

Climate Change Policies

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Introduction

Climate change is already being observed through rising temperatures, melting glaciers, shifting rain patterns, increased storm intensity and rising sea levels. Greenhouse gas (GHG) emissions from human activities – mainly fossil fuel use, deforestation and agriculture – cause climate change. If GHG emissions are not reduced to significantly below current levels within the next few decades, there will be further warming and sea-level rise for centuries to come. This will result in adverse impacts on human health, natural ecosystems, and the economy.

The risk of serious climate change impacts suggests that urgent action is needed to significantly reduce GHG emissions in the coming decades. There is increasing evidence that the overall benefits of strong and early action to reduce GHG emissions outweigh the costs. But we need to reduce emissions at the lowest possible cost if we are to have a realistic chance of limiting further climate change.

OECD analysis shows that large reductions in GHG emissions are achievable at relatively low costs, if the right policies are put in place. This includes strong use of market-based instruments world wide to develop a global price for GHG emissions, accompanied by better integration of climate change objectives in relevant policy areas such as energy, transport, building, agriculture or forestry, and other measures to speed technological innovation and diffusion.

Since the early 1990s, most industrialised nations and many developing countries have implemented climate change-related policies. The OECD has contributed to the debate through its analytical work on the design and implementation of effective climate change policies, as well as its peer reviews of policy performance in individual countries. This Policy Brief summarises the main messages of OECD work to date, and provides suggestions for how governments can achieve their climate change commitments in the future. ■

How to price greenhouse gas emissions?

Stabilising GHG concentrations in the atmosphere at a relatively stringent level can be achieved at costs of less than one-tenth of a percent of gross domestic product (GDP) growth per annum, or less than a 3% loss in GDP by 2030. These are the figures indicated in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report and supported by recent OECD estimates. These relatively low-cost estimates of reducing GHG emissions assume widespread use of economically efficient market-based policy instruments, such as carbon taxes and emissions trading, and broad participation in mitigation efforts across the world. The likely costs of action increase significantly, however, if countries opt for less efficient policies, such as prioritising the use of regulatory or voluntary instruments, or exempting large energy-intensive industries from tax or trade schemes.

Several policy instruments can help put a price on GHG emissions: carbon or energy taxes, the removal of environmentally harmful subsidies, tradable permit schemes and the project-based flexibility mechanisms of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC). While all OECD countries have applied one or more of these instruments to some extent, a priority is to extend their use and to link them so as to provide a strong and consistent price signal across all GHG-emitting activities. Developing a global carbon price not only reduces the total costs of reducing GHG emissions, but also helps to level the playing field between countries, thus addressing concerns about the potential effects on competitiveness of climate change policies.

All OECD countries levy energy taxes to some extent, while a few countries impose carbon taxes. Such taxes can be a particularly cost-effective approach to reducing GHG emissions. But OECD governments have often reduced their effectiveness by offering energy tax reductions or exemptions, typically for the most energy-intensive or polluting sectors where abatement costs are particularly low.

The use of emissions trading is expanding quickly, although it currently covers less than 20% of GHG emissions from the industrialised world (the “Annex I” countries in the Kyoto Protocol). Emission trading schemes are in use or under discussion in a number of countries or regions, including across the EU, in Norway, Switzerland, Japan, Australia and at the state level in the US. Increasingly, countries are looking at options for linking together the existing or proposed schemes.

Many OECD countries also participate in the two project-based market mechanisms that have been established under the Kyoto Protocol – the Clean Development Mechanism (CDM) and Joint Implementation (JI). These mechanisms allow firms in industrialised countries to earn emission credits by investing in emission reduction projects in other countries. Emission credits can usually be bought or sold in national or international carbon markets. Governments and companies have earmarked over USD 11 billion for CDM funding to 2012, and it is expected that CDM will result in a reduction in emissions equivalent to about 2 billion tons of CO₂ by 2012. JI is at an earlier stage of development, but its use is increasing.

