

# HAMLET: An Agent-Based Testbench for the Detailed Interplay of Energy Systems and Markets

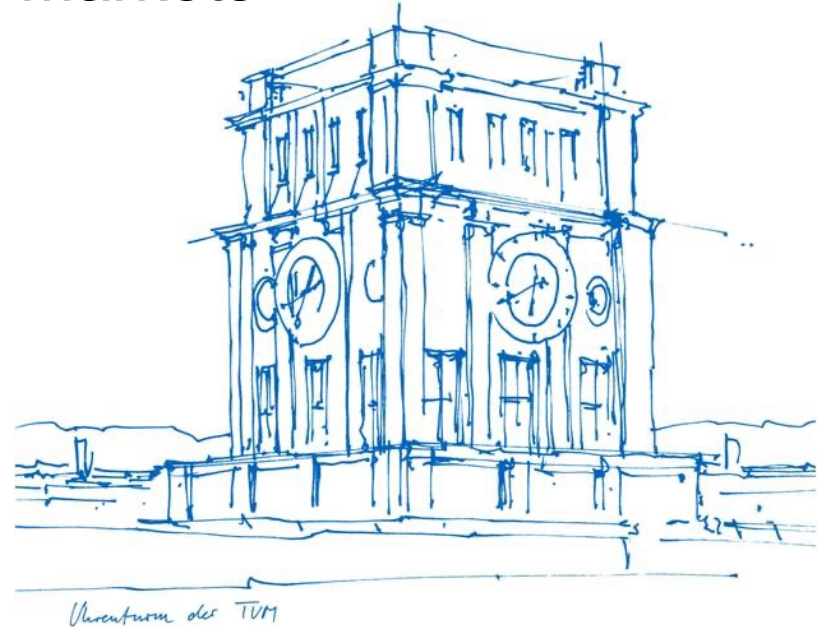
Markus Doepfert

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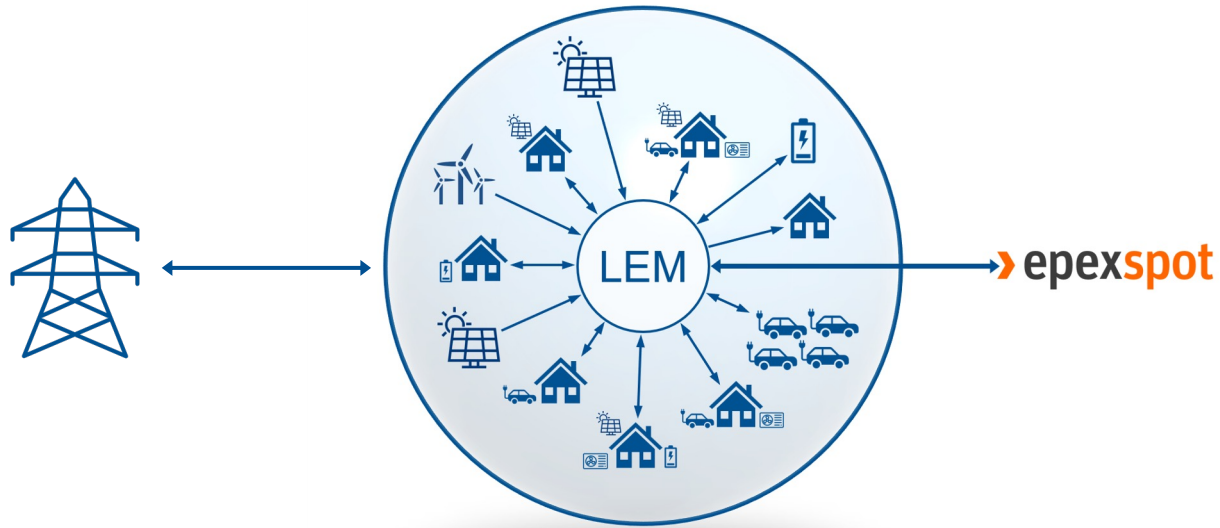
TUM School of Engineering and Design

