



COM/ENV/EPOC/IEA/SLT(2002)3

OECD ENVIRONMENT DIRECTORATE  
AND  
INTERNATIONAL ENERGY AGENCY

**CLIMATE RELEVANT POLICY ASSESSMENT  
RECENT WORK IN THE OECD, IEA, NEA AND ECMT**

INFORMATION PAPER



## ACKNOWLEDGEMENTS

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## 1. Introduction

This paper presents an overview of current OECD, IEA, ECMT and NEA work that may be relevant for designing, implementing and assessing domestic policies and measures for climate change mitigation (and adaptation) as well as to foster international co-operation on climate change. There are a wide variety of on-going projects that may be of interest to climate experts. Some of them focus primarily on climate change. In other cases, climate change is mentioned as one of the main concerns among other policy issues. They are undertaken by a number of OECD and IEA Directorates, including:

- OECD Environment Directorate (OECD/ENV)
- OECD Economics Department (OECD/ECO)
- OECD Directorate for Science, Technology and Industry (OECD/DSTI)
- OECD Directorate for Food, Agriculture and Fisheries (OECD/AGR)
- OECD Public Management Service (OECD/PUM)
- OECD Directorate for Financial, Fiscal and Enterprise Affairs (OECD/DAF)
- OECD Trade Directorate (OECD/ECH)
- OECD Development Co-operation Directorate (OECD/DCD)
- OECD Development Centre (OECD/DEV)
- IEA Long Term Office (IEA/LTO)
- IEA Office of Energy Efficiency, and Technology and R&D (IEA/EET)
- IEA Statistics Division (IEA/ESD)
- Nuclear Energy Agency (NEA); and
- European Conference of the Ministers of Transport (ECMT)

Different types of analyses and reports are relevant to mitigation (and adaptation) policies and international co-operation. The Environmental and Energy Outlooks, the work on Sustainable Development, scenario and modelling work, as well as peer-reviews of national policies provide comprehensive analyses of environmental challenges and policies that address them. Policy evaluations by sector (energy, construction, transport, consumption and waste, agriculture) and assessments of specific policy instruments (emissions trading, taxes and subsidies, voluntary instruments, market reform and technology policy) provide more targeted analyses. Some analytical work targets directly climate-relevant international issues or issues related to non-OECD countries. Several studies analyse specific costs and benefits of climate policies, in particular related to employment and other “ancillary” benefits or institutional issues (i.e. related to governance and information systems). Finally, databases and indicators are useful tools to monitor the implementation of specific policies and measures in OECD and non-OECD countries.

This paper briefly describes the objectives, main achievements and future work of each project activity and, in some cases, the main substantive results that are relevant to climate. It also provides some references and contact information. The paper focuses primarily on work that is underway or that was recently completed (i.e. in 2001). References to older pieces of work are only made to the extent they provide the background for current work.

Further background and most of the reports mentioned here can be found through the OECD, IEA, NEA and ECMT internet sites ([www.oecd.org](http://www.oecd.org), [www.iea.org](http://www.iea.org), [www.nea.fr](http://www.nea.fr), [www1.oecd.org/cem](http://www1.oecd.org/cem)) and/or OLISnet (for those who have access rights). Publications (cited in italics) are either available on OLISnet (in PDF format) or for sale from the OECD online bookshop.

## 2. Outlooks, Horizontal Projects and Modelling

### 2.1 Environment and Energy Outlooks

#### 2.1.1 *The OECD Environment Outlook and Strategy*

Drawing on an analysis of the economic, social and technological forces driving environmental change, the OECD Environment Outlook (2001) provides projections to 2020 of environmental pressures from key sectors (agriculture, forestry, fishery, transport, energy and selected industry sectors). It also analyses changes in the state of the environment for selected environmental issues, including climate change. The key findings of the report are summarised using “traffic lights”. Issues that need to be addressed urgently by OECD countries are grouped under the “red lights”, of which climate change is one of the main ones identified.

Based on the results of the Environment Outlook, OECD Environment Ministers adopted on 16 May 2001 the OECD Environmental Strategy for the First Decade of the 21<sup>st</sup> Century. This Strategy provides directions for environmentally sustainable policies in OECD Member countries and focuses on the issues highlighted in the “red lights” of the Outlook. For climate change, as with the other issues singled out in the Strategy, it includes commitments to national actions to be undertaken by OECD countries, as well as on future work by the OECD, which is described in the following sections of this report.

The energy and climate chapters of the Environmental Outlook were largely derived from a more detailed background paper on the topic, which addressed the trends and drivers underlying climate-related policies. This paper concluded that (in the 2020 time-frame) there is potential for significant improvement in the efficiency and environmental performance of fossil fuel combustion; and that the market shares of renewable and alternative technologies are likely to grow. However, this will require aggressive policies to accelerate the use of low emission technologies and to hasten improvements in the efficient use of fossil fuels (including wider use of GHG taxes, subsidy reform, domestic or international emission trading systems and R,D&D). It will also require a commitment to strengthen the policy infrastructure for integrating GHG considerations into sector policies, for improved monitoring, and for international co-operation. The background paper will be published later in 2002.

#### References:

*OECD Environment Outlook*, OECD, 2001

*OECD Environmental Strategy for the First Decade of the 21<sup>st</sup> Century*, 16 May 2001 [see: <http://www.oecd.org/env>]

Climate Change and Energy: Trends, Drivers, Outlook and Policy Options,  
ENV/EPOC/GSP(2001)6/FINAL

“The long term outlook for agriculture and the environment”, pp.105-118 in, *OECD Agricultural Outlook 2001-2006*, OECD, 2001.

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### **2.1.2 The World Energy Outlook**

The *World Energy Outlook* examines energy supply and demand into the future. It is based on the World Energy Model (WEM), a mathematical econometric model with four sub-models (evaluating final demand, power generation and other transformation, fossil fuel supply and emissions trading). It uses exogenous assumptions for GDP, population, international fossil fuel prices and technological developments. The Outlook presents a Reference Scenario, which incorporates new policies and measures already taken by OECD countries to meet their commitments under the Protocol. In 2000, the last year in which a full Outlook was prepared, a set of alternative cases was also developed, including for power generation, transportation and emissions trading.

In 2001, the WEO looked at issues related to the supply of energy. The study's central finding is that reserves of oil, gas, coal and uranium are more than adequate to meet projected demand growth at least until 2020. But massive investment in energy production and transportation infrastructure will be needed to exploit these reserves. Beyond 2020, new technologies such as hydrogen-based fuel cells, clean coal burning and carbon sequestration hold out the prospect of abundant and clean energy supplies in a world largely free of climate-destabilising carbon emissions.

In 2002, the IEA will revise its projections of world energy use. The 2002 WEO will project forward through 2030, and will incorporate policies and measures taken through the year 2001 (with some 2002 policies as well). Individual sectors (including industry, transport, residential/commercial, and energy production) will be modelled separately, as will in increasingly disaggregated set of countries and regions. In addition, there will be an in-depth review of issues related to energy access (a particular concern in developing countries), as well as of CO<sub>2</sub> implications for energy use. Both a reference case, and an alternative case will be developed. It is anticipated that the 2002 WEO will be published by the beginning of the fourth quarter of 2002.

#### References:

*World Energy Outlook 2000*, IEA, 2000

*World Energy Outlook: 2001 Insights -- Assessing Today's Supplies to Fuel Tomorrow's Growth*, IEA, 2001

*World Energy Outlook 2002*, IEA, forthcoming

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## **2.2 The OECD Horizontal Project on Sustainable Development**

A three year OECD horizontal programme on Sustainable Development was launched in 1998 and led to the publication of several reports (see references below), which include an in-depth analysis of policies designed to address key threats to sustainability in several areas, including climate change, as well as recommendations for national policy. The report also contains a separate chapter on energy, which includes many recommendations that relate to climate change. OECD Ministers endorsed these recommendations in May 2001 and provided a new mandate for OECD work on Sustainable Development, including work on integrating sustainable development indicators in the OECD peer reviews, on overcoming obstacles to reform and on policy integration and coherence. These specific work items are also described in relevant sections of the present report. *Working Together towards Sustainable Development: the OECD Experience* will be released in June 2002 as an input to the WSSD in Johannesburg later in the year.

In addition to contributing to the larger OECD horizontal project (particularly the development of the chapter on energy), the IEA also undertook a more focused analysis to consider the role of energy in sustainable development. This work culminated in a statement on energy and sustainable development, released at the 9<sup>th</sup> session of the Commission on Sustainable Development in the Spring of 2001, along with a fuller volume elaborating the issues (*Toward a Sustainable Energy Future*). Energy Ministers endorsed this Statement at the IEA 2001 Ministerial session. Work in 2002, following the Energy Ministers mandate, is further elaborating on the role of energy under the three pillars of sustainable development: economic, social and environmental. The IEA is preparing a set of recommendations on energy that is to be provided to the final preparatory committee meeting for the World Summit on Sustainable Development to be held in Jakarta, Indonesia in May 2002.

References:

*Working Together Towards Sustainable Development: the OECD Experience*, forthcoming, OECD 2002

*Sustainable Development: Critical Issues*, OECD, 2001

*Policies to Enhance Sustainable Development*, OECD, 2001

*Toward A Sustainable Energy Future*, IEA, 2001

*IEA Statement on Sustainable Development*, IEA, 2001 [see [www.iea.org/about/sustdev.pdf](http://www.iea.org/about/sustdev.pdf)]

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## **2.3 Modelling and Scenarios**

### **2.3.1 ACROPOLIS Project**

The ACROPOLIS project's goals are clearly expressed in its title: ACROPOLIS is the acronym for: *Assessing Climate Response Options: Policy Simulations – Insights from using national and international models*. The project was launched by the IEA in May 2001, and involves 12 of the top world research institutions in the area of energy modelling from 11 IEA Member countries. The collaboration seeks to explore the future role of new energy technologies in mitigating GHG emissions and to facilitate communication among modellers and policy makers. Its approach is to compare the results of different models, mostly characterised by a high level of energy technology detail, using consistent assumptions, and to extract from the results common messages that could be useful for policy makers. The project is now entering its second year and has already completed the simulations for the reference case and for the first policy case. Fifteen models describing country, regional or global energy systems are used to test these policies. Participating models include country models, regional models and world models. Five of them are optimising models (MARKAL) and most of the others are "bottom-up" models with considerable energy technology detail.

The project is investigating several policies that might bring about the development and penetration of sufficient low-carbon technologies to reduce GHG emissions. Current work involves four types of policies:

- Impact of imposing minimum required electricity production targets from renewables and cogeneration

- Implication of a generalised flexibility mechanism involving trading of GHG emission permits
- Energy efficiency standards for both energy end-use and power generation
- Impact of an internalisation of environmental costs in energy production and use.

References:

<http://www.ier.uni-stuttgart.de/public/abt/esa/projekte/acropolis/>

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### **2.3.2 Longer-term Energy and Environment Scenarios**

Building on work begun in 2001-2002, this project will continue a process to develop a series of longer-term energy and environment scenarios. Various futures will be envisioned (e.g., relating to climate protection, energy security and other issues) and then “story-lines” will be constructed to understand how such futures might unfold. The project aims to increase understanding of – and ultimately developing a set of policy recommendations addressing – the timeframe beyond 2020. This timeframe represents a period in which capital stock turnover in the energy sector becomes significant, technology developments could begin to have a substantial impact, and energy supply questions may be more critical, as well as marking a turning point when climate related emissions of greenhouse gases must start to decline if high concentrations of GHGs in the atmosphere are to be avoided.

The project will be undertaken initially through a series of workshops on longer-term energy and environment scenarios, and the development of short scenario reports. The project will serve primarily as a forum for discussion of scenarios on possible futures in the energy sector. In this regard, the project would differ substantially from the formal economic and econometric modelling of the World Energy Outlook (although results could also contribute to that effort). Work would be carried out with support from other parts of the IEA and OECD, as well as with international modelling groups such as the Stanford Energy Modelling Forum (EMF), the IEA Implementing Agreement on the Energy Technology Systems Analysis Programme (ETSAP), the International Institute for Applied System Analysis (IIASA), the modelling network involved in the ACROPOLIS Project and others.

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### **2.3.3 OECD Modelling Work**

The OECD Economics Department, Development Centre, and Environment Directorate have developed the GREEN and JOBS models for use in environment policy analysis and, in the past years, have completed climate policy studies, using these models. Another, recently released, study, undertaken by the Environment Directorate in 1999, looked at the efficiency of climate policies with a material systems modelling approach.

The Environment Directorate is currently undertaking a study on the relevance of New Growth (or Endogenous Growth) theories for simulation models. According to these theories, factors that are traditionally exogenous in models, like technical change, can be seen as responsive to factors in the economy. The study aims to assess the possibility of incorporating elements of endogenous growth in numerical models in use within the OECD.

References:

*Action Against Climate Change : The Kyoto Protocol and Beyond*, OECD, 1999

*OECD Environment Outlook*, OECD, 2001

Instruments and Technologies for Climate Change Policy: An Integrated Energy and Materials Systems Modelling Approach, ENV/EPOC/GEEI(99)15/FINAL, 2001

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### **3. National Policy Reviews**

#### **3.1 Environment Performance Reviews**

Since 1991, the OECD has been carrying out environmental performance reviews (EPRs) of Member countries, following the mandate given by the OECD meeting of Environment Ministers (Paris, January 1991), and confirmed by the OECD Council meeting at Ministerial level and the London G-7 economic summit (June and July 1991, respectively). The principal aim of the OECD EPRs is to help Member countries improve their individual and collective performances in environmental management. Each review examines a country's progress towards objectives established in its domestic policies or international commitments. A country's progress towards its objectives is evaluated for the entire decade preceding the review, but with a special focus on the period elapsed since the latest EPR was conducted.

The EPRs programme is one of peer review. The OECD team of experts participating in the in-country missions includes Member country experts. Subsequently, in a full-day session, the Working Party on Environmental Performance conducts an oral examination of the country, with the conclusions and recommendation of the review forming the basis for discussion. During the "first cycle of EPRs" (1992 - 99), 33 country reviews were carried out. All OECD Member countries were reviewed, as well as a few non-Member countries such as Russia. In doing so, the Secretariat drew on the OECD's considerable databases and indicator sets related to various environmental issues, including climate change (see Section 5, below). Performance with respect to climate change commitments has been addressed in all the EPRs conducted to date. In the "second cycle of EPRs," launched in 2000, the coverage of climate change has been expanded. In addition, Member country performance in implementing the OECD Environmental Strategy for the First Decade of the 21<sup>st</sup> Century (2001) is also being evaluated (see Section 2.1.).

The EPR reports typically consist of three Parts. Part I, "Environmental Management," evaluates the country's implementation of environmental policies, its management of air, water, waste, and biodiversity issues. Part II, "Sustainable Development," evaluates the integration of environmental concerns into economic decisions, explores the environment - social interface, and focuses on selected sectors. Part III, "International Commitments", evaluates the country's progress towards its international environmental

commitments, including those concerning climate change. Within Part III, climate protection policies and related performance are either assessed in the standard chapter concerning international environmental commitments and co-operation, or in a specially dedicated chapter. The EPRs also evaluate energy outlooks and national GHG emissions forecasts, as well as the cost-effectiveness of GHG measures, however these tasks would normally build on other analyses (e.g. IEA and EDRC policy reviews as well as UNFCCC in-depth reviews of national communications).

The following climate-related topics are systematically treated (in text and indicators) in the EPRs:

(a) Progress/trends in the period 1990 to 2000

- National objectives and GHG reduction targets (domestic legislation, international commitments); strength and specificity; progress towards them
- state and trends in emissions, removals of greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>)
- major emissions sources and sinks; trends and projections of their relative importance
- key trends in the energy sector (energy and carbon intensity, fuel mix, consumption, energy prices and taxation); transport sector (modal mix and energy efficiency, rate of car ownership, travel/capita), and other sectors (e.g. agriculture, forestry, industry)
- international context (progress relative to other OECD countries, cost-effectiveness)

(b) Evaluation of policies and measures

- institutional arrangements, climate change related strategies, plans and programmes
- climate protection measures (regulatory, economic, voluntary, other); their cost effectiveness; outlook on emissions and sinks (2000 to 2010)
- environment-related taxes and subsidies potentially influencing GHG emissions
- integration of climate protection priorities into sectoral policies (e.g. energy, transport, industry, agriculture, forestry)

References:

First cycle of EPRs for 33 countries (1993-2000)

Second cycle of EPRs (2001-..): Germany, Iceland, Norway and Portugal (published); Japan, Slovak Republic, Italy and United Kingdom (forthcoming).

