

# Fuel poverty. A case study of vulnerable households in Vienna/Austria

Karl-Michael Brunner  
Department for Sociology and Social Research  
Vienna University of Economics and Business  
Augasse 2-6  
1090 Vienna/Austria  
Karl-Michael.Brunner@wu.ac.at

Markus Spitzer  
Austrian Institute of Sustainable Development  
Lindengasse 2/12  
1070 Vienna/Austria  
Markus.Spitzer@oin.at

Anja Christanell  
Austrian Institute of Sustainable Development  
Lindengasse 2/12  
1070 Vienna/Austria  
Anja.Christanell@oin.at

## Keywords

behaviour, user behaviour, qualitative study, low-income families, fuel poverty

## Abstract

People living at risk of poverty or in conditions of manifest poverty are frequently incapable of satisfying basic needs such as heating their homes adequately. These groups of energy consumers are vulnerable to the consequences of insufficient or insecure access to energy. Reports by social welfare organisations state that a large part of low-income households has problems in paying their energy bills, at least for certain periods of time, and that disconnections are more widespread than expected. Rising fuel costs, bad housing conditions, the use of energy-inefficient appliances etc. feature on the list of problems these vulnerable consumers are facing and which call for socio-ecological solutions that contribute to energy efficiency as well as to social empowerment.

The paper at hand presents results and policy recommendations from the project “Sustainable energy consumption and lifestyles in poor households” (German acronym: NELA) which investigates energy consumption in low-income households in the Austrian capital Vienna. The study is based on a broad, multidisciplinary approach regarding underlying social theories and is guided by questions about the type of socio-cultural and everyday images that shape energy consumption in low-income households, as well as exploring target-group-specific strategies and measures that can be developed in order to combine energy efficiency and energy saving with an improvement in the living standard. The qualitative paradigm forms the premise for the methodological approach of the project; data was thus collected in qualitative interviews. In summary, 50 in-

terviews were conducted in low income households in Vienna and subsequently analysed.

The main aim of the project is to identify determining factors of energy consumption and coping strategies in poor households and/or households in situations of fuel poverty, and to identify potentials for energy efficiency and energy saving. Developing and implementing policy measures that help combat fuel poverty and social exclusion in close cooperation with key actors within the energy system (e.g. energy companies, policy makers, NGOs, social workers) constitutes another major target of this project.

## Introduction

In the face of the complex interplay of rising energy prices, stagnant or decreasing incomes, high levels of unemployment, processes that multiply casualisation and the slow rate of re-development of residential buildings in terms of improving energy efficiency, the problem of energy poverty has become increasingly urgent in recent years. A common definition of energy poverty has still not been agreed upon; therefore, it could only be described approximately as a lack of access to adequate, affordable, reliable, secure, high-quality and environmentally friendly energy services that create favourable conditions for human development (Kopatz et al. 2010). It has been estimated that within the EU, between 50 and 125 million people are living under conditions of energy poverty (EPEE 2009), and these figures are predicted to rise further in the near future. Social and political awareness for this problem, however, is still relatively low or rather, varies considerably (Santillán Cabeza 2010). From a scientific viewpoint, it is particularly obvious that there is a lack of studies investigating the matter from the

perspective of the people concerned, focusing on their energy practices, conditions for action, and coping strategies (Boardman 2009). The project NELA (German acronym for “Sustainable energy consumption and lifestyles in poor households”) takes exactly this stance, shedding light on energy consumption in poor and at-risk-of-poverty households in Vienna. The situation regarding fuel poverty in Vienna is less grave than, for example, in the United Kingdom, as the structure of buildings in this city is comparably efficient, the number of expensive filament heating systems is on the decline, and a number of subsidies are granted to support expenses for heating costs. It has to be mentioned, however, that only a small number of the people interviewed find themselves at this more advantageous starting point.

Before discussing the results of the research project in greater detail, the following paragraphs are going to expound the basis of the project, providing an outline of the understanding of energy consumption in social sciences.

### Disciplinary perspectives on the complexity of energy consumption

For at least 40 years now, social sciences have been investigating energy consumption from various angles. In the 1970s, the oil and energy crises raised awareness for questions about the development and the determining factors of energy consumption and efficiency. Consequently, the increased relevance of these questions also had an effect on energy consumption research, a scientific field which until this date had predominantly adopted a technical stance based on technical sciences, and had focused on the technical side of optimizing efficiency. In the wake of these events, research started to include behavioural factors, as well, subsequent to the discovery that identical households sometimes showed considerable differences in energy consumption (Reusswig 1994). Increasingly, it became evident that it is the people who consume energy, not their dwellings or devices (Shove et al. 1998).

While research in this field had been dominated strongly by psychological and economic approaches in the 1970s and 1980s, a genuinely sociological perspective started to prevail from the 1990s onwards. The emphasis thus shifted to the socially mediated nature of energy consumption and its socio-technical and infrastructural embeddedness.

Analyses rooted in economic approaches usually centre on income and energy prices, resulting in the finding that income and energy expenses are directly related. In absolute numbers, increased income entails increased expenses for energy, while at the same time, the share of energy expenditure in the total consumption expenditure decreases. Low income households consequently spend a larger part of their income on energy. If the energy prices increase, therefore, this could have an accelerating effect on the development of energy efficient technologies or stimulate higher demand for and investment in energy saving devices and measures (Brohmann et al. 2009). However, this does not necessarily hold true for households on a lower income, which tend to answer increases in energy prices rather with changes in behaviour (e.g. reduced room temperature) than by investing in more efficient (but probably expensive) technologies or facilities (Dillman et al. 1983). Investment in increasing efficiency, however, may be accompanied by re-

bound effects; therefore, energy consumption might not be sustainably decreased only by increasing efficiency (Haas/Biermayr 2000).

Along with income, other sociodemographic factors also matter when it comes to evaluating energy consumption: For instance, a larger number of residents in a household signify increased energy consumption, while, on the other hand, the per capita energy consumption decreases with growing size of the household. Moreover, a positive correlation between the size of the dwelling and energy expenses could be observed (Lutzenhiser 1997). The same holds true for rural residential areas: energy expenses are generally lower in regions with a larger population density.

(Socio-)psychological approaches offer insights into the relevance of factors other than economic ones. According to these, energy expenses are also affected by attitudes and values, that is, factors which manifest themselves in a ‘limited rationality’ of the agents, to put it in economic terms. However, it is debatable to which extent attitudes influence behaviour, as a large number of studies only discover small correlations between the two (Brand 2010). Presently, psychological research into energy consumption commonly highlights the importance of social networks and participation, as well as the status of technology, institutions and culture as being the framework thereof (Heiskanen et al. 2009). This in turn shows how much these approaches bear on sociology, as the relevance of contextual factors is frequently stressed (Poortinga et al. 2004). The conviction that other factors apart from economic ones (e.g. consumer behaviour, culture, climate) need to be taken into account in order to reach a better understanding of the complexities of energy behaviour has recently also been gaining more acceptance in economy, at least for some part (Köpl/Wüger 2007).

