Sustainable Products

Introduction

The environmental impacts of products and services depend on how they interact with the surrounding socio-economic and technical systems, sectors and actors along their lifecycles. However, the economic rationale and market forces are often ineffective for improving environmental performance of products.

In order to compensate for market failures that lead to environmental and social externalities, policy makers have to intervene by introducing measures that create a climate favourable to the environmental business innovation and that stimulate the demand for sustainable products. Thus, the role of governments is to create institutional structures and incentives that support innovation and competitiveness of environmentally superior products and services, to promote international harmonisation and cooperation, reduce trade barriers and help developing countries leapfrog the high-polluting development phases. The challenge however is to find the optimal set of measures and the right actors in supply chains that are most capable to induce changes with the utmost economic efficiency and environmental effectiveness.

Businesses are often the most capable actors to make product changes, since many environmental aspects can be prevented at the product design stage. By using their position of power and through communication strategies they can affect behaviour of many actors and optimise products' lifecycle beyond manufacturing stages. Retailers too are an important actor who can exert pressure on suppliers, create greener market offerings, market SP and, most importantly, provide easily accessible product information to consumers. Consumers in turn can take a more responsible attitude towards their purchasing decisions and lifestyles. Awareness raising and education of children and youth are effective strategies that are often neglected. Here media and trendsetters play an important role. Certain improvements in product innovation can already be noted in the area of energy efficiency, waste reduction, de-materialisation, toxics substitution, pollution prevention and eco-design. Proactive companies find benefits in strengthening brand names and managing future risks through green product innovation and lifecycle management. Examples of corporate and governmental initiatives for SP span from cutting edge innovations (solar cells, fuel cell, hybrid vehicles, composite materials, etc.) to organic agriculture, fair trade and corporate social responsibility in developing countries.

However, while examples of improvements can be found, we are still far from mainstreaming SPs and equalising the access to sustainable solutions across the world. Greener products are largely still perceived as niche markets, consumer awareness and readiness to act is still low, and innovation capacity is very fragmented and under-maintained.

Current status
Policy instruments and initiatives for sustainable products

Today governments have a range of administrative, economic and informational policy instruments to address SP. Examples include substance bans, performance standards, labelling schemes and producer responsibility regulations. Their success varies both geographically and sector-wise.

Polices targeting hazardous substances such as CFCs, POPs, heavy metals in electronics and others have already proven to be effective in reducing product toxicity. During the last decade, a range of new product policies have been developed based on the extended producer responsibility (**EPR**) principle aiming at improving end-of-life management and inducing product innovation. Positive effects of these polices can be seen worldwide in packaging, electronics, automotive and other sectors where examples of eco-design, material substitution and de-materialisation can be found. The spill-over effects of regional initiatives are significant due to globalisation and international trade. For instance, the EU's RoHs Directive led to elimination of six hazardous substances from many groups electronic products internationally. The **WEEE** Directive intends to increase recycling and facilitate product re-design by placing the responsibility of waste management on producers. The **EuP** Directive that sets energy efficiency requirements for energy using products is intended to affect the use phase.

Eco-labels are an effective tool to communicate the environmental properties of SP. Several eco-labeling schemes in Scandinavia, Germany and Japan have shown successful cases (e.g. the Nordic Swan, the Blue Angel). Their success is often linked to the level of consumer awareness and marketing efforts. Proactive approaches of the retail sector also contribute to eco-label success by active sourcing and marketing of eco-labelled products, by improving their visibility in shops and adequate pricing. An important issue for the globalising market is standardisation (e.g. ISO 14020 Type I, II and III frameworks) and internationalisation (e.g. the Energy Star) of eco-labels. For example, over the last decade Energy Star has been a significant driver of eco-innovation[1] in energy using products and today is recognized in Europe too.

In order to optimise and prioritise actions it is important to understand what products have the highest environmental impacts. Several international initiatives have been taken to answer this question. For example, the **EIRPO** project by IPTS analysed the lifecycles of 283 product groups, where food and drink, passenger transport, housing and utilities, healthcare, communication and recreation were top-ranked.

Some *national initiatives* are important learning sources. Examples of success could be electricity feed-in laws (e.g. Germany) promoting the development and diffusion of wind and solar power technologies. Danish innovation programmes[2] are praised not only for securing 20% of electricity from wind power, but also for giving enough innovation momentum to the Danish turbine industry to

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[1] Examples include IT and office equipment, residential appliances, lighting, heating and cooling equipment, as well as new buildings, etc.

[2] Technology Scenarios (TES) research programme (Risø National Laboratory, DTU). URL: http://risoe-staged.risoe.dk/. See also Danish Wind Industry Association, URL: http://www.windpower.org/en/core.htm

become the front runner on the world market. The Top Runner Approach[3] is effective in setting energy efficiency standards for electric appliances in 18 product groups in Japan. Remarkable results can already be noted in e.g. energy efficiency and stand-by reductions.

