

# Introduction to Panel 8

## Dynamics of consumption

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### Introduction

Energy consumption is not only the “end of the chain” of energy production and energy efficiency. It has its own logic and its own dynamic. Energy consumption is not stable, defined once and for all or in any way taken for granted – that is why the dynamics of consumption continue to be central when we discuss energy efficiency. We need to know more about how and why people consume energy if the potential for energy savings by efficient technologies are to be achieved in real life. More knowledge of the dynamics of energy consumption is decisive both when designing policy programs for energy efficiency and when developing more energy efficient technologies, buildings and systems. The papers presented in panel 8 this year thus illustrate the diversity of actors, approaches and scales that can be applied to the topic of “dynamics of consumption”. This is why the presented papers propose not only an analysis on how and why different types of people and households consume energy, but also on how people interact with technologies and systems as well as how they react to policy initiatives.

A transversal reading of the papers proposed in this panel points out some key issues that we'd like to debate during the sessions. This relates first to how households and individuals can be studied and in different ways be made objects of analysis. Secondly focus is also on how not only households and individuals but also objects and services are relevant objects of analysis, e.g. new smart technologies may contribute to the distribution of agency from human beings towards technologies and systems. The third issue goes beyond the micro-oriented perspective and also includes mezzo and macro perspectives on differences in energy cultures and regimes, whereas the last issue deals with how civil society and public debates influence the dynamics of consumption.

### Households, individuals and practices as units of analysis

Some of the papers take households/individuals as the unit of analysis, and thus show that analysing the practices in depth is a really fruitful way to understand the background conditions for households' energy practices, decisions and consumption. Wilson et al. (8-371-13) for instance describe how decisions on home renovation take shape and emerge from the background conditions of everyday domestic life of the households. The paper by Gnoth (8-469-13) in a parallel approach focuses on the periods of the individual's life when energy is an issue or not, and the study finds that past experience, life stage and differences in perceived comfort levels in a new dwelling can have considerable influence on the types of energy-related changes that occur after moving home. Karresand (8-013-13) focuses on household activities and her results show that activities may be carried out in very different ways, and they may result in more or less electricity use depending on the resources and restrictions that apply to the different households.

Examining how new tendencies in demographics as the ageing population and the declining households size is influencing energy consumption, is highly relevant from a planning perspective. Deutsch and Timpe (8-053-13) thus wonder if age, all else being equal, influences the level of the households' energy consumption, and they point out some of the methodological challenges involved when studying this. Huebner et al. (8-398-13) similarly focus on the ageing of the population together with declining household size in the structure of energy consumption for heating, and their data analysis also includes detailed daily temperature profiles.

Energy efficient technologies are one of the strategies used to reduce energy consumption; however, it is well known that the rebound effect, due to behavioural changes, renders the actual

observed energy savings lower than those expected from engineering analysis. As shown by Dütschke et al. (8-082-13) who focus on residential lighting, the rebound effect is often only treated in an economic point of view, but needs to be extended to a psychological and social perspective. The rebound effect implies that people use more energy, e.g. get higher norms of comfort, when they have more energy efficient technologies. The prebounced effect has also recently been introduced, implying that people living in inefficient houses often use less energy than expected because they adjust their comfort to the poor building conditions. Allibe et al. (8-316-13) advocate including elements of realism in the bottom-up models which use technical descriptions to model energy consumption.

Studying the relationship between energy and the body could be a way to link the micro, mezzo and macro-levels of analysis, and also the individual and systemic approaches as shown by Wilhite and Wallenborn (8-132-13). In their paper they develop the idea that not only agency but also memory are distributed between body, mind and the material objects that are integrated in the performance of a practice.

### Distribution of agency between actors, objects and services

Some of the papers in panel 8 analyse the distribution of agency between individuals/households and objects or services, in particular those dealing with smart technologies, displays and offers implemented in experimentations or the real market. Topouzi (8-313-13) studies low carbon houses, and shows how designed and installed technologies influence how active or passive the users become. Behar and Chiu (8-502-13) similarly focus on the relation between householders and building technologies and they use theories of domestication to explore how people relate to and learn to use new technologies. Beillan and Goater (8-094-13) focus on households which produce energy themselves with PV's and they show that producing electricity can be a way, for some consumers, to become more active in the energy transition and to take part in local energy challenges.

