Introduction to Panel 2 Current energy efficiency policies: On stage and backstage

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Introduction

Why bother discussing policies for energy efficiency? Hasn't everything been said? Isn't there the ever-recurring triad of regulatory policy, financial incentives, and information instruments – and that's it? Aren't there a thousand of reports about specific instruments around, and a good half-dozen of theories of why policies develop the way they do?

Yes – and no, not at all. The papers in panel 2 offer many a fresh look on policies.

In the "Designing policies" section, there are two types of papers. A more analytical set offers refined accounts of how policies develop and can be developed, heavy with empirical evidence. A more descriptive set takes us round the globe, shedding light on countries that have often just recently begun to discover the potential of energy efficiency policies.

In the "issues" section, we encounter actually new phenomena – or at least, new to the discussion. Smart grids. The advent of energy poverty to the political agenda. What will they do to energy efficiency – or what can energy efficiency do with them? But also when dealing with an established issue such as appliances, we can see how new insights can be gained from examining backstage processes, assessing impacts, or evaluating compliance.

Then, the section on the usual suspects – financial incentives, information instruments, and public procurement. They present a creative array of how basic ideas, such as loans, grants, or market overviews, have to be moulded and fine-tuned, adapted to the specific situation and target groups to reap most benefits – how not only the devil, but very much the success, is in the details. Or else, they provide us with timely and insightful evaluations of the workings of instruments that have been around for only a short time – such as white certificates. And some of them attract us with a distinct "backstage" view, revealing hidden processes and influences in policymaking.

And finally, what's so stimulating in discussing the greening of cities? Easy: Energy efficiency policy is about complexities, about dealing with a web of entangled actors, challenges, rules and infrastructure. The local level provides a laboratory for dealing with these complexities we are more and more becoming aware of.

We hope the readers will enjoy discovering this collection of fresh looks onto the ever-important question: How will we carry energy efficiency further?

DESIGNING POLICIES

So we want a low-carbon society? Where do we start? The big picture is provided by Nan Zhou *et al.* (2-120): they use a China End-Use Energy Model and propose scenarios to design medium and long-term policies, understand major trends in global CO_2 emissions and possibly contradict preconceived ideas. Robert Passey and Iain MacGill (2-077) propose a framework identifying the characteristics of energy efficiency policies that affect their likelihood of introduction and their robustness against adverse changes during the policy development process. They confront their framework to various Australian case studies and suggest governments can set up strategies for a successful policy development process. Sara Pasquier and Alan Meier (2-416) specialize in the design of emergency demand side responses. Looking at post-2005 electricity shortfalls in Alaska, Chile, New Zealand and South Africa, they propose to first analyse the context of the electricity shortfall and implement a corresponding robust package of demand-side measures to mitigate the shortfall. Entering the programme level, Jan Rosenow (2-024) analyses

what are the drivers for the design of energy efficiency policies and the conditions for policy changes. He confronts three major policy theories to two examples of successful policies: the energy efficiency obligations on energy suppliers in the UK and the low interest loans and grants for energy efficiency measures in Germany. Violeta Kogalniceanu (2-118) also uses a country comparison to confront declared priority for energy efficiency to policy implementation – often too slow – in the Western Balkan area. She highlights the importance of the institutional framework and the price signal compared to the legal framework in order to implement coherent, long-term policy measures with a significant impact. Exploring the backstage design, Nora Smedby (2-482) provides an analysis of the outputs of the PRONUREE programme in Argentina focusing on the existing stock of residential buildings. She proposes an interesting assessment of transparency and administrative burden in the design process, which may explain why the programme output has been limited so far. Sven Ernedal and Enkhtuya Gombosuren (2-229) present an on-going international cooperation project in Mongolia, showing how German and Mongolian authorities can work together on energy policies.

POLICY ISSUES

Boosting efficient appliances

There are several ways to act on the appliance market, which needs a full tool box to deliver more energy efficient models. Steven Nadel and Andrew deLaski (2-098) propose an exhaustive review on how the US appliance efficiency standards were negotiated. They underline each stakeholder's perspective and review the creative compromises that can be made in order to reach an agreement. Focusing on electric water heaters in Australia, Sara Williams and George Wilkenfeld (2-173) analyse not only the way decisions were taken (for standards, rebates, etc.), but also their impact (through a model-based analysis) and which additional strategies are needed to help the users achieve the maximum energy saving potential. Corinne Faure *et al.* (2-461) explore the reasons for retailers to comply with labelling requirements, using an econometrical confrontation of a theoretical model to a large sample of products and shops. Margaret Taylor *et al.* (2-088) explore how environmental protection goals can be reached by creating good conditions for stimulating innovation on the manufacturing side. They develop an innovation metrics to help decision makers understand the backstage of innovation, and apply it to the refrigerator case in the USA.

