



Smart Energy Suburbs

The purpose of the postdoc project is to design a system concept for the implementation of Intelligent Collaborative Demand Response in the consumer end of the distribution network, i.e.. from 10 kV and less.

Intelligent Collaborative Demand Response means, that the consumption and production sides are dynamically adjusted to each other through continuous real-time negotiation. In the negotiation is used knowledge about on going and upcoming activities and processes on the demand side to match the current consumption with the expectations of local production and the available import and export capabilities to neighbouring cells.

The use of knowledge in the form of adaptive models for the energy consuming activities and processes is an important element in the system concept, as the market has shown that solutions that actively requires consumers to participate, do not win the necessary acceptance to be common. Therefore there is a need for a transparent solution, that automatically adapts to the needs of end users.

Unlike traditional Automated Demand Response the negotiation based Demand Response ensures, that the inherent flexibility in energy consuming processes at the consumer end comes to its optimum use for Energy Load-Sculpting.

The system has made real-time negotiation possible via high-speed Internet connections that integrate Energy Management Systems (EMS) in private homes, commercial buildings, and industrial monitoring systems for decentralized production units located within the same cell in the distribution network. To deal with the large diversity of system solutions within the EMS the developed system concept is built around a Software Product Line hereby ensuring the generality of the concept.

The system concept will further form the basis of experiments with local pricing, for example bottlenecks between cells by local overproduction of energy.

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Funding:

SydEnergi

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