

POLICIES TO PROMOTE SUSTAINABLE CONSUMPTION

First results from an EU-wide impact evaluation project

Norma Schönherr¹, Bettina Brohmann^{1,3}, Uwe R. Fritsche¹, Eva Heiskanen², Franziska
Wolff¹

¹Öko-Institut, Freiburg/Darmstadt/Berlin, Germany

²NCRC, Helsinki, Finland

³ Öko-Institut, Rheinstraße 95, D-64295 Darmstadt, Germany, b.brohmann@oeko.de,
ph +49 (6151) 8191-35

Abstract

The development of policies to promote sustainable consumption is a growing and demanding task of today. Many different actors have to cooperate, or even integrate their strategies and portfolios from the local to the international level, and across sectors. In order to achieve effective and coherent policies, many uncertainties have to be dealt with. These include uncertainties about how policy instruments influence consumption patterns with regard to cultural or lifestyle differences and about the impact of changes in consumption patterns on the supply side and, thus, on sustainability. The FP7-funded project “Policies to Promote Sustainable Consumption Patterns (EUPOPP)” is aiming to increase the knowledge about context and framework conditions as well as on the impact of policy instruments. Guided by a Conceptual Framework, research is focused on the need areas of food and housing – reflecting present and future lifestyles as well as existing best-practice to promote more sustainable lifestyles. The assessment of such impacts must account for interlinkages of consumer action with activities of other market players and path-creating effects of systems of consumption and supply. The paper presents an interdisciplinary tool for the assessment of consumption policies, which combines policy and material flow analyses. First results on consumption trends and projections are discussed as well as on instrument-specific effects on consumer behaviour. These form the baseline against which sustainability impacts can be quantified in order to identify the potential that, e.g. information, incentives or regulatory instruments, may offer to reduce adverse impacts, such as GHG emissions, costs, and employment. Effects and sustainability impacts of future instrument bundles will be explored in the next project steps.

Keywords

Policy instruments, impacts, sustainable consumption patterns, food, housing, material flows

1. Introduction

Over the last decade, many European governments have developed strategies and policy instruments to promote sustainable consumption (hereafter: SC), and the European Commission has launched an Action Plan for Sustainable Consumption and Production (EC, 2008). In this context, five priority fields of action have been identified by the EC: Smarter Consumption, Better Products, Innovation, Leaner and Cleaner Production, and Global Markets. On these different levels of action, cooperation among several stakeholder groups is crucial. Furthermore, agreements between sectors, lead market initiatives and the networking of innovation actors are expected to be shaped and organized (Aichinger, 2009). It follows from the above mentioned levels of activities that SC encompasses a variety of measures and instruments, such as Integrated Product Policy, Clean Production, Smart Consumption, and Green Public Procurement.

However, relatively few policy instruments implemented so far directly target consumer behaviour (as opposed to production processes and producer behaviour). Existing instruments focusing consumers are mostly communication-based, especially labels. Regulatory and market-based instruments to a large extent – though not exclusively – relate to producers, production processes and product design and address consumers only indirectly e.g. by limiting consumer choice in the market (Tukker et al., 2008).

What is also still missing is a societal discourse on the objectives of sustainable consumption and a common vision of change, including the participation of strategic actors of demand and supply side as consumers, retailers or intermediaries that promote SC. Moreover, evidence suggests that SC policies are still fragmented and their effectiveness limited by significant uncertainties (cp., e.g., Hertwich, 2005; Fuchs & Lorek, 2005; Mont & Plepys 2008; Tukker et al., 2008).

The approach of the FP7 project “Policies to promote sustainable consumption patterns” (EUPOPP) addresses these different activities, actor groups and limitations. EUPOPP aims at increasing the knowledge about the impacts and effectiveness of SC instruments on the EU and the Member State level and addresses the current academic and practical knowledge deficits in this field.

The EUPOPP project focuses on the priority need areas of housing and food. Direct and indirect energy consumption, the efficiency of energy use in both sectors and the material

flows associated with both need areas constitute a significant field of action for SC policies. Nevertheless, little is known about the total, societal-level impacts of various instruments to promote sustainable household consumption and 'better' products. The EUPOPP project aims to address this gap and particularly asks for:

- Conditions of success or failure that promote or hamper the impacts of an instrument focusing consumption behaviour and consumption patterns
- Options to enhance sustainable consumption policies.

Starting from an integrated conceptual framework (Chapter 2) and an initial analysis of consumption trends (Chapter 3), this paper presents a hybrid approach to assessing SC policies which was developed in EUPOPP (Chapter 4). Particular emphasis is given to the combination of policy analysis and material flow analysis in a coherent methodological approach. While the policy analysis is used to evaluate pathways to change consumption patterns by assessing them in a step-by-step approach, the material flow analysis quantifies their impact *ex post* and is the basis for future scenarios of the development and the respective impacts of new policy packages. Chapter 5 of our paper provides a first glance at the results of the analytical steps elaborated so far. In the concluding section (Chapter 6), we discuss some of the challenges of assessing the environmental, social and economic impact of policies for sustainable consumption.

2. Conceptual Framework

The effectiveness of strategies and policies for SC depends on a variety of contextual factors, as well as on the interactions between policy instruments. When addressing the sustainability of consumption patterns as a whole, the interactions between various factors influencing consumption patterns, including individual-level factors, such as awareness and attitudes, and framework conditions such as market structures, institutions, and physical infrastructures need to be accounted for. In the following, we outline some of the main elements of our conceptual framework (see Heiskanen & Schönherr et al., 2009).

Instruments to promote sustainable consumption

Despite the manifold work to define '*sustainable consumption*' (see, e.g., Norwegian Ministry for the Environment, 1994; UNDESA & UNEP, 2005), the exact scope and definition of sustainable consumption and sustainable consumption policies remains ambiguous. In addition, the term cannot be fully disengaged from the concept of sustainable production. For our purpose, we define sustainable consumption as *a more ecologically but also socially premised way of buying, using and disposing of goods and services* (Eberle, Brohmann &

Graulich, 2004). Following this logic, SC patterns can be determined in relative terms – through comparing the improvement of economic, social, and environmental performance indicators with a business-as-usual scenario. By ‘*policy instruments*’ we mean the set of techniques of governance by which institutional actors support and effect social change towards a defined goal, in our case SC. They usually “*involve the utilization of state authority or its conscious limitation*” (Howlett, 2005:31).

