

A social practice view on product efficiency policies

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Abstract

Many product efficiency policies are based on a barrier analysis and assume an economic rational user: once the informational, financial or other hurdles are removed with the help of policy instruments the energy savings will be unlocked. In reality, savings fall short of the expectations and are nowhere near the deep reductions that are needed to prevent global warming. This paper shows the use of social practices for product energy policy by offering an alternative for the barrier approach. Unfortunately this provides a less rosy and ready to use picture for product energy policy: better insight into energy consumption behavior does not automatically crack the hard nuts of how to reduce this consumption to a sustainable level. Based on the analysis of how social practices can change, changing products (product efficiency standards) and context, triggering conscious reflection and presenting alternative actions are the main clues for product policy. Since time for reflection on and processing of alternatives is scarce, instruments that rely on this mechanism should be used selectively. But first of all energy policy needs clear goal setting requiring leadership to set goals and get public support for them.

Introduction

In daily life people use products, period. Normally, one would expect the foregoing sentence to carry on like 'to provide food, shelter, entertainment, mobility, etc.' However, in most situa-

tions this goes without saying. Products are used without people consciously thinking why they use them or even being aware of them, let alone being aware of the environmental impacts (the use of) products have. On the other hand, policy makers are very much aware that the use of products has consequences, such as energy use, material use and other environmental impacts, that need to be reduced in order to secure a sustainable future (Jollands et al. 2010). Products are the link between human activity and consumption of energy and other resources and the associated environmental impacts (Shove 2003). Therefore the acquisition and use of products is seen as an important "source" for energy savings: people should buy efficient products and use them efficiently, should turn off products when not in use, use products less, buy smaller products or even none at all. A variety of policy measures is in operation to realize these energy savings (Geller et al. 2006, Gynther et al. 2012) such as: minimum efficiency performance standards (MEPS); energy labels and other product information; providing feedback through smart meters and home displays; information campaigns to wash at lower temperatures. Although these policies are having effect, the results are not sufficient to achieve a sustainable future and more needs to be done, see e.g. the IEA analysis on energy efficiency (IEA 2012, p. 267–380).

This paper explores some of the background of product efficiency policy making by focusing on the models that are (implicitly) used when designing the policy measures. The following assumptions guide this exploration. The first is that these models at least partly determine the results of the policy measures and that their scrutiny reveals possibilities for improving the effectiveness of the policy measures. The second is that social practice theory can be used for this scrutiny because it links

behavior, products and the social context. In the examples in this paper, we focus on residential products because worldwide residential energy consumption and certainly residential electricity consumption is growing (IEA 2014).

This paper is organized as follows. Firstly we sketch the barrier model that enjoys widespread use in product energy policy, and we briefly discuss the alternatives that have been put forward. Secondly we present social practice theory and indicate how it can be used in a policy making context. This framework is then used to scrutinize policy measures. Finally we discuss the findings, draw conclusions and provide recommendations for product efficiency policy.

Barrier and multi-disciplinary models – fit for the policy context?

THE BARRIER MODEL

In general the mapping of product use or acquisition to (product) energy policy is based on a simple three step scheme (see e.g. European Commission 2011, US DOE 2006). Firstly it is stated that there is a large (technical and economical) savings potential that can be achieved without or with minimal impact on comfort and other functionalities. Secondly it is investigated why this potential is not used. The reasons are often called ‘barriers’, reflecting the hurdles that people have to take to get from their current situation to the situation with less energy use. Thirdly, instruments are proposed to remove the barriers, such as an information campaign to provide information on savings possibilities, a subsidy to lower investment costs or an energy tax to increase running costs. A proper policy cycle also includes, after the implementation, an evaluation of the instruments and – if appropriate – a revision based on the evaluation results.

The popularity of this approach with policy makers is not without reason. The great advantage is that it directly maps the (policy) instruments to the problems, the barriers: when the barriers are identified, it is clear what needs to be done to remove the barriers and thereby unlock the energy savings; see e.g. Schleich (2009, p. 2158–2159) and Jollands et al. (2010, p. 6411). However, this advantage is outshined by two related issues: the limited results and the simplistic, mechanic view on human behavior.

When results are available¹ they indicate that realized savings are moderate, less than the full potential and certainly nowhere near the deep reductions in energy use that are needed to secure a sustainable future. As stated in the introduction the world is not on track regarding energy saving in order to mitigate climate change. We illustrate the limited results with two specific examples. The first example is on product efficiency. Whereas the potential savings for individual products are large, the (estimated) realized savings from product efficiency on household energy or electricity consumption are moderate. For the EU, Almeida et al. (2011) calculated potential electricity savings of 50 % per household switching to BAT (best available technology) products. On the other hand estimated savings

on household electricity from ecodesign and energy labeling measures amount to 16 % of household electricity consumption (Siderius 2013, p. 9). The second example is on behavior. An indication for the savings potential can be found in the variance of the electricity consumption in households with the same housing type. The maximum consumption divided by the minimum consumption in various studies ranges from 1.5 to 7 (Jenssen 2008, p. 358, Morley and Hazas 2011), suggesting potential savings between 35 % and 86 %. On the other hand, Stromback et al. (2011) found average savings between 5 % and 9 % in 74 studies on different types of feedback experiments.

