

7 smart energy service concepts

The determination of 7 essential smart energy services was one of the results of phase 1 of Smart Energy Collective. These services with potential business value were identified for further detailed design and demonstration. The 7 essential services can be clustered into three types: Organizing Market Access, Providing Insight and 5 Smart Energy Flexibility Services. Once these essential services are provided almost infinite new propositions may be shaped by the various stakeholders in the energy system.

The essential services will support the transition to a 'new order' of energy supply and the development of more intelligent energy systems, which is the rationale behind Smart Energy Collective. This development is deemed necessary to create more freedom of choice for consumers and 'prosumers', to facilitate the growth of electric transport, to fit in decentralized energy systems like heat pumps and microCHP as well as intermittent renewable energy sources like wind and sun.

Detailed data and real time information of flexible prices are the input for the detailed design and demonstration of both the essential services that provide access to the market and insight:

Market

1. Organization of access to the market

The aim of this service is to organize the market for smart energy services. This market organizes selling and billing between all stakeholders. Organizing the market may be a precondition for several other services, and it may also be a stand alone service.



Insight

2. Provide the stakeholders with insight and information

The aim of this service is to give greater possible insight to smart energy services. This insight might help to influence people's behaviour, resulting in another profile of the energy demand and possibly lower energy consumption. Giving insight gathers data and translates all these data into information. Providing insight could be a precondition for other services, and it may also be a stand alone service.

Data, prices, market access and insight on their turn, are the input for the detailed design and demonstration of 5 types of Smart Energy Flexibility Services that meet more specific needs:

Smart Energy Flexibility services

3. Demand response smart appliances

Demand response (DR) refers to shifting demand for energy in response to certain incentives, mostly supply conditions. The objective of this service is to use maximum flexibility in the energy consumption of customers by use of smart appliances. Smart appliances are all appliances that may react automatically on the supply conditions (e.g. with price incentives) given, e.g. smart washing machines, dimmable lighting and cold stores.

4. Demand response electric vehicles (EV)

This service is similar to the service above, and now the demand response is applied to the charging of electric vehicles. This service is about home charging as well as public charging. The latter service takes fast charging facilities into account. As

demand response for EV has to take into account other preconditions than demand response of smart appliances (mobility requirements of end users, vehicles that may charge at different locations, charging stations at home, and also 'stand alone' charging stations directly connected to the grid), therefore this service is considered as a separate service.

5. Manage local generation

The aim of this service is to manage the energy generation of local generation units in time to supply flexibility in the supply of energy. This may be done to match local demand and supply, and also to hit high prices in the energy market. This service is mainly interesting for microCHPs, miniCHPs, CHPs and backup generators. This service may control local generation automatically, and may also include propositions which stimulate local generation at certain locations.

6. Manage local storage

The aim of this service is to use storage either to match local demand and supply or to control peaks in demand and supply. Storage may be applied for different interests of end users, grid operators or suppliers.

7. Energy management

Energy management services are defined as those propositions or advices to improve energy usage as well as to save energy. Examples are minimization of costs for the end user or optimization of the local infrastructure.

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