OECD EPR 1<sup>st</sup> Cycle: Conclusions & Recommendations - 32 Countries, Paris, 2001

OECD EPR 1<sup>st</sup> Cycle: Country participation (1993-2000), Paris, 2001

*OECD Environmental Performance Reviews: Achievements in OECD Countries*, Paris, 2001

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## 3.2 EDRC Reviews

Since 1999, the OECD Secretariat has conducted Sustainable Development Reviews of several Member countries under the umbrella of the Economic and Development Review Committee (EDRC). These Reviews consist of special chapters of OECD Economic Surveys. Countries for which chapters have been published are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Norway, Poland, Sweden, and the United States. The central focus of the survey chapters is how countries succeed

in conducting cost-effective and consistent policies in the environment and natural resources areas. There is thus less focus on environment outcomes themselves (unlike the Environment Performance Reviews).

A new round of reviews is foreseen in 2002. It is to have a policy focus, aiming at identifying policy settings that will improve performance across all three dimensions of SD, i.e. economic, environmental and social aspects. EDRC reviews would therefore be confined to such policy issues that arise on the interface between the various dimensions of SD and be aimed at identifying policies of a win-win character or which will improve trade-offs between conflicting policy concerns. One of the selected issues for review is the reduction of greenhouse gas emissions.

The round of reviews starting in 2002 will use a new analytical framework as well as an agreed set of indicators (see Section 8.3) that are currently being developed by the Economics Department under the OECD Sustainable Development Programme. Pilot reviews will be carried out in Denmark and Canada.

#### References:

“Enhancing Environmentally Sustainable Growth: A Framework for EDRC Country Reviews”,  
ECO/CPE/WP1(99)8

Special chapters of OECD Economic Surveys (Belgium, Canada, Denmark, Finland, Germany, Norway, Sweden, United States, Australia, Austria, France, Ireland and Poland)

“Encouraging Environmentally Sustainable Growth: Experience in OECD Countries”, Economics  
Department Working Papers n°293, ECO/WKP(2001)19

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### **3.3 IEA Country Reviews**

The IEA, under the auspices of the Country Studies Division, has conducted reviews of the energy policies of its Member countries for more than 20 years. Under this element of the IEA programme, each IEA Member country is reviewed over a four and a half-year cycle. Annually, approximately 6 countries are reviewed “in-depth” (in 2002-3 these include Finland, Hungary, Ireland, Italy, Japan and Switzerland). An additional six or seven undergo “standard” reviews (in 2002-3 these include Australia, Belgium, Czech Republic, New Zealand, Norway, Spain and Turkey). The IEA also solicits information from Member countries via an annual questionnaire.

In 2002/2003, a significant number of elements of the questionnaire reflect on climate related policies in the energy sector. Countries are asked to provide information on (and the reviews include) not only a retrospective examination of existing programs, but are also forward-looking projections, providing a review of official forecasts of supply and demand. Reviews cover energy demand and end-use efficiency, renewable energy and non-conventional fuel use, examination of fossil fuel production and consumption (for coal, oil and natural gas), nuclear power, electricity markets, subsidy and tax policy, and R&D policies. The reviews address major energy policy developments, and general trends in energy policy (including how countries are meeting the IEA’s “shared goals” of energy security, environmental protection and economic growth. To this end, reports address issues of energy governance, including describing and discussing how governments develop regulatory, R&D, renewable, efficiency and transport policy.

Specific issues addressed in the environment chapters of each review include:

- Overall objectives and priorities, in particular, to meet the Kyoto target: (e.g. energy-related environmental policies and new energy related environmental legislation; co-ordination of environmental and energy policy including organisational and procedural arrangements that facilitate co-ordination).
- Climate change policies: (e.g., government studies, proposals and actions, including national plans and programmes including voluntary agreements, estimates of effectiveness of measures and projections of impacts on energy supply and demand and greenhouse gas emissions).
- Environmental regulations and other measures including research, policy development or analysis efforts, government objectives or targets and specific policy measures; emission inventories. Where possible, the environmental problem or pollutant at which the measure or analysis is aimed is specified (e.g. climate change, acid deposition, urban air pollution, etc., or CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, PM, HC, VOC, etc.).

In addition, the IEA undertakes energy policy reviews of key non-Member countries, like the Russian Federation, Korea, China and India. Each of these also contains discussions of energy and environment issues, including of climate change.

#### References:

2001 Overview: *Energy Policies of IEA Countries*, IEA, 2002, forthcoming

2001 Country reviews: Belgium, Spain, Czech Republic, Turkey, New Zealand, Australia

Forthcoming country reviews: USA, Denmark, Korea, Greece, United Kingdom, Germany, Austria

*Russian Energy Survey*, IEA, 2002

*Power Market Development in India*, IEA, Forthcoming

IEA-China Workshop on " Energy Efficiency Standards & Labelling ", Beijing 2001

IEA-Mexico High Level Meeting on "Renewable Energy: Best International Practices for Mexico", Cuernavaca, 2001

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## **4. Sectoral Policy Evaluations**

### **4.1 Energy Policy**

Emissions from energy and energy related activities account for approximately 85% of the OECD country greenhouse gas emissions. While energy is widely used in all sectors of economies, and countries have sector specific policies to address this, most countries are also taking actions to address emissions in energy supply. IEA efforts in this area are discussed below.

### 4.1.1 Renewables

Renewable energy technologies, with near-zero GHG emissions, can serve many purposes. Renewables can supply bulk and distributed electricity, energy services for rural development, heat, and transport fuels. Each of the main renewable energies is currently cost-effective in some specific markets, but none is yet broadly competitive. Renewable energy markets are growing rapidly in the IEA and developing countries. Successful government actions to support renewables have taken various forms, including demand stimulation through tariffs and quotas, and reduction of transaction costs through streamlined permits and environmental rules.

One key area of IEA's renewables activities is long-term research and development. Further R&D is required to advance renewable-energy technologies to the stage where they can truly become the next-generation option in the transition away from fossil fuels. Another component of work on renewable energy is analysis to assess the market scale and financial implications of recent and possible future changes in the policy supports for renewables.

Current IEA projects in the area of renewables policy have several key aims:

- Characterise the evolving policy environment.
- Evaluate the costs and benefits of renewables, and the implications of large-scale markets.
- Encourage the private sector to invest in technology and infrastructure.
- Identify barriers to renewables market growth, and develop tools for co-ordinated actions to remove them.
- Increase public awareness of renewables' benefits to society and to the consumer.

In 2002 and 2003, the IEA is planning the following renewable energy projects:

- A compilation and assessment of policy trends stimulating renewable market growth and renewable market patterns in OECD and developing countries in the context of overall national energy policies;
- A study of fuel cell markets related to renewables, including the commercialisation/market entry path of renewables-based fuel cells with an assessment of niche applications;
- An analysis of the levelised-market costs of energy from all technologies, based on taxes and fuel price risk, and technology commercialisation issues;
- A symposium and publication on Transmission Network Pricing and Organisation for Renewable and Distributed Generation Technologies in the Baltic Sea Region.
- Assistance to developing countries to strengthen renewable market strategies, including encouragement to join Implementing Agreements, facilitation of national renewables planning, and assessment of sustainability benefits. This includes a Workshop in South-East Asia on Grid Interconnection of Renewables.
- REMAC 2000 – action plans and private sector engagement (Renewable Energy Market Accelerator, REMAC 2000 is a project funded by the EC, with links to non-EU countries through IEA), including four sub-tasks: (1) Impact of Technology Developments and Cost Reductions on Market Growth; (2) Impacts of Industry Developments on Market Growth; (3) Impacts of Market Development on Market Growth; and (4) Market Acceleration Policies, Business Strategies, and Roadmap.
- The facilitation of a tradable renewable certificates (TRC) expert network, to explore the possible strategies, benefits and implications of such systems.

- A cost/benefit study of the investment needed to bring renewables into more widespread use, and the implications for fossil fuel demand, and potential reduced emissions.
- A project to provide an international overview of selected market case studies and trends in renewable energy applications for the built environment.
- A report compiling the latest information on planning barriers, highlighting how different IEA countries successfully address planning barriers through best practices.
- A study of the unintended barriers to renewable energy in international agreements.
- A project is to investigate customs classifications of renewable energy technologies, highlighting the process by which a determination could be changed.
- A project to characterise steps to strengthen regional markets for renewables, addressing enabling policy frameworks, private sector infrastructure, and financial instruments.
- An investigation of the implications for renewables caused by utility privatisation in developing countries, as well as a case study of renewables potential and barriers in Russia.

References:

*More than Power, Renewable Energy for Developing Countries*, IEA, forthcoming

*More than Power, Renewable Energy for IEA Countries*, IEA, forthcoming

Workshop on Tradable Renewable Certificate Expert Network, February 2001

*Needs for Renewables: Developing a New Generation of Sustainable Energy Technologies -- Long-Term R&D Needs*, IEA/REWP 2001; <http://www.iea.org/techno/renew/needs.pdf>

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#### **4.1.2 Nuclear**

Given the fuel prices that have prevailed in recent years, fossil-fuelled plants generally provide cheaper electricity than nuclear plants. But a sharp rise in fossil fuel prices could tip the economic balance in favour of new nuclear plants. So could new restrictions or taxes on carbon dioxide emissions or progress in reducing the capital costs of nuclear plant. The search for greater energy security could also work in favour of nuclear power.

Nuclear energy provides significant amounts of energy that would otherwise have to be purchased outside the OECD. The great environmental drawback of nuclear power use is the waste it produces. Its chief advantage is its ability to provide a clean substitute to fossil-fuelled plants that emit airborne pollutants. Despite the broad scientific consensus that geological isolation is the best way to dispose of high-level and long-life nuclear waste, progress on implementing these methods is slow. Efforts to combat climate change could alter the prospects for, and the perception of, nuclear power. A strong commitment to reduce CO<sub>2</sub> emissions could have a positive effect on the prospects for nuclear power over the coming decades.

The NEA has undertaken a study aiming at a better understanding of the relationship between nuclear energy and society in order to provide Member countries with insights on practices and policy measures that could improve public acceptance of nuclear energy.

The NEA is also pursuing work on aspects of nuclear energy and sustainable development taking into account the outcomes from the OECD Ministerial meeting of May 2001. In co-operation with other Standing Technical Committees, the NEA will investigate key issues raised by the background document *Nuclear Energy in a Sustainable Development Perspective*, including indicators and external costs. In addition, a project on external costs of electricity generation was undertaken in 2001 examining externalities and energy policy. Outcomes from the work will be used for contributions by the NEA to the international debate on climate change

References:

*Nuclear Energy in a Sustainable Development Perspective*, NEA, 2000

Contact:

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### **4.1.3 Gas**

The IEA is undertaking a project to examine upstream activities in the natural gas industry, including exploration, drilling, production and transportation with a view to evaluating how these activities contribute to greenhouse gas emissions. While beginning with a GHG life cycle evaluation, the project will focus on a more in-depth examination of those areas of the gas production cycle that contribute the most to the sector's GHG emissions. The aim would be to identify:

- emissions reduction potentials;
- technologies available to reduce emissions (from both the private sector and governments, and both at the present and over time); and
- policy options to promote the introduction of such policies into the market.

A key component of this project would be to examine the opportunities and potential for greenhouse gas emission reductions through project-based mechanisms. This would involve some research on key elements and considerations to be taken into account in the development of a reference case, or emission baseline, for emission-reducing activities in the natural gas sector.

In carrying out this project, a number of case studies would be considered. Countries examined could include the United States, Norway, Nigeria and India – although both which countries might be chosen, as well as the potential depth for the case study analysis, would depend on data availability. In addition, the examination would include discussions with the private sector, including through representatives of the International Gas Union.

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### **4.1.4 Coal**

The IEA has an active program of research in issues related to coal, including to its relationship to climate change. Work is undertaken in the Energy Diversification Division, the Technology Office, through the Coal Industry Advisory Board (CIAB), and the Clean Coal Center (an IEA Implementing Agreement). It

is recognised that coal has the highest GHG emissions per unit of output of any of the fossil fuels. However, coal also provides a significant share of the total electric power generation of the OECD Member countries – ranging up to 90% in some. In addition, coal production remains subsidised in a number of countries, including in Germany, Spain and much of Eastern Europe. Ongoing IEA studies are evaluating issues such as coal subsidies, technology options for increased efficiency, and environmental implications in the coal sector.

Analysis of potential greenhouse gas reduction in coal-fired power stations requires detailed knowledge of coal composition and energy flows to obtain accurate efficiency data for plant under representative operating conditions. This results in CO<sub>2</sub> equivalent emission factors per energy output but surrogate data from heat rates, boiler efficiency and fuel use also indicate greenhouse gas emissions reduction. Studies yielding such data are reviewed for the options of upgrading coal or using it with other energy sources, plant upgrading and optimisation, repowering and cogeneration or combined heat and power (CHP). The Clean Coal Center (an IEA Implementing Agreement), and the IEA Statistics Division are both currently undertaking such work.

Significant greenhouse gas emissions reductions may be achieved by the use of clean coal technologies which increase the net efficiency of coal-fired power stations, so that less carbon dioxide (CO<sub>2</sub>) is emitted per unit of electricity generated. The net plant efficiency of coal-fired power generation in non-OECD countries is up to 10% lower than the 36% average in the OECD and even further below the 45% efficiency being reached with new supercritical pulverised coal and combined cycle technologies. Technology transfer is therefore the key to enabling non-OECD countries to reduce greenhouse gas emissions from power generation. Research on Clean Coal Technologies is also part of the IEA work program in 2002.

References:

*Coal upgrading to reduce CO<sub>2</sub> emissions*. IEA Clean Coal Center, forthcoming, 3rd quarter 2002

*Coal with other fuels to reduce greenhouse gas emissions*, IEA Clean Coal Center, forthcoming, 2nd quarter 2002

*Coal Information*, IEA, 2001

*Potential for economic greenhouse gas reduction in coal-fired power generation*, IEA Clean Coal Center, 2001

*Efficient Coal Use, Energy Diversity, Effective Trading Mechanisms and Compliance*, IEA Coal Industry Advisory Board, 2000

*The Future Role of Coal*, IEA, 1999

*Clean coal technology transfer: CO<sub>2</sub> reduction in power generation*, IEA Clean Coal Center, 1999

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#### **4.1.5 Electricity: Market Reform and Distributed Generation**

##### Market Reform

The electricity supply industry makes a large contribution to total CO<sub>2</sub> emissions and the potential for reducing emissions from the sector is substantial. Despite this, to date GHG emissions from power generation have remained largely unregulated (unlike other pollutants such as sulphur or nitrogen oxide). At the same time, electricity markets are undergoing rapid changes driven by regulatory reform of the sector in virtually all IEA Member countries, and in some regions, also the increased opening of markets to international trade can be expected to have a significant impact on the future electricity structure. It is difficult to conclude what effects the reform of electricity markets will have on CO<sub>2</sub> emissions, as most effects are specific to each country. Ongoing IEA studies suggests that market reform is not necessarily in conflict with the goals of reducing CO<sub>2</sub> emissions or with other, sometimes more pressing, local environmental problems. Nevertheless it largely ignores these issues. The reforms may thus require some modifications in regulatory approaches to ensure compliance with environmental targets.

Current IEA research seeks to provide an overview of policy approaches which governments can undertake in order to increase the deployment of low-carbon generation technologies in deregulated electricity markets. The policies necessary to address CO<sub>2</sub> emissions raise a number of questions for regulators that are being studied in current work: how should the cost of reduction measures be passed to consumers? How should environmental constraints apply to new entrants, especially in the case of CO<sub>2</sub> trading mechanisms? Clearly, environmental policy needs to be thought through in order to best fit in the new regulatory framework of the electricity sector, and market reform must not ignore the potential implications of environmental constraints on the competition among power companies.

##### Distributed Generation

Distributed generation is often considered as holding promise for electrification at lower GHG emissions levels. A larger IEA study on distributed generation considers the GHG issues, as well as other aspects of the off-grid power systems in Member countries. The study, which will lead to a report in 2002, has three main objectives:

- To survey the current situation and market status of distributed generation in selected OECD countries, including the impact of current energy policies.
- To examine the economic, environmental and energy security implications of wider deployment of various distributed generation technologies as well as the implications for the operation of electricity transmission and distribution networks, and
- To make general recommendations on accommodating distributed generation in liberalised electricity markets.