The simplistic view on human behavior has been severely criticized in literature already for several decades; see e.g. Lutzenhiser (1992), Spaargaren and Van Vliet (2000), Kurz (2002, p. 263–264), Jackson (2005, p. 35–41). The model used in the analysis of the barrier approach is mostly based on an economic rational user (*homo economicus*) and on physical, technical aspects of products. The user is expected to behave in such way that the total costs for the required functionalities are minimized or that, within budget constraints, the functionality is maximized. Everything that prevents the user from acting in such way is a barrier. Users that do not behave according to the theory are irrational, suggesting that user motives other than cost minimization, and behavior not aimed at maximizing functionality are not taken seriously. However, the ‘calculating’ way of the *homo economicus*, evaluating different alternative actions is rarely the way people normally go through life. Normal life is to a large extent shaped by habit and routine behavior. To avoid mental overload, this behavior follows much simpler rules, if any, than assumed by the economically rational user model. And even if people are thinking of their behavior, Cogoy (1999, p. 390) states: “Wishing to change some aspects of one’s life, regretting not to have changed behavior or learned new skills in the past, being satisfied with other past behavioral changes, considering future learning possibilities and so on are typical attitudes of consumers rather than maximizing behavior.”

Also non-economical behavioral models, e.g. Reasoned Action, Planned Behavior and Values Norms Believes (see for a good overview Jackson 2005), can be used with the barrier concept. These models postulate that variables like attitudes, intentions or beliefs “determine” the behavior. They suggest to policy makers that changing e.g. attitudes will change behavior – all other aspects being equal. In this case the barrier to the right behavior is the wrong or missing attitude, intention or values, and instruments are applied to change this. However, the causality between attitudes and behavior (Lutzenhiser 1992, p. 52–53) and the relation between values and the energy consequences of activities are challenged. Green values and green consumption do not guarantee a lower energy consumption (Jensen 2008, p. 358). Vringer et al. (2007, p. 564) concluded that there is no relation between total household energy requirement and value patterns of consumers.

MULTI-DISCIPLINARY MODELS

Inspired by the criticism of the barrier approach, the assumption is that a fuller, broader and richer analysis of the (daily) behavior of people results in a better understanding of that behavior. Consequently this better understanding should provide better clues for (product) energy policies aimed at reducing

1. Literature reviews, e.g. BEHAVE (Gynther et al. 2012) show that an evaluation of the results (achieved savings) of policy instruments is not common practice.

energy consumption through changing behavior concerning both the acquisition and use of products. Models combining technical, economical, social and psychological factors have been suggested to provide for better understanding of daily behavior in relation to energy consumption (Lutzenhiser 1992, Hitchcock 1993, Spaargaren en Van Vliet 2000, Stephenson et al. 2010).

The problem for policy makers is, that although cross-disciplinary models may offer a better understanding, they do not offer a larger array of policy instruments. Explaining (differences in) energy consumption does not automatically provide clues for decreasing it. An example is household size that is a relevant variable in many models, but is difficult to influence; see e.g. Druckman (2008). Also, according to Stephenson et al. (2010, p. 6122) the 'world of understanding use behavior' and the 'world of policy makers' are far apart, so that a better understanding does not automatically lead to better policies.

Segmentation studies (see Sütterlin et al. 2011, Gadenne et al. 2011 and Yohanis 2012 for example) offer a grouping of end-users based on certain characteristics that should allow for a targeted and therefore more effective approach of the various segments. Segmentation studies often assume that marketing and communication instruments can address the challenge (Sütterlin et al. 2011, Sanquist et al. 2012) whereas evaluation studies (Abrahamse 2007, Gynther et al. 2012) show that certainly general information is not effective in changing behavior. Moreover, the segmentation often is not related to actual energy consumption but to attitudes or behavior. These are expected to have a link with energy consumption, but this need not be the case. A further issue is how to actually reach these groups. This requires a link between the segmentation and socio-demographic variables which probably results in a dilution of the segmentation. Also from a legal point of view, such an approach may not be possible for all instruments, because a different treatment of people should be based on objective criteria and not on whether they belong to a certain segment.

Cross-disciplinary models emphasize the interaction between all variables or parts of the model, suggesting that policy instruments or packages of instruments should act on all variables. This can result in instruments that match the complexity of the process they want to change. An example category of such instruments is social networking including instruments like ecoteams (Nye and Hargreaves 2009) or concepts like transition towns. These are labor intensive instruments and therefore costly unless executed by volunteers. They also tend to decentralized decision making which increases the complexity if the coverage is intended to be the same as for traditional instruments. Mainstreaming these instruments is a challenge (Breukers et al. 2011). This links with another line of critique saying that policies focus too much on individuals, e.g. Shove (2010), Moezzi and Janda (2013). Finally, in some overarching views everything relates to everything which can easily result in the statement that first 'institutions' have to be changed before the 'right' instruments can be introduced (Shove 2010). Given the challenge of reducing energy consumption to a sustainable level, it is indeed plausible that fundamental changes are needed. However, it is a less fruitful strategy to presuppose such changes before anything can be done.

