

Non-Public Bulk Consumers as Drivers of Eco-Innovations

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Abstract: Environmental innovations are one path towards new “Green Economy” using natural resources only within the boundaries of the ecosystem’s ability to renew itself. The paper focuses on product related demand-side eco-innovations. It addresses commercial procurement. According to the hypothesis of our research, a properly displayed demand for eco-innovative solutions could attract vendors to market their respective products, enhance their further diffusion and thus make non-public bulk consumers acting as change agents for eco-innovations. The analysis shows that bulk consumers play a crucial role as lead buyers. Activating them to purchase eco-innovative solutions requires several pulling and pushing measures: regulatory, economic, informative/communicative, reflexive/discursive, co-operative, monitoring and the role of lead market initiatives. By implication, a demand-side related political promotion could complement the various ongoing efforts for activating public institutions and private end consumers to purchase eco-innovations systematically and more frequently. The strategy of focusing seems promising when it comes to bulk consumers as change agents for innovation. Therefore, the authors advocate further research and pilot actions in the field.

Keywords: Demand-side innovation, Innovation policy, Procurement, Sustainable consumption

1. Introduction

Eco-innovations are held to be a motor of a new “Green Economy.” This term was introduced by the OECD and the United Nations Environmental Program (UNEP). In the context of the Rio+20 Conference, “Green Economy” was developed as a mission statement for the economic and social transformation; it attempts to elaborate a new framework for the orientation of the economy. The goal is to create a form of management of the economy using natural resources within the limits of renewal capacities, to preserve their life cycle and which maintains emissions within the receptive boundaries of the eco-system (Rockström et al. 2009, 2013). Eco-innovations in this context are regarded as a possible way of achieving this change and pushing for a market transformation (UNEP 2011).

This paper mostly puts an emphasis on product related eco-innovations. Innovations can be fostered and supported by innovations policies to stimulate demand and supply of innovative environmental goods and services. Traditionally, two opposing perspectives confront each other regarding economic research on technological change. These are the so-called “technology-push” and “demand-pull” perspectives. Meanwhile, innovations are understood as a complex interplay of demand- and supply-side factors and actors, as well as feedback processes. The point of view that “technology-push” and “demand-pull” factors, or their interplay in shaping innovation processes, is accepted to a large extent in the academic literature (Edler 2013; p. 13; Godin and Lane 2013; p. 622f; Knell 2012; p. 2; Di Stefano et al. 2012; p. 1283; Konrad and Nill 2001; p. 12; Rothwell 1992; p. 236; Schumpeter 1939; p. 73).

For more than ten years, demand-side related innovation policies increasingly gained attention (Edler 2006, 2007, 2013; Borrás and Edquist 2013; Falck and Wiederhold 2013; Dalhammar and Mundaca 2012; OECD 2011; del Río et al. 2010; Rennings et al. 2008; Rennings 2005, 2000). Many OECD and emerging countries now use policy instruments to specifically foster demand-side related innovations, especially, in areas with a significant need for society as a whole and where this need is not sufficiently met. This political intervention related to the demand-side is based on the following arguments (Edler 2007 and 2013):

- **Market and system failures:** The “conceptual core” of demand-side related innovation policy is the overcoming of structural obstacles (externalities, information asymmetry, lock-ins and non-diffusion of eco-innovations, etc.), which hinder market entry and the diffusion of demand-side innovations.
- **Lead market:** Regarding the political objectives, demand-side related innovation policy can “just like every innovation oriented policy [...] target economic competitiveness and growth” (Edler 2007; p. 48). Edler (2013; p. 15) broaches the issue of the lead market concept in this context. It assumes that “[...] new technologies or services are first introduced in a certain domestic market and that the functioning or the design of these technologies or services prevail as the ‘dominant design’ on the global markets” (Edler 2007; p. 49). Due to early diffusion, vendors in the domestic market can realize early learning effects and economies of scale and obtain therefore a competitive advantage to vendors in other countries (Edler 2013; p. 15; Rennings et al. 2008; p. 4). The national market thereby represents a test market to scrutinize the technical load profile of the application of innovations. According to the OECD (2011; p.25) an important role for the creation of lead markets is assigned to the “lead user”: „A lead market often originates in areas with demanding customers, who are willing to pay for the innovation.”
- **Environmental orientation:** As already mentioned, the objectives of demand-side related (innovation) policy very often affect innovation dynamics not (only) through economic mechanisms, but are also of a socio-political character. Applied instruments are used to foster innovations which contribute to the management of social challenges (e.g., in the fields of environment and sustainability) or to accomplish other sectorial political goals (e.g., in the field of mobility).

