Beyond households: discovering the collective consumer

Dr. Corinna Fischer
Forschungsstelle für Umweltpolitik
Ihnestr.22
D-14195 Berlin
GERMANY
cofiffu@zedat.fu-berlin.de

Keywords
electricity, consumer, electricity consumption, sustainable development, energy efficiency, energy saving, collective actor, group, organisation, public sector, company, non-governmental organisation

Abstract
Discussion about the consumer's role in creating a sustainable energy future has mostly centred around the individual or, at best, the household. This paper will shed some light on the role of collective action, focusing on electricity consumption.

Collective action is defined as "all activity involving two or more individuals contributing to a collective effort on the basis of mutual interests and the possibility of benefits from co-ordinated action." Defined like this, it can be performed by a rather heterogeneous set of actors, among them groups of individuals, municipalities, companies, NGOs, or even social movements.

Collective consumer action may have important systemic effects. First, electricity saving or substitution efforts by such actors are potentially highly visible. Thus, they may help to increase awareness in the general public and serve as models. Secondly, electricity conservation or substitution in collective actors involves internal discussion processes, which may trigger learning processes among their individual participants. Thirdly, actions especially by public and political actors may help to create a legal, political and technical framework that in turn facilitates electricity conservation for individuals.

However, conditions for collective action are different from conditions for individual action. Co-ordination and the settlement of conflicts are required. Characteristics of the implementation process play a role, as well as the general political, legal, and economic setting.

The paper presents an heuristic framework for examining the potentials and barriers of collective consumer action. It is based on a typology of actors and actions, a literature review of factors influencing success or failure, and a discussion of distinctive features of electricity consumption as compared to other commodities. A brief analysis of an empirical example demonstrates the applicability of the framework.

Introduction: Consumers and Sustainable Development in the Electricity System

The liberalisation of electricity markets in Europe has changed the consumers' position in the electricity system. Consumers' decisions seem to gain importance with respect to the development of the system. In many European countries, consumers today may not only decide upon the total amount and temporal distribution of their electricity consumption, they can also choose among different suppliers and products. With suitable political and economic incentives present, it may even be attractive to "change sides" and invest in electricity production – be it physically by installing micro generation systems in the own home, or financially by investing in electricity shares.

The consumer therefore also receives heightened attention when it comes to environmental protection and sustainable development[1]. In the German discussion, on which I will focus here, recent scenarios for a sustainable energy system assign the consumer an important role. Crucial areas of action involving end consumers are demand-side energy efficiency, energy saving, electricity substitution, and decentralised self-production. Empowerment strategies have been suggested in order to help consumers make use of their new options in such a way that a sustainable development of the electricity system is supported. (Böde et al. 2000, Matthes & Cames 2000, Thomas et al. 2002, Enquete-Kommission Nachhaltige Energieversorgung 2002).

This line of thinking parallels a renewed focus on end consumers in the environmentalist community in general. Environmental psychologists have investigated consumer choice, among other types of ecologically relevant behaviour, since the 1980s. A number of psychological factors influencing sustainable behaviour have been identified, thereby differentiating and partly correcting the concept of the "*homo oeconomicus*" (Homburg & Matthies 1998). The applicability and effectiveness of different instruments for governing behaviour has been assessed – for example, information, feedback, gratifications or public commitment (Mosler & Gutscher 1998). Some authors have applied these more general findings to energy use (Linneweber 1995; Mosler 1997; Wortmann 2000, Brohmann, Cames & Herold 2000). The publishing of the influential report "Zukunftsfähiges Deutschland" (Sustainable Germany) in 1996 gave the discussion about sustainable lifestyles and ecologically compatible consumption patterns a boost (BUND e.V. & Misereor 1996). Research programmes on "sustainable consumption" sprung up, supported by the Federal Environmental Ministry and leading to a number of comprehensive publications (Günther, Fischer & Lerm 2000, Hansen & Schrader 2001, Umweltbundesamt 2002, Scherhorn & Weber 2002). Lifestyle analyses have been applied to understand consumer decisions in their social context (Reusswig 1999; Hofmann, Maase & Warneken 1999; Schultz, Empacher & Götz 1999). Thereby it became possible to define target groups for specific interventions in favour of sustainable consumption (Kleinhückelkotten & Neitzke 1999). Here as well, some authors have applied the findings to the energy sector (cf. Schoenheit 1995; Niedergesäß & Winkler 2000). Broadening the perspective even more, Elizabeth Shove and others have demonstrated how energy consumption is embedded in everyday routines and "normal" standards of comfort, cleanliness or convenience, and how these routines and standards evolve in interaction with infrastructures, policies, and strategic behaviour of business actors (Shove & Chappells undated, Shove & Wilhite undated).

However, all of this work has focused on the individual or, at best, the household. In this paper, I will explore the relevance of *collective* consumer action for the sustainable development of the electricity system. I will explain why I think these type of action deserves more attention than it has hitherto received, and I will sketch out a tentative theoretical framework for studying it. The work is part of the research Project "Transformation and Innovation in Power Systems" (TIPS; see www.tips-project.de) and will provide the basis for several case studies to be conducted in the following years.

The first part of the paper gives a definition of the term "collective action". After that, I will discuss why it is interesting for sustainable development in the electricity sector. A few examples will demonstrate the variety of possible collective consumer action and lead to questions concerning the conditions for success or failure. The following sections are dedicated to developing a heuristic framework that covers possible success factors and may be used for studying and comparing cases. The fourth to sixth section contain preparatory considerations. I will propose a typology of different variants of collective consumer action, examine literature on collective action, and discuss distinctive features of electricity as compared to other consumer goods. Based on these considerations, I will develop a heuristic framework the seventh section that may be useful for analysing success or failure of collective consumer action. Finally, I will try out the framework on an empirical case.

The Notion of Collective Consumer Action

By collective action, I understand "all activity involving two or more individuals contributing to a collective effort on the basis of mutual interests and the possibility of benefits from co-ordinated action." (Marwell & Oliver 1993). It is therefore distinguished from purely cumulative action where independent individual actions just "add up". I am interested in cases where those "mutual interests" and "benefits" consist in more sustainable patterns of electricity use. Such action can be performed by a host of different collective actors – like firms in the commercial and industrial sector, public authorities or NGOs in the public service sector, or groups of households in the residential sector. Sometimes, existing collectives may decide to move to a more sustainable pattern of electricity consumption – for example, a university introducing energy management. In other cases, collectives may be formed specifically with the purpose of "greening" their (electricity) consumption. An example for this is the Global Action Plan (GAP), where households form "Eco-Teams" in order to support each other in learning about and testing sustainable consumption patterns (Bruppacher & Ulli-Beer 2001, www.globalactionplan.org). In the area of electricity, the GAP involves switching to green electricity as well as a detailed set of conservation measures (http://www.ergo-living.com/practinfo/info_intro_fset.html). As these examples show, collective action may be performed by a variety of quite differently structured actors, ranging from loose groups of people via organisations or even networks made up of several organisations. I will come back to these distinctions in the section "Typology".

1. I will not delve deeper into the definition and operationalisation of sustainable development in the electricity system here. Helpful guidelines are provided by Nitsch et al. (2001) and by Enquete-Kommission Nachhaltige Energieversorgung 2002, stressing four areas of importance: the resource aspect, the aspect of nature as a sink (emission of pollutants, greenhouse gases and waste), the risk aspect and the distributive justice aspect. It follows that sustainability goals can generally be approached by reducing primary energy consumption in general and / or by switching to renewable energies. Both options allow to reduce the use of nuclear technology (thereby reducing risk) or fossil fuels (thereby mitigating climate change and the possibility of resource shortages and resource conflicts).

