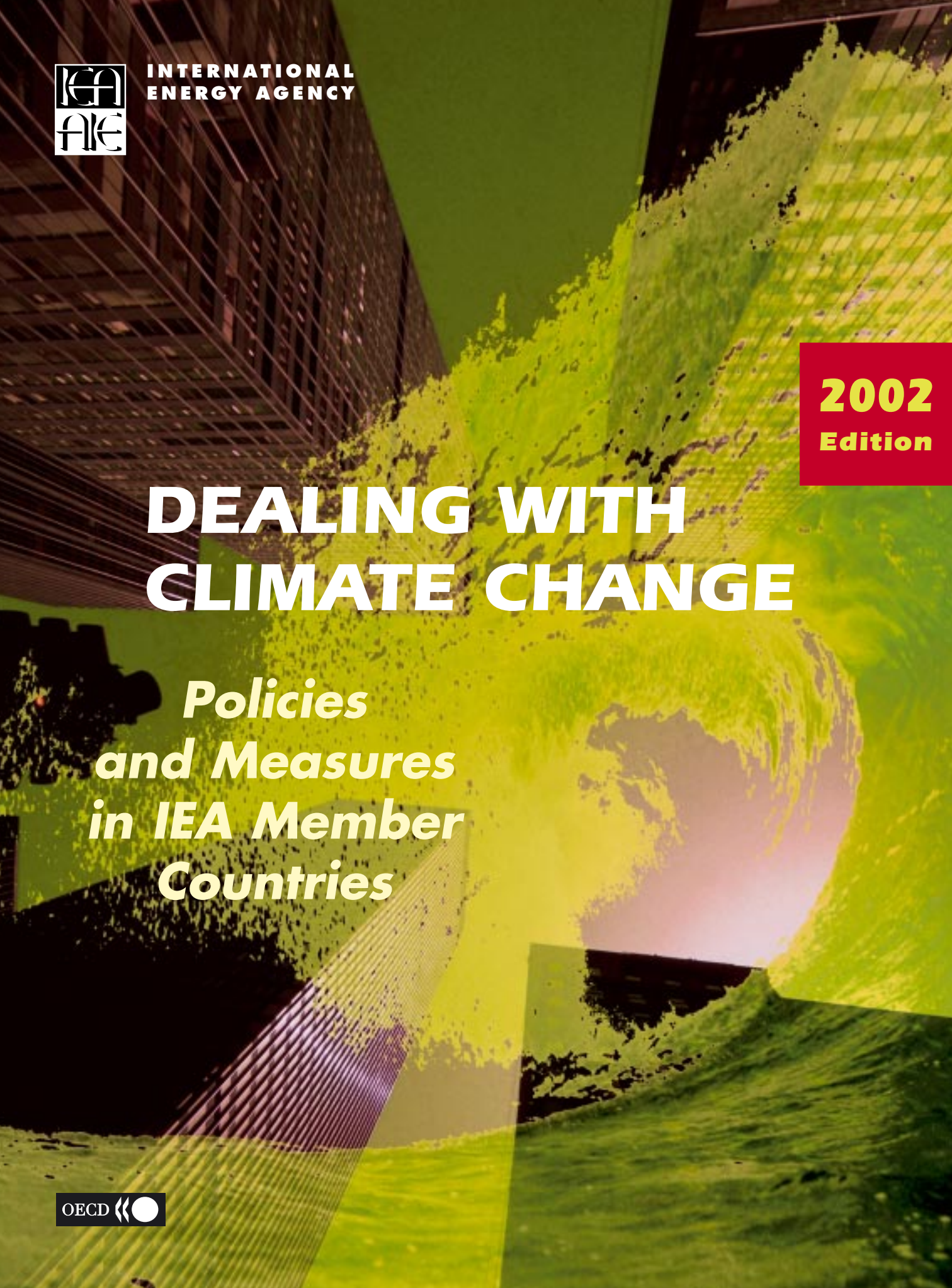
INTERNATIONAL
ENERGY AGENCY
2002
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DEALING WITH
CLIMATE CHANGE
Policies
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DEALING WITH CLIMATE CHANGE

Policies and Measures in IEA Member Countries

INTERNATIONAL ENERGY AGENCY

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The International Energy Agency (IEA) is an autonomous body which was established in November 1974 within the framework of the Organisation for Economic Co-operation and Development (OECD) to implement an international energy programme.

It carries out a comprehensive programme of energy co-operation among twenty-five* of the OECD's thirty Member countries. The basic aims of the IEA are:

- To maintain and improve systems for coping with oil supply disruptions;
- To promote rational energy policies in a global context through co-operative relations with non-member countries, industry and international organisations;
- To operate a permanent information system on the international oil market;
- To improve the world's energy supply and demand structure by developing alternative energy sources and increasing the efficiency of energy use;
- To assist in the integration of environmental and energy policies.

** IEA Member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, the Republic of Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States. The European Commission also takes part in the work of the IEA.*

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Pursuant to Article 1 of the Convention signed in Paris on 14th December 1960, and which came into force on 30th September 1961, the Organisation for Economic Co-operation and Development (OECD) shall promote policies designed:

- To achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy;
- To contribute to sound economic expansion in Member as well as non-member countries in the process of economic development; and
- To contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28th April 1964), Finland (28th January 1969), Australia (7th June 1971), New Zealand (29th May 1973), Mexico (18th May 1994), the Czech Republic (21st December 1995), Hungary (7th May 1996), Poland (22nd November 1996), the Republic of Korea (12th December 1996) and Slovakia (28th September 2000). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention).

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Foreword

Climate change is accepted by IEA governments as a major challenge. With over three-quarters of total human-induced greenhouse gas emissions stemming from the burning of fossil fuels, energy is clearly at the heart of the problem – and energy policies at the heart of the solution.

This report provides a comprehensive listing of new or modified policies taken or planned in the energy sector during 2001 by IEA Member countries in order to reduce damage to the climate system. These policies will make a difference. However, we do not have the analytic tools to understand exactly how great these differences will be – leaving open the question as to whether we are on track to meet the challenge of reducing greenhouse gas emissions in a cost-effective or environmentally sound manner. There is still much to be done to determine how best to make policy choices and combine them in packages and evaluate their effectiveness.

This third edition of *Dealing with Climate Change* is a result of a continued effort by the IEA to support decision-makers and policy experts, researchers and scholars; but it is also intended to offer a source of comprehensive information to a broader public.

Robert Priddle
Executive Director

Acknowledgements

This report was principally the work of two members of the IEA's Energy and Environment Division: Nicolas Lefevre-Marton and Jonathan Pershing. Laurent Dittrick from the Renewable Energy Unit provided significant input into the analytical section. Jenny Gell and Maggy Madden helped throughout the process. Member governments offered considerable assistance, including reviewing policy listings, and providing updates and corrections.

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Overview

Introduction

Background and Context

2001 was a turning point for international climate negotiations. At the end of 2000, the Sixth Conference of the Parties (COP6) under the United Nations Framework Convention on Climate Change (UNFCCC) in The Hague ended without agreement on several issues that were necessary before countries could begin the process of ratifying the Kyoto Protocol. In early 2001 further concerns about the outcome of climate negotiations were raised when the newly elected Republican administration of the United States decided not to ratify the Protocol. With the United States representing over 36% of greenhouse gas (GHG) emissions from Annex I countries in 1990, this decision marked an important point in the global effort, now over ten years old, to address climate change through an international agreement. Indeed, the key criteria for ratification of the protocol – Annex I Parties ratifying the Protocol must account for a minimum of 55% of 1990 carbon dioxide (CO_2) emissions from this group – seemed unreachable (see Box 1 on the impacts of the US withdrawal from the Kyoto Protocol).

Yet, against expectations, in July 2001, the resumed session of the Sixth COP in Bonn resulted in a political agreement among nearly all participating countries – the United States, following its rejection of the Protocol, essentially acted as an observer only, and did not participate in the negotiations. Many analysts held that the unfavourable events that marked the beginning of the year seem to have played a catalytic role; the strength of the political consensus on the importance of reaching an agreement prompted a degree of international compromise and engagement that the process of the previous year had sorely lacked. Political consensus emerged on how to interpret the Kyoto text for the implementation of its "flexible mechanisms" (emissions trading, Joint Implementation and the Clean Development Mechanism), on how to undertake financial assistance and technology transfer to developing countries, and on the methodology to be used in accounting for emissions and sinks in land use. The political agreement was followed by legal text at COP7 in Marrakech at the end of 2001, opening the road for ratification. As of 18 September 2002, 94 countries, including 25 Annex I Parties, had ratified the Kyoto Protocol.

2001 was an important year also at a national level. Countries continued to make progress in the domestic reduction of emissions, although few countries met their commitment to return emissions to 1990 figures (the aim of the 1992 Framework Convention on Climate Change for all developed countries, including those of the former Soviet Union and eastern Europe). In 2001 Annex I countries were to prepare

and present their third national communications under the UNFCCC, which was to report on the steps each country was taking to implement the Convention, as well as to update current inventories of GHG emissions, and projections of expected emissions over the next decade. Although twenty countries did indeed submit reports in 2001, by year's end nearly an equal number had yet to do so. However, though formal reporting has been somewhat incomplete, all countries in Annex I (which includes all IEA countries apart from Korea) have taken action.

This volume of *Dealing with Climate Change* provides a detailed listing of polices and measures taken or planned by IEA Member countries to reduce energy-related GHG emissions during 2001. This is the third edition of the publication, the result of an effort started in 1999 by the IEA to provide an annual update of actions taken by its Member countries to mitigate climate change. Since the "Policies and Measures" database was initiated, over 750 actions have been classified and entered. The three-year record offers an increasingly accurate picture of how national climate strategies are developing.

As the previous editions noted, no review of national policies and measures to mitigate climate change can ever be complete. Multiple factors affect how comprehensive such an effort can be and it is often difficult to determine what qualifies as a "climate change" policy and what does not. For example, policies and measures to promote nuclear power existed long before climate became an issue. And yet such policies directly mitigate the effects of climate change since they promote the replacement of energy sources which emit carbon with those which produce none. In this volume, we have listed primarily those policies that were specifically intended as part of a climate change strategy. Policies such as a new nuclear programme, or market deregulation, although they could have substantial consequences for the climate, are listed only if considerations of the climate were one of the reasons for their implementation.

A second limitation of this compendium is the scope of the measures listed: the database focuses almost exclusively on action taken nationally or federally, and includes only a few policies enacted by lower tiers of government. Similarly, the focus is on government actions, and private-sector or non-governmental organisation initiatives, although potentially very important in the effort a country might make to mitigate the effect of climate change, are not listed.

A third limitation is one of timing. Each year, this database provides a snapshot of all the policies that were newly developed as well as existing policies that were modified. But many countries have programmes which are not reflected in the database because they were initiated before 1999 and have not been changed during the past three years. The database therefore cannot be considered as a complete reflection of national climate programmes that countries have undertaken.

Finally, the focus of this compendium is on energy-related policies and measures. For many countries, efforts to mitigate emissions from activities in industry or agriculture

that are not related to energy issues constitute a large part of the national programme. This volume does not seek to address those efforts.

Within these limits, this database nonetheless reflects the major new actions taken. Although this overview presents some analysis, policies are not listed in the database in a manner that implies any relative weighting – no "scale of importance" is attached to them.

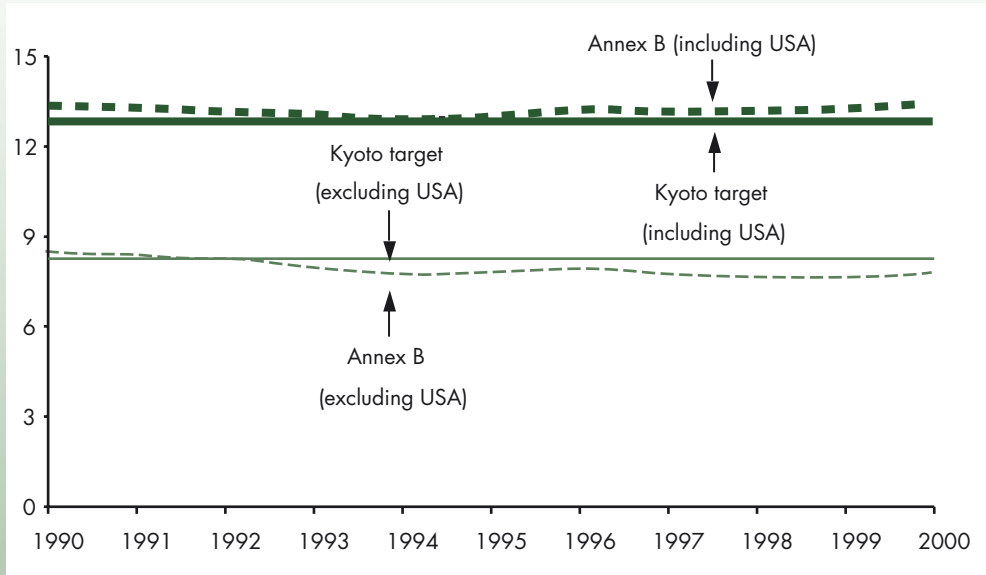
Box 1. Impacts of the US Withdrawal from the Kyoto Protocol

In view of the significant policy shift announced by the United States in 2001 (leading to its currently isolated stance in the international climate debate) and its importance in the global climate arena, it is useful to measure the actual impact of such a stance on the negotiation process.

The United States represents over 36% of Annex I GHG emissions and over 40% of emissions from IEA Member countries (based on 1999 UNFCCC data of all sources and sectors, including land use change and forestry). Following a decade of engagement in the climate change negotiations (including being the first OECD country to ratify the Convention in 1992, and strongly influencing the form of the Kyoto Protocol), a new Administration was elected in 2000 that considered the Kyoto agreement flawed – and forcefully rejected it.

The US announcement of its intent to withdraw from the Kyoto Protocol has strong implications for the overall environmental effectiveness of the Protocol. Without the participation of the United States, which produces more GHG emissions than any other country in the world, the scale of prospective emissions reductions under the Protocol has sharply decreased. In combination with the relatively liberal rules on sinks of GHGs agreed in COP7, the US withdrawal will also have a major impact on emissions trading and on the development of the Clean Development Mechanism. Since the United States was expected to be the largest buyer of emission rights, its non-participation is almost certain to lead to a reduced international price. Although this development will also reduce the price of compliance for other Parties to the Protocol, it may decrease the volume of technological activity, and diminish the longer-term effectiveness of the agreement. Figure 1 indicates the change represented by the US withdrawal as a function of historic emissions.

Figure 1. **Annex B* CO_2 emissions – with and without the United States (Gigatonnes of CO_2)**



*Annex B countries are those that have emissions reduction targets under the Kyoto Protocol. Membership in Annex B is almost identical to that of Annex I, except that Turkey and Belarus are excluded. However, the United States and Australia have expressed their intention not to ratify the Protocol. This figure includes all Annex B countries, except the United States.

Source: IEA (2001) – *CO_2 Emissions from Fuel Combustion.* International Energy Agency, Paris.

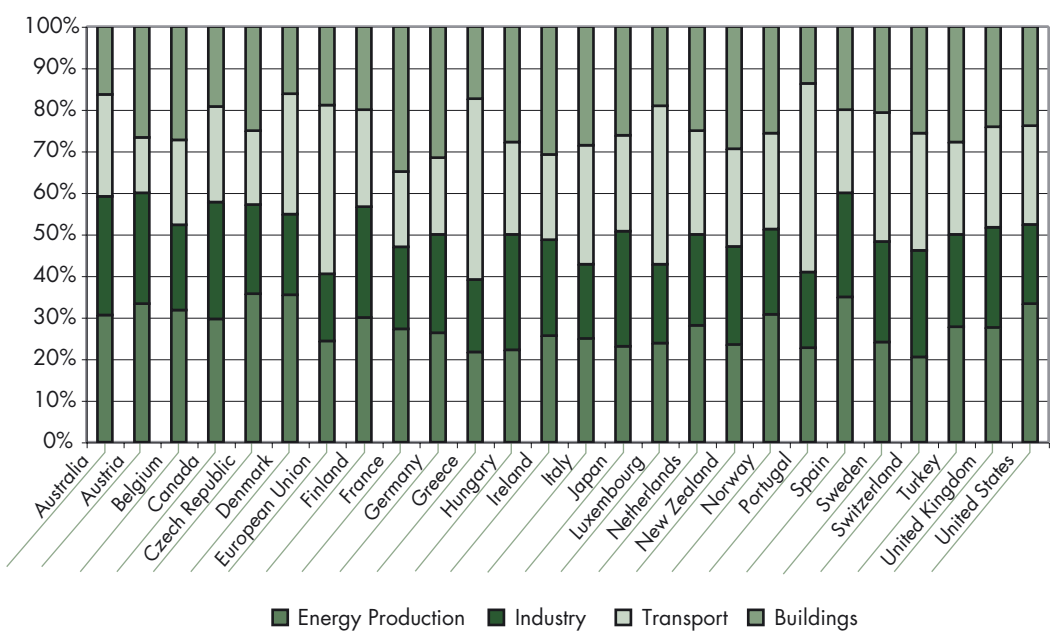
Policy Options and Trends

Climate Change Policies in IEA Member Countries

Issues related to climate change are taking an increasingly important place in decision-making processes in both the public and private sectors. The strong determination common to all IEA countries to mitigate climate change has not led to common paths towards that end; the policy programmes countries have designed to meet their national goals are extremely diverse. Using the IEA database allows an examination of the diversity of policy mixes as well as of the various policy options available to decision-makers, although the relatively limited scope of this exercise (only newly implemented or planned measures over the past three years are listed) makes it impossible to analyse policy trends fully.

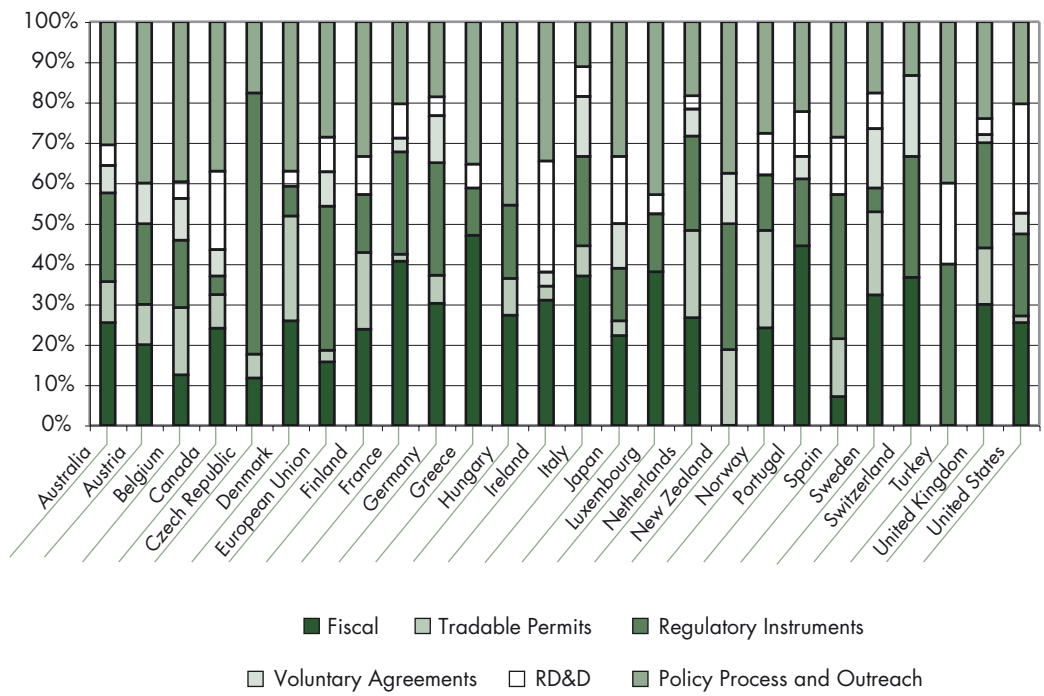
To fight against climate change, all IEA Member countries have adopted a portfolio of policies and measures (PAMs) involving all energy-intensive sectors. No particular sector in any IEA Member country has been an exclusive target over the past three years, reflecting the multi-sectoral nature of the climate mitigation problem (Figure 2). On the other hand, the mix of policy types used over the past three years varies enormously among IEA Member countries (Figure 3).

Figure 2. **Policy Sector by Country, 1999-2001**



Most new policies tend to come from three policy "families": *policy processes* (strategic planning, disseminating information, and consultation), *fiscal instruments* (taxes, tax exemption or credit, incentives, subsidies), *regulatory instruments* (mandates, standards and regulations). These policy types are familiar to policy-makers of all countries as they are commonly used in areas other than climate change. In addition, two instruments are quite common in new climate policies – *voluntary agreements* with industry, and *tradable permit* systems.

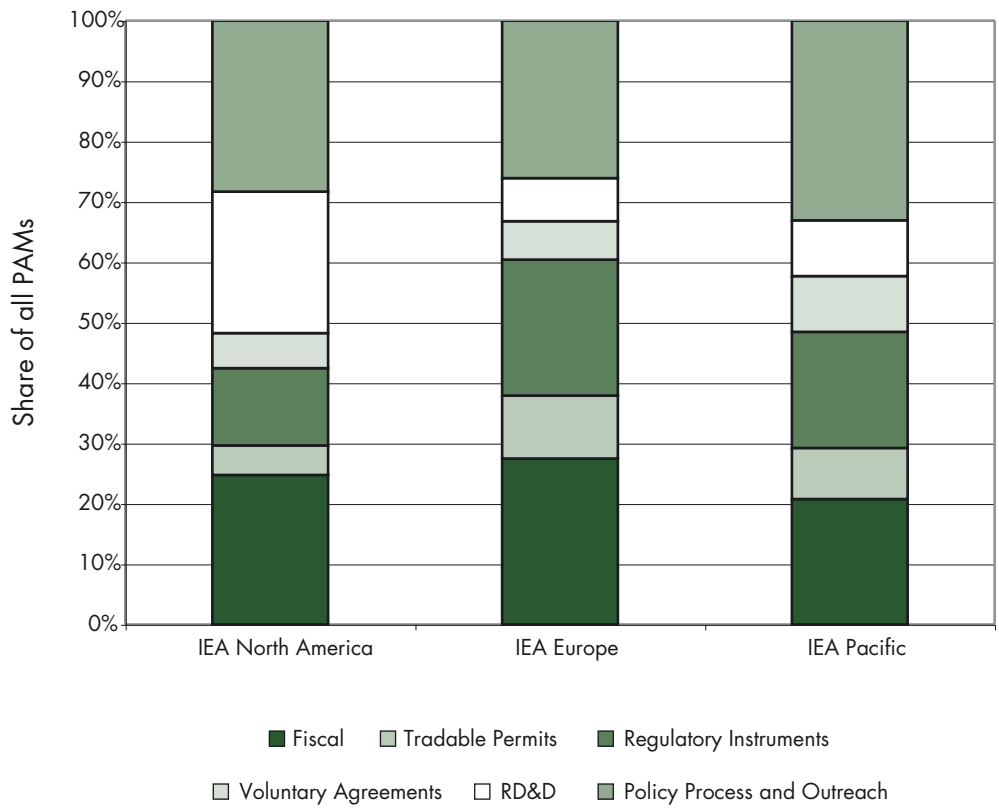
Figure 3. **Policy Type by Country, 1999-2001**



Policy process and outreach characterises policies which reflect a phase of information gathering and organisation or of information dissemination. In any case, it is often the precursor (as with strategic planning, consultation and institutional development) of, or complementary (outreach, information dissemination) to, more concrete measures. Not surprisingly, now that countries are seeking to promote new policy initiatives – in fact, the whole category of climate mitigation policy is new – a substantial investment is being made to inform people of the policy effort, and to seek input in the design of new policies. As can be seen in the aggregated data (Figure 4), the share of such policies in the total mix of newly implemented policies is high in all IEA regions. The comparatively higher number for the Pacific region may be interpreted as a result of the emphasis on voluntary approaches in those countries. Indeed, most of the initiatives undertaken in Japan are of a voluntary

nature, and require continuous efforts to promote public awareness to insure their success. It is also noteworthy that Japan and Australia, two of the three IEA Member countries in the Pacific region, have experienced considerable controversy in public debates over ratification, particularly when compared to European countries.

