

eco@work

January 2019

Sustainable reading
from the Oeko-Institut

**The social
side of the
energy transition**



Energy transition for all



Michael Sailer
CEO, Oeko-Institut
m.sailer@oeko.de

The transition to sustainable energy is a major societal venture. Back in 1980 the Oeko-Institut described the challenges of an energy supply “without oil and uranium” in its groundbreaking study that coined the term “energy transition” (Energiewende). The issues today are the phasing out of coal, the further expansion of renewables, energy efficiency and climate change mitigation. In short, we need an energy supply that is clean, affordable and safe – for everyone in our society. To achieve this, the German state must create the right incentives and it must invest. And that means that we members of the public must help finance the re-shaping of our energy system and our economy. From our point of view at the Oeko-Institut, it is important to consider how the burden is distributed so that ultimately everyone can afford clean electricity, access sustainable transport and adopt an environmentally friendly lifestyle.

As I see it, environmentally friendly behaviour does not depend on how much one earns. There are people of limited means who act sustainably and wealthy people who take little interest in the environment or in climate issues. Protecting the climate and the environment is therefore always partly a question of attitude: it involves living consciously, buying sustainable products, saving energy and sometimes doing without things. In everyone’s life there are lots of potential starting points – for the energy transition, the transport transition and the nutrition transition.

If we turn our attention to policy-making, this must involve creating the “right” incentives for investment, defining the guiding principles of a renewable infrastructure and coming up with a holistic vision. Only then can positive social impacts kick in and only then will all members of society benefit from the energy transition.

This issue of eco@work looks at this topic and at what we are doing in this field. I hope you enjoy reading it and wish you all the best for 2019.

Yours,

Michael Sailer

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Address of editorial office: Schicklerstr. 5-7, 10179 Berlin, Germany

Phone: +49 (0) 30/4050 85-0, Fax: +49 (0) 30/4050 85-388, redaktion@oeko.de, www.oeko.de

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“What we need is an Energy Demand Ministry”

Energy-efficient technologies and energy-conscious behaviour influence how much energy we use – but strategies like these do not challenge the social foundations of energy demand. Professor Elizabeth Shove believes that deeper and more comprehensive strategies are needed to engage with the many areas of public policy that impact indirectly on energy demand. Non-energy policies that matter for energy demand are, for instance, embedded in employment, health and education agendas. In this interview with *eco@work*, the sociologist from Lancaster University (UK) and Co-Director of the DEMAND Centre (Dynamics of Energy, Mobility and Demand) talks about the paradigm shift needed in energy policy and new challenges for research.

Professor Shove, can you give us some examples of non-energy policies which impact on our energy demand?

There are so many examples, at international and at national, regional and local level – of course, with varying degrees of impact. Take the building sector: if a large number of out-of-town shopping centres are approved and constructed, energy demand for transport increases. Or education: the introduction of tuition fees seems to have changed the services provided for students – libraries are open around the clock, for example, and they consume energy. Or employment: if working time models change or people are increasingly working from home, this has an impact on energy demand. If broadband internet is installed across the board as part of a digitalisation strategy, this will have an effect on energy demand as well.

Are politicians aware of these linkages?

There is an awareness, but it's not often followed by action. In policy fields such as health or defence, reducing energy demand is rarely a priority. There's also little emphasis on cross-cutting thinking and action. The focus is very much on technical innovation in areas like those of energy efficiency or changing

individual consumer behaviour. And in research, too, we tend to think in terms of separate disciplines and generally focus on in-depth analyses of energy supply rather than looking at energy demand.

Why is that, do you think?

Well, firstly, this is such a large and complex area that the question of where to start and how to proceed is very difficult to answer. It is much easier to talk about energy-efficient lighting than about sweeping social and organisational reform. In politics, goals and processes are not usually developed with reference to climate change, even though fresh ideas are urgently needed to deal with it.

What might a solution look like?

Energy demand needs to be mainstreamed, as has happened with the issues of gender equality and diversity. These two issues are now embedded in every field of politics and business. But to achieve that, various departments need to talk to one another and work together. At the moment, there is no clear sense of ownership for this process. That's why one solution might be an Energy Demand Ministry to bring together all the various strands and set things in motion.

And what are the starting points for related research?

