

FRESH:COM and GUSTO

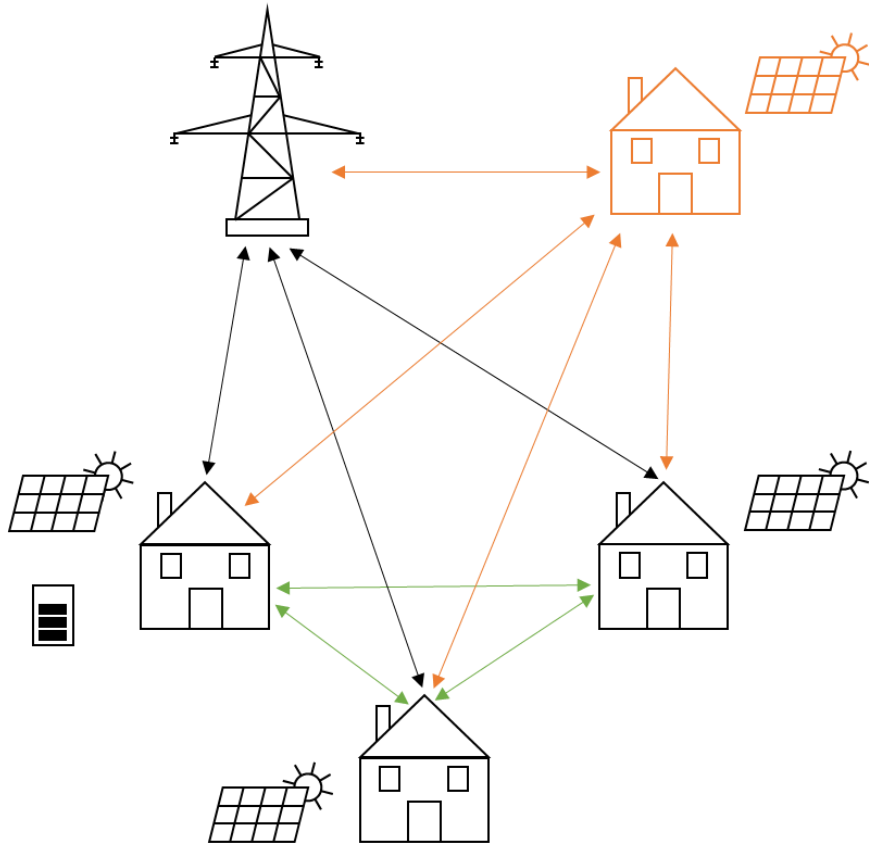
Two local energy system models with focus on urban neighborhoods and local energy communities

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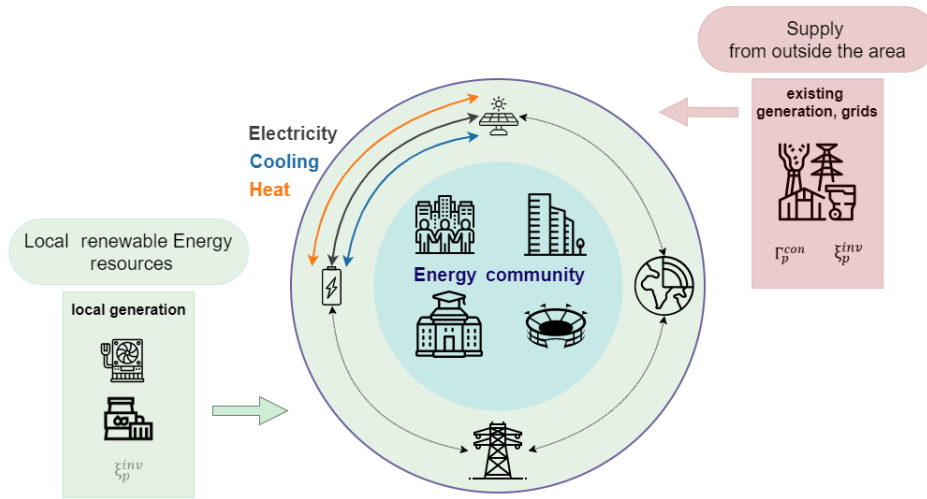


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- Linear optimization model maximizing the social welfare of a **local energy community**
- Members: Private households and SMEs
 - Voluntary participation
- Photovoltaic (PV) and Battery Energy Storage Systems (BESS)
 - Electricity only
- Allocation mechanism: Peer-to-peer trading under the consideration of each prosumer's individual willingness-to-pay
- FRESH:COM includes individual incentives for participation in energy communities:
 - Analyses of communities over several years considering phase-in/phase-out of prosumers
- Implemented in *Python* using *Pyomo*



- Optimal energy technology portfolio and technology dispatch on neighborhood level
 - Minimizing total annual costs of energy supply
 - Multiple energy carrier systems
 - Implemented as a Mixed Integer Linear Program (MILP)
- Different operation strategies for small-scale batteries
 - Profit maximization by single consumers or communities
 - Minimization of local excess/deficit by prosumers
 - Scheduled generation compliance and load following

Trade-offs between...

- ➔ local distributed renewable generation and supply from outside the community
- ➔ distribution grids and (*versus*) local energy storage systems

¹ GUSTO merges the former models HERO&OSCARS into one modeling framework and is written in Python (using Pyomo).

Further Information and Contact

FRESH:COM

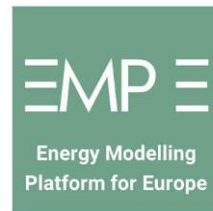
- Social welfare maximization
- Operating model for energy communities with voluntary participation
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GUSTO

- Cost minimization
- Energy system planning tool for neighborhoods
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The models are open-source available on GitHub

- FRESH:COM: <https://github.com/tperger/FRESH-COM>
- GUSTO: <https://github.com/sebastianzwickl/GUSTO>



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