

Introduction to Panel 1

The foundations of future energy policies: Initiating change and breaking walls

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Introduction

Reducing energy demand sustainably. Here we are in 2009. All of us are in the same boat as social, political, economical or scientific *actors*: the energy field community – producers & suppliers, researchers, stakeholders and players (new and old) and policy-makers – as well as people, both citizens and consumers.

Managing the transition from our high-intensive energy production and consumption modes towards a new low-intensive Energy Society remains a major challenge. This said, and as demonstrated by a persistent energy-efficiency gap, what we have at hand is a complex and demanding matter. Obviously, energy uses are at the heart of our social organizations and daily life. They are the corners stones of our – so-called – *modern* societies. Imagine hospitals without scanners, industries without electricity, teenagers without their mobile phones, and social networks without the Web.

Still energy is too often taken for granted and treated casually. In Europe, as in other parts of the planet, it is seen as abundant, inexhaustible, inexpensive and benign. An absolute *given*: Energy *whenever and wherever needed and required*. It is so closely linked to our lifestyles, as well as to the performance of our organizations, that we forget that it is a rare and scarce resource. Europe will have to compromise on this. Without leveraging on the energy demand-side, we will not be able to achieve this lower-intensive energy society.

ECREE 2009 Summer Study's Panel 1 precisely addresses this major challenge – *Reducing energy demand sustainably* – particularly focusing on the foundations of future energy policies and related scientific issues, as well as on possible solutions, in all their complexity. Both are intimately linked. Improving current policies and imagining future ones demands restructuring

the imagination itself and seeking the ideas required for *initiating change and breaking down the walls*.

Energy policies possess a convenient quality: they can be dreamt of and sketched out, as well as conceptualised, put into perspectives and, at times, re-framed and improved. In other worlds, they are *forgeable*, a useful property for those who innovate. This capability must be better exploited by all. However, confronted with the *real world* and its realities, energy policies may fail to achieve their goals, be ignored, circumvented; generate non-desired side effects and so forth. We should stop and think about this.

Panel 1's papers give evidence of the complexity of these dimensions, multiple realities, potential solutions, as well as the diversity of approaches, thinking, conceptual and operational tools required to move forward. The authors confirm the need for a breath of fresh air and innovative work. **Sessions 1 & 2** focus on the benefits of energy efficiency. Many direct and indirect benefits of energy efficiency do exist (even if sometimes difficult to evaluate). However, these benefits, as well as the efforts made by many professionals in the field, are not sufficient: they often fail to convince economic actors to make the decisions needed to fill in the under-investment in energy-efficient technologies (better known as the «energy efficiency gap»). This situation questions the validity of dominant approaches and conventional decision-making models, as it is highlighted in **Sessions 3, 4 & 5**. In these sessions, authors plead for more *de-compartmentalized* approaches and for a stronger integration of non techno-economic dimensions, especially social actors and surrounding context, to better understand the drivers of energy demand. Still some programs based on conventional economic approaches do work – or could work – as described by the

authors of **session 6**, dedicated to some successful negawatts experiences. **Session 7** addresses the issues more closely linked to markets transformations. The authors analyse what we can learn from current markets and explore possible solutions. **Session 8** broadens the scope of energy efficiency by showing how it can positively bridge energy, climate and development issues, and by introducing the new concept of a global energy governance framework, whereby the public and private sectors of an economy, decision-makers and implementers, using political authority, institutions and resources in an integrated way, are aligned to achieve improved energy efficiency.