Figure 4. **Policy Type by Region, 1999-2001**



Fiscal measures and *regulatory instruments* are widely used in IEA Member countries to tackle climate change. Many IEA Members have explicitly adopted such measures as part of policy packages developed to implement the Kyoto commitments. Such measures usually play a central role in national climate strategies by modifying markets to "make room" for new or cleaner technologies.

Regulatory instruments modify a legal framework. In 2001, as in previous years, these instruments have been most commonly used to promote energy efficiency, as with the mandatory use of energy labels on cars introduced in early 2001 in the Netherlands, or renewable energy sources, such as the introduction of portfolio standards (mandating the share of renewable energy in the power generation mix) in 2001 in Illinois, USA. *Fiscal measures*, whether in the form of a tax or a subsidy, seek

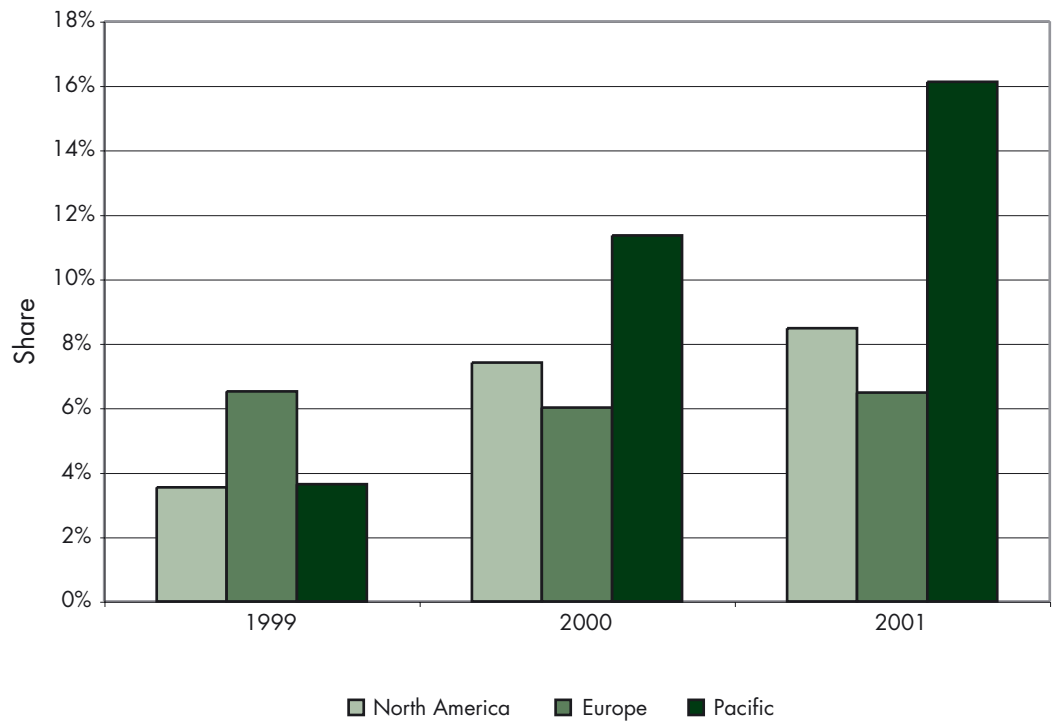
to change resource allocations or the prices of goods to promote clean technologies. Examples include the subsidy of renewables by feed-in tariffs (predetermined pricing for electricity produced from renewable energy sources) in France, or the use of tax exemptions in the United Kingdom to support combined heat and power generation (CHP). More fiscal and regulatory instruments were introduced in Europe in 2001 than elsewhere; they are much more heavily used there than in either the Pacific region or in North America. Both *fiscal measures* and *regulatory instruments* may generate economic and political constraints if they are not well developed. They may, for example, lead to the loss of competitiveness in a particular industry or induce industries to relocate in other countries with less stringent measures in place. They may also lead to social disruptions, such as those that arose after increases in petrol tax in several European countries during 2001.

Research, development and demonstration (RD&D) measures are another traditional area of government intervention. Although many analytical studies suggest that the private sector is best suited to pursue such measures, private RD&D investment occurs only under a specific (and limited) set of market conditions. At an early stage of technological development, risks are high, the payback period of RD&D investments is undetermined, and R&D findings are often difficult to protect. In the case of RD&D for climate-friendly technology, the current uncertainties on the timing of entry into force of the Kyoto Protocol is another aspect that limits private-sector interest. In these cases, whether it is investing public money or developing fiscal incentives for private investment, government intervention plays an essential role in filling the gaps in RD&D investment. Indeed, despite the recent private-sector rush for "social responsibility", "triple bottom lines" (i.e., social, environmental and economic) and "sustainability" reporting, or the acknowledgement from major private-sector players that "clean" technologies will form one of the important markets of tomorrow, private-sector RD&D efforts, although increasing, have been relatively limited. Government support to RD&D, as with *fiscal measures* and *regulatory instruments*, aims to stimulate the creation of new markets for climate-friendly technologies. The share of RD&D policies in the mix of new policies taken over the past three years, both nationally and supra-nationally, is particularly interesting as it clearly reflects major differences in approaches to climate change mitigation. Government funding of RD&D is especially frequent in North America where such measures represent close to a quarter of newly implemented policies (Figure 4). For the United States especially, this trend reflects the ambition to curb GHG emissions by competitive technological development rather than an early use of more rigid measures such as regulatory or fiscal instruments.

Voluntary agreements rely on co-operation between governments and actors of the various energy-intensive sectors to reduce GHG emissions. The use of such voluntary approaches usually represents a small share of national strategies, but has an important role in offering a flexible and integrated (public-private) approach compared to traditional policy instruments. An examination in regional blocs of new measures involving *voluntary agreements* over the past three years (Figure 5) reveals

that such measures are playing an increasingly important role in the Pacific and North American regions, although they are generally less central to the policy developments in Europe.

Figure 5. **Change in the Share of Voluntary Agreements in Total of New Policies by Region, 1999-2001**

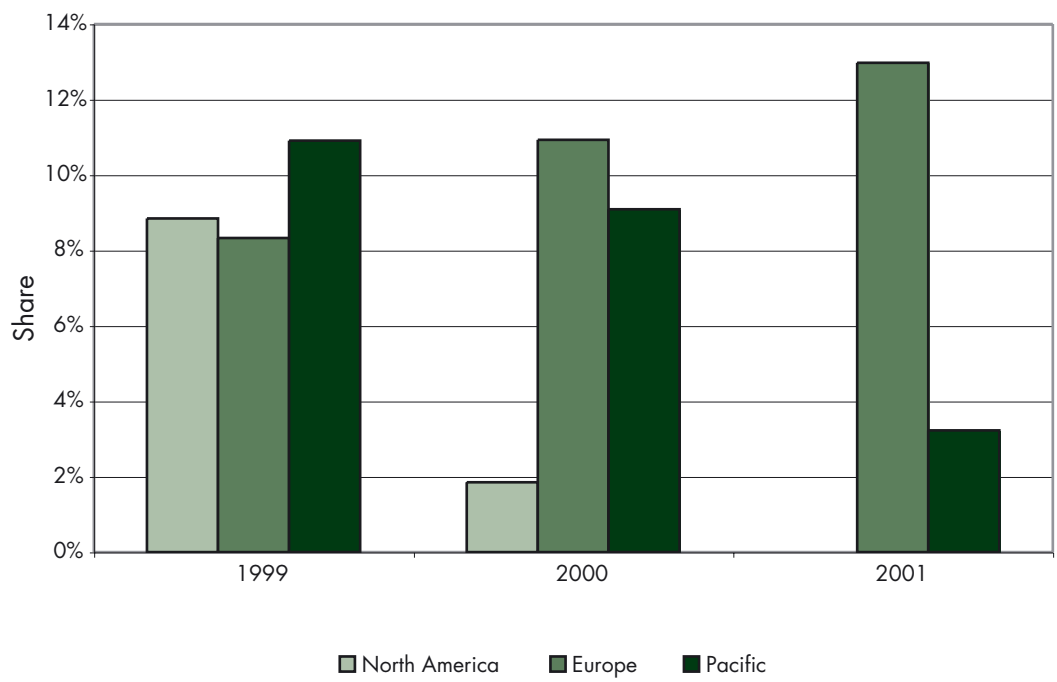


Tradable permits, whether emissions trading, green certificates or flexible mechanisms, have been a central theme of international and national debates on strategies to mitigate climate change. The inexperience of countries in using such options to reduce GHG emissions as well as the complex framework required to exploit the flexible and efficient nature of these measures fully have meant a slow start in their use. With such measures representing over one in ten of all measures newly undertaken in IEA Member countries, 2001 confirmed the central role that market instruments will play in climate mitigation strategies both nationally and internationally. In 2001, policies and measures involving tradable permits were adopted or planned by thirteen countries and by the European Union, twice the number of countries as in 2000. At present the most active countries in developing policies for tradable permits are in Europe – an EU-wide trading scheme for GHG emissions is expected to be launched in 2005. As a result, a real momentum for the implementation of such measures in European countries is clearly developing (Figure 6). Interestingly, at the same time, no new measures for tradable permits were

taken or planned in 2001 in North America, and only a few in the Pacific region – although in both regions, exploratory efforts were launched in 2000 and earlier.

The policy types mentioned above are the ingredients of IEA Member countries' climate change strategies. With a database covering multiple years, it is possible to observe policy preferences over time in the different IEA regions. Although all regions have considered each of the policy options, the use of tradable permits is most pronounced in Europe, voluntary agreements are the focus of both the Pacific countries and North America, while North America holds a clear lead in focusing on RD&D measures.

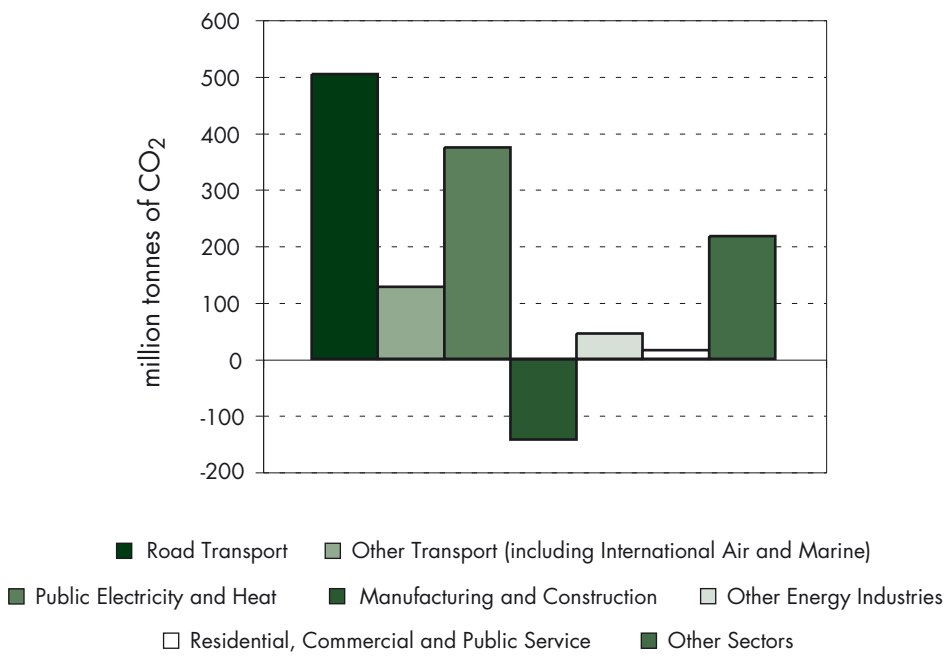
Figure 6. **Change in the Share of Tradable Permits in Total of New Policies by Region, 1999-2001**



Policy Focus: The Transport Sector

Emissions of CO_2 from transport in IEA Member countries have increased more than in any other sector between 1990 and 1999 (Figure 7), with road transport accounting for most of the growth. Based on the IEA 2002 *World Energy Outlook* (IEA, 2002), under a business-as-usual scenario (the "reference scenario"), energy demand from transport in IEA Member countries over the next three decades will continue to grow faster than any other sector – although at a generally slower rate than in the past. The share of road-based transport will more or less remain constant, at approximately 80-90% of total passenger transport (in passenger-km). Road-based freight transport is expected to take a larger share of total freight transport (increasing to 50% in both IEA North America and Pacific, and up to 80% in IEA Europe)[1]. This high share of energy use in road-based transport translates into close to 90% of CO_2 emissions from the transport sector as a whole (Figure 8).

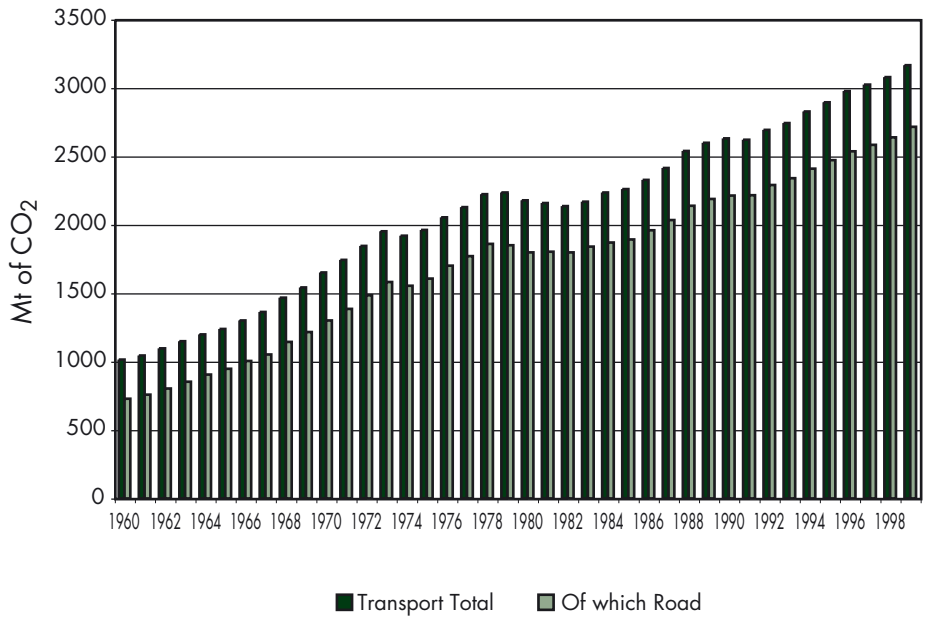
Figure 7. **Change in CO_2 Emissions by Sector in IEA Countries, 1990-1999**



Source: IEA (2001) – *Saving Oil and Reducing CO_2 Emissions in Transport.* International Energy Agency, Paris.

1. Data based on the IEA *World Energy Outlook 2000* (IEA, 2000) alternative transportation case (forecasts through 2020).

Figure 8. **Evolution of CO_2 Emissions from Transport, 1960-1999**



These statistics make clear that road transport must be addressed if GHG emissions from the transport sector are to be reduced. Yet it is apparent that measures to mitigate climate change in the transport sector have, to date, had little if any effect on GHG emissions. Partly because of the central role transport plays in the social and economic structure of IEA Member countries, the responsiveness to fluctuating fuel prices for cars and other vehicles using the road network is very low. Evidence from past research indicates that a 10% increase in fuel prices usually results only in a 1-3% decline in travel (IEA, 2001). This renders the use of fiscal measures on conventional energy sources, already heavily taxed in European countries and Japan for reasons other than their environmental impact, particularly difficult.

Moreover, although fleet turnover for private vehicles is only approximately 10 years, the capital stock turnover for transport infrastructures is particularly long, from 40 to well over a hundred years. As a result, few policies taken in the transport sector could be expected to have a significant result in the Kyoto Protocol first commitment period (2008-2012), and any major project of road or rail construction would not only be extremely costly and controversial, but also time-consuming.

IEA Member countries have nevertheless been active in the transport sector over the past three years. Transport policies represent almost 20% of all policies and measures taken by IEA Member countries in 1999, 2000 and 2001. But in contrast to policies addressing activities in other sectors, most of the mitigation effects of transport policies are likely to show their most substantial results only in the longer term.

Although surface transport is the focus of IEA Member countries' policy action, air transport is also growing rapidly, and will ultimately require policy action to reduce emissions. Yet the international nature of the air transport sector means that few countries have taken any policies in this area. One policy recorded in the database is the development of a strategy paper by the European Commission in 1999 that proposed unilateral charges on air transport by 2001. No follow-up work on this plan has yet taken place.

A study recently carried out by the IEA (2001) suggests that three broad policy options are available to governments to reduce GHG emissions from surface transport.

- Option 1, *improving fuel economy through technical changes to vehicles*, is based on the technical characteristics of vehicles and how they can be improved, modified or simply replaced to reduce fuel consumption. Within this category of actions, a clear distinction can be made between efforts on conventional technologies and on new technologies.
- Option 2, *improving the on-road fuel efficiency of vehicles*, focuses on existing vehicles, and how their in-service properties, the way they are driven and the transport infrastructures on which they operate can be enhanced to reduce GHG emissions. A distinction is made between *vehicle maintenance* measures, *on-board driving technology and driver training* measures, the use of *speed limits and enforcement, traffic flow and roadway capacity* enhancement, and *scrappage programmes.*
- Option 3 consists of measures aimed at *reducing vehicle travel.* A broad distinction can be made within this category between *transit systems and modal switch improvement* measures, *pricing* mechanisms, *parking-related* measures, *land use planning and the use of non-motorised modes of transport,* as well as measures to promote *teleworking* (working from home) and thus reduce the time spent commuting.

Table 1 is based on polices and measures submitted by Member countries over the past three years in the scope of the IEA project "Dealing with Climate Change". This table may not therefore reflect all transport-related measures adopted by IEA Member countries over the past three years. It focuses only on measures that affect surface transport, and is limited to those proposed or adopted specifically to reduce GHG emissions (thus omitting policies that may have effects on emissions but were adopted in a separate context, such as those related to urban congestion or mass transit).

The policy listings make clear that the national focus to date has been on improving fuel economy through technical changes to vehicles. The majority of these measures involve the exchange of information and include mandatory labelling of fuel consumption and of the emissions of new passenger cars imposed by many European countries over the past two years as a result of a 1999 European Union directive. More direct measures were also applied to promote improvements in fuel efficiency; these include the agreement signed between the European Commission

and European/Korean/Japanese car-manufacturers in 2000 to increase the efficiency of new models, and the grants scheme set up in Luxembourg for the purchase of efficient vehicles in 2001.

There is considerably more diversity in the measures used to promote advanced vehicle technologies. In addition to measures intended to stimulate the funding of RD&D, fiscal measures (such as tax incentives or grants) and information dissemination programmes have been used to promote technological development. Over the past three years, multiple technologies have benefited from such policies, including hydrogen fuel cells, vehicles using liquid natural gas (LNG) and ethanol-blended fuels.

European countries and Japan put an approximately equal emphasis on measures promoting technical changes to conventional vehicles and advanced technologies. In North America, by contrast, measures to promote advanced technologies represent the majority of cases. The rationale for such differences may lie partly in regional culture (cars play a central role in both Canada and the United States), and geographical characteristics (since the large populations of both Canada and the United States are distributed over a wide area, road transport is particularly important). An additional impetus for European policy action is the importance of generating reductions to meet the Kyoto commitments in the nearer term; compared to measures promoting the development of new technologies, measures promoting efficiency developments of conventional vehicles have substantially bigger mitigation effects in the short term. For example, more efficient vehicles are expected to enter the European market as a result of the agreement signed with Korean/Japanese car-manufacturers before 2010, while results from RD&D investments are often estimated to require up to 30 years to mature.

Only 7% of all transport-related measures in the past three years fall under the category of "improving the on-road fuel efficiency of vehicles", partly because of the downstream nature of such policies, which usually involve high logistics costs and generate relatively limited reductions in emissions for the degree of effort expended. New policy initiatives may help offset such costs, not least by associating new policies with other programmes already in existence. For example, periodic vehicle maintenance is already obligatory in most IEA Member countries (largely for reasons of road safety); Canada (through an initiative of the government of Ontario) has expanded the scope of its vehicle maintenance programme to cover climate mitigation through its 1999 "drive clean" programme. Similarly, driver training is already required in all IEA Member countries. Expanding the scope of training to include less fuel-intensive driving techniques (e.g., information dissemination on the gains in fuel efficiency possible through improvements in braking and acceleration techniques, engine idling, etc.) has been exploited as a way of reducing emissions from the transport sector in Switzerland. Speed limits, too, are being considered as policy tools (in 2001, for example, the EU developed plans to reduce speed as a fuel efficiency measure), as are policies to control traffic flow, to improve roadway

capacity and to encourage the scrapping of old vehicles. A central advantage of these policies is their near-term benefit: unlike many of the technology options, they can reduce emissions well within the Kyoto time-frame (2008-2012).

Option 3, "reducing vehicle travel", represents 40% of all measures taken by IEA Member countries over the past three years and includes some of the most ambitious and innovative programmes. Improving transit systems and encouraging modal switching (for example from road to rail) has been a priority in European countries and, to a lesser extent, in Japan and Canada. In 2001 alone, the EU adopted five major measures in this field, including the creation of the European Reference Centre for Intermodal Freight Transport (EURIFT) to support the development of the intermodal transport industry, and the development of a programme to encourage shipping over short distances by sea. Information dissemination campaigns – such as the European Car-Free Day – have also widely been used to promote public transport. Other major developments, such as the opening of a new subway system in Athens, have also occurred in recent years.

A number of different policy instruments have been applied to reduce travel by vehicle. One of the most widely used is taxes, such as the heavy-weight tax developed in Switzerland in 2001, or the Dutch tax scheme aimed at discouraging the use of company cars for private purposes. Pricing mechanisms have also been used to reduce travel by vehicle. Options such as roadway pricing (tolls), annual registration fees based on travel distance, or pay-at-the-pump programmes are alternatives that have been extensively studied for their GHG emissions reduction potential but they are rarely used for such purposes. This trend seems likely to change in the next couple of years, as GHG emissions from road transport will continue to increase, particularly around urban areas, and pricing policies already planned are implemented. For example, the municipality of Tokyo is planning road-pricing schemes to reduce emissions, and a toll ring around central London is under consideration to reduce congestion and GHG emissions.

Another new, innovative possibility for reducing travel by vehicle is the development of teleworking. Japan and the United States are the only IEA Member countries to have actively developed measures to promote this option over the past three years.

Although not fully considered in the IEA database of climate change policies and measures, land use planning can have a considerable impact on GHG emissions. Over the long term, planning the design of urban areas with the goal of limiting GHG emissions from road transport can substantially reduce emissions. Similarly, in the short term, including facilities for pedestrians and bicycles in land use planning can also have an impact on GHG emissions. Such measures have been developed in many IEA Member countries often for reasons other than mitigating climate change. Some measures of this sort are listed in the database – but more may be currently undertaken and not reported – as they often fall outside the purview of energy agencies in governments.

Table 1. **Transport Policies Taken over the Past Three Years in IEA Member Countries to Mitigate Climate Change**

Policy Options		Australia	Austria	Belgium	Canada	Czech Republic	Denmark	European Union	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Japan	Luxembourg	Netherlands	New Zealand	Norway	Portugal	Spain	Sweden	Switzerland	Turkey	UK	USA	IEA North America		IEA Europe		IEA Pacific		IEA TOTAL		
Improving fuel economy through technical changes to new vehicles	Conventional technologies	3	1		1		3	2	1		1	1				1	2	2									1	2	10%	13	22%	4	33%	19	21%	
	Advanced technologies	2			5			2		1		1				3				1	2	1	1			1	6	11	55%	14	23%	5	42%	30	33%	53%
Improving the on-road efficiency of vehicles	Vehicle maintenance				1																							1	5%	0		0		1	1%	
	On-board driving technology and driver training																							1				0		1		0		1	1%	
	Speed limit and enforcement																											0		0		0		0		7%
	Traffic flow and roadway capacity							1				1														1		0		3	5%	0		3	3%	
	Improving transit systems – mode switching																				1							0		1	2%	0		1	1%	
Reducing vehicle travel	Improving transit systems – mode switching			1	2		2	6	1	1		2				2	1	1			3		1					2	10%	21	35%	2	17%	25	27%	
	Travel pricing mechanisms							1										2						2			2	2	10%	5	8%	0	0%	7	8%	
	Parking-related measures							1																			1	1	5%	1	2%	0		2	2%	40%
	Land use planning and non-motorised modes																1											0	-	1	2%			1	1%	
	Telematics and telework															1											1	1	5%	0		1	8%	2	2%	
																												20	100%	60	100%	12	100%	92	100%	100%

Policy Focus: Renewable Energy Production

Renewable energy has been defined by the IEA as energy from natural processes that are replenished constantly. In its various forms – including solar, wind, biomass, geothermal, hydro and oceanic (waves, tidal), as well as hydrogen derived from renewable resources – it is derived directly or indirectly from the sun, or from heat generated deep within the Earth.

