OECD's Recent Work on CLIMATE CHANGE

OECD

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OECD's Work on Climate Change

Global climate change threatens to disrupt the well-being of society, deter economic development and alter the natural environment, making it a key policy concern of the 21st century. The long-term impacts of climate change include increased intensity and frequency of heat waves, droughts, storms and floods, which would damage the economic infrastructure, cause crop losses and present new risks to human health and life. The costs of inaction, though somewhat uncertain, are expected to be significant. A central challenge in responding to climate change is the integration of climate policy objectives into economic development strategies and sectoral policies.

The OECD is a multi-disciplinary inter-governmental organisation, tracing its roots back to the post-World War II Marshall Plan. Today, it comprises 30 member countries and the EC committed to democratic government and the market economy with the major emerging economies increasingly engaged in the work. The OECD provides a unique forum and the analytical capacity to assist governments to compare and exchange policy experiences, and to identify and promote good practices through policy decisions and recommendations.

The OECD has been working on climate change economics and policy since the late 1980s. The OECD works closely with governments to assist them to identify and implement least-cost policies to reduce greenhouse gas (GHG) emissions in order to limit climate change, as well as to integrate adaptation to climate change into all relevant policy areas. In the wake of the economic crisis, the OECD is also looking at how measures that governments are taking to spur economic growth can best be formulated so that they support – or at least do not work against– the objectives of moving towards a low-carbon economy. Given the global nature of the climate change challenge, and its widespread economic, social and environmental impacts, the OECD is in a unique position to assist countries put international climate policy on a solid economic footing consistent with frameworks for development. Work on climate change is underway across the OECD, engaging government representatives from a range of Ministries. This brochure provides an overview of the recent OECD work on climate change.

1 Economic and Policy Analysis on Climate Change

1.1 Climate Change Mitigation

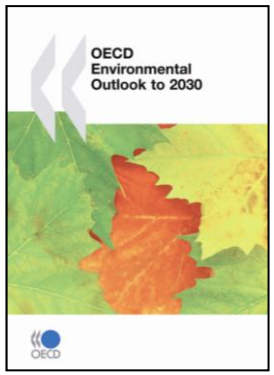
Economic and Environmental Modelling

Economic models and quantitative assessments of climate change mitigation scenarios, and how these impact on the economy, play a key role in informing policy-makers of costs, benefits and potential tradeoffs.

OECD's modelling assesses how policies can be applied to cost-effectively reduce greenhouse gas emissions in a post-2012 framework. The analysis examines the costs of different mitigation scenarios globally as well as the distribution of these costs across regions, countries and sectors. It focuses on: the pros and cons of different policy instruments (e.g. market instruments, regulatory, and research and development polices) and how they can be combined in environmentally- and cost-effective policy mixes; potential carbon leakage and competitiveness impacts of policies, and how these might be addressed; policies to incentivise technological change in the medium to long-term; the aggregate and distributional impacts of climate change and the co-benefits of climate policies in terms of reduced air pollution and improved human health; dealing with uncertainty and risk in a post-2012 policy framework. The main conclusions of this work are summarised in a booklet on "Climate Change Mitigation: What Do We Do?"

OECD's current analysis also looks at how a global carbon market can be built up gradually from existing and prospective climate policies, including through providing sufficient incentives for broad participation in climate change action. A book on *The Economics of Climate Change Mitigation*, highlighting the results of this work, will be released in September 2009 and presented at an OECD Conference on the Economics of Climate Change in Paris.

Current work partially builds on the modelling-based analysis undertaken for the *OECD Environmental Outlook to 2030* which was released in March 2008. The Outlook provides projections of the economic, social, and technological forces driving environmental change. It examines environmental outcomes in depth, including climate change, and possible policy responses.



Key links:
www.oecd.org/env/cc/econ
www.oecd.org/env/outlook

Political Economy Issues: Competitiveness and Carbon Leakage

The OECD modelling work on *The Economics of Climate Change Mitigation* (forthcoming 2009, see above), includes analysis of competitiveness and carbon leakage impacts of climate change mitigation policies, as well as some of the policy approaches that might be used to address these, such as Border Tax Adjustments or sectoral approaches.

In recent years, the International Energy Agency (IEA) work on climate policy has also addressed issues related to the competitiveness implications of unilateral emission caps, the interaction between electricity markets and CO_2 markets. "Issues Behind Competitiveness and Carbon Leakage" (Reinaud, 2008) provides a comprehensive review of studies on carbon leakage, statistical analyses of leakage in the EU for main industries, and a survey of possible response measures.

The Political Economy of Environmentally Related Taxes (OECD, 2006) addressed political economy issues related to the use of environmentally related taxes, including sectoral competitiveness and income distribution concerns in the context of climate change. A more recent study examined practical differences between taxes and tradable permits, using climate-based policies in the UK as the basis for the comparison.

The Roundtable on Sustainable Development housed at the OECD will hold a High Level Meeting in July 2009 to discuss carbon leakage and Border Tax Adjustments (see section 4.5).

Key links:
www.oecd.org/env/taxes
www.oecd.org/env/cc/econ
www.iea.org/textbase/publications/index.asp

1.2 Adaptation to Climate Change

Recent OECD work on adaptation has focused on three main streams of work: adaptation in domestic policy context; mainstreaming adaptation in development co-operation; and economic aspects of adaptation.

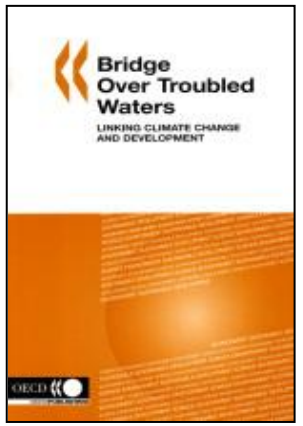
Adaptation in Domestic Policy Context

This line of work focused on two main areas: i) an assessment of broad trends in progress on assessment and implementation of adaptation to climate change in developed countries; and ii) an analysis of adaptation to climate change in the winter tourism sector and with respect to natural hazards in the European Alps, resulting in the publication of the book *Climate Change in the European Alps — Adapting winter tourism and natural hazards management*.

