

Adoption Potential Estimation for Smart Metering in Flanders

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Introduction

Smart grids are the electricity network of the future, allowing an intelligent monitoring and/or controlling of electricity streams. By the implementation of metering technologies, such as smart meters, which allow to record the consumption of a household and allows a two-way communication between the household and the utility, households can be made more aware of their energy consumption and thus encouraged to control their environment more efficiently. Indeed, research has shown that feedback on energy consumption can aid households to reduce it significantly. However, often neglected in this debate, is the motivation or barriers of consumers towards new ways of energy consumption and energy management. This article tries to fill this gap by applying a user centered approach, both when it comes to the assessment of adoption potential for smart metering technologies and consumers' motivations or barriers.

Method and results

To obtain this goal, we conducted a representative survey with 1314 respondents in Flanders, Belgium, both offline and online. A segmentation on ownership of, attitude towards and adoption intention of Home Energy Management Systems was performed on the data. Traditional approaches of intention surveying often result in an overestimation of the innovation adoption potential. To overcome this problem, the Product Specific Adoption Potential scale (or PSAP-scale) was used.

This PSAP methodology (De Marez, 2006) calibrates the respondents into adopter segments based on their answers to 3 questions gauging for their adoption intention of both optimal and suboptimal product offerings of an innovation. 6 segments were found. These segments were labeled "Current Owners", "Innovators", "Early Adopters",

"Early Majority", "Later Adopters" and "Out of Potentials. For each of these segments the ecological attitude and the energy efficient behaviour was measured. The most important conclusions regarding the ecological attitude were that Current Owners, although very aware of their energy consumption, don't do this out of ecological beliefs. This result fits in the rational profile of this segment. Nonetheless, overall a moderately positive ecological attitude could be seen in Flanders.

Ten use cases were provided to these segments in order to identify their interest in Home Energy Management Systems and to familiarize them with some of the possibilities of smart metering. Use cases are defined as possible applications of a Home Energy Management Systems. The general conclusion of the analysis of these use cases was that besides the general information about their energy consumption (such as graphs and other visualizations) people also want to interact with their data and get personalized information. Two use cases that received reasonable interest were "receiving personalized tips based on your personal energy consumption data" and "setting goals to save energy in the future". Only a small part of the sample already uses software/tools for the monitoring of their energy consumption. The biggest drawback they mentioned was the effort that was necessary for putting in their meter readings. Another drawback was the lack of detailed information that the users experienced. Nevertheless, these two problems can be solved with Home Energy Management Systems.

Discussion

Especially financial benefits were found to be great motivators for inducing energy efficient behavior. However, personal comfort can be something of a limitation on this. The respondents seemed to be somewhat distant towards giving up some of their

comfort in order be more energy efficient.
Consequently, this is a topic which certainly
needs more study.