The profile of renewable energy has been raised by its environmental advantages, which can be measured in terms of the local pollution and GHG emissions avoided. The competitive position of renewable energy *vis-à-vis* fossil fuels would improve substantially if a market price were attached to these factors. Renewables can also contribute to the diversification of the energy sector – the expansion of fuel sources beyond conventional fossil fuels – with resulting economic and security benefits. Nevertheless, governments are pursuing a wide range of strategies to promote the development and broader use of renewable energy technologies.

Over the past five years, renewable energy technologies have advanced considerably, and costs are continuing to decline, resulting in increasing market penetration. According to the IEA *World Energy Outlook* (IEA, 2002), renewables are the fastest-growing segment of the energy sector. Nevertheless, the *Outlook*'s "Reference Scenario" indicates that non-hydro renewables, at 2% of electricity generation in the OECD area in 2000 (the base year), will achieve only 8% in 2030, on the basis of policies in place by mid-2002. Yet, the *WEO 2002* Alternative Policy Scenario suggests that policies and measures under consideration in 2002 could more significantly increase the share of non-hydro renewables in electricity generation in the OECD, reaching over 14% in 2030. These widely divergent scenarios are an indication of the degree to which the recent and near-term market success of renewable energy sources is dependent on government intervention.

Most IEA countries have increased market support for energy from renewable sources, intending that they should play a larger role in the supply of energy as a whole. Although historic support in the European Union (Oosterhuis, 2001) and the United States (Goldberg, 2000) shows that current annual tax relief and budget transfers for renewable energy are still substantially below support for more mature sources of energy (such as coal, oil and gas), budgets to support renewable energy could increase with growing market shares.

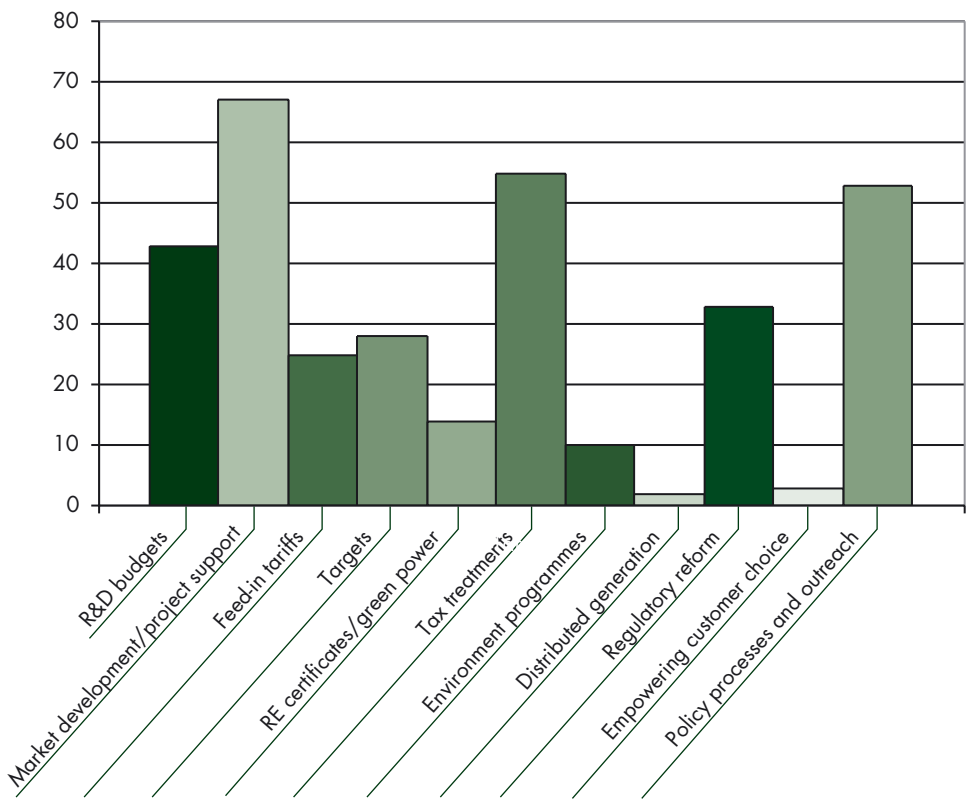
Insights from the Policies and Measures Database

The distribution of renewable-specific policies in the database is shown in Figure 9. Government instruments to enhance emerging technologies generally evolve to follow technology advances and market developments; variations in the balance of policies in each group give an indication of how the focus of incentive systems is changing. Although a comprehensive review of all policies has not yet been

undertaken, IEA countries seem to be enhancing direct technology and project support mechanisms with policies that establish competitiveness by valuing a fuller range of costs and benefits in the context of sustainable development goals.

The wide range of policies currently being used (as described below) to promote the development of renewable energy in IEA countries is unsurprising: the diverse characteristics and benefits of renewable energy make it difficult to envisage a single instrument to foster its market development. Currently, the database reveals that a combination of instruments is being used to address different aspects of the challenge of bringing renewables into mainstream use. Recent trends indicate that these combinations of policies have so far been successful in accelerating the market penetration of renewables.

Figure 9. **Number of Entries for Current Renewable Energy Policies in IEA countries**



Source: *IEA (2002) – Database on Renewable Energy Policy Frameworks in IEA countries.* International Energy Agency, Paris.

- *Research and development*: although publicly funded energy R&D[2] has been decreasing throughout the 1980s and 1990s, funding for research into renewable

2. Energy Technology R&D Statistics Database, IEA.

energy has stayed relatively stable. Funding is increasingly aimed at helping industry to reduce costs of energy production to increase commercial viability.

- *Capital grants* for market development are still a major element of renewable energy policies in IEA countries (see Figure 9). There are currently 66 entries in the renewable energy policies and measures database that relate to government grants for the development of renewable energy, although information is not available on spending. In most cases, though, this type of instrument is now limited either to very small-scale technologies which cannot directly compete on mainstream markets under current conditions, or to technologies which are handicapped by high costs of market entry.
- *Feed-in tariffs*: by rewarding energy production instead of investments, feed-in tariffs encourage market deployment while promoting increases in production efficiency. Fourteen IEA countries are applying favourable tariffs for the production of electricity from renewables. Advanced "feed-in" tariffs – where incentives are reduced over time to reflect reductions in the cost of technologies, or are banded[3] to reflect differences in available technologies, resources and other variables – have recently been implemented in France and Germany.
- *Targets*: clear targets have now been set for the size of renewable energy markets in IEA countries, providing more policy stability for stakeholders. Australia has established a target for renewable penetration and has implemented renewable energy certificate trading. Europe has implemented the Directive on the Promotion of Electricity from Renewable Energy Sources in the Internal Electricity Market,[4] setting indicative national targets for the penetration of renewable energy in EU member States (an EU-wide target has been set at 12% for gross domestic energy consumption by 2010). Although not mandatory, these targets will become binding if projections show that countries will not meet them. The United States is debating a national portfolio target for renewables; fourteen states have already instituted renewable portfolio standards.[5] Japan and New Zealand are also considering establishing portfolio targets.
- *Renewable energy certificates*: as a means of achieving these portfolio targets, tradable renewable energy certificates (TRCs) are being presented as the instrument of preference to build markets in renewable energies – although, since they were introduced only recently, it is not yet clear how effective they will be. They generally include penalties for non-compliance – or ceilings on the certificate price – which are expected to be high enough to encourage a range of investments in renewable energy.

3. In thie case, banded refers to a differentiation of tariffs.

4. *Electricity Production from Renewable Energy Supply*, Directive 2001/77/EC of the European Parliament and the Council on the promotion of the electricity produced from renewable energy sources in the international electricity market (http://europa.eu.int/comm/energy/en/fa_3_en.html). European Commission, 27 September 2001.

5. Database of State Incentives for Renewable Energy (DSIRE), United States (http://www.dsireusa.org/).

- *CO_2 and other environmental taxes* are being used in many countries, resulting in competitive gains for renewable energy projects compared with fossil fuel projects. Ten IEA countries have implemented taxes to reflect environmental costs based on the CO_2 content of energy sources or on electricity consumption.[6] These taxes have been introduced over the last ten years to serve environmental goals (reduction in CO_2 emissions, etc.) but also as a means to offset other, more distortionary taxes seen as hampering economic growth.

- Regulatory reform has generated a number of new legislative requirements that have promoted the penetration of renewable energy. Perhaps most significant of these have been requirements to offer power customers with a choice of provider – including of green electricity products offered by distributors. This has been further encouraged by regulations on labelling schemes which oblige utilities to reveal what resources were used to produce electricity.

Governmental support for emerging technologies usually evolves to follow technological and market developments. Support measures for renewable energy are thus becoming more elaborate, reflecting experience gained in policy-making, as is demonstrated in the evolution of policies in IEA countries, with specific attention given to supporting developments from laboratory to market competitiveness.

A Closer Look at Key Renewable Energy Policies

Feed-in tariffs from straight/direct incentives to advanced systems

Feed-in tariffs are based on actual energy production, providing an incentive to maximise capital use and reduce the costs of energy production. In doing so, they reduce costs to consumers; they thus may be contrasted with capital incentives, which reduce initial costs of obtaining capital for plant construction.

Straight feed-in tariffs set a predetermined buy-back rate for all electricity produced under certain conditions. Where bidding systems are used, regulatory authorities decide on an amount of electricity to be produced from renewable energy sources and invite project developers to bid for that capacity. Successful bidders are guaranteed their bid price for a specified period – fifteen years in the case of the UK's Non-Fossil Fuel Obligation (NFFO).[7]

To date, fourteen IEA countries subsidise electricity produced from renewable energy sources through feed-in tariffs. Those that boast the highest deployment rates for renewable energy (Table 2) are the ones that have chosen to implement stable, long-

6. Few of these countries have applied the full CO_2 tax on fossil fuel use in electricity generation.
7. The Non-Fossil Fuel Obligation (NFFO), a policy developed in the United Kingdom in 1990 (replaced in 2000 by the Renewables Obligation), is a scheme by which electricity companies are obliged to buy a fixed amount of power from producers of non-fossil fuels. This capacity was secured through contracts which paid premium rates to electricity generators using renewable energy sources. The Non-Fossil Purchasing Agency (NFPA) selected the eligible technologies when they showed the potential of becoming competitive (and also excluded technologies which were approaching competitiveness in the open market and no longer required financial support). The NFPA then invited renewable energy generators to compete in a tender process.

term feed-in tariffs. The United Kingdom has chosen a bidding system but has not issued any bids beyond NFFO 5,[8] and has now introduced a Renewable Obligation, combined with TRCs. France too has chosen a feed-in tariff system to overcome low deployment from existing incentives provided to wind energy (Eole 2005).

Table 2. **Impact of Incentive Schemes on the Installed Wind Power Capacity in Europe**

Incentives	Country	Installed capacity in MW (end 1999)	Additional capacity in MW (in 2000)
Fixed feed-in tariffs	Germany	4445	1668
	Denmark	1742	555
	Spain	1530	872
	Total	**7717**	**3095**
Bidding systems	United Kingdom	356	53
	Ireland	73	45
	France	23	56
	Total	**452**	**154**

Source: *Wind Power Monthly,* The Windindicator (www.wpm.co.nz).

In spite of their success, some early feed-in tariffs did not differentiate according to available resources, leading to strong geographical concentration of projects in the regions with the highest resources. Feed-in tariff programmes for wind have been modified to address this issue. For example, to calculate the recently announced French wind feed-in tariff, governmental authorities defined a standard rate of return for projects using a profitability index (Chabot *et al.*, 2002) and calculated tariffs to make projects in regions with high and low renewable energy resources equally profitable. This step is intended to balance the geographical development of wind projects, but it does so at the expense of efficiency in power generation.

Some feed-in programmes fail to recognise that costs can drop as markets grow. In newer programmes, "technology learning" (OECD/IEA, 2000) is reflected as buy-back rates for successive fifteen-year contracts decrease from year to year. The EEG (Erneubare Energiengesetz) introduced such a system in Germany; it became effective in April 2000.

A comparison of markets nonetheless shows that in countries with feed-in tariffs, maximum reductions in technology costs have not always been attained (World Bank, 2001). Yet these are the countries which have developed the most vibrant renewable energy industries. It would appear difficult simultaneously to achieve high rates of market growth, promote industry development and meet cost-competitiveness goals, despite continuous innovation in policies.

8. NFFO 5 was the fifth bidding round of the NFFO.

Obligations and trading

The adoption of feed-in tariff systems has led to debates on their economic efficiency. One of the main issues is to define how the benefits from price reductions arising from government support should be redistributed between consumers and industry.

Many countries are now considering (or have already implemented) minimum renewable energy targets combined with TRC systems as a way to stimulate the development of renewable energy markets while minimising their costs. By introducing a certain degree of competitiveness in the market for renewable energy, governments seek to bring down technology costs and increase efficiency in production.

Portfolio targets: by guaranteeing a minimum market size and a schedule for implementation, governments reduce regulatory uncertainty and attract private-sector investment. Environmental goals are often used to justify renewable energy targets, but energy security is also increasingly being cited as a major factor in such decisions. The requirement to meet the target can be imposed on a variety of market participants (the power producer, the electricity utility, the transmission company or large end-use consumers).

Tradable renewable energy certificates: in theory TRCs reveal the marginal cost of reaching a certain renewables market penetration by creating a tradable commodity. The principle is simple: liable entities (generators, suppliers or even end-users, depending on the country) are mandated to generate or use a given quantity or percentage of electricity produced from renewables. Certificates are issued by the generators and must be surrendered by liable entities to prove compliance. They are traded separately from the electricity, their price representing a premium that generators of renewable energy will seek to maximise by lowering their production costs and competing for the largest market share. TRCs have the advantage of letting liable entities fulfil their renewable energy obligations at least cost by acquiring the cheapest available certificates.

Each certificate contains information on its origin, which means that potential purchasers can choose those from specific technologies. In theory, preferences can be defined, leading to different TRC prices for each technology. Data from Australia's Office of the Renewable Energy Regulator (ORER), for example, show that companies without a public profile tend to pick up the lowest-cost certificates,[9] regardless of the underlying energy source, while others have been less inclined to acquire certificates that environmental groups question on ecological grounds. Spot-market prices for Australian TRCs vary according to the origin of certificates. (Spot-

9. ORER registry for renewable energy certificates (http://www.rec-registry.com/).

market prices, though, are not particularly informative, since most trades – for the moment, at least – are based on bilateral contracts for which prices are not communicated.)

Markets apparently differentiate between certificates from different technologies, even if the differences in price reflect not so much the differences in cost of the underlying technologies as a preference for sources perceived as cleaner. This differentiation arises because certificate trading does not monetise the expected contribution of renewable energy as full-cost pricing would, but instead reflects an *assumed* value, based on the commitment of the government in question to develop a specific share of renewables in total electricity generation. The price of certificates will depend on the targets set, how they are to be enforced (specific penalties), other support measures for eligible renewable sources, and the resulting scarcity of certificates.

Since combined TRC and obligation systems would benefit mostly those technologies already closest to market competitiveness, in the absence of other support systems they will not necessarily result in the development of a diversified portfolio of renewables. That is why governments often complement them with other support measures for those renewable sources – not least programmes for R&D and government purchasing – that are not competitive enough to find their niche on the market established by the obligation. In some cases, governments have also banded the obligations to ensure the development of a diverse renewable energy portfolio.

Policy Analysis

Optimising Climate Change Mitigation: A Policy Assessment Exercise

Climate change is a particularly complicated area for governments to tackle. Internationally, the complexity of the issues at stake is reflected by the difficulties in reaching agreements in the climate change negotiations. Although the negotiations appear to have reached a successful conclusion with the near-unanimous international consensus for the ratification of the Kyoto Protocol, in reality the task has been passed to national governments, which now must determine – if indeed they ratify the Protocol – how best to reach their goals in reducing emissions.

The IEA database reflects the fact that Member countries are actively pursuing GHG emissions reductions through a substantial variety of policies and measures. In light of the extent of policy action, it is not surprising that efforts to improve the monitoring and assessment of policy effectiveness are under way. In fact, the value of such exercises has been recognised throughout the history of the international negotiations on climate change. However, the advent of legally binding obligations under the Kyoto Protocol made the development of policies certain to meet national targets all the more critical. Moreover, as policies become more stringent, they also cost more – and efforts to identify the cost-effectiveness of policy interventions are increasingly in demand.

Policy assessments and follow-up, however, do not yet form an integral part of decision-making processes in most IEA Member countries. Few of them provide integrated analyses of the effects of their energy policies in aggregate, and only a few more provide in-depth assessments of individual measures.

The European Commission, in its project "Monitoring Mechanism of Community Greenhouse Gas Emissions", makes this clear. Its annual reports (of which there have been two to date, in 2000 and 2001) assess the projected progress of member States in fulfilling their commitments on GHG emissions under the Kyoto Protocol. The main conclusion of the 2001 report is that *"member States' projections suggest that existing policies and measures will not be sufficient to continue the EU-wide reductions of total EU greenhouse gas emissions* [... and that ...] *progress made so far will be outweighed by further increases."* The report also highlights the lack of quantification of the effects of policies and measures, in terms of both GHG emissions reductions and costs. Table 3, extracted from the 2000 report focuses specifically on policies and measures to mitigate climate change. Its conclusions are corroborated by the 2001 report, which indicates that *"reporting on projected progress has not*

significantly improved." It reflects the range in quality and depth of information from EU member States on their climate change policies and measures before 2000.

Table 3. **Information from EU Member States on their Policies and Measures, and their Costs**

Country	Information on costs	National programmes and updates
Austria	Some information on policy costs. None on non-GHG mitigation	Draft Climate Strategy Report, 2000
Belgium	None on policy costs or non-GHG mitigation	Specific communication, June 2000
Denmark	Little or no costs data, and non-GHG mitigation not included	Climate 2012 Strategy, March 2000; Energy 21 reviews, June 1999
Finland	Little or no costs data	Specific communication, April 2000
France	Overall investment costs given but not for individual measures. Non-GHG mitigation not addressed	National Climate Change Programme, February 2000
Germany	None on policy costs or non-GHG mitigation	Specific communication 1999; interim report on Climate Strategy, 2000
Greece	None on policy costs or non-GHG mitigation	Table compiled by NOA, May 1999
Ireland	Abatement cost supply curves given but measures aggregated	Second National Communication (UNFCCC) and national study
Italy	Overall costs given	Second National Communication
Luxembourg	None on policy costs	National Strategy, May 2000
Netherlands	Detailed info on policy costs	Climate Policy, June 1999
Portugal	None on policy costs	Portuguese GHG projections, April 2000
Spain	None on policy costs	Second National Communication
Sweden	Good information on policy costs	Specific communication, March 2000
UK	Limited policy costs are included. Benefits other than GHG reductions discussed	Draft Climate Strategy, March 2000

In the United States, although considerable information is available on each policy, only about a third of the policies listed in the Third US Communication to the UNFCCC Secretariat[10] have detailed information about the annual expected reductions in emissions – and none of the policies reported includes a specific projection of their longer-term effects. The United States does seek to assess the interactions between policies by projecting the effects of the measures that it undertakes, but the model used to make these projections does not incorporate

10. See http://unfccc.int/resource/docs/natc/usnc3.pdf

specific policies; instead, it projects their collective effect through a series of assumptions on price and competition.

A New Policy Tool

In theory, determining the most appropriate policy programme to mitigate climate change would consist of several steps: countries would first assess the reference case (that is, where no policy was in force), and then compare it, from the perspective of welfare[11] changes, to a series of alternative cases, where different types of policy were in force; decision-makers could then select the most appropriate programme of actions. In reality, countries do not undertake such analyses, since a number of reasons, both technical and political, make them difficult, if not impossible. A central consideration is that climate change is an extraordinarily complex, multi-sectoral problem involving multiple social, economic, political, environmental and ecological factors over a very long time-frame. (This in part explains the discrepancies in the information supplied by EU member States in Table 3.)

There is nevertheless growing recognition that an assessment framework is essential in determining the most economically, socially and environmentally sound pathway for policy. One approach is to use models which project the outcomes of different policy options and which thus help policy-makers assess their impact.

The type of model used has an important impact on the range of results obtained. The most basic distinction that can be made is between macro-economics-based "top-down" and technology-based "bottom-up" approaches. Each technique has its benefits and drawbacks. "Top-down" models, for example, are unable to effectively reflect the "no-regret"[12] potential of technology-related measures. Conversely, "bottom-up" approaches usually fail to reflect the full effects of more general parameters, such as the influence of markets and organisational measures, or of learning. These differences can produce substantially different results, with "bottom-up" models generally leading to lower costs than "top-down" models. The value of combining the two approaches is increasingly being accepted – although it is still rarely applied.

Case Studies

Three case studies of current policy assessment schemes in IEA Members – France, the Netherlands and the European Commission – illustrate the importance, as well as the complex nature, of such exercises.

France

France presented its Third National Communication under the UNFCCC at the end of 2001. It prepared three energy policy scenarios, based on a bottom-up approach: one with no measures, another with measures taken before the end of 1999, and a

11. That is, the wellbeing of society as a whole.

12. Measures which can be implemented at zero or negative costs.

third with all measures planned in the document. France does not provide details on individual policy costs. A further study was commissioned by the government and carried out by the Commissariat Général du Plan on economic modelling and climate change policies (Plan, 2002). It examined the efforts carried out in the preparation of the Third National Communication and concluded that a complex sectoral co-ordination and methodological framework were missing to assess disaggregated policy costs rather than technical capabilities.

The study further determined a methodology to assess the cost, not of individual policies, but of policies grouped in packages sufficiently independent of one another (usually by economic sector) so as to include the effects on costs of interaction with related polices. As modelled, the approach would examine only the direct effects of policies – not the ancillary benefits.

These studies on the assessment of energy policies are carried out on average every five to seven years (Plan, 2002).

The Netherlands

The Netherlands is one of the few countries where energy scenarios are based on an integrated method: parameters determined by a bottom-up model are introduced into a top-down model. Then, through an iterative approach, the assessment group seeks to converge on "reasonable results" that are then used in policy selection. The degree of co-ordination and organisation in this process is very high. First, all projections are based on the same data and assumptions. Second, international parameters and major economic hypotheses are systematically revised every four years. Third, energy scenarios are updated every two years, providing a regular and frequent follow-up and an opportunity to include measures recently implemented.

The Netherlands uses different discount rates for the two models. Sectoral discount rates are applied in the top-down approach, while a (generally lower) rate is applied in the bottom-up approach, although an iterative process is used to converge on a single discount rate that is then applied in both approaches.

Policy options are systematically assessed by experts for their costs, effectiveness and social acceptability and, if satisfactory, are either implemented or retained for possible implementation at a later date. In the latter case, three policy packages with increasingly stringent climate change mitigation potential are determined.

As with the French planning process, the Dutch analysis also does not include ancillary benefits in the cost calculations, although they are considered when experts discuss the various options.

The European Commission

The European Climate Change Programme (EC, 2001b) was established to support and co-ordinate the schemes of member States for reducing GHG emissions under the Kyoto Protocol. Based on co-ordinated analytical work started in 1999

(EC Energy DG, 1999; EC Environment DG, 2001a, b, c, d), policy scenarios expressing costs and emissions reductions were used to determine cost-effective measures across all sectors and for all EU member countries. To do so, both "bottom-up" and "top-down" approaches were used in parallel and compared as far as possible (although for non-CO_2 greenhouse gases, only the bottom-up approach was used). Although the two studies were based on different discount rates (4% for the bottom-up approach and between 8 and 17% – depending on the sector – for the top-down approach), adjustments were made to ensure comparability.

