Policies to address climate change: the OECD experience and relevance for Mexico
OECD Environment Directorate

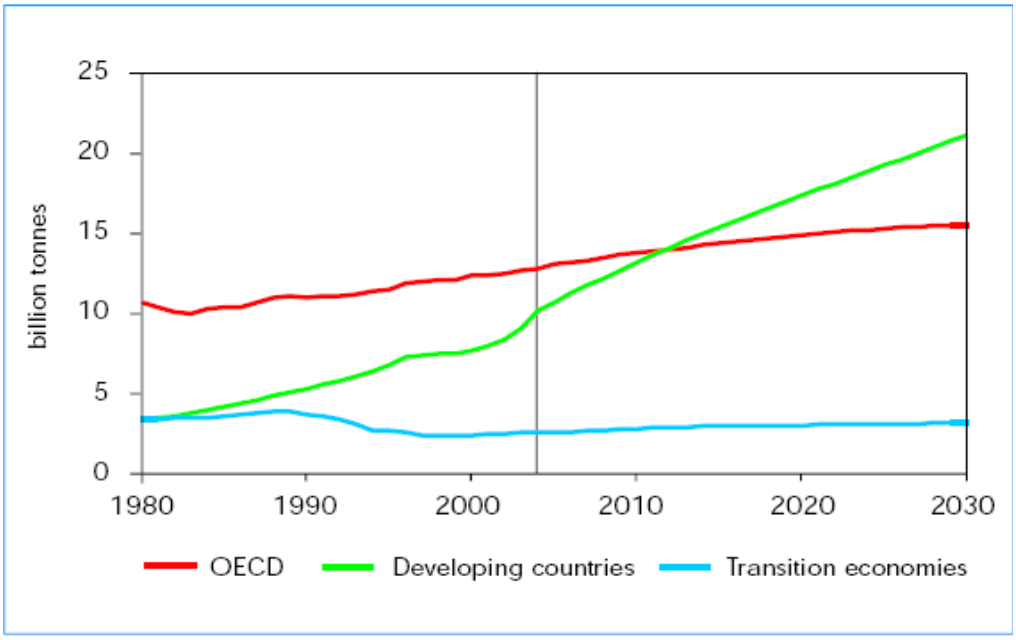
Introduction: the nature of the challenge

1. Climate change is one of the greatest challenges we face – both in terms of its potential impacts on our societies and the Earth, and in terms of the scale of the international co-ordination and co-operation needed to seriously tackle it.

2. Evidence of global climate change is mounting. Global mean temperatures have already risen by about 0.6 ^{o} C since pre-industrial times, and are currently increasing at the unprecedented rate of about 0.2^{o} Celsius per decade. Changes in precipitation patterns and sea level rise are part of a rapidly changing climate. Left unmitigated, climate change will steadily increase in magnitude.

3. The scientific community is increasingly confident that climate change stems from human activities. Simply put, human-induced climate change is caused by the expanded use of fossil fuels and by unsustainable land use patterns, such as deforestation, both driven by global economic growth and population growth. Since the 1970s, emissions of carbon dioxide (the main greenhouse gas) from fossil fuel use have grown by 60%, and they are expected to grow by a further 60% to 2030 under a business-as-usual scenario (Figure 1). As a result, the atmospheric concentration of greenhouse gases is increasing, which in turn is warming the surface of the planet by trapping solar heat in the atmosphere.

Figure 1. Historical and projected energy-related CO2 emissions by region (1980-2030)



Note: Excludes emissions from international marine bunkers.

Source: *IEA (2006), World Energy Outlook*

Should Mexico worry about climate change?