What sociology criticises in both economic as well as psychological theories first and foremost touches upon individualist models for the behaviour of agents which are not socially embedded and neither take into account the context nor the structural conditions of actions. In these models the latter are often separated and externalised from the actions, understating thus the intrinsically social nature of energy behaviour. The starting point for sociology when analysing (energy) consumption is always a social contextualisation of different states of consciousness and behaviour (Brunner 2007). In contrast to individualist theories derived from the fields of economy or psychology, these approaches do not limit explanations for the agents’ behaviour and actions to conscious choices but also include pre-reflexive behaviour and routines. There is a variety of social practices in households (e.g. cooking, heating) which strongly determine energy consumption but which are rather based in the “performance” of largely embedded everyday routines than they are the result of conscious choices (Warde 2005).

It has frequently been pointed out in sociological research into social structures how deeply human behaviour is embedded in social milieus and lifestyles, and how social groups increasingly differentiate in the course of changes in social structures according to socio-cultural features they have in common. Attitudes and behavioural orientations should be taken into account when analysing energy consumption, which, however, does not necessarily include a culturalistic devalorisation of distinguishing social features.

Orientations towards efficiency can differ widely among lifestyle groups, just as energy saving behaviour does (Reusswig 1994). Therefore, different technologies could acquire various meanings, depending on their respective social contexts (Lutzenhiser/Gossard 2000). For instance, seven distinctive types that vary in their values, lifestyles and consumption patterns have been identified in a study about energy saving (Prose/Wortmann 1991). According to their lifestyles, the households thus display different behavioural patterns which could be termed distinctive “energy cultures” (Aune 2007).

Energy use, in most cases, is invisible and unspoken of, silently accompanying everyday actions and routines. Therefore, awareness for the factors determining energy consumption can only be raised if lifestyle-specific ideas about what “home” means (what is understood by comfort, a cosy atmosphere or hospitality), as well as their consequences in terms of energy (the “right” lighting, a “pleasant” room temperature), can be identified (Shove 2003; Wilhite/Lutzenhiser 1999).

Apart from the internal social structure of a household, it is also the embeddedness of consumer behaviour in everyday life that needs to be investigated; the pragmatic, workaday life quests for viable solutions to the coordination of lives within time and space (Berker 2008); the individual attempts at piecing together various actions in order to form a coherent and consistent whole; the often contradicting expectations and demands which have to be met when coordinating and integrating different schedules and structures. The distinctive groups of impoverished or at-risk-of-poverty households thus clearly show differences in their everyday way of life. The practices of the long-term unemployed, for instance, in conducting their lives and following everyday routines (and, consequently, accordingly differing energy practices) are distinct from those of people categorized as belonging to the group of the “working poor”.

However, patterns of consumption are always embedded in and influenced by social discourses about energy, the environment and poverty, just to name a few. These discourses, to a smaller or larger extent, determine the role models of our society, which in turn feed back into the legitimization of certain patterns of consumption (cf. for example the public discussion about advantages and disadvantages of the prohibition of common light bulbs). In addition, it should be stressed that the scope of consumption could be limited, but also stretched by macrostructural trends in society (as, for example, individualisation), political, legal and economic frameworks, the structures of production and supply, or technological developments (Brunner 2007).

Berker (2008) rightly points out that the technical aspects of energy use are frequently left behind in analyses originating in the fields of social or cultural/anthropological sciences. One possibility to remedy this shortcoming could be encountered in taking a socio-technical stance, focussing on the dynamic interrelations between technology and everyday energy use and extending the view to include the constructed environment and infrastructural and institutional frameworks, as well (Hinton 2010).

All in all, it could be said that energy practices are influenced both by resources and restrictions determined by the respective living situation (e.g. income, size of dwelling, facilities), as well as by attitudes, values, social and cultural norms,

ways of leading everyday life, technologies, the built-in infrastructure of homes, and the complex interrelations between all of these factors, which are in turn influenced by discourses, infrastructure, institutions and social trends (Hinton 2010). Without possessing an understanding of these manifold factors influencing energy consumption, any measures taken to stimulate energy efficiency and energy saving are only going to have minor repercussions. Monodisciplinary approaches offer necessary contributions to the overall understanding of the matter, but are not sufficient in themselves. Only the inclusion of an interdisciplinary, socioeconomic viewpoint can complete explanations of the multi-dimensional phenomenon of energy consumption. The latter offers a broader and much more diversified perspective, suited to the complexity of energy use.

### Problems related to energy consumption in conditions of poverty: The status quo

In the year 2008, more than 1 million people in Austria lived in households at risk of poverty; the share of individuals at risk of poverty was 12.4 percent (Statistik Austria 2009). 6 percent of the population manifestly lived in poverty, that is, in conditions of coinciding low income and low standard of living. The groups that bear the largest risk of poverty are migrants and people in single-parent households. Single women or single mothers run a higher risk of poverty than men; but also the retired, the unemployed and households with a large number of children belong to the high-risk groups.

Households which are poor or at risk of poverty often experience considerable pressure by rising energy prices, and therefore merit particular consideration with regards to energy consumption. Low income households - although they generally draw less on resources than other households - are often confronted with having to cope with a deterioration of their living conditions, caused by rising energy prices, despite already finding themselves in a less favourable socioeconomic situation to start with. It has been commented that “it is particularly unfair that those who already consume less or little energy should be hit the hardest by rising prices, as ‘fixed costs’ for energy have increased notably recently” (Official representation of employees, quotation from FORUM Nachhaltiges Österreich 2007, 10). It seems that households which are poor or at risk of poverty profit little from the liberalisation of power markets, as the possibility of switching to a different electricity provider is mostly seized by people at higher levels of income (Boardman 2009). A pilot study about low-income households in Vienna revealed that the majority of these households have difficulties settling their energy costs, and suspensions of energy services frequently occur (Proidl 2009). Moreover, it has been addressed by social organisations that there are numerous indications for hardships in relation to energy consumption that a large part of the population which is poor or at risk of poverty has to suffer, at least at certain times.

Generally speaking, the state of the art in relation to energy consumption in poor and at-risk-of-poverty households has little definite knowledge available (Dünnhoff et al. 2006). For example, a English survey from 1999 reveals that half of these households don’t dispose of sufficient energy to heat their dwellings, or spare one or more rooms from heating at cold

days (Summerton 2004). An international survey comparing four countries revealed that underprivileged groups show less concern for the environment as compared to the whole population (although countries differ largely here), but in spite of this, are acting noticeably more environmentally friendly than the overall population (Grant 2001). Concerning energy efficiency it has been stated that these groups use equal amounts of energy as the overall population; however, large differences between behavioural intents and conditions of consumption (e.g. badly insulated houses) have to be taken into account. What is of paramount importance here, too, is the finding that households on low incomes are composed of largely heterogeneous groups which differ with regards to their use of resources, receptivity for measures regarding behaviour and environmental sensitisation. The group consisting of single parents (keyword: responsibility for children), for instance, proved to be highly receptive to measures improving sustainable consumption, whereas the group of the long-term unemployed appeared to be difficult to motivate. These findings intimate that also households on lower incomes can reveal extremely different conditions and mindsets influencing their actions, despite facing similarly restricted material situations (Grant 2001).