Generally speaking, instrument types have been classified as:

- regulatory instruments,
- economic instruments (including the special category of sustainable public procurement)
- communication-based instruments (including the special category of labelling) and
- voluntary and procedural instruments.

SC is tightly interlinked with production patterns and technological evolution; however, our focus is on the actual leverage of demand side actors. For the question of policy instruments, this means that we are particularly interested in instruments that target private or organizational consumption, and products use. Such instruments seek to influence what products and services people can buy or do buy and how they use and dispose of the good or service towards more sustainability.

Focus on the need areas of housing & food

While early discussions on SC focused on individual (harmful) products, the need to go beyond a product focus is today widely acknowledged. SC is not merely about substituting harmful products by less harmful ones, it is about how human needs are fulfilled in a more sustainable way (Wiegmann et al., 2005). There is growing consensus that food and drink, housing, personal travel and mobility, as well as tourism are the four major areas of household consumption with the highest negative environmental impacts (EEA, 2005, see also Tukker et al., 2008a). Among these priority areas, the EUPOPP project focuses especially on the ‘need areas’ of housing and food.

Both housing and food markets are highly regulated today. However, the perspective of SC has been much longer on the agenda for housing, in the form of various energy policy instruments. Building codes and mandatory energy performance standards have a long tradition in most countries, as do grants for energy renovations, energy advice for

households and labelling of energy-efficient products. In contrast, food is a newer area for SC policy instruments. Instruments dealing with packaging as well as organic food labels and promotion of organic food have a fairly long tradition, but instruments to influence people's food consumption patterns are a newer feature in SC policy. Of particular interest for us are instruments that aim to reduce the use of meat and high-fat dairy products and increase the vegetable-based content in people's diets. This is a sensitive area, but also one in which significant impacts could be made in terms of reducing environmental pressures of consumption.

Influencing consumer behaviour via public policy: individual and framework determinants of consumption

Consumption is a complex area to target through conventional policy measures. It is usually perceived of as a private domain in which government regulation has only a limited role. A conventional, economic view of consumption assumes consumers to be sovereign, i.e. they can make choices freely in the market, independently from each other, and those choices reflect their preferences. However, a more sociological view of consumption argues that a large part of consumption cannot be explained within a conventional decision-making frame. The sociological perspective also stresses that we should not examine consumers in isolation. Sustainable or unsustainable behaviour and respective consumption patterns are also influenced by the social "environment" at the local community level, as recent research on energy efficiency programs and the role of intermediaries indicates (Heiskanen et al. 2009a). Moreover, individual choice is limited by the way cities, energy supply systems, housing designs and products are configured (Wilhite et al., 2000). Thus, changes in consumer behaviour can be seen as part of a larger change process in the socio-technical organization of 'systems of provision' (Shove, 2003; Spaargaren, 2003), which define the opportunities and limits for individual patterns of consumption.

In this regard, we can identify sustainable consumption instruments that target consumer behaviour directly or indirectly, the latter by changing the market environment or by modifying the social and physical environment of the consumer (Table 1).

Table 1 Target areas for policy influence on sustainable consumption (source: Heiskanen & Schönherr, 2009: 53)

| <i>Consumers / individual citizens</i> | <i>Market environment</i> | <i>Social and physical environment</i> |
|--|---|--|
| <ul style="list-style-type: none"> - Ability and opportunity - Routines and habits - Motivation and norms - Confidence and empowerment | <ul style="list-style-type: none"> - Prices - Product information - Consumption feedback - Market transparency - Availability of products and services - Use of government market power and example | <ul style="list-style-type: none"> - Systems of provision - Enabling infrastructures and conditions - Support for local sustainable communities and social groups |

Mechanisms that focus primarily on the individual level do so by trying to build up consumers' motivation and ability to 'do the right thing' by providing the appropriate information, and incentives or disincentives. These initiatives can target the consumers' abilities and opportunities, routines and habits and/or motivation and internalized norms. They can also aim to build up confidence and empowerment, e.g., by providing feedback on the aggregated effects of many individuals' actions, or by supporting tendencies toward political consumerism (Stø et al., 2008; Schultz & Stieess, 2009).

Mechanisms addressing the market environment of the consumer have an effect by changing the relative prices of products (e.g., via grants, levies, taxes or by setting restrictions on production), but also by providing information about products, about consumers' purchases (feedback) or about the market in total (e.g., comparative environmental impacts of various products offered in the market). One can also argue that rules about marketing, advertising and product labelling influence market transparency by requiring or forbidding certain information to be provided. Finally, policies can aim at structural change in the market (the availability of goods and services) by supporting R&D in innovative solutions, setting minimum product standards, getting retailers to agree to drop certain products or promote certain other ones, or simply by banning certain products. Government can use its market power through green public procurement aiming to bring new products into the market. Where government also provides services, it can showcase new solutions under the auspices of these services, thus 'leading by example' and creating demand among private consumers.

The framework conditions for SC are also shaped by the social and physical environment. Policies could, in principle, try to target entire systems of provision (interlinked sets of market and non-market goods). While such ‘whole system’ interventions are rare, Martens and Spaargaren (2005) give one example of the attempt in the Netherlands to create a sustainable Do-It-Yourself (DIY) system for home maintenance by simultaneously targeting the supply and demand side. Enabling infrastructures and conditions, such as sustainable urban plans, are another approach to shaping the social and physical environment of the consumer. Finally, if we agree that the social environment significantly influences consumer behaviour, initiatives that target local communities and social groups are one way to facilitate change in consumption patterns.

Uncertainty & effectiveness

The previous section has shown that there are a variety of instruments and ‘levers’ through which consumption can be influenced in order to promote SC patterns. Yet the dynamic interaction between consumption and production, and markets and public policy, makes steering of consumption very difficult. The relationship between changes in consumption patterns and sustainability effects is rarely linear. It is mostly indirect, mediated by the resulting impacts on production patterns. The more indirect it is, the more there is a possibility of confounding factors. For example, if consumers substitute green electricity for the electricity mix of their current supplier, this should have an impact on the production of various kinds of electricity, and the ensuing greenhouse gas emissions; yet, the impact depends on whether demand for green electricity exceeds the existing supply so that additional (new) green electricity supply enters the market.