In addition, several reports were published on the role that national policy frameworks for various sectors play in adaptation to climate change. Case studies were carried out in Annex I countries (United Kingdom, United States, Canada and Finland) and non-Annex I countries (Mexico, Argentina, India and Zimbabwe) for the water sector and in the Gulf of Mexico for coastal zones. New work in 2009-2010 will look at adaptation in the agriculture sector (see section 2.1).

Mainstreaming Adaptation in Development Co-operation

This work focused on putting adaptation to climate change in the mainstream of development co-operation efforts represents joint work by the Environment and Development Co-operation Directorates. An early output from this work was the book *Bridge Over Troubled Waters — Linking Climate Change and Development*, based on country studies in six developing countries (Tanzania, Bangladesh, Nepal, Uruguay, Fiji and Egypt). In 2006, Development and Environment Ministers from OECD Countries endorsed a 'Declaration on Integrating Climate Change Adaptation into Development Co-operation', in which they called for "meaningful co-ordination and sharing of good practices on integrating climate change adaptation in development co-operation".

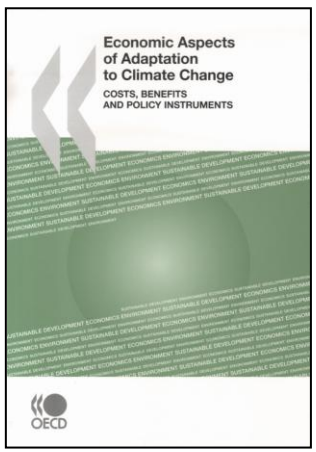


Follow-up work to this Ministerial Declaration includes a report which takes stock of the progress made on integrating adaptation into development co-operation activities, and *Policy Guidance on Integrating Adaptation into Development Co-operation* that was endorsed at the Joint High Level Meeting of the OECD Development Assistance Committee and the

Environment Policy Committee in May 2009 (see section 3.1).

Economic Aspects of Adaptation

Efforts to reduce greenhouse gas emissions need to move hand-in-hand with policies and incentives to adapt to the impacts of climate change. How much adaptation might cost, and how large its benefits might be, are issues that are increasingly relevant both for on-the-ground projects and in international contexts. Ongoing OECD work in this area focuses on a critical assessment of adaptation costs and benefits, both at sectoral level as well as in national and global contexts. Economic modelling work is also underway to better examine the synergies and trade-offs between mitigation and adaptation policies. This work is also examining the potential for economic and policy instruments to incentivise and motivate adaptation actions. Outputs of this work include the book *Economic Aspects of Adaptation to Climate Change — Costs, Benefits and Policy Instruments* (2008), and a recent report on reflecting adaptation in Integrated Assessment Models.

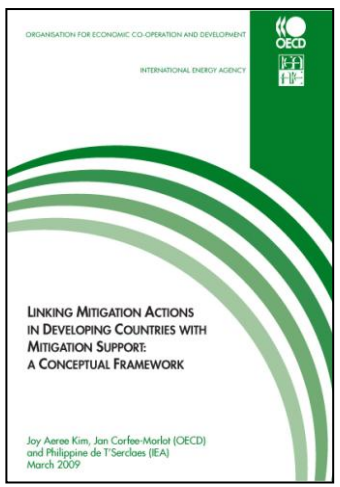


Key links:
www.oecd.org/env/cc/adaptation
www.oecd.org/env/cc/ecoadaptation
www.oecd.org/env/cc/aixg

1.3 Post-2012 Framework

Much of the OECD's work on assessing options for a post-2012 climate change framework is undertaken via the Annex I Expert Group (AIXG), run jointly by the OECD and the IEA (see section 4.3).

Analytical work from this Group has played an important role in building understanding and support for the use of market instruments (e.g. emissions trading and Clean Development Mechanism in the Kyoto Protocol) and for harmonised monitoring, reporting and compliance assessment in international climate policy responses.



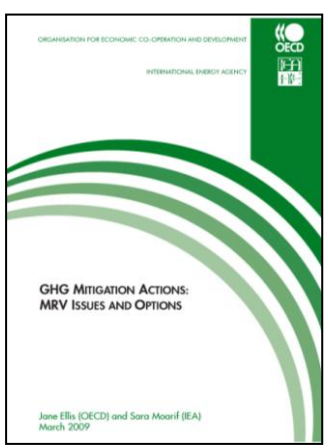
Recent work focuses on the post-2012 climate change framework. It includes a paper on "Linking Mitigation Actions with Support in Developing Countries: A Conceptual Framework", that explores a number of elements for a possible conceptual framework to "link" mitigation

actions with mitigation support, with a view to understanding the role for such a framework in a post-2012 agreement.

Other recent analyses on key parts of the Bali Action Plan include measurement, reporting, and verification (MRV) of mitigation actions; differentiation of commitments of countries; reducing emissions from deforestation and forest degradation in developing countries (REDD); sectoral approaches for mitigation; and adaptation in a post-2012 framework (see below).

Measurement, Reporting and Verification (MRV)

The Bali Action Plan introduces the phrase "measurable, reportable and verifiable" (MRV) in the context of countries' post-2012 GHG mitigation actions and/or commitments and in the context of support of such actions. A number of papers examin possible interpretations of such language, and their implications for the post-2012 framework. Recent work explores MRV options for different types of mitigation actions and highlights decision points needed to establish a post-2012 framework. Ongoing work is assessing the possible form and content of a NAMAs registry and operational models of linking mitigation actions with support.



Key links:
www.oecd.org/env/cc/mrv

Differentiation

The Bali Action Plan calls for nationally appropriate mitigation commitments or actions by developed country Parties and nationally appropriate mitigation actions by developing country Parties bearing in mind their differences in national circumstances. A recent paper "Differentiating Countries in terms of Mitigation Commitments, Actions and Support" (2008) explores approaches and possible indicators for a post-2012 differentiation framework.