In the following paragraphs, selected results of a qualitative study about energy consumption in conditions of poverty will be discussed.

## The NELA project

The target of the project “NELA” (abbreviation of the German name Sustainable Energy Use and Lifestyles in Poor and at-Risk-of-Poverty Households) is to investigate energy consumption in the households mentioned in the project title in Vienna, followed by an analysis of stakeholder-related, data-based measures for the reduction of energy consumption, based in the results of the previous steps<sup>1</sup>. Adopting a qualitative approach allows for investigations into the manifold forms of energy use, their respective motivations, driving forces and causes. In doing so, potentials for energy efficiency and the reduction of energy consumption (and, concurrently, of cost reduction) can be identified, and possibilities and limits of adequate behaviour can be determined. Starting from the assumption that poor households and households at risk of poverty are by no means homogeneous but show different ways of dealing with energy, even under precarious circumstances, measures suited to different target groups are being developed. Environmental targets (energy efficiency and reduction, climate protection) and socioeconomic targets (improving the standard of living in poor and at-risk-of-poverty households) are tightly linked in this project.

The core theme of this project is a comprehensive qualitative interview survey in Viennese households afflicted with poverty. The work is based on the research methodology of “Grounded Theory”, focusing on the systematic development of theories resting on the data collected (Strauss/Corbin 1990).

Understanding the research process as a cyclical procedure, the inquiries are conducted in two steps, in which survey and analysis are closely interrelated. Data was collected in qualitative interviews, employing an open interview guide and a complementary questionnaire for collecting socio-demographic data and information about the equipment and infrastructure of households. The criteria for the selection of interview partners were based both in socio-demographic characteristics and in their adherence to significant groups at risk of poverty. The interviews were transcribed and analysed according to hermeneutic methods and computer-based qualitative data analysis.

The interviews were conducted within the dwellings of the interview partners, which at the same time allowed insights into their living and housing conditions.

50 people between 24 and 74 years of age were interviewed, 28 of which were women and 22 men. Three quarters of the people interviewed were single or separated (less frequently, widowed) at the point of inquiry, and one quarter was married or in a relationship. The interviews were conducted in 27 single households and 23 multi-person households.

72 percent of the people interviewed had terminated an apprenticeship or compulsory schooling, 28 percent had taken A levels or completed an academic course. Three quarters of the interviewees were Austrian by nationality, one quarter had a migration background. 22 of the people interviewed were unemployed at the point when the survey was conducted, 18 of them had been unemployed for more than a year.

Half of the households had a total income of up to 769 Euros at their disposal, which corresponds to the indicative rate for welfare payments in 2009. Another fifth of the households had an income between 769 and 912 Euros, which corresponds to the limit for the risk of poverty of a single person household, according to EU-SILC (Statistik Austria 2008). The remaining 30 percent dispose of a minimal household income of 913 Euros. Some of the people interviewed had a total household income that surpassed the limit according to the definition of a household at risk of poverty. However, they are still considered as being at risk of poverty in this study, as alimony payments, debt payments and other liabilities further reduce the sum of money at their disposal. If the interviewees are classified into the groups of people at risk of poverty with the highest frequency, some happen to fall into more than one group at the same time, which is indicative of a multiple-risk situation.

## HOUSING AND LIVING CONDITIONS

A large number of households display conditions of more or less severe austerity because of their low income, and often, debts, lack of provisions and economizing as a way of life are the order of the day. Adopting a modest lifestyle in various dimensions is often a necessary long-term strategy in order to cope with the situation. When it comes to satisfying basic human needs, it becomes particularly obvious that the subjective definition of what a “basic human need” is already starts at a very fundamental level and has mostly been defined in processes that continuously lowered the standards. Later on, it is going to be shown that the subjectively perceived well-being is frequently adapted to a room temperature that is perceived as (apparently) financially affordable, and not the other way

1. The project is funded by the Austrian fund for climate and energy and is being administered by the Austrian Institute for Sustainable Development (ÖIN), in cooperation with the Institute for Sociology and Social Research at the Vienna University of Economics and Business, and the Wuppertal Institute for Climate, Environment and Energy. The duration of the project is from 2008 until 2011.

round. What is characteristic for many households is an attitude that already anticipates shortages and hardships. An unexpectedly high supplementary payment for energy costs, for instance, could severely reflect the often quite delicate financial planning – as much as a broken household device could cause great problems in coping with everyday life. Those who dispose of social capital, who are tightly embedded in a social network, have less difficulty in managing their lives in precarious conditions and shortage of resources than those who cannot draw on these resources. Having recourse to the support of people or organisations is of immense importance, as this could prevent fatal consequences of any shortages that might occur (e.g. eviction or power cuts). However, feelings of shame frequently inhibit the activation of social networks in these cases.

The limited financial resources of most of the interviewees are also visibly evident in their dwellings. The majority lives in blocks of council flats or similar blocks of flats for rent, the larger part of which date back many years in their construction, are badly or even un-insulated and have leaking windows and doors. Adverse conditions particularly come to bear when the flats profit little from “co-heating effects” of the neighbouring flats because of their location (ground floor, external walls). Altogether, the scope of action as regards energy saving practices is limited. Redevelopments of the housing stock often delay for years, especially in the case of private landlords, who see little need for immediate action. In the case that redevelopments do take place they often find agreement, but are still met with doubt because of fears of possible rises in rent and running costs. Asked about desired changes in their housing conditions, the interviewees often show modest demands in their responses; answers include, for example, an additional room that could be used as a bedroom. This could be interpreted as an expression of their habitus of necessity or modesty, respectively (Bourdieu 1984).

Income does not only limit the free choice of dwelling, but is frequently also reflected in household equipment and appliances. The furnishings and devices – largely of a lower quality – in most households at the lower scale of the income spectrum is often a mix of things that had been there already, were acquired newly or used, or were received as a present (mostly used). However important a supporting social network may be, when it comes to household equipment it can only help out in matters such as basic fittings and replacement of broken devices; but often, old or out-of-use devices are given to households on a low income. From an energetic point of view, however, these are Greek gifts, as they are often defective or prone to defects and energy intensive. Old household devices could even represent a safety hazard: If they are defective, but are not being replaced due to financial straits in the near future, makeshift solutions or workarounds representing a health hazard could be opted for in some cases. Even those involved perceive provisional mending of devices, old wiring for electricity or misappropriation of gas stoves (e.g. as a short-term solution for heating individual rooms) as a hazard. Makeshift solutions have to be accepted even in the case that functioning appliances cannot be used because of power cuts. 69-year old Ms Reisinger<sup>2</sup>, for instance,

had been forced to do the cooking with a gas camping cooker and “lighting” her flat with a cheap, battery-driven camping torch for various days, as gas and electricity had been cut in her flat. Short-term makeshift solutions, however, in some cases turn into long-term ones and become normality. If financial resources cover for the acquisition of new appliances, it frequently occurs that cheaper ones are being purchased, implicating less energy efficiency. Sometimes, these devices are also considered to be the most energy efficient only because they feature energy label A. In many cases, used devices are bought in second-hand shops or at flea markets, rendering the household fully functional again, but, on the other hand, entailing quality restrictions or additional repair expenses because of higher rates of failure.

