

Co-simulation based assessment of energy systems

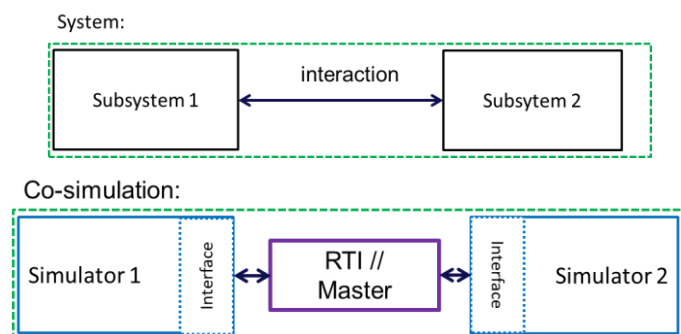
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Digitalisation and technological advancements lead to complex energy systems, the interactions of which need to be studied in their planning phase. Classical numerical tools do not suffice--the system's complexity must be captured by advanced tools like co-simulations. Standard interfaces and scheduling algorithms allow a modular approach for multiple stakeholders and multiple purposes.

Research aim

- trend towards complex (intelligent & integrated) energy systems
- interactions among various domains, time scales, spatial scales, etc.
- simulation is an integral part of the testing and validation procedure
- simulation challenge:
 - domain-specific: fast but limited scope
 - general purpose: scales badly

How can we study complex energy systems with high accuracy, workable execution times, and good applicability?

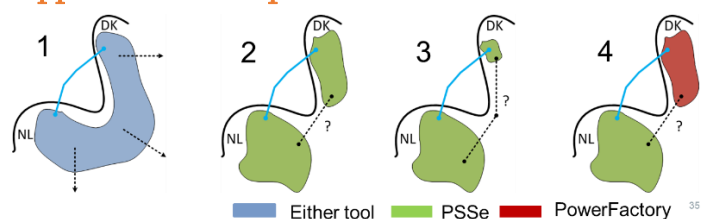


*RTI=runtime infrastructure

Co-simulations: Method / process

- each subsystem: own numerical model
- couple subsystems with standardised interfaces
- simulate all subsystems with standardised scheduling (time-stepping) algorithms

Application example: Cobra cable



Options: 1) integrate all data to single tool, 2) migrate one model to the other tool, 3) simplification, 4) co-simulation

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