Changes in consumption patterns are also often mediated into sustainability impacts via changes in other consumption patterns. Such changes can offset part of the reduction in environmental impacts, and they are conventionally called rebound effects (Schipper, 2000; Jalas, 2001; Herring, 2008). For example, purchasing of more energy efficient appliances should lead to less consumption of electricity, eventually leading to less production of electricity, resulting in less CO₂ from power plants. Yet, because it is relatively cheaper to use more energy efficient appliances, they may be used more frequently (e.g., lights are left on). Additionally, changes in the consumption of an individual commodity, such as energy, can lead to unpredictable changes in the consumption of other commodities. For example, if we manage to reduce the demand for residential energy use via a successful campaign, and the price of energy remains constant, the consumers will have more money to spend on other things (‘indirect rebound effect’, see Herring, 2008). Finally, savings of energy and

natural resources are often at least partly offset by ‘transformational’ effects (Herring, 2008; Heiskanen et al., 2005). An example of transformational effects is the introduction of the microwave oven, which is more energy-efficient for heating small amounts of food than a conventional oven. Yet, microwave ovens have not replaced conventional ovens, but have rather engendered a totally new category of products (ready-to-heat microwave meals).

This discussion does not imply that the gains from SC policy measures are always offset by rebound effects. It is also possible to envisage the opposite, i.e. positive, spin-offs, or “spill-over” effects. Rather, the discussion suggests that close attention needs to be paid to intervening variables between changes in consumption patterns and the resulting effects on the environment, society and the economy. These intervening variables need to be analyzed on a case-by-case basis, as they can be different for different kinds of policy measures and targets.

3. Methods – policy analysis & material flow analysis

The growing recognition that sustainable development presupposes public policy to tackle consumption patterns raises a number of questions: How effective are the existing policy instruments? What unintended and possibly undesired side-effects do they create? What factors promote or hamper the impacts of SC instruments on consumption patterns? And, ultimately, what can we learn from existing SC instruments with regard to the design of new and more effective instruments?

While recent years have seen the evolution of a growing body of knowledge and reflection on these issues (see, among others, Tucker et al., 2008; Rubik et al., 2009), a few important gaps remain. On the one hand, quantifying impacts of SC policies on GHG-emissions, resource use, and other sustainability indicators is still a methodological and data challenge. On the other hand, most contributions to the SC debate have a very narrow instrument focus and do not provide an overarching vision of the ultimate objectives and impact potentials of SC policy. In the following, we address these issues and provide a coherent integrated methodological approach to determine and value the effects of policy instruments, quantify their sustainability impacts, and design future scenarios for sustainable consumption in the EU.

Policy analysis

The successfulness of policies can be evaluated either in terms of goal achievement or using some external indicators (results-based evaluation), or both. This issue also relates to

the analysis of individual instruments vs. entire ‘packages’ of instruments, which are best evaluated using a results-based approach. A thorough policy analysis with a view to evaluating the effectiveness of eleven selected sustainable consumption instruments existing at Member State and community level. The policy analysis applied a framework (or ‘tool’) for evaluating and explaining how sustainable consumption instruments impact on consumption patterns and sustainable development. The tool was designed for the ex-post analysis of policies¹.

The policy analysis tool devised in the context of the project draws on three bodies of literature: policy evaluation (Bemelmans-Videc et al., 1998; Vedung, 2004; Weiss, 1998), sustainability assessment (e.g., De Ridder et al., 2007; Ness et al., 2006) and various disciplinary approaches to consumer behaviour (cp. Heiskanen & Schönherr 2009: 30-47). While each of these literatures is rich and mature, not much work exists to combine these literatures for studying the particularities of policy instruments for SC and their assessment throughout the whole impact chain (Tukker et al., 2008). This gap is the starting point of our methodological approach.

Our approach builds on an established categorization of effects (output, outcome, impact) resulting from policy instruments and combines qualitative and quantitative methods. We suggest going beyond the question of goal attainment in the assessment of instrument effects – by looking at side effects and by critically reflecting stated policy goals. Moreover, our framework serves not only to assess instrument effects but to systematically explain these effects, too. For this explanation we suggest developing and discussing theory-based hypotheses on drivers and barriers of instrument effects.

Let us now turn to our understanding of the relationship between SC instruments (‘policy outputs’) and their effects. These include ‘policy outcomes’, i.e., changes in consumption patterns resulting from outputs, and ‘policy impacts’, i.e., sustainability effects resulting from outcomes (Prittwitz, 2001; Vedung, 2004).

¹ It is hence not for use in planned or ongoing policy processes as is, for instance, the EC’s Impact Assessment procedure (cf. George & Kirkpatrick, 2007; Jacobs, 1997; Schubert & Störmer, 2007).

First of all, SC instruments are being developed and implemented in the form of various *outputs* of the policy process. These include laws, regulations, programs, schemes and implementation measures. When successful, policy outputs lead to *outcomes*. Outcomes of an SC instrument are changes in consumption patterns triggered by changes either in individual consumer behaviour or in framework conditions of consumption. Changes in consumption patterns typically entail changes in related production systems.

An instrument is likely to trigger a whole series of successive and interlinked outcomes (see Figure 1). We suggest numbering these outcomes according to their chronological “order” (1st, 2nd, 3rd etc.). The higher the order, the more comprehensively the ‘net’ effects can be determined. To give an example: studies show that a (1st order) *effect on consumer behaviour* of the EU energy labelling scheme is an increase in demand for highly efficient appliances (labelled A++, A+ or A) (Hünecke & Rausch, 2009). A desirable subsequent (2nd order) outcome effect on consumer behaviour would be a decrease of electricity used for appliances per household. The latter, however, is no matter of course, as intervening factors can take effect. Consumers in OECD countries, for example, increasingly keep their old fridge when buying a new, efficient one (IEA & OECD, 2003). This means that electricity consumption can increase rather than decrease at household level, despite the promising outcome of a significant market penetration of A-labelled appliances.