Key links:
www.oecd.org/env/cc/aixg

Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD)

Emissions from deforestation and forest degradation are estimated to account for up to 17% of global GHG emissions and analysis suggests it is a low-cost mitigation option. AIXG work on REDD has examined issues including the drivers and causes of deforestation; what lessons can be learned from existing environmental policies such as the Payments for Ecosystem Services programmes in Costa Rica and Mexico for a REDD mechanism; and how to design and implement REDD financing mechanisms (whether fund or market based) to ensure environmentally — and cost-effective emission reductions.

Key links:
www.oecd.org/env/cc/redd

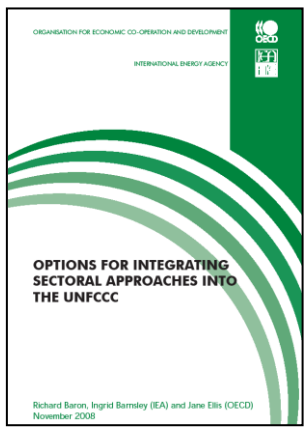
Adaptation in a Post-2012 Framework

Adaptation has been identified as one of the key building blocks of a post-2012 climate change agreement. Recent OECD work on adaptation in a post-2012 framework includes the report on 'Adaptation to climate change: international agreements for local needs'.

Key links:
www.oecd.org/env/cc/aixg/adaptation

Scaling up mitigation: Sectoral Approaches

Sectoral approaches offer the potential to scale up greenhouse gas mitigation, and so are a potentially attractive — although as yet undefined — option for future mitigation actions.



OECD/IEA have been working on sectoral approaches to GHG mitigation since 2005, under the aegis of the Annex I Expert Group. Several different papers have explored various aspects of different potential sectoral approaches in detail, for example, different ways of designing "sectoral crediting mechanisms", institutional implications of different design choices, and exploring how different sectoral approaches could be integrated into a post-2012 climate regime. Since Bali, and its report on *Sectoral Approaches to Greenhouse Gas Mitigation — Exploring Issues for*

Heavy Industry, the IEA has continued its analysis of this issue. Sectoral approaches are featured in the climate policy scenarios of the *World Energy Outlook 2008*. The IEA plans further quantification of the possible role of sectoral approaches, based in part on its detailed energy efficiency and CO_2 indicators for industry. Ongoing OECD work on economic and environmental modeling also includes analysis of the potential and scope of sectoral approaches in a post-2012 climate regime.

The Roundtable on Sustainable Development held a High Level Meeting in March 2009 to discuss sectoral approaches (see section 4.5).

Key links:
www.oecd.org/env/cc/aixg
www.oecd.org/env/cc/sectoral
www.worldenergyoutlook.org

1.4 Cost of Policy Inaction and Benefits of Action

The costs of not responding to climate change can be considerable. In 2009, a new OECD working paper – *"Assessing the Impacts of Climate Change"* – highlights that there are large uncertainties, which are not fully reflected in existing estimates of global impacts of climate change in monetary units. Nevertheless, two features of the impacts of climate change tilt the balance in favour of action: their irreversibility, and the risk that they are extreme.

This builds on a 2008 book — *Costs of Inaction on Key Environmental Challenges* — which offers a framework that interprets recent damage cost estimates. These include characterising uncertainty; thresholds and irreversibilities; the long-run nature of environmental problems; the degree of substitutability between environmental resources and other inputs into the economy; the distribution of environmental impacts, and their links to social concerns about equity; and the endogeneity of responses to changing environmental conditions (e.g. adaptation).

Other work on the benefits of climate change policies covers both the direct, indirect and co-benefits of action. One strand focuses on methods and metrics to assess the climate change impacts under scenarios of inaction and the change in impacts by sector (i.e. in agriculture and coastal zones) and across different scales (from global to local scale). This also includes a conceptual framework for the economic assessment of impacts and policy benefits at an urban scale.

Focusing on the importance of local understanding, a series of working papers assesses the economic impacts of and vulnerability to climate

change at a local scale. For example, "Ranking Port Cities with High Exposure and Vulnerability to Climate Extremes" shows that the impact of climate change could more than triple the number of people in port cities globally that are exposed to coastal flooding by 2070. Two other papers develop in-depth case studies on the port cities of Copenhagen and Mumbai, (forthcoming) estimating the economic benefits of both global mitigation and adaptation at local scales.

Finally, mitigation policies may also yield significant co-benefits, which can offset the costs of action. These include health benefits from improved air quality, and quality of life improvements from less congested and more liveable urban environments. A 2009 Working Paper — "Co-Benefits of Mitigation Policies" — provides an update of understanding of these local benefits and looks at how they may strengthen the incentives for developing countries to participate in a global climate change mitigation agreement.

Key links:
www.oecd.org/env/cc/cities
www.oecd.org/env/cc/benefits

2 Sector-Specific Analysis

2.1 Agriculture

Recent OECD work in this area includes a report published in 2008 on the *Environmental Performance of Agriculture in OECD Countries Since 1990*, which provides comparative data on agriculture's GHG emissions. A 2008 study entitled *Biofuel Support Policies: an Economic Assessment* examines inter alia the effects on GHG emissions of policies to promote biofuels. In particular it estimates the policy cost of avoiding GHG emissions, and applies a modeling approach to analyse the environmental effects of agricultural policies that lead to a shift in land use to the production of feedstocks for biofuels. The study also includes work by the IEA on life cycle analysis of feedstocks for biofuels, focusing on the GHG impacts.

The Committee for Agriculture held a Policy Forum on Agriculture and Climate Change in November 2008, which provided an opportunity for countries to share experiences on analysis underway and policy thinking in OECD countries, including on the possibilities for incorporating agriculture in carbon trading schemes. The OECD Joint Working Party on Agriculture and the Environment will focus on agriculture's role in mitigating GHG emissions and adaptation of agriculture to climate change in 2009-10. A report reviewing the latest evidence on the effects of climate change on agriculture will provide context to these projects. The aim of the mitigation study is to identify potential trade-offs and synergies between GHG mitigation and other environmental objectives, such as water and air quality and biodiversity; and to analyse alternative agricultural policy and market approaches that have the potential to be cost-effective in delivering those multiple environmental benefits. The aim of the adaptation study is to analyse the role of OECD agricultural policies in facilitating or hindering adaptation of the sector, building on modelling different policy scenarios of shifts in land use and production patterns due to climate change and alternative agricultural support measures.