Why does Collective Consumer Action Matter?

There are a number of good reasons to believe that collective action by electricity consumers may prove crucial for the sustainable development of the electricity system. First, a substantial number of electricity consumers *are* collective actors. Firms, NGOs, or municipalities all consume electricity and are not covered by the discussion on households. The next reason is a pure matter of size. Collective action can make it easier to produce a noticeable effect on the electricity system. A group or organisation usually possesses better resources than an individual actor, allowing for larger projects. For example, it may be easy for a company to invest in a solar panel, thereby substituting part of its fossil or nuclear power supply. For an individual household, in contrast, the same investment may be too demanding. When thinking of smaller contributions that can be made easily by an individual alone, a huge number of individuals is needed in order to produce a cumulative effect. To motivate a sufficient number of participants, usually the backing of a sophisticated campaign or political program is needed. By addressing a collective actor, it is possible to reach a greater number of individual electricity users "at once", making use of existing group and organisational relations. Therefore, the same effort may produce a greater effect. For example, it may be more effective to launch an energy savings campaign at a university than to address all the employees individually in the context of their household.

Thirdly, collective action is more likely to produce indirect, "systemic effects". This means that besides its immediate effect on economic, ecological, or social parameters, such action may change the conditions for other actors, thereby stimulating or inhibiting certain sustainability-relevant behaviour. For example, electricity saving or substitution efforts by collective actors are potentially more visible than individual actors' endeavours. Thus, they may help to increase awareness in the general public and serve as models for others. Furthermore, electricity-related projects in collective actors usually involve internal discussion processes. These may trigger learning processes among their individual participants. Also, some actions by collective actors may help to create a legal, political and technical framework, which in turn facilitates electricity conservation for individuals. An example for this would be the decision of a municipality to install for the power supply of public buildings a demonstration plant fuelled by renewable energies. The experience and knowledge gained this way could be communicated to individual citizens interested in such technologies. Another possible example is a collective procurement initiative which may create a market for certain energy-efficient appliances and thus make them available to the general public.

Finally, collective action is an important tool for overcoming what is termed the "tragedy of the commons" or the "commons dilemma" in sociology (see for an overview Diekmann & Jann 2000, Kerr & Park 2001, Ostrom 2002). The "commons dilemma" is characterised by the common use of some good from which no individual user can be excluded. The users need to maintain or cultivate the common good so that it is preserved for the future (or, in the case of exhaustible resources, they need to minimise use in order to gain time for the resource to be substituted). The description applies to electricity consumption because the latter entails the use of a number of resources. Among them are exhaustible fuels whose use should be minimised. But also the atmosphere is used as a "sink" for emissions or land is destroyed in order to mine coal. These resources partly have a "public good" character because electricity prices do not cover their real social costs. Many externalities have not been internalised – like costs caused by CO_2 and pollutant emissions, surface mining, or social conflicts about nuclear energy (Hohmeyer 1997). Rather, the tariff system honours non-sustainable behaviour, e.g. via degressive tariffs.

In this situation, a number of problems occur. Take the example of electricity conservation campaigns directed at households. Will people be ready to make a contribution? First of all, there will be a *motivation problem*. It stems from the fact that any individual conservation effort will only have a marginally small effect on environmental protection. This motivation problem will be exacerbated by a *free rider problem* (Olson 1965): a person refusing to participate in the conservation activities will still profit from the environmental benefits produced by others' efforts. Knowing this, people will hesitate to take part – either in the hope of getting a free ride, or out of fear that others might take advantage of them. Adding to this is an *information problem*. The individual usually neither knows the precise impact of her electricity consumption on natural resources, nor the size or regeneration rate of those resources, nor the prospective behaviour of the other users (will they co-operate or not?) This lack of information makes it difficult to make an informed choice. Finally, whenever a campaign involves investment, an *investor – user problem* may turn up. For example, a house owner may be responsible for replacing an electric heating system by a more efficient and environmentally friendly district heating system. But when the house is rented out, it is not himself who will profit from his investment, but the tenant whose electricity bills go down. The owner thus has little motivation to make the investment.

In this situation, collective action can help to overcome the dilemma. It allows for communication, thus providing participants with information about others' behaviour, and enabling them to combine their knowledge in order to get a better picture of the resource status and possibilities of sustainable use. Collective action also involves co-ordination mechanisms that help to ensure the participation of everybody and thus overcome free-rider and motivation problems. This may happen in the form of arrangements and agreements, or even via coercive measures.[2]

To sum up, collective consumer action offers a promising potential for supporting sustainable development in the electricity sector. It is easier for collective actors to make large contributions, their actions may produce indirect effects conducive to sustainable development, and resource dilemmas may be overcome via collective action. In the fol-

2. However, collective action itself may be subject to certain commons dilemmas. It can be regarded as a "common good" itself which requires time, commitment, and sometimes money to be brought about, posing problems of motivation and free riding. I will discuss these matters briefly in the section on collective action.

lowing section I will sketch a few examples of collective electricity consumer action, chosen to cover a broad range of different types of actors and actions. Thereby, I hope to demonstrate the variety of collective action and its potential for bringing about sustainability. I will also show that some questions arise which suggest a systematic approach in the further study of such action.

Examples for collective consumer action

Collective procurement (Engleryd & Öfverholm 2002, International Energy Agency 2002). In collective procurement, a group of purchasers organises in order to articulate a strong demand for certain product features and thus create new markets. Procurement may aim at creating a better market share for an existing product or at stimulating innovation. In the latter case, it lowers the innovator's risk because he is provided with a reliable sales market. The strategy is applicable, for example, for energy efficient electric appliances. Recent examples stem from the IEA (for copiers) and the EU SAVE programme (for combined fridges and freezers). The potential purchasers formulate the desired efficiency standards and issue a tender to which manufacturers can react. They may also commit themselves to buying a certain amount of the product. In some cases, procurement initiatives have increased energy efficiency up to 30-50%. Evaluations have shown several critical points, though. For example, it is difficult for buyers to commit themselves years ahead to buying a certain product. The buyer group needs to include some crucial, leading buyers. Also, it may prove difficult for buyers, especially in an international context, to arrive at agreed-upon product standards.

Energy management networks by public buildings. In a project conducted by the Austrian Energie-Verwertungs-Agentur (Energy Use Agency, EVA), Austrian universities have formed a network in order to share information and help each other improve their energy management (http://www.eva.ac.at/projekte/uni.htm; Benke, Leutgöb & Freund 1999). In workshops and conferences, information on topics like lighting, CHP, load management and facility management was distributed. A thesis exchange was organised to motivate students to deal with energy efficiency issues and to promote knowledge sharing. Dialogue between universities, the EVA, the national students' association and public authorities responsible for energy issues and building was established via the project board. At the moment, a similar project is being conducted on hospitals (http://www.eva.ac.at/(de)/projekte/eenet.htm). The university project contributed to distributing success stories, identifying "weak points", developing a number of recommendations, and implementing energy efficiency measures at the participating universities. One problem the project faced was universities' disinterest due to investor-user-problems between the state and the universities, but also between the central university administration and the individual departments. Another problem was universities' distrust towards the authorities. Also, it seems that the network character of the project was not very pronounced, most activities rather resulting from "top-down" communication between the EVA and the participating universities.