There is also scope to reduce subsidies that may indirectly increase GHG emissions, such as those to energy or transport. Subsidies to energy producers in OECD countries are around USD 20-30 billion a year. The removal of environmentally harmful subsidies can be seen as a necessary first step towards an economically efficient and environmentally effective climate policy. However, taxation or emission trading will be necessary to effectively put a price on GHG emissions. ■

How to encourage innovative solutions?

Large reductions in GHG emissions are needed in the coming decades and throughout the century. This will require greater policy attention to accelerate the up-take of existing “green” technologies and practices, for example policies to encourage greater energy efficiency. Market-based instruments provide strong incentives for innovation, but market forces alone may not be enough; firms underinvest in research and development (R&D) if they fear they will not be able to earn a decent profit on resulting product development.

R&D programmes, regulations (e.g. building codes and regulations), and information instruments (e.g. eco-labelling of energy appliances) can complement market-based approaches. They can help to overcome some of the market and information failures that slow the development and diffusion of climate-friendly technologies. To ensure flexibility and encourage innovation, regulations should be based on achieving particular results, rather than specifying the methods or technologies to be used to achieve those outcomes. Care needs to be taken in choosing instruments in a policy mix, however, to ensure that they are complementary and avoid unnecessary overlap, and that they are cost-effective.

On the demand side, consumers or businesses may be slow to change their behaviour in response to price signals. This can be because of inadequate information on the performance of new technologies, or simply inertia. Many energy efficiency improvements, such as phasing-out incandescent lamps, are estimated to cost little or nothing to implement and to bring potentially large, near-term emission reduction benefits, but people need to be persuaded to take them up. It is estimated that current GHG emissions could be reduced by one-tenth using opportunities that cost less than they save. Well-designed regulations or information-based instruments, such as energy efficiency labels on household electrical appliances, can help to address some of the information or other barriers, as a complement to greater use of market-based incentives. ■

Box 1.

OECD ENVIRONMENTAL PERFORMANCE REVIEWS

The OECD carries out periodical peer reviews of the environmental performance of each member country. These reviews assess a country’s efforts to meet domestic objectives and international commitments and provide recommendations, including on climate change policies. All OECD countries are periodically reviewed in the OECD Environmental Performance Review process, as well as selected non-OECD countries, including Chile (2005) and China (2007).

Can climate, economic and social aims be complementary?

Climate change concerns should be integrated in all areas of public policy, particularly economic and social policies. This means addressing possible conflicts and defining trade-offs between policy objectives, as well as identifying and strengthening policies with potential “co-benefits”. The co-benefits of GHG mitigation actions can include improved energy security, urban air quality and human health benefits.

Ambitious climate change policies can be perceived as being detrimental to sectoral competitiveness. Indeed, carbon or energy taxes may affect the competitiveness of energy-intensive sectors (such as aluminium, steel, or cement) if competitors in other countries are not similarly taxed. However, they are unlikely to negatively affect the economy as a whole. With the right policies, countries can even take advantage of being a “first mover” with regard to low-carbon technologies and practices.

Nevertheless, governments often face significant opposition from affected industries to the use of measures such as environmental taxes. While such impacts are often over-stated, moving towards a low-carbon economy will necessarily entail a shift in the structure of the economy. Several policy options exist to address competitiveness concerns – such as recycling tax revenues back to the affected sectors – without reducing the policy incentives to minimise GHG emissions. They should be used sparingly, however, and for a limited time, as they can raise the costs of achieving a given level of emissions abatement. Using taxation and trading together in a complementary manner can also provide a convenient and sometimes more politically acceptable approach to cover almost all GHG emissions. Some specific sectors – such as the aluminium industry – are discussing the adoption of sector-wide GHG emissions targets, which could also help to level the playing field for the sector across countries, and allow the trading of emission credits between installations. Other international, sector-based approaches to mitigating climate change include agreements for research and development on new technologies.