2.2 Energy

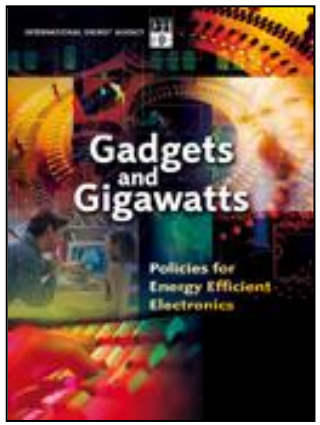
The International Energy Agency (IEA) has been providing analytical work on the energy dimension of climate change since the early 1990s, originally with a focus on the implications of the UNFCCC and its Kyoto Protocol for the energy sector. The IEA also studies options for the future evolution of the international climate change mitigation regime, including for the

OECD/IEA Annex I Expert Group on the UNFCCC (see section 4.3). The current IEA work covers areas such as emissions trading and other flexibility mechanisms, international sectoral approaches, policies and measures, and international technology collaboration.

Energy Efficiency and Security

The Agency has an extensive work on energy efficiency, a major possible contribution to greenhouse gas mitigation and to energy security objectives. At their meeting in Gleneagles (2005), the G8 leaders mandated the IEA to provide advice on a range of energy policy issues linked to climate change. In 2008, the IEA made energy efficiency recommendations over 25 areas. Its key outcomes in this area include: *Mind the Gap — Quantifying Principal-Agent Problems in Energy Efficiency* (2007), which is the first quantification of how market barriers and failures hamper rational energy use; *Promoting Energy Efficiency Investments* (2008) provides insightful case studies in the residential sector, based on IEA Member country experience. Of more direct interest to climate policy-makers, the IEA published: *Energy Security and Climate Policy — Assessing Interactions* (2007), a quantitative framework to evaluate synergies and conflicts between these two pillars of energy policy; *Climate Policy Uncertainty and Investment Risk* (2007), addresses the effect of policy design on investment choices based on risk-analysis.

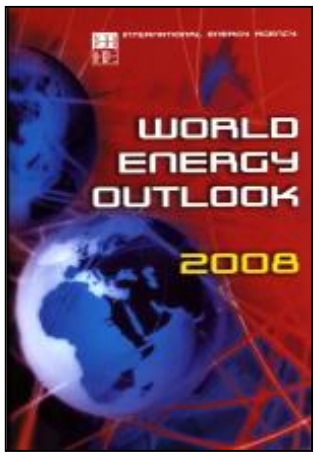
IEA's new book in 2009, *Gadgets and Gigawatts: Policies for Energy Efficient Electronics*, which includes a global assessment of the changing pattern in residential electricity consumption over the past decade and an in-depth analysis of the role played by electronic equipment. It reviews the influence that government policies have had on creating markets for more energy efficient appliances and identifies new opportunities for creating smarter, more energy efficient homes. This book is essential reading for policy makers and others interested in improving the energy efficiency of our homes.

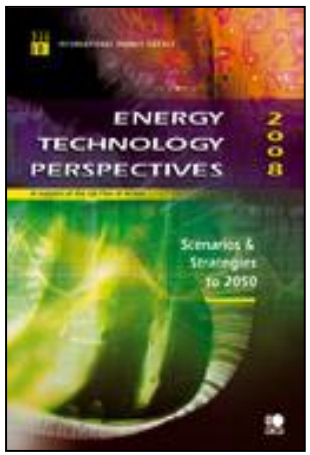


World Energy Outlook and Energy Technology Perspectives

The IEA also contributes to two major scenario exercises, the *World Energy Outlook* (WEO) and the *Energy Technology Perspectives* (ETP). WEO (2008) for the first time considers various policy scenarios to achieve climate change goal, consistent with stabilisation of CO_2 in the atmosphere at 450 and 550 ppm, with insights on a possible international framework to support action in the energy sector. ETP (2008) describes various technology development scenarios that would allow returning global CO_2 emissions to current levels, or half of these, by 2050. ETP also describes technology road maps that identify

priorities for action if ambitious emission goals are to be realised by 2050. Both ETP and WEO include estimates of capital requirements and energy/cost savings of their scenarios.

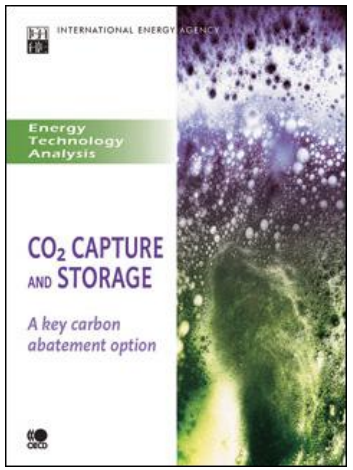




Key links:
www.worldenergyoutlook.org
www.iea.org/textbase/techno/etp/index.asp

Carbon Capture and Storage (CCS)

The IEA explores a range of technology options, including CO_2 capture and storage from energy-using installations such as power plants. *CO_2 Capture and Storage* (CCS) — *A key carbon abatement option* (2008) evaluates a range of issues related to this promising, yet-to-be-deployed technology: cost projections, transport and storage, the appropriate demonstration efforts, as well as support measures, regulatory frameworks and public awareness for broader adoption of CCS as part of an effective climate change mitigation strategy.



OECD/IEA have also assessed issues relevant to the inclusion of CCS in the Clean Development Mechanism.