Citizens' solar roof. Citizens may join together to form an investor group for a renewable energy project – e.g. solar panels on the roof of a public building. One of these projects is at the moment being realised at the Kiel town hall (http://www.labourcom.uni-bremen.de/ak-alternative_fertigung/rundbrf/rundbrf/rund011/s016-buerger-solardach-kiel.html). The Bund Naturschutz (Association for Environmental Protection) in Bavaria is running a project that tries to encourage such investor groups by informing and counselling. It seems that this sort of project needs a promoting and co-ordinating organisation as well as a favourable political environment. The latter is provided in Germany by the "100 000 roofs programme" subsidising solar panels, and by the electricity feed-in law guaranteeing fixed tariffs for electricity from renewable sources.

When looking at these examples, questions arise as to the preconditions for successful collective consumer action. In all cases, it seems crucial to win and motivate suitable participants. In the collective procurement and the hospital / university network case, relationships and communication between the partners seem to matter: procedures must be established to generate trust and / or arrive at common conclusions (e.g. on product standards). For the university / hospital networks as well as for the citizens' solar roof, the legal, political and economic environment seems decisive. For example, for the universities the question of who profits from the monetary savings is essential.

In my research project, I am trying to identify a general set of such success factors. This needs systematic comparative study of different cases, which in turn requires a heuristic framework guiding the analysis. In the remaining sections of this paper, I will develop a tentative framework. I do this in three steps: First, I distinguish different types of actors and actions which I believe face different problems and depend on different conditions. In the future course of the research, this typology will be used for guiding the choice of cases for comparison. Secondly, I evaluate existing literature on collective action in order to identify potential success factors. Thirdly, I discuss some of the peculiarities of electricity consumption which may modify the more general considerations on collective action.

Typology of actors and actions

The typology presented here will be a tentative one, comprising categories that I deem relevant for shaping the course of the collective action and determining its chances for success. An empirical demonstration of its analytic power has not yet been provided. The typology will become the basis for a series of case studies to be conducted in the following years. The outcomes will also serve to refine this framework.

TYPOLOGY OF ACTORS

As relevant dimensions for characterising actors, I see the *internal structure* and *economic orientation* of the actor.

Internal structure. Concerning the internal structure of an actor, I distinguish between groups, organisations, and meta-collectives. *Groups* are defined by having little formal organisation and rely heavily on personal acquaintance and face-to-face contact (Neidhardt 1979). An example of

Table 1: Collective actors by internal structure.

	Low formal structure	**High formal structure**
First order collective	Group (e.g. EcoTeam)	Organisation (e.g. school introducing energy savings campaign)
Second order collective (meta-collective)	Network (e.g. Energy University Network)	Meta-organisation (e.g. municipality performing energy management)

groups relevant to sustainable electricity consumption are the "EcoTeams" mentioned above. *Organisations* differ from groups in that they are formally organised. They involve division of labour and fixed roles and tasks for the individual members to fulfil. An example of organisational action would be the purchasing strategy of a firm or public authority. *Meta-collectives* are collectives of collectives. Groups or organisations co-operate to form a second-order collective – sometimes including individual actors as well. Ideally, the second order collective can be of two types. There is a looser type with little formal organisation and little hierarchies, much like the "group" on the first level. I will call this type a "network". The "energy university" network discussed above is an example. Another type is more formally organised, involving more division of labour and fixed roles and tasks. The groups and organisations comprising it relate to each other in institutionalised ways. I will call this type a "meta-organisation". An example of a meta-organisation is a municipality, where different political and administrative bodies may work together to modify the community's consumption patterns – for example by municipal energy management or climate protection campaigns. Table 1 gives an overview over the differently structured actors, including examples concerning electricity consumption.

I consider this distinction relevant because different mechanisms of interaction, information processing and decision making operate in the differently structured actors. *Groups* rely strongly on face-to-face-communication and, in the absence of many formalised rules, depend on the social skills of, and the personal relations among, their members. They are therefore rather flexible, but also susceptible to ruptures in the social relations. Furthermore, in this rather informal situation personal skills and character traits of individual members may gain special weight. In *organisations*, in contrast, the form formal structures and rules may be more important for shaping the process. In *meta-collectives*, finally, information processing and conflict settlement is supposed to become a special problem due to the size and complexity of these actors.

Economic orientation. The economic orientation of a collective actor describes its position in the economy. The distinction I make here is twofold: First, I distinguish between commercial and non-profit orientation. Commercially oriented actors are defined by their goal to make profit. Therefore, they have to compete in the market. Non-profit oriented actors, whether belonging to the public sector or to civil society, do not depend on economic success. They live on state or private funds and / or voluntary contributions in order to provide some public good or work for a social or political cause. This distinction is important because it influences the constraints actors face and the incentives to which they respond. Commercial actors have to think economically, maximising profits and minimising costs. Therefore, they are likely to respond to price incentives. Even if they also hold values and pursue goals of non-economic character, they can only do this to the extent that their economic survival is not threatened. With non-profit actors, it is the other way round. They also have to think economically, but this is not their primary goal and *raison d'être*. Rather, they are interested in what they perceive to be the common good, in the quality of the social service they are to perform, or in the ideational goals of the respective organisation. Therefore, they are more likely to respond to non-economic arguments and their actions and behaviour are to a stronger degree influenced by social and psychological factors than is the case in profit-oriented enterprises.

The second dimension of the economic orientation is which kind of economic activity the actor is primarily concerned with. Is it consumption, production, or service provision? This is important because it influences the purposes of electricity use, the technology involved, and thereby the social and technological options for substitution or efficiency gains. Actors primarily concerned with *consumption* can be found the residential sector. They use electricity in order to directly fulfil their own needs. Typical purposes are lighting, heating, and entertainment electronics. These purposes are quite standardised across households, allowing for standardised (technical) energy efficiency or substitution strategies.

Actors in the *service sector* provide services to others. This may happen on a commercial basis (like in a restaurant) but also on a non-profit basis (like in a charitable soup kitchen). In the service sector, there are two types of electricity use. First, there is a broad share of quite standardised and widespread applications, like lighting, heating, or office equipment. Like in the consumptive sector, these can be targeted with standardised strategies. But there are also electricity uses specific to the respective service provided. For example, a hospital needs electricity to run medical equipment, a hairdresser needs it for his hairdryers.

In the *productive sector*, finally, electricity is used to produce goods. This is mainly done commercially, but can also happen on a voluntary basis, e.g. in the form of neighbourhood help or even in the household. Due to the diversity of goods and manufacturing processes, it is almost impossible to offer standardised solutions for cutting electricity demand. As a general rule, it can therefore be said that electricity applications are most standardised in the consumptive sector and become more diverse and specific via the service sector towards the productive sector. Table 2 gives an overview of actors by economic orientation, with examples for electricity applications.

TYPOLOGY OF ACTIONS

As relevant dimensions distinguishing between different types of action, I see the type of the intended change, the

Table 2: Collective actors by economic orientation.