By adopting an approach based on cost-effectiveness with no sectoral or geographical prerequisites, the two-year scenario study allowed the Commission to design an EU-wide policy strategy to reinforce national efforts in the most cost-effective[13] manner. Yet, although the costs of individual policies were considered, indirect costs were seldom included in the calculations (not at all in the bottom-up approach and only to a limited extent in the top-down approach); ancillary benefits were not calculated.

Assessing the Cases

These three cases highlight several important points. First, technical expertise aside, *ex ante* policy assessment requires a high degree of organisation and co-ordination among policy-makers, economists, engineers and politicians. The cases observed suggest that it seems to be a matter of mustering sufficient political will to integrate the assessments in decision-making processes. In France, for example, such exercises are considered as research rather than policy support, and so the results are not systematically, or even adequately, transmitted to the politicians who take the final decisions on policy.

By contrast, the EU and, even more, the Netherlands use the results of continuous studies as an integral part of the decision-making process. Recognition of the value-added of long-term policy assessment ensures a minimum degree of co-ordination and organisation among users and developers.

Second, it is clear that policy scenarios cannot be the sole basis for such decision-making. Most analyses of previous projections, notably that carried out in the Netherlands (Bonney, 2001), have shown surprising differences between forecast and reality. Nevertheless, policy scenarios provide useful economic and environmental insights on potential outcomes. Over time, as constraints on emissions reduction increase and "basic" mitigation measures (such as "no regret" measures) are exhausted, pressure will rise on governments to develop the most cost-effective strategies, and policy assessment tools will become increasingly important. This will require efforts to integrate *ex ante* assessments with *ex post* analysis to learn and improve approaches.

13. In the EC programme, "cost-effective" refers to measures with a minimum average marginal cost of maximum (1999)€20 per tonne of CO_2 equivalent.

Third, some essential aspects of climate mitigation are not rigorously considered in any of the three cases cited above, although more because of the high degree of uncertainty among economists and scientists rather than through process errors. The potential impact of these aspects on policy outcome is nonetheless important and, even if it is not quantifiable, it should be systematically discussed by policy experts and economists. Some of the most important of these aspects are described in more detail below.

Ancillary costs and benefits, and double dividends

In all three of the cases examined, the analytical frameworks used do not estimate ancillary benefits and costs. Yet the very nature of climate change as a multi-sectoral and intergenerational issue involves a wide range of secondary costs and benefits – which are, unfortunately, very difficult to quantify, let alone evaluate in monetary terms or integrate into scenario-building models. Issues affecting health, ecosystems, equity or sustainability are of particular concern. Recent studies suggest that the ancillary benefits of climate change mitigation may represent between 30 and 100% of the direct costs of policies (IPCC, 2001; OECD, 2000).

Policy measures intended to mitigate the effects of climate change may also stimulate benefits in other sectors, often referred to as "double dividends". When, for example, a government spends some of the revenues it earns from taxing carbon, the environmental benefit is calculable in GHG reductions, while the spending may contribute to general revenues, to reducing government debt or to new technology research. Although better understood than ancillary benefits, double dividends still require considerable care in cost-benefit analysis.

Discounting climate change mitigation

Climate change mitigation occurs over many years. Policy scenarios are therefore usually based on long time-frames – generally several decades, which raises the issue of which discount factor to apply. France, the Netherlands, and the European Commission all use different values.

To some extent, these countries have avoided the potential impacts on cost estimates of discounting[14] since it is direct, immediate costs that form the bulk of the policy cost calculations. The theoretical impact of discounting if all costs and benefits of climate change mitigation are considered (including ancillary benefits occurring far in the future because of the adoption of a policy framework) is nonetheless worth investigating. Indeed, the time-span that should be considered would theoretically be that of climate change mitigation itself – that is, the length of time that greenhouse gases can reside in the atmosphere, which can be over a century. Such a long time horizon creates a series of problems. First, the use of discount rates based on current market values (as in the three cases described above) would not necessarily be justified (there are few markets where the maturity life-span exceeds 30 years).

14. See Newell and Pizer (2001) for a discussion on the potential impacts of discounting climate change costs and benefits.

Second, calculations would involve discounting the welfare of future generations, which raises difficult ethical considerations. Third, on a time-scale of such length, the value of the discount rate is not the only important parameter to consider; the way it fluctuates also has important consequences.

The US-based Pew Center on Global Climate Change recently carried out a specific study on discounting and climate change (Newell and Pizer, 2001) and found that variations in the parameters for discounting produced surprisingly high changes in the cost-benefit estimates of climate change mitigation. The Third Assessment Report of the IPCC (2001) likewise highlights the importance of the discount rate when determining policy scenarios.

Interaction between policies and measures

Hardly surprisingly, the framework in which a policy is developed substantially affects its outcome. For example, the effectiveness of a measure aimed at improving the energy efficiency of buildings by establishing standards (for insulation, or electricity consumption of appliances and lighting systems) is highly dependent on the technologies to hand. Similarly, the outcome of a measure aimed at reducing the personal use of cars depends a good deal on whether alternative options – not least public transport – are available. The interaction of policies and other measures therefore has to be understood, and a distinction has to be made between the potential of a measure in cost-effectiveness and emissions reduction and its current value.

In practice, this judgement is very difficult to make, and it is no easier integrating it into policy assessment exercises. It would require an assessment not only of how mitigation measures are affected by the existing environment (both physical and regulatory), but also of how they might be influenced by future measures – lower fees for the registration of cars, for instance, would obviously have an impact on measures aiming to promote public transport. One solution to this problem, applied in the French study (Plan, 2002), considered interactions among climate change measures by regarding not individual policies but sectoral packages of measures sufficiently independently of one another so that no interaction would occur. This approach may provide a simplified solution, but it is unlikely to be particularly accurate, especially for policies with intersectoral effects.

Impacts of Climate Change Measures on Fossil-Fuel Exporting Countries

Climate change policies and measures can have adverse effects on developing countries with economies highly dependent on the export of fossil fuels. Both the UN Convention (Article 4.8.h) and the Kyoto Protocol (Article 3.14) require that Annex I Parties strive to minimise adverse impacts on developing countries. Yet the extent to which a particular mitigation strategy can damage countries exporting fossil

fuels is very difficult to quantify, both in terms of the resulting reduction in fossil fuel exports and in the timing of this reduction.

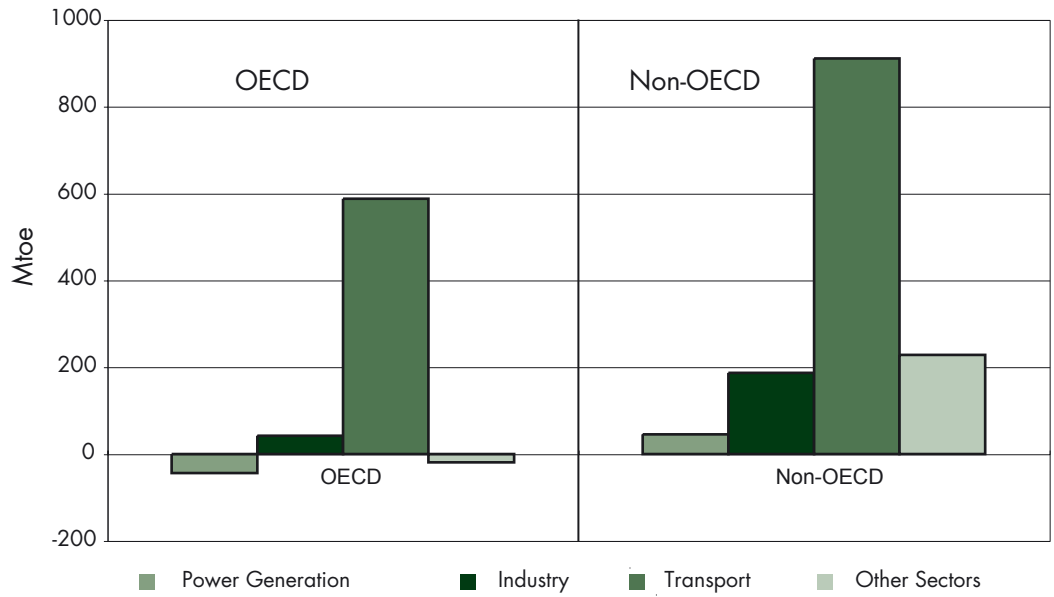
Reducing GHG emissions can involve three different types of action: *using less* fossil fuel resources through energy efficiency developments or a change in habits; *changing sources* of energy to cleaner technologies; or *capturing and sequestering emissions*, allowing the same processes to be used as beforehand, but with a decrease in net emissions into the atmosphere. All measures seek to promote one of these outcomes. Because these actions lead to changes in price or behaviour, each of them can have important economic impacts on fossil fuel use – and, by extension, on coal, oil and gas exporting countries.

Coal. In 2000, the top ten exporting countries were, in descending order: Australia, South Africa, Indonesia, China, the United States, Colombia, Russia, Canada, Poland and Kazakhstan. Together they accounted for more than 90% of coal exports. Only five of them, though, are developing countries whose exports might be affected by the policies of IEA Member countries – and for most of them the expected increase in domestic demand would absorb the production capacity freed by lower exports. Based on the current trends of coal use in OECD countries, and consequent changes in demand for imported coal, it appears that only South Africa would see any significant loss of revenue from policies implanted by OECD Member countries. Indonesia, which also has substantial exports to OECD countries, may also offset some of its revenue losses from lower exports of coal with an increase in exports of natural gas, demand for which is expected to grow more rapidly as a result of fuel-switching policies. Most reductions in the use of coal because of policy measures in the OECD countries seem more likely to reduce demand for domestic production, or production from other IEA Members (among them Australia, the United States and Canada).

Gas. GHG mitigation measures will generally benefit countries which export gas: it is the least carbon-intensive source of energy among the fossil fuels, and as a result is often used to replace sources which are less friendly to the environment – notably coal in power generation.

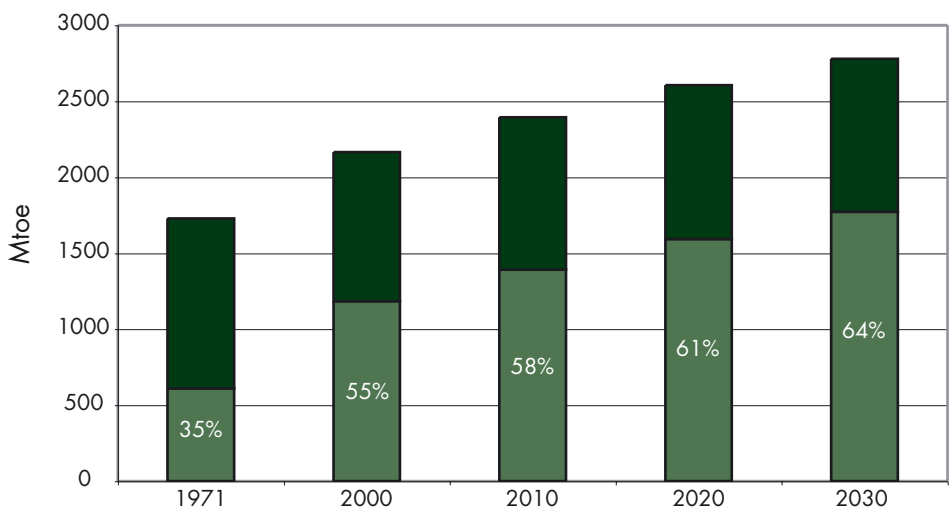
Oil. In 1970 transport accounted for less than a third of the total oil consumption in the OECD countries; it now represents well over a half. Based on the "Reference Scenario" of the IEA *World Energy Outlook* (IEA, 2002), over the next three decades, transport is expected to account for virtually all growth in the demand for oil in the OECD countries and by far the largest proportion in the rest of the world (Figure 10). The explanation is straightforward: in most other sectors, other fuels are substituting for oil, such as natural gas, nuclear or renewables for power generation. As a result, the share of primary oil demand in the OECD for the transport sector is expected to increase by 2020 to two-thirds of total primary demand (Figure 11).

Figure 10. **Incremental Oil Demand by Sector, 1997-2030**



Source: IEA (2002) – *World Energy Outlook 2002,* International Energy Agency, Paris.

Figure 11. **Share of Transport Sector in OECD Primary Oil Demand**



Source: IEA (2002) – *World Energy Outlook 2002, I*nternational Energy Agency, Paris.

It is thus clear that countries with economies dependent on exports of oil are the most vulnerable of all fossil fuel exporters to climate mitigation strategies – and that this sensitivity is largely a function of policies taken in the transport sector.

Most climate mitigation projections suggest that the fuel intensity of the transport sector will be substantially reduced. In its 2000 *World Energy Outlook*, for example, the IEA has derived an alternative transport scenario based on policies that are relatively more aggressive. The alternative scenario policies are described below – and compared to the current policy actions from the IEA database.

All regions

- *A fuel tax increase equivalent to US$ 95 per tonne of carbon for all fuels.* Compared to current policies, this measure would constitute a major step. Only very few IEA Member countries (such as Switzerland and Denmark) have even adopted any carbon tax – and none of these reaches this magnitude.

North America

- *Stricter CAFE (Corporate Average Fuel Economy) standards for cars and light trucks from 2005.* In 2001 the US government proposed to examine such a measure, although it has yet to be implemented.
- *Introduction of low-carbon fuels after 2010 with widened regulation of the share of alternatively fuelled vehicles in fleets ("fleet mandates") and tax incentives for fuel.* Both the United States and Canada are actively pursuing RD&D measures that could contribute to this policy goal – indeed, measures aimed at promoting alternative fuels have already been taken in 2001 – but it is not clear that the penetration rates assumed in the alternative scenario would be likely, in view of current policy efforts.

Western Europe

- *Further increased commitment until 2020 under the Voluntary Agreement of the European Association of Automobile Manufacturers (Association des Constructeurs Européens d'Automobiles or ACEA).* The ACEA agreement to voluntarily reduce carbon emissions from new models is supposed to come to an end in 2003, although an agreement signed with Asian car-manufacturers in 2000 implies that further agreements with European car-manufacturers are indeed foreseeable.
- *Policies to restrain or shift demand: urban car restraint; expansion of urban public transport; high-speed rail expansion and electronic charging of trucks per tonne-km.* Such measures are already being implemented and are increasingly popular in Europe (they are discussed in the section on transport policies above). As with policies in North America, it remains unclear whether, at their current rate of implementation, they are likely to generate noteworthy reductions in demand by 2010.

Japan

- *Sharpened requirements for car and light truck fuel efficiency under the Top-Runner Programme until 2020.*[15] Considering recent policy trends, this is clearly foreseeable for the near future.
- *Policies to restrain or shift demand: urban road-pricing and other measures to restrain car use; improving public transport; mandatory city-logistic schemes for small commercial vans and trucks; and expansion of high-speed rail.* Such measures have been increasingly developed over the past three years. As in North America and Europe, the extent to which they will result in decreased demand remains unknown.

This overview indicates that the alternative case presented in the 2000 *World Energy Outlook* is consistent with – if an aggressive extension of – the current policy debate. Most measures included in the scenario have been planned by IEA Member countries and could thus be realistically foreseeable. But what might be the impacts on the exporters of fossil fuels of such a policy scenario?

The IEA estimates (Table 4) suggest that by 2020 the policy shift described above would translate into a reduction in the energy demand of the transport sector of over 150 Mtoe (equivalent to a 10% reduction in its oil consumption) – a reduction from "base-case" total oil consumption in the OECD area of over 6% (although still increasing over 1997 figures by almost 30%). This would result in a similar percentage reduction in oil imports to OECD countries.

Table 4. **Oil Demand from Transport: Reference and Alternative Scenarios** (Mtoe)

	OECD Europe		OECD Pacific		OECD North America		OECD Total	
	1997	2020	1997	2020	1997	2020	1997	2020
Reference Scenario	337	478	123	162	622	890	1082	1530
Alternative Scenario		439		147		792		1378
Difference		39		15		98		152

But no policy actions as aggressive as these are being suggested. Fuel taxes, proposed by many countries during 2000, were rolled back in 2001 – in some cases, leaving fuel at lower real prices than for years. Even the most aggressive policy actions – for example the agreement between European governments and auto-

15. The Top Runner Programme sets energy efficiency standards for products such as cars, light trucks, air-conditioning units, television receivers and other energy-intensive products. The programme is expected to represent 16% of total reduction targets.

manufacturers in Europe, Japan and Korea[16] – might not have much effect on oil imports in the short term.

Yet, notwithstanding the limited effect of current policies on oil imports or exports, it does seem likely that the adoption of further measures to reduce GHG emissions, with increasing focus on reducing emissions from transport, could have a significant impact on the level of oil demand in the longer term. There will, nonetheless, be a substantial rise in the absolute level of oil demand, and an increase in the share of that demand met by the countries of the Organization of Petroleum Exporters. Moreover, some of these countries will benefit from increased gas demand.

16. In 2000, the European Union signed a voluntary agreement with the auto-manufacturers of Europe, Japan and Korea, calling for a reduction of CO_2 from 180g/km (1995) to 140g/km for European car-manufacturers and from approximately 200g/km (1995) to 140 g/km by 2009 for Japanese and Korean car-manufacturers, entailing a substantial concomitant reduction in fuel consumption. But only a small share of this would be from OPEC imports; OPEC collectively would see their EU exports drop by only a marginal amount below the reference case.

METHODOLOGY

Introduction

Section II of this publication provides a compendium of energy-related policies and measures planned or implemented in 2001 by IEA Member countries. For each country, key indicators are also provided on energy use and CO_2 emissions, in addition to a sectoral division of CO_2 emissions in 2000.

The material in this publication has been classified according to a variety of criteria and factors (described below) to facilitate the use and comparison of the information it contains. Since, however, national circumstances are never exactly equivalent, international, intersectoral or inter-policy comparisons should be treated with caution.

As already mentioned, any compilation of national policy information is bound to be incomplete. Some countries do not maintain centralised records of policy actions, and some devolve authority to regional or local bodies. In addition, the data in this volume are limited to new policies or measures enacted or proposed in 2001; those initiated in previous years but not modified in 2001 may still be in force, but they are not represented here. This compilation should therefore be viewed as a snapshot of new or modified policies; it is not a comprehensive view of all policies in place during 2001.

Methodology for Data Collection

Early in 2002, as part of an expanded effort to collect and exchange information on Member countries' energy policies, information was collected on energy-related policies and measures implemented or planned in the year 2001 with the intention of mitigating climate change. The sources were government ministries, agencies and departments, international organisations and periodicals and journals reporting on policy actions. Once compiled, this information was then submitted to Member countries for their review and revision, as well as for additional material and the correction of errors.

Since the IEA will continue to update its database, readers are invited to submit additional information on climate change policies and measures in energy or energy-related sectors in IEA countries.

Scope of the Database

Timing of Policies and Measures Collected for the Database

A variety of policies and measures, while undertaken in the year 2001, *are not* included as part of this database:

- Measures for the capture and storage of GHG unrelated to energy production.
- Measures adopted, planned or modified in the year 2001 which may lead to an increase in GHG emissions, such as decreases in taxes on fossil fuels.
- Measures proposed during 2001 but subsequently rejected.
- Measures announced in 2001 but cancelled.

Data Classifications and Database Categories

The data on policies and measures have been classified under a system of categories and sub-categories which are described below. The database has been developed in a fully searchable format. The following tables give details of the classifications used. As can be seen in the country listings, in addition to the description provided for each entry, the policy is classified according to three categories: the *policy type* and its *classification* (Table 5), the *sector* (Table 6) and *fuel source* (Table 7) targeted by the policy.

Table 5. **List of Policy Types and Classification Sub-categories**

Type	Classification
Fiscal	Taxes (tax, tax exemption, tax reduction, tax credit) Fees/Charges, Refund Systems Incentives/Subsidies (transfers, grants, preferential loans, preferential funds, feed-in tariffs)
Tradable Permits	Emissions Trading Green Certificates Project-based Programmes (including CDM and JJ)
Regulatory Instruments	Mandates/Standards Regulatory Reform
Voluntary Agreements	Strong VA Weak VA
Research, Development and Demonstration	Research Programmes Technology Development Demonstration Projects
Policy Processes and Outreach	Advice/Aid in Implementation Consultation Outreach/Information Dissemination Strategic Planning Institutional Development

Table 6. **List of Sectors and Sub-sector Categories**

Sector	Sub-sectors
Buildings	Residential Non-Residential Community Use
Transport	Passenger Freight
Industry	Manufacturing Non-Manufacturing
Energy Production	Exploration/Extraction Refining Transmission/Transport Electricity Generation

Table 7. **List of Fuel Sources and their Sub-sector Categories**

Fuel Source	Fuel Source Sub-sectors
Fossil Fuels	Oil; Coal; Gas; Peat; All
Electricity	
Renewables	Hydro; Biomass; Waste; Wind; Solar; Geothermal/Ocean; Tidal/Waves; All
Nuclear	
Hydrogen	

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IEA Country Actions

Republic of Korea

The Republic of Korea became a Member of the International Energy Agency during 2001. It is the only Member country not included in the list of Annex I countries under the United Nations Framework Convention on Climate Change. The Republic of Korea is currently in the process of reviewing its existing climate change and environmental policies as well as developing a new climate strategy. Policies and measures undertaken by the Republic of Korea are thus not included in this publication, or in the IEA database.