The demand side consists of different actor groups, namely private consumers, public procurement, retailers, commercial procurement and export. When discussing strategies to mobilize the demand side as users of eco-innovations, political and scientific debate in particular targeted public authorities and public procurement (BMBF 2010, p. 10; OECD 2011, p. 11; Falck and Wiederhold 2013, p. 9; BMBF 2014, p. 6 and 40ff.). Since the announcement of the EU-research framework Horizon 2020 containing the call for pre-commercial „public procurement of innovative solutions (PCP)“, it is obvious that many hopes are pinned on public authorities becoming market players who might succeed in making eco-innovations commercially viable at a faster rate. An academic debate emerged on this topic. The new high-tech strategy of the German Federal Government (BMBF 2014) shows that leverage effect on the innovation performance of the country's economy and linked research institutions is closely associated with the demand-related behavior of state.

Therefore, state governments and local authorities are encouraged to reinforce procurement of innovative goods, services and technologies (Wegweiser 2009; Knopf et al. 2011). Supporting public procurement of (eco-)innovations, the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) is funding public purchases of e.g. hybrid drives in busses and LED indoor and street lighting under the national climate protection initiative (Nationale Klimaschutzinitiative; NKI) of 2008. In 2012, the Federal Ministry of Economic Affairs and Energy (BMWi) set up the Competence Centre for Innovative Procurement

(Kompetenzzentrum innovative Beschaffung; KOINNO) run by the Association Materials Management, Purchasing and Logistics (Bundesverband Materialwirtschaft, Einkauf und Logistik e.V.; BME) with the core objective to promote innovations. According to the government's new high-tech-strategy, (BMBF 2014) KOINNO will expand. Thus the center continues to set incentives for procurement of innovative solutions including inter alia the initiation of pilot actions on pre-commercial procurement (PCP) as this procurement approach is expected to function well but - for the time being - only rarely applied in Germany.

Private purchasers are another group of market actors whose demand volume is of overall importance, but needs to be mobilized and focused on much more to achieve a sufficient target-oriented market share. Environmental policy and environmental associations address private consumers with a variety of actions and measures to change consumption and usage patterns into environmentally more benign behavior. This covers the purchase of environmentally sound and innovative solutions (eco-innovations). In contrast, an exceptional case is the target-oriented and coordinated organization of eco-innovative purchases regarding time. „Buy-cott“ actions (Neuner 2000) have been limited to only few examples such as the “Greenfreeze“-refrigerator.

Within the scope of this paper, we put the emphasis on the current and potential role of non-public bulk consumers as procurers of eco-innovations. As such, we define

- commercial as well as non-commercial organizations,
- non-governmental organizations,
- organizations which present themselves in the market as a central organizational unit concerning purchasing, or which are characterized by common or bundled procurement, and
- who have a significant shares in the concerned market sector (i.e., purchase quantities and market turnovers per product group or service).

The procurement of larger quantities mobilizes a demand volume, which is assumed to stimulate eco-innovations due to its market power and to foster faster and deeper market penetration of eco-innovations. The display of such a demand could – according to our hypothesis – offer vendors incentives to market eco-innovations (faster), lower their unit costs (economies of scale), to mobilize learning effects and offer incentives for broader diffusion either in the concerning market or within new/ other demand groups.

Figure 1 presents these hypotheses. Against the graph representing the allocation of goods in a standard market, the figure visualizes procurement options and responding to sales volumes depending on the chosen strategy of either „Market procurement“ or „Technology procurement“. „Market procurement“ refers to goods, services, and technologies already established on the market aiming to increase the market share of existing goods, services and technologies with the preferable environmental performance. On the contrary, „Technology procurement“ aims at improving environmental performance of a large number of products. This can be achieved by the purchase of innovative goods, services and technologies characterized by an environmental performance higher than the previous/current standard; commonly called eco-innovations (cp. Ostertag and Dreher 2002; p. 315).