The first critical step is to look at what energy is used for in society, and how energy demanding practices develop and change over time according to circumstances. We need to know how energy is used – and how patterns for instance of heating, of leisure, or health care are changing and with what consequences for energy demand. Only then can we develop forms of intervention that focus on changing practices, and the consumption associated with them.

Thank you for talking to *eco@work*.

The interviewer was Christiane Weihe.



Talking to *eco@work*: Elizabeth Shove, Professor of Sociology at Lancaster University

The social side of the energy transition

Balancing climate change mitigation and fairness

If we want to help keep global warming significantly below two degrees, we cannot avoid the energy transition. Its main aim is to create an energy supply that is clean but also safe and affordable. Key elements include replacing fossil and nuclear fuels with renewables and significantly reducing energy consumption. However, in addition to its positive environmental impacts, the energy transition also has social consequences. For example, the effects of higher electricity prices, which are partly the result of the levy for re-

newable energies, are felt most sharply by low-income households. The Oeko-Institut is exploring many different aspects of this social side of the energy transition. Its researchers are studying the contributions that various social groups can make, including the high savings potential of affluent households. They are also looking at the unequal impacts on these groups and the question of how the burden on low-income households can be reduced, for example through efficiency and sufficiency measures.



Although electricity prices in Germany have stabilised in recent years, they rose sharply between 2004 and 2014: during this period the prices paid by private households increased by 38 per cent in real terms. "Such increases mainly affect low-income households," says Dr Katja Schumacher of the Oeko-Institut. "On average the poorest spend five per cent of their household income on electricity, while the most affluent spend only 1.5 per cent – despite using about twice as much electricity." This was one of the calculations made by the Oeko-Institut and its partners in their "Assessment of the environmental, social and economic impacts of the sector targets for 2030 of the German government's Climate Action Plan 2050" compiled for the Federal Environment Ministry. The picture with regard to expenditure on heating and hot water is similar, with spending ranging from about 1.5 per cent of household income for the wealthiest households to four per cent for the least well-off. At the same time the most affluent households use about three times as much heating energy as the least well-off, across all types of energy source. "The burden of energy prices is felt most keenly by people such as single parents and the unemployed whose disposable income is small and who do not receive transfer payments for heating," says Schumacher.

BURDENS AND POTENTIALS

A large proportion of the increase in electricity prices is the result of taxes and levies – especially the EEG levy that is imposed to fund the expansion of renewables. "Between 2008 and 2018 the levy has increased from 1.17 to 6.79 cents per kilowatt-hour," says Schumacher, Deputy Head of the Energy & Climate Division in Berlin. "Here, too, the poorest households spend a significantly larger proportion of their income on the EEG levy than the most affluent ones." She also stresses, though, that



there is no way round the expansion of renewables. "They are a key element of the energy transition, but at present the design of the renewable energy system is not entirely fair – for instance with regard to the cost burden and the many exceptions for industry." Private households can of course benefit from the expansion of renewables – for example, by installing their own solar thermal collectors. "High-income households have an advantage here because they can afford to invest in systems of this sort and are also likely to own their own homes and thus be entitled to install such systems." Her colleague in the Energy & Climate Division, Dr Johanna Cludius, points out that these households have significant energy-saving potential. "However, these consumers are not usually swayed by the cost argument," she says. "Alternative approaches are needed." The Oeko-Institut's experts are constantly coming up with new ideas and feeding them into public discourse. "For example, it might be possible to highlight greater protection against burglary as an aspect of energy-saving improvements to residential buildings."

ENERGY POVERTY – UNDERESTIMATED?

On the other hand, many people on a low income are at risk of energy poverty. "In Germany we still have no clear definition of energy poverty," says Dr Johanna Cludius. "Basically it refers to the link between energy costs and poverty when people can no longer afford the cost of electricity and heating or when they risk being driven into poverty by these costs." In a module of the project "Aspects of civil participation in the energy transition with consideration of distribution issues" for the Federal Ministry of Education and Research, the Institute's researchers explored socially fair approaches to climate change mitigation and the energy transition and also considered energy poverty. "We

looked at five different EU countries – France, Sweden, Ireland, Denmark and the UK – and analysed the strengths and weaknesses of their existing policies and the steps they are taking to combat energy poverty. Such steps might include extending the reimbursement of heating costs to additional groups or helping less well-off home owners undertake energy-saving improvements." Something that has been successfully established in Germany is the Electricity Saving Check (Stromspar-Check). "This scheme involves training people who have been long-term unemployed as electricity-saving assistants who then advise low-income households in their area on energy issues and implement ad-hoc measures," explains Cludius.