FIT FOR THE POLICY CONTEXT?

The foregoing analysis shows a fundamental problem for energy efficiency policy. The barrier model is "ready to use" in a policy context, because it directly maps the policy instruments to the problems. However, it is poor in understanding real life and the delivery in terms of energy savings is at best moderate and not sufficient. Cross-disciplinary models may offer a better understanding. However, this does not automatically provide better clues for policy makers to design instruments that result in decreasing energy consumption to a sustainable level.

In the next section we use social practice theory to dig deeper into this. The concept of social practices is a framework offered for analyzing user behavior in order to explain, i.e. provide meaning to, behavior and to change behavior. It provides an alternative for the homo economicus (Reckwitz 2002, p. 244) and a link between individual behavior and the social context. We introduce social practices using the concept as presented by Schatzki (1996, 2002) because it is the most detailed and concrete regarding the role of products.

Social practices have been used to analyze a variety of (user) behavior (Shove 2003, Strengers 2009, Bartiaux et al. 2011, Gram-Hanssen 2011, Hargreaves 2011, Morley and Hazas 2011). Of these studies Strengers (2009) and Bartiaux et al. (2011) offer some remarks on the relation between social practices and policy (instruments). In Gram-Hanssen (2011) and Hargreaves (2011) the policy instrument was chosen before the concept of social practices was applied (as an analytical framework) and in Morley and Hazas (2011) policies are not discussed at all.

Social practice theory and its use for product efficiency policy

A SHORT INTRODUCTION TO SOCIAL PRACTICES

We start with the – obvious – statement that 'real life' is the stream of things that happen. It is a continuous stream of doings and sayings involving people and other living creatures and artefacts in an environment. The stream indicates the time aspect and the environment the space aspect. Real life cannot be stopped and is always tied to a place. As such this might not be seen as very useful for product policy, but the statement shows that with each further step in the analysis we abstract from and interpret real life. In the end policy making is about changing real life, therefore we must ensure that despite the (necessary) abstraction and interpretation the policy making process will result in effective and efficient policies.

The level of social practices is used as the first step to extract meaning out of the stream of actions. Meaning is the basis for understanding the actions and with that the basis for policy making. A social practice consists of doings and sayings that are linked in a certain way (Schatzki 1996, p. 89). Practices provide intelligibility to the stream of actions. A practice is a way of transferring meaning: it is what by both the participant(s) and an observer is recognized as doings and sayings that hang together, are linked so that it is meaningful to label them, e.g. cooking, watching television, showering. The organization of a practice is out there in the practice itself, it is not in the mind of the participant(s), and need not be conscious for the performers of the practice.

Schatzki (1996, p. 89) distinguishes three types of links, also called the organization of the practice: understandings, explicit rules and teleoffective structures. Practical understanding means the ability to or knowing how to carry out acts, identify and attribute acts, and prompt or respond to acts (Schatzki 1996, p. 91). Practical understanding is a skill or capacity (know-how) that underlies activity. However, understandings expressed by doings and sayings are not internal states that cause the behavior (Schatzki 2002, p. 78–79); these understandings do not explain actions. Operating products, e.g. loading and programming a washing machine, typing on a computer, riding a bicycle are examples of practical understanding. The second link between doings and sayings are (explicit) rules. Rules in social practices are not what spontaneously emerges as a pattern but are “explicit formulations, principles, precepts and instructions that enjoin, direct or remonstrate people to perform specific actions” (Schatzki 2002, p. 79). Rules as such do not (further) explain doings and sayings. However the answer to the question why a certain rule was established should provide insight in the reasons for (not) performing the doings and sayings as instructed by the rule. An example of a rule is the instruction in clothing to wash it at a certain temperature. Teleoffective structures are the normativized and hierarchized orders of ends, purposes, projects, actions (teleological structure), beliefs, emotions etc. (affective structure) (Schatzki 2002, p. 80). As with the other type of links a teleoffective structure is to be understood as a property of the social practice and not as a set of properties of the participants of the social practice; this is why a social practice is called a *social* practice. Not all participants oversee and understand the total structure of a practice. A teleoffective structure is governed by normativity in two ways:

- Oughtness, rightness; this follows from the practices itself. If you want to have clean laundry then it follows that you have to collect the dirty laundry, sort it for the right programme, operate the washing machine etc.²
- Acceptability: actions that are acceptable (to others). This opens to broader behaviors than the behavior already performed in the practice and thereby is one of the drivers for the change of practices.