For many households, high energy expenses or unexpected additional margins for energy providers can represent tremendous difficulties. Even though they often adopt different strategies in order to keep energy costs at a minimum and exploit any potential for economising there may be (see also below), doubts always remain about whether the actions taken are really relevant to the problem. Frequently, they are due to a lack of feedback systems, as many of the people interviewed complained about the inability to evaluate their own attempts at saving energy. It is exactly in those households, however, that the interest in behaviour-related saving measures is particularly high, despite often already having reached the limits of their saving potentials. What remains as a source for feedback is only the annual statement, often coming as a shock to the people interviewed – first and foremost in those cases where high additional margins jeopardise the already fragile financial management of the household. One of the major problems here is the large time gap between energy saving initiatives and the cost reduction potentially resulting. In fact, it is in most cases only the annual statement which shows whether the saving measures taken have been fruitful. In some cases, a lack of monitoring in terms of consumption could even have as a consequence that people refrain from using some of the tools in the household due to high estimated energy expenses, and opt for a service provider instead. The example of one interviewee serves to illustrate this point: Instead of washing his shirts at home, he engaged the services of a dry cleaner’s since the singular payment for this service seemed more reasonable to him than the accumulated energy use of his own washing machine.

Since the energy market has been liberalised, one possibility for lowering the costs could be found in changing the energy provider. But even if some of the people interviewed sometimes consider such a change it is rarely effected in the end. Changes of this nature demand certain defined conditions, and therefore are considered to be high-involvement decisions. Apart from actively procuring information (many households are not equipped with internet access), physical and psychic resilience, as well as a systematic approach to the matter are required. However, these conditions are not always given to a sufficient extent in low-income households. Moreover, the influence certain energy companies have on the market leads to question the seemingly easy possibility of switching the provider. Narratives about difficulties in such changes corroborate this assumption. Another point for grievance is constituted by the lack of transparency of the offers made.

2. To safeguard the anonymity of the interviewees, fictitious names are used here.

Power cuts are the order of the day for a large number of the interviewees: Even when they have not personally experienced this situation, they often remember friends or acquaintances who have. The problems power cuts cause are manifold: Besides the obvious direct consequence of having to cope without electricity and/or heating, a number of additional direct (e.g. fines and charges) and indirect expenses (e.g. spoilage of foods) following from this have to be taken into account in households which are considered poor or at risk of poverty. Subjective consequences like “feelings of shame”, roused by the inability of paying for a life in dignity with basic services, have to be remembered here, too. These feelings could even lead to the renouncement of a timely activation of support networks.

An analysis of the housing and living conditions yielded a number of contextual factors which affect energy behaviour in poor and at-risk-of-poverty households (for more detailed information, go to Brunner et al. 2010). In the following paragraphs, empirical results focusing on two crucial energy practices will be discussed: heating and lighting. The central concern here is to describe the coping strategies<sup>3</sup> the interviewees adopt in order satisfy the basic needs for warmth and light in their constrained situation of limited financial resources and restricted housing and living conditions (which could even be aggravated by rising energy prices).

### HEATING PRACTICES

From an economic perspective, people at risk of poverty should be saving on energy costs because of their financial situation. This would be a rationally replicable measure in reaction to rising energy prices concomitant with stagnant welfare benefits or incomes. But the real heating costs for any type of dwelling depend on a number of factors that are often without the reach of the interviewees, as, for instance, the cladding of the building and its windows, the heating system, the location of the flat within the house, the size of the living space, but also the severity of the respective winter. What is characteristic for households at risk of poverty is that they dispose of drastically limited possibilities for investing in improvements, which is why coping strategies here mostly consist of user behaviour. Within the sample of 50 interviewees, a large number of different coping strategies could be identified, which could be divided into strategies for efficiency and strategies for sufficiency. Both are characterised by low necessity for investment. Efficiency, expanding the technical-economic sense of the word, includes strategies like sealing leaking windows and/or covering these windows with thick protecting curtains, affixing window blinds, also with the aim of conserving heat, and constantly adjusting the thermostat to the precise needs of the living situation.

Strategies for sufficiency are those which serve to render the cold bearable or to concentrate the heat. Among those features, for example, not heating side rooms or using the heating as little as possible in transition periods. Some of the people interviewed sat directly in front of the radiator in order to avoid loss of warmth. Even cases of dwellings which were not heated

for several years were noted. In order to exploit the potentials of sufficiency to the maximum, sometimes even the children are being accustomed to low temperatures over extended periods of time.

Three of the most common coping strategies identified are described below (for further details see Brunner et al. 2011). Examining the reasons for each single and specific heating practice can also reveal how various other economic rationalities could become relevant in relation to energy practices.

- In 21 of 50 households included in the survey, the heating is turned on in only one room of the flat. This was found to be the most common coping strategy in order to reduce costs, especially in smaller flats, but was also observed in the case of larger ones. This mostly occurs when some of the rooms are not being used, or when the bedrooms are adjacent to the living room, and it is therefore sufficient to open the doors at night in order to facilitate heat circulation. The reason for this strategy being particularly popular could be found in the fact that it allows for reducing the heating costs while at the same time still having one room which can be heated to comfort temperature. Therefore, freedom of mobility within the living space is restricted but still, one central room remains at a warm, comfortable temperature. Limiting the freedom of mobility and enduring the cold in the rooms which are not heated (e.g. the bathroom or the kitchen) seems to be easier to bear than an all over reduction of the temperature throughout the whole flat.
- In one third of the households, the cold part of the year also signifies having to put on various layers – that is, in most cases, at least two pairs of warm socks, sometimes even long underpants, and several layers of clothes on the upper part of the body – inside their dwelling. Being dressed like this provides warmth within the limits of their financial resources; however, it is rarely sufficient to reach the comfort temperature.
- Another related strategy for coping with the cold inside the flat is to ‘slip under the covers’. Six out of the people interviewed claimed this to be part of their practices for enduring cold temperatures. As with all the coping strategies quoted, there are many different possibilities of interpreting these practices: for some, the thought of slipping under their favourite blanket is a pleasant idea in itself; others might feel considerable psychic strain having to accept that going to bed is their only choice for fighting the cold.

31 out of 50 households adopt one or more of these three strategic options aimed at lowering the heating costs. Concentrating the warmth in one single room as well as using clothes and blankets to preserve body warmth in a cold flat could be read as economically rational strategies of households at risk of poverty in the face of limited financial resources and rising energy prices.

Including technological factors into the analysis could expand the horizon of a socio-technological point of view considerably. It is frequently the case that households are by no means able to reach a pleasant room temperature despite disposing of the necessary equipment. Ms Leitinger, for instance, is forced to regulate her storage heating meticulously in order

3. The concept of ‘strategy’ is not used in the sense of a purposive-rational action in the following, but mostly to indicate more or less reflected ways of dealing with the matter.

to evenly distribute the accumulated heat throughout the day. On extremely cold days, turning up the heating would have a cold flat later in the day as a consequence, because the heating would not be available anymore from 4 o'clock in the afternoon onwards. Turning the heating down, on the other hand, would entail suffering from the cold during the day but could at least stabilize the temperature at a lower level until the evening. Therefore, the heat stored by the technology used here is the determining factor for heating practices and coping strategies in this case. Assuming that heating practices are not merely the result of individual rational decisions but are also influenced by processes of appropriation of the technologies in question, it could be asked how people actually reach an understanding of the functioning of the technology in place (e.g. heating, thermostat, lighting).