The IEA study will provide a brief overview of distributed generation technologies. It will then evaluate the factors influencing the economics of distributed generation both as a direct competitor with centrally-generated power, and in terms of additional benefits that it can provide to the grid and the additional value it can provide to the electricity customer such as increased reliability or meeting heating and cooling needs. It uses a series of four case studies to examine the situation and key policy issues in depth (in Japan, the United States, the Netherlands and the United Kingdom). Work then analyses the policy issues arising from distributed generation, including interconnection, issues arising from market liberalisation such as access to distribution networks, pricing of grid benefits, and electricity market rules, the emissions impacts and regulations affecting different distributed generation technologies, and the possible implications of distributed generation for energy security. Distributed generation also has implications both for the

distribution network in terms of technical requirements and for the distributor as a supplier of more sophisticated power management services; this project reviews those.

References:

*Electricity Information*, IEA, 2001

*The Impact of Electricity Network Organisation, Regulation and Pricing on Renewables and Distributed Generation*, IEA Workshop, 2001

*Regulatory Institutions in Liberalised Electricity Markets*, IEA, 2001

*Competition in Electricity markets*, IEA, 2001

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## **4.2 Environmentally Sustainable Construction and Buildings**

### **4.2.1 The OECD Sustainable Buildings Project**

The OECD Sustainable Buildings Project was initiated in May 1998 as a four-year project. Its objective was to provide guidance for the design of government policies to address the environmental impacts of the building sector. Various building activities, such as the design, construction, use, refurbishment and demolition of buildings, directly and indirectly affect the environmental and GHG performance of the sector. Three activities, - which provide an instructive cross-section for policy design, were selected as priorities of the project:<sup>1</sup>

- reduction of CO<sub>2</sub> emissions;
- minimisation of construction and demolition waste (C&DW);<sup>2</sup> and
- prevention of indoor air pollution.

The four-year work programme of the project can be divided into several different parts: analysis of the significance of the environmental impact of the building sector and the current situation of policy instruments in OECD countries; examination of both the theoretical and empirical aspects of policy design for discussion. Analytical work has aimed to establish a theoretical framework on which to base the design of environmental policies; in parallel case studies of policy instruments gathered empirical evidence indicating the degree of effectiveness and efficiency of alternative instruments. Policy makers and experts gathered in June 2001 at an OECD/IEA Joint Workshop to discuss preliminary results of the project. A final synthesis report will be presented at the April 2002 meeting of the Working Party on National Environment Policies (WPNEP) and to the Spring 2002 meeting of the IEA Committee on Energy Research and Technology (CERT).

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1. Other environmental issues related to the building sector, such as water use, land use and preservation of biodiversity, have not been examined in this project, and were left for future study.

2. This project focuses on the quantitative aspect of the issue.

Key findings on CO<sub>2</sub> emission reductions are:

- While mandatory standards for building design set in building regulations are usually not economically efficient, they do appear to be the most dependable instrument for achieving a given goal of energy efficiency if they are effectively enforced. Although it is often difficult to set standards that are strict enough to have a substantial impact on a significant proportion of new buildings, there may be room for upgrading such standards and improving their effectiveness in many OECD countries.
- Capital subsidy programmes could encourage energy efficiency investment for both new and existing buildings if the proportion of free riders were sufficiently reduced. However, it is unlikely that such programmes could have a major impact on a wide range of building activities because they require tax revenue expenditures. Although the impact of energy taxes on energy efficiency investment remains uncertain, the taxes are presumed to achieve the least-cost solution and provide continuous incentives to seek more cost-effective technologies.
- Empirical evidence suggests that energy audit programmes can encourage energy efficiency investment in existing buildings. Although environmental labelling schemes could theoretically play a large role in the sectors for new and existing buildings, no clear empirical evidence was found to indicate how the schemes could actually affect building design.

References:

The following papers (currently being finalised (except (2001)6) are available on OLIS :

ENV/EPOC/WPNEP(2001)5 "Analytical Report on the Design of Sustainable Building Policies: Scope for Improvements and Barriers"

ENV/EPOC/WPNEP(2001)6 "Policy Instruments for Environmentally Sustainable Buildings"

ENV/EPOC/WPNEP(2001)32 "OECD/IEA Workshop on the Design of Sustainable Building Policies: Summary of discussion, Conclusions and Contributed Papers"

ENV/EPOC/WPNEP(2001)33 "Case Studies on Policy Instruments for Environmentally Sustainable Buildings"

The annotated outline and the first draft of the Synthesis Report are available on OLIS.

ENV/EPOC/WPNEP(2001)34 "Preliminary Outline: Synthesis Report of the Sustainable Building Project"

ENV/EPOC/WPNEP(2002)5 "Draft Synthesis Report: Sustainable Building Project"

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#### **4.2.2 The IEA Buildings Program**

The IEA, along with Ministries and agencies in IEA Member countries and the building and construction industry more broadly, has also been focusing increasingly on sustainable buildings in recent years. Reflecting this, the IEA Programme of Work for 2002 includes two items relating to the broad field of sustainable buildings. First, a project on *Policies and Measures to Reduce Energy Use and Greenhouse Gas Emissions in the Buildings Sector* is focussing on identifying best practices to encourage building energy efficiency retrofits and to bring out lessons learned from national programme evaluations. It would also analyse the interface between energy efficiency measures and technology development. Programme and policy measures to be reviewed include:

- Public purchasing power to promote energy efficient design and building products. Gathering of actors into purchasing groups, the use of networks for "green" purchasing, technology procurement to foster development etc.
- "Good practice" purchasing practices in the private sector through information and example. The development of purchasing routines and Life Cycle Costing (LCC).
- Auditing. Special emphasis on the role of energy auditing in light of the need to undertake benchmarking in different sectors.
- Development and use of labelling programmes, especially to cover dynamic aspects of technology development in order to both follow and drive technology applications.
- Updated building codes and their relation to e.g. environmental certification.
- Favourable financing of building retrofits.

Outputs from this project include:

- Publication: Overview of Policies and Measures to Reduce Energy Use and Greenhouse Gas Emissions in the Household Sector.
- Workshop: Best Practices – Building Energy Retrofit Programmes.
- Input to alternate scenario for the IEA World Energy Outlook 2002 assessment on the evolution of the energy demand in the residential and commercial sector.

Second, a project on *Building Technologies and Implementation* is to result in a review of new technologies for building systems, installations, design, planning and maintenance. This will be carried out in close co-operation with IEA Building Related Implementing Agreements (BRIAs) and would cover the use of new technologies/applications for distributed generation, for cooling and for increased use of renewable fuels.

The output from this project would be a publication entitled *New Building Sector Technologies to Reduce Cost and Energy Use*, covering both building envelopes and local generation. In co-operation with BRIAs, a survey on possible new and/or re-organised work in Implementing Agreements in order to better cover the need for enhanced deployment and to serve activities related to the issues of GHG emissions and sustainability.

In order to ensure that policy and technologies issues are not treated in isolation from each other, to take an integrated look at the issue of sustainable buildings, and finally to streamline project management, these two projects will be treated as one. The primary output will be a major publication tentatively entitled *Policies and Measures for Sustainable Buildings* (subtitle: *creating a low-impact built environment*). Other outputs from this project will include – subject to the agreement of key stakeholders – the creation of a Buildings Co-ordination Group (BCG).

#### References:

*Overview of Policies and Measures to Reduce Energy Use and Greenhouse Gas Emissions in the Household Sector*, IEA, forthcoming

*New Building Sector Technologies to Reduce Cost and Energy Use*, IEA, forthcoming

*Policies and Measures for Sustainable Buildings: creating a low-impact built environment*, IEA, forthcoming

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### 4.3 Environmentally Sustainable Transport

There are a number of projects in the area of transport that relate either directly or indirectly to the reduction of GHG emissions. They are conducted through several parts of the OECD family, including the Environment Directorate (ENV), the Directorate for Science, Technology and Industry (DSTI), the European Conference of Ministers of Transport (ECMT), and the International Energy Agency (IEA), as collaborative work between them. These projects and studies illustrate different aspects of the integration of climate objectives into transport policies.

#### a) The Environmentally Sustainable Transport Project (ENV)

“Environmentally Sustainable Transport” (EST) is a new approach to transport policy development initiated in 1994 by the EPOC Working Group on Transport. The core of the EST approach was to identify objectives and quantified environment and health criteria for EST, develop long-term scenarios for environmentally sustainable transport and identify instruments and strategies capable of achieving it. In May 2001, the Ministers endorsed the *EST Guidelines* using the findings from the EST project and adopted the Environmental Strategy for the 1<sup>st</sup> Decade of the 21<sup>st</sup> Century based on the conclusions from the global long-term environmental outlook for the transport sector. These long-term projections contained specific data on CO<sub>2</sub> emission trends from motor vehicles. Current work focuses on developing implementation strategies and best practices for EST in OECD regions, including the holding of regional workshops that address priority issues, barriers to EST and how to overcome them. Outreach activities to non-Member countries (in particular countries with economies in transition) are on-going in co-operation with UNEP in a joint initiative “EST goes EAST” where long-term projections and alternative scenarios have been developed. Current activities focus on pilot projects and best practice initiatives for the CEE region.

#### b) Implementing Sustainable Urban Travel Policies (ECMT and OECD)

In 1995, the ECMT and the OECD published a report investigating strategies for (environmentally) sustainable forms of urban travel. This ECMT/OECD project (1998-2001) revisits that earlier work and builds on it by explicitly focusing on the practical issues surrounding the implementation of these strategies. To this end, the project teams organised a series of thematic workshops, a multiple-city survey of policies and implementation issues concerning urban travel and a number of in-depth country reviews.

#### c) Sustainable Urban Transportation Project (IEA)

This project is assessing opportunities for policy intervention in the transport sector of developing countries. The motivation for this work includes the following considerations:

- The growth of transport demand in non-Member countries is expected to be significantly higher than in OECD countries.
- Most of this new transport demand is expected to be in the developing "mega-cities" of less developed countries.
- These cities are also beginning to experience severe traffic congestion, air pollution and petroleum dependence that collectively form a barrier to sustainable development. Public transportation has the potential to make a significant difference, but in many cities, substantial improvements to bus system operation and technology are required.

This project has therefore focused on reducing the growth of urban motor fuel through improved bus transit. It focuses on the opportunities for advanced bus technologies and seeks to achieve practical insights on their application in specific less-developed urban centres. There is a particular emphasis on the environment in which buses operate. The advanced bus technologies considered include fuel cell and hybrid-electric propulsion systems, compressed natural gas powered and other alternative fuels, and clean diesel technologies.

d) Decoupling economic growth and transport growth (DSTI, ECMT, ENV and IEA)

Numerous analyses have demonstrated a strong statistical correlation between economic growth and growth in demand for transport. Projects undertaken by DSTI (Road Transport Research (RTR) and Interlinkages Programme) have looked at some specific factors and developments outside the transport sector that influence transport demand, like e-commerce (in co-operation with ECMT), urban sprawl and its implications for freight logistics. More generally, the Environment Directorate has initiated a project on decoupling transport impacts from economic growth to study the key factors and driving forces that link them. There is potential for co-operation with proposed work of DSTI/RTR on driving factors for growth in transport demand. The project will also analyse policy tools and options that promote the use of more sustainable transport modes and foster their growth in the long-term.

e) Transport pricing (DSTI)

The current taxation and charging regimes in the transport sector are often not transparent for users and are generally not related to full cost recovery (including both direct and external costs). In most Member countries, congestion pricing and internalisation of other external costs are being discussed, but not yet applied in practice. This project is to examine the link between theory and practice, by building upon the experiences of Member countries in the development and implementation of pricing regimes. A workshop on this issue will be held in 2002.

f) Road transport sector strategies to reduce CO<sub>2</sub> emissions (DSTI)

The OECD Road Transport and Intermodal Linkages Research Programme established a Working Group in 2000 to undertake a comprehensive study on CO<sub>2</sub> emissions from road transport, with the aim of providing a useful framework for assessing the performance of the road transport sector in reducing emissions on a global scale. A report "Analytical Methods of Road Transport Sector Strategies (see references) was finalised in 2001 and will be published in the second quarter 2002. The Environment Directorate contributed with a global outlook of CO<sub>2</sub> emissions from motor vehicles, the dominant transport source of GHG gases.

g) Study on Policies and Measures in Transport (IEA)

With diverse technological options for automotive technology at an advanced research and development stage, market stimulation and introduction through different mechanisms is likely to become very important for the success of the different technologies over the coming decade. In 1999, the IEA launched a study that focused on transport policies and measures in three IEA Member countries (Germany, Denmark, and the US). The study considered options for cutting fuel consumption in new cars and light trucks, as well as performance criteria that could offset these fuel economy improvements. The study considered fuel-efficiency targets and regulations needed to produce efficiency improvements, as well as advanced technologies (such as hybrid electric engines) that could lead to even greater fuel economy improvements and provide dramatic reductions in tailpipe emissions in the 2010 timeframe. The study also considered the issue of cost – a limiting factor in the development of fuel cell vehicles, and in curbing oil use and greenhouse-gas emissions.

h) Policies and Measures to Reduce CO<sub>2</sub> Emissions from transport (ECMT and IEA)

For its 2003 Council of Ministers, ECMT is preparing a follow-up to its 1997 publication CO<sub>2</sub> Emissions from Transport, which is a compendium of transport-sector CO<sub>2</sub> abatement policies and measures and accompanying emissions data in 29 ECMT and OECD countries. The current work will describe and assess transport-sector CO<sub>2</sub> mitigation strategies in ECMT countries in the post-Kyoto context. It will build on the ECMT work undertaken in 1999-2000 on Quantifying CO<sub>2</sub> Abatement Policies and the joint IEA-ECMT work on Smart CO<sub>2</sub> Reductions (see below), and attempt to evaluate how transport sector policies and measures stand to contribute to overall climate change abatement objectives in the countries.

i) Transportation Energy Efficiency (ECMT/IEA)

To reduce oil use and GHG emissions in transport, ECMT and IEA is developing a new joint activity to identify and develop promising areas for near term energy savings in transport.

- Smart CO<sub>2</sub> reductions: ECMT and IEA will co-operate, together with industry representatives on the ECMT's Informal Government Industry Group to review measures taken in Member countries to promote: (a) better vehicle maintenance; (b) driver training (training and testing of skills for efficient car driving, manufacturers and distributors provision of information to drivers, training and incentive schemes for commercial drivers); (c) renewal of the vehicle park (public bus fleet renewal, renewal of passenger car fleets to achieve CO<sub>2</sub> cuts), (d) introduction of econometers and tire pressure indicators, and the use of voluntary agreements in this area; (e) enforcement of speed limits. A report on the questions raised over the fiscal/regulatory treatment of modern automatic gear-boxes could also be included. A report on these issues will be discussed at the 2003 ECMT Council of Ministers and by the IEA's Governing Board.
- Incentives for alternative fuels and vehicles: This study, also undertaken by ECMT and IEA together with industry representatives, will review fiscal and other measures to promote alternative fuels and vehicles in Member countries. It will discuss means to improve co-ordination of the measures implemented to achieve optimal results for Government and manufacturing industry. A report will also be prepared for discussion at the 2003 ECMT Council of Ministers and by the IEA's Governing Board.
- Voluntary agreements: possible work would raise the profile of Vas or develop additional elements to the IEA's Joint Declaration with Industry.
- Freight Transport Efficiency: possible work would provide a follow up to the joint IEA/ECMT workshop (see references).
- Improving the design of support for R&D related to more efficient vehicles and alternative fuels.

j) Alternative Fuels Assessment (IEA)

The transport sector is almost entirely dependent on petroleum and transport accounts for about 54% of oil demand in OECD countries. Reducing this dependence could be an important strategy to improve Member country energy security. In addition, certain alternative fuels offer significant potential to reduce carbon emissions while maintaining vehicle mobility. IEA Implementing Agreements have been active in promoting technologies and programmes to advance the use of alternative transportation fuels and, in 1999, the IEA published *Alternative Fuels for the Future: The Search for Alternatives* based on their work.

The IEA is currently undertaking additional analytic work to help Member countries develop effective alternative fuel policies and programmes. One important area concerns life cycle emissions. Data on life-cycle emissions will be expanded to include a broad range of fuels and regional variations that affect life cycle emissions. Since policy makers are often confronted with conflicting information, sometimes from sources associated with different fuel interests, this has been selected as a high priority area.

Biofuels availability is a second high priority area. Regional variation is a particularly important dimension. Many Member countries have identified the use of bio fuels as an important option to both reducing energy dependence and greenhouse gas emissions but there are considerable uncertainties as to the size and cost of the resource base.