A number of initiatives exist also *in developing countries* in the areas of greening forestry, agricultural products and local community benefits. Examples[4] of these are: sustainable forest management certification systems in Malaysia, Ghana and Brazil. A variety of initiatives exist in Latin America[5]: Brazil and Chile's sustainable forest management certification (Certflor&Certfor); Argentina and Costa Rica's organic agriculture certification system; Uruguay's 'Natural Meat' system; Paraguayan Programme for Organic Production and Commercialisation; Costa Rica's eco-labelling for ecotourism, which has been adopted as a model for the development of the Sustainable Tourism Stewardship Council; the Green Markets Programme in Colombia.

Energy efficiency of products seems to be an active area for some *international initiatives*. For instance, the *EU IEE-programme[6]* promotes the most energy efficient products in the EU (the Top Ten project) and assists developing countries with investments though structural and cohesion funds, pilot and demonstration projects, institutional strengthening and support with monitoring and evaluation. *Asia-Pacific Economic Cooperation (APEC)* has developed Energy Standards Information System[7] (ESIS) providing information on different appliances and equipment in the region. It is also a platform for expert discussions on how to harmonise and rationalise the testing, labelling, and setting the minimum energy standards for specific appliances and equipment. EPIC-ICT[8] is the European Commission initiated project on the development of environmental performance indicators for ICT products in order to assist decision makers. The Marrakech Task Force for Sustainable Products (ITFSP) is focusing on i) raise awareness of product policy as means of achieving international development and environmental objectives; ii) seeking common priorities and opportunities for cooperation in encouraging more innovation on product eco-design; and iii) establish and participate in open and transparent processes for improving product performance. To do that, the TF has created 3 Global Sustainable Products Networks (GSPNs) one the following product groups: lighting, home entertainment, electric motors.

A relatively new trend is to address the *social dimension* of sustainability by labelling material origin or ethics of production. Examples can be Forest Stewardship Council and the Fair Trade

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[3] [6] URL: http://www.eccj.or.jp/top_runner

[4] UNCTAD (2004), 'Trading Opportunities for Organic Food Products from Developing Countries –Strengthening research and policymaking capacity on trade and environment in developing countries' (New York and Geneva: United Nations, 2004).

[5] Borregaard, N. and A. Dufey (2005). Challenging preconceptions about trade in sustainable products. Towards win-win-win for developing countries. London, International Institute for Environment and Development:

[6] URL: http://ec.europa.eu/energy/intelligent/index_en.html

[7] URL: http://www.apec-esis.org/home.php

[8] URL: http://www.epic-ict.org/

labels.[9] Corporate Social Responsibility (CSR) is gaining momentum among businesses and there are attempts to develop international standard for CSR, e.g. ISO series.[10]

Business approaches for sustainable products

Businesses and other actors use a variety of *analytical tools* such as lifecycle assessment (LCA), lifecycle costing, risk assessment, environmental impact assessment, ecological footprint and MIPS for systematic evaluation of environmental impacts along the entire supply chain or product lifecycle.

Gradual improvements are being made in the quality of LCA databases[11] and the development of simplified hybrid methodologies, e.g. combining traditional LCAs and macro -economic input-output assessments (I/O LCAs). The majority of initiatives are being taken by SETAC[12], the Life Cycle Initiative (UNEP), Carnegie Mellon Green Design Inst. (USA), LCA Centres in Denmark and Japan, Leiden University in the Netherlands and other academic institutions and consultancies.

In the *managerial toolbox*, approaches such as eco-design, eco-innovation, lifecycle management (LCM), supply chain management (SCM), corporate social responsibility and product-oriented environmental management systems (POEMS) are being used to collect and analyse lifecycle information. Business concepts such as *Lifecycle Management* or Product Stewardship are important for bringing the lifecycle thinking into the corporate culture and structure in order to stimulate systematic product innovation from its conception, through design and manufacture, to service and disposal. The lifecycle thinking also includes communication with customers, product marketing, information and support. A number of businesses have realised that LCM, can help prevent some environmental and social problems with low costs leading to overall economic benefit. The joint programme of UNEP and the SETAC – the **Life Cycle Initiative**[13] - is an important platform for knowledge exchange and the promotion of Life Cycle Management in business practice through partnerships with other international activities like the Sustainable Building and Construction Initiative.

Other *entrepreneurial approaches* promoting SPC are based on selling product's functionality rather than physical products and comprise newly emerging business models such as Product-Service Systems (PSS), Demand Side Management, Least Cost Planning and other. PSS as an

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[9] Fair Trade initiatives in 17 countries cover 50 products to date. URL: http://www.fairtrade.net/

[10] URL: http://www.iisd.org/standards/csr.asp

[11] A number LCA related databases exist: Eco-invent, Bousted Model, ETH -ESU 96, BUWAL 250, Dutch I/O Database, IDEMAT 2001, Franklin US LCI database, IVAM, FEFCO and other.

