

# Science for Environment Policy

## Household energy policies promote energy-efficient innovation in industry

**In addition to reducing carbon emissions, policies promoting efficient energy use can encourage innovation in the manufacturing sector.** This study evaluated the innovation effect of household energy policies using a comprehensive dataset of 21 European countries. The results show that policies such as financial subsidies and product labels can promote the development of sustainable-energy technologies.

**As climate mitigation becomes increasingly important, the sustainable production and use of energy is taking a prominent role in political discussions throughout Europe.** To improve energy efficiency in Member States, the EU has adopted several measures, including the [Energy Efficiency Directive](#), which sets out actions to achieve a target of 20% final energy consumption from renewable sources by 2020.

The development of more energy-efficient technologies is central to achieving this goal. Demand-side policies aim to increase the benefits of innovation through measures such as rebates for consumers, the protection of intellectual property of new technologies, or the imposition of taxes on competing technologies. This study investigated the impact of demand-side policies targeting the household sector on the development of new energy technologies. Specifically, the researchers investigated whether household-energy policies increase the number of patented energy-efficient technologies, within the fields of building and lighting.

The researchers based their investigations on a comprehensive dataset of 550 policy measures spanning 30 years (1980–2009), 22 industries and 21 European countries, taken from the [MURE \(Mesures d'Utilisation Rationnelle de l'Energie\) database](#) of EU energy-efficiency policies, which were analysed with econometric tools (the application of statistical and mathematical theories in economics in order to test hypotheses, in this case relating to energy innovations). Statistics on the number of patents covering energy-efficiency innovations (taken from the [European Patent Office's PATSTAT](#) patent database) were used to measure innovation.

The design of this study allowed the researchers to control for energy costs, industry size and gross domestic product (GDP), as well as the effect of alternative policies, such as technology-push policies, which encourage industry to develop certain types of products.

The study focused on six types of household-energy policy:

- **Subsidies:** financial incentives that reduce the initial investment cost for energy-efficiency changes in a household, such as offering grants or tax deductions for more efficient appliances.
- **Standards:** these set out a minimum level of energy efficiency, such as minimum requirements for thermal insulation in a home.
- **Campaigns:** these aim to educate the public about energy-efficient behaviour.
- **Labels:** product labels rate the energy efficiency of appliances, such as white goods and light bulbs.
- **Voluntary agreements:** voluntary energy-efficiency agreements are undertaken by firms and include building codes and exchanging appliances at the end of their lives.
- **Taxes:** on energy consumption or carbon emissions — taxes can be used to penalise the use of inefficient technologies.

*Continued on next page.*



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Econometric estimations showed that these policies are significantly associated with the number of patented energy-efficient innovations in the fields of building and lighting. On average, one household policy increased the number of patents by 3%.

The researchers found that financial subsidies and energy labels are especially beneficial for encouraging more energy-efficient inventions. Their analysis indicated a significant influence of 6% and 8% increases in patenting activity for the introduction of a subsidy or label policy, respectively.

The researchers also showed that household-focused energy policies can complement and enhance the action of technology-push type policies, such as research and development subsidies.

As part of their conclusion, the researchers suggest that [appliance labels](#), (the [EU energy label](#) was established under [Directive 92/75/EC](#) and rates appliances in terms of energy efficiency from A to G) could provide consumers with information on the savings that can result from using more energy-efficient devices.

Overall, the results show that policies which support the early market adoption of energy-efficient technologies can also effectively promote industries' innovation activities. As a result, the researchers recommend subsidies to reduce investment costs, which will encourage innovation and address the high initial costs for energy-efficient technologies.