Chair for Renewable and Sustainable Energy Systems

Copenhagen, 31. March 2025



# HAMLET in a nutshell

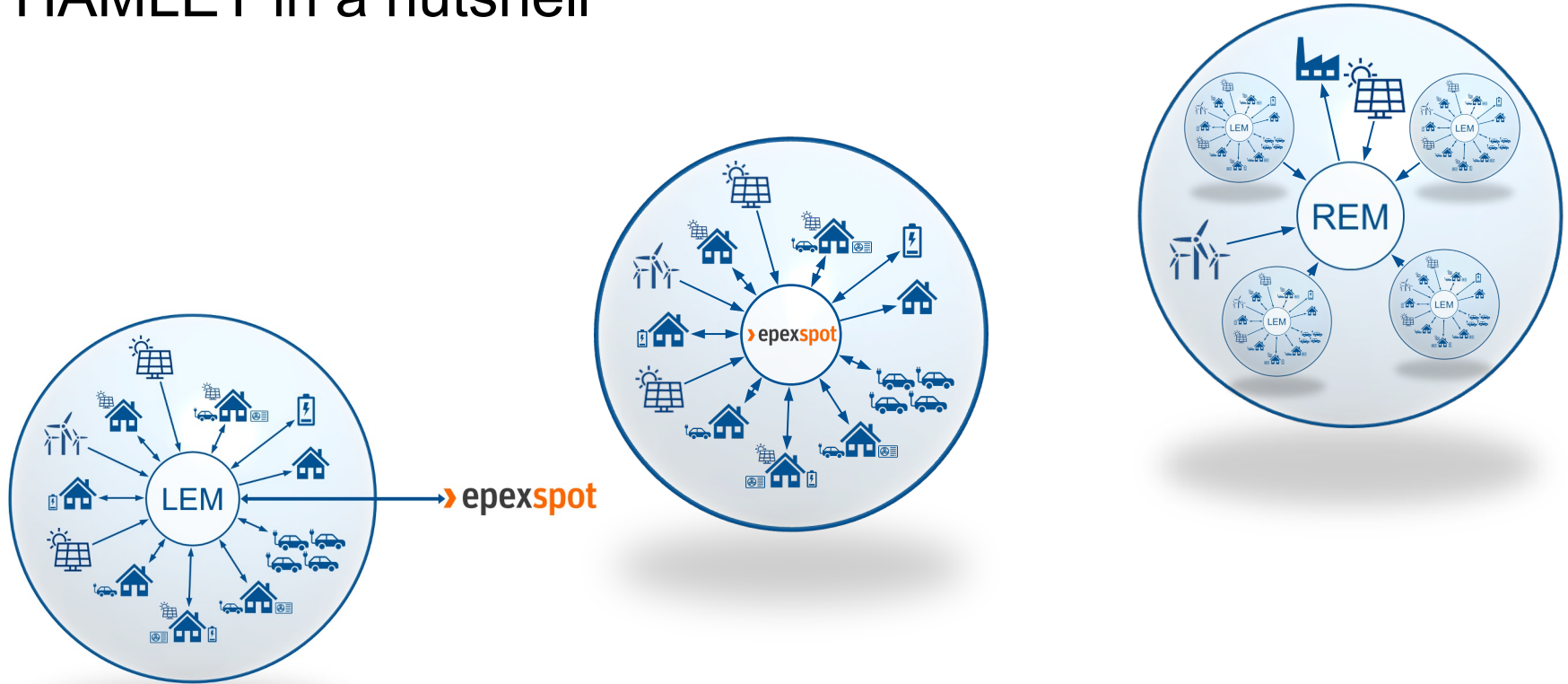


 technical

 economic

 social

# HAMLET in a nutshell



# What is already integrated?



Agent

1. SFH
2. CTSP
3. Industry
4. Producer
5. Storage



Components

1. Electricity
2. Heating
3. DHW
4. PV
5. Wind
6. EV
7. Heat pump
8. Battery
9. Heat storage



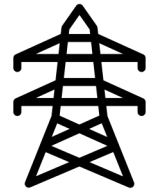
EMS

1. Forecasts  
(naive, etc.)
2. Controller  
(RTC&MPC)
3. Trading



Market

1. Electricity

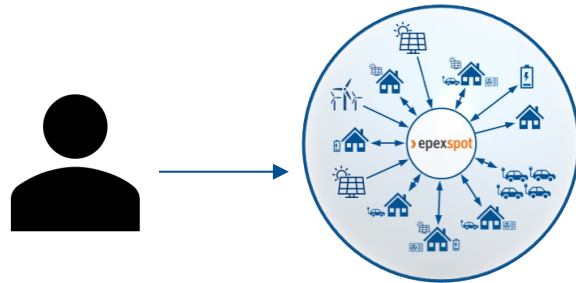


Grid

1. Electricity

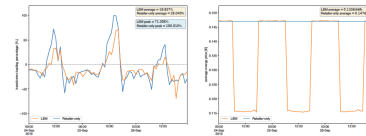
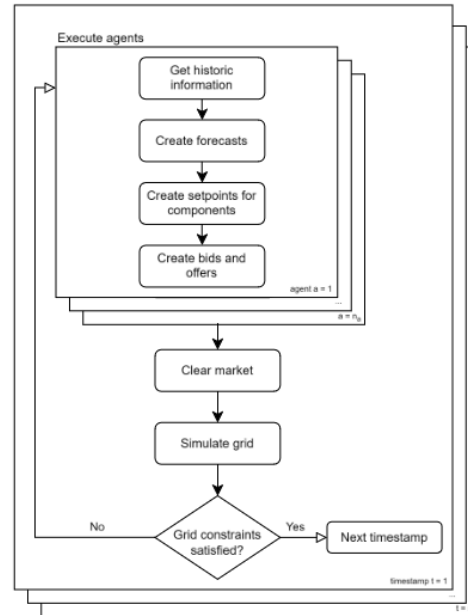
SFH: Single-family household | CTSP: Commerce, trading, services & public | DHW: Drinking hot-water | PV: Photovoltaics | EV: Electric vehicle | RTC: Real-time controller | MPC: Model-predictive controller

