

Science for Environment Policy

Eco-innovation encouraged by regulatory measures and R&D – especially important for Eastern Europe

The factors enabling eco-innovation have been analysed across 19 European countries in a new study. Regulations and environmental subsidies were found to be more important factors in Eastern Europe than in wealthier Western European countries. External research and development (R&D) was also more relevant in Eastern Europe, demonstrating the need for specific technology transfers from other countries and competitors.

Eco-innovations – the development of products, processes or services that provide benefits to the environment – are important in reducing the environmental impact of [business](#) and in [improving sustainability](#).¹ [New technologies](#), such as renewable energy, can also lead to cost and efficiency savings. The factors that encourage eco-innovation, and which can help us understand the importance of the regulatory measures or systems required for such developments, have not previously been studied across multiple countries. Countries in Eastern Europe are less wealthy than those in Western Europe, and, therefore, often have lower levels of research and development as well as different environmental priorities and awareness. As such, understanding eco-innovation in Eastern Europe was a particular focus of this research.

The [Community Innovation Survey](#) (CIS) was used to analyse the environmental benefits from eco-innovation across 19 European countries in six technology fields: **materials; energy; carbon dioxide; dangerous substances; air, noise, soil and water** and **recycling**. In addition, the environmental benefits from the after-sale use of a product or service were considered for energy, recycling and air, noise, soil and water.

The researchers used an economic model to examine the specific determinants of eco-innovation in Eastern European countries, using richer Western European countries as a reference for comparison. The following determinants of eco-innovation were considered:

- regulation measures;
- subsidies;
- market factors;
- innovation inputs (including research and development);
- innovation objectives (such as an increase in the range of goods and services or entry into new markets);
- information sources; and
- organisational innovations.

In terms of the importance of different environmental areas, the CIS data indicated that reducing **energy** use was an important innovation area for nearly all of the countries studied, but especially for Germany, Hungary and Sweden. **Recycling** was an important sector for the Czech Republic, Germany, Hungary, Ireland, Luxembourg and Portugal.

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1. 'Eco-innovation is the production, application or exploitation of a good, service, production process, organizational structure, or management or business method that is novel to the firm or user and which results, throughout its life cycle, in a reduction of environmental risk, pollution and the negative impacts of resource use (including energy use) compared to relevant alternatives.'

OECD (2007). [Final report MEI project about measuring ecoinnovation](#)

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In general, eco-innovation was lower in Eastern European countries (with Hungary as an exception) than in Western Europe. The researchers say this is probably because of lower spending on research and development in these countries.

Regulation as a trigger factor was found to be more important in Eastern European countries than Western European countries for developing eco-innovation. The researchers say this may be linked to the fact that the CIS data showed that populations in Eastern European countries also had lower environmental awareness and a higher dependence on subsidies, indicating the importance of the state in encouraging eco-innovation. Due to the high costs for the transition to cleaner production, the Eastern European countries are disproportionately dependent on subsidies. Regulation measures were specifically important for air, noise, soil and water as well as for dangerous substances. But regulation was less important for materials and energy saving, where the desire to save costs was more of a factor. Environmental subsidies were found to be particularly important when developing innovations to reduce carbon dioxide.

The researchers say that regulation may be a vital factor in the development of eco-innovation because there are often no market incentives to improve negative environmental impacts. The appropriate use of regulations, such as taxing polluting technologies when cleaner options are available, can therefore encourage a shift to more environmentally beneficial technologies or processes.

Research and development is also important for eco-innovation, as many fields are new and require research to enable further development. Universities and other research institutions therefore have a significant role to play in providing skilled workforces and new sources of information. Supporting the technological capabilities of Eastern Europe may help the development of eco-innovations in these countries.

