Impact of Prosumers and their Clusters on the Energy System

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IMPACT OF PROSUMERS AND THEIR CLUSTERS ON THE ENERGY SYSTEM

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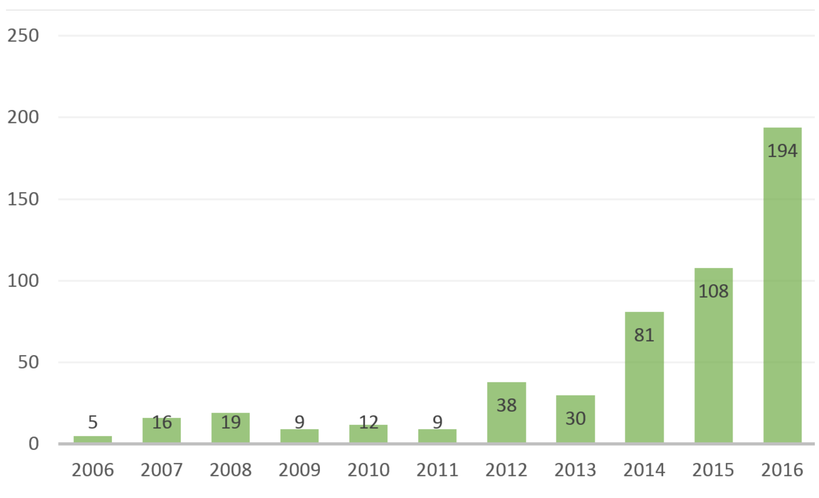
MOTIVATION

With the global and national policies for the reduction of greenhouse gas emission, increasing capacities of renewable sources are being installed. As those are becoming profitable, small actors in the market are becoming more important, changing the paradigm of the centralized, top-down operation [1] and calling for new business models and operation logic appropriate for prosumers [2, 3].

Prosuming buildings - produce and consume energy (renewable energy from PV, solar heat, wind)
- store energy by local means

- Growing number and influence
- Economic benefits of bidirectional connection [5]
- Benefits of cooperation within the prosumer group and with the energy system [6,7]