Key links:
www.iea.org/textbase/publications/index.asp

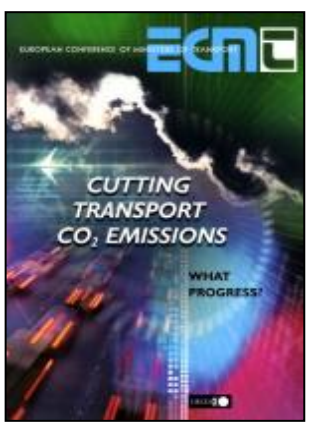
Nuclear Energy Outlook

Many governments are now giving further consideration to the use of nuclear energy, particularly because of its very low full life-cycle carbon emissions and for reasons of security of energy supply. The Nuclear Energy Agency provides factual studies to assist in these evaluations. The *Nuclear Energy*

Outlook is a major study examining all the issues affecting the future of this energy source, including its potential role in reducing greenhouse gas emissions. The book contains a wide range of data and information of use to those countries that may choose to use nuclear energy to address climate change concerns. In particular it addresses the key questions of the build rate for reactors and the availability of uranium to fuel an expanded world fleet; neither present a limitation to a very considerable expansion.

Key links:
www.nea.fr/neo

2.3 Transport



The International Transport Forum (ITF) together with the Joint Transport Research Centre (JTRC) of the OECD have recently held roundtables on GHG abatement potential and costs of biofuels, on the impact of oil prices and dependency for transport and on the cost and effectiveness of policies to reduce vehicle CO_2 emissions.

ITF's recent work focussing on policies and measures to reduce CO_2 emissions from the transport sector have resulted in the reports *Cutting Transport CO_2 Emissions: What Progress?* and *Making Cars more Fuel Efficient* (with the IEA). Other recent reports from the ITF and JTRC include *Can Cars Come Clean? Strategies for Low Emission Vehicles* and *Strategies to Reduce Greenhouse Gas Emissions from Road Transport: Analytical Methods*.

The ITF held the first full Ministerial meeting of the Forum on 28-30 May 2008 in Leipzig on the theme "Transport & Energy: The Challenge of Climate Change". In collaboration with the IEA, the ITF has looked at fuel efficiency improvements in heavy goods vehicles and held a workshop on Eco-driving. Finally, the JTRC has set up a working group on "Transport Sector GHG Reduction Strategies" that has prepared a preliminary report to the ITF Forum. The working group's final report will be released early 2009.

An OECD/ITF Global Forum in 2008 examed transport and environment integration, in the context of the global economy. Much of this meeting focused on policies and instruments for dealing with transport-based greenhouse gas emissions.

Key links:
www.oecd.org/env/transport/GFSD
www.internationaltransportforum.org

2.4 Waste

The OECD Working Group on Waste Prevention and Recycling is carrying out work in 2009-10 that will examine the potential for greenhouse gas mitigation from an integrated (life-cycle) approach to materials/waste management. Work is also being

undertaken to analyse life-cycle approaches to ICT design, production, use and disposal under the auspices of the OECD Working Party on the Information Economy.

Key links:
http://www.oecd.org/sti/ict/green-ict

2.5 Tourism

The OECD Tourism Committee is carrying out work in 2009-10 that aims to improve the integration of sustainability in national tourism policies. In particular, the Committee will review current challenges related to climate change at mature tourism destinations. The review will do a cross-country analysis of the key priority areas (e.g. air transport emissions, tourism infrastructure emissions, economic mitigation instruments, adaptation to climate mitigation policies, eco-efficiency of tourism programs, impacts on tourism mobility, data and information needs, etc.) and of the programmes and measures implemented at national level by countries to address these priorities. With this activity, the OECD Tourism Committee aims to develop a more long-term agenda for its work in this area.

Key links:
www.oecd.org/cfe/tourism

3 Cross-Cutting Issues

3.1 Development

Ongoing work in this area has focused on mainstreaming climate change considerations within development processes. A particular focus has been on integrating adaptation to climate change into development co-operation (see section 1.2). In order to further disseminate the Policy Guidance developed on this issue, the OECD will develop additional analysis and policy guidance for implementing climate change responses. This will include work on capacity to adapt to climate change, as well as sector-specific guidance, for example in the agriculture, water or energy sectors. In addition the OECD Development Assistance Committee (DAC) is undertaking work on applying the lessons learned from decades of aid financing to climate change financing.

The OECD collects data on levels of official development assistance (ODA) targeting the objectives of the UNFCCC through the so-called "Rio markers". In June 2008, after a three-year trial period, DAC members approved the inclusion of the Rio markers as permanent items of the DAC statistical reporting requirements. The Rio marker on climate change relates to climate change mitigation only, with no data currently available on ODA spending for adaptation. Possibilities for recording the latter are being examined however. The Task Team examining this issue will elaborate a working definition of what constitutes an adaptation activity, and will propose a statistical approach for tracking flows targeted towards such activities. The Task Team is furthermore preparing a report on the existing Rio marker data quality and proposals on how to improve the comparability of the data between donors.

Key links:
www.oecd.org/dac/stats/crs

3.2 Clean Innovation

Innovation in Energy Technology

The OECD Innovation Strategy focuses on innovation for global challenges, including climate change as part of its whole-of-government approach to innovation; a range of work is underway in this area under the auspices of the Committee on Scientific and Technological Policy (CSTP). *Innovation in Energy Technology* (2006) for instance examines the barriers to innovation in energy, particularly focusing on fuel cells. The OECD *Compendium of Patent Statistics 2008* includes indicators on environmental technology,

nuclear energy, wind energy, and fuel cells [see www.oecd.org/sti/ipr-statistics].

A number of OECD governments and firms are now placing a strong emphasis on eco-innovation to address priority environmental issues, including climate change, while addressing concerns about the competitive impacts of environmental policies. In conjunction with the European Commission's Environmental Technology Action Plan, the OECD is reviewing the policies and programmes that OECD countries have put in place to promote eco-innovation; country profiles will be available at the end of 2008.

On-going analytical work assesses how different policy instruments affect the incentives for firms and households to develop and adopt environment-friendly technologies (see the Policy Brief "Business, Eco-innovation and Globalisation", 2008). More work is underway, for instance on indicators for eco-innovation in such areas as climate change, based on patent counts.