S1 – Energy efficiency benefits (part I)

Sofia Simoes, Júlia Seixas, João Cleto and Patrícia Fortes (1294) address the interactions between energy supply and demand side policies, by estimating the gains of end-use energy-efficiency & renewable applications, using the Portuguese energy system as a case-study. Through four different modelling scenarios, they show the positive effects of energy efficiency demand-side measures in terms of avoided electricity generation installed capacity, final energy consumption, share of renewables in final energy and, finally, of reductions of greenhouse gases emissions. **Diana Ürge-Vorsatz, Aleksandra Novikova and Maria Sharmina** (1316) discuss the important question of the non-energy benefits (generally labelled as co- or ancillary benefits) of efficiency policies. Although several studies attest that these benefits often amount to more than the direct energy benefits, they are rarely monetized and included in cost-benefit analyses. The authors provide a taxonomy of the various non-energy benefits, summarise the various methodologies applied for their quantification and, finally, offer equations on how different co-benefits could be integrated into a more holistic cost-benefit and/or cost-effectiveness assessment.

S2 – Energy efficiency benefits (part II), players and field of intervention in Europe

Stefan Lechtenböhrer, Stefan Thomas and Christoph Zeiss (1019) show that the 20% energy savings target set in the Action Plan “Doing more with less” in 2006 is still the most significant strategy element within an ambitious EU climate and energy strategy. They also show that a strong energy efficiency strategy entails the important co-benefit of the achievability of the targets of the EU RES directive. However implementation is significantly lacking in the EU, in almost all fields of energy efficiency. The authors make an analysis of the current weaknesses of EU energy efficiency policy and derive recommendations on how the EU can still reach its targets for 2020. **Eva Heiskanen, Mike Hodson, Tiit Kallaste, Petra Maier, Simon Marvin, Ruth Mourik, Samuli Rinne, Mika Saastamoinen and Edina Vadovics** (1408) discuss the diverse ways in which new energy intermediaries in old and new EU member states are working to promote energy efficiency. They describe in particular how the promotion of energy efficiency has broadened to include a broader ‘climate’ or ‘sustainability’ agenda. The authors conclude that hosting energy efficiency under such a broader agenda doesn’t solve all the problems in promoting energy efficiency: energy efficiency can remain just as ‘invisible’ as it has always been, and can even be sidetracked from

the core of the programmes. **Katie Lindgren and Lars Nilsson** (1259) describe the challenges for ESCOs in transforming the “efficiency gap” into a viable business. Today Sweden’s ESCO market is booming: mutual trust between companies and customers has grown, leading to increased experience and comfort with energy services. Even so, lack of knowledge remains a significant challenge for developing savvy consumers of ESCO services who understand how to negotiate contracts, use new equipment, and align occupant behaviour to maximize the energy savings potential.

S3 – Constructing consumers: beyond economic rationality

Åsne Godbolt, Henrick Karlstrom and Knut Sorensem (1061) set out a reflexive reading of the ways policies are shaped and constructed. The authors focus on the way household consumers have been perceived and how Norwegian policy-makers, through a period of 30 years, built a “rendering” of the consumer itself. They show how the non-effectiveness of energy efficiency measures to some extent was the consequence of these renderings and plead for a broader spectrum than an exclusive economic-focused one. **Robert Passey, Regina Betz and Ianin MacGill** (1166) argue that end-users behaviour is far more complex than the focus of policy usually claims: actually, it seems to be heavily influenced by the *broader social context* (BSC) in which people live. Based on the Australian example, the authors explore more specially one of the BSC’s components, the “*infrastructure of provisions*” which appears to have an especially strong influence on end-user’s energy consumption. They conclude with the necessity of going beyond the simple price and information signals to drive uptake of EE policies. **Adrian Muller** (1083) explores the ethical foundations of the concept of *sufficiency* in the context of liberal societies. He suggests that *sufficiency* based on the moralization of actions can be understood as the boundary conditions for social justice that come with notions of liberal societies, in particular not to harm other people. According to his argument, he claims that to increase *sufficiency* is a duty beyond individual choice.