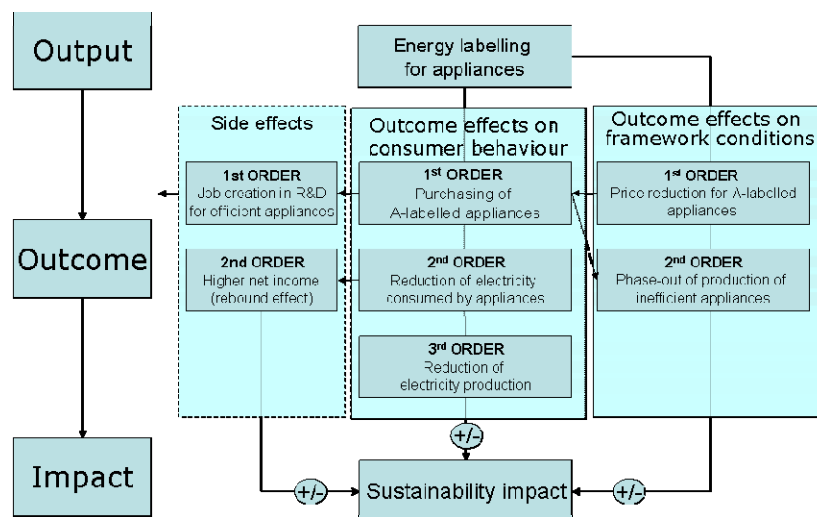


Figure 1 Examples of potential effects of a SC policy instrument (energy labelling of appliances, source: own)

In a final step, changes in consumer behaviour (outcomes) can lead to positive changes in the environment, economy and society (sustainability *impacts*). Outcomes can stimulate

impacts in a direct or indirect way. For instance, when increased demand for energy-efficient products reduces energy demand and GHG emissions we deal with direct causation. When technological progress leads to the phase out of energy intensive production methods and/or products, this is an example of indirect causation. Due to internationalized value chains, sustainability impacts of SC instruments often emerge beyond the country or region in which they are implemented, e.g., in developing countries from which input materials are being sourced.

Having established the relation between instruments and their effects, we would like to emphasize some salient points. Firstly, changes in consumption patterns and sustainability indicators which cannot be attributed to the SC instrument, i.e. the policy output, per definition, are *not* outcomes and impacts. Secondly, instrument effects have a temporal dimension. In some cases, instruments stimulate outcomes quickly (and the same holds for impacts). In others, instrument effects may take much longer to emerge, and may also change over time. This means not only that the timing of an assessment is important. It also implies that impact assessments need to identify short-term outcomes and, where possible, indicate whether longer-term outcomes are likely to occur (Leeuw & Vaessen, 2009). Thirdly, the successive delivery of instrument effects from output via outcome to impact along one or, more realistically, several interlinked causal chains can be understood as the instrument's policy pathway.

The above expositions can be integrated into a comprehensive model of policy pathways as illustrated in Figure 2:

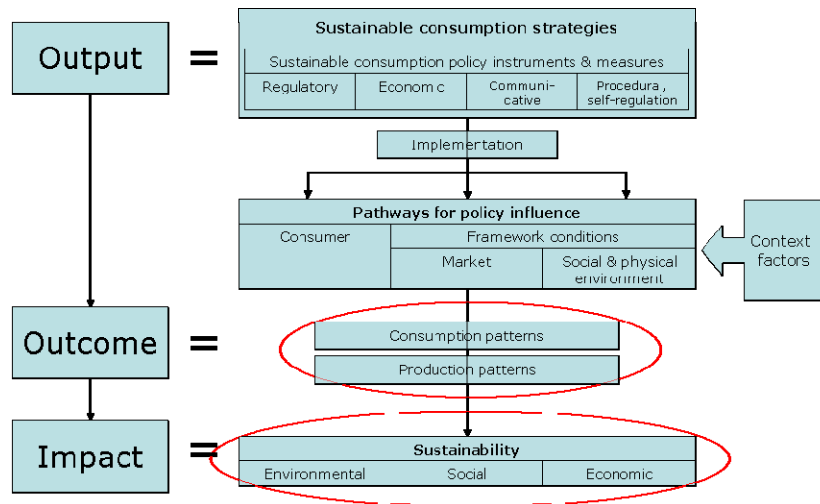


Figure 2 Model of policy pathways of sustainable consumption instruments

A few components of the model merit further explanation. The first one concerns the definition of what constitutes policy success or failure in the field of SC. In our model, this definition is linked to two major *empirical* benchmarks. First, if successful an instrument will have a positive effect on consumption patterns (outcome) and, indirectly, on production systems. Second, a successful instrument will induce improvements in the state of the environment, the society and/or the economy (impact). If one or both of these conditions are not met, we speak of instrument failure. This, of course, is a more ambitious approach than assessing whether a policy instrument has reached its stipulated goals (Heiskanen & Schönherr, 2009). Third, our model puts context factors at the centre of analysis. Context factors, i.e., factors that independently of the instrument have an effect on consumption patterns, will intervene with the instruments' policy pathways in a supportive or hampering way. By acknowledging the potentially crucial role of context in uncovering the circumstances in which policies are embedded we assume that the context is part of why an instrument works or fails. Thus, the causal explanation of why an intervention works is expected to consist of at least two components: mechanism and context (see, e.g., Blamey & Mackenzie, 2007).

Procedurally, we subdivide the evaluation into three phases: (1) examining the 'intervention logic' and implementation of an instrument; (2) measuring the instrument effects and establishing causality; (3) assessing and explaining instrument effects. The ex-post evaluation was guided by a number of hypotheses on drivers and barriers of SC instrument effects. These propositions – rooted mainly in the policy evaluation literature and the sociology of consumption – have been developed within the project and applied across

eleven case studies. The hypotheses are linked to the above mentioned model of policy pathways (see Table 2), i.e. cover the various elements and stages of this model. The following factors are conceptualised to influence the achievement of outcomes and impacts (as success factors or barriers, if absent):

Table 2 Factors influencing the achievement of SC instrument effects (policy analysis hypotheses)

- | |
|---|
| <ul style="list-style-type: none"> - A valid intervention logic underlying the instrument - Involvement of stakeholders in instrument development and implementation - Acknowledgement and accommodation of the diversity of consumers' everyday needs and practices in instrument design - Consideration of the framework conditions of consumption in instrument design - An environment of synergetic other policies and instruments, possibly through instrument mixes and policy packaging - A favourable market context |
|---|

Material Flow Analysis

EUPOPP uses material flow analysis (MFA) for quantifying impact indicators influenced by SC policies. MFA is a methodology to determine life-cycle impacts of product groups and services in a comprehensive, cross-sector and cross-border (i.e. global) approach (Bringezu, Bleischwitz 2009; Fritsche et al., 2004). As a more generic and scenario-oriented form on life-cycle analysis, MFA is the systematic determination of stocks and flows within a system: it connects the resources, pathways and final sinks of energy and materials, taking into account all relevant conversion steps, and transports (Brunner, Rechberger 2003).