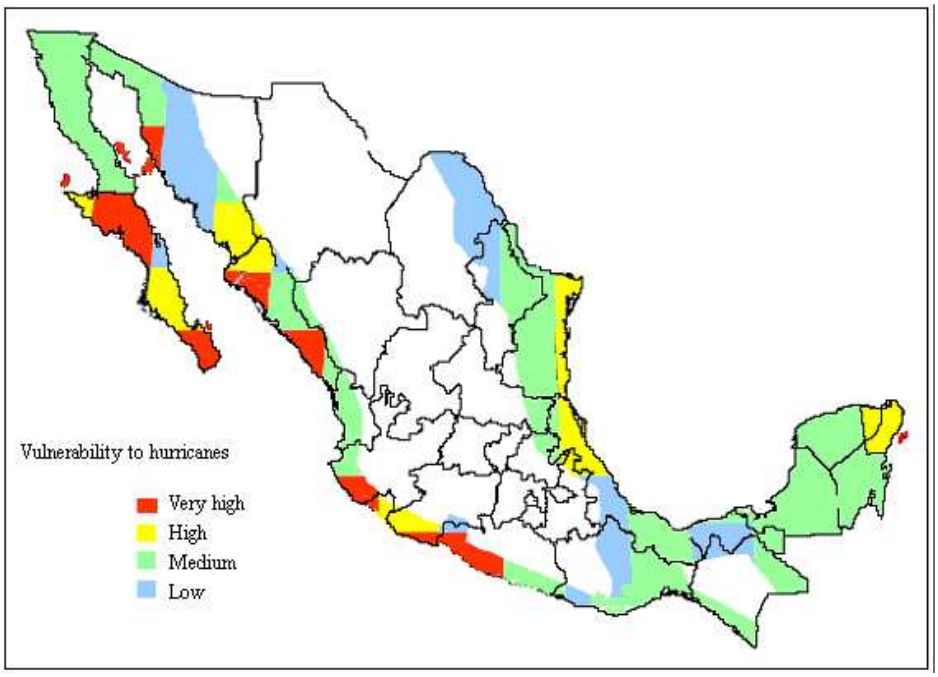
4. Mexico is particularly vulnerable to climate change due to its extremely long coastlines and the high concentration of economic activity in these areas, which includes petroleum production, fisheries and tourism. Impacts are likely to include an increase in extreme weather events including coastal flooding, hurricanes and droughts. In 2005 total damages from the strongest events equalled more than 44 billion pesos or about USD 4 billion (Table 1). In six different Mexican states 80% of their economic activities derive from coastal zones. Gulf coast fisheries are also dependent on wetland estuaries, which are threatened by sea level rise and changes in storm patterns (Figure 2).

Table 1 Damages caused by strongest hurricanes in 2005 along the Gulf of Mexico coastline

Hurricane	State	direct damages	indirect damages	Total (millions of pesos)
Emily	Tamaulipas	1491.5	38.7	1530.2
Emily	Yucatán	892.7	127.6	1020.3
Emily	Quintana Roo	431.1	679.7	1110.8
Stan	Veracruz	1505.7	1029.9	2535.6
Wilma	Quintana Roo	4506	13752	18258
Wilma	Yucatán	295.3	219.5	514.8
Gula total		9122.3	15847.4	24969.7
Country total		21463.1	22758.7	44221.8

Source: CENAPRED

Figure 2. Vulnerable regions and degrees of vulnerability in Mexico to hurricanes



***Source*:** CENAPRED, 2001. *Diagnóstico de peligros e identificación de riesgos de desastres en México. Atlas Nacional de Riesgos de la República Mexicana*

5. However the details of climate change impacts are less well known than the underlying science of the problem and there is no international consensus about what level of climate change is "tolerable." Left unmitigated, current emission trends will push atmospheric concentrations of carbon dioxide to more than double in this century, leading to 2-4.5 ^{o}C, or more, of additional warming. Warming of this magnitude and pace will significantly challenge the ability of nations to adapt naturally to climate change, no matter how rich. Of course poorer nations will suffer the worst from a rapidly changing climate. As demonstrated in the debate surrounding the Stern Report[1], the economic effects of climate change cannot be predicted with any precision. However the sheer physical scale of predicted impacts at higher levels of global warming, and their uneven distribution around the world, provides a compelling case for policy action.

