

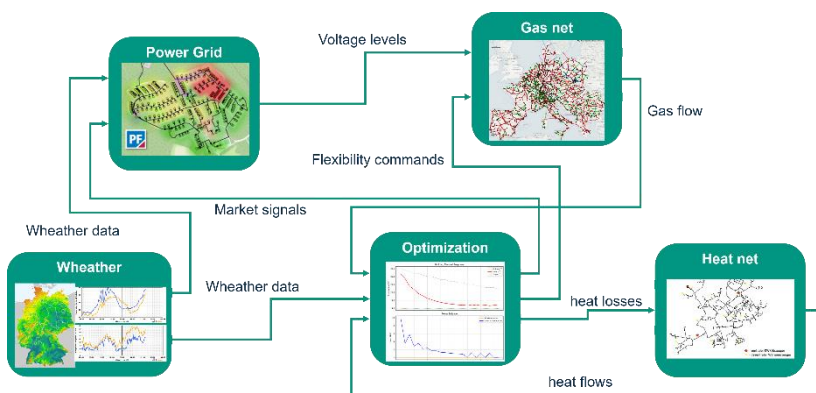


Bachelor's Thesis / Master's Thesis

# Integration of Co-Simulation-Tools

Integration of Co-Simulations-Tools into a container-based Co-Simulations-Framework <sup>1</sup>

Integrating co-simulation tools makes it possible to simulate, analyze, and better understand complex relationships between different areas and sectors (electricity and gas grids, anaerobic digestion, real-time weather and market data, and much more).



The aim of this thesis is to investigate the integration of commercially available co-simulation tools into a container-based co-simulation framework. In particular, the study will examine the extent to which different simulation and synchronization strategies can be combined or specifically controlled. Special attention is given to the different communication and simulation principles.

The result of this work is a concept for integrating various co-simulation tools into the framework, as well as an evaluation of the concept through a pilot integration.

Sound exciting? Then get in touch with us!

The proposed project consists of the following parts:

- Step 1: Analysis of the "co-simulation systems" problem domain
- Step 2: Development of an integration concept
- Step 3: Evaluation through a sample integration

We're happy to answer any questions you may have. Feel free to send us an email!

The thesis may also be written in English.

## Referenzen

- [1]: J. Liu et al. "Tackling Heterogeneity with Containerized Wrappers and Synchronization Methods for Multi-Domain Energy Systems", 2026, <https://publikationen.bibliothek.kit.edu/1000191927>

All Images © KIT-IAI, BMWI

## Supervisor:

M.Sc. Michael Maier

Dr. Richard Lutz

## Programming languages:

- Java
- Python

## Systems, Framework(s):

Docker, RabbitMQ

## Required Skills (Preferred):

- Strong analytical skills
- Strong programming skills
- Ability to work well in a team
- Excellent language skills

## Languages:

German or English

## Start Date:

As soon as possible

For more information, please contact:

## Michael Maier

E-Mail: michael.maier@kit.edu

## Richard Lutz

E-Mail: richard.lutz@kit.edu

Institute for Automation and Applied Informatics (IAI)  
Karlsruhe Institute of Technology,  
Campus North  
Hermann-von-Helmholtz-Platz 1  
76344 Eggenstein-Leopoldshafen