MFA delivers quantitative results for environmental aspects such as resource use and GHG or air emissions, but also data on cost and employment effects, and consistently takes future developments of technologies and markets into account. It is thus an appropriate approach to quantify the effects product and service provision on the customer level, and to determine the effects of changing consumption levels, and patterns. For this, MFA compares scenarios in which both the demand side (e.g. customer behaviour) changes and the supply-side responses are dynamic and both have cross-sectoral and cross-border impacts on energy and material flows, and their environmental and cost impacts. MFA has been applied successfully in the need areas of housing and food (Fritsche, Eberle, Wiegmann, Schmidt 2007), and recently also for mobility (Fritsche et al. 2009).

The MFA uses the GEMIS2 model and database which is calibrated to represent energy and material flows for a broad variety of feedstocks, products, and conversion systems, and which also offers scenario data for the 2010 to 2030 time horizons of the European energy and transport systems (see www.gemis.de). GEMIS also covers imports of e.g. energy carriers and food/feed from abroad, and their conversion to final products and services used by European customers.

The MFA approach provides a model to determine quantitative changes in sustainability indicators on the basis of changes in outcome parameters. In EUPOPP it will be used to estimate sustainable consumption instrument impacts in the need areas of housing (with a focus on energy consumption) and food. Also, a quantitative analysis of distributive effects (EU vs. global) will be carried out to address the international dimension.

In our hybrid methodological approach, quantitative material flow analysis is used both to complement (by tackling different aspects) and to corroborate ('triangulate') findings of qualitative policy analysis. For this purpose, a number of impact indicators have been chosen to measure changes in the environment, society and economy that contribute to an attainment of the instrument's goals. Impact indicators may be quantitative or, where reliable and comparable quantitative data is lacking, qualitative. Table 3 lists a selection of impact indicators used for SC instrument impact assessment in the EUPOPP project.

Table 3 Selected impact indicators for SC policy instruments (EUPOPP project, source: own)

| Dimension | Indicator | Expression | |
|-------------|--|--------------|-------------|
| | | quantitative | Qualitative |
| Environment | GHG emissions (CO ₂ , CH ₄ , N ₂ O) | ✓ | |
| | Air emissions (SO ₂ , NO _x , particulates) | ✓ | |
| | Non-renewable primary energy (coal, gas, oil, uranium) and raw materials (alumina, | ✓ | |

² see www.gemis.de – it is a publicly available life-cycle and material flow model and respective database.

| | | | |
|---------|---|-----|---|
| | copper, iron ore, sand etc.) | | |
| | Land use (areal footprint) | ✓ | |
| | Agrobiodiversity | | ✓ |
| | Water use ³ | ✓ | |
| Social | Distributional effects (income) | (✓) | ✓ |
| | Gender equality (income/living standards, time budget, labour market structure) | (✓) | ✓ |
| | Employment | ✓ | |
| | Health (e.g. PM ₁₀ emissions, diets) | (✓) | ✓ |
| Economy | Costs to households (monetary) | ✓ | |
| | Costs to society (monetary) | ✓ | |

Material flow analysis can not only contribute to the ex post impact assessment of instrument impacts, but can also model *ex ante* impacts of *future* (hypothetical) instrument implementation. This capacity is used to develop scenarios on the future application of instrument bundles. The MFA scenarios in EUPOPP consist of a baseline case which represents the business-as-usual (BAU) development as a reference, and a set of sustainability scenarios which assume the successful implementation of SC instrument “bundles” in the need areas of food and housing.

3 Ex post case study results

The impact assessment was carried out for ten case studies at the Member State level. In addition, an excursion paper was prepared on the EU Energy Label in order to explore the particularities of an EU level instrument as well. While the individual cases will not be treated in detail here, first results from a comparative analysis are presented in this section.

The comparative analysis starts from the hypotheses which have been tested in the single cases with a view to inferring general statements about the conditions of success and failure of SC policy instruments. Pattern matching was used as the analytical approach for this task

³ = only for selected countries as an excuse; (✓) = semi-quantitative, i.e. change in “intensity”

for every hypothesis in order to generate a comprehensive cross-case analysis (Dye, Schatz, Rosenberg & Coleman, 2000; de Vaus, 2001: 253-260). Table 4 gives an overview of the cases that were selected for an impact assessment in the EUPOPP project and the respective need area they pertain to. While the cases address different SC problems, they have in common that they aim at changing consumer behaviour towards more sustainability. The cases cover the purchasing and use, as well as the disposal phase of consumption and cover all regions of the EU-27. The selection of instruments took account of the full range of different instrument types available to tackle SC issues.

Table 4 Overview of EUPOPP case studies (source: own)

| No. | Need area | Instrument |
|-----|--------------|--|
| C1 | Housing | Energy Expert – voluntary scheme encompassing volunteer residents who have been trained to be active in energy issues in their building (EEE, Finland) |
| C2 | Housing | Mandatory energy efficiency standards for residential buildings (EnEV, Germany) |
| C3 | Housing | Voluntary scheme to enable individual heat consumption metering (Latvia) |
| C4 | Housing | Consumer Advice in the context of the “Carbon Emissions Reduction Target” program (UK) |
| C5 | Housing | “Install-me!” campaign in the context of restrictions on water use in periods of exceptional and/or emergency warning (Catalonia, Spain) |
| C6 | Food | Requirements for public catering to serve sustainable meals (Finland) |
| C7 | Food | Mandatory deposit on environmentally detrimental beverage packaging (Germany) |
| C8 | Food | Quality product label – voluntary label for locally produced foodstuffs (Latvia) |
| C9 | Food | WWF Campaign on Reducing Meat Consumption (UK) |
| C10 | Food | Selective collection of organic waste (Catalonia, Spain) |
| C11 | Housing (EU) | EU Energy Label |

In the need area of housing a relatively more extensive selection of instruments from all instrument types were implemented over a longer period of time with better data available thus facilitating the analysis. In the need area of housing it was tougher to conduct impact assessments because instruments tackling consumer behaviour are still very scarce and often localised, while data was not easily available. The preliminary results presented here can, therefore, at best be regarded as tentative.

