Prosumer market design

Session organizer

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Abstract
As consumers are becoming more active participants in the electricity market, the design of retail markets needs to be adjusted. Real-time meters, roof-top solar PV systems, electric vehicles and home electricity storage systems are a few of the innovations that are making it possible for consumers not only to become more active in the market, but also to reduce their environmental impact. The flat rates for electricity consumption that were used in the past clearly no longer suffice, but it is not yet clear what is an efficient and effective design of consumer markets. Should consumers be exposed to real-time prices or is this too complicated for them? How should rooftop solar energy be remunerated? How can we avoid substantial investment in home batteries for the sheer purpose of avoiding levees on the energy price? In this session, empirical knowledge of prosumer behavior and market design expertise will be brought together to discuss the pros and cons of alternative market designs.

Presentation 1

Flexibility Mechanisms including Net Metering

Author: Sebastiaan Hers

Presentation 2

Examining the influence of in-home displays on residential energy consumption patterns

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A major challenge of the current electricity grid is the 'triad of anonymity,' between utilities, consumers and embedded energy practices (Summerton, 2004). Advanced metering infrastructure (AMI) or the smart grid, brings new opportunities to reduce this anonymity. In particular, real-time data from smart meters can provide households with consumption feedback, while also providing utilities with increased knowledge of consumption practices. But

how can AMI influence residential energy cultures (Stephenson et al., 2010)? In order to develop a smart energy culture, households need to be properly engaged with smart metering data. One method of engagement is through In-Home Displays. One case study in Ontario, Canada can bring insights for policy and program development for engaging households with real-time smart metering data. In-Home Displays (IHDs) were installed within 5275 households in Ontario. Utilizing 2 years of hourly consumption data for the 5275 households compared to a control group of 3022 households allowed for assessing the households' load shape profiles as well as thermal archetypes, and separating them into different 'sub-cultures' of consumption using clustering methods. This paper aims to answer: what can smart meter data convey about residential energy cultures and sub-cultures? Do different sub-cultures of consumers respond differently to real-time feedback? What do policy-makers need to take into consideration when designing smart meter feedback policy/programs? Overall, this case study provides insights into the effective use of smart meter data for targeting consumers, designing effective programs and establishing a smart energy culture alongside the introduction of AMI.

Presentation 3

USEF, the market coordination mechanism for demand-side flexibility

Author: Elke Klaassen