



Chamber of Eco Commerce (CEC)

About Eco Innovation

THE IMPORTANCE OF ECO-INNOVATION

Given current economic and environmental policies, nature's life-sustaining services will continue to decline at a rapid pace. "Business as usual" may put human life on Earth eventually into question. Meanwhile, economic options will become limited and world peace more fragile.

Traditional *environmental* policies and measures focus on dealing with specific problems. In certain respects, this approach has been quite successful. For instance, it has cleaned up water pollution, taken dangerous products off the market, and recycled certain products.

However, since traditional problem solving begins *after* recognizing a problem's existence, such policies are neither helpful on a systems level, nor are they preventive in a general sense. Solving individual problems by specialized environmental technologies can even exacerbate other problems, in particular those as yet undiscovered.

Today, more than 95% of the resources lifted from nature are wasted before the finished goods reach the market. And many industrial products - such as cars - demand additional natural resources while being used.

The key for sustainability is to radically increase the resource productivity of all economic activities, including energy generation.

Key challenges include widespread hunger and water shortages, desertification, the spread of diseases, massive erosions, and increasing natural catastrophes such as hurricanes, floods and tornadoes and floods. And yet, only some 20% of humankind enjoys the full benefits of our economic model, while *all* human beings - and in particular the poor - have begun to suffer the consequences of its flaws.

But even if one were to ignore the ecological problems caused by the overuse of nature, globalizing the western lifestyle is *not* possible, because it would require more than two planets as a resource basis. Rapidly rising raw material prices testify to this.

Understanding eco-innovation

Eco-innovation is "the creation of novel and competitively priced goods, processes, systems, services, and procedures designed to satisfy human needs and provide a better quality of life for everyone with a whole-life-cycle minimal use of natural resources (materials including energy and surface area) per unit output, and a minimal release of toxic substances".

Eco-innovation encompasses novel or significantly improved solutions introduced at any stage of the product life-cycle with the aim of improving resource productivity or reducing environmental impact. Indeed, evidence suggests that the biggest resource efficiency gains can be realized in the upstream part of the supply chain that is in the production of basic

(most notably during extraction of the raw material) or intermediate goods. In the *downstream* phases of the product life cycle (use of the product, consumer practices) resource efficiency gains are significantly lower.

Understanding the full implications of eco-innovations implies taking into account in a systemic manner the consequences of their application. Indeed, eco-innovation needs to be analyzed at three levels: micro (product, service, process, company); meso (sector, supply chain, region, product/service system); and macro (economy-wide).

Product innovations can lead to either positive or negative changes in eco-efficiency, however an analysis limited to the product-level does not allow for a complete understanding of the changes induced in resource use or environmental impact. At the other end of the scale, the introduction of an innovation in more complex systems (e.g. energy systems), requires implementation of a series of micro level innovations implemented by multiple actors. The paradox is that system innovations are the most challenging to achieve, but also promise the most significant resource efficiency gains.

Accordingly, measuring the importance of eco-innovation in the economy is both a necessity and a substantial challenge. It requires creating a coherent measurement approach drawing on different traditions, most notably from innovation studies and environmental economics (resource efficiency and resource productivity). The current indicators, statistics and knowledge base in the European Union about eco-innovation is insufficient as a robust basis for making correct policy choices.

Survey-based data are valuable to analyze company profiles and various aspects of innovation activities and as such are relevant for innovation policy makers. Nevertheless, a limitation is that they do not include technical information about specific processes or products. In this context, even future plans for new questions on eco-innovation in the Community Innovation Surveys are not a sufficient tool for an informed design of eco-innovation policy measures.

Therefore, there is a need to adopt and use other methods to gather data on the level of products and processes. There are established tools to analyze the whole life-cycle eco-efficiency of products and services. However, there is not an integrated database at the global level currently, which can serve as a reliable policy reference for information on eco-innovative products or services.

One of the key challenges is to relate innovation performance to eco-efficiency gains and to macro-level resource efficiency indicators, which could serve as a reference framework for setting long-term innovation policy targets. Policy makers thinking about eco-innovation should reflect on how to use material flow measurements in the context of innovation policy in order to embed eco-innovation in an overall resource productivity perspective.

Barriers and drivers to eco-innovation

While high costs of innovation activity, the lack of an appropriate source of finance and perceived excessive economic risks were highlighted by CIS3 data as barriers for eco-innovation, a study on a large sample of eco-innovative companies identified **costs, notably energy, reduction as one of the key reasons to introduce eco-innovation**. Companies are often not aware of the longer-term opportunities to cut costs thanks to investment in eco-innovation process (most notably eco-efficiency). Price and regulatory factors are key competitive issues for companies introducing eco-innovations. Indeed, higher price (and not lower quality or less reliability) of environmental products seems to be a major barrier to market penetration. In this context, not surprisingly, customer proximity and acceptance are

considered by over 40% of eco-innovators as important for innovation activity. Similarly, improving the firm's image is one of the most important motivations to introduce eco-innovation.

A significant element of demand for 'eco-innovative' products and services should be that exercised by public agencies through their purchasing practices: so called green public procurement. However, only 36% of the tender documents in the EU25 contain appropriate and legal environmental criteria. Moreover, certain categories of purchase are more suitable for green procurement than others. A recent study has underlined the important that green procurement should integrate a life cycle cost assessment and not only purchase cost and that a focus on the purchase price during the tender process is not justified. It is crucial that public authorities start procuring 'green' products, in order to help these products towards a wider placement on public and private market and to generally serve as a 'positive role model'. However, the effect of green public procurement on eco-innovation will depend on the tendering criteria set

Eco-innovation and innovation policy

The underlying rationale of innovation policy is to improve the competitiveness of the economy and, consequently, to contribute to higher economic growth and employment. Defined in this way innovation policy does not give any specific preference to deploying measures, which aim at more environmentally and socially sustainable development. Even if environmental concerns are identified in policy

Conclusions and recommendations

The major global challenges (mega-drivers) for eco-innovation are climate change, limited natural resources and increased global competition. The overall policy response to these challenges is to connect sustainability and economic growth. Eco-innovation is still subordinated to economic growth in policy practice. Therefore, there is a need to review overall strategic policy priorities and make eco-innovation a key policy driver.

The radical change and system innovation should be taken into account in designing and implementing innovation policy. It was argued that in order to encourage systemic change there is a need to both set clear long-term strategic policy targets as well as revise existing policy mix.

The following four main 'political messages', sum up the findings:

- Eco-innovation is neither sector nor technology specific, limiting eco-innovation to 'environmental goods and services' is not a road for policy to continue to follow.
- There is no conclusive evidence that innovation performance is contributing to less resource intensive or more environmentally friendly socio-economic activity.
- Simply merging traditional environmental and innovation policy tools will not lead to a radical ('factor-x') dematerialization of our economies nor reduce environmental footprints. Therefore, there is a need for a radical shift in framework conditions, notably in regulatory and taxation systems leading businesses and consumers to price their resource use correctly.
- Innovation policy, therefore, needs to a) adjust its targets towards longer term metrics related to the impact of innovation on resource productivity; b) re-focus attention from direct subsidies to fiscal, regulatory and standard setting practices, promoting eco-innovation c) support innovation leading to an eco-efficient production cycle (e.g. integrating industrial symbiosis with cluster policy).