The role of a valid intervention logic

In both need areas, a valid intervention logic proved to be crucial for success. By “validity of an instrument’s intervention logic” we mean that

- the central concepts on which the instrument are based are clear and non-contradictory;
- the instrument is designed to have a great scope and depth of effects (by targeting many people and many artefacts and aiming for substantial change in the behaviour of target groups); and
- the policy pathway (i.e. the causal assumptions linking the instrument’s mechanisms to its goals) is plausible.

On all three accounts, “hard” instruments such as regulations and economic incentives scored better than voluntary schemes. Also, instruments in the need area of housing generally profited from a clearer understanding of what the goals and central concepts of the instrument were.

However, for both need areas, it became clear that the more decentralised the implementation of the instrument, the less consensus there was on goals and the causal pathways leading to positive sustainability impacts. For example, the case of the Energy Expert Scheme revealed a plethora of intervention logics among the stakeholders involved. While the goal of achieving energy efficiency improvements in multi-dweller residential buildings guided by a trained energy expert was agreed upon, outcomes and impacts significantly varied. This could be traced back to the fact that every expert is responsible for their respective building with no central monitoring of progress. Consequently, there are no clear operational goals and guidance on what should be done by individual energy experts and, thus, no clear benchmarks for success could be fixed.

In the need area of food, the case of the German deposit scheme for one-way beverage packaging showed how an invalid intervention logic may be detrimental to instrument success. According to the instrument rationale, the deposit on environmentally detrimental packaging would level out price differentials with environmentally preferable reusable packaging (that had been subject to deposits already) and eliminate the convenience of just throwing away emptied containers instead of having to return them to the point of sale. This was assumed to lead to a stabilisation or even increase the sales of beverages in reusable

packaging. However, the opposite was the case, since other factors important to consumers were not considered in the intervention logic. These other behavioural determinants included the lighter material and more convenient storage of some kinds of environmentally detrimental packaging as well as the blurring of the distinction between one-way and reusable packaging. Many consumers are now unable to tell the difference between the packaging types and do not realise which option is environmentally preferable.

While a sound policy design based on a valid intervention logic is a necessary, it is not sufficient for instrument success. Hypotheses on five other success factors and barriers were tested in the case studies. The hypotheses and the respective findings are briefly presented here below.

Stakeholder involvement

Hypothesis two stated that the involvement of stakeholders in the development and implementation of a sustainable consumption instrument significantly fosters the creation of instrument effects, i.e. changes in consumption patterns and resulting sustainability gains. This hypothesis was only conditionally confirmed by the case study results. The kind of involvement and the point in time of participation seem to be crucial. Moreover, stakeholder involvement was found to be more important for instruments in the need area of food, in general, and for those instruments that rely on the active participation of the target group, in particular.

For example, in the case of setting and implementing sustainability requirements for public catering the involvement of stakeholders does not appear to have been only positive. It appears to have been one of the reasons why the requirements are formulated in an ambiguous way. This, in turn, is confusing for the stakeholders who should be implementing the instrument and seems to be leading to a diversity of interpretations of the requirements. On the other hand, participation of the target group of instruments is an important success factor if consumers are to be convinced to substantially change behavioural patterns. This is evident from the case study on the reduction of meat consumption in the UK. While the instrument has very ambitious goals it demands a shift in the diet of individual consumers that is not likely to happen if a long-term involvement of the target group in the form of

information sharing, “green marketing” of diet alternatives, and a societal dialogue on the importance of meat consumption for well-being are not taking place⁴.

Consumer needs and practices

The third hypothesis posits that the scale of effects resulting from a sustainable consumption instrument increases strongly with the degree to which the instrument acknowledges and accommodates the diversity of consumers’ everyday needs and practices. This pertains to the requirements and the broad variety of institutionalised activities (largely governed by habits and routines, cf. Giddens 1984) related to consumption, such as cooking, shopping, caring work etc.. Individuals have to balance different and sometimes conflicting demands of work life, household organisation, family management and their own needs, taking their own preferences as well as the wishes of other family or household members into account” (Schultz and Stieß 2008).

While the relative importance of this factor varies with the degree to which an instrument explicitly addresses those needs and practices – generally it is more important where a direct modification of consumption practices is required – this hypothesis was confirmed for all case studies. A radical shift in consumption practices irrespective of ingrained routines and habits only seems to be achievable if there is a sense of urgency across a large portion of the target group – a condition that frequently cannot be created for ethical reasons – that must be built and maintained over time.

The most prominent example among the examined cases is the campaign on restrictions on water use in periods of exceptional and/or emergency warning in Spain. The campaign is an example for a unusually effective communication-based instrument. While water scarcity is a very regionalised sustainability problem in Europe, the example illustrates how the magnitude of policy instrument effects increases with a sense of urgency among consumers. Guaranteed access to water is perceived as a basic need that goes beyond environmental awareness. Although there were never restrictions on the household water supply, the instrument contributed to creating the perception that “we have run out of water”. This feeling of urgency in a severe drought context made the population feel a will to make a big effort to

⁴ It must be noted, of course, that stakeholder involvement is only one necessary condition for the success of the instrument.

save water. Once the sense of urgency passed, effects were only partly upheld indicating a need to follow up with more permanent incentives to uphold and institutionalise an achieved behavioural change.

Framework conditions of consumption

Our fourth proposition was that the scale of effects resulting from a sustainable consumption instrument increases strongly with the degree to which the instrument not only addresses consumers, but adjusts the framework conditions of consumption. A clear and general confirmation or rejection of this hypothesis was not possible. This has to do with the fact that most SC instruments currently in place are rather new while structural change and its effects are only observable over the long term. However, there are indications that instruments addressing both individual and framework conditions of consumption may be conducive to more significant impacts over the long term, for example, when new infrastructures and shifts in systems of production are required in order to generate impacts. This was true, for example, in the case study on the separate collection and improved treatment of bio-wastes in Spain.