How this is dealt with shall be illustrated using the example of the accounting procedure for long-distance heating. The basic proceeding here is as follows: each radiator is equipped with an evaporimeter which measures evaporation after the period of a year and calculates the annual heat consumption on the basis of this. Usually, this billing method does not influence heating practices. However, a number of the people interviewed try to comprehend this technology and the corresponding accounting method in more detail. Believing that the calculation is made for each radiator, even if it is not used, they deduce that their rate of fixed costs is too high. The truth is that fixed costs are calculated according to size of the flat in square metres. In extreme cases, thus, it occurs that radiators are dismantled, or that the apartment is heated using only the minimum number of radiators in order to avoid evaporation on the others. This is based on the logic that fewer radiators entail lower heating costs. In the most extreme case, represented by Ms Milich, the flat is heated up to 28 degree centigrade using only two radiators in one room. At the same time, the person concerned subjectively perceives this to be an economical practice of heating, as several radiators remain turned off. What seems to be rationally justifiable from a subjective point of view, though, can result in excessive energy costs. Often, reasoning and ideas other than economic ones can determine how people understand and appropriate technologies (Gram-Hanssen 2008). Lay concepts about energy and technology can play a major role in this (Kempton/Montgomery 1982).

Heating practices are also affected by social norms. This was corroborated by the interviews, particularly regarding one point: the norm which decrees that nothing must be wasted. Regarding heating, this norm is largely binding. Therefore, if heating the entire apartment is regarded as wasteful (or a luxury) it is often avoided, even if it would be technologically and economically feasible. Concentrating the heat in one room is an indication of a habitus that centres on avoiding waste, and often had been developed in the family of origin already or was adopted over years of living in conditions of poverty.

Apart from cost calculations, individual approaches to technology and habitual dispositions, it is also people's attitudes which could influence heating practices. If, for instance, low income and high ecological awareness coincide, the chances are high that energy saving is a target, and it could even occur that ecological motivations predominate. Mr Gruenbacher, for example, commented that he could hardly imagine saving only in order to reduce energy expenses. For him, this would be paral-

lel to the motive of not throwing away food. Avoiding wasteful behaviour and attempting to reduce his ecological footprint are thus the main motivations in this case.

Coping strategies related to heating practices evolve over time, and changes in the financial situation can be just as important in this as social and technological factors, which include ways of appropriating and handling technologies but also social norms, different forms of habitus or a lack of feedback systems.

#### LIGHTING PRACTICES

There are a number of studies that predict a continuing rise of power consumption in the future. On one hand, this is attributed to the rising number of different types of smaller households; on the other hand, changing needs regarding lighting and forms of usage are to be held responsible. Up to the present day, however, hardly any studies have tried to investigate the consumption of light from the point of view of the consumers (Bladh/Krantz 2008), which is why the reasons for the rise attributed to usage still remain largely unknown.

As with heating practices, the example of illumination makes abundantly clear that energy consumption is characterized by an interplay of economic, social, cultural and technological factors.

Lighting practices not only depend on the location of the flat but also, for some part, on the seasons and times of the day and the resulting amount of daylight. Depending on the combination of these factors, the requirements for illumination can vary considerably. In the most extreme cases, a dense stock of trees in front of the window makes it indispensable to keep at least a source of lighting on when someone is present in order to allow for certain activities. The sample features a large number of dark dwellings, which entails an increased need for lighting.

Apart from the question of the availability of daylight, a large part of the requirements for lighting results from the necessities (factors for well-being) and activities of the inhabitants. If dimmed, indirect lighting is preferred for reasons of well-being or comfort; other domestic tasks (reading, cooking, changing diapers etc.) require different qualities and intensities of lighting. In this context, a large preference for brighter (and partly, also more intense) light could be noted; therefore, the ceiling lamp or frequently also additional sources of light are switched on.

Almost without exceptions, the results from this study prove the existence of a "European" lighting culture, manifesting itself in the duality of the modes of illumination. To cite one interviewee, these modes could be termed "illumination for a purpose" and "atmospheric illumination", respectively. The first refers to central sources of light, mostly suspended from the ceiling, which illuminate the room and are mostly connected with brightness, immediacy, glaring or artificial light and cold; sometimes, they are compared to the ambience of offices and associated with the corresponding tasks and activities (work) which mostly require bright lights. "Atmospheric illumination", in contrast, provokes associations of decentralised sources of light, dimmed and indirect lighting, comfort, warmth, tranquility, and romance. The latter form of lighting is in most cases perceived as being more pleasant and associated with ideas of a comfortable home. The results of the present study also cor-

roborate that mood is a central factor for determining lighting practices (Stokes et al. 2006). “European lighting culture” refers to the difference between “brightness” and “cosiness” with reference to lighting which has become apparent in intercultural studies. For example, the differences between Japan and Norway that have been identified include a preference for one central source of light, suspended from the ceiling, which illuminates the room brightly in Japan, as opposed to a Norwegian preference for various smaller lamps spreading a feeling of cosiness. These cultural differences in lighting practices also have repercussions on the energy consumption: the consumption in Japanese households averages at 2.5 light bulbs per room, Norwegian households had an average of 9.6 (Wilhite et al. 1996). Even if the choices are not the most economic ones or entail a higher energy consumption, these cultural differences always influence people’s energy practices.

The problem of the infrastructure available in the household, which is dated in many cases, also extends to lighting practices. Many of the people interviewed refer to light fittings that came with the flat or to lights they have become used to because they have been part of the household for a considerable stretch of time, and which are often seen as difficult to modify or regarded unsuitable for energy saving bulbs. Frequently, these fittings are chandeliers that are considered as having an extremely high consumption of power. However, even a source of light that has high energy consumption and provokes aesthetic objections, and is therefore perceived as problematic, can change its rank on the hierarchy of values within the prolonged process of domestication (Berker et al. 2006). It could even be integrated into the fittings of the dwelling, inhibiting changes. Preferences for sources of light integrated into the furniture are frequent, be it kitchen lights, the lighting of small bathroom cabinets, or the lights of a kitchen hood. They are either used as additional sources of light (in the evening), or as the only source of light (e.g. when using the toilet). Forming part of the inventory of the dwelling, they thus immediately suggest themselves to this use, even if they could be extremely inefficient in their energy consumption (as it is also the case with tools that have integrated functions, e.g. a television set; cf. Crosbie 2008).

The economic situation, of course, also surfaces in the lighting practices. In many interviews, modesty regarding lighting becomes evident, manifesting itself in according lighting strategies. One strategy, for instance, consists of using the potentially available sources of light only selectively or not at all. Thus, chandeliers are sometimes only equipped with a part of the light bulbs (if some of these have broken over time they are not being replaced) to dim the light. This could be attributed to economic reasons, but could also be related to the intensity of the light (too strong) in single cases. Some of the sources of light considered as having excessive energy consumption are only used scarcely or not at all (e.g. neon tubes). Moreover, using small lights instead of larger ones or generally reducing illumination (using light bulbs with less luminosity, or only using one instead of many sources of lights) also belongs to these practices. In many households, the light emission from a TV set serves as the only source of illumination in the evening, justified with the argument of being sufficient for the activities that accompany watching TV. Another frequent practice is combining the light emitted by the TV set with a second, smaller source of light.

