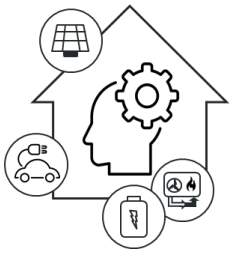
Masterarbeit

Effects of dynamic electricity price tariffs on active grid customers and smart grids

Current developments such as the electrification of the mobility and heating sectors, increasing market shares of home energy storage systems and new types of pricing models on the electricity market are changing the behavior of distribution grid customers and are thus leading to new challenges for grid operators. In the future, the electric profiles of grid customers will, in addition to the individual consumption behavior, also be influenced by time-varying price incentives (market and/or grid-oriented) and other external signals and factors and will therefor interact with the individual flexibility potentials. The topic is gaining further relevance through the upcoming redesign of §14a EnWG.



The thesis aims to further develop a model for modelling the interaction between the self-demand optimization of distribution grid customers and future smart distribution grids. The model considers flexibility potentials from PV systems, battery storage systems, electromobility and heat pumps as well as their interactions with electricity markets and incentives for grid-serving behavior (including time-variable grid charges). The model developed will then be used to investigate the effects of future electricity price tariffs on smart grids in more detail.

Main tasks and objectives of the thesis:

The existing optimization model is to be extended by further parameters and constraints and the resulting consumption behavior is to be analyzed in detail. In addition, the model is to be enhanced with an automated interface to the load flow simulation program that is being used. In addition to the existing model, models of the individual components and software tools for determining the underlying consumption time series can be utilized for this purpose.

Your Profile:

Degree in computer science or engineering or industrial engineering (electrical engineering, computer science, mechanical engineering, power engineering).

- You are interested in current research topics related to the future energy supply task.
- Knowledge of Python or C++ is an advantage.
- Basic knowledge in the construction of optimization models as well as experience in dealing with
- with object-oriented programming are advantageous

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Key Words

- Dynamic Pricing
- Smart Grids
- Active Grid Customers