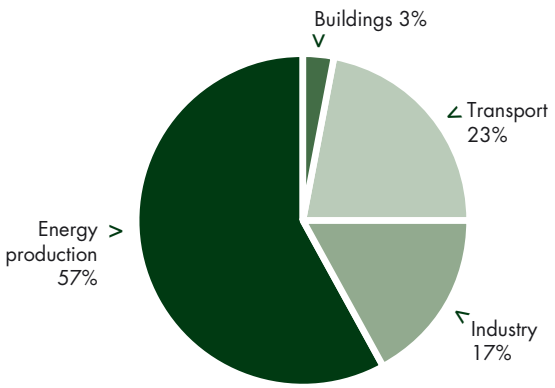
AUSTRALIA

Key Indicators

	1990	1995	2000
TPES (Mtoe)	87.54	94.38	110.17
TPES/Capita (toe per capita)	5.12	5.22	5.75
TPES/GDP (toe per thousand 1995 US$ PPP)	0.26	0.24	0.23
CO_2 Emissions (Mt of CO_2)	259.70	280.01	329.28
CO_2/Capita (t CO_2 per capita)	15.20	15.49	17.19
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.78	0.72	0.70

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Outreach / Information Dissemination***	*The Australian government announced a new public information campaign that it hopes will increase awareness and influence behaviour regarding the abatement of GHG emissions. The campaign will advise citizens on the most energy-efficient practices inside and outside the home (with information on electrical appliances, transport, home heating and cooling, etc.) through television, newspaper and magazine advertising, supplemented by a telephone hotline.*	*All*	*All*
		policies and measures taken over the year 2001		
Fiscal	**Incentives/ Subsidies**	The government of Canberra announced that it would provide A$37 million to fight against climate change. Through this initiative, Emissions reduction projects will be financed in four local industries: Powercoal, BHP Billiton, Envirogen and CargoSprinter. These four programmes should allow Australia to reduce its GHG emissions by 8.2 million tonnes between 2008 and 2012.	Industry	All

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Outreach / Information Dissemination**	The Fuel Consumption Guide provides reliable comparative data on the fuel consumption of new passenger cars and some classes of four-wheel drives and light commercial vehicles. The Guide helps consumers choose the most fuel-efficient vehicle for their requirements; one can search for models from 1986 to 2001. This measure is a support to the fuel consumption labelling scheme.	Transport (Passenger)	Fossil Fuels
Regulatory Instruments	**Mandates / Standards**	From 1 January 2001 the windscreens of all new passenger vehicles, four-wheel drives and light commercial vehicles sold in Australia will carry a fuel consumption label which will tell you how many litres of fuel the vehicle uses to travel 100 kilometres when driving around the city. A promotion campaign will accompany the introduction of the new labelling scheme, which is designed to stimulate demand for more fuel-efficient vehicles, and to produce environmental benefits, not least by reducing GHG emissions.	Transport (Passenger)	Fossil Fuels
Policy Processes and Outreach	**Outreach / Information Dissemination** **Advice / Aid in Implementation**	Cool Communities is a project designed to reduce the creation of greenhouse pollution by the community. Aimed primarily at households, the project will provide information, support and financial assistance to help communities undertake easy practical actions to reduce GHG emissions from households.	Buildings (Residential)	All
Regulatory Instruments	**Mandates / Standards**	The Greenhouse Friendly programme enables manufacturers and service-providers to obtain certification by the Australian Greenhouse Office for products or services whose GHG emissions have been offset by reductions in emissions elsewhere. The Australian Greenhouse Office certifies products and services as being Greenhouse Friendly when it is satisfied that they have met stringent certification criteria.	Industry (Manufacturing)	All
Voluntary Agreements	**Weak VA**	The Department of Defence, the Commonwealth's largest and a major emitter of GHG, has joined the Greenhouse Challenge, a voluntary government programme to limit emissions. The department has agreed to cut GHG emissions from its operations all over Australia by 120,000 metric tonnes (132,000 tons) a year by 2004, representing a reduction of more than 13% below 1999-2000 emission volumes.	All	All
Fiscal **Tradable Permits**	**Incentives / Subsidies** **Green Certificates**	Development of a voluntary, industry-owned Green Electricity Market (GEM) that trades in "green electricity rights" with government funding under the Renewable Energy Commercialisation Program (RECP). This trading incorporates the Renewable Energy Certificates under the Mandatory Renewable Energy Target (MRET). In 2000, the federal government set a renewable energy target of an additional 9,500 GWh of renewable energy annually by 2010, using 1997 as the base year.	Energy Prod.	Electricity Renewables

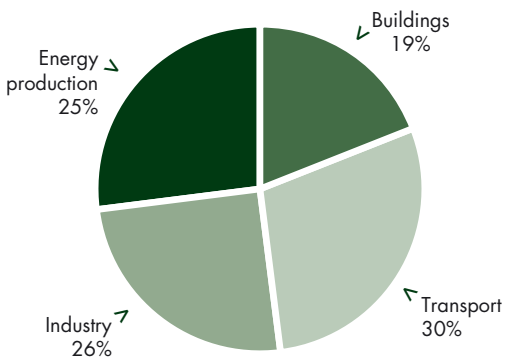
AUSTRIA

Key Indicators

	1990	1995	2000
TPES (Mtoe)	25.22	26.36	28.58
TPES/Capita (toe per capita)	3.27	3.28	3.52
TPES/GDP (toe per thousand 1995 US$ PPP)	0.16	0.15	0.15
CO_2 Emissions (Mt of CO_2)	56.90	58.76	62.77
CO_2/Capita (t CO_2 per capita)	7.37	7.30	7.74
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.37	0.34	0.32

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Strategic Planning***	*Burden-sharing within the EU under the Kyoto commitments requires Austria to reduce its GHG emissions by 13% below 1990 figures during the period 2008-2012. Against this background the Federal Ministry of Agriculture, Forestry, Environment and Water Management in co-operation with the relevant ministries, unions and the Länder developed a strategy to meet the Kyoto target, the "Climate Strategy 2010". It contains packages of measures for seven areas (room heating and "other small consumers"; electricity and heat production; waste management; mobility; industry, agriculture and forestry and "other gases") and aims to achieve an annual reduction of more than 17 million tonnes of CO_2-equivalents. The strategy is finalised, but negotiations about financial implications were not settled in 2001.*	*All*	*All*
		policies and measures taken over the year 2001		
Fiscal	**Incentives / Subsidies**	The Federal Environment Fund is enabled to fund environment projects with a total budget frame of actually more than €40 million annually. Over the past years, increasing priority has been given to projects related to climate change. In 2000, 70% of the funding was dedicated to projects with direct implications for GHG emissions, and that share will even be	Energy Prod. (Electricity Generation) Buildings (Non-Residential)	Electricity (CHP) Renewables

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		extended. For the budget periods 2001 and 2002, the total budgetary frame has been increased to reach €40 million and €47 million, respectively, after an average of €36 million during past years. All additional funding (€15 million for both years) will be channelled to climate change purposes. Over the past years, funding focused on biomass and biogas district heating, entrepreneurial biomass central heating systems, solar panels and energy efficiency measures, small hydro and wind power stations and thermal renovation of entrepreneurial buildings. Since the Austrian Electricity Law stipulates that feed-in tariffs have to be set at figures that make the production of electricity from renewable sources competitive, the Federal Ministry of Environment is planning to phase out subsidies for those technologies.	Industry	Fossil Fuels
Fiscal	**Incentives / Subsidies**	According to the Electricity Act 2000, the provincial governments set minimum prices (feed-in tariffs) for electric energy purchased by grid operators from plants recognised as eco-plants. These prices are based on the average cost of generating electricity from the eco-plants, including the value of electricity used, as well as past or actual subsidies. If the expenses from purchasing the electricity at fixed tariffs exceed the revenue from sales, the grid operator will be reimbursed for the balance between the minimum or purchase price and the proceeds achieved. The required sums are raised by a surcharge to the network tariff (paid by the end-user) which is set by the Provincial Governor. This surcharge is set annually on the basis of the additional expenses incurred in the previous year. If a Provincial Governor fails to determine minimum prices and surcharges by 31 March 2002, this competence will pass to Elektrizitäts-Control GmbH. It will retain this competence until provisions issued by the respective Provincial Governor enter into force. By October 2001, only the Province of Vorarlberg had introduced new feed-in tariffs, valid from 1 October 2001 (tariffs in Sch/kWh): • solid biomass: 1.3-1.8 for existing plants; 1.3-2.2 for new plants; • liquid biomass: 1.7 for existing plants, 2 for new plants; • biogas: 1.2-1.55 for existing plants, 1.71-2.2 for new plants; • wind: 1.5 for new plants; • solar (photovoltaic): 7 for existing plants, 5-10 for new plants, depending on capacity. The equalisation levy for eco-electricity is 1.59 Sch/kWh. The surcharge to the network tariff is 1.11 Gr/kWh (0.08 cent/KWh).	Energy Prod. (Electricity Generation)	
Tradable Permits	**Green Certificates**	Green certificate trading was introduced by the Electricity Act 2000. Electricity suppliers based in Austria have to include 8% of electricity generated by domestic small-scale hydropower plants in the energy sold to final customers. Final customers purchasing electricity directly from foreign suppliers are required to prove that 8% of the electricity they consume is generated by domestic small-scale hydropower plants. "Small-scale hydropower certificates" are used as proof. Hydropower plants with a maximum capacity of up to 10 MW are designated by the provincial government, entitling their operators to issue such certificates. The designations are notified to Electrizitäts-Control GmbH. Small-scale	Energy Prod. (Electricity Generation)	Renewables (Hydro)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		hydropower certificates are in units of 100 kWh. They have to be authenticated by the operator of the grid of the plant in question, who keeps a record of the small-scale hydropower certificates authenticated. The system is electronic and is monitored by Elektrizitäts-Control GmbH. Certificates can be banked for up to two years. In the event of non-compliance, an equalisation levy is imposed upon electricity suppliers and final customers by the provinces.		
Policy Processes and Outreach	**Outreach / Information Dissemination**	Federal law has implemented EU directive 1999/94/EC on compulsory labelling for new passenger-car fuel consumption and dissemination per kilometre of CO_2 emissions by February 2001. The label, classifying each type of new cars, and other transparent and comparable information on CO_2 emissions are of major importance for public awareness of climate change and a prerequisite for consumers making their choice for "climate-friendly" cars.	Transport (Passenger) Industry (Manufacturing)	Fossil Fuels (Oil)
Regulatory Instruments	**Regulatory Reform**	A new pact on tax revenue sharing between the Federation, the Länder and the municipalities, allows more flexibility for housing support schemes. The Federal Act on Revenue Sharing now explicitly suggests spending parts of the funds for GHG-mitigation measures. The Länder receive a total of €1.78 billion annually from the Federation under the title of "housing support". Although that money can also be spent for purposes other than housing (on improving infrastructure, for example). The GHG-mitigation effect from housing support schemes therefore largely depends on specific political intentions followed by individual Länder. The conferences of the environment and finance ministers of the Länder governments have declared their political willingness to spend a relevant part of the money for climate change purposes in order to achieve the targets indicated in the Austrian Climate Strategy 2010.	Buildings (Residential)	All
Voluntary Agreements	**Strong VA**	The federal government decided on March 2001 to launch a Programme on Third Party Financing (contracting) in energy-saving investments for federal public buildings. It is assumed that around 20% of federal buildings (representing 50% of heated space in federal buildings) are eligible for classical energy-saving contracting, meaning that measures and investments with relatively short payback periods because of energy savings can be undertaken by a third party (a "contractor" – an energy planning consultant, for example). Public high schools have been affected most by this measure. In a pilot programme in Vienna, energy standards for 46 schools have already been substantially improved. There are plans for the general renovation of a further 20% of federal buildings within the next ten years, although through a differentiated model of "guaranteed energy savings" rather than a classic third party financing. The initiative probably has the potential to accelerate growth in the total contracting market, covering also public buildings of municipalities and private service-sector buildings. This initiative is expected to result in an annual total reduction of CO_2 emissions of 70,000-100,000 tonnes by 2012.	Buildings (Non-Residential) Industry (Non-Manufacturing)	Fossil Fuels Electricity Renewables

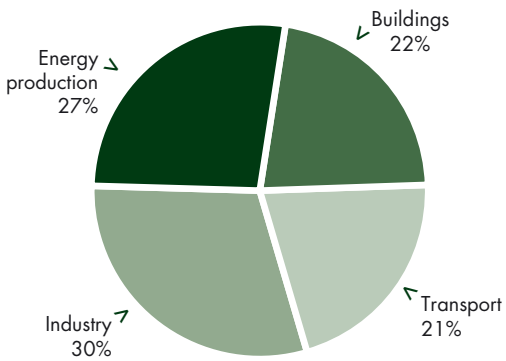
BELGIUM

Key Indicators

	1990	1995	2000
TPES (Mtoe)	48.43	52.40	59.22
TPES/Capita (toe per capita)	4.86	5.17	5.78
TPES/GDP (toe per thousand 1995 US$ PPP)	0.23	0.24	0.23
CO_2 Emissions (Mt of CO_2)	107.25	113.60	120.28
CO_2/Capita (t CO_2 per capita)	10.76	11.21	11.73
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.52	0.51	0.47

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Strategic Planning***	*The Brussels government presented the draft "Air Plan". This has as objectives the reduction of total vehicle-kilometres travelled by 20%, an increase in the share of total displacements in the region by bicycle of up to 10%, as well as the promotion of environment-friendly vehicles for public transport and the introduction of mobility plans by private companies.*	*All*	*All*
Tradable Permits	***Green Certificates***	*The Flemish government has confirmed its agreement to set up a CHP certificate market in order to install an additional capacity of 1.200-MW CHP in 2005.*	*Energy Prod. (Electricity Generation)*	*Electricity (CHP)*
Tradable Permits	***Green Certificates***	*The Federal Council of Ministers has introduced a Green Certificate Scheme project by royal decree dealing with the renewable-electricity market. It would define the procedures for licensing the off-shore installations, for giving the guarantee of origin and the delivery of the green certificates. It would determine the quota of electricity from renewable energy sources delivered to the users connected to the transport net (from 2% in 2002 up to 6% in 2006), the fine for not fulfilling the quota being €75 per certificate (corresponding to 1 MWh). It would also set the obligation to the transport grid manager for buying the green certificates at a minimum price (equivalent to €0.02/kWh for biomass, €0.05/kWh for wind energy and up to €0.15/kWh for solar energy).*	*Energy Prod. (Electricity Generation)*	*Electricity*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Fiscal	***Incentives / Subsidies***	*In order to support the introduction of energy accounting in industry, the Walloon government is preparing a decree subsidising energy auditing or monitoring (covering 50 to 100% of the costs depending on the achievement of the measures, the commitment to covenants, etc.).*	*Industry*	*All*
Voluntary Agreements	***Weak VA***	*Flanders has planned to introduce voluntary agreements for energy-intensive industries. They will be based on benchmarking and on commitment by larger companies to bring their energy efficiency up to international best practice by 2012. Smaller companies will be requested to make energy-saving investments with a payback time of less than five years.*	*Industry*	
Policy Processes and Outreach	***Advice / Aid in Implementation*** ***Consultation***	*The Flemish Parliament is considering a proposal with objectives in the line of the European Directive on the Energy Performance of Buildings. The Walloon region is also seriously considering legislation in this area, and, in particular, introducing "as built" dossiers to make the sector more aware of its energy performance.*	*Buildings*	*All*
Policy Processes and Outreach	***Strategic Planning***	*The Federal Secretary of State for Energy has issued a draft project for a "National Climate Plan", which aims to formulate a coherent national policy with sufficient measures to realise the Kyoto objective (-7.5% of 1990 emissions), by sector, for individual industries, and across the board. For the energy sector, the plan will deal with energy efficiency and standards, the use of covenants on renewables, and the application of flexible mechanisms. The Belgian Federal Planning Bureau is studying more efficient ways of introducing appropriate taxation types and incentive mechanisms (with "double dividends" gains) to achieve the reduction of CO_2 emissions. The Climate Plan will also cope with the general strategy of sustainable development and realisation of a "low carbon economy". For the transport sector, the main objective is to increase the share of the market of rail transport by 15% by 2010.*	*All*	*All*
Policy Processes and Outreach	***Advice / Aid in Implementation***	*The Flemish government has approved a resolution by which the public authorities will demonstrate their willingness to save energy by a reduction of 10% of the electricity and fuel consumption in the 100 largest buildings by 2004, to enhance the energy efficiency of, and the use of renewable energy sources in, new public buildings.*	*Buildings*	*All*

BELGIUM (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Voluntary Agreements	**Weak VA**	In Wallonia, following previous voluntary agreement efforts with large energy-intensive industries, three additional industrial sectors (cement, limestone and non-ferrous) signed letters of intent. Within twelve months, these letters of intent are to lead to voluntary agreements to reduce energy consumption by 2010.	Industry	All
Policy Processes and Outreach	**Advice / Aid in Implementation**	The Walloon region has initiated the "local action programmes for promoting energy efficiency" (Plan d'actions locales pour la maîtrise de l'énergie, or "PALME"), aiming at giving financial support (50%) and communicative support to municipal initiatives to manage energy consumption and deploy renewable energy sources. Pilot projects have been selected in ten municipalities for a period of three years. The aim is to implement 50 such "PALMEs" by 2010.	Buildings (Residential) (Community Use)	All
Policy Processes and Outreach	**Strategic Planning**	The Flemish government decided to set up the "Flanders Climate Policy Task Force" to develop and implement policies aimed at reducing emissions of all GHGs. This incorporates the Flemish Mobility Plan, of which a draft has been issued in June 2001, and which aims at stabilising CO_2 emissions from the transport sector by 2010 through support to public transport while taking into account measures in favour of intermodality.	All	All
Policy Processes and Outreach	**Strategic Planning**	The Walloon government finalised the "Walloon Region Climate Change Action Plan" on 18 January 2001, and issued a draft of the "Walloon Plan to Master Sustainable Energy". The first gives a general overview of all measures for dealing with climate change (in energy, transport, agriculture, waste, etc.). The second deals more specifically with energy matters with a horizon 2010-2020, along five axes: modifying consumption patterns, enforcing energy efficiency policies, developing and deploying renewables, reporting research and regulating the energy market.	All	All
Regulatory Instruments **Tradable Permits**	**Regulatory Reform** **Green Certificates**	The relevant regional and European jurisdictional advice bodies approved the Flemish frame-decree on 17 July 2000 liberalising the electricity market. It foresees a tradable Green Certificates programme in order to increase renewable energy consumption from the then-current figures to 1% in 2001, 3% in 2004 and 5% in 2010. Energy distributors will have new obligations, with a penalty of about €0.12 per kilowatt-hour. The programme is in a test phase with voluntary action by all market players. Mandatory actions were planned to begin in January 2002. On 28 September 2001, the Flemish government approved the implementing decree determining the procedures for delivering the green certificates.	Energy Prod. (Electricity Generation)	Renewables

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Advice / Aid in Implementation** **Consultation**	The Federal Scientific and Cultural Services has initiated contracts with many universities and research centres to model the GHG reduction policies in Belgium, to assess electricity generation from coal, and to analyse the instruments aiming at reducing the GHG emissions (network CLIMBEL). The Federal Planning Bureau has developed and run models to project an energy outlook for 2020 in Belgium, to evaluate the impact of appropriate taxation types and incentives to achieve reductions in CO_2 emissions, and has produced a paper on international co-operation and possible instruments for decision-making within the climate policy framework.	All	All
Fiscal	**Taxes**	The federal law on the reform of the household fiscal system foresees that investments undertaken to improve rational use of energy may qualify for tax reductions in 2003; a budget of €37.18 million has been assigned to this end.	Buildings (Residential)	All
Regulatory Instruments	**Regulatory Reform**	The Flemish region has transposed the European directive 98/30/EG on the organisation of the gas market. Final users generating electricity from an efficient (quality) CHP installation or provided by a supplier using gas from a renewable energy source are eligible. Moreover, the Flemish government will also impose public service obligations, including programmes dealing with rational energy use and renewable energy sources, as well as establishing minimum standards for consumers. It will also set up a system of green heat certificates.	Energy Prod.	Renewables Electricity (CHP)
Tradable Permits	**Green Certificates**	Since the framework-decree of the Walloon government of 12 April 2001 on the liberalisation of the electricity market (which foresees the creation of funds to encourage the rational use of energy, financed by a charge imposed on the grid manager), and its implementing decree of July 2001, the government supports the production of green electricity through green certificate trading. The Walloon targets are expressed in terms of CO_2 emissions avoided so that the certificates (corresponding to 1MWh for a generation producing no emission) can also contribute (with appropriate weighting factors) to quality CHP. The Walloon government is planning for a quota of 2.9% by 1 January 2002, 5% by 1 October 2004 and 12% by 1 October 2009. The objective of 12% can be achieved by producing 8% from renewable energy sources (RES) and 12% from quality CHP. From September 2010, the quota is increased each year by 10%. The fine for not reaching the target will be €75 per certificate in 2002 and €100 from January 2003. From 2002, moreover, the Walloon government might be able to introduce direct support to green electricity producers, who will have to choose either this system or that with the green certificates.	Energy Prod. (Electricity Generation)	Electricity

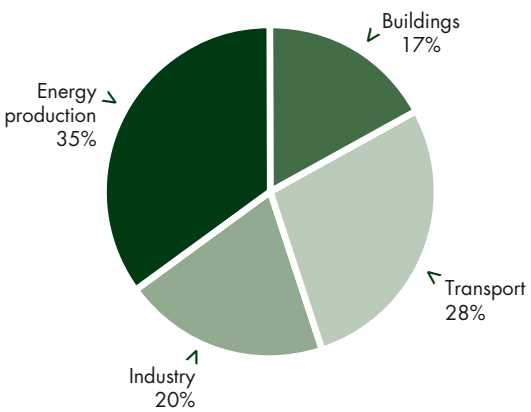
CANADA

Key Indicators

	1990	1995	2000
TPES (Mtoe)	209.09	231.75	250.97
TPES/Capita (toe per capita)	7.55	7.90	8.16
TPES/GDP (toe per thousand 1995 US$ PPP)	0.34	0.34	0.31
CO_2 Emissions (Mt of CO_2)	430.21	461.20	526.77
CO_2/Capita (t CO_2 per capita)	15.53	15.71	17.13
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.69	0.68	0.64

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Fiscal	***Incentives / Subsides***	*Delivered through National Resources Canada's (NRCan) Energy Innovators' Initiative, the Subsidies Commercial/Institutional Buildings Retrofits Initiative will further encourage owners and operators of existing commercial and institutional facilities to reduce operating costs and energy use through investment in energy efficiency retrofits. The measure primarily encompasses funding assistance and facilitation services. This initiative is expected to generate an annual reduction in GHG emissions of 2.2 megatonnes by 2010.*	*Buildings (Non-Residential)*	*All*
Policy Processes and Outreach	***Advice / Aid in Implementation***			
Voluntary Agreements	***Weak VA***	*The Freight Efficiency and Technology Initiative is aimed at increasing participation by the freight sector in voluntary climate change initiatives to achieve measurable GHG reductions, increase training and awareness, and promote the demonstration and evaluation of new technologies and innovative tools. The programme is expected to result in annual reductions of approximately 2 megatonnes of GHG emissions by 2010.*	*Transport (Freight)*	*All*
Policy Processes and Outreach	**Outreach / Information Dissemination**			
Policy Processes and Outreach	***Strategic Planning***	*The Technology Transfer, Promotion and Analytical Support component of the Canadian International Technology Initiative will work to identify and develop technology-transfer projects overseas, to facilitate the expansion of market opportunities for climate change technologies for Canadian companies and to provide a sound analytical base for future international technology marketing activities. A second component will encourage and build effective partnership with other nations to*	*All*	*All*
	Advice / Aid in Implementation			

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		help reduce GHG emissions through Clean Development Mechanisms (CDM) and Joint Implementation (JI) projects.		
Policy Processes and Outreach	***Outreach / Information Dissemination***	*In consultation with the automobile industry and the United States, Canada will develop an agreement on targets to improve fuel efficiency for 2010. This initiative will also implement a consumer education campaign to help move the market towards the purchase of more fuel-efficient vehicles and to improve clean driving habits and maintenance practices.*	*Transport (Passenger)*	*All*
Policy Processes and Outreach	***Outreach / Information Dissemination***	*The one-year Aboriginal and Northern Climate Change Program will facilitate the engagement of Aboriginal peoples and Northerners in climate change activities and undertake specific initiatives to address the energy needs of Aboriginal and northern communities, with an emphasis on capacity building, use of alternative energy sources and energy best practices.*	*All*	*All*
Policy Processes and Outreach	***Outreach / Information Dissemination***	*The Energy Efficient Housing Initiative aims to promote the construction and purchase of more energy-efficient, environmentally responsible housing and the energy-efficient renovation of existing housing. Builders will be encouraged to build houses that are more energy-efficient, based on the R-2000 Home Standard and, through procedures established by NRCan's EnerGuide for Houses, home-owners and other participants in the housing market can obtain and use assessments of the energy performance of new and existing homes to assist their decision-making.*	*Buildings (Residential)*	*All*
Policy Processes and Outreach	***Outreach / Information Dissemination***	*To accelerate the penetration of existing high-efficiency products into appliance and equipment markets, the Accelerated Standards Action Program will deploy a series of "market-based" actions that address market barriers arising from the lack of information. It will encourage consumers to purchase a best-in-class efficient products and thereby set the stage for the future enhancement of current standards. This effort is expected to result in an annual reduction in GHG emissions of about 2.8 megatonnes by 2010.*	*Buildings (Non-Residential)*	*All*
		policies and measures taken over the year 2001		
Voluntary Agreements	**Weak VA**	The two-year Sector Agreement Initiative will facilitate discussions between the federal and provincial governments, industry and electrical utilities to develop a framework agreement and covenants that will lead to reductions in GHG emissions from the electricity sector.	Energy Prod. (Electricity Generation)	Electricity
Policy Processes and Outreach	**Strategic Planning**	Under the Climate Change Action Plan 2001, approved on 27 August at the Annual Conference of New England Governors and Eastern Canadian Premiers in Westbrook, New Brunswick, the governors of the six US New England states and the premiers of five eastern Canadian provinces signed the unique bilateral agreement and committed the region to cut GHG emissions to 1990 levels by 2010 and by at least 10% below 1990 levels by 2020.	All	All
Regulatory Instruments	**Mandates / Standards**			