Some households use candles as an additional or the main source of light – sometimes for reasons of reducing illumination, but mainly because of the warmth of the light they radiate, especially in winter. There are limits to the use of candles, however, mainly because of potential fire hazards or in the presence of visitors.

Another strategy that is tightly linked to the respective heating practices consists in only lighting one room – in most cases, the main living room – thus benefiting from the light for the adjacent rooms (e.g. the bathroom). Single cases of refraining from lighting the room (e.g. the toilet) at all occur if the ventilation connected to the light switch is too noisy. Centralising the light in one main room could also come out of the intent to economise, affecting the lighting in other rooms of the dwelling: One room is lit sufficiently to satisfy the need for illumination, while the others are being saved on. This strategy has already been described above with regard to the heating practices.

Another strategy, corresponding to the norm of not wasting energy, is the practice of switching off the lights when leaving a room. This is a central practice especially in those cases where children are being trained to save energy. Energy socialisation is a term that frequently appears when trying to explain the roots of this attitude. Often, this practice is being taken for granted and considered to be an evidence of energy saving behaviour; however, single cases refer to the development of this attitude over time, following a period of wasteful lighting. Using energy saving bulbs is another frequent strategy for economising (find more details on this point below).

Even if many of the people interviewed refer to more or less developed practices of reducing the lighting in their everyday illumination habits, many examples appear in which a reduction is not considered adequate and a full illumination of the house is opted for. This seems to be the norm particularly in the presence of visiting friends or relatives: For visitors, the flat has to be bright and well-lit. Illumination, therefore, appears to be a way of showing respect, and brightness as opposed to saving money could be considered an indication of hospitality.

Despite considerably developed consciousness regarding energy, Christmas lights could be quoted as another example of renouncing the norm of reducing consumption. Installing these lights signifies being able to participate in cultural celebrations without restrictions, and therefore permits feeling like an integrated member of society. Similarly, psychic strains (e.g. burnout or anxiety) can set limits to energy saving practices. Social isolation and lack of communication could lead to an incessant use of appliances, generating socially communicative background noise and reducing feelings of isolation. This way, entertainment devices frequently become tools for counteracting loneliness. However, some of the interviewees appear not to reflect on their lighting practices in spite of their restricted conditions, nor do they show intents of saving or identifying potentials for economising in their households.

Regarding illumination practices it could also be of interest to ask whether affordable ‘minor investments’ (e.g. energy saving bulbs) which contribute to raising energy efficiency are realized despite the scope of action being limited by financial resources. As the results of the study show, a fifth of the people interviewed already shifted to using mostly energy saving bulbs; three fifth changed at least partly to energy saving bulbs,



and the remaining fifth does not use them at all. Consequently, more than three quarters of the households are already using energy saving bulbs, revealing a strikingly high tendency towards saving energy through affordable investments in low-income households, besides lowering their standards (*habitus* of modesty). Whereas other studies explained the use of energy saving bulbs with motivations rooted in cost and environmental aspects (Wall/Crosbie 2009), the factors that clearly predominate in the impoverished households under investigation in the present study are mainly related to expenses.

The discussion of selected results of the study on energy consumption in poor and at-risk-of-poverty households has shown that many of these households could be characterised by contextual conditions of energy efficiency and other more or less restrictive living conditions (e.g. tight budget, problems in defraying energy expenses, power cuts, and psychic stress). Some of the interviewees seem to have resigned to the situation or pay little attention to energy consumption; the larger part of them, however, strives to actively counter these conditions by adopting diverse coping strategies in order to ensure consumption of energy services on at least a basic level, or economise as much as possible. In many cases, though, the contextual conditions are unfavourable to the extent of hampering or even impeding respective efforts. Given the complex issues related to this topic, the question about possible resolutions and measures that could contribute to improving the situation of people living in energy impoverishment arises.

## Conclusions

The postulation to place actions to counter fuel poverty as a 'new social priority' on all levels of EU policies (Santillán Cabeza 2010) has not been recognized completely yet. Many of the member states have been identified not to comply with their duties in protecting underprivileged consumers in order to prevent fuel poverty. Although some countries have already taken initiative and are actively registering and opposing fuel poverty, others still have not acknowledged it as a problem (EPEE 2009; Kopatz et al. 2010). Single measures in the course of the implementation of the Third EU Single Energy Market Package, designed to protect vulnerable consumers, are being taken (also in Austria), but yet, a comprehensive debate of this issue on the level of society or politics is pending in Austria. Precise numbers are still not available and it remains difficult to reliably estimate the frequency of fuel poverty; a scientific investigation of this topic is currently on the point of emerging.

Set against this backdrop, the project NELA provides first insights into the issue of energy consumption and poverty which are mainly focused on the perspective of the people concerned, due to the qualitative methodology adopted in the study. This paper presents a range of selected results of the project that illustrate the specific strains of the situation on households which are poor or at risk of poverty, and their respective coping strategies. Following this, the corresponding question about the type of measures that could be taken to counteract fuel poverty needs to be raised. Various suggestions for possible measures have already been made based on the results of the project and of two stakeholder workshops with representatives of energy companies, public administration, NGOs, science and people

concerned that took place during the project, also taking into account the state of the art in international research.

The results of the project clearly show that certain distinctive features characterise the critical situation of the households in this study:

Regarding the structural framework, the factors that render households more vulnerable and, at the same time, are without reach of their sphere of influence, could mainly be found in an inefficient structure of the buildings, the heating technology and larger household appliances. The greater inefficiency is in these three areas, the higher the resulting charges will be, as much in terms of energy costs as due to the cold or mould growth in the flat. Particularly regarding heating costs, the vulnerability of a household and, concurrently, the respective energy costs are raised dramatically if the dwelling is located in a decentralised part of the building, featuring a large number of external walls. Under these conditions, it is not the questions regarding expenses or ecology which have priority, but primarily the difficulties in dealing with the cold. Saving energy or adopting energy efficient behaviour in heating practices are out of the question in these cases, as long as the basic condition of heating at least one room up to an agreeable room temperature has not been met. Lacking feedback systems form another part of the adverse structural conditions: without feedback, the people concerned are unable to evaluate the effects of their strategies. Receiving statements each month or every other month would render the costs more transparent and allow for a timely evaluation of potential saving measures.

If the structural framework mentioned here thus exerts a paramount negative influence on energy consumption and well-being, any measures taken will have to start from there. The study at hand reveals that households at risk of poverty have great difficulties in tapping the full efficiency potentials related to the cladding of the building, the heating technology and the household equipment. Smaller and cost-neutral efficiency potentials are often already being exploited to a large part (for example, using energy saving bulbs or window sealing). For further measures, however, financial resources and agency are not sufficient even if requests for raised efficiency in the building exist. It is exactly from this point that measures for raising the efficiency of buildings and tools could start, offering solutions that are ideally as cost-neutral as possible for the people concerned. On the long run, entirely refurbishing the whole building would be the most efficient way of lowering energy costs and therefore of opposing fuel poverty. Alongside long-term strategies like this, however, additional measures of effectively combating fuel poverty for the short term are necessary. A number of possibilities for this are presented in the following paragraphs.