Lastly, a technology database on conversion technologies will be developed. The potential progress resulting from expanded R&D and the technology learning from process deployment will be evaluated in close collaboration with IEA Implementing Agreements. This is a particularly important area for expanded international collaboration.

k) Motor Vehicle Emissions

- Regular Monitoring of CO<sub>2</sub> emissions from passenger cars: ECMT will present a report to Ministers in 2003 under their Joint Declaration with Industry with updated data and analysis of trends in specific CO<sub>2</sub> emissions from new passenger cars. The data will be extended to cover more countries in central and Eastern Europe if possible and in a way that preserves the consistency of the core series of data.
- Low emission vehicles - implementation issues: this 2001-2002 project, developed by DSTI, complements the ECMT project mentioned above and aims at developing strategies to facilitate the implementation of low-emission vehicles, including their global performance in terms of safety and environment.
- Global motor vehicle emissions (MOVE II): this study, proposed by the Environment Directorate for 2002, is an update and extension of previous work done within the Directorate's Environmental Outlook project (published by OECD in 2001) and will project global motor vehicle emissions, including costs and benefits of advanced emission controls, with a possible extension to assess life-cycle impacts of different modes such as aviation and freight.

References:

Project brochures, technical reports, workshop reports and experts papers for the EST project are available on the OECD website (<http://www.oecd.org/env/ccst/est>)

Environmentally Sustainable Transport in the CEI countries in transition, final report, ENV/EPOC/WPNEP/T(2002)1/Final

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*Alternative Fuels for the Future: The Search for Alternatives*, IEA, 1999

*Regulatory Reform in Road Freight Transport: Proceedings of the International Seminar, February 2001*, ECMT, 2002

*Intermodal Freight Transport : Institutional Aspects*, OECD, 2001

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## **4.4 Sustainable Consumption and Waste**

The OECD and IEA Programme of Work in this area includes many different projects that may be relevant to the work on climate, since increased resource efficiency and waste minimisation can have a substantial impact on GHG emissions.

### **4.4.1 Sustainable Consumption**

#### Greener Public Purchasing

Government consumption of products and services in OECD Member countries is estimated to be responsible for 9 to 25% of GDP. Given the importance of public purchasing, national and local authorities have been paying increasing attention to the opportunities to improve the environment by selecting environmentally sounder products. OECD's activities in this area date from 1996 and show how greener public purchasing can support a number of other crucial policy objectives such as the reduction of government operating costs, the improvement of governance, and the reduction of greenhouse gases. Recent work focuses on financial, accounting and budget issues related to Greener Public Purchasing, with a workshop organised in Austria in November 2001. Several background papers are available and a synthesis report will be prepared in early 2002.

At a more political level, a recommendation by the OECD Council of 23 January 2002 cites concrete steps that governments should take to "Improve the Environmental Performance of Public Procurement". OECD Environmental Performance Reviews (see Section 3.1), undertaken periodically in OECD Member countries, will assess the implementation of these steps.

#### Sustainable Household Consumption

The OECD Programme of Work on Sustainable Consumption includes different sectoral and policy case studies on the environmental impacts of household consumption. Some of these impacts are directly or indirectly related to climate change, especially in the areas of household tourism-travel patterns, food consumption, energy use and waste generation. The Programme on Sustainable Consumption has identified a combination of policy tools that can help to reduce household environmental impacts such as: economic instruments (taxes on energy fuels and electricity, fees on household waste generation),

economic incentives and regulations to promote eco-design and to improve material and energy efficiency; eco-labelling and environmental standards (e.g. on energy efficiency), policies for waste prevention and minimisation, provision of infrastructure (e.g. public transport and recycling facilities) and information and environmental education, among others.

A main report, finalised in late 2001, summarises the work undertaken in 1999-2001. In addition, several case studies were completed in 2001 on household energy and water consumption and household waste generation; on information and participatory decision-making for promoting sustainable household consumption; and on regulatory, economic and social instruments to help households reduce the environmental impacts. Work in 2002 includes two new projects related to “Sustainable Consumption Indicators” (see Section 8.3) and “Environmental Policy Design for Consumer Durables”. As regards the latter project, a report is being prepared on the relative effectiveness of policies that target consumer durables. Two issues are discussed: the links between policy incidence and the internalisation of externalities; and the effect of these policies on innovation. Possible case studies on some specific products will also be prepared.

References:

*Improving the Environmental Characteristics of Public Procurement: Issues of Policy Coherence*, OECD, 2002 (forthcoming)

Recommendation of the Council on Improving the Environmental Characteristics of Public Procurement (C(2002)3).

Synthesis Report of the 1999-2000 Programme on Sustainable Consumption “Towards Sustainable Household Consumption? Trends and Policies in OECD Countries” (Forthcoming)

OECD (2002) Household Food Consumption: Trends, Environmental Impacts and Policy Responses [ENV/EPOC/WPNEP(2001)13/FINAL]

OECD (2002) Household Tourism Travel: Trends, Environmental Impacts and Policy Responses [ENV/EPOC/WPNEP(2001)14]

Household Energy and Water Consumption and Waste Generation: Trends, Environmental Impacts and Policy Responses. [ENV/EPOC/WPNEP(2001)15]

Information and Consumer Decision-Making for Sustainable Consumption [ENV/EPOC/WPNEP(2001)16]

Policies to Promote Sustainable Consumption: An Overview [ENV/EPOC/WPNEP(2001)18]

Environmental Policy Design for Consumer Durables (ENV/EPOC/WPNEP(2002)7)

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#### **4.4.2 Household Appliances: Standby Power, Energy Labels and Standards**

The residential sector accounted for 31% of electricity use and 36% of natural gas use in OECD countries in 1998, and is the second fastest growing sector of energy use after private transport. When the relevant energy conversion losses as well as other fuels are included, the residential sector accounted for 27% of the

OECD's primary energy use and 21% of its energy-related CO<sub>2</sub> emissions. A number of IEA studies consider end-uses of electricity in this sector.

A study on standby power – sometimes referred to as "leaking electricity" – was completed in 2001 (*Things that go Blip in the Night: Standby Power and How to Limit It*). Standby power represents a significant and growing share of electricity demand. Up to 10% of residential electricity use occurs while electric equipment is OFF or in standby mode. Standby power in the residential and commercial sector is responsible for as much as 1% of the OECD's CO<sub>2</sub> emissions. Large reductions in standby power consumption are technically feasible, are cost effective and can be achieved without sacrificing any of the features or amenities expected by consumers. Since the market for most products with standby power losses is international, there is a need for internationally co-ordinated action.

In 2000, the IEA completed a study on energy labelling and standards in home appliances and office equipment (*Energy Labels and Standards*). The study noted that governments have used carefully targeted labels and standards programmes to slow the growth of electricity and gas use and CO<sub>2</sub> emissions from residential and office products. Energy labels are in force in 37 countries; standards in 34 countries. The impact of labels and standards is increasing as countries expand and strengthen their programmes. Meanwhile, developing countries and countries with economies in transition are initiating new programmes. Details differ considerably from country to country because of market conditions, jurisdictional issues and policy preferences.

Future IEA work is to focus on assessing the benefits, costs, strategies and elements of success of policies aimed at improving appliance energy efficiency. It will:

- analyse the potential GHG reduction from appliance energy efficiency programmes in the building sector in IEA Member countries,
- identify lessons learned from Member country programmes to promote appliance energy efficiency, and
- identify promising areas in which energy efficiency measures on appliances could be expanded.

The new work will complement that published in the 2000 IEA book, *Energy Labels and Standards*, by:

- emphasising the quantitative aspects of energy savings and CO<sub>2</sub> emissions reduction potential,
- examining a wider scope of appliance efficiency policies, beyond labels and standards,
- updating sections on new, innovative policies, i.e., Japan Top-Runner and Australia World Standard, and
- expand on lessons learned.

New work will also extend analysis into new domains. In particular, there is a growing recognition that the consumption of power by devices linked to the ever-growing 'information economy' – in both active and standby modes – may represent a major new and price-insensitive energy end-use. While the utility and productivity delivered by these information and communication technologies (ICT) has been and will no doubt continue to be enormously significant (perhaps a key driver of economic growth overall), a lack of attention to energy issues could have equally significant but possibly detrimental impacts. A workshop on this issue was held in February 2002, and it is anticipated that results from this work will be included in the *World Energy Outlook* or dedicated publications.

New work is also planned to reach out to major economies beyond the IEA. Firm policies and action standby power in China and India, for example, may do more to combat global emissions from these

sources than action in many IEA Member countries (although co-ordinated policies may be more effective again). Collaborations with the Climate Technology Initiative, individual Member countries or other agencies (such as the EC, the UN Foundation, UN DESA or others) could provide an opportunity to transfer policy designs and lessons to China and Brazil in the first instance, and to others subsequently, subject to resource availability.

References:

*Energy Labels & Standards*, IEA July 2000

*Policies and Measures to Reduce GHG Emissions from Appliances*, IEA, 2001

*Things that Go Blip in the Night: Standby Power and How to Limit it*, IEA, Paris, April 2001

*Third International Workshop*, Tokyo, February 2001

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#### **4.4.3 Waste**

In general terms, the work in this area focuses on assessing economically efficient tools to prevent/minimise waste. In this context, many different projects may be relevant for climate policy (in addition to the work on indicators – see Section 8.3).

- Work on waste minimisation has recently focused on market failures for secondary market materials, with a final goal to provide policy recommendations related to recycling markets.
- Current work on “Extended Producer Responsibility” (EPR) is based on the outcome of an important project that started in 1994. More recently, a Seminar was held on 13-14 December 2001 on EPR Programme Implementation and Assessment. Work in 2002 in this area will focus on the economics of EPR. It will focus on developing an analytical framework for governments to use to review the economic efficiency and environmental effectiveness of EPR and to examine in more detail economic instruments used to implement EPR policy.
- Work on “Environmentally Sound Management” of wastes (ESM) continues with several pieces of work on recoverable wastes and used and scrap materials, use of environmental management systems as a key component of ESM and applicability of ESM to small and medium size enterprises.
- Work on Transboundary Movements of Waste destined for recovery operations: the development of a notification and tracking system for this type of waste contributes to efficient waste recycling. A Guidance Manual was recently finalised on this issue.

References:

Improving Recycling Markets (ENV/EPOC/WGWPR(2001)1/REV1)

Strategic Waste Prevention, OECD Reference Manual, ENV/EPOC/PPC(2000)5/Final

*EPR, A Guidance Manual for Governments*, OECD, 2001

Guidance Manual for Transboundary Movements of Wastes Destined for Recovery Operations,  
ENV/EPOC/WGWPR/2001/6/REV1

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## 4.5 Industry/Manufacturing

The IEA is undertaking a project examining how structural changes affect manufacturing energy use and contribute to reducing energy use per unit of GDP. The methodology used is based on IEA's energy indicator approach, which separates structure and intensity effects at a relatively disaggregated level<sup>3</sup>. Due to data limitations, the analysis focuses primarily on eleven IEA countries covering the period from 1973 to 1994<sup>4</sup>. For the U.S. the analysis is extended through 1998 using data on U.S. manufacturing energy use.

Preliminary results show that structural changes have significantly affected energy use in manufacturing between 1973 and 1994. In most countries, particularly the U.S. and Japan, the mix of manufacturing output moved away from energy-intensive products, leading to lower manufacturing energy use, all else being equal. In a few smaller countries, however, the manufacturing structure became more energy intensive and thus drove up energy use over this period. For the group of eleven IEA nations the share of value added from the production of energy intensive raw materials has declined. This change accounted for about a quarter of the reduction in total manufacturing energy use per unit of output between 1973 and 1994. The rest of the reductions in this period can be explained by falling energy intensities in individual manufacturing branches.

The information economy affects all sectors, not simply manufacturing. Information is a vital ingredient in the acceleration of economic growth, and it is important to see how this growth affects energy use. The present work lays down the foundations for such analysis using the manufacturing sector as a focus. As detailed data on other sectors become available, subsequent studies will present results for all end-use sectors and with more countries updated through recent years.

Through further work on energy indicators, the Secretariat will expand the group of countries for which data at the necessary disaggregation level are available (i.e., to cover all IEA Members) and updating time series through the most recent years, which is crucial to explaining effects of the information economy.

### References:

*Impacts from Structural Change in the Manufacturing Sector*, IEA, 2001

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## 4.6 Agriculture

In addition to the specific work on agri-environmental indicators (see Section 8.3), the Agriculture Directorate prepares regular reviews and evaluations of agricultural policies in Member countries,

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3. The study investigates trends in manufacturing energy use disaggregated into the following branches; paper and pulp; chemicals; non-metallic minerals; iron and steel; non-ferrous metals; food and kindred products; and one category including all remaining branches of manufacturing, here denoted "other industries". The first five sub-sectors are all energy-intensive, and this paper sometimes refers to them as production of raw materials.
  4. In this work, the IEA-11 includes Australia, Denmark, Finland, France, Japan, Italy, Norway, Sweden, the U.K., the U.S. and w. Germany. For all these countries we have consistent time series with energy data from 1973 through 1994. The analysis excludes energy use in the territories of the former East Germany in order to maintain a consistent time series after 1990. IEA-11 constituted in 1994 about 82% of IEA total final energy consumption.

including agri-environmental policy measures. It has also recently produced specific reports on agri-environmental policies and technologies. As part of the new mandate on sustainable development, new studies will be prepared on the issue of overcoming the obstacles to phasing-out of environmentally damaging subsidies, including in agriculture (see Section 5.2). Finally, Austria and Hungary will co-host an OECD Workshop on Agricultural Biomass, in Vienna, May 2003, which will examine, among other issues, the links between agricultural biomass and renewable energy production. Although not primarily focused on climate change, this work is relevant to climate change policy.

In 1998, a project was launched that focused specifically on GHG emissions in the agricultural sector. In addition to the indicator work, an overview paper was commissioned on agricultural practices that reduce the emissions of GHG, which are in place in Member countries. This document collects the available information on some of the practices in place in OECD countries, the policies to encourage their implementation, and –where available- some of the costs of their implementation and political and social barriers to their adoption.

#### References:

*Agricultural Policies in OECD Countries: Monitoring and Evaluation*, 2001

*Improving the Environmental Performance of Agriculture: Policy Options and Market Approaches*, 2001

“The long term outlook for agriculture and the environment”, pp.105-118 in, *OECD Agricultural Outlook 2001-2006*, OECD, 2001

Agricultural Practices that Reduce GHG Emissions: Overview and Results of Survey Instrument – COM/ENV/EPOC/AGR/CA(1998)149/REV4 - final report forthcoming

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## **5. Analysis of Policy Instruments**

### **5.1 Tradable Permits**

#### **5.1.1 OECD Project on Domestic Tradable Permits**

Earlier OECD work on domestic TP systems led to the publication in 2001 of *Domestic Transferable Permit Systems for Environmental Management: Design and Implementations*. It analyses the approaches, challenges, enabling conditions, and potential solutions related to the design and introduction of domestic TP schemes, and served as the basis for *Strategic Guidelines for the Design and Implementation of Domestic Tradable Permits*, which is available on line (see below.) In 2001, the OECD launched a new project on domestic tradable permits to take stock of the new developments in this area.

Phase I (2001) of the project is now nearly complete. Its main outputs are: (i) reviews of recent developments in application of the TP concept in new environmental areas including, GHGs, renewable energy (with the IEA input), solid waste management, transport and water resource management; and (ii) a report examining ex-post evaluation methodologies. These reports as well as a short paper, which drew

lessons learned from them and proposed future work directions, were discussed in an Experts Workshop on Domestic Tradable Permits held in Paris, in September 2001.

During Phase II (2002-3), the project will focus on three areas: (i) further work on ex-post evaluations of domestic TP systems, (ii) issues related to the use of TP schemes in combination with other policy instruments, and (iii) interface between national, regional and international TP systems for greenhouse gases. The latter will be based on the ongoing work of the climate change programme under the WPGSP including the Annex I Expert Group (see section 6.1.1).

Apart from the domestic TP project, the Environment Directorate of the OECD secretariat is developing two databases on economic instruments, which include information on TPs in OECD countries (see Section 8.1.2).

Key findings of the work under Phase I that are relevant for climate are:

Domestic GHG emissions trading systems (official national systems, not voluntary or pilot schemes) are implemented only in Denmark to date (since start of 2001), while the UK scheme was officially launched in August 2001 and will become operational in April 2002. Several other countries in Europe (e.g. Norway, Sweden) are currently in the design phase of their own domestic schemes, but are keeping an eye on the development of the proposed EU-wide scheme scheduled to be in place in 2005. Domestic GHG or CO<sub>2</sub> emissions trading schemes have also been under consideration in several other countries (e.g. France, Germany, Canada, Australia, Japan, Slovakia, Czech Republic) but no conclusive decisions to introduce such schemes have yet been reached. Domestic emissions trading schemes are often used or considered in policy mixes, with taxes and voluntary approaches.