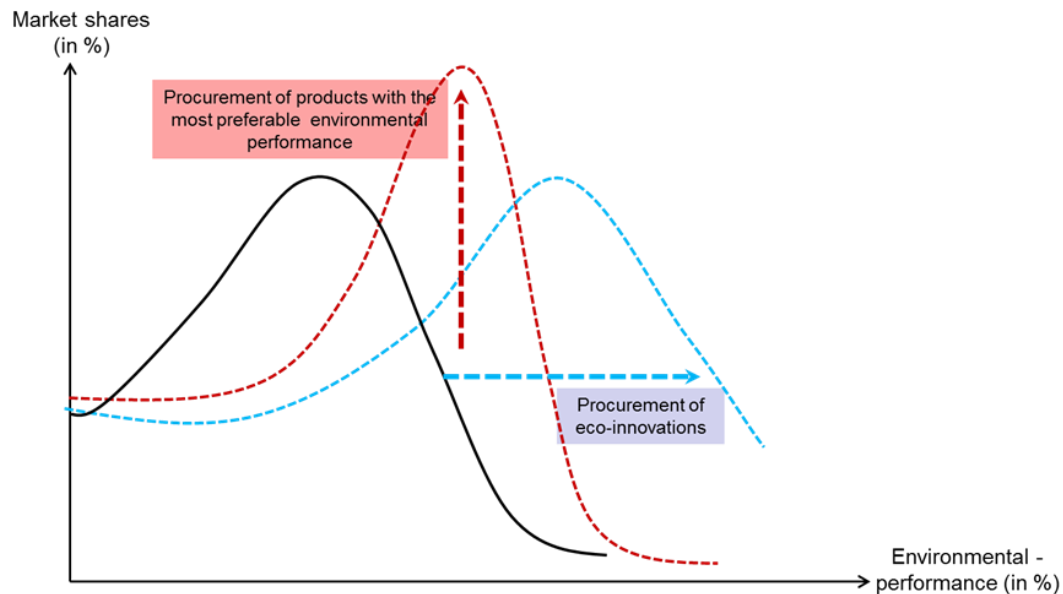


Figure 1: Options of market transformation in the spectrum between “Procurement of products with the best environmental performance” and “Procurement of eco-innovations” (according to Ostertag and Dreher 2002; p. 315)

2. Methods

In a finished research project, the role of greening demand by bulk consumers has been analyzed. First, we determined the relevant markets on which bulk consumers play a crucial role. Based on preparatory work of the authors and on literature evaluations, we identified over 200 product related eco-innovations from various technical fields. These were selected systematically according to different filter criteria. As a result, we first compiled a “longlist” of 86 and subsequently a “shortlist” of 30 promising eco-innovations. This selection was examined and discussed in interviews with 19 national professional experts applying the following criteria: doubts about the respective environmental benefits, market maturity of the innovation (especially market barriers, potential use losses) and accessibility of bulk consumers within the scope of the project. Based on these hurdles, the 30 eco-innovations with a promising environmental relief potential were prioritized. The following ones were selected in correspondence with the project initiator for further investigation throughout the course of the project and especially for technical discussions with potential bulk consumers:

- Energy-efficient commercial tumble dryers,
- Textile fabrics either produced of recycled cotton fibers or organic-cotton, and
- Air-conditioning systems in passenger cars using CO₂ as a cooling agent.

It was of central interest to collect empirical evidence on the preferences, strategies and mobilization potential of (potential) large-scale buyers. Therefore, three national (German) technical discussions were held in Berlin, on behalf of the German Federal Environment Agency (UBA), in autumn 2013 (air conditioning in passenger cars), and summer 2014 (tumble dryers and cotton textiles). Each of them explicitly addressed non-public bulk consumers for one of the above-named eco-innovations. Participants were representatives of the UBA, the research contractors and at least one respected expert who is familiar with the relevant product market and who has a reputation in this market, representatives of companies and business associations. To enlarge the focus and knowledge of our work and validate results, we

additionally considered experiences from innovation-oriented public procurement (as case studies). Based on these various sources, we suggested policy strategies and measures to activate bulk consumers to the project initiator, the German Federal Environment Agency (UBA).

3. Experiences in Activating Bulk Consumers

Bulk consumers act on the demand side. Their purchases potentially influence the supply side: a selective demand for eco-innovations could stimulate and disseminate them. A couple of interesting examples were analyzed and expanded by expert interviews. The information gained was first assessed in the light of supporting and impeding factors, and subsequently assigned to six different clusters, namely:

- Innovation-related key factors: Quality and reliability, visibility and recognition, complexity and compatibility of innovation.
- Supplier-related key factors: Availability of innovation, adaptation costs, reputation of supplier, branch-related key factors, system management, configuration of the branch, business associations, lock-in dependencies.
- Demand side-related factors: seriousness of purchasing intention, supply channels and routines, uncertainties as to available qualities, position of supplying departments, change agents, rationalities, company culture, and objectives, demand-side fragmentation, potential benefits for bulk consumers, knowledge of innovation developments.
- Context-related factors: Product and production standards, public interest, promoters, problem awareness/minimum level of attention, relationships among key players in the product chain.
- Policy-related factors: (Non) supportive policy framework, defined lead markets, antitrust law.

Based on these factors, we gained several summarizing insights on the context of market transformation towards more eco-innovations via a demand-push of bulk-consumers. As a result, a variety of aspects are worth to be taken into account:

- **Roles in the innovation process:** Bulk consumers may appear in different roles as drivers of innovations, either triggering innovations or take the role of co-producers or "early adopters." In the first case, consumers signal their need, which ideally generates new eco-innovations from vendors. In the second case, bulk consumers contribute to innovation development in a cooperative R&D process with vendors and are available for testing prototype solutions. In contrast to these two roles, in the third case, the role of bulk consumers is more responsive and oriented towards early adoption of eco-innovations supposing to gain a competitive advantage this way.
- **Public attention and problem awareness:** The creation of attention for environmental problems, for instance, through environmental organizations, sensitizes the public. The public can be households as consumers or commercial and public procurement bodies. The degree of problem awareness by customers represents a potential economic "risk" for vendors whose products are associated with environmental problems, and who therefore increase the incentives to deploy eco-innovations. "Focal companies" are in the spotlight of public and non-governmental (environmental) organizations (NGOs) (Seuring and Müller 2004; p. 144 and Seuring and Müller 2008; p. 1699).