Political will to address climate change

6. Political will to address climate change is growing. Over 180 nations, including all of the world's largest economies including Mexico, are Parties to the UN Framework Convention on Climate Change (UNFCCC). The Convention aims to stabilise the concentrations of greenhouse gases so as "to avoid dangerous anthropogenic interference with the climate system." All nations agree to take national policies and measures to combat climate change. The Kyoto Protocol of the UNFCCC commits industrialised countries to binding targets to cut emissions to at least 5% below 1990 levels in the period 2008-2012. 168 countries ratified the Kyoto Protocol. However, some of the world's largest emitting nations either not obliged under the Protocol to reduce emissions by 2012 (e.g. China, Brazil, India, Mexico) or have not ratified the Protocol (e.g. USA). With 1.5% of the world's share of greenhouse gas emissions, Mexico is the 9thlargest emitter[2] in the world.

7. Historical greenhouse gas emissions, which have accumulated in the atmosphere, already "lock" us into a certain amount of unavoidable climate change. Concerted action will be needed to ensure adaptation to inevitable climate change and extreme weather events. Despite the need for adaptation, mitigation of greenhouse gas emissions remains the main strategy to avoid dangerous climate change in the last half of this century and beyond.

8. Successfully slowing climate change to avoid the worst of impacts inevitably requires a major transformation of the world's energy-economy. In order to achieve a stable climate, the current trend of rapidly growing global emissions will need to be reversed sometime in this century. Such a transformation of energy and development trends requires a massive shift in investment patterns. Policies will be needed to discourage investment in carbon-intensive activities and technologies and reward investment in low or no-carbon options. That is the nature of the energy and sustainable development challenge in the 21st century.

9. A transformation of the world's energy-economy of this scale cannot occur without strong and efficient policy. Estimates of the costs of climate stabilisation vary widely, ranging from a few tenths of a percent to a few percent of the world's future GDP. The essential role of

[1] *Stern Review on the Economics of Climate Change* released by the UK government in October 2006. While its main conclusion that the benefits of taking early action to curb climate change far outweigh costs is widely accepted, the methodology used for estimating the cost and benefit figures has generated much debate.

[2] The ranking is based on counting 25 (out of 27) member states of the European Union as one country.

government in the climate challenge is to establish clear market incentives through taxes and other measures to guide investments as efficiently as possible towards sustainable, low-emitting energy and land-use technologies and practices.

10. For a given level of ambition, mitigation costs will depend to a great extent on how policy is implemented, in particular on whether investments to lower emissions are least-cost. A second important factor determining global mitigation cost is how fast innovation can lower the costs of new clean technologies. How innovation interacts with mitigation costs of different technological options is beyond the scope of this presentation, which will focuses on policy tools to address climate change and challenges in implementing them, which is a core issue for the OECD.

International co-operation to address climate change

11. A first international priority is to address the question of *who* should be responsible for reducing greenhouse gas emissions and in what time frame. Under the UNFCCC, industrialised countries have committed to take the lead to combat climate change and to assist developing countries to mitigate and adapt. However, it is clear that climate stabilisation requires mitigation effort from all of the world's largest emitting nations; this includes not only all OECD nations including Mexico but also rapidly industrialising developing countries such as China, Russia, India and Brazil. Without broad participation from these nations, it is simply not possible to curb global emissions sufficiently to stabilise growth of carbon dioxide concentrations as required to limit climate change. But developing countries raise the issue of "fairness," that they should not have to bear the full cost of mitigation. To provide incentives for developing countries, existing mechanisms to finance their mitigation efforts, such as Clean Development Mechanism (discussed below) under the Kyoto Protocol and the new Adaptation Fund under the UNFCCC, will need to be improved and expanded.