## Replacement of devices

Legal requirements for raising energy efficiency have made energy providers relatively open towards implementing measures for increasing efficiency. This was corroborated by the experiences in the workshop with energy providers, which formed part of the project. Apart from energy efficiency funds aimed at raising the energy efficiency of devices in dwellings of people suffering from fuel poverty, we propose a model of micro contracting, which is designed to prevent energy efficient devices from having a negative effect on the budget

of the people concerned. In this model, a share of the costs for the programme of replacing devices is funded by energy efficiency funds, the second share is contributed by own financial means of the people participating, and the third part accrues from contracting. The latter share is calculated according to the annual energy savings achieved by replacing the device, and is subtracted from the energy bills and withheld by energy providers over the course of three years. This means that the amount economised through less consumption is only passed on to the customer in the fourth year of the programme. The clear advantages of this model on the side of the energy provider lie in the simple and easily calculable improvement of energy efficiency and in the effect of customer retention, whilst allowing households suffering from fuel poverty a largely cost-neutral replacement of large household devices.

### Energy counselling tailored to target groups

Not all households are fully exploiting the potential of possible economisations yet. There are indeed households which could be identified as lacking the knowledge necessary for taking action and thus show room for an improvement of their energy efficiency. Other projects reach the same conclusion (Seifried et al. 2009). In this context, energy counselling is definitely worthwhile. If, however, the counselling is based on the standards of a middle class household, the benefits for poor and at-risk-of-poverty households are limited. Therefore, energy counselling needs to be adapted to the needs of the respective target group – in this case, households suffering from fuel poverty – and their respective needs, according to their context and scope of action (Kopatz et al. 2010). France provides an excellent example here of a close cooperation between institutions including social services and energy counselling companies, and of monitoring fuel poverty (EPEE 2009).

Although increasing energy efficiency should be the centre-piece of any strategy aimed at countering fuel poverty, the clear disadvantages of it showing only long-term effects and not being tailored to target groups remain. Therefore, it is crucial to complement these efforts with strategies that specifically target households in situations of fuel poverty and fight the phenomenon of fuel poverty quickly and across the board. The analysis of the interviews revealed that many households are struggling with high energy expenses which weigh down on the household budget and often cause debts with energy providers or even power cut-offs. This creates a critical situation of vulnerability that is typical for households living in fuel poverty. The following measures illustrate possibilities of alleviating these strains.

### Guaranteed minimum power provision

A guaranteed minimum power provision has the provision for costs resulting from ensuring a health-promoting indoor climate for households at risk of poverty as an aim. To achieve this, demand-based calculations for energy expenses are made, based on the condition of the building, the location of the flat within the building, as well as the heating system. Calculating the expenses on the basis of the actual needs, this system ensures that only the costs that are required for providing a beneficial indoor climate are covered. This has two major advantages: on one hand, it promotes an economising behaviour,

and on the other hand, it shifts the interest in an improvement of the efficiency of the building and the devices from the people concerned to official administrative bodies, as low efficiency in these areas entails higher costs for a guaranteed minimum power provision. Beneficiaries of this system are the groups which are included in the national definition of fuel poverty. This strategy, as opposed to others aimed at increasing energy efficiency, could help reducing the strains of a situation of fuel poverty for the households concerned directly and inclusively, whilst at the same time creating structures that support other measures for efficiency.

### Power cut-off prevention system

The target of a prevention system for power cut-offs is that independent counselling of individual energy customers becomes compulsory before a power cut-off may be effected. This might include the following points:

- Financial and legal counselling for exploiting all possibilities of support and providing assistance with financial planning and debt prevention.
- Energy counselling in order to raise energy efficient behaviour and assist a change to energy efficient devices which is as cost-neutral as possible, as well as giving advice in case a change of the power supplier is requested.
- A general prohibition of power cut-offs during the winter season in order to minimize health-related risks in cold dwellings.
- Installing pre-paid meters which feature a function for minimal provision as a less drastic alternative to a complete power cut-off.

It is widely known in energy efficiency research that individuals find it difficult to evaluate their own energy consumption and to independently take steps leading to economisation. This especially concerns poor and at-risk-of-poverty households, which have a limited scope of action (and often lack the resources to invest in measures which increase energy efficiency), and is largely due to a lack of feedback systems. Prolonged billing periods, which only visualize the effects of any measures taken in annual differences, render measures for economising on energy relatively pointless in the face of a financial management which only caters for short-term distress. Consequently, two types of measures become salient here: those which reduce billing periods and those which visualize an increase in efficiency:

### Prepaid meters and power limitations as a minimal equipment of Smart Meters

The introduction of intelligent power meters in all countries of Europe not only represents a great technical feat but also a unique chance for improving energy efficiency, as well as the challenge to protect end users. Smart Meters are equipped with adjustable displays and are capable of giving direct feedback on energy consumption. Thus, in combination with other systems for direct or indirect feedback, they enable users to exploit potentials for energy efficiency (Spitzer 2010). Regarding households at risk of poverty, technological possibilities which decrease the likelihood for a power cut and, consequently, their

vulnerability, should form part of the minimum configuration of intelligent meters. For this, a prepaid function is as efficient as the possibility of power limitations.

These paragraphs only represent a selection of suggestions for policies that could help reduce fuel poverty, as deduced from the analysis of the critical situations described in the interviews. All the measures proposed, however, should not be implemented singularly and in an uncoordinated manner, but integrated into a (national) strategy for the reduction of fuel poverty.

Just as fighting fuel poverty requires agents to concurrently place a focus on “homes and people” (Boardman 2010), a situation of “shared responsibilities” of all players involved in the energy system (e.g. energy providers, the government, social security offices, housing cooperatives, NGOs, churches, consumers) is a fundamental prerequisite for improvements. It is the task of science now to remedy the lack of knowledge on fuel poverty. The project NELA takes one step into this direction.