- **Political support and “background music”:** The political system can act, or react, in a multi-level system on the international level (e.g., Montreal Protocol) and on the national level (e.g., transformation of the energy system). It can set political signals and influences the definition on which current issues are of importance or not. As a consequence, companies, and associations receive indications for steering their topics and activities and can design their risk management actively.
- **Transforming potential market power into real demand:** To shift the market, generating a binding demand is crucial. However, realizing this underlies several challenges; sole declarations of purchase intentions are of unbinding nature and are not necessarily transformed into real demand. Besides that, procurement structures in commercial enterprises are often decentralized. Associated problems are a limited “cut through power” in the management level together with the fact that to date purchasing departments only very rarely are embedded at strategic management level and thus rarely participate in the company’s global strategic debate neither respective decisions.
- **Mediators and brokers:** Different institutions, such as scientific organizations or business associations, can take the role of mediators. The pooling of purchasers in one single market power demands professional action and mediation between very heterogeneous actors (producers, commercial purchasers, public purchasers, associations, lobby groups, etc.). At this moment, several constellations could arrange. On the contrary, the role of environmental and consumer organizations is rather the one of an initiator and producer of public attention raising awareness for a certain issue or even taking the role of an amplifier of credibility.
- **Pre-study for market exploration and PCP:** The mobilization of market power would profit from stronger market exploration sounding out relevant market actors, their position in the value chain, experts, key persons and networks, windows of opportunity for prospective innovations and path dependencies, political context, market differentiation, and segmentation, as well as technical developments.
- **Pooling of purchasers:** Goal-orientated joint procurement by several bulk consumers has to overcome various hurdles. In a situation where several commercial companies cooperate, one has to bear in mind the competitive situation. Joint procurement is more difficult in horizontal cooperation than in a diagonal one (Hieronimus and Ahlf 2004; p. 6). For the time being it occurs less often in the non-profit sector as here – often – procurement tasks are not professionalized. Each time public actors are involved, public procurement law applies and may complicate or hinder joint procurement activities. A similar hurdle can be anti-trust law in the context of two or more non-public bulk consumers willing to pool large-scale purchases.
- **Business application context:** Mediators or public debates on eco-innovations have to “pick up” and address the purchasers. It is easier when purchasers act as “change agents” willing to take several risks. Purchasers in commercial companies are, as already mentioned, often embedded in the strategic management level and not necessarily part of product development teams. Therefore, eco-innovations need to be promoted credibly, a long-term and comprehensive life cycle costing is requested. In addition to that, differentiated risk-sharing models between the vendors of eco-innovations and bulk customers have to be developed. It also applies vice versa that diffusions of eco-innovations are facilitated if product lines and organizational processes are connected. Companies which are intrinsically motivated, or which dispose over environmental or sustainable management systems, tend to be more easily accessible than other companies.
- **Monitoring:** The permanent observation of innovation related procurement activities may lead to a better understanding of success and failure in (innovation) management and

strategic procurement. Monitoring supports companies in documenting their practical experience. Ideally, it is the starting point of a critical debate on success factors, reasons for possible failure and improvement potential. Evaluation results can be used sensibly in reporting practice. They may also contribute to communication and awareness raising within networks and in the context of training and consultation. Valid documentation of results and pro-active communication can support snowball-effects in the respective markets.

4. Technical Discussions to Activate Potential Bulk Consumers

A set of three exploratory expert discussions with bulk consumers was conducted as a further component aiming at mobilizing potential customers to join procurement activities towards the specific eco-innovation introduced. Each technical discussion introduced one of the three eco-innovations selected, namely energy-efficient commercial tumble dryers, textile fabrics either produced of recycled cotton fibers or organic-cotton, and air-conditioning systems in passenger cars using CO₂ as a cooling agent. In agreement with the German Federal Environment Agency (UBA), presumed bulk consumers were contacted and invited. As a result, the following insights into attitudes and strategies of current and potential large-scale purchasers were gained:

- **Accessibility of bulk consumers:** The identification of bulk consumers of a specific market or product segment requires a good knowledge of the market and its actors. Companies and other non-public institutions do not necessarily regard themselves as bulk consumers, but as regular market actors. Their interests are organized in business associations, in which a significant fragmentation and task sharing is apparent, at least in the German context. "The one" association pooling all large purchasers does not exist as such (as anticipated by anti-trust law). This is also connected to the fact that the context of applications of eco-innovations is mostly very heterogeneous.

The availability of the key responsible person for the purchasing department is a difficult process in reality. However, usually, the eco-innovations are not naturally a topic on the agenda of the respective purchasing department.