12. The Kyoto Protocol is an important first step, and additional effort is required to deliver on its commitments. But emission reductions under the Protocol are nowhere near sufficient to stabilise atmospheric concentrations, so reduction targets will need to be strengthened in the future. How to design a post-Kyoto framework (after the current commitment period to 2012) poses the greatest challenge for global mitigation. OECD analysis has shown that the costs of mitigation will be lower if more countries are involved (all large emitting countries), and more greenhouse gases (carbon dioxides, methane, nitrous oxide) and sectors (transport, electric generation, industry combustion and processes, fugitive emissions from oil industry, agriculture, waste) are covered.

13. A second policy priority for effective and efficient international action on climate change is to establish clear market signals – to put a global price on carbon. We need a common price for using the atmosphere as a waste basket for greenhouse gas emissions and that needs to be priced into all economic activities. But how do we generate a common price for carbon? Already there is an international carbon market. Although the market is not yet global, it is large and growing[3]. This reflects a number of existing market-based mechanisms; national and sub-national CO2

[3] The international carbon market is estimated to have exceeded USD 10 billion in 2005 and USD 7.5 billion in the first quarter of 2006.

emission trading schemes[4], EU Emissions Trading Scheme, and the Kyoto flexibility mechanisms which allows countries to buy additional emission credits by investing in emission reduction projects in other countries (e.g. Clean Development Mechanism-CDM). But these individual country and regional initiatives only cover a small share of global emissions, and so will not be sufficient alone to seriously address climate change. In a post-Kyoto framework, countries need to expand and improve these existing initiatives, as well as to foster greater inter-linkages amongst them. There is an urgent need to broaden participation, strengthen emission targets and extend the timeline of the existing market mechanisms beyond 2012.

14. A global price on carbon can be established also by harmonising carbon taxes across a greater number of countries. A global price for carbon would provide a clear long term signal to markets, help to level the playing field between countries, thus addressing one of the main barriers to ambitious climate change policies – the fear of a competitive disadvantage for industries competing on the international market in a carbon-constrained country versus industries in countries that do not impose similar policies.

National-level mitigation policies to keep the costs low

15. Domestically, how can countries build public support to overcome the obstacles to take actions to curb climate change? A major concern is that the costs of limiting climate change will be high, while the benefits are more difficult to monetise. But, even if the overall benefits outweigh the costs, there is still resistance to expenditures on climate action now, when most of the benefits will only accrue to future generations. So how can governments overcome this resistance? This can be accomplished by designing policy packages that achieve emission reductions at least cost.

16. Greater use of market-based instruments at the national level will be important for economic efficiency. OECD countries are already using market-based instruments to help address climate change, including the phasing-out of distorting energy subsidies, and energy or carbon taxes (Denmark, Norway, UK), and national tradable permit schemes (Norway, Sweden, UK). All OECD countries levy taxes on energy, motor fuels and vehicles – which also provide incentives to reduce greenhouse gas emissions, even if they are not specifically linked to the carbon-intensity of the activity.

17. Emission trading is an important national policy instrument that has recently been implemented or is being considered by a number of OECD countries or regions, including the EU, Norway, Japan, and sub-national entities such as states in the United States and Australia. Emissions trading schemes can be designed to cover only a few sectors of the economy or all, only CO_2 emissions or a range of greenhouse gases, and – depending on design features – they can be linked to similar schemes in other countries. In Mexico, the intra-firm emission trading scheme which has been introduced within PEMEX is a good starting point.

[4] In a CO2 emissions trading scheme, emitters are allowed to emit CO2 up to the amount of allowances they hold. Those that manage to lower emissions and thus hold excess allowances can sell to those which need additional allowances. This leaves more flexibility by allowing those who can cut emissions cheaply to do so first, while allowing those with higher emission reduction costs to buy additional allowances while taking time to make technological adjustments.

18. Project-based mechanisms and offsets also have a role to play in domestic and international emission trading systems. In particular, the Clean Development Mechanism under the Kyoto Protocol is an important tool to stimulate learning about the potential and costs of greenhouse gas reduction in many countries. Mexico has been one of the "success" stories in the CDM as it is amongst the top 5 or 6 countries hosting emission reduction projects and generating emission credits in this market. However, the scale of the emission reduction required in a post-2012 period is unlikely to be delivered efficiently through project-based mechanisms alone.