CANADA (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Fiscal	**Incentives / Subsidies**	The existing Renewable Energy Deployment Initiative (REDI) programme stimulates market demand among business, federal, institutional and municipal organisations for commercially reliable, cost-effective renewable energy systems for space and water heating and cooling. REDI for Industry will extend the programme to industrial organisations. This extension is expected to reduce GHG emissions by 0.1 megatonne by 2010.	Industry	Renewables
Fiscal **Policy Processes and Outreach**	**Incentives / Subsidies** **Technology Development / Demonstration Projects**	The Government Procurement programme will contribute to the objectives of the federal House in Order programme by helping to reduce GHG emissions associated with federal operations. It will encourage the purchase of emerging renewable sources of electricity that are certified by a third party as having beneficial environmental impacts and thus displace carbon-intensive electricity sources while also assisting the development and expansion of Canadian markets for renewable energy.	Buildings (Community Use)	Renewables
Fiscal	**Incentives / Subsidies**	The Market Incentive Program aims to provide incentives to electricity retailers to purchase or produce electricity based on emerging renewable energy sources from new or expanded generating capacity, or to promote the sales of electricity from emerging renewable energy sources. By offering financial incentives to electricity retailers to purchase or produce electricity from emerging renewable sources (EERES) from new generating capacity, this initiative will increase the competitiveness of EERES to residential and small business customers under "green" power programmes.	Energy Prod. (Electricity Generation)	Electricity
Policy Processes and Outreach	**Strategic Planning**	Over the next three years, the federal government will work with interested jurisdictions on issues pertaining to access to electricity grids for generating plants that emit zero or low levels of GHGs, and on reducing the barriers to inter-provincial transmission and trade that would permit electricity from such sources to reach markets in neighbouring provinces.	Energy Prod. (Electricity Generation)	Electricity
Policy Processes and Outreach	**Outreach / Information Dissemination**	The federal government and several provinces are undertaking initiatives (Natural Resources Canada is developing and will implement a consultative strategy to engage the key players, foster a collaborative approach and effectively produce scientifically sound results) to support disclosure to consumers by electricity retailers of their generation sources and associated environmental attributes. This disclosure will help consumers take informed decisions about their electricity consumption.	Industry (Manufacturing)	Electricity
Fiscal **Policy Processes and Outreach**	**Incentives / Subsidies** **Advice / Aid in Implementation**	The Cross-cutting Measures for Industry Program includes six different measures: • Expansion of the Canadian Industry Program for Energy Conservation (CIPEC): CIPEC, the industry organisation which has already reduced emissions among its members to 2% below 1990 levels, will be expanded to include the electricity generation, construction, forestry and upstream oil and gas sectors. • Emissions Benchmarking Studies: The programme will help companies to assess their energy efficiency and GHG emissions relative to comparable operations.	Industry	All

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		• Improved Tracking and Reporting of Energy Efficiency and Emission Trends: The industrial portion of the National Energy Use Database will be improved, which will encourage industry to pursue activities related to climate change and help the Government of Canada pinpoint promising areas for reducing emissions. • The Industrial Energy Innovators Initiative: This programme will be extended and enhanced to help companies and individual organisations better deal with barriers to energy efficiency and emissions management programmes. • Supporting Energy Efficiency Audits: Financial assistance and guidance will be provided to companies to conduct on-site industrial audits to identify opportunities for energy efficiency. • Awareness Building: Small and medium-sized enterprises, in particular, will be made aware of the benefits of reducing GHG emissions and provided with tools, such as customised energy management workshops, technical support, guidebooks and videos, to achieve reductions. The combination of these measures could lead to a potential annual reduction of 5.8 megatonnes of direct GHG emissions by 2010.		
RD&D	**Technology Development**	Working with provinces, territories and other partners, the government will pursue preliminary analysis for the development of refuelling infrastructure for fuel-cell vehicles that emit low or no emissions. This undertaking will involve evaluating different fuelling routes for fuel-cell vehicles and developing the necessary framework for the fuelling infrastructure (standards and procedures, training, certification and safety).	Transport (Passenger)	Hydrogen
Policy Processes and Outreach	**Strategic Planning**			
Policy Processes and Outreach	**Outreach / Information Dissemination**	The Industrial Buildings Incentive Program (IBIP) will increase the energy efficiency of new manufacturing and industrial buildings by modifying owners' expectations about energy performance and the response of designers to those expectations. IBIP is expected to result in an annual reduction of about 0.1 megatonnes in GHG emissions by 2010.	Industry	All
Voluntary Agreements	**Weak VA**			
Policy Processes and Outreach	**Advice / Aid in Implementation**	The initial phase of the Energy Ratings System (for industry) will identify products and platforms for an energy efficiency labelling and rating programme for industry. By targeting industrial equipment, identifying effective information dissemination channels, and testing them on a sample of industries, the programme will ultimately improve the efficiency of the stock of energy-using equipment available for industrial applications, thereby leading to a reduction in GHG emissions. The Government of Canada, through its Action Plan 2000 on Climate Change, is investing C$ 2.5 million over five years to put the principles and lessons learned from the long-standing EnerGuide for Appliances Program to work in equipment markets in the industrial sector. This investment will provide and promote the information and assessment tools required for industrial energy managers, procurement and financial officers and plant engineers to include energy efficiency in their buying	Industry	All

CANADA (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		decisions. This programme is expected directly to reduce GHG emissions by 1.4 megatonnes annually by 2010.		
Fiscal	**Incentives / Subsidies**	The aims of the Climate Change Technology and Innovation Program are to accelerate the development of cost-effective GHG-mitigation technologies, build the intellectual foundation for long-term technological advances and build R&D alliances and partnerships in the field of energy production.	Energy Prod.	All
RD&D	**Technology Development**	The federal government, provincial and territorial governments and industry are working together to encourage increased investment in CO_2 capture and storage and to facilitate the development and deployment of the required technologies. This measure is the federal contribution towards optimising the use of CO_2 capture and storage in Canada. It provides basic information that may be needed to stimulate investment in CO_2 capture and storage, and promotes the use of existing CO_2 capture and storage technologies. The CO_2 Capture and Storage Initiative is expected to result in a reduction of about 7 megatonnes in GHG emissions by 2006.	Industry (Manufacturing) Energy Prod.	
Fiscal	**Incentives / Subsidies**	The goal of the Future Fuels programme is a fourfold increase in the supply and use of ethanol produced from biomass such as plant fibre, corn and other grains, which could result in 25% of Canada's total gasoline supply containing 10% ethanol.	Energy Prod. (Exploration / Extraction)	Renewables

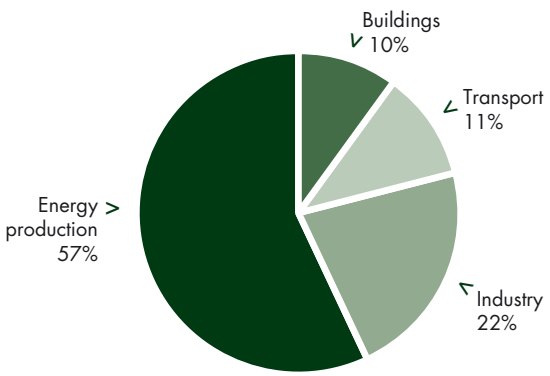
Czech Republic

Key Indicators

	1990	1995	2000
TPES (Mtoe)	47.40	41.38	40.38
TPES/Capita (toe per capita)	4.57	4.01	3.93
TPES/GDP (toe per thousand 1995 US$ PPP)	0.35	0.32	0.30
CO_2 Emissions (Mt of CO_2)	153.77	125.72	118.78
CO_2/Capita (t CO_2 per capita)	14.84	12.17	11.56
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	1.15	0.98	0.89

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Regulatory Instruments	**Regulatory Reform**	A Ministerial Decree (No. 252/2001 Coll.) on the methodology of purchase of electricity produced from renewable energy sources and combined heat and power (CHP) generation entered into force on 24 July 2001. This decree sets the power administration issue, pricing and tariffs framework for electricity from renewable and CHP sources.	Energy Prod. (Electricity Generation)	Renewables (All) Electricity (CHP)
Policy Processes and Outreach	**Strategic Planning**	The "National Programme" is a document defining objectives related to energy conservation and to the use of renewable and secondary energy sources. It complies with economic and social requirements according to the principle of sustainable development and the protection of the environment and is based on the national energy policy and on the national environmental policy. The most important objectives are that renewable energies should reach 2.9% of energy consumption by 2005, and that the energy intensity of the national economy will be reduced. The priority is promotion of renewable energy sources and energy-saving projects. It defines instruments for its implementation, including subsidies from the state budget.	All	All

CZECH REPUBLIC (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Tradable Permits	**Emissions Trading**	A Prototype Carbon Fund (PCF) Purchase Agreement between the Czech Republic (Host Country) and the IBRD (Trustee) on the sale, generation and delivery of emissions reductions is under preparation. The Czech Energy Agency and State Environmental Fund will serve as the organisation for implementing projects in the Czech Republic (Project Entity). About 40 projects worked out in accordance with the required PCF parameters are foreseen.	All	All
Regulatory Instruments	**Regulatory Reform**	The Energy Act, which came into force in January 2001, sets out conditions for the business activities, state administration and regulation in energy sub-sectors, such as electricity, gas and heat as well as the rights and obligations of individuals. It defines a framework for the liberalisation of the electricity and gas markets. It supports the use of renewable energy sources and CHP. It defines conditions for the obligatory purchase of electricity and heat produced from renewables and from CHP through the creation of the Energy Regulation Office. From 2002 electricity consumers with annual consumption of more than 40 GWh will have the right to choose their supplier; and the threshold will be lowered gradually. Full liberalisation of the market is scheduled for 2006. Access to the networks by generators will be liberalised by 2003. Generators of electricity from CHP and from renewable sources will have the right to sell their electricity to the local distributor. The introduction of competition in the natural gas market will start in 2005.	All	Electricity (CHP)
Fiscal	**Incentives / Subsidies**			Renewables
Regulatory Instruments	**Regulatory Reform**	Part of the Energy Management Act (Chapter 4), Measures to Enhance Economical Use of Energy, deals specifically with ways of promoting energy efficiency, such as minimum requirements, labelling, energy audits, and the combined generation of heat and power (CHP). Under this measure, the Czech Republic introduced energy labels for those appliances for which the EU has introduced labels: refrigerators, washing machines, tumble dryers, dishwashers and lamps.	All	All
	Mandates / Standards			

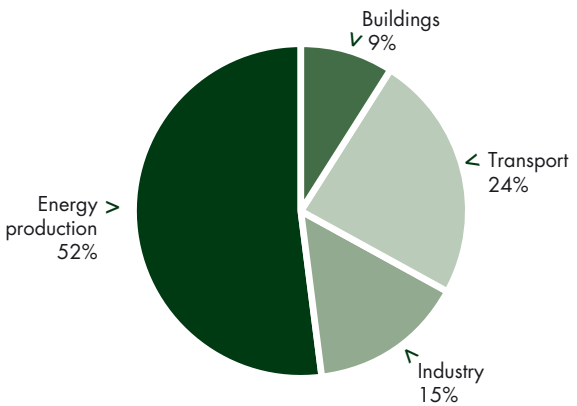
DENMARK

Key Indicators

	1990	1995	2000
TPES (Mtoe)	18.07	20.29	19.46
TPES/Capita (toe per capita)	3.52	3.89	3.65
TPES/GDP (toe per thousand 1995 US$ PPP)	0.17	0.17	0.14
CO_2 Emissions (Mt of CO_2)	50.56	57.86	50.09
CO_2/Capita (t CO_2 per capita)	9.84	11.08	9.38
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.47	0.48	0.37

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Strategic Planning***	*The Danish Government is currently discussing an action plan on Planning energy savings. The objective of the action plan is to strengthen energy savings efforts so as to maximise the environmental return on the investment. The action plan will specify energy savings targets for the various sectors up to the year 2005, and will outline the measures required to achieve them. They will include suggestions for new economic incentives to promote energy savings and the enhanced use of labelling schemes and standards. The intention is that energy savings efforts should be made more efficient by collating the state initiatives in framework programmes to be submitted for tender to external actors, creating competition for the implementation of the programmes and ensuring that the most suitable operators implement the project. The electricity grid companies will play a major role in the efforts to promote energy savings. Projects will be submitted to tender to test the efficiency of the energy savings efforts. Moreover, as part of their commercial activities the companies can tender for the implementation of framework programmes in competition with other parties.*	*All*	*All*
Fiscal	***Taxes***	*The draft "National Programme for Reducing Greenhouse Gas Emissions in 2000-2010" has been completed and its measures are under discussion between ministries. The programme contains a set of approximately 40 measures for emissions reduction, covering all relevant sectors (electricity*	*Energy Prod.*	*Fossil Fuels (Gas)*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		generation, industry, residential/tertiary, transport, agriculture, wastes, etc.), through the implementation of which the national target set by the Kyoto Protocol will be fulfilled.		
Policy Processes and Outreach	***Strategic Planning***	*Denmark released its first draft national sustainable development strategy in March 2001. The strategy attaches high importance to the challenge of climate change. The draft strategy was open for consultation with stakeholders until 1 May 2001. An NGO dialogue meeting was held on the strategy and a debate forum has been established on the Danish Environmental Protection Agency's Internet homepage.*	*All*	*All*
Fiscal	***Incentives / Subsidies***	*In June 2001, the EU Commission approved the rules for payment of green electricity from new renewable energy plants notified by Denmark to the Commission as a step in the gradual transition to market-based prices pursuant to the Danish Electricity Reform Agreement. The new rules will be stipulated in a revised Statutory Order on Wind Turbines. With the Commission's approval, new wind turbines will in future be guaranteed a fixed settlement price of DKr 0.33 per kWh for the first 22,000 full-load hours, corresponding to approximately 10 years' production. When these hours have been used up, remaining electricity produced by the wind turbine is to be settled at the market price. Furthermore, a premium of DKr 0.10 per kWh is added to the market price. The premium will be replaced by Green Certificates for electricity production once the coming green market for renewable energy is established (2004). Electricity from biomass-based plants is currently settled at a price of approximately DKr 0.60 per kWh. The Danish Energy Agency also submitted the economic outlines of proposed biomass-based electricity production for consideration by the parties behind the Electricity Reform Agreement.*	*Energy Prod. (Electricity Generation)*	*Renewables (Wind, Biomass)*
Policy Processes and Outreach	***Consultation***			
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Strategic Planning**	In 2001, the Danish Parliament supported the decision that the Danish government should ratify the Kyoto Protocol.	All	All
RD&D	**Demonstration Projects**	In July 2001, the Danish Energy Agency approved an application by the energy company Energi E2 to establish a marine wind-farm at Rødsand, south of Lolland. The project is the second of five large-scale marine wind-farms in a demonstration programme. The marine wind-farm is expected to consist of 64 to 96 turbines with a combined total effect of approximately 150 MW, erected in eight rows each containing 8 to 12 turbines. The farm will produce approximately 500 million kWh annually, corresponding to the annual consumption of 110,000 homes. This will provide Denmark with annual savings of 302,000 tonnes CO_2. It is expected that the wind turbines will be erected in summer 2003.	Energy Prod. (Electricity Generation)	Renewables (Wind)

DENMARK (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Outreach / Information Dissemination**	The Danish Green Traffic Week took place in September 2001, under the slogan "Skip a car trip, it relieves the strain". In order to draw attention to the activities during Green Traffic Week, organised by more than 55 Danish municipalities, the Green Traffic Secretariat carried out a number of events during the summer 2001 with the participation of the Minister of Transport, the motoring organisation FDM, town mayors and others.	Transport	Fossil Fuels Renewables Electricity
Tradable Permits	**Emissions Trading**	In 2001, following a round of hearings, the Danish Energy Agency allocated CO_2 emission permits to individual power companies for 2001. Allocation of the emission permits is based on the power companies' emissions in 1994-1998. The larger the percentage of their emissions attributable to CHP production during that period, the smaller the amount by which the emission permit decreases in subsequent years. The CO_2 Quota Act for electricity that entered into force in 2000 established a CO_2 quota system whereby each year the individual power companies are given an annual CO_2 emission permit for the following year.	Energy Prod. (Electricity Generation)	Electricity

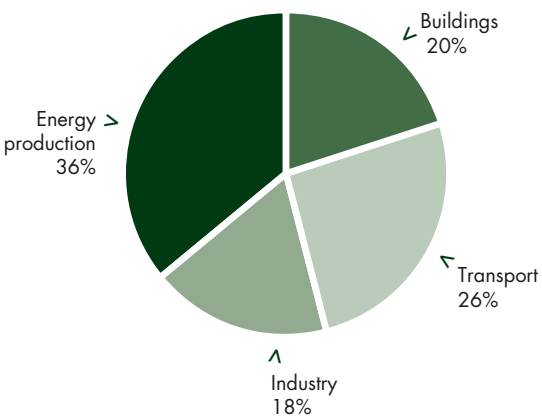
European Union

Key Indicators

	1990	1995	2000
TPES (Mtoe)	1,322.75	1,376.24	1,460.28
TPES/Capita (toe per capita)	3.62	3.69	3.86
TPES/GDP (toe per thousand 1995 US$ PPP)	0.20	0.19	0.18
CO_2 Emissions (Mt of CO_2)	3,114.84	3,083.14	3,161.74
CO_2/Capita (t CO_2 per capita)	8.52	8.26	8.35
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.46	0.43	0.38

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Fiscal	***Incentives / Subsidies***	*The European Commission proposed in October 2001 to concentrate investment on infrastructure projects for the Trans-European transport network in order to reduce bottlenecks and curb congestion [COM(2001)544], thereby considerably reducing the CO_2 emissions from transport. The Commission is also proposing to update the list of priority projects and to raise the minimum amount of Community financing from 10 to 20% for a number of critical railway projects and for cross-border projects in future accession countries [COM(2001)545]. The European Commission proposes to modify the priorities of the Trans-European network so as to optimise its capacity by concentrating investment on the creation of a rail network that gives priority to freight, including port connections; the development of a high-speed network for passengers, integrating rail and air; and intelligent transport systems, in particular through plans to deploy traffic management systems along congested routes. In making these changes, the European Commission intends to update the maps of the outline plans and to incorporate the most recent Community legislation on the environment. These proposals are a natural follow-up to the call from the Gothenburg European Council to give priority to rail, inland waterways, short sea shipping, intermodal transport and the corresponding connections.*	*Transport (Passenger Freight)*	*All*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Regulatory Instruments ***Fiscal***	***Mandates / Standards***	*In November 2001 the European Commission adopted an action plan and two proposals for directives to foster the use of alternative fuels for transport, starting with the regulatory and fiscal promotion of biofuels [COM(2001)547]. The action plan outlines a strategy to achieve a 20% substitution of diesel and gasoline fuels by alternative fuels in the road transport sector by 2020. It concludes that only three options would have the potential to achieve individually more than 5% of total transport fuel consumption over the next 20 years: biofuels which are already available, natural gas in the medium term, and hydrogen and fuel cells in the long term. The use of fuels derived from agricultural sources – biofuels – is considered the technology with the largest potential in the short to medium term. One proposed directive would establish a minimum proportion of biofuels in total fuels sold from 2005, starting with 2% and reaching 5.75% in 2010. The second proposed directive would give member States the option of applying a reduced rate of excise duty to pure or blended biofuels, when used either as heating or motor fuel.*	*Transport (Passenger, Freight)*	*Renewables (Biomass)* *Fossil Fuels (Gas)* *Hydrogen*
Regulatory Instruments	***Mandates / Standards***	*The European Commission in June 2001 adopted a report on the effect of using speed limiters on heavy vehicles, following the compulsory introduction in the EU in 1992 of speed limiters on all lorries over 12 tonnes, and buses over 10 tonnes, registered since 1988. Lorries are limited to a maximum speed of 90 km/h and buses to 100 km/h. The Commission report examines the effects of using the speed limiters and concludes that there is substantial evidence of improvements in both road safety and pollution. As a result, the Commission proposes that the legislation should be extended to cover all buses and large vans. That means that all passenger vehicles with more than 8 passenger seats and all goods vehicles over 3.5 tonnes would have to be fitted with speed-limiting devices. The net financial benefit of installation on large vans alone is estimated at €3 billion in the European Union. This takes into account the cost of installation, and the benefits derived from reduced emissions, noise, fuel costs and tyre wear, and fewer and less severe accidents. Reduced fuel consumption will also contribute to curb the growth of CO_2 emissions from freight transport.*	*Transport (Passenger, Freight)*	*All*
Policy Processes and Outreach	***Strategic Planning***	*In October 2001 the European Commission adopted a package, containing:* *• A proposal for a Council Decision on the ratification of the Kyoto Protocol by the EC to allow the EU to ratify the Kyoto Protocol simultaneously with the member States.* *• A communication on the implementation of the first phase of the European Climate Change Programme (ECCP) with a first list of measures for reducing GHG emissions, in order to prepare the Community for the Kyoto Protocol commitments.* *• A proposal for a directive on emissions trading for the energy sector and a selected number of energy-intensive industries, the intention being to reduce the cost for the EU of fulfilling the Kyoto obligations [COM(2001)580].* *The Communication on the implementation of the first phase*	*All*	*All*

EUROPEAN UNION (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		of the European Climate Change Programme (ECCP) draws on the outcome of a year-long cross-sectoral activity involving Commission and stakeholders in a wide consultation process. It includes the following measures in the energy sector: *• Framework Directive for Minimum Efficiency Requirements for End-Use Equipment.* *• Directive on Energy Demand Management.* *• Directive for the promotion of Combined Heat and Power (CHP).* *• Initiatives on increased energy-efficient public procurement.* *• Public Awareness Campaign and Campaign for Take-off.* *• Promotion of the use of biofuels for transport.*		
Regulatory Instruments ***Policy Processes and Outreach***	***Regulatory Reform*** ***Strategic Planning***	*In December 2001 the European Commission proposed an energy infrastructure package aimed at optimising the use of existing gas and electricity infrastructure and encouraging the construction of new infrastructure of European interest. Environmental impact of the energy system would thereby be reduced, and an increase of the market share of less CO_2 emitting gas and/or renewables would be facilitated. The package consists of a communication on European energy infrastructure, a proposal for a decision revising the Trans-European Network Energy Guidelines and a report on the implementation of Energy Trans-European Network programme (1996-2001). Seven critical bottlenecks in cross-border electricity transmission and five key gas supply projects have been identified. The action plan aims to:* *• Optimise the use of existing infrastructure, chiefly through transparent congestion management and tarification rules.* *• Encourage the construction of new infrastructure based on a transparent regulatory framework conducive to investment.* *• Focus on a new list of Priority Projects by revising Trans-European Network Energy guidelines and concentrating financial support on these twelve electricity and gas projects which should be declared of European interest. The Commission also proposes to increase from 10 to 20% the maximum share of possible co-financing for Priority Projects.* *• Raise political awareness of, and commitment to improving energy infrastructure.* *• Secure gas supplies for Europe.*	*Energy Prod. (Transmission / Transport)*	*Electricity* *Fossil Fuels (Gas)*
Regulatory Instruments	***Mandates / Standards***	*The European Commission proposed in April 2001 a new draft directive aiming at improving the energy performance of new and existing buildings within the European Union [COM(2001)226 final]. More than 40% of energy consumption is accounted for by the building sector, most of which is heating, providing hot water, cooling and lighting. It is estimated that there may be a cost-effective savings potential of over 22% of this figure. The main elements of the new draft directive are the following:* *• Common methodology for the development of integrated minimum performance standards in energy use to be adopted by member States for each type of building. The methodology will integrate insulation, heating, ventilation, lighting, orientation of the building, heat recovery, and renewable energy sources.*	*Buildings*	*All*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		• Application and regular updating of minimum standards based on this methodology for new buildings and also for existing buildings of over 1,500 m² when renovated. *• Certification schemes for new and existing buildings.* *• Specific inspection and assessment of heating and cooling installations by qualified personnel.* *A political agreement on the proposed directive was reached in the meeting of the Energy Council on 4 December 2001.*		
Policy Processes and Outreach ***Fiscal***	***Strategic Planning*** ***Taxes***	*The European Commission adopted in September 2001 a new Transport Policy White Paper [COM(2001)370], proposing an action plan aimed at substantial improvements in the quality and efficiency of transport in Europe. The White Paper aims at a shift of the balance between modes of transport to an environment-friendly mix and the removal of bottlenecks by revitalising the railways, promoting maritime and inland-waterway transport and linking up the different modes of transport. Modal shares should be restored to 1998 levels by 2010. The White Paper proposes a total of about 60 measures, some of which would lead to substantial reductions in energy consumption and CO_2 emissions, chief among them being the following:* *• The completion of market opening in freight railways.* *• The development of fair infrastructure-charging for all modes by proposing a Framework Directive taking into account external costs, addressing climate change in a manner co-ordinated with energy taxation.* *• The harmonised taxation of transport commercial fuel.* *• The support of investments in ten railway infrastructures.* *• The "Marco Polo" programme to promote intermodality.* *These measures are part of the strategy proposed by the White Paper gradually to break the link between transport growth and economic growth in order to reduce the pressure on the environment and prevent congestion.*	*Transport (Passenger, Freight)*	*All*
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Strategic Planning**	In January 2001 the European Commission adopted the 6th Environmental Action Programme [COM(2001)31]. The programme sets out the major priorities and objectives for environment policy over the next five to ten years and details the measures to be taken. Tackling climate change is highlighted as one of four central objectives. The first priority is the ratification and implementation of the Kyoto Protocol to cut GHG emissions by 8% below 1990 figures by 2008-2012. Actions on climate change identified in the 6th EAP include: • The establishment of an EU-wide CO_2 emissions trading scheme. • An inventory and review of energy subsidies in the member States, with consideration to their compatibility with climate change objectives.	All	All