- **Obstacles for the application of eco-innovations:** Companies joining the technical discussions carried out confirmed largely the state of knowledge of obstacle research up until now, they could be summarized as follows:
- Innovation-related obstacles concerning both types of cotton fabrics presented; especially towards the technical specifications addressing the degree of purity of the recycled cotton fibers.
- Supplier-related obstacles regarding the currently missing availability of sufficient stock of the discussed textile fabrics and air-conditioning systems. To automobile manufacturer, necessary capital investment in the modification of production technologies of passenger cars as well as the air-conditioning systems themselves may become a further barrier. Additionally, economic viability is insecure as long as there remain uncertainties on cost digression effects – this risk may become a hindrance to procure eco-innovative solutions.
- Business branch-related aspects were not subject in any of the three debates. Nevertheless, it can be stated that to date neither single actors nor associations take the key influencing role.
- Demand side-related factors occurred to be considerable obstacles and motives accompanying all three eco-innovation introduced. Procuring entities often do not anticipate

eco-innovations themselves and miss out on the environmental challenges. These should be overcome as they are not part of the company`s core operations – given that the respective innovation or related challenges have not been subject to a critically scrutinized public debate before.

- Further obstacles concern a currently insufficient monitoring of energy consumption and the missing competences within the companies to monitor and control energy flows and costs. The two reasons being that capital shortage or lack of qualifications.
- Context-related obstacles were rarely mentioned. Nevertheless, it was obvious that the participating experts were aware and sensitized to ongoing public discourses and observe their political relevance for their sectors.
- Policy-related obstacles were discussed in the context of innovative air-conditioning systems in passenger cars using CO₂ as a cooling agent. The potential influence of Germany-based bulk consumers on car manufacturers operating globally was questioned: May an increasing demand for an eco-innovative solution on the national market perceptibly affect these companies` production schemes and global business and achieve to promote eco-innovations?
- **(Eco)-innovative starting points:** In a complete view, uncertainty as to the future dissemination of eco-innovations and on the future business strategies about the procurement of eco-innovations could be observed. One interesting aspect is, that in many discussions the participating experts expressed their willingness to conduct follow-up debate and round tables with other companies aiming at further exchanging experiences, networking and explicitly foster eco-innovations. The German Federal Environment Agency (UBA) was assigned the role of appropriate facilitator and activator of the above-named activities and additionally enhance user-integration into innovation processes.

It was striking that the participating experts, CEOs and procuring officers did not dedicate their attention to regulatory measures. They pledged for hands-on information and supportive information channels between R&D and companies, and the more frequent use of respective tools as they are keen to be more expediently informed and to inform customers respectively - concerns on missing information or missing orientation in the context of eco-innovations regard three areas. They mainly concern technical information but also short background information regarding eco-innovations. Secondly, they address production standards and product labeling. It was repeatedly pointed out that there exist too many eco-labels which in total might mislead users as well as applicants. Against this background, the participants pledged for appropriate guidance in or a simplification of the so-called "label jungle." Thirdly, company representatives stated that only valid calculation in a life cycle costing perspective assesses whether something was worth an investment from a view on total costs.

As a further measure, the improvement of consultation within the sector was named, e.g., through associations and their facilitating competences as well as through "technology scouts." Economic measures concerning the promotion of R&D were highlighted, whereas other economic measures were rather left aside.

4. Insights Based on the Technical Discussions and the Three Exemplary Eco-Innovations

The analyses conducted and the three expert discussions showed that the significance of bulk purchasers or consumers, however based on the specific contexts of the three regarded special product markets. Bulk consumers are not a fixed reference value, but one part of a dynamic

market. The product markets examined are partially of a very heterogeneous nature, such as the sector of professional laundry service. Depending on the loading volume, very significant technical solutions have to be taken and used. This sector is extremely segmented and divided into various sub-markets differentiating commercial and private use of tumble dryers. This is not characteristic, to the same extent, to the other two selected innovations of cotton textiles and CO₂ air-conditioning system. In these cases, relatively homogeneous product markets are apparent, in which innovative products can be used without any substantial change by both private and commercial users.

It can be concluded, that – concerning private and commercial use – in the case of relatively homogeneous product markets, bulk consumers are important market participants. However, it is important not to concentrate on the relative demand of one or more bulk consumers, (in the case of car air conditioning roughly 14 % in the German market), but to take “potential for sanctions” into consideration. So to speak, the market power of associations which can be mobilized, and in which bulk consumers often hold a strong position. Through cooperation in an association and a network of multiple associations, the potential is significantly higher, and can, therefore, occur in the sense of a horizontal aggregation of demand and foster eco-innovations. This applies even more if one regards especially the uncertainties and risks for the vendors of innovations in the early phase of a market diffusion. Aggregation of demand by “early adopters” can initiate the production, creation and early diffusion of an eco-innovation. In this way, the whole product market could be influenced and orientated sustainably whereby spill-over effects could also be triggered.

In the case of a heterogeneous product market, there are always specific market relationships. Here, it applies that bulk consumers play a strong role in special sub-markets. Nevertheless, market diffusion in other sub-markets is not necessarily expected, because of technological market segmentation. As a result, different sub-markets have to be approached individually by important market actors such as bulk consumers and associations.