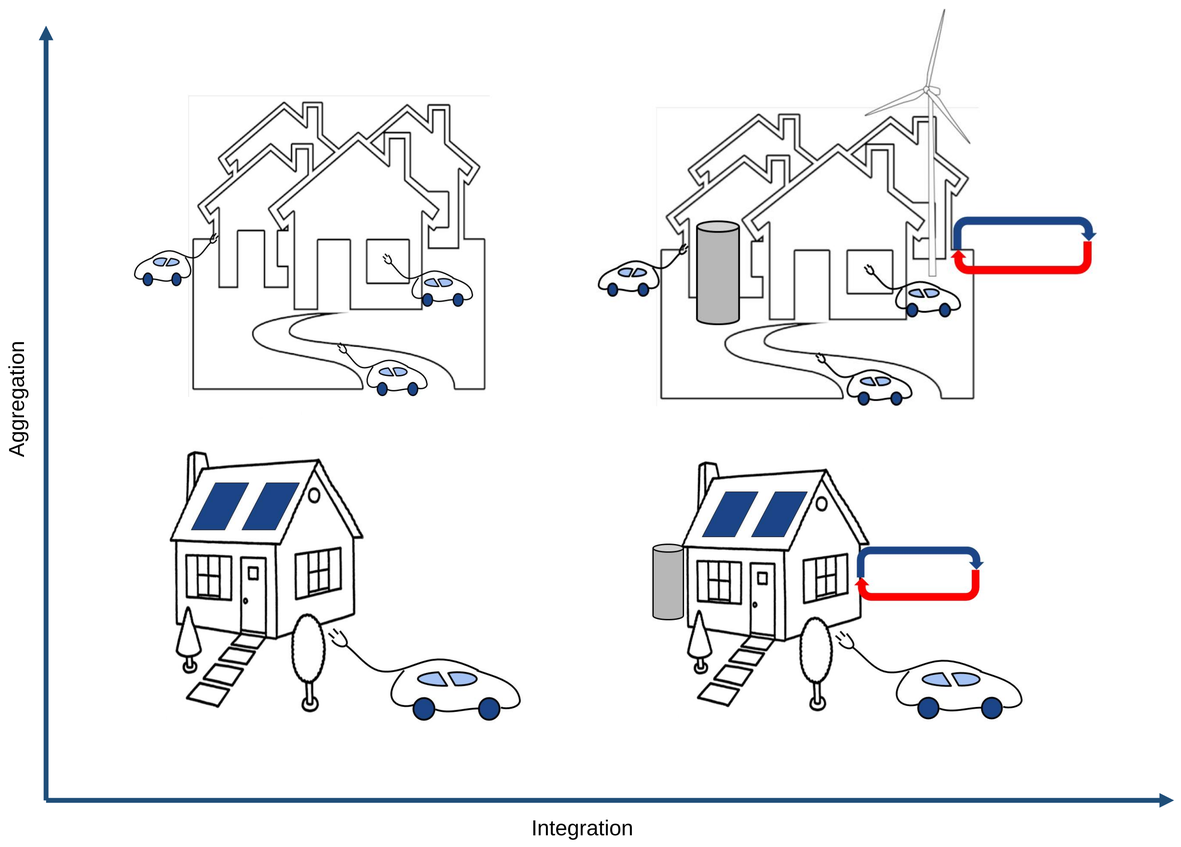


Number of articles that contain keywords "prosumer" and "energy on Science Direct by publication year

OBJECTIVE

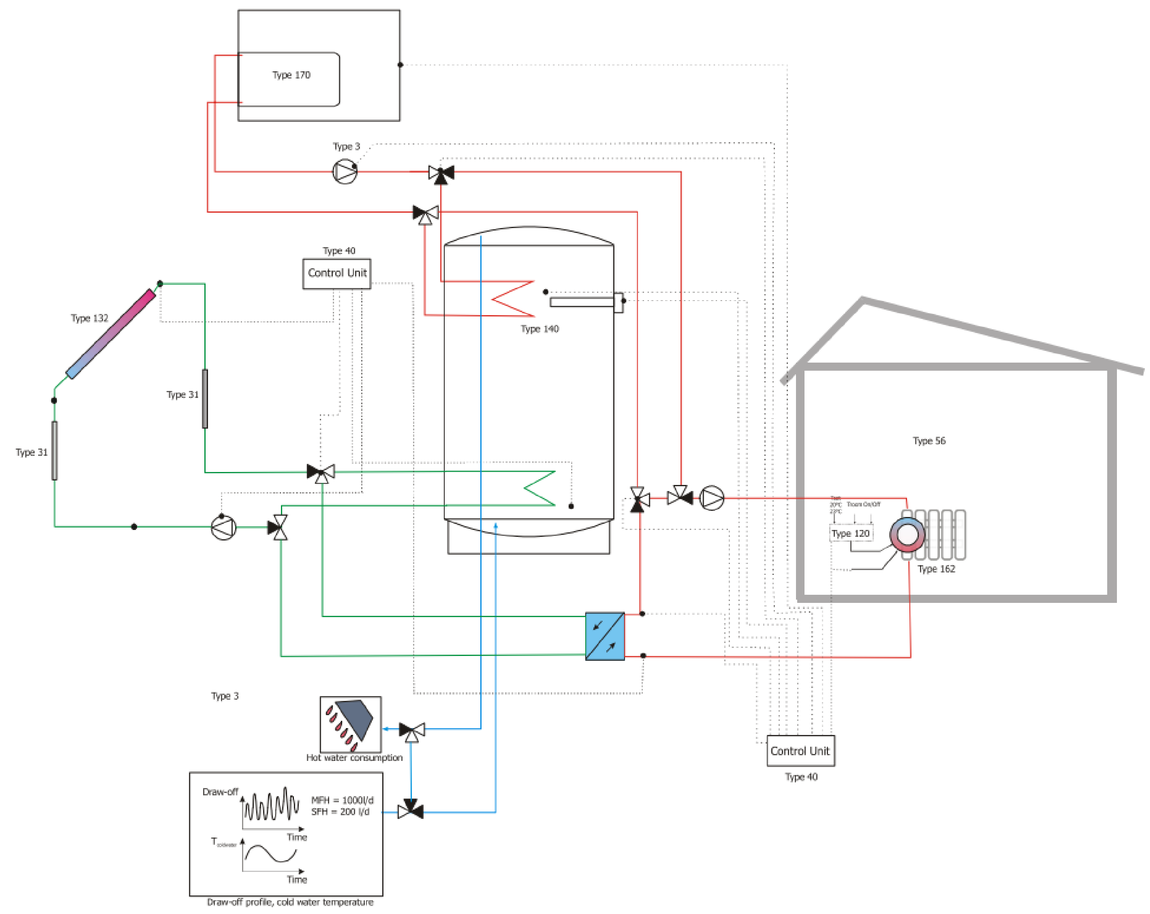
- model future prosumers – individually and at the aggregation level, where buildings play a central role with respect to future smart grids for electricity, gas, heating and cooling [4]
- Section for Building Energy at DTU Byg
- CITIES Work Package 3