	Consumption	Service	Production
Non-profit orientation	Actor: Group of households or individuals Electricity application: Lighting, heating, communication, entertainment electronics	Actor: Group of households / individuals, organised neighbourhood help Electricity application: tools (vacuum cleaner, washing machine, lawnmower…) Actor: Public institutions, NGOs Electricity application: Lighting, heating, communication, tools (medical equipment…)	Actor: Group of households / individuals, organised neighbourhood help Electricity application: cooking, sewing
Commercial orientation		Actor: Service economy Electricity application: lighting, heating, communication, tools	Actor: Industry Electricity application: tools, machinery, process energy for goods production

dominating sustainability strategy, the "demandingness" of the action and its time horizon.

Type of change. One important dimension of consumer action is which aspect of the actor or its environment is tackled in order to produce change. I discern investive, behavioural and organisational strategies (for similar distinctions with slightly different focus see Bilharz 2000, Bruppacher & Ulli-Beer 2001, p. 291). In *investive* strategies, the actor changes or substitutes some factor of his environment that shapes his behaviour. The action basically consists of making a one-time investment, thereby changing the framework conditions for future action and "enforcing" a sustainable consumption pattern. Examples for investments are the purchase of electricity-saving appliances, or the installation of a solar panel. *Behavioural change* targets habits and practices of the actor. Examples include the switching off of appliances or lighting, but also more costly changes, like substituting electric devices by manual work. Finally, *organisational change* means modifying processes, institutions and routines. An example of organisational change would be the shared use of electric devices or office equipment in order to use them to capacity.

This distinction is important because the different strategies pose different kinds of difficulties. Investments are often difficult to introduce in the first place, because they need considerable resources and efforts as well as a supportive environment. However, once introduced they usually require less effort. Behavioural change shows the contrary pattern. One-time examples of alternative behaviour can often be implemented without much financial or organisational effort. However, if the behaviour is to be kept up over time, this usually means changes of lifestyle which are difficult to achieve. Organisational change, like investment, requires much effort to introduce and less to keep up. However, it also shares some features with behavioural change because it involves adaptation of practices and habits. Therefore, similar psychological barriers may occur and similar persuasion strategies may be effective.

Sustainability strategy. Consumers may pursue different strategies for achieving sustainability. Huber (1995) discusses three main strategies: efficiency, sufficiency, and consistency. *Efficiency* means providing the same services with less material or energy input. In the electricity sector, this would mean energy-efficient power generation and energy-efficient appliances. *Sufficiency* means to abstain from certain goods or services. In the electricity sector, it could mean, for example, substituting electric appliances by manual work. In the energy discussion, efficiency and sufficiency strategies are often summarised under the label of "energy saving". *Consistency* means producing goods and services in a manner consistent with natural cycles, meaning that the resources used can be restored and the emissions produced can be absorbed by the ecological system. For the electricity sector, this means the use of renewable energies. The distinction seems important because different sustainability strategies may face different implementation problems. For example, sufficiency strategies may be associated with asceticism which is not very popular. Efficiency and consistency strategies, in contrast, may resonate with the dominant paradigm of technological innovation and competitiveness, though they may have to face the opposition of the proponents of competing technological options or possible victims of structural change.

Demandingness. I coin the term "demandingness" for describing the degree to which an action is dependent on various preconditions, some of them having been discussed above. The difficulty of implementation of a sustainable consumption pattern is a function of the actor's resources on the one side, and the action's demandingness on the other. The more demanding an action is, the more resources are needed in order to realise it, and the harder it becomes for an actor to mobilise these resources. For example, the installation of a CFL is a very little demanding action, because it requires little money, little time, little knowledge, and no organisational change, therefore depending almost exclusively depends on the actor's motivation. The installation of 10 000 CFLs requires more money and time, but still not more knowledge or organisational change. The introduction of energy management, in contrast, is a more demanding action because it needs knowledge, skills, and may depend on the changing of organisational routines. Demandingness relates to, but is not equivalent with the scope of the intended change.

Time horizon. By time horizon, I refer to different aspects: the time required until a collective action is completed, the time needed until the sustainability effect is shown, and payback periods of possible investment. The time horizon is an important factor not only for the motivation of the actors, but also for economic feasibility of a project.

Distinguishing between these types of actors and actions will help to conduct a comparative analysis and find out whether in fact there are type-specific success factors for collective action. In the next section, I will turn to existing theory and research on collective action and see whether it can provide us with helpful suggestions on which factors may be crucial.

Conditions for Collective Action

Research on collective action asks two questions. First, how does collective action come about in the first place? It is especially important to ask this question in cases where a collective actor does not yet exist and has to be created anew. What makes people, for example, group together in order to invest collectively into a photovoltaic panel for their home town's school? But the question is also relevant in cases where a collective actor already exists, but starts a new type of collective activity different from its original purpose. This is the case, for example, when a school or hospital engages in energy management. The second question is, how can the collective action succeed? I will discuss the answers given in the literature in turn.

HOW DOES COLLECTIVE ACTION COME ABOUT? INSIGHTS FROM SOCIAL MOVEMENT STUDIES

This question has been discussed extensively in the context of research on social movements and protest events (see for an overview McAdam, McCarthy & Zald 1996, Hellmann 1999). However, its categories have so far not been used on energy efficiency topics. I will present some of them, showing how they might be applied to the example of the "citizens' solar roof". Resource mobilisation theories drew the attention to the role of *political opportunities* (McAdam 1996, Kitschelt 1999). "Windows of opportunity" may open up, for example, by new policies or by dramatic events that bring new topics to the agenda. This may provide chances for collective action. For the citizens' solar roof, the legislation on subsidising solar panels and the feed-in law provided such a window of opportunity. But to make use of it, financial, informational and human *resources* must be available (McCarthy & Zald 1977, Jenkins 1983). To provide these, so-called *"movement entrepreneurs"* and *"social movement organisations"* are helpful. Functioning as organisational cores of a movement, their task is not only to dig up the necessary resources, but also to resolve "commons dilemmas" and provide incentives to possible participants (Tilly 1984, Klandermans 1989). This is demonstrated by the fact that citizen initiatives for solar roofs have usually been triggered (or at least co-ordinated) by some kind of formal association. In Bavaria, for example, it is an established environmental association that is promoting these projects. At least as important as the formal organisation, however, are *micromobilisation* processes. Micromobilisation takes place via social networks, people being convinced to participate by friends, colleagues, or neighbours. In mobilisation processes, *ideology* is of great importance. Via *framing processes*, ideology allows to develop among participants a shared and motivating understanding of what is the problem, who are the opponents, what is the solution and how can collective action contribute to bringing about this solution (Snow et al. 1986, Gamson 1995, Zald 1996). Micromobilisation processes and framing have not yet been studied in the citizens' solar roof cases. This will be one of the objectives of my project.

HOW CAN COLLECTIVE ACTION BE SUCCESSFUL?

Once collective action has been generated, it needs to be sustained and the process needs to be organised in such a way that it leads to satisfying results. "Satisfying results" may, but need not necessarily mean the achievement of the original goal: goals can also be modified during the process. Social movement theory has to say something about this topic, too. Besides political opportunities, the internal organisation plays a part (Oberschall 1973, Tilly 1984). Furthermore, a *collective identity* is constructed and maintained among movement participants, sustaining their motivation for collective action (Hunt & Benford 1994, Simon et al. 1998).

