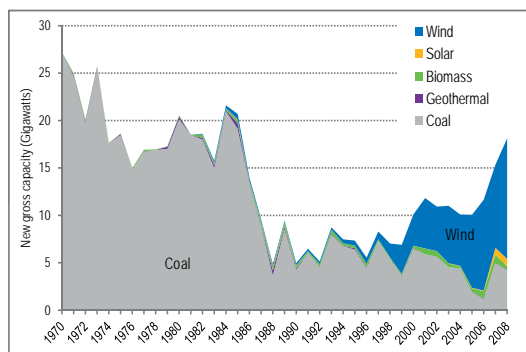


## The Consequences of Innovation

Innovation with respect to environmental technologies is not an objective in and of itself, but rather a means of realising environmental benefits. This can arise through innovation which facilitates the substitution of inputs, and which increases efficiency in their use. For instance, initial work indicates that increases in the stock of knowledge have an appreciable impact on investment in renewable energy plants, but there is significant variation in the strength of this effect by type of renewable energy source.

### Plant Entry in Electricity Generation Markets



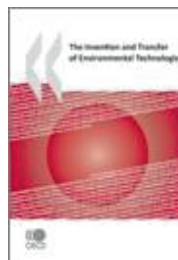
Downstream impacts on CO<sub>2</sub> emissions from such fuel substitution can be considerable. Moreover, related work has shown that an increase in the knowledge stock related to the combustion efficiency of fossil fuels reduces the carbon-intensity of electricity generation appreciably.

## Further Work

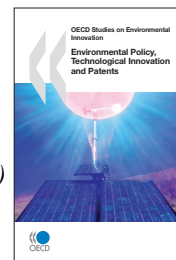
Areas to be explored in future work include analysis of:

- Policies which encourage the development of 'neglected' technologies of particular benefit to developing countries;
- Policies which encourage the development of breakthrough or radical innovations; and,
- Policies which encourage the adoption of environmentally-beneficial innovations by households.

## Publications



*The Invention and Transfer of Environmental Technologies* (OECD, forthcoming 2010)



*Environmental Policy, Technological Innovation and Patents* (OECD 2008)



*Intellectual Property Rights and Environmental Technologies*, by Keith Maskus, (OECD 2010)



*Environmental Policy Design Characteristics and Technological Innovation*, by N. Johnstone, I. Haščič, and M. Kalamova (OECD 2010)

See also: [www.oecd.org/environment/innovation](http://www.oecd.org/environment/innovation)



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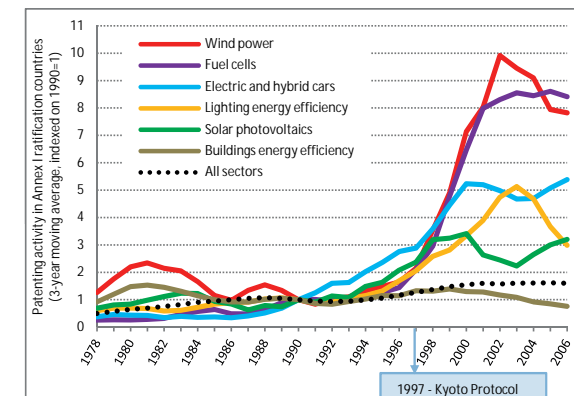
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## OECD Project on Environmental Policy and Technological Innovation

Technological change is undoubtedly one of the keys to ensuring that economic growth and environmental improvements co-exist. As such it is vitally important that environmental policies and policy instruments provide the right incentives for the development and diffusion of 'environmental' technologies.

As part of its work on decoupling environmental pressures from economic growth, the OECD's Environment Directorate has launched a project on the effects of public policy on technological innovation with the aim of improving the design, implementation and evaluation of environmental policies. Drawing upon patent data and other data sources, the links between public policy and technological change are being examined.

### Innovation in Climate Change Mitigation Technologies



OECD Environment Directorate  
[www.oecd.org/environment/innovation](http://www.oecd.org/environment/innovation)

June 2010

## Indicator of Innovation in Environmental Technologies

As a prerequisite for any such work, appropriate indicators need to be developed. This underlying **developmental work** includes: A) the elaboration of search strategies for various areas of 'environmental' technologies; and B) a methodology for the development of measures of innovation which are comparable across countries, time and technology fields.