5. Potential Environmental Policy Approaches for Activating Bulk Consumers as Change Agents towards More Frequent Purchases of Eco-Innovations

In a systematic literature review and internet research as well as in expert interviews, potential measures for pushing and pulling for the activation of bulk consumers have been collected (see Figure 2). These could foster an effective market diffusion of eco-innovations through bulk consumers. We categorize them into different clusters of measures:

- **Regulatory measures:** Previous experiences demonstrate the potential of regulatory measures like strict threshold limits or prohibition. Such measures may support a phasing out of environmental harmful products and services or which are likely to be harmful to human health. Consequently, they are able to support the introduction of eco-innovative ones. Liability rules and mandatory information are suitable complementary actions.
- **Economic measures** intend to change the incentive structure and to strengthen demand for eco-innovations. Economic incentives (e.g., fiscal incentives, subventions) deal with the higher prices of innovative products and services in the first market phase (market entrance) and stimulate purchase. So do innovation funds or the link of subsidies with accompanying advisory services. Co-operation and joint purchases of commercial or business and public procurement entities are possible measures to generate sale

guarantees, economies of scale and reduce risks of early adopters; risk insurance systems might support the early market adaptation.

- **Informative and communicative measures:** Publicly credible labeling schemes (e.g., EU-Ecolabel, German Ecolabel “Blue Angel”) which should integrate eco-innovative product groups/requirements for eco-innovative solutions into their portfolio as early as possible could support eco-innovative products. Training and qualification of public and commercial purchasers are suitable to influence the demand side. Furthermore, demonstration projects, innovation databases and highlighting best practices could promote eco-innovations. Campaigns by NGOs or public entities provide information on environmental concerns, challenges and may promote eco-innovations to overcome them. Innovation or sustainability awards might also accentuate eco-innovations.
- **Reflexive and discursive measures:** Eco-innovations are often not “visible” in the market. An exchange of experiences, fora, experience platforms, etc. might contribute to better reflect procurement activities and foster learning experiences of all actors involved. In general, monitoring, studies, and associated expert boards support this.
- **Co-operative measures:** Cooperation between business and public entities is a suitable approach to start a dialogue among actors of a specific chain (horizontal, vertical networking). Moreover, co-production/user involvement in the innovation process might be used in this context. A broader approach is the elaboration and implementation of road maps/action plans indicating agreed measures among participants to support eco-innovations.
- **Lead market initiatives** could focus national/international efforts towards specific challenges and focus corresponding activities towards them. The creation of lead markets is meant to develop “test” markets where economies of scale may be achieved more easily. An additional aim is to disseminate the respective products on a more global level.
- **Assessment measures** intended to support eco-innovations by monitoring to know more about their success and failure. Connected to that, evaluative work is requested to learn more about the stories behind the monitored numbers.

This overview shows that potential measures include a large spectrum of different perspectives and approaches.

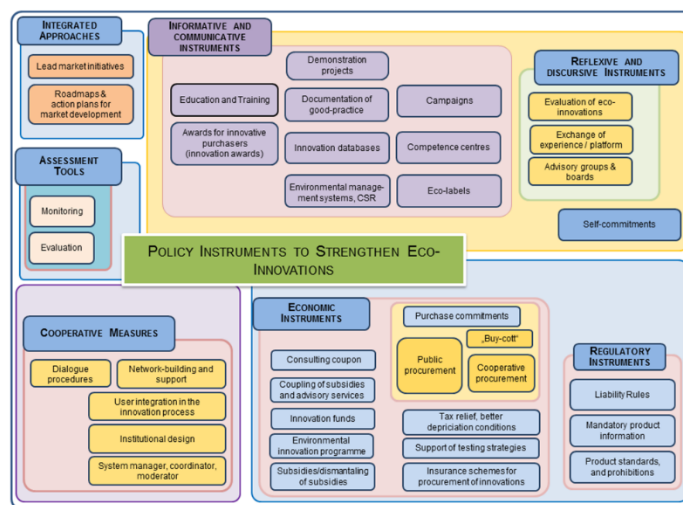


Figure 2: Potential environmental policy measures for activating bulk consumers to support market adaptation and diffusion of eco-innovations

6. Conclusions and Recommendations

This article`s considerations on non-public bulk consumers represent a subset of scientific and political debates over many years concerning the promotion of eco-innovations. A demand-side related political strategy to promote the use of eco-innovations of commercial end consumers could complement the ongoing approaches of stimulating the sustainable purchase of public institutions ("Green public procurement") as well as private end consumers.

It has not been possible to carry out an empirically reliable final proof on the question to what extent the orientation of environmental policy towards bulk consumers opens up new strategic perspectives. However, there are some indicators that the (national) potential in certain product markets could be significant, and that orientation towards eco-innovations, especially in combination with aggregated purchases (joint procurement activities), could diminish environmental burdens.