Insights from group studies

However, social movement theory tends to focus on a macro level, giving less attention to processes at the level of the individual group or organisation. Here, it is helpful to consider insights produced by group and organisational studies. We will first turn to group research. It applies to the rather informal, "group-like" collective actors like the GAP groups. Important research comes from group dynamics (Shaw 1976, Schattenhofer 1992), organisational psychology (Guzzo & Shea 1992, McGrath & Argote 2001), and education and training (Barker 1991; Karas & Hinte 1989). Groups always have to strike a balance between task fulfilment and the fulfilment of member needs in order to sustain themselves and be productive. Whether they manage to do this depends on a number of highly interdependent factors. In Fischer (2002), I have demonstrated this for environmental youth groups. Besides task-related factors, like clear and realistic goals, appropriate skills, and the experience of success or failure, many factors are important that relate to personal needs and growth of the group members: group structure and group relations, learning experiences, and group communication. This can be shown in the case of Global Action Plan groups: participants report that "the group setting was very motivating. Got to know my neighbors" or that they developed "a sense of comradery with like minded neighbor" (EcoTeam Survey, 1999). Given the fact that energy efficiency itself is not a very emotional and motivating issue (see next section), these "secondary" social factors may become even more important in groups dealing with electricity issues.

Finally, the embedding of the group in its *context* is of crucial importance. Physical, social, political and economic aspects of the context interact with the group's development, including, for example, political opportunities, resources, and infrastructures. A major distinction is whether the group is or is not integrated into an organisation. Organisations operate along different lines than groups, as will be discussed in the following section.

Insights from organisational studies

Most collective actors in the electricity sector are not groups, but organisations, or meta-collectives involving organisations. Therefore, we will now examine organisational stud-

ies (covered both by organisational psychology and by management science) for helpful categories. Two strands of theory and research are relevant to our topic: work on innovation *in* organisations and on innovation *of* organisations. While the former introduces new products or processes *within* an organisation, the latter (also addressed as organisational development or organisational learning) aims at changes of the organisation itself (Kasper 1982). Both aspects may become relevant for collective action of electricity consumers: While, for example, the decision to take part in a collective procurement initiative can be classified as innovation *in* an organisation, the introduction of energy management may require changes in organisational routines and thus imply change *of* the organisation.

Research on innovation *in* organisations has rendered a set of variables influencing innovation (King 1990). One subset concerns properties of the *individual organisation members*, like personality traits, skills, values, and perception. For example, there must be individuals in an organisation who are interested in a collective procurement initiative. Another subset encompasses *organisational* factors. This means structural features like size, complexity, centralisation, formalisation, and hierarchies as well as resources and social interaction within the organisation, manifest in categories like culture, communication and leadership style. These factors may decide on how the idea to take part in a collective procurement initiative is communicated within an organisation, and whether it may arrive at a definition of required product standards. The third subset, finally, refers to *external factors*, like market competition or political incentives. An important factor seems to be whether these environmental factors are rather stable and predictable, or whether they appear complex and dynamic, thereby suggesting a need for flexible reaction. In the case of collective procurement, one of the questions is whether it is economically profitable to order a more energy-efficient device, and whether it will continue to be in some years' time.

With respect to change *of* organisations, a comprehensive framework is developed by Porras & Robertson (1992). Based on an extensive review of theory, research, and practice in organisational development, they present a set of 23 organisational variables relevant for change. These can be grouped into four broad categories: *Organising arrangements* include all the formal rules, arrangements and mechanisms that guide the organisations' behaviour, like formal structure (distribution of roles and status), administrative procedures, or ownership. In the case of the energy university network, an important organisational factor were the regulations on who would profit from the monetary savings, posing an investor-user dilemma. *Social factors* comprise characteristics of the organisation's members and their relations, like culture, interaction processes, and individual values, beliefs, and needs. In the energy university example, an important social factor was the distrust between universities and federal bodies. *Technology* comprises all the factors that directly shape the transformation of inputs into outputs; like tools and machinery, work flow design, or technical expertise. Finally, *physical setting* comprises spatial and physical aspects, like room size, lighting and heating, quality of the buildings or architectural design which have all proven relevant in the energy university example. Though an energy efficiency project may set out to change many of these parameters, the existing infrastructure determines to some degree the rage of possible change.

How can social movement theory, group studies and organisation studies be related to each other in order to provide a helpful framework for understanding collective consumer action? Grouping the factors relevant for shaping collective action into three broad categories, one can distinguish factors pertaining to the collective actor's *outer environment*, factors concerning its *internal structure and process*, and factors relating to its *inner environment*, meaning the psychological set-up of the individuals which constitute the actor. Social movement theory focuses on the relation between the outer environment and the internal structure and process, highlighting factors like political opportunities, resources, movement organisation, and mobilisation and framing strategies. Furthermore, it is concerned with explaining how a collective actor is formed in the first place. Group and organisational studies tell us little about how collective actors come about. However, they highlight aspects of the internal structure and process in interaction with the inner environment that have been less discussed by social movement theory. They point to details of organisational structure, social relations and individual member properties. While group theory mostly deals with these social aspects, organisation theory adds the "hardware" of technology and physical setting.

The factors discussed so far hold true for collective action in general, irrespective of its topic or of the specific application context. For our purposes, we need to enrich this framework with information that is specific to electricity consumption. Therefore, a short discussion of its peculiarities will be given before approaching the construction of a heuristic framework.

Peculiarities of electricity consumption

Electricity has a number of distinctive features it shares with some other non divisible, infrastructure-bound goods like gas or water, but that clearly distinguish it from other commodities. I will here only highlight such features that are important from a consumer's perspective. First, electricity supply is basic to the fabric of modern life. Consumers depend on security of supply in order to be able to perform their daily tasks. But unlike other crucial goods – e.g. food – consumers can do little to influence supply, because electricity can not be stored and because they depend on a single supplier and a working infrastructure, making it impossible to switch to alternative sources quickly. Secondly, electricity is invisible, and its consumption is abstract: Electricity is not consumed directly but only via various applications and energy services. There is not a "need" for electricity, but a need for light, music, or hot coffee. This has two consequences: First, it is difficult to give detailed feedback on the amount and timing of consumption. Almost no consumer knows how much electricity is needed for running the washing machine once or surfing in the internet for 20 minutes. Secondly, the emotional meaning attached to purchasing electricity is low. You won't express yourself through your preferred brand of electricity, or value a certain electricity supplier because they give you associations of freedom, so-

ciability, or respectability. Marketing experts have tried to change this situation in the course of the liberalisation of the German electricity market – however, without much success (Birzle-Harder & Götz 2001).

Heuristic framework

In the following, I will combine the above factors to a tentative heuristic framework for analysing success and failure of collective consumer action for a sustainable electricity system. By success, I define that the collective action is completed and that a sustainability effect arises. Sustainability indicators will be part of the final framework in order to assess the effects of any action, yet I will not discuss them here but concentrate on the structure and process variables that influence the process of realisation of the collective action. The heuristic framework yields a number of "sensitising concepts" (Glaser & Strauss 1967) that will be used for analysing and comparing cases. They will tell "what to look at" in the cases, and the set of concepts will be refined and corrected in the course of the case studies.

The framework is subdivided into three subsets of variables. First, the variables discussed within the typology of actors and actions. These are easy to discern even if one is not very familiar with a case. They can thus be systematically varied in advance and serve as a *basis for choice of cases*. Second, some variables derived from the study of collective action. It will usually not be easy to discern their expressions prior to the in-depth study of cases. They will therefore be the *object of study* during the case studies. Thirdly, the characteristics of electricity consumption will be considered as a *moderating variable* that impinges on others – e.g., influencing motivation or implementation process. Table 3 presents the framework.