- Tradable renewable energy certificates (TREC) schemes are also in place in Australia, Austria, Italy, the states of New Jersey, Texas and Wisconsin in the US, and the regions of Flanders and Wallonia in Belgium. Denmark, Sweden and the UK are in the design stage of their own domestic TREC programmes, while the Netherlands has a voluntary scheme in place. While the possibility of linking GHG or CO<sub>2</sub> emissions and TREC markets are often considered, this study concludes that it may be better to keep the two trading systems separate to maintain the effectiveness of each. The IEA is planning continued work on tradable renewables certificates as part of its work on international emissions trading, as well as part of its work on renewable energy policies.
- Domestic TPs systems have also been introduced or considered in other areas which may be relevant for climate, including: transport (application of TPs to non-point sources under the "Ecopoint" programme in Austria, minimum production targets under the Zero Emission Vehicle programme in California, USA, and the French study on upstream and downstream options for TPs in transport sector), and solid waste management (the proposed UK TP scheme for biodegradable municipal waste.)

References:

*Domestic Transferable Permit Systems for Environmental Management: Design and Implementations*, OECD, 2001

Strategic Guidelines for the Design and Implementation of Domestic Tradable Permits, ENV/EPOC/GEEI(99)13/FINAL

*Implementing Domestic Tradeable Permits, Recent Developments and Future Challenges*, OECD, 2002.

The following background papers are available on OLIS :

ENV/EPOC(2001)20 "Domestic Greenhouse Gas Emissions Trading Schemes: Recent Developments and Current Status in Selected OECD Countries"

ENV/EPOC(2001)21 "Renewable Energy Certificates: Trading Instruments for the Promotion of Renewable Energy" (also published as IEA/SLT paper)

ENV/EPOC(2001)22 "The Use of Transferable Permits in the Transport Sector"

ENV/EPOC(2001)23 "New Areas for Application of Tradable Permits: Solid Waste Management"

ENV/EPOC(2001)24 "Tradable Permits in Water Resources Protection and Management - A Review of Experience and Lessons Learned"

ENV/EPOC(2001)25 "Ex Post Evaluations of Tradable Permits Programmes"

ENV/EPOC(2001)26 "OECD Project on Domestic Tradable Permits: Lessons Learned and Proposals for Further Work"

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### **5.1.2 IEA Work on Domestic and International Trading**

Considerable work has also been done on emissions trading simulations under IEA auspices. One simulation of trading in carbon-dioxide emissions (run in 2000), involving officials and private sector players from seventeen countries, demonstrated the feasibility of a greenhouse gas emission-trading regime such as the one envisioned in the Climate Convention negotiation. Results of the IEA simulation indicate that trading can achieve costs savings of over 60 percent. The results nevertheless indicate that optimal economic efficiency is not likely to be achieved. They also suggest that, even when trading is in place, the bulk of CO<sub>2</sub> reductions will be undertaken domestically. Building on this work (as well as earlier collaborations with Eurelectric and the Paris Bourse), a new simulation is currently underway in the Baltic Sea Region, involving 10 countries and more than twenty electricity generators, and incorporating both electricity and CO<sub>2</sub> trades. Results from the simulation are anticipated for COP 8.

The IEA also organised a workshop in April 2002 to understand the specific issues, challenges and opportunities associated with certificate trading as an instrument to promote energy efficiency and DSM and to share learning between practitioners engaged in the development, administration or evaluation of such mechanisms.

The IEA has also been involved in work looking at the linkages between domestic trading systems for greenhouse gases. A first workshop on linkages, co-sponsored by the International Emission Trading Association (IETA, an association of large industrial companies, brokers and consultants specialised in emission trading), and the Electric Power Research Institute (EPRI) of the United States, was held in 2001. More than 100 delegates, private sector and non-governmental organisation experts attended the meeting. The objectives of the workshop were threefold: (1) to share recent information about national and regional developments of greenhouse gas emission trading initiatives; (2) to discuss linkages between domestic systems, in light of different design options and policy objectives, and (3) to identify areas for further work. Follow-on work on linkages is currently being planned, both in conjunction with the IETA and EPRI; pending AIXG workplan decisions, these may be co-organised through the AIXG.

**References:**

*Energy Efficiency Trading Workshop*, Milan, April 2002

*International Emissions trading: From Concept to Reality*, IEA, 2001

*Greenhouse Gas Emission Trading: The Linkages between Domestic Systems*, IEA, IETA, EPRI, 2001

Emissions Trading, A Real-time Simulation, IEA, 2000, <http://www.iea.org/envissu/cop6/emistr.pdf>

*Greenhouse Gas Electricity Trading Simulation. An exercise in trading carried out by the electricity industry in collaboration with the IEA and Paris Bourse SBF SA*, Unipede/Eurelectric, Bruxelles, October 1999

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## **5.2 Environmentally Related Taxes and Subsidies**

### **5.2.1 Environmentally Related Taxes**

Current OECD work on environmentally related taxes is a joint effort between tax and environment experts, organised through the Joint Meetings on Taxation and Environments, with delegates from Working Party 2 under the Committee on Fiscal Affairs and the Working Party on National Environment Policy under the Environmental Policy Committee. A book that provides an in-depth discussion of the use of environmentally-related taxes in OECD countries was published in 2001. The work and the book are largely based on the database on environmentally related taxes, which is described further in Section 5.1 below.

The 2001 report clearly demonstrates that price elasticities for energy products are significantly different from zero. In other words, broader use of taxes or permits that would increase energy prices would lead to reductions in demand. It is also indicated that cross-price elasticities between different energy products can be important, implying that changes in energy prices based on environmental criteria could lead to significant changes in behaviour of consumers and producers.

Another important finding of the work so far is that there are very important exemptions, refund mechanisms, and other provisions embedded in existing environmentally related taxes. This means that hardly any tax revenues currently are paid by heavy industries. Over 90% of all the revenues raised through environmentally related taxes in OECD countries are raised on the purchase or use of motor vehicles or on motor vehicle fuels.

The May 2001 OECD Ministerial Council Meeting asked for an intensification of the work on sustainable development, with particular emphasis on how to overcome obstacles to broader use of economic instruments. A questionnaire sent to Member countries in 2001 identified the fear of loss of sectoral competitiveness and of negative impacts on low-income households as the most important obstacles to relevant policy reform. Hence, ongoing work focuses on these issues, with particular emphasis on the competitiveness issue.

A case study is being undertaken in the steel sector on possible impacts of a broader use of environmentally-related taxes or tradable permits. This case study is based on a global model of the steel sector developed by the Foundation for Research in Economics and Business Administration, Norway. The

model distinguishes between 5 OECD regions and three main processes within the steel sector. The case study should be finalised in the summer of 2002.

References:

*Environmentally Related Taxes in OECD Countries: Issues and Strategies*, OECD, 2001

The following papers are available on OLIS:

COM/ENV/EPOC/DAFFE/CFA(2001)90. Environmental Taxes and Competitiveness: An Overview of Issues, Policy Options, and Research Needs

COM/ENV/EPOC/DAFFE/CFA(2001)92. Strengthening the Work on Taxation and Environment: A Summary of Questionnaire Responses and Suggestions for Further Work

COM/ENV/EPOC/DAFFE/CFA(2001)93. Draft Terms-of-Reference for a Case Study of Potential Impacts for the Steel Sector of Increased Use of Environmentally Related Taxes in OECD Member countries

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### **5.2.2 Environmentally Harmful Subsidies**

The IEA has undertaken a series of projects related to energy subsidies and subsidy reform. In 1999, it published a volume examining energy subsidy reform in eight major non-Member countries, concluding that the effect of subsidy removal could be significant GHG reductions. In 2000 and 2001, the IEA, jointly with UNEP, ran a series of subsidy reform workshops (in Europe, Africa, Latin America and Asia) concluding that subsidy removal, while needing to be cautious regarding the social impact, could have beneficial effects for government expenditures, as well as for the environment. The IEA continues to look at issues related to subsidies in the energy sector, most notably in its work on coal subsidies, as well as its work evaluating Member country policies and measures in climate change.

The OECD is internationally recognised as a leading organisation in the measurement and analysis of subsidies. Many reports on this issue have been produced in the past few years. Co-ordination across the house in this area remains ad hoc however, which leads to data and comparability problems for relevant assessments. At the May 2001 OECD Ministerial Council Meeting, the OECD Ministers asked the OECD to identify how obstacles to policy reforms in relation to the reduction of environmentally harmful subsidies can be overcome; and deepen its analytical work on these instruments. A workshop is planned in late 2002 to bring together experts from the OECD and other organisations to do a stocktaking on subsidy work and to consider how to overcome these problems. To complement this workshop, the OECD will also:

- collect data on subsidies in different sectors, such as agriculture, fisheries, forestry, energy supply, transport and manufacturing industry. These data will be analysed with a view to assessing and possibly quantifying the subsidies according to their degree of environmental harm.
- Analyse the numerous exemptions and other special provisions in existing environmentally-related taxes that erode their environmental effectiveness and economic efficiency

This project will benefit from the participation of several Directorates across the OECD, including the Environment Directorate, the Agriculture, Food and Fisheries Directorate, the Trade Directorate, the Directorate for Science, Technology and Industry, the European Conference of Transport Ministers, and the IEA.

In relation to this work, the OECD released in October 2001 a study, which had been carried out by the Joint Working Party on Trade and Environment (JWPTE), on the *Environmental Effects of Liberalising Fossil Fuel Trade: Results from the OECD Green Model*. This study follows up on earlier JWPTE work on the nature and extent of pricing distortions in fossil-fuel markets and analyses the changes in CO<sub>2</sub> emissions that could be expected from liberalisation-induced shifts in the direction and volume of fossil-fuel production and consumption.

References:

*Coal Information*, IEA, 2001

*Energy Subsidy Reform and Sustainable Development: Challenges for Policy Makers*, IEA/UNEP, 2000

*World Energy Outlook, Looking at Energy Subsidies: Getting the Prices Right*, IEA, 1999

Environmental Effects of Liberalising Fossil Fuel Trade: Results from the OECD Green Model,  
COM/TD/ENV(2000)38/FINAL

*Improving the Environment through Reducing Subsidies, Part I and Part II + Part III*, OECD, 2000

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### 5.3 Voluntary Approaches

In 1999 OECD published the report *Voluntary Approaches for Environmental Policy: An Assessment*. The report, while pointing to potential positive effects, related to dissemination of information and awareness-raising, found that there are also problems concerning the use of such instruments, related *inter alia* to lacking environmental effectiveness and economic efficiency, and to high administrative costs.

Despite these potential problems, the use of voluntary approaches in environmental policy is broadening. Hence, at its meeting in April 2001, the Working Party on National Environmental Policy decided to undertake new work on such approaches, through a number of case studies addressing e.g. environmental effectiveness, economic efficiency, administrative costs and the use of voluntary approaches in mixes with other policy instruments. The case studies cover Canada, Denmark, Japan and USA, and should be ready by the end of 2002. A separate discussion of “policy mixes” will also be undertaken, before a final report is prepared toward the end of 2002.

A main conclusion from previous OECD work is that evidence of low environmental effectiveness and economic efficiency of voluntary approaches indicates that it can be unwise to base climate policies too much on such schemes.

References:

*Voluntary Approaches for Environmental Policy: An Assessment*, OECD, 2000

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## 5.4 Market Reform and the Environment

Over the past decade virtually all IEA Member countries have introduced reforms in previously regulated markets. This has been particularly true in the electricity and gas sectors. The IEA has an ongoing project examining market reforms in energy. The work indicates that countries target their reforms at improving the economic efficiency and lowering prices of their services to industry and households. Reform affects the technology and investment choices of energy companies, as well as their marketing policies, all of which can affect future CO<sub>2</sub> emissions. To be fully successful, policies to limit greenhouse gases must not undermine market reform by excessively distorting competition. At the same time market reforms must take account of the need to mitigate emissions. In some cases, market reform may make reduction of greenhouse gas emissions even more difficult than before. As markets become more competitive and power producers seek to cut costs, voluntary environmental actions by power producers may become harder to sustain. On the other hand, more efficient use of fossil fuels to cut costs may contribute to reduced emissions. There is a wide range of options for reducing CO<sub>2</sub> emissions from power generation.

New work in 2002 in market reform and the environment will focus on further elaboration of the impacts of environmental regulation, including questions related to the environmental implications (through case studies) of energy market reforms, and the environmental- and cost-effectiveness of implementing such standards. Additional work will be undertaken to examine some of the investment implications of meeting environmental regulations. Work under this element would seek to address issues related to the development and deployment of pollution control technologies for the energy sector (i.e., end-of-pipe for SO<sub>x</sub>, NO<sub>x</sub>, CO, VOC, particulates and mercury, and capture and storage of CO<sub>2</sub>), as well as the cost to the energy sector of their installation and maintenance. Additional work under this program would evaluate the environmental impacts of non-fossil fuel forms of energy (both renewables and nuclear); and address some of the links between environmentally “benign” energy and jobs/employment.

References:

*Competition in energy markets: implications for public service and security of supply goals in the electricity and gas industries*, IEA Workshop, February 2002

*Impact of access regulations on new power generating capacity*, IEA, Forthcoming

*Regulating Liberalised Electricity Markets*, IEA, 2001

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## 5.5 Technology Policy

Several IEA and OECD projects focus on the linkages between technology innovation and sustainable development, which may be of relevance for climate policy. Technology has a critical role to play in reducing greenhouse gas emissions and increasing greenhouse gas sinks. The wider adoption of existing climate-friendly technologies, and the development and deployment of demonstrated, new and improved and innovative technologies will be important aspects of a market-based response to climate change concerns.

### 5.5.1 Energy Technology Policy Analysis

#### Energy Technology R&D and Deployment Policy

Development and use of advanced energy technology is critical to reducing greenhouse gas emissions from the energy sector and to ensuring future energy security. IEA Member country governments recognise the urgent need to intensify efforts to develop cost-effective technology options to further these policy goals. They also strive to ensure that medium- and long-term R&D receives sufficient attention notwithstanding forces pushing the private sector and some governments towards a shorter-term focus. They endeavour to base technology deployment policies and programmes on the accumulated experience and lessons learned to date. They also want to ensure that energy technology policy takes advantage of the positive links between R&D and deployment.

Work of the Energy Efficiency, Technology and R&D Office will continue in 2002 to follow-up on a 2001 project examining lessons learned and best practices for (1) energy technology research, development and demonstration (RD&D) and (2) energy technology deployment. Work will also continue, in co-operation with Member country experts, to evaluate changes in the structure and content of energy technology RD&D in IEA Member countries and to examine the links between energy technology RD&D and technology deployment. Topics such as the use of deployment policies as one means of stimulating industrial R&D, and mechanisms for feeding performance information back to researchers, will receive particular attention.

Selected contributions to in-depth reviews of Member country energy policies, and to the annual *Energy Technologies of IEA Member countries* publication, will continue. This publication will reflect case studies on lessons learned and best practices in RD&D and in deployment provided by Member countries.

#### Energy Technology Analysis

Deployment of new energy technologies affects fuel markets, greenhouse gas emissions and energy security. This IEA Technology Office project assesses cost-effective technology options in order to achieve energy policy goals (e.g., reduced emissions and increased energy security) and provides an analytic basis for designing policies to further develop and deploy these technologies.

Technology learning will be an important element in the project. Basic information on technology cost, performance, lead-times and others will be developed in close relationship with the Implementing Agreements. The work will produce a variety of scenarios to investigate possible "energy futures", reflecting different market conditions and policy interventions. The scenarios will build on technology information from IEA committees and sub-groups like the Advisory Group on Oil and Gas and IEA Implementing Agreements. The data developed in this project will be used to help develop the alternative technology and policy scenarios in the *World Energy Outlook (WEO) 2002*. Data will be provided for technologies and technology deployment policies in all sectors.

References:

*World Energy Outlook, 2002*, IEA, Forthcoming

*IEA technology database with state-of-the-art information for existing and advanced supply and end-use technologies*, IEA, Forthcoming

Contact:

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### **5.5.2 Capturing and Storing Carbon Dioxide: Zero Emissions Technologies Strategy for Fossil Fuels**

Atmospheric concentrations of CO<sub>2</sub> are expected to double between now and 2100 if no measures are taken at international level to reduce greenhouse gas emissions. To stabilise carbon concentrations by the end of this century, developed and developing countries have to cut significantly their emissions. Capturing and permanently storing CO<sub>2</sub> emissions from fossil-fuel-fired power plants could provide very large, rapid reductions in carbon emissions, thus allowing a full exploitation of the huge fossil energy resources with minor impact on climate, and a smoothed changes away from our fossil-fuel-based energy infrastructure.