With these three types of links, understandings, explicit rules and teleoffective structures, Schatzki expresses that there is no single mechanism, e.g. only know-how, only rules or only teleoffective structures that provide meaning to what people say and do. The six elements of a social practice are the components that are involved in the doings and sayings: people and artefacts in a certain context; and the (type of) links between the doings and sayings: understandings, rules and teleoffective structures. A practice cannot be reduced to one of its single elements (Reckwitz 2002). It is the links that provide meaning to the doings and sayings. This is demonstrated when we observe certain doings and sayings in another culture. As such bodily movements, including manipulation of artefacts, and words spoken do not make (completely) sense because we lack (part of) the understandings, rules and teleoffective structures. In

the rest of this introduction to social practices we pay attention to the context, people and especially to products.

The linked doings and sayings that constitute a social practice do not happen in a vacuum but in a context (Schatzki 2002, p. 61). Apart from the natural environment, the context of social practices is other social practices. Infrastructures, such as electricity production, transmission and distribution, are themselves (combinations of) social practices that serve as a context for many other social practices. Products depend on infrastructures not only for producing them but also for using them.

People, of course are an essential part of a practice. The doings and sayings are performed (“practised”) by people, these doings and sayings express the meaning, beliefs, intentions etc. held by people involved in the practice. However, as indicated above according to Schatzki these beliefs etc. are first of all properties of the practice and not of the participants. Therefore in different practices different emotions, beliefs etc. can be expressed by the doings and sayings of the same person. However general (physical) characteristics of people, such as age, abilities, are the same in every practice, although of course they may play a different role.

Products are artefacts created by someone or by a process. Products play a central role in practices and there are very few practices that do not involve products, e.g. walking on a nudist beach.³ This paper restricts itself to energy using products, products that need non-human energy input, such as electricity or gas, to function. In general products acquire meaning within practices, i.e. the meaning products have follows from the practices in which they are used. However, on the other hand products structure and influence practices; sometimes in such a way that the practice is dominated by the product. The meaning of products is not only functional, but also emotional and symbolic (Jackson 2005, p. 29–32): a product is not a mere ‘bundle of services’ as suggested by Lancaster (1966).

Regarding practices the above implicates that products especially play a role in teleoffective structures because these links between doings and sayings are hierarchized orders of ends, purposes, projects, etc. and here the functionality and emotional aspects of products comes into play. The functional meaning, functionality of an energy using product is based on the energy service that is delivered by the product, that what the product does with the energy, e.g. producing hot water, rotating a drum, producing light. The distinction between energy service and functionality is important because the functionality might also be realized in another way than by means of an energy using product. Drying clothes can be done with the use of a dryer, but also by hanging them on a line outside. Mobility is not only achieved by using a car or public transport, but also by walking and biking. On the other hand, the energy service might be delivered while there is no user to enjoy this service. In this case the functionality of the service is zero. An example is a radio playing without anyone listening.

Practical understanding regarding the product also includes the know-how of operating the product. Certainly for new products it may not be obvious for everyone how to operate a product. This can restrict the functionality, including energy

2. This washing practice assumes you have a washing machine connected to water and electricity supply and detergent. In many parts of the world washing practices are governed by other conditions.

3. However sunglasses, sun lotion and flip-flops might be useful in this situation.

savings, as the example of programmable thermostats shows (Mallinick et al. 2012).

Regarding the rules in a social practice where products are used we do not mean rules, e.g. regulations, that limit the power consumption of a product (minimum efficiency standards) or that require the product to fulfill certain safety standards. As we discuss later such rules certainly influence end-use practices, but through the products that are used in a practice. An example of rules, instructions by products in the use situation are (programmable) user interfaces that allow users to choose from a large number of settings, but also structure the way the user operates the product, e.g. by default settings.

HOW SOCIAL PRACTICES CAN FIT INTO A POLICY MAKING CONTEXT

In this section we show how the concept of social practices can be used in policy making. As indicated in the foregoing, social practices provide meaning to the stream of real life events that a policy aims to influence. This meaning is by definition the meaning expressed by the people engaged in the practice. Therefore using this approach ensures that policy making is based upon the experience of the people the policy will target. However it is not sufficient for policy making to observe and describe social practices. Firstly, a social practice as such does not provide a goal for policy making. Secondly, social practices are still too complex to directly base policies upon. There are simply too many variables, relations and specific situations. Thirdly, ideally in policy making we want to be able to estimate the effect of a policy or a set of policies. Because of this accountability aspect, an important characteristic of policy making is the conscious processing of different steps (analysis, goal setting, instrument design, effect estimation). So, we need two more steps from social practices to policies. The first is reduction of complexity and introducing causality. The second is goal setting and the choice of instruments, which are main aspects of policies.



Figure 1. Social practices and policy making.

Figure 1 summarizes the approach: social practices organize the stream of real life activities by providing meaning, models reduce complexity of social practices and introduce causality focusing on those aspects that can be affected by policies, and finally policies include goal setting, and choice and design of instruments to reach those goals. With this the circle is closed because the aim of a policy is to change the stream of real life events. The first two steps in the approach can be called analytic, the third step and especially the goal setting is normative.

Some explanation is warranted to the use of models and the reduction of complexity. Figure 2 shows four well-known views on social practices from which models are derived to make social practices manageable for research and policies.