Key links:
www.oecd.org/sti/ipr-statistics

Sustainable Manufacturing and Eco-Innovation towards Systemic Improvements

Under the auspices of the Committee on Industry, Innovation and Entrepreneurship (CIIE), a project on Sustainable Manufacturing and Eco-innovation was launched in 2008. A key objective of this project is to promote the concept of eco-innovation as a new vision that will enable the creation of wealth and business opportunities through stimulating new technological and systemic solutions to climate change. During the first year, the project established an analytical framework of eco-innovation and reviewed eco-innovation examples, relevant policy initiatives, sustainable manufacturing indicators and eco-innovation measurement. During 2009-10, a "sustainable manufacturing toolkit" will be developed to help businesses improve their environmental performance by providing a means for them to benchmark their products and production processes. In addition, best practice examples of eco-innovations that could lead to systemic solutions to climate change and other global challenges will be collected and analysed to draw lessons for policy makers and businesses. The initial first-year outcomes will be published in mid-2009.

Key links:
www.oecd.org/sti/innovation/sustainablemanufacturing

Economics of Eco-Innovation

Part of a 2008-10 project being carried out by the OECD Working Party on National Environmental Policies is developing indicators of innovation in several policy areas that relate to climate change. Another part of the work is examining how environmental policy design (including policy design in areas related to climate change) affects opportunities for technology transfer.

A second project is examining the effects of environmental policy design on the adoption of innovative behaviour at the level of households. Part of this project is focussing on transport and energy efficiency — both of which are directly relevant to the climate change problem.

Biotechnology

Another on-going project focuses on the use of industrial biotechnology with effects on climate change, focusing on R&D, human resource and globalisation issues in relation to bioproducts, bioprocesses, and biofuels. Further work on the role and impacts of nanotechnology in the area of water, which has links to bio-energy issues, and in the role of nanotechnology in helping address energy and climate challenges will continue in 2009-2010.

Information and Communication Technology

The Committee for Information, Computer and Communications Policy (ICCP) works to address how Information and Communication Technologies (ICTs) can improve environmental performance and mitigate climate change in all sectors of the economy. The aim is to guide policy-makers on effective strategies for ICTs, the environment and climate change.

The *Seoul Declaration for the Future of the Internet Economy* invites the OECD and relevant stakeholders to explore the role of ICTs and the Internet in improving energy efficiency and addressing climate change. The ICCP Committee and the Working Party on the Information Economy, are carrying out work to develop a framework for analysis, to survey national policies on ICTs and climate change, to reduce life-cycle environmental impacts of ICTs and to improve the availability of official statistics.

The OECD held a high-level Conference on ICTs, the Environment and Climate Change in May 2009, hosted by the Danish Ministry of Science, Technology and Innovation. The Conference highlighted the role of clean innovation and investments during the economic crisis. Conference outputs will shape further OECD work on clean innovation and will be particularly relevant in the context of the United Nations Climate Change Conference (COP15).

Key links:
www.oecd.org/FutureInternet
www.oecd.org/sti/ict/green-ict

Space Technologies

The OECD International Future Programme (IFP) has published a report in November 2008 on the contributions that space technologies can make in monitoring and managing climate change. The publication entitled *Space Technologies and Climate Change* focuses on examples in water management, marine resources and maritime transport, and provides lessons learned on scientific, technical and economic outputs derived from using space applications. It also provides a review of methodologies (see section 4.1) that could be implemented when considering investments in Earth observation. This IFP climate change activity is part of a larger project to assess the growing role and impacts of the space infrastructure (e.g. meteorology and Earth observation satellites) in OECD and non-OECD countries.

Key link:
www.oecd.org/futures/space

3.3 Taxation

Tax Treatment of Tradable Emission Permits

Tradable permits can be a powerful tool to reduce emissions where it has the lowest costs. However, businesses will make their choices based on the cost of abatement and permits net of corporate income tax and VAT. Therefore it is vital to avoid uneven tax treatment of tradable permits that would imply widely different incentives for different emitters. The risk is particularly important in an international context and when linking carbon markets in the future. The Committee of Fiscal Affairs is currently considering how to approach this area: to aim high and set international standards or at least to describe best practises. Sorting out potential problems early on is vital for easing the administrative complexities and compliance costs for businesses – thereby building a wider social support for effective action against climate change. And by taking this initiative, OECD countries can take a constructive lead in establishing international standards to the advantage of all countries.

Taxation, Innovation and Climate Change

Tradable permits, taxes and other policy instruments that put a price on carbon emissions give incentives to innovate in ways that help reduce emissions and in ways that are less burdensome for industry. A major ongoing study based in the OECD's

Joint Meeting of Tax and Environment Experts (JMTEE) is casting fresh light on what conditions bring about climate and environmental innovation. Brand new technologies are important, but so are innovations within companies adapting organisational forms and practices. A number of case studies of OECD countries are in an advanced stage, such as one on the UK climate change levy. Building on a number of interim elements, a synthesis report is to be released in early 2011.

3.4 Cities

How cities develop will affect both global emissions (and the pace of climate change) and the vulnerability of nations to unavoidable climate changes.

Work at OECD aims to make local and regional development policies more climate-sensitive given the impact of climate change and strategies for mitigation and adaptation on territorial development. Recent OECD analyses focus on assessing the economic impacts of climate change at a local scale, including a conceptual framework for local integrated assessment of impacts and policies (see also 1.4). Another strand of the work addresses green local and regional development policies with a particular focus on linkages between climate change, environmental sustainability and economic development, through renewable energy, public transportation, and climate-friendly R&D initiatives.

A forthcoming working paper on multi-level governance, climate change and cities, reviews the role that cities can play in the design and delivery of cost-effective climate policies and how central governments can assist them to fulfil their potential to become effective players.

A final report on *Competitive cities and climate change* will synthesise some of this work in end 2009.

Key links:
www.oecd.org/gov/urbandevelopment/climate change
www.oecd.org/env/cc/cities

3.5 Trade and Investment

Within the OECD's Joint Working Party on Trade and Environment, two studies are currently being conducted on trade and climate change. The first investigates trade barriers affecting diffusion of climate change technologies and potential implications of liberalising trade in these technologies. The second analyses the extent to which trade liberalisation and subsequent changes in global transportation impact on climate change.