The IEA Working Party on Fossil Fuel (IEA-WPFF) and the IEA Office for Energy Efficiency, Technology and R&D (IEA-EET) have undertaken a broad strategic initiative aimed at promoting development and deployment of so-called zero emissions technologies for fossil fuels (ZET). The Zero Emissions Technology Strategy (ZETS) is a broad concept drawing increasing interest in the energy field. It envisages output and waste streams from industry being used in final products or converted into value-added inputs for other industries or processes. Ideally, the integrated process should produce no wastes. The Zero Emissions concept can fruitfully be applied to fossil energy industry when, for example, CO<sub>2</sub> from energy conversion processes is used for enhanced recovery of oil and gas. Or when electrical power is produced using conversion cycles with closed loops for pollutants rather than the open cycles used in the traditional power generation industry. Development of ZET requires of course further progress on components, innovative system integration, and commercial application.

Major objectives of the ZET initiative are: (i) Improving information to decision-makers and the public about ZET potential; (ii) Enhancing Collaboration in IEA Member countries for ZET implementation and deployment; (iii) Facilitating Co-operation with non-Member countries to improve their fossil fuel facilities; (iv) Increasing Energy Security of fossil energy systems.

The ZET initiative was launched in October 2001. A series of meetings involving representatives of IEA Member countries and leading energy industries was held to define the Strategic Plan which is now available and expected to be implemented by the end of 2002. The initiative is intended to build on the co-operation with all the IEA relevant activities including the Greenhouse Gas R&D Programme, the Clean Coal Centre, the Enhanced Oil Recovery Project, as well as the IEA Collaboration Projects on Hydrogen and Fuel Cell technologies (see 6.4.2). The IEA also provides links with the Coal Industry Advisory Board (CIAB) and a broader international collaboration with industry, research communities, national and international organisations. Contacts are being established for collaboration with the United Nation Intergovernmental Panel on Climate Change (UN-IPCC).

A number of actions have been, and will be, undertaken within the framework of the ZETS and a range of technologies will be the focus of the activity, e.g.: CO<sub>2</sub> utilisation in Enhanced Oil Recovery and in Coal Bed Methane Extraction; Pre-Post combustion CO<sub>2</sub> Separation and Capture; CO<sub>2</sub> Transportation;

Geologic (depleted oil & gas fields, unminable coal beds, deep aquifers) and oceanic CO<sub>2</sub> storage; CO<sub>2</sub> conversion in stable carbonates and clathrates; CO<sub>2</sub> bio-conversion (and fixation) by micro-algae; Integrated ZET process using coal gasification (IGCC and/or Hydrogen production for fuel cell power plants) and CO<sub>2</sub> carbonation for utilisation or storage. Actions to promote technology development and deployment will be complemented by analyses to evaluate RD&D gaps, policy measures and investments required for ZET deploying. Projected cost curves over the next 20 to 30 years will be derived. Carbon sequestration and storage technologies will be included in the modelling systems of IEA Energy Technology Perspectives Project and in the IEA World Energy Outlook to evaluate their impact on the energy and GHG emission projections. The Zero Emissions Technology initiative crosscuts a number of technology fields, as well as the activities of several bodies and organisations. Effective implementation requires a co-ordinated approach.

#### References:

*Vision for 21<sup>st</sup> Century – Zero Emission Technologies for Energy Security, Environmental Protection and Economic Development: Strategic Plan.* IEA-Working Party on Fossil Fuel (Draft, January 2002).

*Capture and Storage of CO<sub>2</sub>: What Needs to be Done?* IEA Special publication for COP6, November, 2000

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### **5.5.3 Best Practices in Energy RD&D**

Governments continue to have an important role to play in energy technology research, development and demonstration (RD&D), particularly as patient investors in long-term R&D and as partners with industry in identifying and pursuing needed technology advances. Wider and deeper RD&D collaboration is needed in support of common challenges. Governments must ensure adequate in-house capability to deliver on their increasingly complex role in supporting energy technology RD&D. Government must ensure adequate *long-term* R&D, particularly in light of industry's decreasing investment in it and the tendency for co-operation with industry to push the government R&D portfolio toward shorter-term, lower-risk projects. Measures to internalise the costs of environmental externalities would help stimulate industry to do more of its own long-term R&D. Until this occurs, however, there will be a role for government to act as a "patient investor" in work that will only bear fruit some years hence.

In 1999, IEA Energy Ministers called for more sharing of "best practices" and "lessons learned" on energy technology policy. The Committee on Energy Research and Technology has responded with the project, "Best Practices in Energy Technology RD&D". The project continues in 2002, and is expected to produce additional papers on technology R&D practices in IEA Member countries.

#### References:

*Lessons Learned and Best Practices in Energy Technology Research, Development and Demonstration,* IEA, 2002, forthcoming

Contact:

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#### **5.5.4 Technology and Sustainable Development**

The OECD Report on Sustainable Development, issued in 2001, includes recommendations with regard to technology. A workshop was also organised in June 2001 as a follow-up to this report and a publication, issued in February 2002, summarises the main results of the workshop. The workshop report includes background papers on the role of technology policy as well as on the issue of technical change in energy/environmental modelling. While not focusing only on climate change, this work has direct relevance to issues related to climate policy.

References:

*Innovation and Environment*, 2000

*Policies to enhance Sustainable Development*, 2001

“Chapter 6: Technology”, *Sustainable Development: Critical Issues*, 2001

*Technology Policy and the Environment*, 2002

*Technology and Environment: Towards Policy Integration*, 1999

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#### **5.5.5 Innovation and Technology Policy**

The Working Group on Innovation and Technology Policy (TIP) under the Committee for Science and Technology Policy (CSTP) has also agreed recently to undertake in 2002 case studies in innovation. These case studies would investigate the processes of knowledge creation, diffusion, and acquisition in particular technology fields and/or industry sectors. These studies would not address climate issues as such, but some of them might be relevant to climate policy. Such studies include so far a study on energy technologies, to be prepared in co-operation with IEA. Other relevant sectors might be tackled later (automobiles, environment). Another case study on “Steering and Funding of Environmental R&D”, under the auspices of an Ad Hoc Group of the CSTP, will address more specifically the issue of public R&D financing.

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#### **5.5.6 Climate Change and Technology**

The Working Group on Global and Structural Policies (WPGSP) under the Environment Policy Committee will also initiate in 2002 a new project on the linkages between climate change and technology/innovation policies. In particular, this work should focus on the question of coherence between two different policy domains: the influence of particular climate policy instruments on technological change and the influence of technology/innovation policy instruments on climate change; it may also consider how to handle

induced technological change in economic analysis of climate change response policies. A proposal in these directions will be developed for discussion later in 2002.

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## **6. International issues**

In addition to the work that is mostly relevant for domestic policies in OECD countries, the OECD and IEA undertake projects that have an international focus, whether their objective is to support international co-operation or whether they are concerned more specifically with developing –or transition- country issues.

### **6.1 The OECD/IEA project for the Annex I Expert Group**

The main objective of the AIXG programme is to support Annex I Parties to the Convention in their efforts to build a solid and efficient international policy response to climate change. Some of the issues in the work programme (market-based mechanisms, evolution of mitigation commitments) are directly relevant to the international negotiating process, both in the short and long-term. Other issues in the programme (policies and measures, EIT support) will continue to address mainly domestic policy issues, but with a view to improving performance, sharing information and building confidence among Parties in their capacity to implement international commitments to address climate change.

#### **6.1.1 International Emissions Trading**

In 2001, the analytical work on International Emissions Trading focussed on technical issues related to the commitment period reserve. Analytical work in 2002 focuses on the issues raised by the linkages among and between domestic and international GHG trading systems. Domestic emission trading is becoming one of the primary policy choices for Parties seeking to reduce their greenhouse gas emissions. There are practical and sometimes policy obstacles to linking domestic systems even if, from an overall economic efficiency standpoint, domestic markets for tradable GHG permits should be linked. The interface with the international trading system(s) also raises specific issues.

#### **6.1.2 Project-based mechanisms**

As during the previous years, the work of the AIXG focussed in 2001 on baseline methodologies, with two new case studies drafted on forestry and transport, as well as through a UNEP/AIXG workshop (7-9 May 2001). In addition, the Secretariat developed an analysis of the possible implications of “fast-tracking” small CDM projects in the electricity sector, and an analysis of permanence, credit accounting and lifetime issues for forestry projects. In 2002, the Secretariat is developing practical baseline recommendations and has initiated new work on project monitoring issues.

Practical baseline recommendations are developed to assess emission reductions from different types of electricity projects (e.g. off-grid and grid connected projects) in different circumstances. This work aims to be as practical as possible, including through the development of decision trees. The focus is on credible baselines and baseline methodologies that can be supported at reasonable cost with available or readily

accessible data. This work builds on previous AIXG work on baselines, including feedback from the UNEP/AIXG workshop, and other sources and experience. In addition, a "road-testing" of baseline recommendations for electricity projects will be carried out with real data from real projects, and through case studies. Results of this "road-testing" should be presented to a broader audience at COP8.

Guidance on monitoring for GHG-mitigation projects can increase transparency, predictability and comparability of credit generation from projects. It could also increase the ease and reduce the costs of verifying emission reductions. While detailed guidance on what and how to monitor will vary by project category, some generic guidance on other aspects of monitoring should be able to be drawn up. Drawing on lessons from project monitoring experience and guidance, the work identifies key questions that need to be answered before any generic (or specific) project monitoring guidance can be agreed, and explores different options to answer such questions.

### **6.1.3 Policies and Measures**

For the past few years, the work on policies and measures has focussed on sharing information and assessing sectoral climate policies. In 2001, the work targeted the building sector, with an OECD/IEA/AIXG workshop on sustainable buildings. In 2002, The Secretariat will organise, jointly with the German government, a workshop on policies and measures to mitigate GHG emissions in the industry sector. In addition, new work will be undertaken on technology-related policies and measures. This piece of work is connected to the work on Evolution of mitigation commitments (see below).

### **6.1.4 Evolution of mitigation commitments**

In 2002 and 2003, the work in this area will be focused on the following issues:

- Assessing environmental, socio-economic and energy implications of alternative pathways to stabilisation, including cost issues
- Technology futures - how to make the transition? Links to P&Ms, RD&D policies, tech. transfer
- Form of commitment testing specific options
- Institutional capacities and contexts - ability to monitor, implement and enforce different types of commitments; affinities for different types.

### **6.1.5 Support for countries with economies in transition**

In 2001, the AIXG supported three case studies: a study on the development of a national registry (Bulgaria); a study on the development of a national inventory system (Russian Federation); a study on domestic emissions trading (Czech Republic). In-country consultants prepared these case studies in close collaboration with the country governments, while the Secretariat provided analytical support.

As a follow-up to these case studies, the Secretariat will organise an international workshop to be held in Szentendre (Budapest) on 13-15 May 2002. The workshop will address design and implementation issues related to the different national systems needed for participation in the Kyoto Mechanisms: national systems for GHG inventories, national registry systems and national GHG emissions trading systems and national programmes for joint implementation projects. In addition, the workshop will include a session on capacity building initiatives relevant to the implementation of the Kyoto Mechanisms.

References:

These documents may be found on the climate change web site <http://www.oecd.org/env/cc/> :

*Emission Baselines: Estimating the Unknown*, OECD/IEA 2000 (ISBN 92-64-18543-7)

Practical Baseline Recommendations for GHG Mitigation Projects in the Electric Power Sector, OECD/IEA 2002, [COM/ENV/EPOC/IEA/SLT(2002)1]

Developing Guidance on Monitoring and Project Boundaries for GHG Projects, OECD/IEA 2002 [COM/ENV/EPOC/IEA/SLT(2002)2]

Framework for Baseline Guidelines, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)1]

An Initial View on Methodologies for Emission Baselines: Transport Case Study, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)10]

Forestry Projects: Permanence, Credit Accounting and Lifetime, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)11]

Fast-tracking Small CDM Projects: Implications for the Electricity Sector, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)12]

UNEP/OECD/IEA Workshop on Baseline Methodologies: Chairman's recommendations & workshop report, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)15]

The Commitment-period Reserve, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)13]

Good Practice Greenhouse Abatement Policies: Transport, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)6]

Good Practice Greenhouse Abatement Policies: Energy Supply and Transport, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)7]

Transition Country Perspectives on the Kyoto Protocol, Workshop Report and Questionnaire Results, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)8]

Designing Inventory, Registry and Trading Systems in Countries with Economies in Transition, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)14]

Kyoto Mechanisms, Monitoring and Compliance, from Kyoto to The Hague, OECD/IEA 2001 [COM/ENV/EPOC/IEA/SLT(2001)9]

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## **6.2 Mainstreaming Environment in Development**

### **6.2.1 Development co-operation**

The Development Co-operation Directorate / Development Assistance Committee undertakes climate-relevant activities in several areas.

a) DAC Guidelines on Strategies for Sustainable Development

The DAC Working Party on Environment and Development Co-operation (WP/ENV) has undertaken to elaborate good practices for donors in assisting developing countries with the formulation and implementation of **National Strategies for Sustainable Development (NSSDs)**. NSSDs are best defined as a set of instruments and ways of working which enable sustainable development challenges to be tackled in a coherent and dynamic way. This includes making sure that action plans formulated in response to the Climate Change, Biodiversity and Desertification Conventions are fully integrated in long-term poverty reduction strategies.

The WP/ENV prepared a set of DAC Guidelines on Sustainable Development Strategies, based on a series of dialogues in Bolivia, Burkina Faso, Ghana, Namibia, Nepal, Pakistan, Tanzania and Thailand. The Working Party also prepared a detailed practical “resource book on sustainable development strategies” as a companion to the Guidelines. The Resource Book sets out technical guidance on the concepts and issues around strategic processes for sustainable development, and options for developing, assessing and implementing country-level strategies.

b) DAC-Guidelines on Integrating the Rio Conventions in Development Co-operation

With the objective of reversing current trends in the loss of environmental resources by 2015, the WP/ENV was mandated to identify practical ways for donors to help developing countries meet their obligations under the Climate Change, Desertification and Biodiversity Conventions. This provides guidance for enhancing aid agencies’ contributions in support of the objectives of the conventions while fostering development objectives as a whole.

The Guidelines are primarily intended for decision-makers and development policy experts in donor organisations. They aim to clarify the linkages between the global environmental issues on the one hand, and sustainable development and poverty reduction on the other hand. They also aim to provide insights on how development co-operation agencies can support developing countries’ efforts at integrating responses to global environmental threats into their national poverty reduction and other development plans, bearing in mind that the most effective assistance is that which supports country-led development programs and builds on rather than substituting for partners’ own efforts. The final draft is now ready for endorsement by the DAC for review and approval at its meeting in June 2002.

A central part of the document is an examination of the linkages between global environmental threats and policies in agriculture, energy and forestry – three sectors which, in most developing countries, are centrally relevant to national development priorities and to global environmental issues.

- On the agriculture-climate change front, this involves a discussion of the main agriculture-related GHG emissions; of ways to contain GHG emissions from agriculture; and of the vulnerability of agriculture to the impact of climate change.
- Concerning forestry and climate change, the document argues that there is a fundamental need for reconciling the multiple functions of forests; recognising the multiple threats to forests; and an awareness of the linkages between forestry, biodiversity, climate change and land degradation.
- With respect to Energy Development and climate change, the paper discusses the main ways to reduce the contribution to climate change from energy use: reducing GHG emissions at the stage of extraction; improving efficiency at the level of energy production, transport and end-use; switching to non or low-carbon-based energy sources; and limiting sink loss by encouraging the production of rural energy sources.

- An overarching theme in the discussion of all three sectors in the climate change context is how to best identify ‘win-win’-options (those choices which allow national and global objectives to be pursued jointly), and how to deal with remaining ‘hard choices’ (those choices exhibiting a disconnect between national (or local) and global priorities).

c) Strategic Environmental Assessment

As a follow-up, WP/ENV is currently looking to further explore the role of Strategic Environmental Assessment (SEA) instruments as one of the most promising instruments to operationalise sustainable development principles. This includes the role of SEA in integrating Climate Change and other environmental issues into strategic decision making, addressing the cumulative and other impacts that cannot be tackled at the project level, streamlining programme and project-specific impact assessment. Future work in this area will aim to advance the understanding of the principles, methods, tools and procedures available in strategic policy assessment, and their application in strategic planning processes such as Poverty Reduction Strategies. These tools will be kept as simple and practical as possible. Identifying the implications of SEA in terms of capacity development needs will also be a priority focus of future work.

d) Improving Statistical Reporting of Aid Targeting the Conventions:

At its meeting, in June 2001, the DAC’s Working Party on Statistics agreed to initiate a new data collection exercise, using revised definitions and covering commitment data from 1998 to 2000. This will aim to cover activities supported by the main aid agencies, which are captured in existing DAC reporting mechanisms, and also Multilateral flows. In addition, efforts will be made to cover relevant activities managed by other agencies. The objective is to have results in time for the Johannesburg Conference in September 2002.