In the context of social practices it is important to emphasize that models *introduce* causality. Schatzki explicitly indicates that the doings and sayings (social practices) *express* beliefs, intentions and desires. This means that on the level of social practices beliefs, intentions and desires *do not cause* these doings and sayings. So, beliefs, intentions, desires etc. indicate how important a certain practice is or the sacrifices people will make to reach certain goals. In that way they provide important information for policy makers, but they are not to be seen as clues or dials for changing practices. Another consequence of the concept of social practices is that in the end all views

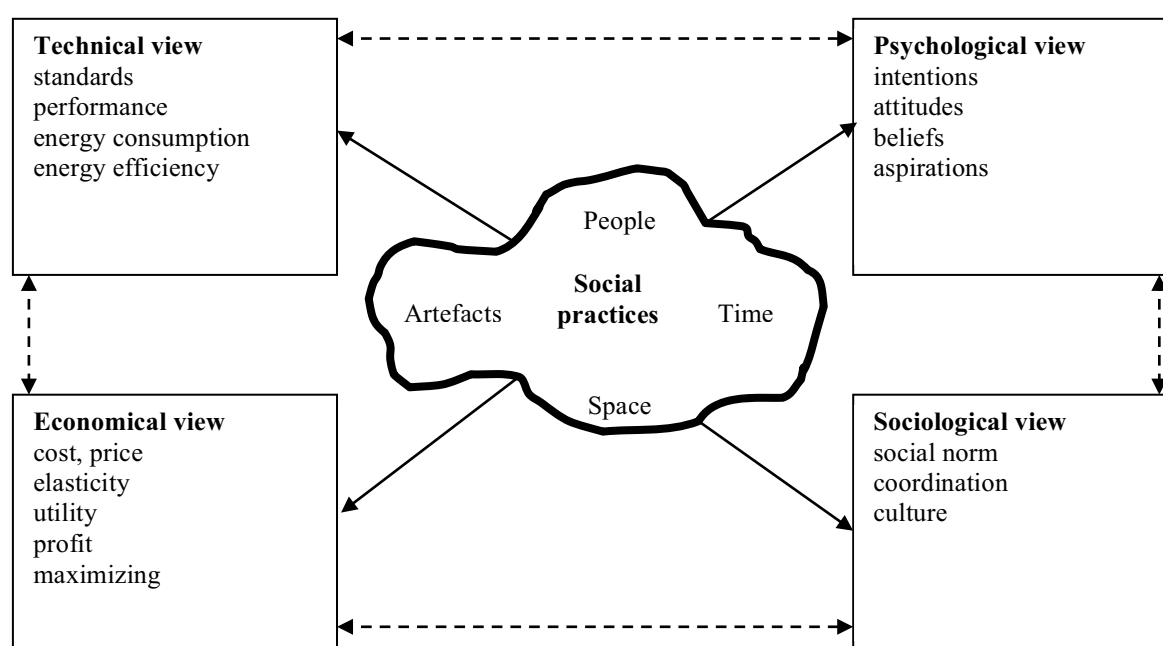


Figure 2. Four views on social practices.

are related and that models simplified to a single view or even a single variable have limited usefulness for policy making. A simple example regarding energy tax can illustrate this. While a tax measure that increases energy prices with 20 % to reduce energy consumption with 1 % sounds reasonable, suggesting a price increase of 200 % to reduce energy consumption with 10 %⁴ will most probably trigger other (political) mechanisms such as questions about equity and affordability of energy, and suggestions for subsidies for lower income households. Another example are product standards set at the level of most efficient technology that will trigger questions about affordability for consumers, patent issues and costs for certain manufacturers. The next section shows how instruments can be linked to the change of social practices.

POLICY INSTRUMENTS DERIVED FROM SOCIAL PRACTICES

In this section we look at the options social practices offer for product efficiency policies and we show how policy instruments are related to the elements of a social practice. The way social practices change provides clues for policies to change behavior to achieve policy goals. The sources of changed behavior lie in the development of practices (Warde 2005, p. 140), in changing the links and the components. These suggest several ways for product energy policies to change practices:⁵ introducing or changing know-how and rules, stimulate variation in practices, change artefacts (products) and context, and trigger conscious reflection and present alternative actions.

Introducing or changing know-how is in many cases supportive to other changes such as changes in products or context. It is to ensure that people know how to operate new equipment or handle a changed context such as knowing how to use the public transport in case no car is available. Policy instruments to introduce or change know-how are providing information and training ("practicing").

Introducing or changing rules is a well-known way for changing practices related to mobility and smoking; examples are speed limits, parking restrictions, smoking bans in public buildings, restaurants and public transportation. Regarding households, by-laws sometimes introduce rules that influence practices such as forbidding line drying of laundry outside the house. However, in general introducing rules that directly interfere with the behavior of people is seen as restricting freedom, certainly in the private sphere of the household, and therefore a less preferred option.