Energy poverty

Despite a long tradition in the United Kingdom, the fact that energy efficiency policies are entangled with social issues has only recently begun to receive wider international attention. "Energy poverty" is now becoming a policy issue and its relationship to energy efficiency a research problem. François Grevisse and Marie Brynart (2-478) compare statistical data from seven European countries, highlighting the variety of definitions, phenomenology, causes, consequences, and structural contexts of energy poverty as well as the impact of this variety on possible policies. They suggest a relative definition of energy poverty by setting a nation-specific threshold for the share of the income allocated to energy. Jean-Sébastien Broc *et al.* (2-420) also choose the comparative method, but focus more strongly on the policies themselves, evaluating instruments from Brazil, Southern Africa, the UK and the US. They point out that, if implemented correctly, energy efficiency policies are an important long-term solution in addition to short-term relief provided by energy price- or income-related measures. Louise Sunderland and Darryl Croft (2-404) share a similar viewpoint. But in analysing UK policies, they also identify risks and potential conflicts in developing energy poverty policies in the context of energy efficiency and carbon reduction programmes.

Smart Grid

Smart Grids seem to offer numerous advantages. They promise to balance loads, integrate fluctuating energy sources, and make life easier for utilities as well as customers. Two papers in this panel alert us to evaluate and use the "silver bullet" with caution. Eric Vidalenc and Laurent Meunier (2-499) simulate effects of certain smart grid functions on peak shaving, overall energy savings and carbon mitigation in France. The effects are rather moderate as compared to, for example, the implementation of highly efficient appliances – especially in a system with a high nuclear share. Grayson Heffner (2-444) reminds us that smart grids are not automatically beneficial to the end consumer. Several issues such as privacy and data ownership, social safety needs, equity and protection from service disruption must be addressed to reap the benefits for end consumers.

POLICY INSTRUMENTS

Economic instruments

Economic instruments may be broad and cross-cutting, or problem-, sector- or target group specific. Papers in this panel cover the whole spectrum. Cowart (2-432) and Irrek *et al.* (2-082) deal with broad market approaches towards energy efficiency. Richard Cowart (2-432) asks: If there is a generic market-based mechanism, such as the European Carbon Trading system, will there be any space left for specific energy efficiency policies? His answer is a definite yes, and he goes on to explain why these policies actually even reinforce each other. Wolfgang Irrek *et al.* (2-082), in turn, discuss the markets for energy services, showing the strong inter-European differences between those markets. Therefore, promising energy services must be developed specifically for each country.

Financial incentives are prominent as a means for market transformation towards highly efficient appliances. Stephane de la Rue du Can *et al.* (2-530) review incentive structures targeted at customers in countries all around the world. As success factors, the authors identify government support through clear mandates, a dedicated budget, and long-term strategies. Daljit Singh *et al.* (2-194), in contrast, sketch a design for "upstream incentives", directed not at the final consumers but at appliance manufacturers, for an Indian context. This kind of incentives, they argue, is more cost effective and easier to administer than incentives to the end consumer. Christian Dehmel (2-275) goes one step further by analysing an instrument targeting overall energy consumption of households: progressive electricity tar-

iffs. Although the data base is difficult, examples from California and Italy suggest that the tariffs may have a dampening effect on electricity consumption.

Who pays the bill?

Even if many energy efficiency measures are economically viable and even profitable in the long run, this is not true for all of them. Furthermore, even the most profitable measures regularly require an upfront investment. The question arises: Who pays the bill? And which financing mechanisms may facilitate the bill-paying?

Casper Tigchelaar *et al.* (2-170) present a rather gloomy view for possible energy efficiency obligations in the existing housing stock. Based on empirical data, they calculate the financial effects of an array of possible measures for 4,700 Dutch households. Although many are profitable on average, in many cases households will not benefit, especially when they already showed a frugal heating behaviour before. In addition, households may have difficulties to even provide the upfront investment. Marie-Hélène Laurent *et al.* (2-231) present an innovative conditional subsidy: The lower the cost of a measure, the higher will be the subsidy. Their simulation shows that this forces the market to lower the prices, opening energy efficiency options for low and medium-income households.