In its analysis for the Federal Ministry of Education and Research the project team also considered whether some of the measures adopted in other countries could be transferred to Germany. "This showed, for example, that extending the reimbursement of heating costs to other social groups is particularly useful if it is combined with the provision of information and other support measures – such as a heating energy check or energy advice," says Cludius. "With regard to support for efficiency and renovation measures, it is worth offering this support specifically to less well-off owners of houses and apartments and taking on board the lessons learned by other EU states."

Also potentially transferable, in the opinion of the Oeko-Institut, are other instruments such as enhanced consumer protection measures to prevent disconnection of gas and electricity supplies, simplified presentation of electricity bills and an integrated contact point for handling complaints about the energy supply. Each of these measures could help improve the social fairness of the energy transition. "But it is also clear that there are no simple solutions that have an impact in both the short and long term and that take

all relevant target groups into account," says the expert from the Oeko-Institut. "Developing an effective integrated approach remains a major challenge."

MORE FAIRNESS

The Oeko-Institut began exploring the social side of the energy transition many years ago, initially in self-financed studies, then via numerous conference contributions and more recently also in larger-scale projects. "For a long time, fairness and distribution issues were barely considered in discussion of the energy transition, but they are now a firm component of political discourse," says Katja Schumacher. "The topic is finally being addressed in energy and climate policy." The next step, in her view, involves improving coordination between social policy and energy and climate policy. "Energy policy cannot be social policy, but it must take account of distribution effects and must not exacerbate existing inequalities," comments the Oeko-Institut's Deputy Head of Division.

Christiane Weihe



As Deputy Head of the Oeko-Institut's Energy & Climate Division (Berlin), Dr Katja Schumacher analyses energy and climate policy strategies and instruments and advises policy-makers and other stakeholders. Her work involves economic analysis and the study of distributional effects. Dr Johanna Cludius works on these issues too. As a researcher in the Energy & Climate Division she also studies market-based climate policy instruments, especially the emissions trading system.
k.schumacher@oeko.de
j.cludius@oeko.de

Efficiency and sufficiency

Reducing costs, advancing climate action

The success of the energy transition depends not only on what sort of energy we use but also on how we use it. Economical use of energy plays a major part in reducing CO₂ emissions and combating climate change. The potential for cutting energy use is often particularly high in well-off households. At the same time, efficiency and sufficiency measures help to reduce the costs of electricity and heating incurred by private households. This benefits low-income households for whom higher energy costs are a particular burden.

“Despite the major price hikes, the energy consumption of private households in Germany has remained very stable,” explains Dr Corinna Fischer, a researcher in the Sustainable Products & Material Flows Division. “For example, their energy consumption in 2016 amounted to 665 billion kilowatt-hours, which was actually 0.4 per cent higher than in 1990.” This meant that private households accounted for just over a quarter of Germany’s total final energy consumption. “By far the largest proportion is used for heating; some way behind is energy use for hot water and household tasks such as cooking, washing and chilling,” says Fischer.

The German government aims to reduce total energy consumption by 50 per cent between 2008 and 2050. “Policy measures such as the Ecodesign Directive and the EU energy label ensure that efficient products are available and easy to identify,” says Fischer. “However, we also need concrete measures to actually enable consumers to replace old appliances.” Changing consumption patterns so that people adopt sufficiency behaviours is an important means of reducing energy demand and costs. “It means, for example, not accumulating too many appliances and also thinking about their size,” explains Fischer. “For instance, doubling the screen diagonal of a TV may quadruple its energy consumption.” The Oeko-Institut has explored the issue of sufficiency in detail in two working papers under the catchphrase “When less is more”.