Stimulate variation in practices is based on the idea that not all ways to achieve a certain goal can be designed on beforehand. There are always other ways to achieve or avoid policy goals than policy makers had in mind. However, a variation in a practice does not automatically mean that there is a change towards the policy goal. The variation cannot effect the aspect the policy aims to change or it can even work counterproductive. It is difficult to link this way of changing practices to an instrument, but it points to the principle that policy instruments should be focused on achieving a goal and less on the way the

goal is achieved. Furthermore it stresses the importance of monitoring goal achievement.

Changing artefacts (products) or the (physical) context is a powerful way to change practices. It can range from making certain behavior more easy to perform to forcing people to change behavior. The choice architecture that changes people's behavior in an easy way without mandating the change, is also referred to as "nudge" (Thaler and Sunstein 2008). Infrastructural measures such as building a natural gas or district heating grid, are instruments to change the physical context. Another example is a restriction of the maximum electrical power a household can draw.

Product standards are an important instrument to change products. Regarding energy consumption such standards mostly relate to minimum efficiency levels or maximum power consumption allowed. However, also standards mandating default settings to be the most efficient or requiring power management belong to this category. Policy makers often try to set the product efficiency standards in such way that only the energy consumption and not the practices of end-users are affected. The energy savings from such standards are then calculated compared to a "business as usual" situation, the practice without the change. However also in this case practices will be affected, because lower energy consumption will result in lower energy costs, unless energy prices are increased or efficient products are more expensive to compensate for the lower running costs. The saved money may be spend on activities that are more energy intensive. Furthermore in several cases the practice – and not only the energy consumption – does change: increasing the room temperature after the house has been insulated, increasing the on-time of lamps when efficient lighting has been installed. This is one of the manifestations of the rebound effect (Sorrell 2009).

All the foregoing ways to change practices can also contribute to the following way to change practices: trigger conscious reflection and present alternative actions. Many policy instruments aim to follow this route. Examples are providing information (energy label, websites with energy saving tips, feedback on energy consumption, brochures, eco-teams), introducing an energy tax to increase energy prices or providing a subsidy to draw the attention to efficient products and make them financially more attractive. However, it is remarkable how many times these instruments do not result in the desired change: information is not noticed or dismissed, subsidies are ignored or increased prices are paid without changing the behavior. One can conceive at least two reasons for this. Firstly, time is a scarce resource and conscious reflection on doings and sayings and thinking about alternatives and how to carry them out cost time. From the practitioner's perspective this time might simply not be available, not lying in the normal course of action. Secondly, conscious reflection and alternative actions are related to the teleoaffective structures, and therefore to beliefs, values, attitudes, goals etc. These often are deeply embedded in current practices and therefore these practices are not changed easily. If you love watching your favorite football club game on a large screen television set, an increased electricity price will probably not change this. However, the offer of watching the game in a local pub with friends and also on a large screen might. "Crisis" situations, e.g. an appliance that breaks down, provide a chance for information to be noticed.

4. Assuming for simplicity that the model is linear.

5. Changing the physical properties of people is generally not an acceptable way for policies to change practices and will therefore not be discussed.

However, in these situations the time for reflection and thinking about alternatives is limited. Thus unless the information is tailored to the situation and is understood easily, people tend to end up with the same product they had before. In this case they only make use of the business as usual improvements.

Based on the overview above, we now can relate product policy instruments to the elements of a social practice (see Figure 3).

Most of the instruments for product energy policy in Figure 3 are well known and can be categorized in four groups: information instruments including feedback, financial instruments (subsidies, taxes), product conformity measures (standards) and supporting measures (infrastructure). Although all instruments but one are placed at one element it is clear from the social practices framework that the interaction between people, product and context will determine the result. Instruments that practice, learn energy efficiency, such as social networking, ecoteams, goal setting and to a lesser extent audits relate to more than one element. They include both information on know-how, challenge teleoffective structures and might even set informal, but explicit rules. Another suggestion are instruments that relate to other practices. An example are instruments that stimulate people to become co-producer of energy (Strengers 2009) by getting involved in local energy production by wind or solar.

Discussion, lessons learned and recommendations

We started this paper by briefly sketching the problematic nature of the barrier approach widely used in product efficiency policy and the need for a policy framework that captures more than the economic rational user if we really want to reduce residential energy consumption to a sustainable level. Next we

focused on social practices as a theoretical framework for the use of products and presented a policy making model using social practices and showed how policy instruments can be related to social practices. In this section we first contrast the social practices concept with the barrier approach. Then, we summarize the lessons learned from the social practice concept for product efficiency policy and provide recommendations.