We propose a series of different measures, which respond directly to the challenges in mobilizing bulk consumers. The proposals are divided according to the "policy-cycle" (e.g., Jann and Wegrich 2003) and are depicted in Figure 3:

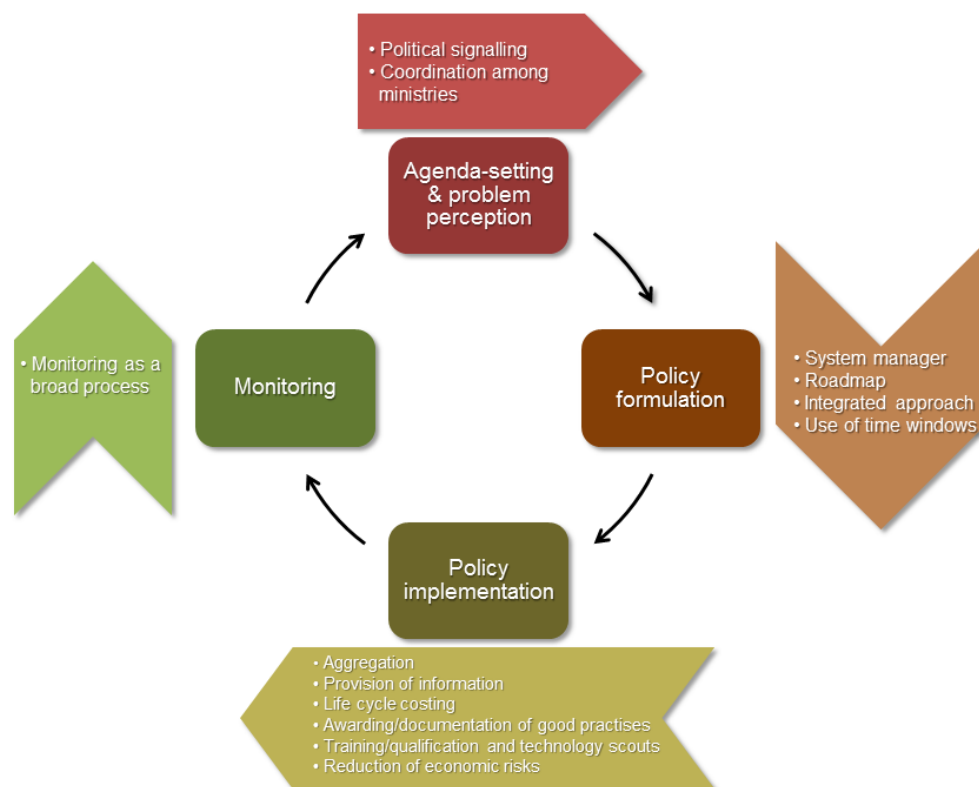


Figure 3: Overview of potential environmental policy measures for activating bulk consumers to procure eco-innovations

- **Agenda-setting and problem perception:** In the context of stimulating market penetration of eco-innovations, environmental policy to date has not focused on large-scale purchasers and their procurement activities. The procurement department in companies is the function which represents the interface with the suppliers (Seuring and Müller 2004; p. 120) and it accordingly has the task to "connect the business needs of the own company with the abilities of the suppliers" (Büsch 2013; p. 3). For environmental

policy, this means that political signals should be sent to direct attention to the procurement of companies. As a consequence, this means the setting of priorities:

1. Primarily, focusing on large-scale purchasers – bulk-consumers.
2. Second, organize procurement in terms of prospective long-term market transformation. Stimulating eco-innovations as discussed in this article pursues this goal as to affect product markets substantially by stimulating joint procurement of eco-innovations by non-public bulk consumers. As a consequence, the respective product market can gradually become more sustainable.
3. Third, it is essential to prioritize fields of action – either market segments or product groups. In our study, we selected and prioritized product groups. On this basis, we specified potential bulk consumers. Although this approach may provide guidance it does not necessarily do so. Due to limited resources, it is recommended to achieve an understanding on priority areas.

The political signals concerning commercial purchasing are to have the same treatment as public procurements such as Knopf et al. (2011) were suggesting in fostering “a culture of ‘good procurement’” (p. 37). Besides signaling, a horizontal alignment among several national ministries and the vertical alignment with regions is needed to guarantee national coherence.

- **Policy formulation:** Within the political authorities, goals, possible procedures and approaches need to be clarified. All effected departments should participate in this process. It is crucial to specify clear personal responsibilities/ “caretakers” pursuing the approach, fostering it and acting as an internal contact person as well as a broker to external key actors. Furthermore, financial means have to be provided to enable the purchase of relevant market surveys from market research institutions. We advise undergoing investigations - before concrete mobilization activities. A pre-study can compile relevant figures concerning the market situation and market dynamics as well as key actors and associations. Subsequently, it needs a strategy on how to stimulate a market transformation in the specific product market.

Promoting eco-innovations requires a differentiated knowledge of the product markets. It is therefore beneficial to cooperate with recognized and accepted experts who perform as brokers or system managers. Such system managers should be supported by an organization in charge of the process design and management. This way the broker can focus on his creative role as the facilitator of the processes.

