Cost-Efficient Steps towards more Sustainable Energy Systems: Behaviour Change in Demand-Side Management and Smart Living

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Abstract

A new work of the International Energy Agency (IEA) concentrates specifically on energy end user behaviour change. There is a great opportunity for Demand-Side Management (DSM) programmes if this potential (to be as vast as 30% of total energy demand, estimated by Gardner and Stern, 2009) could be easily accessed and directed. However, as many other IEA DSM Tasks have discovered, the 'market failure' of energy efficiency is often due to the vagaries of human behaviour and choice. The best ideas, policies and programmes have been shown to fail again and again in achieving their desired outcomes. The current social norm is still not to see energy saving behaviour as a major priority in achieving a transition to a sustainable energy system.

There are several reasons for these challenges and this new Task sets to uncover, unravel and define them in order to provide clear recommendations to policy-makers and DSM implementers (cf. Abrahamse et al., 2005). One of the main challenges is that humans are often still regarded as economically rational actors whose behaviours can be influenced by fiscal incentives alone. However, the complexities influencing human behaviour are so vast and manifold that such simplistic approaches almost invariably fail. It is imperative to uncover the context-specific factors (from infrastructure, capital constraints, values, attitudes, norms, culture, tradition, climate, geography, education, political system, legislature, etc.) that influence human behaviour in specific sectors (the factors that influence our transport behaviours often differ from the ones driving our hot water usage, for example, cf. Scheuthle et al., 2005).

In addition, there is a large variety of research disciplines that endeavour to study human behaviour (social and environmental psychology, environmental and behavioural economics, anthropology, science technology studies, practice and innovation diffusion theory, etc.), each with their own models and frameworks, advantages and disadvantages. Unfortunately, they usually do not communicate well – not with each other and not with the end users of their research – the policy-makers and DSM programme designers and implementers. This leads to confusion and lack of context-specific programme or policy design that is based on the best behavioural information or models.

Another crucial issue relates to monitoring, understanding, learning about and adapting initiatives in a more systematic manner. There is a real and urgent need for analysis of context factors influencing DSM and for robust and concrete evidence on the contribution of DSM to a more sustainable energy system. First results of the research towards an inventory of contextual factors influencing effectiveness of DSM programmes, identified key approaches of resolution and shared learnings and best practices within the IEA work will be presented in this paper.

Why is there a special need to focus on behavioural change?

Governments struggle with achieving their targets (often set in legislation) towards developing low carbon regions in Europe, i.e. sustainable energy systems. There is now a growing international realisation that technological development (i.e. renewable energy supply) will not be sufficient to meet those targets. Energy efficiency and energy conservation have gained renewed interest due to climate convention commitments and the rising concerns about prices and security of supply of imported fuels (Allcott & Mullainathan, 2010). They are the cheapest, fastest and most feasible ways to meet climate change mitigation targets (as well

as many other environmental objectives). Concern for security of supply and 'peak oil' and other resource shortages have added to the urgency of energy conservation. In addition, supporting research in energy efficiency is contributing to the European objectives in resource efficiency (EC, 2006). Today, energy efficiency is promoted under a variety of headings, including climate change mitigation, sustainability, eco-efficiency or energy self-sufficiency.

Recently, DSM programmes are increasingly acknowledging the untapped potential of changing the patterns of energy consumption by focusing on end-user energy demand reduction through behavioural changes (Emmert et al., 2011; IDEA, 2009; Mourik et al., 2009). The potential of behavioural change (peak-load shifting) is, for example, one of the important elements of the business case for an economically viable roll-out of smart meters and thus contributing to smarter living (Faruqui et al., 2010; Servatius et al., 2012).

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