[12] The Society of Environmental Toxicology and Chemistry, URL: http://www.setac.org

[13] [16] See URL: http://www.uneptie.org/pc/sustain/lcinitiative/

innovation strategy can bring about not only the benefits of de-materialisation, but also open up new markets and improve competitiveness. The distinct feature and the core environmental rationale behind PSS is that producer retains product ownership and thus has more incentives to ensure lower costs of ownership per unit of product function. This may in effect translate into resource efficient product systems with mechanisms to recover the rest value from recycling of material and energy content. Properly designed PSS benefits consumers too since new and more flexible service packages are capable of providing more value added as compared to traditional models based on product ownership.

Success cases of demand and supply of sustainable products

There are many *business initiatives* on **dematerialisation** based on the concept of product servicising, such as: integrated pest control services (Koppert), launderette services (Electrolux), copier leasing (Océ, Xerox), carpet leasing (Interface), industrial lubrication (SKF), electronics refurbishment programmes (Sony), network computing and application service provision (HP, Intel, ChipPC), flexible office (Gispen) and many others.[14]

There are also examples of business initiatives that address *social responsibility issues*, such as the use of child labour, poor working conditions and unfair wages. Companies such as American Apparel are active in marketing locally produced goods and socially responsible production methods. Initiatives such as *Fair Trade* direct efforts at ensuring a more fair distribution of revenues among the producers in the poor parts of the world. Examples of sustainable products and services include Freeplay Energy[15] project - helps developing nations in Africa and other parts of the world to get access to modern world products and services. Important for developing countries are innovative solutions in organic agriculture, such SallyFox Natural Cotton[16] (cultivating natural coloured cotton that does not need industrial dying) or the Sustainable Cotton[17] project (supporting fair trade and regional economies). Such projects are important in pioneering new markets for fair-trade, locally produced and sustainable products. Retail sector can also play a role in opening new markets for SP and shaping green consumerism. Companies such as Grupo Pao de Acucar (Brazil), Migros (Switzerland), Eroski (Spain) or Natura (Brazil) promote organic products and shape the demand by active green marketing campaigns and consumer information.[18]

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[14] For more, see the database of product-service system examples by: Goedkoop et. al (1999) Product Service systems, Ecological and Economic Basics.

[15] The products are distributed throughout the developing world by The Freeplay Foundation (www.freeplayfoundation.org) and other AID and humanitarian organizations such as Unicef and other UN agencies.

[16] See URL: http://www.foxfibre.com/

[17] See URL: http://www.sustainablecotton.org/

[18] See UNEP (2005) Talk the Walk. http://www.uneptie.org/pc/sustain/reports/advertising/Talk_the_Walk.pdf

For many companies marketing sustainable products is still a matter of risk management, but nevertheless it increases the share of SP in mature (richer) markets. In developing countries the retailers seem to prefer locally produced products, which are cheaper than imports, but still contribute to local communities.

Challenges

Despite the high potential for innovation, companies often suffer from the lack of *adequate financing* as potential investors still perceive environmental innovation as risky investment. Thus there is a role for governments and venture capitalists to assist in financing innovations and R&D for SP. There is a need for governments to provide more support new innovation systems that could facilitate input from academia, better networking and easier access to information, which all together would reduce the transaction costs of innovations. An even more important issue is *financing product innovations in developing countries*, which is totally insufficient in addition to low innovation potential (due to lack of know-how and education). It is also challenging to make the already existing SP solutions *suitable for poor regions*, due to their costs, underdeveloped infrastructures and distribution channels or poor institutional capacity.

In the world of globalisation and international trade there is often too little room for niche products to enter. When an *international consensus* exists, strict regulations have proven to be a powerful tool to induce world -wide change. When a regulation concerns a large enough market (e.g. the RoHS example), it is more likely to have a global effect. Affluent societies (the EU, USA, Japan) may have a better potential to afford such market interventions than the emerging economies (India, China, Brazil). At the same time softer policy approaches may also be effective in inducing proactive responses by the industry. Clear and consistent policy trends (e.g. towards energy efficiency and climate change measures) often serve as drivers for companies to reduce their risks and impacts.

Using market forces to the largest degree possible, where the challenge is to find the right set of instruments to be applied to the right actors. Getting the prices right through tax/subsidy mechanisms (supply side) along with proper information to consumers about the environmental characteristics of SP (demand side) are the key strategies to develop.

It is also crucial to *address the demand-side* by consumer information and awareness raising with the ultimate aim to shift attitudes and perceptions towards green consumerism – not only consuming greener products and services, but consuming differently (sufficiency, needs vs. wants, etc.). Not only governments, but businesses, media, NGOs and consumer organisations have a role to play in making marketing SP more effective, e.g. by addressing the youth, following the role models and developing visions of new lifestyles). Generation of *knowledge about products' lifecycle related environmental impacts* is still a challenge, especially poor data quality and cumbersome methodologies of environmental assessments.

Finally, globalisation and international trade calls for *harmonized performance schemes* to measure the sustainability of products and services and for intensifying efforts for priority setting

and measuring results. Harmonisation is relevant both for the environmental and social dimension through raising corporate social responsibility in the areas of fair trade, child labour, education and labour rights.