References:

OECD DAC (2001) DAC Guidelines on Strategies for Sustainable Development

OECD DAC (2002): DAC Guidelines on Integrating the “Rio Conventions” in Development Co-operation.

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## **6.2.2 Joint project on Development and Climate Change**

The Environment and the Development Co-operation Directorates jointly initiate this project to explore possible synergies as well as trade-offs of "mainstreaming" climate change responses into development co-operation projects, development plans and activities. The focus is on links between climate change, natural resource management and economic development plans in developing countries. Key questions are:

- How to enhance adaptation through normal development plans and development co-operation projects?
- What are priorities for investment in adaptation in different national contexts?
- How might developing countries and donor communities determine and act upon such priorities?

A pilot project investigated issues relevant to an evolving regime for addressing climate change in 2001, given various national and regional circumstances, including economic profiles, political interests,

institutions and capacities. The pilot project emphasised mitigation policy. Four individual case studies covered Brazil, India, the West Africa region and South African perspectives.

An informal expert meeting, held 13-14 March 2002 in Paris, combined experts from both the climate policy (largely adaptation experts) and the development policy communities. Participants from developing and developed countries, and from relevant inter-governmental organisations, covered a range of questions, including the value-added of OECD contributions on development and climate; adaptation financing issues; scope, structure and criteria for possible case studies.

The project will advance with three to six case studies. An analytical concept paper outlines key issues for investigation in the project and sets out a scope and approach for the case studies. A three-tier framework is proposed for each of the case studies that examines (i) the national demographic and economic context, as well as key climate change impacts and vulnerabilities; (ii) connections between climate change, national economic development plans and development assistance portfolios; (iii) in-depth thematic or project level analyses that explore linkages between climate change adaptation and natural resource management through specific themes such as coastal zone, watershed, land use and forest management activities. In the area of land use and forest management, the analyses could also cover costs and benefits of integrating mitigation measures such as carbon sequestration in development planning.

The project is moving ahead on three case studies (Bangladesh, Egypt, and Uruguay), and several others are under active consideration.

#### References:

Development and Climate Change Project: Concept Paper on Case Study Selection and Scope  
(COM/ENV/EPOC/DCD/DAC(2002)1)

Development and Climate Change: Linkages between natural resource management and climate adaptation strategies. Summary of the Informal Expert Meeting (13-14 March, 2002)  
[COM/ENV/EPOC/DCD/DAC(2002)3]

Analysing the nexus of Sustainable Development and Climate Change: An Overview  
(COM/ENV/EPOC/DCD/DAC(2002)2)

Literature review on Climate Change and Sustainable Development: With emphasis on vulnerability  
(ENV/EPOC/GSP(2004)4)

Climate Change and Sustainable Development Strategies: A Brazilian Perspective by Emilio Lèbre La Rovere (Federal University of Rio de Janeiro)

Climate Change, Sustainable Development and Energy: Future Perspectives for South Africa by Ogunlade Davidson, Lwazikazi Tyani and Yaw Afrane-Okesse (Energy and Development Research Centre, University of Cape Town)

Climate Change and Sustainable Development Strategies in the Making: What Should West African Countries Expect? by Fatma Denton, Youba Sokona and Jean Philippe Thomas (Environnement et Développement du Tiers Monde)

Climate Change: India's Perceptions, Positions, Policies and Possibilities by Jyoti K. Parikh and Kirit Parikh (Indira Gandhi Institute of Development Research)

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## 6.3 Strengthening Institutions in Central and Eastern Europe

The Task Force for the Implementation of the Environmental Action Programme in Central and Eastern Europe (EAP Task Force) carries out several activities on strengthening institutions in these countries.

### 6.3.1 Enforcement of, and compliance with, environmental requirements

This project is part of the OECD co-operation with non-Member economies in Eastern Europe and Central Asia and it builds upon the OECD experience to transfer know-how to the region. It aims at increasing the effectiveness of enforcement institutions and instruments in the context of the transition to a market economy. Although not directly linked to the climate change issues, some activities and findings might be relevant especially with respect to institution building for climate policy implementation. These key areas include:

#### a) Institutional Reform and Capacity Building of the NIS Enforcement Agencies

Addressing climate change problems in the NIS might be substantially hindered by the existing institutional gaps in enforcement systems. Key challenges that might be relevant to climate change are:

- allocation of new responsibilities (and powers) related to enforcement of, and compliance with, international conventions and addressing related new burdens;
- a better identification and monitoring of the regulated community;
- providing sufficient information to enforcement agencies personnel and to the regulated community;
- optimising data management systems.

The project will result, inter alia, in endorsing the *Guiding Principles for Effective Environmental Enforcement in the NIS*. A related publication will include a chapter on enforcement and compliance related to international agreements.

#### b) Environmental Permitting

The design of environmental permitting in the NIS was inherited from the Soviet period and has several weaknesses, including the limited scope and the separation of permitting procedures for emissions to air and water. The orientation towards integrated pollution prevention and control, which includes such new areas of regulation as energy efficiency and waste minimisation, has been increasingly considered in a number of the countries in the region. This trend can potentially influence the pace and approach to achieving GHG emission reduction.

An Environmental Permitting Working Group is currently carrying out an assessment of permitting systems in the NIS, which will result in a *Synthesis Report on Environmental Permitting*. The report will present the current state of environmental permitting procedures in the region and provide recommendations for their reform. It will also describe systems currently in place in OECD and central and eastern European countries.

#### c) Compliance Control

The Inspection Toolkit, which will provide criteria and guidance for performing environmental compliance control, is being developed and will be published in early 2003. The toolkit may include specific criteria for inspecting facilities with high GHG emissions.

d) Compliance Promotion

Most enforcement programmes involve activities both to enforce requirements and promote compliance with these requirements. Compliance promotion aims to provide information about environmental requirements and encourage voluntary compliance by industry. This should facilitate achieving the following goals:

- reduced enforcement burden through a more efficient communication outreach and public compliance monitoring;
- better informed regulated community;
- a more transparent enforcement activity and maintained public confidence in enforcement agencies;
- increased NGO and general public support to enforcement and compliance promotion efforts.

This activity will help to determine the most effective packages of instruments and tools to promote compliance, including developing voluntary schemes and compliance schedules, providing education and technical assistance to the regulated community, publicising success stories, and building environmental management capability within the regulated community. The other objective is to identify stakeholders that can assist in this task (universities and training and information centres, Cleaner Production Centres, NGOs, media etc). Successful examples of applying promotion tools, including those related to compliance with Multilateral Environmental Agreements, will be prepared along with supporting documents describing selected tools used in OECD countries and elsewhere.

References:

Environmental Compliance and Enforcement in the NIS: A Survey of Current Practices of Environmental Directorates and Options for Improvements, CCNM/ENV/EAP(2000)87

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### **6.3.2 Environmental Finance Mechanisms in Economies in Transition**

Over the past five years, the work on environmental finance in economies in transition has largely focused on public (domestic) institutions managing environmental expenditure, with special attention on public environmental funds. Such funds have been established in almost all countries of Central and Eastern Europe (CEE) and the New Independent States (NIS).

The "*St. Petersburg Guidelines on Environmental Funds in the Transition to a Market Economy*" provide the conceptual basis for this work and set forth the key internationally recognised standards for designing and administering such funds. With the view of integrating environmental finance into public finance practices, subsequent work has led to the preparation of "*The Good Practices of Public Environmental Expenditure Management*". These good practice recommendations provide environmental policy-makers in countries with economies in transition with practical tools that could be used to review and, if necessary, reform their environmental financing institutions.

Based on the criteria and standards outlined in the above documents, the OECD Environment Non-Member Countries Division has conducted performance reviews of a number of funds in both CEE and the NIS. Such Reviews usually involve the evaluation of the institutional, organisational, technical and financial performance of the Funds as well as their potential to act as an implementing agency, co-financier

or intermediary for foreign technical assistance or investment support programmes on the environment. For example, recently, the National Environmental Protection Fund of Moldova was reviewed. The report from the performance review provides short and long-term recommendations for strengthening and improving the efficiency and effectiveness of the Fund as a public institution in the overall system of environmental finance in Moldova. Phase II of the project, which is expected to start in the second half of 2003, will focus on the implementation of the reforms suggested by the review.

Another project, worth mentioning, focuses on developing the conceptual framework for managing resources released through debt-for-environment swaps in the NIS. Recently, the Ministry of Environment of Georgia requested assistance in this area. As part of the effort for rescheduling the external debt of Georgia (agreement with Paris club including debt for nature swap clause signed in 2001), donors have agreed to undertake such swaps on a voluntary and bilateral basis. The objective of this project is to assist Georgia in developing the legal and regulatory basis for the institution that will be set up to manage the resources made available for environmental improvements through potential debt-for-environment swaps.

Key findings of the work that are relevant for climate are:

- Most NIS have domestic public environmental funds but there is little progress in the performance of these funds towards compliance with the best-internationally-recognised standards for such institutions. However, provided that these funds are reformed according to such standards, they could become a potential source of (co)-financing climate-related investments in these countries, as well.
- Most NIS have introduced a comprehensive system of pollution charges/taxes, including taxes on fuel (natural and condensed gas, fuel oil, coal). Only Georgia has introduced a CO<sub>2</sub> tax, the revenues of which go to the general budget. Almost all NIS have introduced taxes on transport fuel. Moldova is the only country where the revenue is allocated to and managed by the National Environmental Fund. In the other NIS, the revenue goes to the general budget. In general, though, the rates are so low that they mainly serve as a revenue-raising instrument and are not designed to provide any incentives for changing polluters' behaviour. For example, in Georgia the CO<sub>2</sub> rate is about 5 USD/tonne of CO<sub>2</sub> (1999 data). Also, rates do not seem to be set in proportion to the carbon content in the fuel.
- None of the Funds reviewed so far have explicitly identified climate-related issues as a priority area for their investments. No special financing schemes for climate change measures, implemented through the Funds, are in place in these countries. Some Funds provide support for energy-efficiency measures but given the low level of resources at their disposal, the Funds could not effectively support significant levels of investment in energy-saving projects.
- Given the global benefits that could be derived from climate-related investments, debt-for-environment swap mechanisms provide a new opportunity for both donor and creditor countries to address climate change issues in a more effective and efficient way.

References:

St. Petersburg Guidelines on Environmental Funds in the Transition to a Market Economy, OECD/GD(95)108

The following documents are available at [www.oecd.org/env/eap](http://www.oecd.org/env/eap) :

Swapping Debt for the Environment - The Polish EcoFund, OECD/EU Phare, 1998

Sourcebook on Environmental Funds in Economies in Transition, OECD/EU Phare, 1999

Integrating Public Environmental Expenditure Management and Public Finance in Transition Economies

Good Practices of Public Environmental Expenditure Management

Performance Review of the Estonian Environmental Fund, 1998

Performance Review of the Czech State Environmental Fund, 1999

Performance Review of the Slovenian Environmental Development Fund, 2000

Reforming Environmental Finance Institutions in Kazakhstan: Conclusions and Recommendations of the Performance Review of the Kazakh State Environmental Protection Fund, 2000

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## **6.4 Technology co-operation**

### **6.4.1 Climate Technology Initiative**

The Climate Technology Initiative (CTI) helps strengthen the indigenous capacity of developing countries and economies in transition to employ environmentally-sound technologies and practices. CTI accomplishes this primarily by acting as a facilitator between governments, industry, NGOs and other stakeholders. CTI was launched at the First Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC) in 1995. Twenty-three OECD countries and the European Commission created it to help meet their commitment to technology transfer under Article 4.5 of the Convention. CTI helps meet this commitment through information dissemination, training, capacity building exercises, technology needs assessments and research and development.

Many organisations are involved in capacity building and information dissemination; yet, CTI may be the only organisation focusing solely on technology transfer. CTI has special expertise in energy and with its close link to the IEA, which hosts the CTI, can serve as applied technology policy vehicle in carrying IEA technology and policy messages to developing and economy in transition countries.

For example, IEA countries have recognised appliance efficiency standards and labels as a low cost and very effective policy tool to reduce energy consumption in appliances and curb consequent greenhouse gas emissions. North America, Europe and Japan have varying experiences and methods in setting out standards and labels. CTI facilitates bringing these policy lessons and practical experiences to Latin America where two workshops have been held. A next step may be to sponsor a life-cycle cost analysis of major appliances to help Brazilian regulators set the most economically efficient minimum standard. This would be relevant to other Latin American countries that are setting out standards and labels programmes.

CTI's major activities include:

- Providing assistance to developing and transition countries with the design and implementation of Co-operative Technology Implementation Plans (CTIP). Such support is currently being provided to 14 countries in Southern Africa (SADC), India, and Nigeria;
- Providing technical assistance for technology needs assessments. CTI is currently providing such assistance to Bolivia and Ghana.
- Collaborating with the UNFCCC Secretariat, the Global Environment Facility, and others on the development of effective methods for technology transfer;

- Supporting implementation of a range of technology training and capacity building programmes in Asia, Africa, Latin America, and Central and Eastern Europe.
- Promoting and accelerating collaborative research and development programs through the establishment of world-wide frameworks and expert networks;
- CTI Awards Program to recognise leaders in technology transfer;
- Technology and best practice information activities, including a CTI web-site with a searchable database of technology information.

References:

Search engine and publications located on the Internet at <http://www.ClimateTech.net>

*Technology without Borders: Case Studies for Successful Technology Transfer*, IEA/CTI 2001

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Debra Justus, IEA CTI, Tel: (33 1) 40 57 67 66, e-mail: [debra.justus@iea.org](mailto:debra.justus@iea.org)

#### **6.4.2 Energy Technology Collaboration Projects (Implementing Agreements)**

The IEA's international collaboration programs in energy technology help governments inside and outside the IEA to achieve the objectives of energy security, economic and social development, and environmental protection. Collaborative projects, known as "Implementing Agreements", contribute to the development of new energy technologies as well as to the deployment of clean technologies in the market place. In an increasingly interconnected world, national efforts to adapt to changes in the energy sector no longer suffice. The IEA provides a framework for collaboration on research, development and the deployment of energy technologies. The Implementing Agreements, which the IEA sponsors, offer the legal mechanism and the management structure for collaborative activities.

There are currently some 40 active Implementing Agreements, involving 35 countries, 13 of them non-Members of the IEA, and the European Commission. Several new projects are being developed. Activities cover fossil fuels, renewable energy, efficient energy end-use, fusion power, electricity and transport, as well as the dissemination of information. In total, the programmes spend nearly US \$150 million a year. A few examples:

- In Canada, the CADDET (Centres for the Analysis and Dissemination of Demonstrated Energy Technologies) Analysis Report on Co-generation played an important role in the decision to install a 5 Megawatt co-generation unit, with substantial savings for the community. In the UK, information from CADDET was used by local authorities studying the implementation of a solid-waste incinerator, a small-scale hydro facility and landfill gas developments.
- The Bioenergy Agreement has contributed to the understanding of biomass energy systems. Its work has been used in the development of guidelines for national greenhouse-gas inventories. It was a force for the inclusion of "sinks" in the Kyoto Protocol.
- ETSAP (Energy Technology Systems Analysis Programme) has further developed computer models named MARKAL (for "market allocation"). These models have been used to perform analysis in support of national emission inventories and abatement studies.
- The SolarPACES Agreement (Solar Power and Chemical Energy Systems) undertakes START missions (Solar Thermal Analysis Review and Training missions), which promote deployment of solar systems producing electricity. Its major success to date has been the 130 MW-Hybrid Fossil Solar

Thermal Power Plant project in Egypt, with private-sector participation and a \$50 million grant from the Global Environment Facility.

Collection, analysis and dissemination of information on energy and environmental technologies are important elements in the IEA's collaborative work on energy technology. Some IEA projects focus more intensively on collecting technological data and disseminating them to a wider audience:

- The Energy Technology Data Exchange (ETDE) provides a comprehensive bibliographic database on energy research and development. EDTE has recently developed the World Energy Base (EDTEWEB) and the Energy Information Sources (EIS), which provide web access to information on energy technology.
- The Centres for the Analysis and Dissemination of Demonstrated Energy Technologies (CADET) have several information activities, including CADET-EE, which focuses on new energy-efficiency technologies, and CADET-RE on renewable-energy technologies.
- IEA GREENTIE distributes information on almost 8,000 energy technology suppliers whose products help to reduce greenhouse- gas emissions.
- IEA Coal Research is a provider of information on coal technologies. In a recent survey, 73% of its customers reported that the programme helped reduce the environmental impact of coal.
- The IEA International Centre for Gas Technology Information (ICGTI) provides user-friendly access to gas technology information through an Internet-based system called GTI Online. It gives information on gas technologies covering the complete fuel cycle: from exploration to end-use.

