPEN unit operation /w or /wo input changes (ICapeUtilities::Edit)
  - Units of measure of parameters of CAPE-OPEN unit operation are not shown in some PME's
  - …
- **User feedback:**
  - Is embedding of CAPE-OPEN interface into equation oriented (EO) simulation possible?
  - Can simulation results of internal streams be displayed in the stream table of the PME?
  - …

Embedding OASE® connect into a Process Modeling Environment via the CAPE-OPEN interface

Benefits:

Provide a **fully closed heat and material balance** as basis for the **generation of technical datasheets** and **further equipment design**

Changes in operating or design parameters are automatically reflected in all connected downstream engineering steps

Boosts the **efficiency of collaboration** in **teams with a global setup**

Significant savings in

Time

Resources

Money

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