EUROPEAN UNION (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		• Support to renewable energy sources through the new Directive and by ensuring adequate support in the liberalised energy market. • The use of market instruments, for example through the adoption of proposals for energy taxation. • The promotion of energy saving on both heating and cooling in buildings. • An environmental agreement with industry on energy-efficiency and specific emissions. • The identification of specific action to reduce GHG emissions from aviation, if no such action is agreed within the International Civil Aviation Organization by 2002. • Community policy for research and technological development.		
Policy Processes and Outreach **RD&D**	**Outreach / Information Dissemination** **Technology Development**	In November 2001, the European Commission has awarded under the CIVITAS Initiative – in the scope of the Fifth Framework Programme for Research and Technological Development – €50 million in funding to nineteen pilot cities to implement innovative and integrated actions for the improvement of urban transport. The cities taking part in the pilot projects will combat congestion and pollution through technologies and measures that make energy part of urban transport policy, in particular by enhancing energy efficiency and "clean" fuels. The aim is to promote the development of an attractive alternative to the use of private cars in cities. The measures to be introduced include: • New information and transport management systems. • "Clean" vehicle fleets for passengers and goods. • Promotional campaigns for public transport. • A system of charging for road use and parking based on environmental concerns. • The creation of special areas for "clean" vehicles in city centres. The results will form the basis of a guide on best practice for use by other cities. On the basis of this first experiment, the European Commission intends to re-launch the initiative in 2003. Under the CIVITAS Initiative, the European Commission is funding projects combining energy and transport in a coherent manner. The community provides 37% of the total cost of the initiative.	Transport (Passenger)	Fossil Fuels Renewables
Regulatory Instruments **Tradable Permits**	**Mandates / Standards** **Green Certificates**	The European Union Council of Ministers adopted a directive on the promotion of electricity from renewable energy sources in the internal electricity market (Directive 2001/77/EC) in September 2001. The directive aims to favour an increase of renewable energy sources in electricity production in the internal market and to provide the basis for a future Community framework in this matter. It allows establishing a certificate system for green electricity and accompanying measures to facilitate the market penetration of renewable sources in line with competition rules. The directive obliges member States to fix national targets for the consumption of electricity produced from renewable sources in line with indicative targets as listed in an annex to the directive. It foresees an evaluation by the Commission of the compatibility	Energy Prod. (Electricity Generation)	Renewables

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		of the national targets with the global indicative target of a 12% share of renewable sources in energy consumption and the specific indicative target of a 22% share in electricity consumption in 2010 and the possibility of the Commission proposing binding national targets in the case of incompatibility with global and specific targets. The directive does not foresee a harmonised support scheme for electricity produced from renewable energy sources. But the Commission will have to report on the different national support schemes and eventually propose a common frame within four years after entry into force of the directive.		
RD&D	**Research Programmes**	In May 2001, a scientific co-operation agreement on the development of renewable energy sources (solar energy and hydrogen) and energy efficiency was signed between the United States and the European Union.	Energy Prod. (Electricity Generation)	Renewables (Solar) Hydrogen
Policy Processes and Outreach	**Institutional Development**	A European Reference Centre for Intermodal Freight Transport (EURIFT) was inaugurated on 15 August in Hamburg. The main aim of EURIFT will be to provide independent and comprehensive information to support the development of the European intermodal transport industry. An initiative of the European Commission, EURIFT is jointly funded by the European Union, the cities of Bremen and Hamburg and by the academic and private sectors. Intermodality lies at the heart of the European Union's strategy for a sustainable transport policy, contributing to reducing CO_2 emissions in the transport sector. EURIFT will support the development of an efficient and sustainable intermodal freight system by correlating and integrating relevant facts and figures for the European intermodal industry and making that information publicly and easily available. It will also be a forum for exchanging information, defining and promoting best practices and encouraging innovation. For the first three years of its operation, 30% of the budget of EURIFT will come from the European Commission, after which it should be able to evolve into an independent, self-supported non-profit organisation.	Transport (Passenger, Freight)	All
Fiscal	**Incentives / Subsidies**	In 2001, the EU awarded a grant to BP Alaska to study capturing CO_2 generated by combustion. BP operates the CO_2 Capture Project, a consortium comprised of BP, Texaco, Chevron, Norsk Hydro, Royal Dutch/Shell, Statoil and Suncor Energy. This consortium is contributing US$ 8.8 million to the project, which is also receiving funding from Norway and the United States. Beginning in June 2001, the project will explore capturing CO_2 generated by various fuels and combustion processes and sequestering it in unmineable coal seams and saline aquifers. This project is an example of a government-private sector partnership to develop new technology to meet environmental concerns.	Energy Prod. (Refining)	Fossil Fuels

EUROPEAN UNION (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
RD&D	**Demonstration Projects**	In December 2001, the European Commission awarded €18.5 million to nine European cities (Amsterdam, Barcelona, Hamburg, London, Luxembourg, Madrid, Porto, Stockholm, Stuttgart) to introduce hydrogen and fuel-cell buses into their public transport system. The initiative is part of the CUTE (Clean Urban Transport for Europe) demonstration project funded under the Fifth Framework Programme for Research and Development. Hydrogen is an efficient and environment-friendly power source, which the Commission is committed to promote as part of its plan to foster the use of alternative fuels in transport. This fuel-cell bus project will be the first volume-production test of this scale conducted worldwide. The Energy and Transport Directorate-General of the European Commission has committed one of the largest funds ever to this demonstration project. The buses will be delivered to the cities during the year 2003. The performance of the bus is comparable to conventional diesel-driven buses and each can accommodate up to 70 passengers. Each of the bus operators will build a filling station for gaseous hydrogen. Fuel producers are partners in the creation of the hydrogen infrastructure, some of whom will subsequently operate the filling stations so as to gain experience with alternative fuels themselves. Hydrogen will be produced through different methods in order to provide data for an efficiency comparison.	Transport (Passenger)	Hydrogen Renewables (Fuel Cell)
Regulatory Instruments	**Regulatory Reform**	A Community directive on industrial installations (96/61/EC) covers a wide range of activities such as plants for the production and processing of metals and mineral products (steel, non-ferrous metals, cement, ceramics, glass, etc.), refineries and chemical plants, pulp and paper mills and food processing installations. The Integrated Pollution Prevention and Control (IPPC) directive lays down general obligations for operators of installations, including preventive measures against sizable emissions of nitrous oxide, methane and fluorinated GHGs and efficient use of energy. Since November 1999 all new or substantially changed installations have had to comply, whereas member States have until 30 October 2007 to bring the remaining “existing installations" in full compliance with the directive. The IPPC directive takes an integrated approach to pollution prevention and control. Efforts should be concentrated on those aspects of the performance of an installation that do the most damage to the environment. The European Commission is required to organise an exchange of information on best available techniques. In February 2001 the European Commission adopted a Green Paper on integrated product policy [COM(2001)68], presenting a strategy that aims to promote a gradual increase in the environmental quality of goods and services over their life cycles.	Industry	All
RD&D	**Demonstration Projects**	In July 2001 the European Commission awarded the final grants under the Pilot Action for Combined Transport (PACT) programme. A total amount of €7.5 million will be shared between seventeen selected projects. The selected actions should relieve congested road corridors by about 5 billion tonne-kilometres and thereby considerably reduce CO_2 emissions. PACT promotes international intermodal transport	Transport	

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		through commercially innovative ideas. Combined transport shifts containers and similar units off the road after the start of a journey and onto the rail, inland waterway or short voyages by sea – before returning them to the road at the very end of the journey. The PACT programme thus helps promote socially and environmentally sustainable transport and contributes considerably to reducing CO_2 emissions from transport through modal shift to less GHG emitting modes. PACT projects must be viable on their own after a maximum of three years' funding. The PACT programme came to an end on 31 December 2001 and will be replaced by the new promotion Programme Marco Polo.		
Policy Processes and Outreach	**Strategic Planning**	In June 1999 the European Commission presented a new Communication: "A Dynamic Alternative in a Sustainable Transport Chain" [COM (99) 317 final] which proposed ways of promoting short sea shipping in the Community as an environment-friendly and safe alternative, in particular, to congested road transport. Short sea shipping should become an integral part of the logistic transport chain and a genuine door-to-door service. The expected shift of transport from road to waterways is an important contribution to curbing the growth of CO_2 emissions from the road sector. The Commission is taking a number of steps, such as the examination of existing documentary and administrative procedures, to see whether they create a barrier to the development of short sea shipping, and if so, how this obstacle can be removed. In this context, 2001 saw the adoption by the European Parliament and the Council of Ministers of a directive for the simplification of reporting formalities for ships that call at EU ports. Problems involving bottlenecks at ports are addressed, and the Commission encourages regional exchanges of information and co-operation, as well as giving financial support to the creation and activities of short sea shipping promotion offices in the member States. In addition, the former PACT programme and the future (2003) Marco Polo programme have encouraged and will continue to encourage short sea shipping as part of intermodal transport, reducing reliance on road transport and hence emissions. All these activities are firmly rooted in the Community's Transport Policy White Paper of September 2001.	Transport (Passenger, Freight)	Fossil Fuels (Oil)

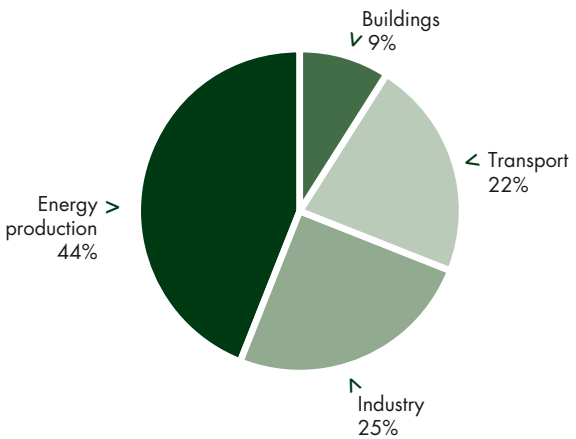
FINLAND

Key Indicators

	1990	1995	2000
TPES (Mtoe)	28.81	29.26	33.15
TPES/Capita (toe per capita)	5.78	5.73	6.40
TPES/GDP (toe per thousand 1995 US$ PPP)	0.29	0.30	0.27
CO_2 Emissions (Mt of CO_2)	54.98	56.43	54.79
CO_2/Capita (t CO_2 per capita)	11.03	11.05	10.59
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.55	0.59	0.44

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Tradable Permits	**Green Certificates**	Participating in a European-wide pilot project on renewable energy certificates, the Finnish market players have successfully set up the national system and proceeded to actual certificate trading. The pilot phase will last until the end of 2002. The Ministry of Trade and Industry and the National Technology Agency have participated in the funding of the project.	Energy Prod. Industry	Renewables
Policy Processes and Outreach	**Outreach / Information Dissemination**	The fuel-economy labelling of new passenger cars sold in Finland came into force at the beginning of 2001, in accordance with the EU directive. Fuel efficiency in cars has been emphasised through a yearly competition to designate the most ecological car of the year in co-operation with the most widely read motoring magazine in Finland.	Transport (Passenger)	Fossil Fuels
Policy Processes and Outreach	**Strategic Planning**	Finland's national climate strategy was published in March 2001. According to the business-as-usual scenario of the strategy, Finland's GHG emissions in 2010 would be 14 Mt CO_2 above the 1990 Kyoto target (+0% increase on 1990 levels). The strategy contains the policies and measures to reach the Kyoto target. Increases in energy conservation and the use of renewable energy sources are expected to account for 50% of the emissions reductions by 2010. Programmes for promoting these measures are already in place. The other half of reductions would result from measures in electricity	All	All

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		production. The strategy includes two options: switching from coal to gas or increasing the capacity of nuclear power.		
Policy Processes and Outreach	**Strategic Planning**	The Finnish Committee on the Kyoto Mechanisms submitted its final report on the application of the Kyoto Mechanisms in Finland's climate policy in January 2001. The committee consisted of representatives of various ministries as well as of organisations in industry, energy and nature conservation. The report provides the basis for the development of regulations and operating models for applying the Kyoto Mechanisms. The committee's recommendations aim at international emissions trading; the national trading option has been abandoned. Further development of an EU-wide emissions trading scheme is now under way.	Industry Energy Prod.	All
Tradable Permits	**Project-based Programmes (including CDM and JI)**			

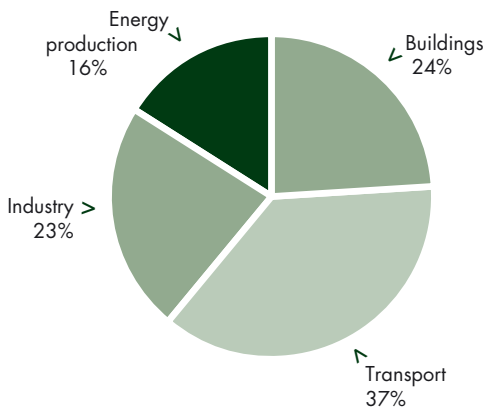
FRANCE

Key Indicators

	1990	1995	2000
TPES (Mtoe)	226.03	239.90	257.13
TPES/Capita (toe per capita)	3.90	4.04	4.25
TPES/GDP (toe per thousand 1995 US$ PPP)	0.20	0.20	0.19
CO_2 Emissions (Mt of CO_2)	352.68	354.53	373.26
CO_2/Capita (t CO_2 per capita)	6.08	5.98	6.18
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.31	0.30	0.28

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Outreach / Information Dissemination***	*The French government is planning to introduce high standards of energy efficiency in its government buildings. The aim is to reduce emissions and to demonstrate the feasibility and benefits from such actions. For example, in 2001, the Ministry of Transport has decided, in accord with the Ministry of Finance and Industry, to improve energy efficiency in all of its buildings. A government Action Plan is expected in 2002.*	*Buildings (Non-Residential)*	*All*
Fiscal	***Taxes***	*The draft 2002 budget bill extends a one-time tax credit of €1,525 for the purchase or the renting of natural-gas vehicles. The tax credit is extended to €2,300 if the acquisition of a clean-fuel vehicle is accompanied with the scrapping of a vehicle first registered before 1 January 1992, when France began requiring the use of catalytic converters on unleaded fuel vehicles. The tax credit is extended also to people transforming their gasoline cars (licensed for less than three years) to gas from liquefied petrol (GPL).*	*Transport (Passenger)*	*Fossil Fuels (Oil / Gas)* *Electricity*
Regulatory Instruments	***Mandates / Standards***	*France must adopt the European Parliament and Council directive on renewable energy objectives at the latest by October 2003. The objective for France is to increase the share of renewables to 21% of national electricity production by 2010.*	*Energy Prod. (Electricity Generation)*	*Renewables*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Regulatory Instruments	***Mandates / Standards***	*Launched in 1996, the Eole 2005 programme aims at developing in France a wind energy capacity of 250-500 MW by 2005. In 2001the government announced a plan to extend the programme to 5,000 MW of installed power by 2010. In addition, favourable tariffs of electricity from wind were adopted in June 2001.*	*Energy Prod. (Electricity Generation)*	Renewables (Wind)
Fiscal	***Fees/Charges***			
		policies and measures taken over the year 2001		
Fiscal	**Taxes**	Extension of the tax credit on the acquisition of large equipment and renewable energy equipment to the acquisition of thermal insulation and heating-regulation material.	Buildings (Residential)	All
Regulatory Instruments	**Regulatory Reform**	The European Parliament and Council Directive No. 2000/55/CE on energy efficiency requirements of fluorescent lighting ballasts has been transposed into French law. This regulation aims to exclude the least energy-efficient ballasts.	Buildings (Community Use)	Electricity
Fiscal	**Incentives / Subsidies**	The following feed-in tariffs have been set. All sites benefiting from the mandatory buyback rates must be under 12 MW of nominal capacity: • Wind energy: production sites built after the law was published (November 2001) can sign a fifteen-year contract which guarantees a FF 0.55/kWh (€0.0838) rate for the first five years for all sites. The tariff for the next ten years depends on wind conditions; plants working at full capacity for less than 2,000 hours continue to get €0.0838, those at a full-capacity of 3,600 h/year receive €0.0541/kWh (tariffs in between are determined by a linear regression). These tariffs apply for the first 1,500 MW of nationally installed capacity, thereafter all tariffs decrease by 10% (only for new projects). These tariffs are applicable until December 2002, after they decrease by 3.3% annually to reflect technology learning. • Small hydro: production sites built after the publication of the law (or for the marginal production from retrofits increasing production by more than 10%) can sign a twenty-year contract which guarantees FF 0.40/kWh (€0.0610) for sites with a capacity under 500 kW and FF 0.36/kWh (€0.0549) for larger ones. An incentive for regularity of production of up to FF 0.10/kWh (€0.0152) is available in winter (regularity and winter incentives can be separated). • Combustible waste: production sites built after the publication of the law are guaranteed rates of up to FF 0.299/kWh (€0.0456) for medium-voltage connections and FF 0.274/kWh (€0.0418) for high-voltage connections. • Biogas from landfills: production sites built after the publication of the law are guaranteed, in metropolitan France, rates up to €0.0572/kWh for small installations, up to €0.0450/kWh for large installations and linear interpolation for medium-sized installations.	Energy Prod. (Electricity Generation)	Renewables

FRANCE (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Outreach / Information Dissemination**	The French government organised, together with several industrial partners, an Energy Week from 14 to 20 May 2001, to improve citizens' knowledge of energy issues, with more than 300 events, including seminars and exhibitions.	All	All
Policy Processes and Outreach	**Outreach / Information Dissemination**	A national information campaign, sponsored by ADEME (Agency for the Environment and Energy Management) and the Ministries of Environment and Industry, ran from June to November 2001, at a cost of FF 40 million. It was aimed at consumers with the objective of harmonising individual interests with the collective goal of reducing GHG emissions, in particular with relation to climate change policies. The campaign was supported by a mass-media plan on television and radio, and field operations with partnership of professionals.	All	All
Regulatory Instruments	**Regulatory Reform**	Energy regulations for new buildings were applied in June 2001. In the residential sector, energy consumption is forecast to fall by 15% with respect to the 1988 regulation, and in the commercial and tertiary sectors, a performance improvement of 40% is expected.	Buildings	All
Fiscal **RD&D**	**Incentives / Subsidies** **Research Programmes**	A new planning contract was signed in June 2001 between ADEME and the Ministries of Industry, Research and Environment. Priorities for the period 2000-2006 are in four areas: waste management, energy efficiency, transport policy and air quality. For 2001, the total budget of ADEME was €400 million, 15% of which is devoted to research.	All	All
Fiscal	**Incentives / Subsidies**	The measure allowing an exceptional twelve-month amortisation on the purchase of specific energy-saving equipment and of equipment based on renewables has been extended to 31 December 2006.	Industry	All
Regulatory Instruments	**Regulatory Reform**	The government has developed a legal framework to promote efficient co-generation systems: • The decree of 6 December 2001 gave details of how electricity produced by co-generation was going to become mandatory for power generators. • The decree of 10 May 2001 defines the conditions of purchase of electricity produced by operators benefiting from the obligation to buy electricity produced by co-generation. • The decree of 3 July 2001 determines the technical characteristics of co-generation installations, which are eligible to benefit from the obligation to purchase electricity. • The decree of 31 July 2001 determines the conditions for the purchase of electricity.	All	Fossil Fuels Renewables (Biomass)
Fiscal	**Incentives / Subsidies**	In 2001, ADEME set up a crediting system (FOGIME) for small and medium-sized businesses' energy saving investments.	Industry	Electricity

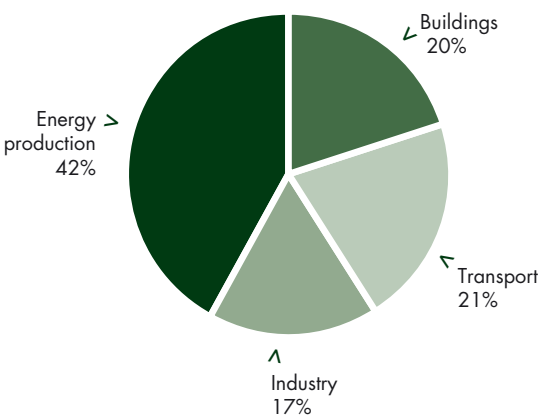
GERMANY

Key Indicators

	1990	1995	2000
TPES (Mtoe)	355.53	339.87	339.64
TPES/Capita (toe per capita)	4.48	4.16	4.13
TPES/GDP (toe per thousand 1995 US$ PPP)	0.22	0.19	0.18
CO_2 Emissions (Mt of CO_2)	964.13	870.02	832.95
CO_2/Capita (t CO_2 per capita)	12.15	10.65	10.14
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.60	0.50	0.44

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Regulatory Reform***	*On 15 August 2001 the German Cabinet adopted the draft of the new Co-generation Act which had been submitted by the Federal Ministry of Economics and Technology. In view of the importance of co-generation for the environment, the draft act will provide financial incentives for retaining and modernising existing facilities. The legislation will further provide for supplementary funding to foster the additional construction of small, block-type thermal power stations and of fuel-cell units. Operators of the assisted co-generation facilities are entitled to bonus payments that are expected to total €4.4 billion by 2010. Operators of fuel-cell units will receive particular assistance. They are to be given a €0.05 bonus for every KWh fed into the grid for a period of ten years after the start of operations.*	*Energy Prod. (Electricity Generation)*	*Electricity (CHP)*
Fiscal	***Incentives / Subsidies***			
Tradable Permits	***Emissions Trading***	*A German state-owned credit institution announced in September 2001 that it was planning to introduce two funds to help the country meet its target to cut 45 million tonnes of GHG emissions a year by 2010.The first fund will help companies finance environmental projects in developing countries as part of the Clean Development Mechanism (CDM) of the Kyoto Protocol. A second fund would aim to encourage small to medium-sized firms to take part in emissions trading in a Europe-wide company cap-and-trade system, which the EU plans to launch in 2005.*	*All*	*All*
	Project-based Programmes (including CDM and JI)			