Application of the heuristic framework

To give an example of how the heuristic framework may be applied, I will now briefly discuss the case of the so-called "Nordlicht" (Northern Lights) campaign (Prose, Hübner & Kupfer 1993, see for an English description of a similar campaign Prose & Wortmann 1991). Though it is an old example, it is still relevant because many energy saving campaigns today even fall back behind insights generated from this one. What is more, it is one of the few examples that has been extensively evaluated and documented in a way that allows for analysis on the basis of the available literature. The "Nordlicht" campaign is special in trying to overcome the purely cumulative action requested by most campaigns ("if everybody just did X, we could save Y tons of CO_2") and establishing rudiments of a truly collective actor by stimulating communication between individual actors, both directly and indirectly.

Though the campaign had a number of different goals and covered different areas of action, I will focus here on one part of it: the dissemination of CFLs. People were asked to buy and install CFLs in their house, with the aim of installing as many of them as possible. The campaign worked by information and persuasion tools, using flyers and extensive media coverage. One important feature was the use of "multipliers". Firms (especially insurance companies, banks and shops), clubs, local electricity suppliers, municipalities, trade unions, parties and schools all participated in distributing the flyers. Also, individual households were asked to pass on the information and appeal. The second special as-

Table 3: Heuristic framework for analysing collective consumer action in the electricity sector.

Core variables guiding the choice of cases	Actor structure
	actor type (group, organisation, network, meta-organisation)
	economic orientation (non-profit or for-profit; consumption-, production- or service oriented)
	Characteristics of the action
	Target of change (investive, behavioural, or organisational action)
	Dominant sustainability strategy (energy efficiency, renunciation of electricity use, renewable energies)
	Demandingness
	Time horizon
Variables under study in case studies	Actor structure
	Organising arrangements (formal rules and structures, distribution of tasks and status, administrative procedures, formal communication channels…)
	Social relations (informal group relations, informal communication channels, conflict, collective identity, collective culture / values / ideology…)
	Resources (financial, time, human)
	Technology (tools, expertise, job and work flow design…)
	Infrastructural and physical aspects (spacial aspects, architecture, design…)
	Implementation process
	Process management (planning, moderation, communication and participation, conflict mitigation, evaluation…)
	Learning opportunities provided to members in the course of the implementation
	Outer environment
	Political (dis-)incentives and opportunities (Policy instruments applied, responsiveness of the political system, allies and opponents, "windows of opportunity"…)
	Economical (dis-)incentives and opportunities (cost and price incentives, competition advantages…)
	Infrastructural constraints (architecture,
	Inner environment
	Psychology of individual participants (motivation, skills, values, attitudes, lifestyles….)
Moderating variable	Characteristics of electricity as a commodity (invisibility, indirect consumption, dependence on security of supply influence on motivations, on role of infrastructure etc.)

pect was the feedback system. Participants were asked to send back a reply coupon containing information about how many CFLs were installed. Cumulative success in terms of number of CFLs installed and CO_2 saved was permanently published in print media, TV, Radio and in the internet.

The campaign was successful both in spreading the devices and in raising awareness. A survey in four towns showed a high coverage: 30% of all households were aware of the campaign and 12.3% took part in it. The percentage of households possessing at least one CFL increased from 43.5% to 52.2% during the campaign. Of the participating households, 81.9% possessed CFLs at the moment of evaluation, compared to 47.7% of non-participants. Furthermore, participants' attitude towards electricity saving became more positive, and their belief in their own influence on environmental protection increased (Prose, Hübner & Kupfer 1993).

What were the crucial factors for success in this campaign? Let's first look at the *actor structure*. We do not observe a full-blown collective actor, because there were many individuals receiving the information via the media and acting rather cumulatively than in a co-ordinated way. However, the multiplier system provided at least rudiments of a network-type actor. It was characterised by no formal organisation and only loose informal ties that linked only subgroups within the network. In such a loose structure, communication and co-ordination become difficult.

These difficulties were counteracted by the factors of *type of action* and *implementation process* The most significant feature of the *action* of installing a CFL is that it is a very little demanding action. It requires little money, little time, and no co-ordination. Therefore it can be implemented easily by individual households. This is also the reason, why the "technology" and "physical" aspect of the actor structure do not matter, because no technological resources were needed and no infrastructural or physical constraints were present. Furthermore, the action did not require asceticism because an efficiency strategy was pursued, and it did not implicate extensive lifestyle or habit changes because it was a one-time investment.

The process management compensated for the loose actor ties by a sophisticated and intensive communication strategy using many different communication channels. Important building blocks were the feedback and multiplier system, establishing communication between the participants and thus overcoming information and motivation dilemmas. The problems arising from the *characteristics of electricity consumption* were overcome by choosing, with the lamp, one familiar and clearly understandable symbol for the vast field of electricity consumption.

The *outer and inner environment* were also favourable. There was political support available in the form of parties and municipalities acting as multipliers. Economically, there were incentives present because a CFL does not need a large investment and pays back after some time. Finally, the population's attitudes towards energy saving had been positive even before the campaign, partly fuelled by a similar, earlier campaign.

This brief analysis shows two things. First, on a methodological level, the usefulness of a heuristic framework like the one developed is demonstrated. However, it is also shown that not any category fits any case and that the framework is in need of further refinement. Second, on a substantial level, we can estimate some of the potentials of collective action: reaching a great number of people by making use of existing networks, overcoming commons dilemmas, and achieving broad media coverage, thereby being able to serve as a model.

In this paper, I have argued that is important to deal with collective action by electricity consumers because of these advantages, and simply because many consumers *are* collectives. I have suggested a typology distinguishing between groups, organisations, networks and meta-organisations, between different economic orientations of actors, and between actions with different types of change, sustainability strategies, and time horizons. I have presented a set of factors influencing success or failure, derived from social movement studies, group and organisational studies. Finally, I have tried out the resulting heuristic framework on an energy saving campaign. The campaign demonstrates some of the benefits collective action can possibly have. However, analysis of a full-blown collective actor is still ahead, serving to substantiate the claims put forward here.

References

Barker, Larry L. (1991): *Groups in process: an introduction to small group communication*. Englewood Cliffs: Prentice Hall.

Bilharz, Michael (2000): Ist weniger mehr beim Autoverkehr? Kritische Anmerkungen zu umweltpsychologischen Schnellschüssen. Initiative Psychologie im Umweltschutz: *ipu-Rundbrief* 11 / May 2000, p.27-35

Birzle-Harder, Barbara and Götz, Konrad (2001): *Grüner Strom - eine sozialwissenschaftliche Marktanalyse*. Frankfurt/M: Institut für sozial-ökologische Forschung.

Böde, Ulla, Gruber, Edelgard, et al. (2000): *Klimaschutz durch Minderung von Treibhausgasemissionen im Bereich Haushalte und Kleinverbrauch durch klimagerechtes Verhalten*. Forschungsbericht, Bd. 204 01 120. Berlin: Bundesministerium für Umwelt, Naturschutz und Reaktorsicherhei. URL: http://www.isi.fhg.de/e/publikation/verhalten/verhalten.htm.

Brohmann, Bettina, Cames, Martin & Herold, Anke (2000): *Klimaschutz durch Minderung von Treibhausgasemissionen im Bereich Haushalte und Kleinverbrauch durch klimagerechtes Verhalten. Bd. 1: Private Haushalte*. Forschungsbericht, Bd. 204 01 120. Berlin: Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit. URL: www.oeko.de/bereiche/energie/documents/klima_b1.pdf.