# How would I work with the tool?



## Creation

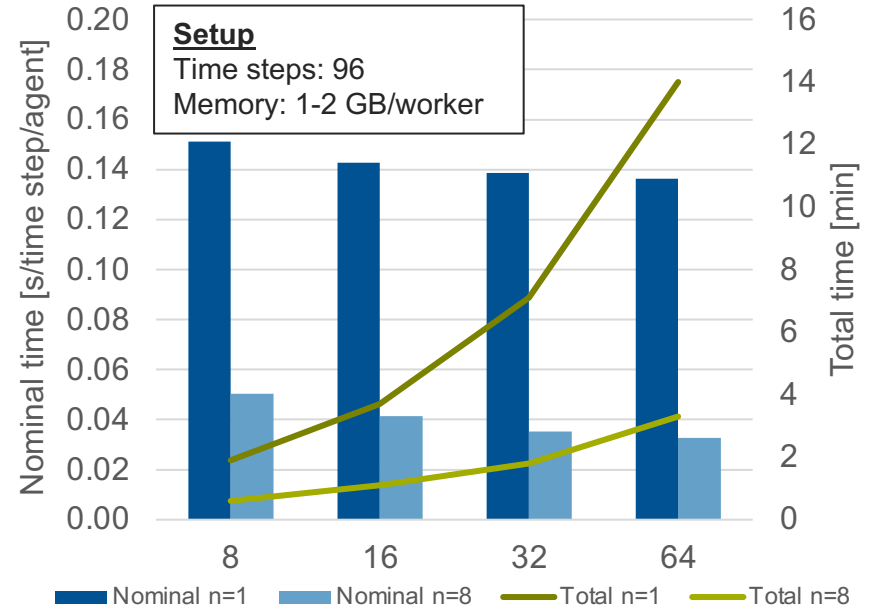
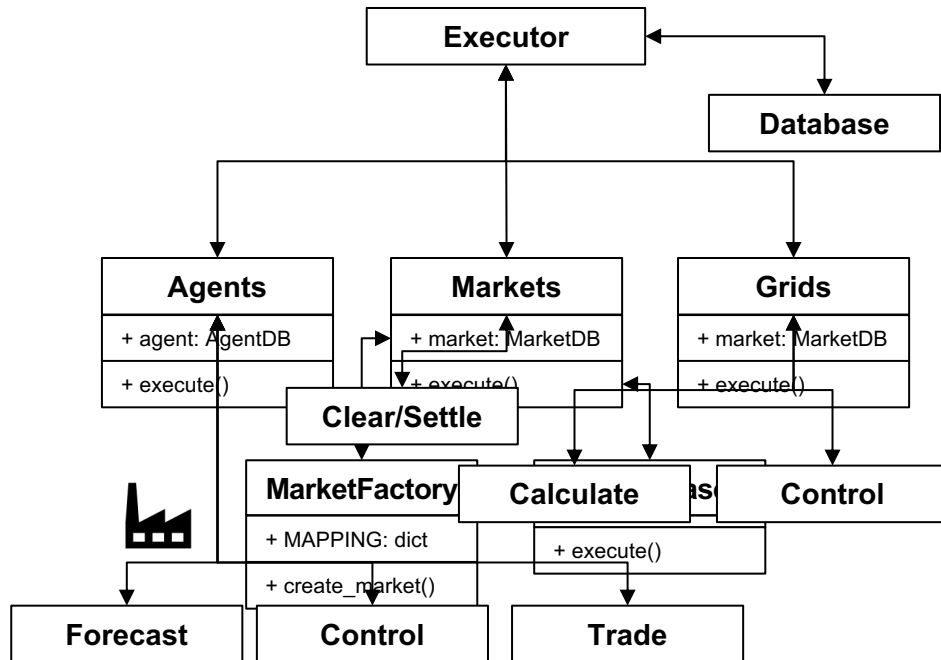
- Yaml files
- Xlsx file
- pandapower



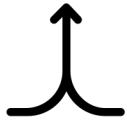
## Analysis

- Agent files
- Market files
- Grid files

# What is the core architecture and principal design philosophy?

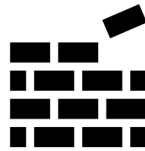


# What are the next steps?



## Consolidation

- Docs
- Code quality



## Features

- Speed
- Memory use
- Analyzer
- Coupling



## Papers

- Market designs
- Grid control



## Environment

- Time series
- Database