Market context

While the case studies did not yield conclusive findings on this point, better results were achieved to the directly related proposition that the scale of effects resulting from a sustainable consumption instrument is highly contingent upon a favourable market context. Even a well-designed and implemented policy instrument can fail if the sustainable products, services or technologies the consumption of which the instrument aims to foster are not easily available on the market; when the costs of purchase and the transaction costs linked to their consumption are significantly higher than those related to less sustainable products; or when consumers cannot get appropriate information on them, i.e. the market transparency is restricted. This factor appears to have played a role for all cases, not surprisingly the correlation was strongest market-based instruments and labels (C8 and C11).

However, there were was a significant exception to this rule in the case of mandatory energy standards for buildings in Germany. The market context does not seem to play a role at all, when the (monetary) benefits of a behavioural change accrue to beneficiaries other than the target group. In this case a principal-agent problem becomes apparent. While the market context for improving the energy performance of buildings is rather favourable – environmentally friendly building materials are available, subsidies and readily available

loans mitigate price differentials, and the transaction costs are not significantly higher than for conventional renovation works – building owners who lease their buildings were unusually reluctant to comply with the mandatory energy standards. This is because for this group it neither matters if the investment is cost efficient, nor does it matter how much are the start up costs or other market conditions, since all benefits accrue to the leaser. This group is thus detached from the market context in a way so that a principally favourable market environment and the economic incentives in place cannot be effective.

Instrument interaction

A last hypothesis relates to the degree of interrelations between different SC policy instruments. It holds that the scale of effects varies strongly with the (synergetic vs. antagonistic) “direction” of policy interaction between the instrument and other policies: while synergetic policy interaction will reinforce an instrument’s outcomes and impacts, antagonistic interaction is a major cause of low levels of instrument effects. This hypothesis was confirmed for all instruments, although it was particularly relevant in the need area of housing where many instruments are in place and interact with each other across several scales. The importance of instrument interaction is illustrated in the table here below for two examples, notably the EU Energy Label and mandatory energy standards for buildings.

Table 5 Policy interaction and its implications for instrument effectiveness (preliminary results)

| Instrument (examples from case studies conducted within the EUPOPP project) | Policy interaction | Implications for effectiveness |
|---|--|--|
| EU Energy Label (Aalto, 2009; Schönherr & Brunn, 2010) | The EU Energy Label is a building block of a larger European initiative to cut energy use of domestic appliances, most importantly the EuP Directive. Moreover, the instrument is promoted through various national information campaigns and supported by voluntary industry commitments to gradually enhance energy efficiency in domestic appliances. | <p>The Energy Label is profiting strongly from the variety of supporting instruments. While large scale information campaigns have led to a situation where an average of 70% of all consumers in the EU recognize the label as well as the cost savings inherent to purchasing more efficient appliances. Significant energy-efficiency improvements were realized due to the synergetic effects of voluntary industry commitments incited by the label, as a lever for marketing more efficient appliances.</p> <p>On the other hand, instruments addressing the significant rebound effects connected to the label as well as incentives to further raise energy-efficiency are lacking thus hindering the full realization of the label's potential impacts on</p> |

| | | |
|---|--|--|
| | | primary energy use. |
| Energy Efficiency Standards for Buildings (Indriksone & Bremere, 2009; Brunn, 2010) | Energy Efficiency Standards for buildings have a long tradition in most EU countries. With the EPBD Directive a consistent framework for energy efficiency in private buildings has been set up. The Directive includes a number of instruments and measures meant to enhance the effectiveness of building standards, such as a mandatory energy passport scheme. Moreover, many countries have instated financial incentive schemes to encourage private consumers to carry out energetic renovations and/or subsidised energy advice schemes in order to support home owners in planning renovations. | Although the instrument is supplemented by a range of supporting instruments within a larger instrument package effectiveness so far is rather limited. This suggests that other context and/or design and implementation issues play a role here. The case study attributes limited instrument success mainly to lack of sanctioning in case of non-compliance, and limited knowledge/training among consumers and contractors in the building sector. |

The above mentioned points are at this point only thin generalisations and more work is needed to fully grasp the implications of the case study findings for policy making. However, they already provide some initial indications of the relevance of the respective success factors and barriers that can feed into building ex ante scenarios in a next step.

4 Hypotheses on policy mixes for sustainable consumption

To describe and model the implementation and effects of future SC instruments and policies it is needed to derive scenarios on that future development. In a first step, a selection of relevant instruments – identified and qualified by the impact assessment under 3.1 – has been quantified with regard to their effects. To facilitate modelling, the instruments should be “bundled” into aggregate policy sets for the respective need areas. It has to be taken into account that each separate instrument might induce tradeoffs outside of the instrument scope and could individually be influenced by context factors. Therefore, a coherent set of instruments for which the *combined effects* in the need areas are considered is required. Furthermore, the selection of instruments to be bundled should consider possible synergies created by the combined implementation of the individual instruments, and the options to reduce negative tradeoffs. Keeping this in mind, a set of “bundling” criteria has been defined:

- bundling could cover more than one consumption phase (purchase, use, disposal);
- it should include various types of instruments which reinforce each other;
- it could be focused on one group of consumers in a certain consumption “setting” (e.g. catering at school);
- it could be focused on a specific issue (e.g. less meat consumption).

Bundling should decisively be achievable at the EU level, this means the transposition of existing national/regional instrument to the EU level. Furthermore, informed estimates on EU level outcomes and impacts and on the magnitude of synergistic interaction between the instruments in one package have been made. In particular, the role of success factors and barriers according to the instrument has been included as well.