S4 – Non-economic drivers of economic decision-making

John A. ‘Skip’ Laitner, Karen Ehrhardt-Martinez and Vanesa McKinney (1367) highlight the potential impact of changed habits, lifestyles and technology-based behaviours in terms of potential energy saving within the US residential sector. Specifically the authors explore the potential of energy savings along what they call a *Behaviour Energy Response Continuum*, dealing with the different behaviours that may affect energy consumption, beyond economic rationality. **Catherine Cooremans** (1393) proposes a review of the literature rooted into organizational finance, strategic decision-making and technology investment, in order to escape from the fruitless debate on energy-efficiency investments profitability, as well as to suggest new ways to consider and influence decision-making. By doing so, she shows how a better understanding of corporate investment decision-making may enable to design more effective public policies. **Agneta Persson, Anders Göransson and Erik Gudbjerg** (1080) set out the results of a Swedish study

on quantifying parts of the energy-efficiency gap, focused on the building sector. Consequently, the authors address the issues anchored into disciplinary fields and visions deriving from engineers and economists and plead for a more open dialogue between both of them.

S5 – Cultural shifts, behaviours and social rationality

Karen Ehrhardt-Martinez and John A. ‘Skip’ Laitner (1350) question the underlying assumptions of most current policies, which model potential energy savings as a function of existing technologies. They explore the ways in which individual behaviour is shaped by the social context and present an alternative framework for modelling efficiency behaviour based on social rationality and related-dimensions, considering people as *social actors*. **Isabelle Moussaoui** (1054) also proposes to plunge into the complexity of energy-related behaviours to help shaping and framing differently policies. She argues that energy efficiency, products and activities are socially embedded and that they especially depend on the constructed “social age” of people as well as on the generation they belong to. Using UK micro generation as an example, **Noam Bergman** (1029) demonstrates that a major cultural-behavioural shift is needed to reduce energy-related CO₂ emissions in the home. Pushing further the argument, he revisits classical theories on the diffusion of innovations to suggest a more systemic and comprehensive understanding based on the complex *transition theory* and related *niche theories*, providing ideas toward a new and more relevant paradigm.

S6 – Valuing and promoting negawatts

Paolo Bertoldi, Silvia Rezessy, Vlasia Oikonomou and Bigna Boza-Kiss (1235) explore the rationale behind and the possible functionality of a feed-in tariff for energy savings, in the form of a fixed financial incentive based on the kWh saved by the end-user. They present various conceptual issues related to design, operation and infrastructure of such a scheme, and to its potential key advantages and complexities, giving examples of similar policy tools implemented or planned. **Cheryl Jenkins, Chris Neme and Shawn Enterline** (1313) describe the Forward Capacity Market (FCM) recently established by ISO New England, the authority overseeing New England’s bulk electric power system and wholesale electricity markets. Under the FCM, ISO New England projects the needs of the power system three years in advance and then holds an annual auction to purchase the resources needed. This market is unique in that it allows energy efficiency and other demand resources to compete directly with generators. After examining the experience, trade-offs and benefits involved in ISO-NE FCM, the authors conclude that the program has resulted in a highly visible platform for the advancement of the policy perspective of energy efficiency as a resource. **Katherine Johnson, Michael Volker, Wade Shimoda and George Willoughby** (1253) compare new programmes, set up by two American utilities, which provide renters and landlords the upfront capital as a way to overcome the split-incentive barrier in the residential rental market and encourage investment in energy efficiency improvements. They conclude that these programs are effective, especially when they

are narrowly focused on the rental housing market rather than all home owners and when they focus on installing measures that have short paybacks.