Bruppacher, Susanne E. & Ulli-Beer, Silvia (2001): Mobilising resources for more sustainable lifestyles: Views of households and local authorities. In: Ruth Kaufmann-Hayoz & Heinz Gutscher (Eds.), *Changing things - moving people: strategies for promoting sustainable development at the local level*. Basel: Birkhäuser, 281-299.

BUND e.V. & Misereor, Eds. (1996): *Zukunftsfähiges Deutschland. Ein Beitrag zu einer global nachhaltigen Entwicklung*. Basel u.a.: Birkhäuser.

Diekmann, Andreas & Jann, Ben (2000): Sind die empirischen Ergebnisse zum Umweltverhalten Artefakte?

Ein Beitrag zum Problem der Messung von Umweltverhalten. *Umweltpsychologie* 4,1: 64-75.

EcoTeam Survey (1999). Neighbor To Neighbor Campaign, Columbus, Ohio. Informal Survey. Available at: http://www.globalactionplan.org/Files/EI_Frameset2.htm

Engleryd, Anna & Öfverholm, Egil (2002): *Procurement for market transformation for energy-efficient products in Europe. Paper presented at the SAVE conference, Nov 8th - 10th, 1999, Graz.*

Enquete-Kommission Nachhaltige Energieversorgung (2002): *Schlussbericht.* Berlin: Deutscher Bundestag. URL: http://www.bundestag.de/gremien/ener/schlussbericht/index.htm.

Fischer, Corinna (2002): *"Das gehört jetzt irgendwie zu mir." Mobilisierung von Jugendlichen aus den neuen Bundesländern zum Engagement in einem Umweltverband.* TU Chemnitz Dissertation. URL: http://archiv.tu-chemnitz.de/pub/2002/0013/data/Index3.html

Gamson, William A. (1995): Constructig social protest. In: Johnston Hank & Bert Klandermans (Eds.), *Social movements and culture.* Minneapolis: University of Minnesota Press, 85 - 106.

Glaser, Barney G. & Strauss, Anselm L. (1967): *The discovery of Grounded Theory. Strategies for qualitative research.* Chicago: Aldine.

Guzzo, Richard A. & Shea, Gregory P. (1992): Group performance and intergroup relations in orgaizations. In: Marvin D. Dunnette & Leaetta M. Hough (Eds.), *Handbook of industrial and organizational psychology.* Palo Alto: Consulting psychologists press, 269 - 313.

Günther, Claudia, Fischer, Corinna & Lerm, Susanne (2000): *Neue Wege zu nachhaltigem Konsumverhalten. Eine Veranstaltung der Deutschen Bundesstiftung Umwelt zur EXPO 2000.* Berlin: Erich Schmidt Verlag.

Hansen, Ursula & Schrader, Ulf (2001): *Nachhaltiger Konsum. Forschung und Praxis im Dialog.* Frankfurt/M & New York: Campus.

Hellmann, Kai-Uwe (1999): Paradigmen der Bewegungsforschung. In: Ansgar Klein, Hans J. Legrand & Thomas Leif (Eds.), *Neue soziale Bewegungen. Impulse, Bilanzen und Perspektiven.* Opladen: Westdeutscher Verlag, 91 - 113.

Hofmann, Michael, Maase, Kaspar & Warneken, Bernd J (1999): *ÖkoStile. Zur kulturellen Vielfalt umweltbezogenen Handelns.* Schriftenreihe, Bd. 6. Marburg: Arbeitskreis Volkskunde und Kulturwissenschaften.

Hohmeyer, Olav (1997): *Social costs and sustainability. Valuation and implementation in the energy and transport sector. Proceedings of an international conference, held at Ladenburg, Germany, May 27 - 30, 1995.* Berlin u.a.: Springer.

Homburg, Andreas & Matthies, Ellen (1998): *Umweltpsychologie. Umweltkrise, Gesellschaft und Individuum.* Weinheim & München: Juventa.

Huber, Joseph (1995): *Nachhaltige Entwicklung. Strategien für eine ökologische und soziale Erdpolitik.* Berlin: Ed. Sigma.

Hunt, Scott & Benford, Robert D. (1994): Identity talk in peace and justice movements. *Journal of contemporary ethnography* 22: 488-517.

International Energy Agency (2002): *Transforming international markets through technology procurement. The examples of energy-efficient motors, copiers and cold appliances.* Stockholm: IEA.

Jenkins, Craig J. (1983): Resource mobilization theory and the study of social movements. *Annual review of sociology* 9: 527-53.

Karas, Fritz & Hinte, Wolfgang (1989): *Studienbuch Gruppen- und Gemeinwesenarbeit. Eine Einführung für Ausbildung und Praxis.* Neuwied / Frankfurt / M: Luchterhand.

Kasper, Helmut (1982): Innovation und Organisation. Ein Überblick über organisationsstrukturelle Bedingungen des Innovationsgeschehens. *WiSt Wirtschaftswissenschaftliches Studium* 11,12: 573-79.

Kerr, Norbert L. & Park, Ernest S. (2001): Group performance in collaborative and social dilemma tasks: progress and prospects. In: Michael A. Hogg & R. S. Tindale (Eds.), *Blackwell Handbook of social psychology. Vol.1: Group processes.* Malden, Mass.: Blackwell, 107 - 138.

King, Nigel (1990): Innovation at work: the research literature. In: Michael A. West & James L. Farr (Eds.), *Innovation and creativity at work. Psychological and organizational strategies.* Chichester et al.: Wiley, 15 - 59.

Kitschelt, Herbert (1999): Politische Gelegenheitsstrukturen in Theorien sozialer Bewegungen heute. In: Ansgar Klein, Hans J. Legrand & Thomas Leif (Eds.), *Neue soziale Bewegungen. Impulse, Bilanzen und Perspektiven.* Opladen: Westdeutscher Verlag, 144 - 163.

Klandermans, Bert, Ed. (1989): *Organizing for change: Social movement organizations across cultures.* International social movement research. A research annual., Bd. 2. Greenwich, Connecticut: JAI Press.

Kleinhückelkotten, Silke & Neitzke, H.-P. (1999): *Wegweiser durch soziale Milieus und Lebensstile für Umweltbildung und Umweltberatung.* Ecolog-Bericht, Bd. 2. Hannover: Ecolog.

Linneweber, Volker (1995): Energienutzung in Privathaushalten: ein feldexperimenteller Vergleich von Interventionsstrategien. *Zeitschrift für Experimentelle Psychologie* 42,3: 455-90.

Marwell, Gerald & Oliver, Pamela (1993): *The critical mass in collective action.* Cambridge: Press Syndicate of the University of Cambridge.

Matthes, Felix Chr. & Cames, Martin (2000): *Energiewende 2020. Der Weg in eine zukunftsfähige Energiewirtschaft.* Berlin: Öko-Institut.

McAdam, Doug (1996): Conceptual origins, current problems, future directions. In: Doug McAdam, John D. McCarthy & Mayer N. Zald (Eds.), *Comparative perspectives on social movements.* Cambridge: Cambridge University Press, 23 - 40.

McAdam, Doug, McCarthy, John D., & Zald, Mayer N., Eds. (1996): *Comparative perspectives on social movements.* Cambridge: Cambridge University Press.

McCarthy, John D. & Zald, Mayer N. (1977): Resource mobilization and social movements: a partial theory. *American journal of sociology* 82,6: 1212-41.