On-going OECD work in this area also includes "The measurement of CO_2 embodiment in international trade: Evidence from the OECD Input-Output Tables for the mid-1990s - early 2000s", which examines the changes in national levels of carbon emissions that may occur as a result of globalisation. This work was presented at the UN Conference on Climate Change and Official Statistics in April 2008.

In 2009, a new strand of work is focusing on investment and climate change policy, looking at how to design and implement public policy to effectively harness private sector investment to mitigate climate change. It will review and analyse policies put in place by countries to leverage the private sector's contribution to mitigation, drawing out lessons for good practice, and identifying corporate good practices in addressing climate change.

Key links:
www.oecd.org/env/cc

3.6 Empowering Consumers

Well informed, empowered consumers are a powerful ally in the fight against climate change. They can contribute to the reduction of carbon emissions by using available energy more efficiently or moving to climate-safe technologies.

The Committee on Consumer Policy (CCP) is examining current practices in consumer protection against fraudulent and misleading environmental claims in terms of both business practices and products. This work will highlight differences and similarities across OECD countries with regard to defining sustainable products, requiring company sustainability reporting, and monitoring advertising and labelling.

The CCP is also developing a consumer policy toolkit that could be applied to reviewing the conditions under which governments may want or need to intervene in markets to promote sustainable consumption, with regard to specific aims (e.g. addressing climate change).

Based on the OECD Report on Promoting Consumer Education, the Committee is developing recommendations that include the sustainable consumption aspects, to assist policy makers in developing effective consumer education policies to promote sustainable consumption.

Key links:
www.oecd.org/sti/consumer-policy

3.7 Employment and Local Development

An ongoing study led by the Local Economic and Employment Development (LEED) Directing Committee aims at providing the support and advice that national and local stakeholders need to maintain their employment levels while expanding into greener activities. The project examines the adjustments required at the local level to ensure that labour markets comply with the demands of a greener economy, and examines the expansion of good quality green jobs as an opportunity to develop low carbon activities. It includes the identification and assessment of new green economic niches, the definition of stimulus frameworks, and the implementation of programmes to educate, train and re-skill the labour force.

4 Fora for Climate Change Discussion

4.1 Advisory Unit to the Secretary-General

The International Futures Programme under the Secretary-General has several relevant projects under way. First, it is co-ordinating a project across the OECD on "The Bioeconomy to 2030: Designing a Policy Agenda". An integral part of this exercise is a prospective analysis of biofuels and the role these might play in addressing climate change. Second, in collaboration with numerous space agencies in the OECD area, work is underway on the use of space-based tools (earth observation, navigation) in monitoring climate change and its long-term impacts, notably in the fields of water management and maritime activities. A final report was published in late November 2008 which examines "Space Technologies and Climate Change: Implications for water management, marine resources and maritime transport" (see section 3.2). Third, a two-year project on Infrastructures to 2030 has been completed which assesses *inter alia* the impact of climate change on water and water treatment requirements worldwide, as well as the level of investment needed to meet those requirements. Finally, reviews of risk management policies are under preparation which will help assess selected member countries' capacity for managing major floods, which are expected to increase as a result of climate change. The latest review includes a report on managing the risks of major flooding in Japan, and will be published early 2009.

Key links:
www.oecd.org/futures
www.oecd.org/sti/gsf

4.2 Africa Partnership Forum

The Africa Partnership Forum's (APF) mission is to strengthen partnership efforts in favour of Africa's development. Following the decision by African leaders to call on member states and Regional Economic Communities to integrate climate change considerations in their development strategies and on development partners for their support, "Climate Challenges to Africa: A Call to Action" prepared under the auspices of the APF looks at the impact of climate change in Africa focusing on three main components (adaptation and risk management, mitigation and clean energy development and finance and other cross-cutting issues) and six key areas (water; energy; agriculture, forestry and fisheries; health;

peace and stability; and financial mechanisms). It calls for urgent actions to be taken both by the wider international community and by African governments, acting both at national level and through their regional and continental institutions. Two additional reports were prepared by the APF: *Carbon Finance and Africa* which lays out the background and key recommendations and actions that can be taken by African governments to improve capacity to take advantage of the CDM; and a brief note examining various current proposals for generating additional revenue either from the current carbon finance market, or through broader charges, levies or taxes.

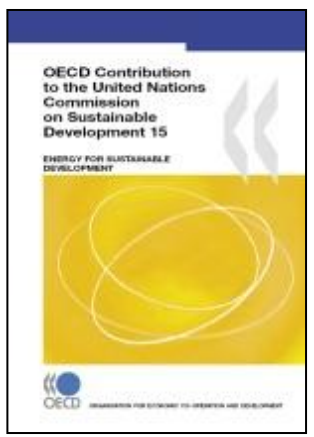
4.3 Annex I Expert Group on the UNFCCC

The OECD and the International Energy Agency (IEA) jointly provide the secretariat for the Annex I Expert Group (AIXG) on the United Nations Framework Convention on Climate Change (UNFCCC). Established in 1994, the AIXG meets twice a year to discuss analytical reports on topical issues in the climate change negotiations and provides a forum for Annex I countries to share experiences with climate change policies and views on how to address the climate change challenge. More recent work focuses on the post-2012 climate change framework and includes analyses and publications on linking mitigation actions with support; measurement, reporting, and verification (MRV) of mitigation actions; differentiation of commitments of countries; reducing emissions from deforestation and forest degradation in developing countries (REDD); sectoral approaches for mitigation; and adaptation in a post-2012 framework (see section 1.3). The AIXG also organises an annual seminar bringing together developed and developing countries to exchange information on climate change policies and issues.

Key links:
www.oecd.org/env/cc/aixg

4.4 Annual Meeting of Sustainable Development Experts (AMSDE)

The OECD Annual Meeting of Sustainable Development Experts (AMSDE) brings together delegates from across different policy areas to discuss issues of a cross-cutting nature related to sustainable development. An ongoing focus for the work of AMSDE is policies to encourage sustainable consumption and production, including with respect to reduced GHG emissions and improved energy efficiency. Two recent publications are *Promoting Sustainable Consumption: Good Practices in OECD Countries* and *Measuring Sustainable Production*. The AMSDE produces an annual report on OECD work to support discussions at



the UN Commission on Sustainable Development (UN CSD), the last biennium focused on climate change and energy issues, as contained in *OECD Contribution to the UN CSD 15: Energy for Sustainable Developmen*t, (2007).