19. Combating deforestation is also important in addressing climate change, particularly in Mexico with 34 hectares of biodiverse tropical forests that sequester large amounts of carbon. However, Mexico has the one of the worlds' highest deforestation rates, and emissions from land use change contribute to a significant share of national greenhouse gas emissions. Initiatives to improve land use planning, to establish and manage protected areas, and to advance sustainable forest management activities should be strengthened. Innovative schemes such as "ecological services" payments to discourage deforestation and thus encourage water resource preservation have both mitigation and adaptation benefits.

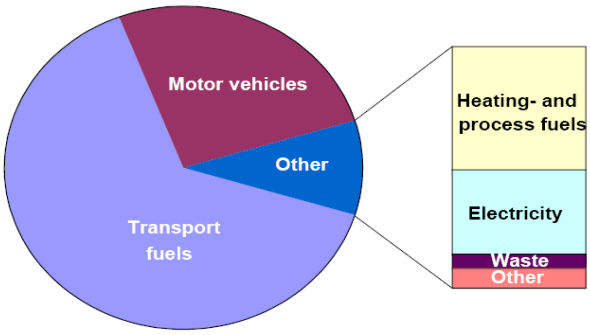
20. Regulatory standards and information tools can also play a role where market barriers prevent consumers from responding to price signals. Energy efficiency standards are already in place in many OECD countries – such as those aimed at increased energy efficiency in buildings and household appliances, fuel economy in automobiles, and reduced methane from landfills – and these deliver a range of environmental and economic benefits, including lower greenhouse gas emissions. For example, Mexico has adopted home insulation standards.

21. Efforts to increase consumer awareness about the energy efficiency and emission implications of their purchases -- for example, through eco-labelling schemes for consumer products and energy conservation education campaigns -- help to shift to more sustainable consumption patters. OECD governments have launched effective awareness campaigns in partnership with NGOs and media. Another important function of government is to support demonstration project for awareness raising about the impacts of climate change in regional contexts. This assists municipalities, business and households to adapt to climate change, and raises awareness about the problem amongst a diffuse set of decision-makers. These policies can overcome information failures, generate political will and encourage behavioral changes that support low carbon futures. Energy efficiency and savings initiatives for industries and municipalities in Mexico should be continued and expanded.

Addressing competitiveness and distributive concerns

22. Even when we know that energy or carbon taxes are the least-cost policy tool to achieve a given emission reduction target, they often face resistance from industry and consumers. They fear that such measures could negatively impact on the competitiveness of affected industries if competitors in other countries are not similarly taxed. OECD analysis finds that the most energy-intensive industries often benefit from exemptions or reduced rates for most of the energy or carbon taxes in use today, in order to limit the competitiveness effects of the taxes. The OECD-EEA database of environmental policy instruments lists over 1,150 such exemptions, and several hundred refund mechanisms or other tax provisions.

Figure 3. Share of total revenues raised from environmentally related taxes in OECD countries



Source: OECD/EU database on environmentally related taxes

23. OECD work has shown that carbon or energy taxes may indeed affect the competitiveness of energy-intensive sectors (such as aluminium, steel, cement), but they are unlikely to negatively impact on the economy as a whole. OECD countries that have introduced green taxes have not suffered economic set-back; the Norwegian and UK economies have been performing quite well. In some cases, they may lead to improved efficiency of the economy, helping steer it away from ailing and inefficient industries. However, governments often face significant opposition to such measures from the affected industries. In order to successfully implement the taxes, some governments have adopted protective policies to limit the impacts of these taxes on industrial competitiveness. If such measures are adopted, they should be implemented wherever possible in such a way as to maintain the environmental incentives of the tax itself. Options include: phasing in the taxes slowly and according to an agreed timetable, to allow industries time to adjust and to replace technologies and capital stocks; recycling the tax revenues back to the affected sectors, but without linking them to energy use or emissions; and/or agreeing the tax with other competing countries or implementing a border tax adjustment, in order to level the playing field with international competitors.