Another possible financing mechanism which also tackles the investor-user dilemma in the rental market, is on-bill financing. Katherine Johnson *et al.* (2-401) analyses two such systems in Hawaii and Kansas. Both were very successful in terms of completed projects but did not equally well address the rental market, and had marked differences in administrative burden and cost-effectiveness. Finally, Sergio Zabot *et al.* (2-084) analyse a regional zero-interest loan scheme for energy efficient refurbishments, introduced in the Italian province of Milan. In a situation where national incentives already existed, the scheme proved to be a successful part of an overall package, removing existing market barriers and triggering an investment worth 11,8 times its cost.

White certificates

At a time when obligations on energy suppliers and white certificates schemes are discussed at European level, two papers present the results of such policy instruments in Italy (Dario Di Santo *et al.* in 2-011) and France (Paul Baudry and Dominique Osso in 2-394). Both underline the specific difficulties they will have to face in the near future, because of a change in policy design. They also make proposals to ease the future implementation from the viewpoints of an Italian ESCO association and of a large French energy supplier.

How will all this be framed at EU level? Two papers contribute to the European thinking: Paolo Bertoldi *et al.* (2-307) take us on a "tour" of obligations and white certificates in Europe, Australia, Japan and the USA, in order to better understand who is the most suitable stakeholder to bear the obligation: suppliers or end-users. There is more than one answer to this question depending on the energy market structures. Reinhard Haas *et al.* (2-136) present a dynamic cost-resource curve analysis of the trading aspects of this instrument – for both green and white certificates. They strongly question the assumption that the ecological burden will be alleviated by the trading activities (which rather seem to be there for the sake of trading …).

Increasing knowledge

One would think that taking policy decisions relies on knowledge of base-line situations, benchmark, monitoring and country comparisons activities … This is surprisingly not often the case but four papers present such approaches and their challenges: Bogdan Atanasiu and Tudor Constantinescu (2-562) cover the building sector and the energy performance certificates in Europe. Based on a pan-European analysis of how EPCs are concretely being implemented, they formulate policy recommendations. Hans-Paul Siderius and Stuart Jeffcott (2-512) present an IEA mapping and benchmarking project and aim to provide product information to policy makers. In their international comparison, they are challenged by very heterogeneous technical and market data. Sophie Attali *et al.* (2-208) want to bring transparency on the markets and propose in their Topten project a continuous, real-time review of most energy efficient appliances and products in Europe, the USA and China.

At the national level, Irmeli Mikkonen *et al.* (2-500) insist on the necessity to develop competences in order to design and implement energy efficiency policies. This is also quite a challenge: trainers are needed in all sectors, and competences cover general education, specific training of the workforce, but also general knowledge and understanding of energy efficiency and its importance in the society.

Public procurement

Public procurement is a driver for energy efficient buildings and products, but it could be more powerful if procurers were fully conscious of their "green power". Starting upstream, the HyLok group in Sweden is a platform for exchange of ideas and experiences as well as a driver for energy-efficiency projects. Magnus Bengtsson *et al.* (2-450) present this group gathering nine governmental agencies renting their premises but willing to reduce their energy consumption, its working methodology and achievements. Getting down to buyers, Mads Lindevall Kristiansen and Sarah Allingham (2-341) have carefully studied public procurers in Denmark and conclude on principles (make it easy) and tools likely to be used by these procurers. They show that purchasing guidelines and cost calculators have improved the visibility of energy efficient products and made purchasers more aware of the need to choose the right energy efficient appliances.

GREENING CITIES

The local level is a specific arena where integrated energy strategies involving multiple actors may be developed. A set of papers shows inspiring examples. Agneta Persson *et al.* (2-410) present a new, sustainable city district designed "from scratch": Brunnshøg, outside of Lund in Sweden, will establish a self-sustained energy system based on energy conservation, renewable energies, closed loops, and changed communication patterns. The rest of the papers deals with the greening of existing agglomerations. Cédric Jeanneret *et al.* (2-409) discuss "éco 21", a 40 million Euro programme of the Geneva energy utility, SIG. It aims at stabilizing energy consumption in the Geneva region, based on an in-depth assessment of re-

duction potentials, and involving all major consumption sectors and relevant actors. Simon Aulagnier *et al.* (2-294) demonstrate the benefits of systematic territorial planning. For the French Greater Lyon Area, they analyse the interactions between built environment, land markets, policies, and patterns of mobility and energy use, and plead for a coordinated effort between cities, inter-municipal local authorities, and regions which integrates urban planning, transport and energy policies. Finally, Ben Taube and Steve Morgan (2-004) show how the success chances of local programmes can be increased by centralized support. The Southeast Energy Efficiency Alliance (SEEA) supports twelve cities in the South-eastern region of the USA in developing and implementing local energy efficiency programmes.