Key links:
www.oecd.org/sustainabledevelopment

4.5 Roundtable on Sustainable Development

The OECD regularly hosts a Round Table on Sustainable Development that brings together Ministers and other high-level stakeholders from OECD and non-OECD countries for informal discussion on various topics on the climate change agenda. Since 2006, the Round Table has organised meetings on the possibilities for sectoral agreements to reduce GHG emissions, the potential of biofuels and the cost-effectiveness of policies that support them and, most recently, strategies for mobilising adequate investment in low GHG emissions energy technologies.

Over 2007-2010, the Round Table will be devoting its programme to climate-related subjects. In March 2009, a meeting was held to evaluate the practical consequences of attempting sectoral agreements in cement production and power generation. In July 2009, a meeting is planned to assess the consequences for trade and the environment of border tax adjustments designed to mitigate 'carbon leakage'. The Round Table is a unique forum that enables Ministers, senior private sector executives and experts from the inter-governmental and NGO communities to conduct a detailed examination of complex issues to one side of the crowded negotiating process. It draws on the full policy capability of the OECD and the IEA, and provides an invaluable opportunity for 'back channel' dialogue.

Key links:
www.oecd.org/sd-roundtable

4.6 Roundtable on Urban Development Strategy

The OECD Roundtable on Urban Strategy of Mayors and Ministers provides a global platform involving both high-level national and local governments to discuss urban development issues in a global perspective. The 2008 Roundtable, held in Milan, focused on climate change issues. Mayors and Ministers endorsed continued policy dialogue and action that strengthens relationships between city competitiveness and climate change and invited the OECD to continue pooling and systematising knowledge around local climate change policies and inter-governmental tools for collaboration for climate change action. Results of this work will be discussed at the 3rd meeting of the Roundtable planned in late 2009. Additionally a special session entitled "'Greening' Cities: An Option for Recovery?" was held in early 2009 as part of the OECD's Ministerial meeting on regional development.

Key links:
www.oecd.org/gov/urbandevelopment

4.7 Sahel and West Africa Club

Together with governments, regional institutions and civil society/private sector organisations, the Sahel and West Africa Club (SWAC) supports the development and implementation of action-oriented policies and investments that take into account the complementarities between local, national and regional levels. The Sahel region is the most ecologically fragile zone. The SWAC has produced a regional analysis on climate change and its impacts on West Africa. The SWAC helps raise awareness of national farmers' organisations in the region on climate change issues and develop their common positions on them.

Key links:
www.oecd.org/swac

5 Relevant Recent or Forthcoming Publications/Reports

ECMT (2007): *Cutting Transport CO_2 Emissions: What Progress?*

ECMT (2006): *Cost Effectiveness of CO_2 Mitigation in Transport: An Outlook and Comparison with Other Sectors*.

IEA (2008): CO_2 Capture and Storage — *A Key Carbon Abatement Option*.

IEA (2008): *Energy Efficiency Policy Recommendations.*

IEA (2008): *Energy Technology Perspectives 2008. Scenarios and Strategies to 2050.*

IEA (2008): *Promoting Energy Efficiency Investments — Case Studies in the Residential Sector.*

IEA (2008): *World Energy Outlook 2008.*

IEA (2007): *Climate Policy Uncertainty and Investment Risk*.

IEA (2007): *Energy Security and Climate Policy — Assessing Interactions.*

IEA (2007): *Mind the Gap – Quantifying Principal-Agent Problems in Energy Efficiency.*

IEA (2007): *Tracking Industrial Energy Efficiency and CO_2 emissions*.

OECD (2009, forthcoming) *Citizens in Focus: Public Engagement for Better Policies and Services*.

OECD (2009, forthcoming): *Globalisation, Transport and the Environment*

OECD (2009, forthcoming): *Measuring the Relationship Between ICT and the Environment.*

OECD (2009): "Mitigating the Risk of Climate Change by Reducing Travel by Light Duty Vehicles", *(www.olis.oecd.org/olis/2008doc.nsf/linkto/env-epoc-wpnep-t(2008)15-final)*

OECD (2009, forthcoming): "Mumbai, Climate Change and Future Flood Risk: Exposure, Economic Losses and Adaptation Options".

OECD (2009): *Policy Guidance on Integrating Adaptation to Climate Change into Development Co-operation*

OECD (2009, forthcoming): *Sensors, Sensor Networks and the Environment: Technologies, Applications and Impacts*.

OECD (2009 forthcoming): "Sustainable Manufacturing and Eco-innovation: Framework, measurement and industry and policy practices" (tentative title)

OECD (2009): "The economics of climate change mitigation: How to build the necessary global action in a cost-effective manner?", ECO/CPE/WP1(2009)7

OECD (2009, forthcoming): *Towards Green ICT strategies: Assessing Policies and Programmes on ICT and the Environment*.

OECD (2008): "An OECD Framework for Effective and Efficient Environmental Policies" (www.oecd.org/dataoecd/39/19/41644480.pdf)

OECD (2008): "Climate Change Mitigation: What Do We Do?"

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OECD (2008): *OECD Environmental Outlook to 2030*.

OECD (2008): *Space Technologies and Climate Change: Implications for Water Management, Marine Resources and Maritime Transport*. (www.oecd.org/futures/space)

OECD (2008): "Statement of Progress on Integrating Climate Change Adaptation into Development Co-operation". (DAC)

OECD (2007): "Business Contribution to MEAs: Suggestions for Further Action". ENV/EPOC/GSP(2007)1/FINAL

OECD (2007): *Climate Change in the European Alps: Adapting Winter Tourism and Natural Hazards Management.*

OECD (2007): *Instrument Mixes for Environmental Policy*

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