24. Similarly, a number of countries cite concerns that policies to mitigate climate change, such as the removal of subsidies to fossil fuels and the implementation of energy taxes or tradable permits, could impact on poorer populations through increased energy prices. Lower income households may experience "fuel poverty" by having to spend a disproportionately large amount of their income on energy and heating. To compensate, measures such as increased social security payments can more directly support the communities in need than across-the-board low energy prices, without providing incentives for wasteful energy use. For example the UK has proactive programmes to address fuel poverty to provide support to targeted households.

Mainstreaming climate concerns across government activities

25. Another key obstacle to climate action at the national level is the perceived conflict with other immediate political priorities. Terrorism, poverty, economic growth, unemployment, world trade, pensions and health care… all of these are priorities, and often seem more urgent than actions taken now which will affect climate change in the future. But this may be very short-sighted. Rather than viewing climate change as an issue that can be left to Environment Ministries alone or put off to a future date, political priorities need to be re-aligned in all areas of policy-

making. Understanding about climate change needs to be integrated into the sector decision-making processes of the ministries or agencies whose main objectives are to increase electricity production, build roads, maintain and build existing industries, and produce food, and sector policy objectives reconciled with the need to shift towards a less carbon-intensive economy to reduce greenhouse gas emissions. Integration is particularly needed in the transport and energy sectors, as these are the largest sources of greenhouse gas emissions. Particularly in Mexico, measures to reduce vehicle emissions in metropolitan areas (e.g. improved and expanded public transport systems) could have the double benefit of reducing pollutants that cause respiratory illnesses while cutting CO2 emissions. Plans and policies in these sectors today will "lock in" the infrastructure, fuels and technologies to be used for decades to come. Some synergies may exist and where there are conflicts between sector and climate change policy objectives, these need to be addressed directly.

26. Incorporating adaptation to climate change into coastal zone management is particularly important in Mexico. Efforts to protecting sensitive coastal areas (e.g., the Meso-American Coral Reef) and improve coastal resource management should be stepped up. Also national investment plans for infrastructure development should take into account necessary adaptation to climate change. For example, drainage infrastructure built in a coastal zone may be damaged even with a slight change in the sea level. Also, petroleum production, fishery and tourism are sectors located in coastal zones and thus are potentially vulnerable to climate change.

27. Actions to address climate change need to go hand in hand with programmes to provide basic services such as adequate water, food and shelter. Government programmes to address poverty alleviation such as investment in water supply and sanitation, or energy and transport infrastructure in underdeveloped regions are potentially affected by climate risks. The poor tend to live in ecologically sensitive or marginalised areas, and their livelihood often relies on agriculture, forestry and fisheries. So they are the most vulnerable to the effects of the changing climate. National and regional development projects need to integrate the necessary adaptation to climate change.

Further Reading

IEA (2006), *World Energy Outlook*, OECD/IEA, Paris.
IEA (2006), *Light's Labour's Lost: Policies for Energy-Efficient Lighting*, OECD/IEA, Paris.
IEA (2006), *Energy Technology Perspectives: Scenarios and Strategies to 2050*, OECD/IEA, Paris.
OECD (2004), *The Benefits of Climate Change Policies: Analytical and Framework Issues*, OECD, Paris.
OECD (2005), *Sustainable Development in OECD Countries: Getting the Policies Right*, OECD, Paris.
OECD (2005), *Bridge Over Troubled Waters: Linking Climate Change and Development*, OECD, Paris.
OECD (2006), *The Political Economy of Environmentally Related Taxes*, OECD, Paris.

For access to all OECD climate-related papers and publications, see: www.oecd.org/env/cc.
The OECD/EU database on environmentally related taxes is at: www.oecd.org/env/policies/database.
Contact on OECD work on climate change: Helen.Mountfored@oecd.org