Likewise, it is essential to conduct several dialogues with companies holding a high market share and interested in cooperating in joint procurement activities. These dialogues could appeal to important bulk consumers and their various industrial interest associations, to connect them via discussion events.

Political acceptance of such processes rises when environmental organizations participate as “amplifiers of credibility” highlighting the specific and general ecological consequences. A possible result is an action plan for market development (“roadmap”), which puts together particular activities of the partners involved and aims at creating a stimulating market dynamic.

The measures taken in specific product markets and respective roadmaps would ideally be summarized to a coherent approach of environmental policy. This means, on the one hand, horizontal department coordination at the Federal level, and, on the other, national coordination of the approach to guarantee a coherent and systematic strategy and operating principle. The phrasing and the promotion of political measures should also take into account time windows – windows of opportunity – which arise. Such time windows have a favorable effect on the activation of bulk consumers.

- **Policy implementation:** The market power of bulk consumers depends on the particular context. Besides the demand for non-public bulk consumers, green public procurement (GPP) has a significant sphere of influence. Aggregating both consumer segments, the shearing force of demand mobilization could become larger. The decision on and specific form of aggregation could reflect the context of a particular product market. The possible spectrum of joint activities ranges from an exchange of experiences in the procurement and use of eco-innovations to a common informational platform, or, even, joint tenders and purchases.

The eco-innovative efforts of environmental politics on specific product groups or particular innovations need to be signaled to the procurement bodies of large companies, this is caused by the focus of the purchasers on the fulfillment of the core activities and the execution of the core features. Environmental and sustainable aspects are not necessarily the focal point. Consequently, environmental politics should create fact sheets for the eco-innovation focused on and the targeted environmental problem and should introduce them, at the latest, at the implementation stage.

One additional measure is a clear orientation in the label jungle for purchasers. Some material for public procurers (cp. e.g., Manhart et al. 2012) exists which deliver an overview of the plethora of labels for several product markets. By hinting to reliable and less reliable ones, they differentiate the product markets and support procurers. This material should also be accessible to non-public procurers.

The calculation of costs of investments should consider the whole life cycle of these investments. The use of life-cycle costings (LCC) should be supported as a more reliable tool, and it might be expected that LCC calculations favor eco-innovations.

The necessity of purchasing eco-innovative products has been dealt with in a couple of European and national strategic policy documents. One additional measure to promote eco-innovations is to use existing award schemes marking eco-innovations.

Besides the emphasis on best practice, their feasibility could be ascertained through pilot actions and demonstration projects, which appropriately document technical realization and the realized benefit. Technology scouts, competence centers or innovation databases, as well as campaigns, could refer to eco-innovations and therefore open up the way for interested bulk consumers. The diffusion of eco-innovations in a sector could also be intensified technology scouts or through information or network meetings. In this context, the development of new financing and leasing opportunities (e.g., crowd funding) could be tested, to see whether capital for the purchase of eco-innovations could be provided for smaller companies.

The purchase of eco-innovations interferes with existing routines oriented at complementary performance goals. Existing procurement ways have to be adapted. To support non-public bulk consumers, qualified and focused training and consulting formats are necessary, which could be financed through contracting models.

Economic risks represent an important obstacle to the introduction of eco-innovations by commercial clients. A possibility for reducing risks when purchasing eco-innovative products could be the creation of an insurance system. It would be necessary to test whether an insurance system could be initiated. A different approach would be the setting up or improvement of liability rules which set clear framework conditions for the sale of eco-innovations, improve the planning security for producers in the sales process and which reduce the risks in the diffusion process. Next to these measures, promotional programs could support the introduction and diffusion of eco-innovations.

- **Monitoring:** Monitoring is necessary to periodically assess the progress of measures; in this context, it is used as a controlling tool. On the other hand, it represents a systematic measure to provide information on the development of measures for every actor involved, for political decision-makers and possibly the public. Monitoring helps to detect deviations from the original goal(s) and conflicts.

7. Final Hints

Our insights refer to a couple of aspects in the area of the long-term discussions on innovation-push and pull criteria. Demand-side public support of eco-innovations of non-public bulk consumers supplements the consumption-oriented approaches directed towards public procurement and private consumers.

Overall, we conclude that mobilizing bulk consumers as purchasers of eco-innovations represents a promising strategy. Nevertheless, it is not possible to guarantee the success of such a strategy, since not sufficient empirical evidence is available, yet. As the commitment of the public is one of the very foundations of it, it is necessary to continue research on the topic to prevent it becoming a “free ride” strategy.

The presented measures and approaches are oriented towards the topic of this paper: How to push non-public bulk consumers? With these measures, the possibility of unchaining a broad demand for eco-innovations through regulative measures such as Blind (2012) and Edler (2013) describes them, have not been addressed. Such regulatory measures, used in Germany in the area of the renewable energy law, influence the framework conditions from the side of the authorities, to support demand for eco-innovations, and, consequently, to create a new market.

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