DISCUSSION: SOCIAL PRACTICES VERSUS THE BARRIER APPROACH

The differences of the social practice concept with the barrier approach are the following. Firstly, the social practices concept allows for – and requires – a broader view on the behavior of people. There is no such thing as “irrational” behavior in normal, healthy people and behavior is not irrational because it does not follow rational economic rules. Social practices do not provide a simplistic view whether and how behavior can be changed to achieve certain goals. Secondly and related, it stimulates a multi-dimensional policy set-up, whereas the barrier concept often reduces this to a one-dimensional approach, e.g. setting the ‘right’ price for energy as the single measure. Thirdly, it is not the potential that is driving the policy making, but the policy goal. The policy goal in essence is set by external circumstances such as the need to reduce CO₂ emissions to ‘safe’ levels or the need to reduce the use of scarce resources. Also on the long run the potential becomes unknown, whereas the external circumstances, e.g. the finite resources on earth, become more certain. The technical-economical potential provides an indication what could be achieved with certain measures. Since it is closely tied to the concept of the rational economic user, it often fails to acknowledge the non-technical and non-economical changes that are needed. With this, social practices also point to the political side of product efficiency policy making. Because the barrier approach tries to reduce

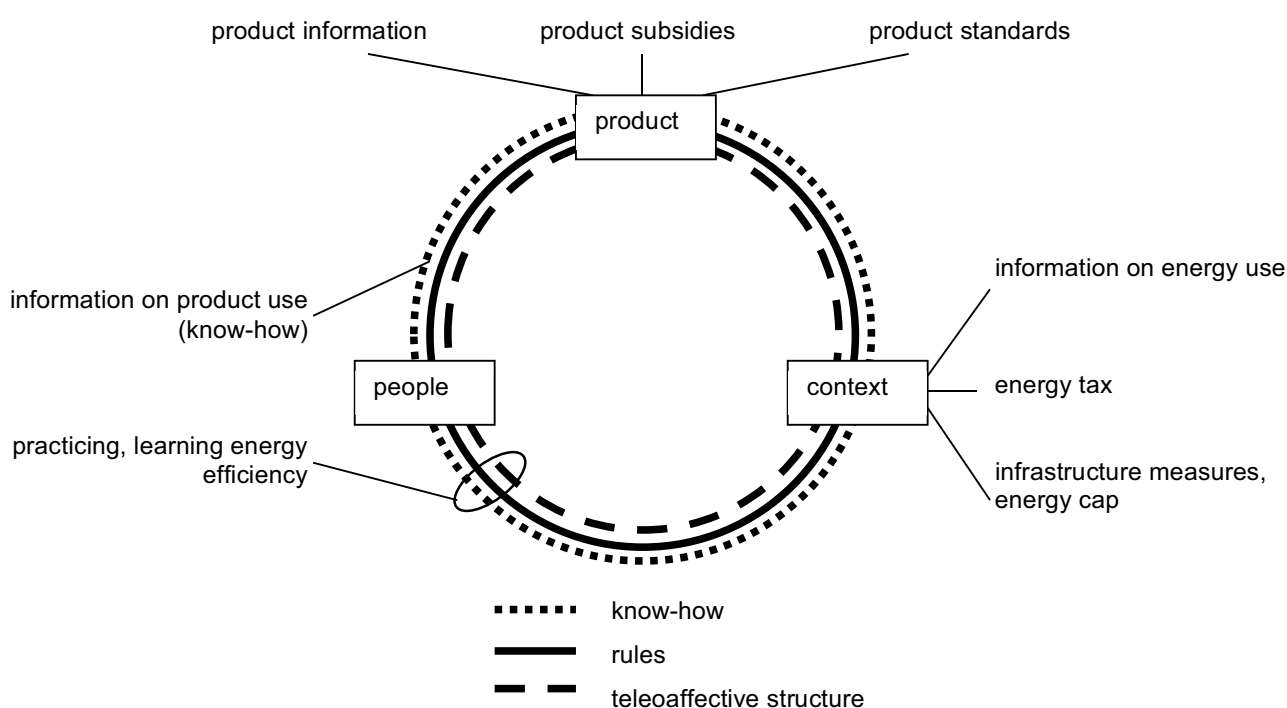


Figure 3. Product policy instruments related to the framework of social practices.

product efficiency policy to a technocratic exercise, it thereby creates a blind spot for the political side that every policy making has.

LESSONS LEARNED

The social practice concept does not provide a ready-to-use concept for policy makers. However, below we provide six lessons learned that are relevant for policy makers.

Firstly, products are an important element in social practices. Products are not only things that provide a certain functionality but also, or in some cases in the first place, artefacts that people value and acquire a symbolic meaning in practices. Regarding policies, products are often isolated from social practices, focusing on technical improvements to reduce energy consumption or increasing efficiency without changing the practice itself. On one hand this is the only way to reduce energy consumption without end-user involvement, and to avoid the problems related to this involvement (see below). On the other hand, completely ignoring the practice is hardly possible and the reduction of energy consumption in practice may well be behind theoretical savings. Reasons for this are the rebound effect, improper understanding and non acceptance of what was thought of as only slightly changed functionality. Furthermore, concentrating on technical improvements per product leaves out important other ways to decrease energy consumption such as the number and use of products.

Secondly, social practices highlight behavior as a key issue. They do so in a balanced way regarding individual aspects and responsibility on one side, and social conditioning on the other side. Although doings and sayings are to a large extent of unreflective nature and guided by (social) context, these doings and sayings are not fixed, but change and can be changed. However, targeting individuals to change behavior has little chance to sustain if these changes go beyond the (social) context or acceptable variations of the practice. Also the social practice framework does not support the claim that energy consumption can be reduced to a large extent without changing practices, i.e. without changing our understandings, rules and especially teleoaffective structures.