The areas covered by the **ENV-Tech indicator** include, for example:

- *Pollution abatement and waste management*
  - \* *Air pollution control at stationary sources*
  - \* *Air pollution abatement of motor vehicles*
  - \* *Water and wastewater treatment*
  - \* *Oil spill clean-up*
  - \* *Solid waste management and material recycling*
  - \* *Land decontamination and soil remediation*
- *Climate change mitigation technologies*
  - \* *Renewable energy (wind, solar, ocean, etc.)*
  - \* *Efficiency in fossil electricity generation*
  - \* *'Clean' coal, carbon capture and storage*
  - \* *Fuel cells*
  - \* *Energy storage*
  - \* *Energy efficiency in buildings and lighting*
  - \* *Motor vehicle fuel efficiency*
  - \* *Electric and hybrid motor vehicles*
  - \* *Energy efficiency in selected industries*
- *Selected climate change adaptation technologies*
- *Other related technologies*
  - \* *Green (sustainable) chemistry*
  - \* *Water efficiency*

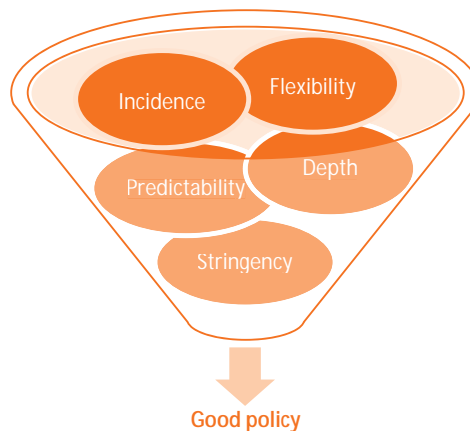
For further details on these indicators see [www.oecd.org/environment/innovation/indicator](http://www.oecd.org/environment/innovation/indicator)

## Government Policy Aimed at Encouraging Innovation

Drawing upon these indicators, economic analyses are focusing on the **effects of environmental, energy, and climate policies on technological innovation**, with the aim of providing guidance for the improvement of the design, implementation and evaluation of policies. For instance, empirical work has been undertaken on the effects of different environmental policies (standards, taxes, public R&D, etc...) on innovation in areas such as renewable energy and alternative-fuelled vehicles.

More generally, recent work has analysed the characteristics of the environmental policy framework (stringency, predictability, flexibility) that are likely to encourage innovation and technology transfer. For example, it has been found that stable and predictable policy framework alongside with flexible (technology-neutral) policy measures are more amenable to encouraging investment in the development and diffusion of environmental technologies than those policy regimes that do not have such characteristics.

### General Principles for Policy Design

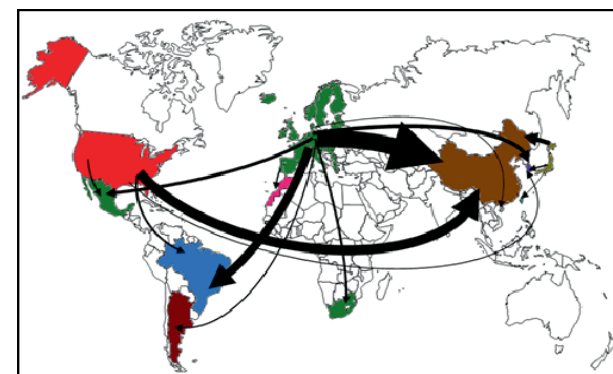


## International Transfer of Environmental Technologies

The international **diffusion of climate change mitigation technologies** (CCMTs) is an intrinsic part of addressing the problem of climate change. Dedicated work on the determinants of the international transfer of energy and climate change mitigation technologies has been undertaken, and the data indicates that there is quantitative evidence of significant CCMT equipment and knowledge flows across countries.

Our analysis suggests that the role of the Kyoto Protocol's Clean Development Mechanism (CDM) in encouraging technology transfer between Annex I and non-Annex I countries has been significant, but relatively small in relation to other factors. In particular, the role of domestic innovation capability of the host countries appears to play an impor-

### Transfer of Wind Power Technologies: 1988-2007



Further work on the role of OECD countries in supporting the development of such capability will be undertaken. This will include analysis of national policy measures as well as multilateral efforts, such as those discussed in the context of on-going climate change negotiations. The role of international research cooperation between OECD and developing countries is also being assessed.