## References

- Aune, M. (2007) Energy comes home. *Energy Policy* 35: 5457-5465.
- Berker, Th., Hartmann, M., Punie, Y., Ward, K.J. (eds.) (2006) *Domestication of Media and Technology*. Maidenhead: Open University Press.
- Berker, Th. (2008) Energienutzung im Heim als sozio-technische Praxis. In: Fischer, C. (ed.), *Strom sparen im Haushalt*. München: oekom, 175-192.
- Bladh, M., Krantz, H. (2008) Towards a bright future? Household use of electric light: A microlevel study. *Energy Policy* 36: 3521-3530.
- Boardman, B. (2009) *Fixing Fuel Poverty. Challenges and Solutions*, London: Earthscan.
- Bourdieu, P. (1984) *Distinction*. London: Routledge.
- Brand, K.-W. (2010) *Social Practices and Sustainable Consumption: Benefits and Limitations of a New Theoretical Approach*. In: Gross, M., Heinrichs, H. (eds.), *Environmental Sociology: European Perspectives and Interdisciplinary Challenges*. Dordrecht et al.: Springer, 217-235.
- Brohmann, B., Heinze, S., Rennings, K., Schleich, J., Wüstenhagen, R. (2009) What's Driving Sustainable Energy Consumption? Survey of the Empirical Literature, *in: ftp://ftp.zew.de/pub/zew-docs/dp/dp09013.pdf*
- Brunner, K.-M. (2007) *Ernährungspraktiken und nachhaltige Entwicklung – eine Einführung*. In: Brunner, K.-M., Geyer, S., Jelenko, M., Weiss, W., Astleithner, F.: *Ernährungsaltag im Wandel. Chancen für Nachhaltigkeit*. Vienna/New York: Springer, 1-38.
- Brunner, K.-M., Spitzer, M., Christanell, A. (2011) *Energiekonsum und Armut*. In: Mikl-Horke, G. (ed.) *Sozioökonomie: Die Rückkehr der Wirtschaft in die Gesellschaft*. Marburg: Metropolis Verlag (forthcoming)
- Brunner, K.-M., Christanell, A., Spitzer, M. (2010) *Energiekonsum, Armut, Nachhaltigkeit*. In: Institut für Elektrizitätswirtschaft und Energieinnovation (ed.), 11. Symposium Energieinnovation. Graz.
- Crosbie, T. (2008) Household energy consumption and consumer electronics. The case of television. *Energy Policy* 36: 2191-2199.
- Dillman, D. A., Rosa, E. A., Dillman, J. J. (1983) Lifestyle and Home Energy Conservation in the United States: The Poor Accept Lifestyle Cutbacks While the Wealthy Invest in Conservation. *Journal of Economic Psychology* 3: 299-315.
- Dünnhoff, E., Stieß, I., Hoppenbrock, C. (2006) *Energiekostenanstieg, soziale Folgen und Klimaschutz*. Heidelberg, Frankfurt: ISOE/ifeu.
- EPEE (European Fuel Poverty and Energy Efficient Project) (2009) *Tackling Fuel Poverty in Europe: Recommendations Guide for Policy Makers* ([www.fuel-poverty.org](http://www.fuel-poverty.org)).
- FORUM Nachhaltiges Österreich (ed.) (2007) *Energieeffizienz im Wohnbereich und Armutsbekämpfung*. Wien.
- Gram-Hanssen, K. (2008) Heat comfort and practice theory – understanding everyday routines of energy consumption. In: *Proceedings of the SCORE Conference Sustainable Consumption and Production*. Brussels.
- Grant, W. (2001) Environmental Policy and social exclusion. *Journal of European Public Policy* 8 (1): 82-100.
- Haas, R., Biermayr, P. (2000) The Rebound Effect for Space Heating: Empirical Evidence from Austria. *Energy Policy* 28: 403-410.
- Heiskanen, E., Rask, M., Mourik, R., Bauknecht, D., Brohmann, B., Vadovics, E. (2009) Basic approaches to studying energy-related behavioural change, *in: http://blogs.helsinki.fi/energiakurssi/files/2009/02/heiskanen-ym-review-chapter.pdf*.
- Hinton, E. (2010) *Review of the literature relating to comfort practices and socio-technical systems*. London.
- Kempton, W., Montgomery, L. (1982) Folk quantification of energy. *Energy* 7: 817-827.
- Köppl, A., Wüger, M. (2007) *Determinanten der Energienachfrage der privaten Haushalte unter Berücksichtigung von Lebensstilen*. Vienna.
- Kopatz, M., Spitzer, M., Christanell, A. (2010) *Energiearmut. Stand der Forschung, nationale Programme und regionale Modellprojekte in Deutschland, Österreich und Großbritannien*. Wuppertal.
- Lutzenhiser, L. (1997) *Social Structure, Culture and Technology: Modeling the Driving Forces of Household Energy Consumption*. In: Stern, P. et al. (eds.), *Environmentally Significant Consumption*. Washington: National Academy Press: p. 77-91.
- Lutzenhiser, L., Gossard, M. H. (2000) *Lifestyle, Status and Energy Consumption*. In: *Proceedings American Council for an Energy Efficient Economy*. Washington, DC: 207-222.
- Poortinga, W., Steg, L., Vlek, C. (2004) Values, Environmental Concern and Environmental Behavior. A Study into Household Energy Use. *Environment and Behavior* 36 (1): 70-93.
- Proidl, H. (2009) *E-Control & Caritas – Pilot-Projekt “Energieberatungen von einkommensschwachen Haushalten”*. Vienna.
- Prose, F., Wortmann, K. (1991) *Energiesparen: Konsumentenanalyse und Marktsegmentierung der Kunden der Stadtwerke Kiel*. Kiel.

- Reusswig, F. (1994) *Lebensstile und Ökologie*. Frankfurt: IKO.
- Santillán Cabeza, S. E. (2010) Opinion of the European Economic and Social Committee on Energy poverty in the context of liberalisation and the economic crisis. Brussels.
- Seifried, D., Richter, E., Schüle, R. (2009) Improving energy efficiency for low-income families. In: Proceedings of the ECEEE summer study. Paris.
- Shove, E. (2003) *Comfort, Cleanliness and Convenience. The Social Organization of Normality*. Oxford: Berg.
- Shove, E., Lutzenhiser, L., Guy, S., Hackett, B., Wilhite, H. (1998) Energy and Social Systems. In: Rayner, S., Malone, E. L. (eds.), *Human Choice and Climate Change*, Vol. 2. Columbus: Battelle Press, 291-325.
- Spitzer, M. (2010): Die Beeinflussung des Energiekonsums durch Energieverbrauchsrückmeldesysteme. Vienna.
- Statistik Austria (2009) EU-SILC 2008. Vienna.
- Statistik Austria (2008) EU-SILC 2007. Vienna.
- Strauss, A. L., Corbin, J. (1990) *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. London: Sage.
- Stokes, M., Crosbie, T., Guy, S. (2006) *Shedding Light on Domestic Energy Use: a Cross-Discipline Study of Lighting Homes*. In: COBRA 2006. London.
- Summerton, J. (2004) The new 'energy divide': politics, social equity and sustainable consumption in reformed infrastructures. In: Southerton, D., Chappells, H., Van Vliet, B. (eds.), *Sustainable Consumption*. Cheltenham: Edward Elgar, 49-64.
- Wall, R., Crosbie, T. (2009) Potential for reducing electricity demand for lighting in households: An exploratory socio-technical study. *Energy Policy* 37: p. 1021-1031.
- Warde, A. (2005) Consumption and theories of practice. *Journal of Consumer Culture* 5: 131-153.
- Wilhite, H., Lutzenhiser, L. (1999) Social Loading and Sustainable Consumption. *Advances in Consumer Research* 26 (1): 281-287.
- Wilhite, H., Nakagami, H., Masuda, T., Yamaga, Y., Haneda, H. (1996) A cross-cultural analysis of household energy use behaviour in Japan and Norway. *Energy Policy* 24: 795-803.