METHODOLOGY

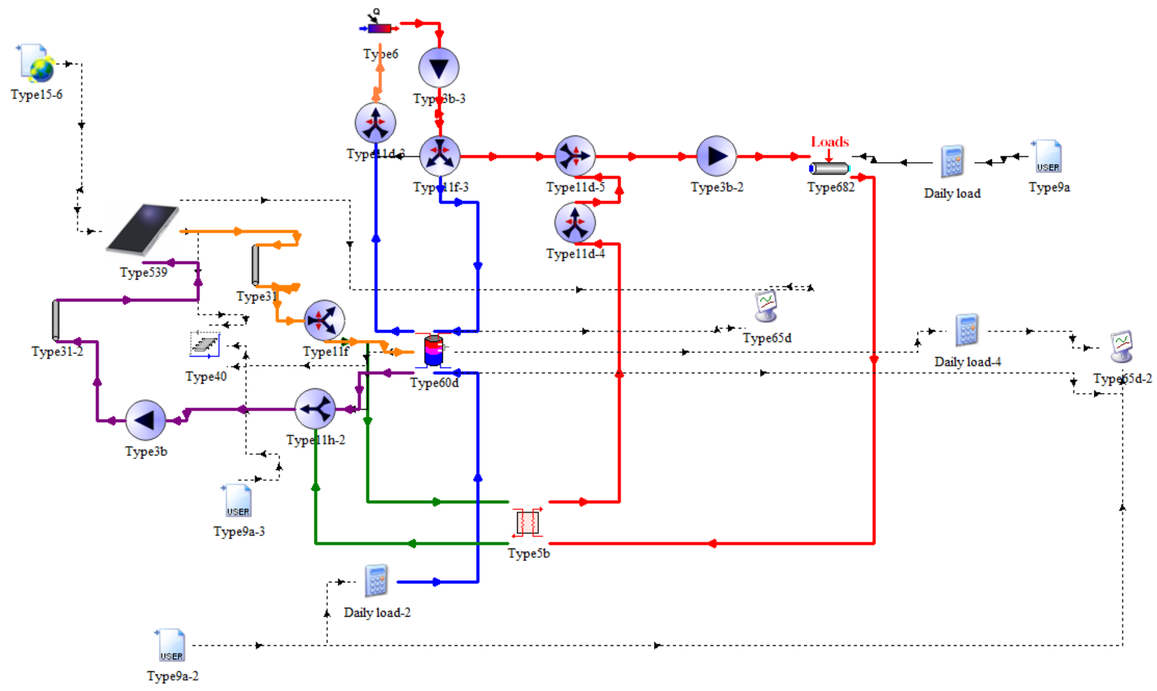


OPTIMIZATION STUDY (IN PROGRESS)

- Influence of pricing policies on optimal set-up of rooftop PV and solar collector system (net-metering and feed-in tariffs)
- TRNSYS model of PV and solar collector system
- Optimal sizing with respect to space constraints with GenOpt
- Sensitivty analysis - influence of grid context (tariff and metering policies), appliances using DHW
- CITIES Data for single-family home



Schematic illustration of the typical Danish solar domestic hotwater and auxiliary space heating combisystem [5]



TRNSYS model of the solar collector system

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[3] J. Rodríguez-Molina, et. al, “Business models in the smart grid: Challenges, opportunities and proposals for prosumer profitability,” Energies, 2014.

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[5] K. Ellehauge, “A Solar Combisystem based on a Heat Exchanger between the Collector Loop and Space-heating Loop (IEA Task 26 generic system #2), 2003.