Many other international IEA projects maintain important information programmes. The Greenhouse Gas R&D Programme recently published a promotional CD-ROM, containing information on climate change and mitigation technologies.

References:

*Implementing Agreements*, <http://www.iea.org/impagr/imporg/imagpub/listof.htm> and  
<http://www.iea.org/techno/agreefr.htm>

*IEA Information Centers on Energy Technology*, IEA2001, <http://www.iea.org/techno/infcenter.pdf>

*Energy Technology and Climate Change: A Call to Action*, IEA/OECD, Paris 2000

*International Energy Technology Collaboration: A Sampling of Success Stories*, IEA/OECD, May 1999

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## **7. Other climate-related analyses**

### **7.1 Benefits of Climate Policies**

The benefits of GHG mitigation policies relate both to reduced impacts of climate change as well as to so-called "ancillary benefits".

As far as ancillary benefits are concerned, an OECD project (1999-2000), initiated by the Development Centre and the Environment Directorate, identified the major areas where these benefits (and costs) are

likely to exist. It developed a framework for analysis, including methods to quantify these effects, and suggested ways of injecting this information back into regulatory and decision making processes.

The project also sought to quantify and value the benefits to the local environment and human health of reductions in local air pollutant emissions. Model-based studies for Chile, China and India find a significant range of abatement (generally up to 10 per cent of baseline CO<sub>2</sub> emissions) over which climate policy would yield local environmental benefits that more than offset welfare costs. This is true even with fairly conservative assumptions about people's willingness to pay for cleaner air and the flexibility of technology – hence opportunities for substitution – in sectors that generate most of the pollution. The monetary savings to society of having cleaner air to breathe and a healthier, more productive population are seldom considered systematically when formulating local air pollution control policy, not to mention climate policy. While attacking local air pollution could involve a different ranking of policy and technology options – in terms of cost effectiveness – from lowering greenhouse gas emissions, frequently the same measure turns out to be cost-effective on both fronts.

An OECD workshop on these topics was held in March 2000, and the proceedings were published. The meeting was co-sponsored with IPCC, RFF, WRI, and received support and participation of the EPA, the World Bank, and the US Department of Energy, among others. In 2001, a short *Policy Report* was prepared to synthesise the main results of this project, and to make the linkages to policy-making even more explicit. This paper was released as a final report in 2002.

The IEA has studied options to engage developing countries in lowering their greenhouse gas emissions. Case studies for China, India and Mexico show that otherwise beneficial changes in domestic energy policy in these countries could also lead to significant reductions in greenhouse gas emissions. The work examines policies on cleaner power technologies, especially in coal; fuel switching; biomass and other renewable energy sources; energy efficiency; and transport. The study demonstrates that both local and global environmental benefits can arise from changes in energy policy – often through low-cost or no-cost action.

The OECD 2001-2002 Work Programme on Climate Change also includes a new project on benefits of climate response policies. A work plan for this project was agreed in early 2002. The planned work will focus on developing a framework for improved accounting for the benefits of mitigation policies (reduced economic impacts, reduced risks, etc.). It will build on available assessments of impacts and vulnerability, and will provide case study examples of current approaches to policy analysis.

#### References:

Ancillary Benefits and Costs of GHG Mitigation: OECD, 2000

Ancillary Benefits and Costs of GHG Mitigation: Policy Conclusions, ENV/EPOC/GSP(2001)13/FINAL

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## 7.2 Employment Effects of Environmental (including Climate) Policies

The potential impact of environmental policies on the level and composition of employment is a much-debated issue. Some argue that environmental policies will lead to job losses; others point to the potential of increased employment that would flow from shifts to more sustainable production processes or technologies.

A BIAC/TUAC meeting was organised in 12 October 2001 to discuss the linkages between employment and climate change. In 2001-2002, the Working Party on National Environmental Policies (WPNEP) is undertaking a study on the economy-wide employment impacts of environmental policies in general, and of policies to combat climate change in particular (see ENV/EPOC/WPNEP(2001)2). A first draft will be available in the third quarter 2002.

The study should consist of a survey of recent models, including an overview of available types of approaches and recent model-based studies, and an assessment of the strength and limitations of the models/simulations reviewed. It will also include new simulations on the possible impacts of:

- The implementation of the Kyoto Protocol: the study will explore the possible differences in impacts on economy-wide employment between policies aiming to fulfil commitments envisaged under the Kyoto Protocol that only addresses CO<sub>2</sub> and policies that address all the 6 gases of the Protocol. It will consider both the use of instruments like taxes / tradable permits, which can be applied across all sectors / polluters, and if possible instruments that in particular seek to “drive” technological change in order to combat GHG emissions.
- The introduction of carbon taxes in the steel and electricity generation sectors: a simulation should be undertaken to assess the economy-wide employment impacts resulting from the introduction of a tax of 100 USD per tonne carbon in the steel and electricity generation sectors.

The simulations will estimate impacts on total employment and on the sectoral composition of employment as well as differences in employment impacts resulting from the implementation within the whole Annex I area, within all of OECD, within only western Europe. The simulations will provide results with the assumption of endogenous growth and without incorporating this assumption.

### References:

Joint Meeting of Management and Trade Union Experts on Climate Change and Employment, 12 October 2001, Discussion Paper, PAC/AFF/LMP(2001)5. A meeting report will be available shortly.

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## 7.3 Governance for Sustainable Development

The OECD has initiated work on the issue of governance for sustainable development, as part of the horizontal project on sustainable development. This led to the publication of a report including 5 case studies, presenting efforts by 5 OECD countries to develop truly integrated frameworks of effective institutions. The work does not focus specifically on climate change, but deals with three specific questions that are very relevant for climate change policy: the challenge of policy integration, the role of civil society and the creation of a long term view in policy-making. An OECD Seminar on “Improving Governance for Sustainable Development” took place on 22-23 November 2001 in Paris.

According to the Mandate given by Ministers in May 2001, the work, undertaken by the Public Management Service (PUM), will focus on policy coherence and integration, with the aim of assessing countries' progress towards integrating sustainable development in the policy process and of identifying indicators for monitoring countries' performance in this respect.

In addition, the Public Management Service of the OECD has a specific project on Regulatory Compliance, including Environment Compliance, which led to the completion of several reports in recent years (see references).

References:

Governance for Sustainable Development, Five OECD Case Studies, OECD, 2002

Innovative Approaches to Improve Regulatory Compliance in the Field of Environment Protection: Non-European Initiatives, PUMA/REG(2000)8

Innovative Approaches to Improve Regulatory Compliance in the Field of Environment Protection, PUM/REG(2001)5

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## 7.4 Environment Information Systems

The Environment Directorate conducts studies on Environmental Information Systems, which are complementary to the work on environment data and performance reviews. Two Seminars on Environmental Monitoring and on Public Access to Environmental Information were held in 1999 and 2000. In addition, the Environment Directorate has conducted reviews of national environment information systems, upon requests from some non-Member countries (or new Member countries). This work does not deal specifically with greenhouse gas inventory systems. However, the work is related to Annex I Group work assessing the steps needed in EIT to establish sound monitoring of GHG emissions under the UNFCCC.

References

OECD Seminar "Environmental Monitoring" – Proceedings, CCNM/CHINA/EPOC/SE(99)1/Final

OECD Seminar "Public Access to Environmental Information" – Proceedings, ENV/EPOC/GEP(2000)8

Environmental Information Systems in Bulgaria, An OECD Assessment, ENC/EPOC/SE(2001)4/FINAL

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## 8. Databases and Indicators

### 8.1 Databases on Domestic Policies

#### 8.1.1 Database on Energy-related Climate Policies

Underpinning international efforts to combat climate change are a series of actions being taken by developed countries' governments to mitigate emissions of greenhouse gases. An IEA project underway since 2000 collects, catalogues and analyses new policies and measures taken to address energy-related emissions in IEA Member countries. Actions are listed for each of the 26 IEA Member countries under six major headings: fiscal policy, tradable permits, regulatory instruments, voluntary agreements, RD&D, and policy processes and outreach. In addition, policies are classified according to energy source, end use and sector.

The project's analyses puts current national activities into context, providing an overview of current emissions and emissions-related policy trends, and reviewing other energy policy initiatives, including those in energy taxation, that have an effect on overall emissions and energy paths. The database also includes extensive descriptions of policies taken in renewable energy and energy efficiency – which are also maintained as separate, searchable databases by the IEA.

The project is continuing in 2002 – at which time the database will incorporate all policies taken from 1999 to the present. It is anticipated that as of 2002, the full database will be available interactively on-line at the IEA web site.

#### References:

Dealing with Climate Change: Policies and Measures in IEA Member countries: 2001, IEA, forthcoming

Energy Efficiency Update: <http://www.iea.org/pubs/newslett/eneeff/table.htm> (regularly updated)

Dealing with Climate Change: Policies and Measures in IEA Member countries: 2000, IEA, 2001

Dealing with Climate Change: Policies and Measures in IEA Member countries: 1999, IEA, 2000

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#### 8.1.2 OECD/IEA/EU Databases on Environmentally Related Taxes and Other Economic Instruments

In co-operation with the IEA and the European Commission, the OECD has prepared a database on the use of environmentally related taxes, fees and charges in Member countries. Through a co-operation with the European Environment Agency (EEA), the coverage in the database is about to be extended also to include EEA member states not being members of OECD.

The database is available – to anybody, free of charge – at [www.oecd.org/env/tax-database](http://www.oecd.org/env/tax-database), and contains information on more than 650 taxes, fees and charges, and almost 4000 separate tax-bases. Further, the database lists more than 1300 exemptions in the levies, and about 100 different refund mechanisms. Addresses of web-sites where more information can be found on the relevant levies is also available.

As a complement to the tax database, another database is being prepared on the use of other economic instruments and voluntary approaches – in co-operation with EEA. This database will also be made available free of charge on the Internet, in the summer of 2002. It will be possible to extract information from the two databases simultaneously, e.g. to get an overview of all the instruments covered in a selection of countries used to address climate change (or other selected environmental “domains”).

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## **8.2 Databases on Energy/Environmental Data**

### **8.2.1 OECD Database on Environment Data**

The OECD has long been active in the field of environmental data. Since the early 1980s, it has published every two years a compendium of environmental data to monitor environmental conditions and trends in OECD countries and to promote international harmonisation of data. Environmental data are collected from Member countries mainly through a biennial OECD questionnaire, but also from other OECD and international sources. For European Member countries, data collection is carried out jointly with Eurostat.

With regards to climate change, this work includes the regular collection and compilation of data on GHG emissions. The data is collected directly from Member countries (via the OECD questionnaire on the state of the environment sent every two years), from the European Environment Agency, from the UNFCCC, and from the IEA database on CO<sub>2</sub> emissions. It also includes the compilation of data on a number of related aspects such as forest areas and resources, energy supply and use (from IEA) and transport trends. Most of these data are published in the OECD compendium of environmental data.

References:

OECD Environment Data. Compendium 1999 (the next Compendium is forthcoming)

Contact:

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### **8.2.2 CO<sub>2</sub> Emissions From Fossil Fuel Combustion**

*CO<sub>2</sub> Emissions from Fuel Combustion, an annual publication by the IEA*, contains statistics on CO<sub>2</sub> emissions by sector and by fuel from 1971 to 1999 for more than 140 countries and regions. The 2001 publication provides comparisons between countries and regions made for selected indicators such as: CO<sub>2</sub> emissions / GDP; CO<sub>2</sub> emissions / population; CO<sub>2</sub> emissions / Total Primary Energy Supply; CO<sub>2</sub> emissions / kWh from electricity and heat generation. It also presents the evolution of CO<sub>2</sub> emissions since 1972, and highlights regional and sectoral trends. A diskette service is available that provides the complete

historical series from 1960 to 1999 for Annex II countries and from 1971 to 1998 for other countries. The diskette also contains a detailed sectoral breakdown of CO<sub>2</sub> emissions for individual fuels.

The 2002 edition of the CO<sub>2</sub> statistics will be available in the third quarter of 2002, and will cover emissions through the year 2000. Statistics are calculated using IPCC methodology, and draw on other energy statistics compiled by the IEA for all countries.

A specific database on CO<sub>2</sub> emissions from passenger cars is also updated regularly at ECMT (see Section 4.3k)).

References:

*CO<sub>2</sub> Emissions From Fuel Combustion, 1971-1999*, IEA/OECD, Paris 2001

*Energy Balances of OECD Countries, 1997-1999*, IEA/OECD, Paris 2001

*Energy Balances of Non-OECD Countries, 1997-1999*, IEA/OECD, Paris 2001

*CO<sub>2</sub> Emissions From Fuel Combustion, 1971-1998*, IEA/OECD, Paris 2000

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### 8.3 Indicators

The OECD and IEA have developed several sets of indicators, each responding to a specific purpose. For example, the OECD Core Environmental Indicators track environmental performance and progress towards sustainable development. Sectoral Environmental Indicators help monitor the integration of environmental concerns into sectoral decisions (e.g. transport, energy, household consumption, agriculture). Ministers adopted key Environmental Indicators in May 2001 for use in informing the public about key issues of common concern in OECD countries.

In 1998, the OECD embarked on the development of indicators to measure progress towards sustainable development at OECD level. The indicators cover all three dimensions of sustainable development — the economy, society and the environment — combined in a way that is useful for practical policies. OECD and Member country experience in developing and using indicators in the economic, social and environmental fields, together with more recent national and international initiatives focused on sustainable development indicators, provide a good basis for this work.

The OECD systematically uses agreed indicators in country environmental performance reviews and sustainable development reviews (see Sections 3.1 and 3.2), where climate change is one of several themes. The OECD also assists its Member countries in developing and using environmental indicators, and promotes the exchange of experience with non-Member countries and other international organisations. As far as climate change is concerned, a number of indicators related to CO<sub>2</sub> and other GHG emissions are regularly published as part of the OECD's indicator work.

Current initiatives focus on fulfilling the mandate given by Ministers in May 2001. This mandate refers to the development of an agreed set of indicators of sustainable development, including indicators to measure de-coupling of environmental pressure from economic growth, with a view to use them more systematically in OECD peer review processes (see Sections 3.1 and 3.2). The Mandate also asks the Secretariat to identify key information or data gaps and to develop work aimed at filling these gaps. The

Economics Department and the Environment Directorate, in co-operation with other OECD directorates, lead this work. Other related work includes:

- The development by the Agriculture Directorate of agricultural greenhouse gas emission indicators (drawing on UNFCCC data) (see publication below).
- The development by the Agriculture Directorate of indicators of soil organic carbon for agricultural land, with an Expert Meeting to be held in Ottawa, Canada, 15-18 October 2002, jointly organised by the Agriculture Directorate and Agri-Food Canada (see <http://www.oecd.org/agr/env/indicators.htm>).
- The development by DSTI of indicators of the embodiment of carbon in imports of manufactured product (2002-2003).
- The development by the Environment Directorate of performance indicators in the areas of waste prevention. A workshop on waste prevention performance indicators took place on 8-10 October 2001.
- The development of OECD Sustainable Consumption Indicators, also by the Environment Directorate. This project consists of revising and updating the 1999 publication on Household Consumption Indicators. The new publication will include other indicators that have been used the sector case studies on sustainable consumption and will present new indicators to measure sustainability.
- The IEA began to develop a set of energy indicators in 1997. Over the last five years these have been further developed and used as tools for studying energy-use developments. The main purpose of this work is to assist IEA Member countries in analysing factors behind changes in energy use and CO<sub>2</sub> emissions. Indicators (and the associated databases) also reveal key couplings between energy use, energy prices and economic activity. This insight is crucial for assessing and monitoring past and present energy efficiency policies and for designing effective future action. The IEA is using the indicators in its project on “Domestic Policies and Measures for Meeting the Kyoto Target and Beyond”. The indicator databases are also a key element in a project to study how new and efficient technologies can reduce transport-related CO<sub>2</sub> emissions. An important aim of the IEA’s work on indicators is to increase the transparency and quality of energy-use data. This provides a better basis for meaningful comparisons of energy and emission developments across countries, as well as a tool to measure progress in emissions reductions and efficiency improvements within one country over time. The IEA indicators are being developed both in co-operation with its Member countries and with the European Commission to ensure the official and consistent collection of data. The IEA is also assisting non-Member countries to improve their energy statistics and to establish energy indicators. Involved are countries in Eastern Europe, China and India, as well as APERC (Asia Pacific Energy Research Centre).

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