Thirdly, in addition social practices point to the mundane, day to day behavior that is mostly habitual and unreflected. On the other hand changing social practices requires conscious reflection, thinking and talking about alternatives and learning new doings and sayings. This costs time that is a scarce resource in social practices. Too many policy instruments assume that people will pay attention to the instrument, e.g. notice and read a brochure, visit a website with energy saving tips, read and understand their energy bill. In many cases these activities are not integrated in practices. What does not help is that energy consumption is a consequence of many single behaviors and especially electricity consumption is fragmented.

Fourthly, although energy consumption is a consequence of the use of energy using products in social practices, it is much less often part of a social practice. With that we mean that energy consumption is not in the understandings, rules or teleoaffective structures that form the organization of a practice. Information on actual energy consumption is not available on the product level and certainly not in a way that is easily integrated in social practices.

Fifthly, the social practice framework applied to the use of products does not provide the goals for product energy policy. Reducing product energy use is not integrated into most practices and certainly not to a level that is needed; on the contrary, business as usual tends towards higher energy use (Shove 2003).

Sixth and final, although the concept of social practices provides insight in a number of clues for changes, these will not happen automatically. Better insight into energy consumption behavior of people does not automatically crack the hard nut of how to reduce this consumption to a sustainable level. So the question whether a better understanding of use behavior leads to better energy policies cannot generally be affirmed or denied. It may be not the lack of insight or knowledge that holds us back from setting ambitious goals, but the knowledge that such goals will require serious changes in people's lives; see Crosbie (2008) and Hargreaves et al. (2010, p. 6117–6118).

The foregoing lessons learned suggest a less rosy and ready to use picture for product efficiency policy than the barrier approach assumes. There is no “magic hand”, “silver bullet” or “quick fix” that will reduce (residential) energy consumption to sustainable levels. On one hand, the reason is indeed that human behavior is less simple than the barrier approach assumes. On the other hand, better understanding this behavior does not automatically give insight in how to reduce energy consumption and to what level. Such a target is ultimately a political decision and it seems that the political aspect is missing. And with that we might have entered the following vicious circle. Because there is no quick and painless fix, the issue needs to be brought to the political level. However, political leaders tend to favor solutions that do not frighten large parts of their electorate, in other words they prefer the quick and painless fix. As noted before, first changing the political level before we can do anything, might not be a fruitful strategy.

RECOMMENDATIONS FOR PRODUCT EFFICIENCY POLICY

In the above, we put product efficiency policy in a broader framework using the lessons learned from the social practice concept. From this we provide the following recommendations for product efficiency policy.

First of all, the goal for product efficiency policy needs to be clear. Probably such a goal will be derived from a politically determined goal, like the 20 % energy savings from the EU 20/20/20 targets (European Commission 2010); a goal that is based upon climate change goals, e.g. the 2,000 W/capita goal in Spreng (2005); or a goal based upon ethical foundations (Muller 2009). Policy making requires leadership to set goals and get public support for them, even if achieving these goals requires (on the long run) fundamental changes in the real life, the social practices of people. Concrete goals and a clear time path itself can be a stimulus for changing behavior, including finding creative solutions to achieve the goals other than indicated by the policy instruments. Last but not least, concrete goals require monitoring to assess whether policies and other activities are on track to achieve the goals.

From a social practice perspective, we can distinguish between product efficiency policy instruments that require specific action of the end-user and those that do not require specific action of the end-user. In most cases product efficiency standards are an example of the latter, they can be implemented to

change practices as little as possible. Product efficiency standards can also contain parts that interfere with and try to change practice, e.g. auto power down requirements or requirements on default settings. In general products should be designed in such way that the user is guided (“nudged”) to using the product with minimal energy consumption as default. Policy instruments that involve end-users intend to use their scarce time for reflection and processing of alternatives. A classical example are energy labels that guide consumers to the most efficient products on the market. Since their introduction in the EU in the nineties, energy labels are probably part of the buying practice of a large part of the consumers. Energy labels are useful to guide buying decisions for large appliances where savings per product are significant. However, they seem less useful for products or aspects with small savings per product, e.g. external power supplies or standby power consumption. Instruments that rely on the mechanism of reflection and processing of alternatives should be used selectively. These instruments should support people when they establish changed practices that use less energy, including the non use of products. Analysis of social practices will help to find ways of introducing instruments into practices, e.g. through social networks.

Feedback on household energy consumption is only indirectly related to products. Without further processing it is difficult to relate changes in total household energy consumption to (the use of) a specific product. However, information on household energy consumption, available in a format that is useful for end-users, can be a strong driver for change. Such feedback can have three functions: as an instrument for reducing energy consumption, to include energy consumption in social practices (see Grønhoj and Thørgersen 2011) and indicating whether goals are achieved.

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