Reducing carbon emissions may also affect workers in energy-intensive industries. Phasing-in the policies according to a clear timetable, and helping workers to retrain or move to other forms of employment, are examples of measures that can help to smooth the transition to a low-carbon economy. Green tax reform can be used to combine environmental objectives with economic or social benefits, for example by using the revenues from carbon or energy taxes to reduce taxes on employment. ■

What about energy, transport, agriculture and forestry?

In the energy sector, integration of climate change and energy policy objectives is particularly important as today’s investments will “lock in” the infrastructure, fuel and technologies to be used for decades to come. Similarly, the buildings and transport infrastructure put in place today will be in use for decades or centuries.

Therefore, greater attention must be paid to the energy efficiency requirements in building codes and long-term public transport planning. Major improvements in energy efficiency, as well as fuel switching to low- or

non-carbon-intensive energy sources such as renewables, carbon capture and storage, are the main technical options to reduce GHG emissions. Improving vehicle energy efficiency is also essential, and can be encouraged through pricing mechanisms such as increased taxes or charges and/or regulatory measures. In most countries, biofuels for transport are not economically competitive without substantial subsidies, and their environmental benefits are limited. Air and marine transport are largely exempted from fuel taxes, despite rapidly accelerating growth in the CO₂ emissions from these forms of transport.

Many policies with significant climate co-benefits are found in the agriculture and waste sectors. These include landfill gas recovery, animal manure management and agriculture fertiliser management. While in most cases these measures were introduced for other reasons, they have often led to significant GHG emission reductions. Policies to reduce environmentally harmful agricultural subsidies, or at least to redirect the subsidies to support environmentally friendly forms of agricultural production, can help to further reduce GHG emissions. Similarly, economic approaches in waste reduction or recovery schemes can bring multiple benefits, including lower GHG emissions.

In developing countries, large amounts of total GHG emissions come from deforestation and forest degradation. Moreover, studies suggest that reducing emissions from deforestation in developing countries is a cost-effective option relative to GHG mitigation in other sectors with multiple benefits. Policy options and positive incentives are needed to reduce emissions from deforestation, as well as to enhance the uptake of CO₂ by forests. ■

How to address climate change adaptation?

Climate change is already being observed in many parts of the world, and some further climate change is already locked-in due to past and current GHG emissions. Mainstreaming climate change adaptation into all relevant areas of public policy is a priority. It is a long-term process including awareness-raising, integration into sectoral planning and implementation of specific adaptation options. Integrating climate change risks requires more flexible, preventive and forward-looking approaches, and will involve legal, institutional and policy changes. For example, climate change adaptation could be facilitated through greater use of market-based instruments such as efficient water pricing and water markets, and risk-based insurance for properties, floods and droughts.

Box 2. THE ANNEX I EXPERT GROUP ON THE UNFCCC

The OECD and IEA support the work of the Annex I Expert Group (AIXG) on the United Nations Framework Convention Climate Change (UNFCCC). The AIXG is an *ad hoc* group of government experts from the industrialised countries that have taken on emission reduction commitments under the Kyoto Protocol. The AIXG provides a forum where Annex I countries can address key analytical issues related to the UNFCCC, and share experiences with climate change policies and approaches. Analytical work under the AIXG laid the groundwork for the inclusion of emission trading and other market instruments in the Kyoto Protocol, generating widespread support for the use of these mechanisms to keep global mitigation costs low.

In some cases, market forces are already driving adaptation. The winter tourism industry in the European Alps, for example, is moving ski resorts to higher altitudes, developing year-long activities to broaden their income base, and increasingly employing artificial snow-making in reaction to changing winter weather patterns.

Development co-operation is another policy area that is relevant for adaptation, in particular as developing countries are generally the most vulnerable to the impacts of climate change. OECD analysis indicates that a significant portion of official development assistance (ODA) is directed towards activities potentially affected by climate risks, such as water supply and sanitation, or energy and transport infrastructure, yet very little attention is paid to adaptation concerns within these investment decisions.

How to achieve global co-operation?