Smart grids are high on the utilities agenda at the present time and households are assigned a key role in these changes, as described by Haunstrup Christensen et al. (8-297-13). This paper uses a comparative study of three countries to explore how country-specific factors influence the conceptualisation of households' role in the future smart grid. In addition, variable tariffs to persuade people to change their load are nowadays high on the agenda. In the paper by Darby and Pisica (8-318-13) focus groups are used to discuss the general principle of time-varying pricing, including a static time-of-use tariff, critical day pricing, real-time pricing, and capacity charging/load-capping. Another element introducing load management in households is smart appliances. Stamminger and Anstett (8-020-13) analyse households equipped with smart appliances and show how much flexible tariffs are able to influence the operation of household appliances (washing, drying, ironing the laundry and dish-washing) towards a flexible demand. With the introduction of smart meters, many different types of feedback to consumers become possible. In the survey based on 10,000 households and presented in the poster by Pyrko (8-381-13), an evaluation has been made on how much electricity could be saved according to different types of feedback.

All these papers have in common the variation and diversity of acceptability of these new offers among consumers. Some likewise explore how these "displays" are built and which role is given to households: are they really considered as active people, do they really have a choice, are they economic agents, what is the influence of their culture? More globally, Labanca and Bertoldi (8-078-13) wonder if we are in the "age of systems" where humans and non-humans do not only co-exist but cooperate and co-evolve.

### Differences in energy cultures and regimes

Where many of the papers in panel 8 analyse energy consumption at household level, some papers argue that households are also influenced and could be analysed within broader social and cultural aspects at national or regional levels. Heidenstrøm et al. (8-164-13) thus compare differences in energy cultures between Denmark and Norway and discuss how this may influence norms of comfort and the use of heat pumps. Not only are households responsible for energy savings, energy efficiency and energy consumption, also the supplier side of the chain which influences consumption. Blumstein and Taylor (8-203-13) thus raise the question: How could supplier strategy issues help to explain the observed "energy efficiency gap" between the privately optimal energy efficiency of goods and services and their actual energy efficiency? The market side and the intermediaries shape the offers and the implementation of energy policies as analysed by Maneschi (8-420-13) who concludes that research dealing with energy consumption should not limit itself to study factors and practices determining energy consumption at the user level, but should include the interactions of energy users with other actors and how these may define energy consumption. Similarly Brown et al. (8-030-13) include all the chain of actors involved in the process of implementing energy efficient technologies in the UK social housing stock. The end-users are the end-chain actor and do not have so much choice in their decisions, not only because of their own constraints, but also because of the way the market and the system are built.

### Civil society and public debates

The market and demand side are not the only part of the system. Policies and politics are of course linked and engaged with energy efficiency and energy consumption. Civil society plays a role in developing concrete actions, for example community actions, which two of the papers presented in panel 8 deal with. Martiskainen (8-290-13) compares different community energy projects, and concludes that their successful development is often due to several factors including dedicated leaders, external funding sources and the ability to seek new information. Jensen (8-287-13) in her paper studies shared conventions for efficient lighting and emphasises that even though practices involving light may be socially reproduced across time and space, also some patterns related to *performing* social practices seem to differ due to particular living arrangements in communities.

Furthermore, the public debates on energy merge political opinions and values to create diverse public opinions on energy issues as described by Brugidou and Escoffier (8-134-13). Collective actions can therefore have an impact, maybe on prac-

tices but surely on values and opinions as described by Olexsak and Meier (8-011-13) in their poster evaluating the impact of the Earth hour.

### **Opening the box and observing the tangled threads**

Questions of consumption and the human dimension have been important issues since the eceee Summer Studies started. In the first eceee Summer Study in 1993, one out of its five panels was on the “Human dimensions of energy use and conservation”, and since 1999, the eceee Summer Study has featured a panel on Dynamics of Consumption. These panels have in different ways throughout the years been dealing with how

to open the box of energy-related behaviours and practices. Researchers who present papers in panel 8 this year demonstrate that the box still contains lots of strongly linked tangled threads. More knowledge comes from this year’s papers, regarding some of these threads and the nodes they make when relating together. At least three ways to analyse this box and its contents are developed and presented in different papers: how to untangle the threads, to better understand some of them; how to observe the nodes and the links between threads; and how to participate in knitting these threads in a new way. We hope that the discussions during the panel 8 sessions will contribute to this collective hand- and mind-work that needs lots of patience and meticulousness.