Within the two need areas food and housing different implementation conditions have been taken into account. One of the main context factors of instruments is the time to find acceptance in the respective customer groups and need areas. Moreover, the behavioural change regarding food and housing is influenced by economic or political instruments which induce both short- and long-term reactions of consumers. Especially the long-term reactions can generate rebound effects, which could negatively affect e.g., GHG emission reductions. To derive valuable hypotheses on future instrument effects and impact,

It has been confirmed by recent statistics and recalculations elaborated by EUPOPP that the most 'promising' target area as regard food is the consumption of meat and dairy products, as both product groups impose high emissions, biodiversity, land and water impacts, and also cost implications (EUPOPP, 2009). However, dairy products are deeply integrated in many diets and food styles, and their sustainability depends on a variety of specific factors such as fat content so that changes in dairy consumption are very hard to address. Meat consumption, on the other hand, is a more "generic" element of diets and food styles and easier to be (partially) replaced either by cereals or vegetables, or their combination⁵. Empirical evidence of consumer reactions to meat scandals (e.g. BSE crisis in the 1990ies) and increasing health awareness shows that consumer can and do react in the short-term if health is concerned (Egenolf, 2004). For this reason, meat consumption has been identified as key for instrument bundling in the need area of food within EUPOPP.

⁵ Besides the GHG emission and biodiversity impacts of meat consumption, an important aspect is the associated health impact. Several medical studies show an overall increased risk of cancer and mortality due to lifestyle factors such as nutrition habits and diets, and meat plays a prominent role in this (Sinah et al. 2009, Zarraga et al. 2010, Ford et al. 2009).

In the need area housing, there are three different aspects regarding sustainable consumption to be considered with regard to instrument bundling:

- household *electricity* consumption due to the use of *appliances*;
- household *heating* requirements due to *building* characteristics; and
- household *energy* consumption for heating and hot water.

These three consumption aspects must be dealt with separately, as they have very different linkages to customer behaviour: For example, appliances are closely connected to everyday life which is contingent on routines and use patterns of curtailment behaviour. Typically most appliances are replaced within less than 10 years, which then is related to so-called investment behaviour with specific implications for change.

On the other hand, the buildings characteristics with regard to heating requirements are determined mainly by the construction of the building, and major renovation cycles which typically occur within several decades. The choice and use of heating and hot water systems lies in between these two extremes. Therefore, the bundling of instruments for housing has to be differentiated and was compiled for the three above mentioned energy demands.

After the definition of bundles, more concrete elements have been chosen and varied and effects of their future impact have been estimated. The results will offer a prioritization on and recommendation of strategies toward a more sustainable consumption in the EU.

5 Conclusions

Although citizens in many OECD countries are increasingly aware of their consumption's negative implications, they often do not act on this awareness (EEA, 2005; OECD, 2002; OECD, 2008). This is due to barriers in what we sum up under the concepts of individual and framework conditions for consumption. Knowing about these barriers, governments can actively contribute to more effectively putting sustainable consumption into practice by shaping norms and incentives conducive to more sustainable patterns of consumer behaviour. This might require a substantive redesigning of public policy. More specifically, it means abolishing or revising policies detrimental to sustainable consumption; improving the performance of existing SC policies; and/or introducing new and (more) effective SC instruments.

When analyzing the impact of strategies and policy instruments on SC, we need to be aware of the complexity of the causal chains determining the effectiveness of particular instruments. When addressing the sustainability of consumption patterns as a whole, we also need to account for the interactions between various factors influencing consumption patterns, including individual-level factors such as awareness and attitudes, and framework conditions such as such as market structures, institutions and physical infrastructures. We also need to be aware of the interactions between policy instruments. The dynamic effects of SC policies depend on overall developments in policies, institutions and the market at large. Thus, improvements in one part of the system may lead to a shift of impacts to another part and piecemeal policy instruments may thus result in counterproductive effects. Influencing society via SC policies needs to be embedded in a broader and consistent set of policies in order to have the desired effects. This means the application of multiple instruments to address multiple barriers to SC practices (Stern, 1999), but also the promotion of a consistent shift in society so that the natural resource intensity of all behaviours and all sectors is progressively reduced.

In this contribution, we suggest a theory-driven, case study based framework for SC policy instrument evaluations. The case study design allows for in-depth analysis of contextual factors enhancing or limiting instrument success. The policy analysis consists in examining an instrument's intervention logic and implementation (output); measuring instrument effects (outcome, impact); and, finally, assessing and explaining them. While our evaluation approach is not suited to provide a basis for statistically valid generalizations, it allows for the testing and refinement of theories on instrument effectiveness in the field of sustainable consumption. It can thus contribute to evidence-based policy making in a field where data (beyond individual cases) is frequently still scarce and where instrument success or failure depend on larger societal context factors that are not easily captured.

Policy analysis is successfully combined with material flow analysis thus allows to quantify ex post instrument impacts on the environment, society, and the economy. The results of the case studies serve in our approach to generate hypotheses feeding into the set up of future scenarios for sustainable consumption policy in the EU for which the impacts are derived using MFA.

The assessment of instrument impacts involves some real-world difficulties that need to be overcome on the path to putting sustainable consumption more effectively into practice, and the challenge to evaluate impacts of future SC instruments lies in the careful development of hypotheses for which the ex-ante assessment of instruments is a base to start from.

The preliminary results from the EUPOPP so far confirm a number of important points that policy makers may want to take into consideration when devising new interventions in the field of SC, in general, and in the need areas of housing and food, in particular.

While SC policies in the need area of housing are relatively mature, the need area of food – albeit its significant potential for reducing adverse sustainability impacts – is still deficient when it comes to instruments tackling consumer behaviour. Interventions in this field for reasons other than ensuring food safety and security are not yet widely accepted and envisioned. Existing initiatives are mostly local or regional except for a number labelling and voluntary schemes. The preliminary results show that there is a significant room for manoeuvre for policy makers in this area.

The ex post analysis of the case studies conducted confirms that while well designed regulatory and economic instruments are most effective when it comes to producing efficiency gains in both need areas, instruments aiming at a more long term change in consumer attitudes are important as well – particularly for paving the way for more tangible sustainability impacts in the need area of food. Ambitious target setting, taking account of consumer needs and practices, as well as viewing individual instruments as part of a larger policy bundle with dynamic interaction are crucial in this regard. While there was no conclusive evidence on the role of structural changes for realising impacts from the ex post analysis, this was mainly due to short time horizons to track effects and the scarcity of instruments aiming at inducing changes in the framework conditions of consumption. The ex ante scenarios will provide some more conclusive ideas on how such change might take place and the sustainability gains that may be realised in the longer term.

In order to arrive at the scenarios, the results from the ex post analysis together with a sound exploration of sustainability potentials in both need areas were integrated into a number of instrument bundles. The potential sustainability impact of these bundles will be explored in the next step of the project.

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