McGrath, Joseph E. & Argote, Linda (2001): Group processes in organizational contexts. In: Michael A. Hogg & R. S. Tindale (Eds.), *Blackwell Handbook of social psychology. Vol.1: Group processes.* Malden, Mass.: Blackwell, 603 - 627.

Mosler, Hans-Joachim (1997): Energiesparendes Verhalten im Haushalt: Der Beitrag sozialpsychologischer Theorie. In: Thomas Frahm, E. Gruber, E. Jochem & K. Ostertag (Eds.), *Bericht zum Expertenseminar 'Verhaltens- und Hemmnisforschung im Bereich Energie'*. Karlsruhe: Fraunhofer-Institut für Systemtechnik und Innovationsforschung, 13 - 14.

Mosler, Hans-Joachim & Gutscher, Heinz (1998): Umweltpsychologische Interventionsformen für die Praxis. *Umweltpsychologie* 2,2: 64-79.

Neidhardt, Friedhelm (1979): Das innere System sozialer Gruppen. *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 31: 611-38.

Niedergesäß, Ulrike & Winkler, Stefanie (2000): Lebensstile als Möglichkeit der Zielgruppen-Segmentierung für ökologisches Bauen und Wohnen - Die Synergie-Haus-Studie von PreussenElektra. In: Claudia Günther, Corinna Fischer & Susanne Lerm (Eds.), *Neue Wege zu nachhaltigem Konsumverhalten. Eine Veranstaltung der Deutschen Bundesstiftung Umwelt zur EXPO 2000*. Berlin: Erich Schmidt, 125 - 134.

Nitsch, Joachim, Kopfmüller, J., et al. (2001): *Schlüsseltechnologie Regenerative Energie.Teilprojekt im Rahmen des HGF-Projektes "Global zukunftsfähige Entwicklung - Perspektiven für Deutschland"*. Stuttgart & Karlsruhe: DLR-Institut für Technische Thermodynamik; Forschungszentrum Karlsruhe, Institut für Technikfolgenabschätzung und Systemanalyse.

Oberschall, Anthony (1973): *Social conflict and social movements*. Englewood Cliffs: Prentice Hall.

Olson, Mancur (1965): *The logic of collective action. Public goods and the theory of groups*. Cambridge, Mass.: Harvard University Press.

Ostrom, Elinor et al. (2002): *The drama of the commons*. Washington: National Academy Press

Porras, Jerry I. & Robertson, Peter J. (1992): Organizational development: theory, practice, and research. In: Marvin D. Dunnette & Leaetta M. Hough (Eds.), *Handbook of industrial and organizational psychology*. Palo Alto: Consulting psychologists press, 719 - 822.

Prose, Friedemann, Hübner, Gundula & Kupfer, Dirk (1993): *nordlicht - Zur Wirkung einer Klimaschutzkampagne. Forschungsbericht/Kurzfassung*. Kiel: Universität Kiel, Institut für Psychologie. URL: http://www.nordlicht.uni-kiel.de/evalg.htm.

Prose, Friedemann & Wortmann, Klaus (1991): *A Consumer Initiative for better Lighting and Energy Saving - Negawatt for Megawatt*. Paper given to: 1st European Conference on Energy-Efficient Lighting, Stockholm, May 28-30, 1991. http://www.nordlicht.uni-kiel.de/prowo.htm

Reusswig, Fritz (1999): Umweltgerechtes Handeln in verschiedenen Lebensstil-Kontexten. In: Volker Linneweber & Elisabeth Kals (Eds.), *Umweltgerechtes Handeln: Barrieren und Brücken*. Berlin: Springer, 49 - 69.

Schattenhofer, Karl (1992): *Selbstorganisation und Gruppe. Entwicklungs- und Steuerungsprozesse in Gruppen*. Opladen: Westdeutscher Verlag.

Scherhorn, Gerhard & Weber, Christoph (2002): *Nachhaltiger Konsum. Auf dem Weg zur gesellschaftlichen Verankerung*. München: ökom.

Schoenheit, Ingo (1995): Lebensstile und Energieberatung. In: VDI Gesellschaft Energietechnik (Ed.), *Lebensstandard, Lebensstil und Energieverbrauch. VDI Bericht 1204*. Düsseldorf: VDI-Verlag, 163-176.

Schultz, Irmgard, Empacher, Claudia & Götz, Konrad (1999): *Konsumtypen und Konsumstile deutscher Haushalte. Ergebnisse einer empirischen Haushaltsexploration zu nachhaltigem Konsumverhalten*. Frankfurt/M: Institut für sozial-ökologische Forschung.

Shaw, M. E. (1976): *Group dynamics*. New Delhi: Tata-McGraw Hill.

Shove, Elisabeth & Chappells, Heather (undated): *Ordinary consumption and extraordinary relationships: utilities and their users*. Online publication.

Shove, Elisabeth & Wilhite, Harold (undated): *Energy policy: what it forgot and what it might yet recognize*. Online publication.

Simon, Bernd, Loewy, Michael, Stürmer, Stefan, Weber, Ulrike, Freytag, Peter, Habig, Corinna, Kampmeier, Claudia & Spahlinger, Peter (1998): Collective identification and social movement participation. *Journal of personality and social psychology* 74: 646-58.

Snow, David A., Rochford, E. Burke, Worden, Steven K. & Benford, Robert D. (1986): Frame alignment processes, micromobilization, and movement participation. *American sociological review* 51,4: 464-81.

Thomas, Stefan, Wissner, Matthias, Kristof, Kora & Irrek, Wolfgang (2002): *Die vergessene Säule der Energiepolitik. Energieeffizienz im liberalisierten Strom- und Gasmarkt*. Wuppertal Spezial, Bd. 24. Wuppertal: Wuppertal-Institut für Klima, Umwelt, Energie. URL: www.wupperinst.org/energieeffizienz/pdf/Energieeffizienz.pdf.

Tilly, Charles (1984): Social movements and national politics. In: Charles Bright & Susan Harding (Eds.), *Statemaking and social movements. Essays in history and theory*. Ann Arbor: University of Michigan Press, 297 - 317.

Umweltbundesamt (2002): *Nachhaltige Konsummuster. Ein neues umweltpolitisches Handlungsfeld als Herausforderung für die Umweltkommunikation. Mit einer Zielgruppenanalyse des Frankfurter Instituts für sozial-ökologische Forschung*. Berichte, Bd. 06. Berlin: Umweltbundesamt.

Verband der Elektrizitätswirtschaft (VDEW) (2001): *Endenergieverbrauch in Deutschland 2001*. M21-2001

Wilson, J. (1966): Innovation in organizations. In: J. D. Thompson (Ed.), *Approaches to organizational design*. Pittsburgh.

Wortmann, Klaus (2000): Energiepolitische Gestaltungsmöglichkeiten aus psychologischer Sicht. In: Claudia Günther, Corinna Fischer & Susanne Lerm (Eds.), *Neue Wege zu nachhaltigem Konsumverhalten. Eine Veranstaltung der Deutschen Bundesstiftung Umwelt zur EXPO 2000*. Berlin: Erich Schmidt, 111-122.

Zald, Mayer N. (1996): Culture, ideology and strategic framing. In: Doug McAdam, John D. McCarthy & Mayer N. Zald (Eds.), *Comparative perspectives on social movements*. Cambridge: University Press, 261-274.