“By adopting efficiency and sufficiency measures households can in theory halve their electricity consumption,” says the researcher, “but sadly almost none of this potential is currently being realised.” Ways of using energy more sustainably are being highlighted in the project “Electricity efficiency classes for households”. As part of this project the Oeko-Institut and the Institute for Social-Ecological Research (ISOE) have developed various tools to help private households save electricity. Funding from the Federal Ministry of Education and Research has enabled these tools to be tested in a field trial. “We divided households into efficiency classes on the basis of factors such as the number of people in the household and the type of hot water heating,” the researcher explains. “This means that similar households can be compared with each other.” The field trial also included personal advice on saving electricity and monthly documentation of participants’ electricity consumption. “As a result of the individual measures – such as buying more economical refrigerators and freezers or using the tumble dryer less often – the participating households cut their electricity consumption by an average of about five per cent,” says Fischer. “For those who used a lot of electricity the savings potential was in fact nearly ten per cent.” The Oeko-Institut’s researcher believes that sufficiency measures that lead to changed consumption patterns are particularly promising here: “The people who use a lot of electricity are often



affluent. They use the electricity for their numerous appliances and devices – in this project we came across households that are using four refrigerators and freezers, although they don't really need so many."

NEW LIVING SPACES

One of the main reasons why average electricity consumption for heating, lighting and many other purposes remains high is that housing space per person is also high: living space per person increased from 46.1 m² in 2011 to 46.5 m² in 2016, partly as a result of an increase in the proportion of single-person households and the proportion of older people who are owner-occupiers. The average living space for pensioners is 88 m². The current project "Opportunities for instrumenting energy consumption reduction through behaviour change" for the Federal Environment Agency pinpoints a number of obstacles to reducing living space, including lack of awareness of the issue and emotional ties to a property. However, with the Institut für Energie- und Umweltforschung (ifeu), the Oeko-Institut is also highlighting the opportunities of instruments such as financial subsidies for dividing detached and semi-detached houses, thereby creating additional accommodation units. "If only a fraction of the pensioners who own their detached homes were to reduce their living space, this could cut energy consumption by about 250 gigawatt-hours and greenhouse gas emissions by 59,300 tonnes annually," explains Tanja Kenkmann, a researcher in the Energy and Climate Division. "Reducing living space is therefore a very worthwhile sufficiency measure."

The "LebensRäume" ("Living Spaces") project, which will run until 2020, is also addressing the issue of over-large living spaces: with the Steinfurt district authority, the "energieland 2050 – Haus im Glück" association and the ISOE, the Oeko-Institut is exploring how the use of living space can be optimised and made compatible with the requirements of generation-appropriate living. "In this project the first step involves analysing the background – factors such as the ownership structure and the needs of residents," says Kenkmann. "The aims include setting up an advice point that will help people find accommodation of a size appropriate to their needs." With funding from the Federal Ministry of Education and Research the project team is also monitoring a trial of the accommodation-finding service.

MEASURE AND IMPACT

Specific ways in which people in different income groups can cut their energy usage have also been explored by the Oeko-Institut in the project "Concept for an absolute reduction in the demand for energy: Potentials, conditions and instruments for achieving the energy consumption goals of the energy action plan" conducted for the Federal Environment Agency. "We analysed the possible effects of various measures in the periods to 2020 and 2030, focusing in particular on sufficiency measures such as reducing hot water consumption, lowering room temperatures and cutting down on living space," says Fischer. In all income brackets the biggest potential savings arose from reducing people's living space. "Other measures were also considered, including in connection with mobility a shift from driving to cycling and in connection with electronics a reduction in television viewing." The analysis shows that each measure can result in cost savings of between 0.03 and 0.25 per cent of household income; for an average household this is equivalent to about 10-100 euros per measure. Various sufficiency measures can therefore result in significant savings in total – without the need for any investment. This is of particular relevance to low-income households and it can make a substantial contribution to the success of the energy transition.

Christiane Weihe



Dr Corinna Fischer specialises in sustainable consumption and sustainable products. She is a Senior Researcher in the Sustainable Products & Material Flows Division, where she works on issues such as the consumer perspective, consumer behaviour and energy-efficient products. The work of Tanja Kenkmann, a Senior Researcher in the Energy & Climate Division, includes developing and evaluating instruments to increase the energy efficiency of the building stock. She also specialises in municipal climate change mitigation.

c.fischer@oeko.de

t.kenkmann@oeko.de