S7 – Housing market transformation: fostering and hindering factors

Constant Van Aershot and Dominique Glachant (1413) report the research carried out by the Energy Efficiency in Buildings (EEB) Project between 2006 and 2009. They submit a new model designed to simulate decision-making in the building sector. This model aims at identifying the mix of financial, technical, behavioural and policy options that could achieve dramatic cuts in buildings energy use. Using as an example diverse sub-markets from two national cases (China and France), they specify six key measures necessary for a substantial progress towards zero net energy building. **Tina Fawcett and Brenda Boardman** (1387) review the challenges and examine the extent to which the well-known *market transformation theories* work for the housing sector. To this effect, they draw a comparison between how the market transformation worked for light and appliances and for the emerging market transformation strategy for housing, looking closer at to the *Energy Performance Certificate* measure. Most of the examples are from the UK but can be transformed into general principles. **Véronique Beillan, Emanuelle Cayre, Aurélie Goater, Pia Laborgne, Andreas Huber, Regine Trotignon, Ulrich Rochard, André Pouget and Dusan Novakov** (1117) analyse the key factors for allowing the offer of low energy buildings to meet successfully the demand of the households. Therefore, they used a qualitative and cross-cultural comparative approach among three European countries: France, Germany and Switzerland. Main results show the role of the *meso* actors like housing professionals, associations and local communities, as well as the importance of regulation and constructed standards to be taken into account in future policies.

S8 – Energy efficiency: broadening the scope

Nikolaus Supersberger, Stefan Lechtenböhmer, Dieter Seifried and Saeed Moshiri (1060) examine the Iranian energy system, pointing to important inefficiencies in infrastructures and a soaring electricity demand, which threat the Iranian capacity to export oil and gas, as well as the local environment and the global climate. Using a bottom-up modelling approach, the authors highlight the large Iranian potentials for energy saving and efficiency and show how Iran, but also the international community, would benefit on various levels from a more energy-efficient Iranian economy. **Sandrine Mathy and Céline Guivarch** (1335) argue that the purely climate centric approach of the Kyoto system induce irreconcilable contradictions for developing countries between climate change mitigation and economic development. Taking the example of the Indian energy system, characterized by a high dependency on imported energy and a structural electricity shortage, the authors show how an alternative strategy, based on the research of synergies between economic development, energy efficiency and climate issues, enables to drop down the transition costs beard by developing countries in mitigating GHG emissions. **Nigel Jollands and Mark Ellis** (1086) contend that the energy

efficiency potential within an economy will not be maximised without understanding the complete governance framework, whereby the public and private sectors of an economy are aligned towards energy efficiency. They term this framework 'energy efficiency governance', defined as the "use of political authority, institutions and resources by decision-makers and implementers to achieve improved energy efficiency". The authors explore this very new topic and present a description of the IEA governance programme of work.

Short papers

Successful innovation requires experimentation and confrontation to multiple realities and socio-cultural contexts. Short papers presented during the Poster's Session all represent stimulating examples of this multiplicity and promising experiments.

Vasco Ferreira, Luis Alves and Pedro Ferreira (1265) present TV ENERGIA, a Portuguese Web TV dedicated to involving the public and the business community in energy issues, and induce social change by promoting more sustainable behaviours and the use of more energy efficient technologies. TV ENERGIA uses Web 2.0 capabilities, video and existing

social networks as the main tool for reaching and interacting with the audience.

Oliver Wagner, Kurt Belo and Anja Biewirth (1055), set out the example of a fruitful cooperation between local authorities of the city of Bad Hersfeld (Germany) and researchers from the Wuppertal Institute. Together, they both compiled a climate protection concept rather ambitious for a city of this size, including a range of practical and accompanying measures. Their experiment suggests that some of the results may be transferable to other cities and towns.

Wiktorija Glad (1002) submits an example of the ways ideas and concepts travel across national boundaries, become a reality in new organizational contexts and are implemented in new local settings. Based on a 10 months ethnographic fieldwork focused on the *Carlton and United Brewery Site* (CUB Site), Australia, the author discusses her results and their possible implications for policies.

Ola Larsson (1263) reports the results of a Swedish project aiming at identifying and quantifying energy-efficiency measures capable to reduce carbon emissions and primary energy use in Sweden. One important result is that the highest cost-efficient measures are to be found on the supply side rather than on the demand side of the energy system.