Strong and early international action is needed to stabilise GHG emissions at a level that would prevent dangerous interference with the climate systems by human activity. Countries are working together through the UNFCCC to develop a comprehensive framework for action post-2012. A number of countries – including the European Union, Canada and Japan – have underscored the need to at least halve global emissions by 2050.

Establishing a global price on carbon is essential for cost-effective reductions in GHG emissions. But how do we generate a common price for carbon? International co-operation is needed to establish the rules for carbon markets and the conditions to bring them into existence. This includes systems for monitoring emissions reductions, reporting and compliance. There is a need to extend and link existing international and national initiatives, such as emissions trading and carbon taxes. Other policies, including regulations and offset mechanisms, may be needed to extend GHG constraints to numerous small and diffuse emission sources, especially where market barriers limit the effectiveness of price signals.

The participation of all major emitters is needed to ensure sufficient global emissions reductions, while minimising the costs of action. The wider the coverage of abatement efforts across sectors and countries, the lower the economic costs of action. Global participation in mitigation efforts can also help to provide a level playing field, to address competitiveness concerns. Under the principle of common but differentiated responsibility, industrialised countries have the responsibility to provide leadership in addressing climate change internationally. But many opportunities for low or no-cost emissions reductions exist in non-OECD countries, for example through greater use of energy efficient building practices in new construction, or through ensuring that new coal-fired power stations are high-efficiency and designed in such a way that they can be easily retro-fitted for carbon capture and storage.

A key element of international negotiations on a post-2012 international framework will be to effectively engage all large emitting nations in the effort to significantly curb global emissions in the coming decades. But developing countries may not have the capacity to pay for large-scale GHG emissions

reductions themselves. Official development assistance plays an important role in supporting efforts by developing countries to climate-proof new investment for development, particularly in terms of leveraging private sector financing, as do the financing mechanisms under the UNFCCC. Development of a mechanism to provide financial incentives to support reduced emissions from deforestation and forest degradation will also be important, as this is a major source of emissions in many developing countries.

Further integration of cost-effective adaptation to climate change into all policy areas is a new challenge in all countries. Poorer countries and regions are also likely to need sustained financial and technical support to help increase their capacity to adapt to the level of climate change already locked-in due to past emissions. ■

For further information

For more information about the OECD's work on climate change, please contact: env.contact@oecd.org, or visit www.oecd.org/env/cc/. Free reports of the OECD/IEA Annex I Expert Group on climate change are available on line at: www.oecd.org/env/cc/aixg/.



For further reading

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Where to contact us?

OECD HEADQUARTERS

2, rue André-Pascal
75775 PARIS Cedex 16
Tel.: (33) 01 45 24 81 67
Fax: (33) 01 45 24 19 50
E-mail: sales@oecd.org
Internet: www.oecd.org

GERMANY

OECD Berlin Centre
Schumannstrasse 10
D-10117 BERLIN
Tel.: (49-30) 288 8353
Fax: (49-30) 288 83545
E-mail:
berlin.contact@oecd.org
Internet:
www.oecd.org/deutschland

JAPAN

OECD Tokyo Centre
Nippon Press Center Bldg
2-2-1 Uchisaiwaicho,
Chiyoda-ku
TOKYO 100-0011
Tel.: (81-3) 5532 0021
Fax: (81-3) 5532 0035
E-mail: center@oecdtokyo.org
Internet: www.oecdtokyo.org

MEXICO

OECD Mexico Centre
Av. Presidente Mazaryk 526
Colonia: Polanco
C.P. 11560 MEXICO, D.F.
Tel.: (00.52.55) 9138 6233
Fax: (00.52.55) 5280 0480
E-mail:
mexico.contact@oecd.org
Internet:
www.oecd.org/centrodemexico

UNITED STATES

OECD Washington Center
2001 L Street N.W., Suite 650
WASHINGTON DC. 20036-4922
Tel.: (1-202) 785 6323
Fax: (1-202) 785 0350
E-mail:
washington.contact@oecd.org
Internet: www.oecdwash.org
Toll free: (1-800) 456 6323

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