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Regulatory Instruments	**Mandates / Standards**	The federal government and Bundesrat passed a new ordinance for energy saving in buildings; it took effect on 1 February 2002. With the new Energy Conservation Ordinance, the low-energy-house standard will become the norm. The heating requirements of new buildings will be approximately 30% below the previous stipulations. The ordinance also mobilises energy-saving reserves when existing buildings are modernised. Above all, roughly 2 million inefficient heating furnaces, installed before 1 October 1978, are to be upgraded or replaced in the next few years, and thermal insulation is to be added to certain non-insulated pipes and to the top floors of buildings under attics that cannot be converted into usable space. In addition, the instrument of energy certification will be extended in order to make the energy efficiency of buildings more transparent.	Buildings (Residential Non Residential)	All
Regulatory Instruments	**Regulatory Reform**	In June 2001 an ordinance came into effect which specifies what substances and technical processes used in connection with biomass fall within the scope of application of the Renewable Energy Act; the act came into effect on 1 April 2000 and lays down the relevant environmental standards.	Energy Prod. (Electricity Generation)	Renewables (Biomass)
Policy Processes and Outreach	**Institutional Development**	In 2001, the federal government developed the German Energy Agency (Dena). Dena was set up under the Federal Ministry of Economics and Technology and is owned by the Federal Republic of Germany and Kreditanstalt für Wiederaufbau (KfW). Dena works on projects, programmes and campaigns that promote energy efficiency and environment-friendly transformation of energy, distribution and use, renewable energies, climate protection and sustainable development.	All	All
Regulatory Instruments	**Regulatory Reform**	To transpose the legal acts of the European Community, the 2001 act to amend the EnVKG enables the Federal Ministry of Economics and Technology to require by law that appliances and motor vehicles bear labels showing the consumption of energy and other important resources. For appliances, additional maximum values can be stipulated unrelated to the above legal acts. The EnVKG entered into effect on 31 January 2002. It has been agreed to transpose two European energy conservation directives (Directives 1999/94/EC and 2000/55/EC).	Transport (Passenger) Industry (Manufacturing)	Electricity Fossil Fuels (Gas)
Fiscal	**Incentives / Subsidies**	A programme to reduce CO_2 emissions was launched in January 2001 as part of Germany's climate protection strategy. It offers low-interest loans for complete modernisation packages for residential buildings. About 9,000 loans totalling some €500 million were committed through the end of November 2001. These funds have been invested to reduce CO_2 emissions and raise the energy efficiency of 30,000 units of the existing stock of residential buildings. This programme is complementary to the still running KfW (Kreditanstalt für Wiederaufbau) interest-rate reduction programmes for single	Buildings (Residential)	Electricity Fossil Fuels (All) Renewables (All)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		measures in existing buildings, permitting whole packages of measures intended for energetic modernisation to benefit again from even further reduced interest rates. The programme is intended to run until 2005.		
RD&D	**All**	A Special Funding Programme for 2001-2003 was launched to endorse energy research in: • Fuel cells (stationary and mobile application) – about €63 million. • Alternative vehicle propulsion (e.g., high-performance batteries) and regenerative fuel production (e.g., hydrogen, methanol) – together about €15 million. • Geothermal energy production (heat and electricity) – about €15 million. • Offshore wind energy – about €15 million. • Renovation of the energy characteristics of existing buildings – about €15 million.	All	Renewables Fossil Fuels (Gas)
Voluntary Agreements	**Strong VA**	On 25 June 2001, the German government and German industrial sector and energy industry initialled an agreement concerning the reduction of CO_2 emissions and the promotion of CHP generation, the objective being to reduce emissions by 2010 by a total of roughly 45 million tonnes of CO_2/year of which preferably a total of 23 million t CO_2/year, but at least a minimum of 20 million t CO_2/year, in CHP.	Industry (All) Energy Prod. (Electricity Generation)	Electricity (CHP)

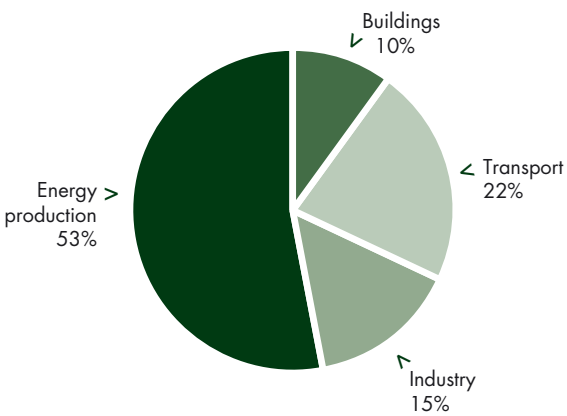
GREECE

Key Indicators

	1990	1995	2000
TPES (Mtoe)	21.75	23.13	27.82
TPES/Capita (toe per capita)	2.14	2.21	2.63
TPES/GDP (toe per thousand 1995 US$ PPP)	0.17	0.17	0.18
CO_2 Emissions (Mt of CO_2)	70.58	73.22	87.75
CO_2/Capita (t CO_2 per capita)	6.95	7.00	8.31
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.56	0.55	0.55

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Regulatory Reform*** ***Mandates / Standards***	*Following the Joint Ministerial Decision 21475/4707/1998 on the limitation of CO_2 emissions from the building sector, a regulation for rational energy use and conservation in buildings is being prepared; it will replace the existing regulation on thermal insulation. Consequently, minimum energy standards for new buildings will be established, as will other measures, such as energy audits, classification of buildings according to their energy consumption, and so on.*	*Buildings (Residential Non-Residential)*	*All*
Policy Processes and Outreach	***Strategic Planning***	*The objective of the "Hellenic Action Plan for the Abatement of CO_2 and Other Greenhouse Gas Emissions", developed in 1995, was to restrict the increase in CO_2 emissions in 2000 to no more than 12.4 Mt from 1990 level. This action plan expired in 2000 and Greece is planning to introduce a new "National Programme for Reducing Greenhouse Gas Emissions 2000-2010" in 2002 to monitor the effectiveness of policies and measures.*	*All*	*All*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Fiscal	**Tax**	In accordance with the Law 2836/2000, lower tax rates were set for unleaded petrol. In 2001, the excise tax was raised for leaded petrol, as well as for unleaded petrol with special additives to be used in conventional engine. These regulations will provide an incentive for replacing old-technology passenger cars by new ones. CNG (compressed natural gas) buses are exempted from the excise taxes.	Transport (Passenger)	Fossil Fuels (Oil)
Regulatory Instruments	**Mandates / Standards**	The law 1350/83 makes a regular technical control of vehicles mandatory. It takes place at the Centres for the Technical Control of Vehicles, of which there are currently 58 in operation all over Greece. Since infrastructural and personnel problems have meant insufficiently frequent controls in some prefectures, law 2963/2001 was introduced. It provides for the establishment of private centres for technical control, the improvement of public ones and the development of a special service that will supervise their operation.	Transport (Passenger)	Fossil Fuels (Oil)

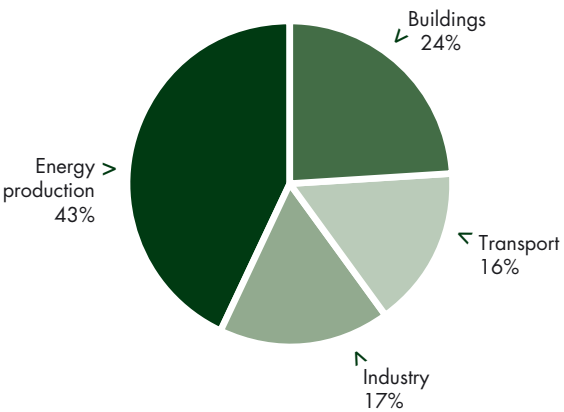
HUNGARY

Key Indicators

	1990	1995	2000
TPES (Mtoe)	28.44	25.53	24.78
TPES/Capita (toe per capita)	2.74	2.50	2.47
TPES/GDP (toe per thousand 1995 US$ PPP)	0.27	0.28	0.22
CO_2 Emissions (Mt of CO_2)	70.53	58.61	55.22
CO_2/Capita (t CO_2 per capita)	6.81	5.73	5.51
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.68	0.63	0.49

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Regulatory Reform***	*During 2001, the Hungarian Energy Centre, in co-ordination with a number of ministries, prepared a renewable energy strategy. Part of this work was in the new PHARE programme, which contains the following main themes:* *• Preparation of the harmonisation of law for the EU directive on biofuels, and assessing the impact of its introduction.* *• Preparation and impact assessment of the harmonisation of law for the proposed directive on the support of the electricity production from renewables.* *• Survey of the EU financial support systems for renewable energy resources, including support to agriculture and rural development, and the possibility of structural support; Defining the tasks in reorganising the Hungarian support system in order to develop possible cofinancing.* *• Further development of the statistical system for renewable energy resources.* *The implementation of the programme began in January 2002.*	*All*	*Renewables*
Policy Processes and Outreach	***Strategic Planning***			
Tradable Permits	***Green Certificates***	*The Hungarian Parliament approved the new Act on Electricity on 18 December 2001. The act will enter into force on 1 January 2003 and allows the gradual introduction of competition from that date. The first step will be an opening of 35% of the market. The new act includes the use of a system of green certificates, which will be rigorously regulated by a secondary legislation process.*	*Energy Prod. (Electricity Generation)*	*Renewables*
Policy Processes and Outreach	***Strategic Planning***			

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Strategic Planning** **Advice / Aid in Implementation**	The UNDP/GEF Public Sector Energy Efficiency Programme seeks to remove barriers to improved energy efficiency in municipal buildings, including schools, hospitals and other public buildings. The main objectives of the programme, which started in 2001, are: • To improve the development and co-ordination of energy efficiency policy, as well as increase policy awareness. • To identify, develop and finance energy efficiency projects in municipalities. • To improve the knowledge base for energy management and energy efficiency technologies. The Energy Centre, under the authority of the Ministry of Economic Affairs, is the implementing agency of the project. The programme also intends to reach out to municipalities and local advice centres and networks. The budget of the Programme is approximately US$ 5 million from the donors (the United Nations Development Program and the Global Enrironmental Facility) and US$ 10 million from national sources.	Buildings (Non-Residential)	All

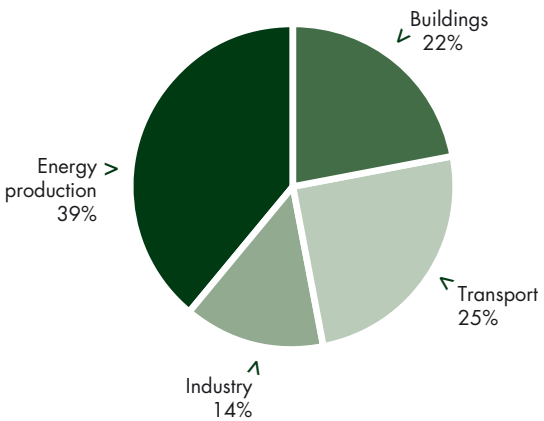
IRELAND

Key Indicators

	1990	1995	2000
TPES (Mtoe)	10.46	11.35	14.62
TPES/Capita (toe per capita)	2.98	3.15	3.86
TPES/GDP (toe per thousand 1995 US$ PPP)	0.20	0.17	0.14
CO_2 Emissions (Mt of CO_2)	30.26	32.67	41.20
CO_2/Capita (t CO_2 per capita)	8.63	9.07	10.88
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.58	0.50	0.39

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Strategic Planning***	*In order to attain the revised 500 MW target for renewables based electricity-generating capacity (part of Ireland's Climate Change Strategy launched in October 2000), the fifth competition in the Alternative Energy Requirement series, AER V, was launched in May 2001. Through AER V, contracts for 362 MW of electricity-generating plant based on renewable energy – large and small-scale wind, biomass and small-scale hydro – have been offered to the market. All projects successful in the competition must be installed and selling electricity by 31 December 2004. The balance of the 500 MW target will be offered to the market as soon as is practicable so as to ensure that the overall target is achieved by 2005.*	*Energy Prod. (Electricity Generation)*	*Renewables (Hydro, Biomass)*
Fiscal	***Incentives / Subsidies***			
		policies and measures taken over the year 2001		
RD&D	**Technology Development**	The House of Tomorrow Programme 2001-2006, launched in September 2001, offers support for research, development and demonstration projects aimed at generating and applying technologies, products, systems, practices and information leading to more use of sustainable energy in Irish housing. The main focus of the programme, which has a proposed five-year budget of €21.1 million, is on stimulating widespread uptake of superior energy planning, design, specification and	Buildings (Residential)	All
Fiscal	**Incentives / Subsidies**			

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		construction practices in both the new-home-building and home-improvement markets. The House of Tomorrow Programme 2001-2006 is part of the implementation process of the Green Paper on Sustainable Energy, published in 1999.		
RD&D	**Technology Development** **Demonstration Projects**	The aim of the Public Sector Building Programme, with an allocated budget of €12.7 million, is to stimulate the application of improved energy-efficiency design strategies, technologies and services in building construction and retrofit projects, acting as both an exemplar for good practice and as a demand leader for the services and technologies involved. The Public Sector Building Programme is part of the implementation process of the Green Paper on Sustainable Energy.	Buildings (Non-Residential)	All
Fiscal **RD&D**	**Incentives / Subsidies** **Technology Development**	Under the Economic and Social Infrastructure Operational Programme of the National Development Plan 2000-2006, a provision of €222.52 million has been made in 2001 for the development and implementation of energy efficiency and renewable energy initiatives.	All	All
RD&D **Policy Processes and Outreach**	**Technology Development** **Strategic Planning**	The report "An examination of the future potential of CHP in Ireland" was commissioned by the government in the Green Paper on Sustainable Energy and was carried out by the Irish Energy Centre. It examines the status of CHP in the current Irish market, its potential for growth, the barriers to that growth, and possible measures that might assist CHP achieve the target laid out in the National Climate Change Strategy (a reduction of 0.25Mt of CO_2 by 2010). This report was presented to the Minister of State at the Department of Public Enterprise on 6 December 2001 and was then opened for public consultation.	Energy Prod. (Electricity Generation)	Electricity (CHP)

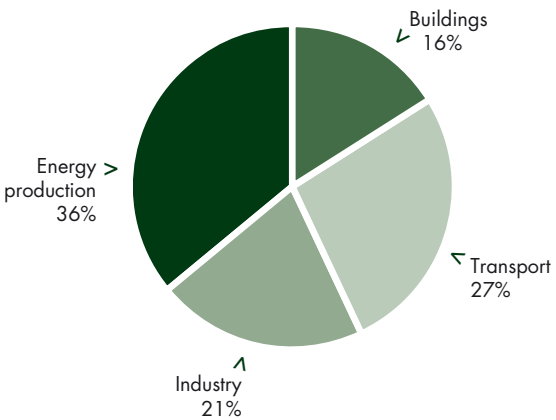
ITALY

Key Indicators

	1990	1995	2000
TPES (Mtoe)	151.63	159.82	171.57
TPES/Capita (toe per capita)	2.67	2.79	2.97
TPES/GDP (toe per thousand 1995 US$ PPP)	0.14	0.14	0.14
CO_2 Emissions (Mt of CO_2)	400.07	412.91	425.73
CO_2/Capita (t CO_2 per capita)	7.05	7.21	7.38
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.37	0.36	0.34

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Mandates / Standards***	*Italy's Council of Ministers has announced that the government will eventually cut out all but "green" petrol in order to keep prices down and reduce GHG emissions as mandated by the Kyoto Protocol. After 1 January 2002, leaded fuel will not be sold, leaving only unleaded and much cleaner "green" petrol available to Italian consumers.*	*Transport (Passenger)*	*Fossil Fuels (Oil)*
Policy Processes and Outreach	***Strategic Planning***	*A clean air plan of L111 billion, financed from the national carbon tax and local governments, has been introduced in the Milan Province and region, in order to reduce atmospheric pollution and CO_2 emissions in this area. The objective is to bring Milan within the European directive (still not approved by the Italian State). This plan is still in the early stages, although the directive should be in place by 2002.*	*All*	*All*
Fiscal	***Incentives / Subsidies***	*The Environment Ministry is working on developing tax and fuel incentives to promote the use of cars that run at least partially on hydrogen. The government is prepared to require public sector auto fleets to include the new hybrid cars.*	*Transport (Passenger)*	*Renewables*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Regulatory Instruments	**Regulatory Reform**	A constitutional referendum aimed at decentralising Italy's power structure held on 7 October 2001 gave the 20 regions responsibility for evaluating potential environmental problems arising from the power sector and to allocate funds.	Energy Prod.	All
Regulatory Instruments	**Mandates / Standards**	The legislative Decrees 79/1999 and 164/2000, enacted to comply with the European directives on the opening of the electricity and gas markets, set out that the government concession to companies which undertake the distribution of electricity and gas shall include the obligation to implement measures and interventions aimed at the improvement of energy efficiency in end uses, measured according to quantitative targets. These targets, the modalities for designing and implementing the energy-saving programmes, along with the procedures to be adopted to monitor and evaluate them, were defined by two decrees issued on 24 April 2001 by the Ministry of Production Activities in collaboration with the Ministry of Environment. The obligations were in force for distributors providing electricity or gas to more than 100,000 end-users by 31 December 2001. An innovative element is represented by the establishment of a trading scheme of energy efficiency "certificates". The implementation of energy efficiency programmes in agreement with the two decrees will allow the achievement by 2006 of reductions in GHG emissions of 7.3Mtoe – about 15% of the Italian commitment under the Kyoto Protocol.	Energy Prod.	Fossil Fuels (Gas)
Tradable Permits	**Green Certificates**		Buildings	Electricity

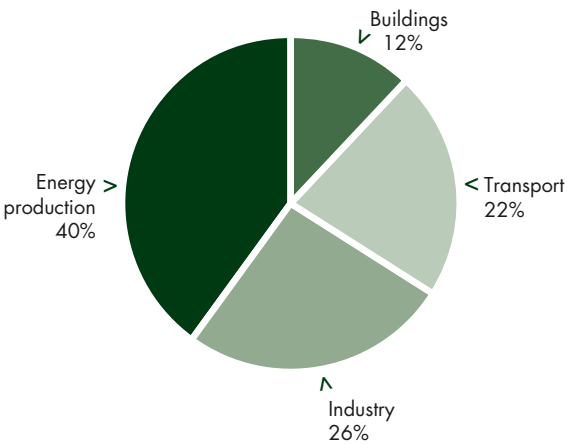
JAPAN

Key Indicators

	1990	1995	2000
TPES (Mtoe)	438.85	497.81	524.71
TPES/Capita (toe per capita)	3.55	3.96	4.13
TPES/GDP (toe per thousand 1995 US$ PPP)	0.16	0.17	0.17
CO_2 Emissions (Mt of CO_2)	1,018.72	1,099.86	1,154.84
CO_2/Capita (t CO_2 per capita)	8.25	8.76	9.10
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.37	0.38	0.37

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Regulatory Reform***	*The Japanese government is planning to replace all of its government official vehicles (some 7,000 approximately) with low-pollution vehicles between 2002 and 2005. This plan aims to promote energy efficiency, reduce oil consumption and, as a result, reduce CO_2 emissions from transport.*	*Transport (Passenger)*	*Fossil Fuels*
Regulatory Instruments	***Regulatory Reform***	*The Japanese government will introduce solar power in its government office buildings to ensure energy security and promote renewables. In this initiative, the Japanese government will introduce 410 kW capacity of solar power to the thirteen eligible offices. The amount of electricity production is expected to be 0.43 million kWh and it will provide 0.15% of electricity consumed in these buildings.*	*Buildings*	*Renewables (Solar)*
		policies and measures taken over the year 2001		
Policy Processes and Outreach	***Outreach / Information Dissemination***	The Energy Conservation Centre Japan (ECCJ) held the 25th Energy and Environment Exhibition (ENEX2001) in February 2001 in Tokyo and Kyushu. The main theme of this exhibition was "Energy conservation and energy efficiency to enrich our lives". Participants from the industrial and residential sectors presented environment-friendly "ways of life" and exchanged information.	All	Fossil Fuels Electricity

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Fiscal	**Incentives / Subsidies**	METI (Ministry of Economy, Trade and Industry) provides subsidies through NEDO (New Energy and Industrial Technology Development Organisation) for introducing energy management systems in homes and buildings which help manage the energy consumption of appliances such as lighting, air-conditioning, and hot-water supply by using information technology systems. These systems enable automatic management of several appliances simultaneously, leading to energy savings and reduced environmental impact.	Buildings (Residential, Non Residential)	Fossil Fuels Electricity
Policy Processes and Outreach	**Outreach / Information Dissemination**	The ECCJ held the Smart Life 2001 Campaign. This campaign invited consumers to use energy efficiently and promoted simplicity in many aspects of Japanese life (clothing, preparing food, around the house, in the office, in education, in the car, and so on). The campaign included proposals to reduce energy consumption in air-conditioning; educational initiatives to deepen environmental awareness and energy efficiency; proposal for fuel-efficient driving.	All	Fossil Fuels Electricity
Policy Processes and Outreach	**Outreach / Information Dissemination**	The ECCJ published a guidebook on energy saving for buildings that includes measures (with examples) to promote energy savings in buildings, energy management measures, and a check-list for energy saving. The ECCJ also published a technical handbook on energy savings in buildings that focuses on technical aspects, including air-conditioning, ventilation, elevators, ICT devices.	Buildings (Non-Residential)	Fossil Fuels Electricity
RD&D	**Technology Development**	METI has provided subsidies for R&D projects that will contribute to energy saving or the diffusion of renewables. Examples of projects and funding include R&D on: • The basic technology of high-performance energy efficiency, with funding in 2001 of Y13 billion. • The Polymer Electrolyte Fuel Cell, with funding in 2001 of Y30.5 billion. • The efficient conversion of biomass energy, with funding in 2001 of Y20 billion. • The practical use of space photovoltaic with funding in 2001 of Y58 billion.	Transport Energy Prod.	All
Voluntary Agreements	**Strong VA**	Keidanren (the Japan Federation of Economic Organisations) conducted a follow-up survey on its voluntary action plan on the environment. It concluded that CO_2 emissions in 2000 were 486.09 million tonnes, a 1.2% increase over 1990 figures; estimated CO_2 emissions in 2005 will be 563.7 million tonnes (approximately 5.5% higher than in 1990), and on a business-as-usual basis, CO_2 emissions in 2010 will increase to 532.88 million tonnes (11% higher than in 1990). Keidanren has therefore called for further effort to mitigate GHG emissions for all industries, with particular emphasis on the role of technology development.	Industry	Fossil Fuels Electricity

JAPAN (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Advice / Aid in Implementation**	The ECCJ conducted a field survey with energy-saving diagnosis of sixteen factories (chemicals, iron, steel, oil refining, electronic appliances manufacturing, etc.) in 1997-2000. The results and proposals for further energy savings for each industry were published in 2001.	Industry (Manufacturing)	Fossil Fuels Electricity
Policy Processes and Outreach	**Strategic Planning**	In July 2001 the Japanese government revised its Long-Term Energy Policy so as to to meet its commitments under the Kyoto Protocol. The revised outlook emphasises the following areas: • Further promotion of energy efficiency and conservation policies. • Additional introduction of renewable energy.	All	All
Fiscal **Voluntary Agreements**	**Incentives / Subsidies** **Weak VA**	The Japanese government is now carrying out its Action Plan on Promoting Low-Pollution Vehicles. This plan aims to deploy 10 million low-pollution vehicles by 2010 (such as CNG cars, electric cars, hybrid cars, methanol cars, etc.) and 50,000 fuel-cell cars. The plan foresees that the government sector will set the example by introducing low-pollution vehicles in government, inviting local government to change existing vehicles into low-polluting vehicles, providing tax or financial incentives for private purchasers, and launching publicity campaigns.	Transport (Passenger)	Fossil Fuels (Oil) Renewables
Policy Processes and Outreach	**Outreach / Information Dissemination**	The Japanese government and the ECCJ implemented the Energy Saving Month Campaign in February 2001 and gave energy-saving awards to high-performance energy-efficient appliances.	All	Fossil Fuels Electricity

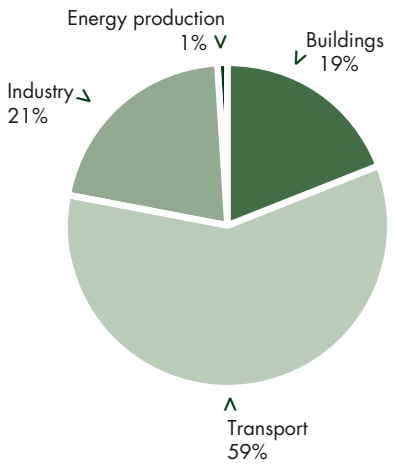
LUXEMBOURG

Key Indicators

	1990	1995	2000
TPES (Mtoe)	3.57	3.38	3.68
TPES/Capita (toe per capita)	9.37	8.18	8.34
TPES/GDP (toe per thousand 1995 US$ PPP)	0.34	0.25	0.20
CO_2 Emissions (Mt of CO_2)	10.47	8.19	8.04
CO_2/Capita (t CO_2 per capita)	27.47	19.83	18.24
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.99	0.60	0.43

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Outreach / Information Dissemination**	The Ministry of Environment developed a new Renewable Energy Guide in September 2001. This guide, created in collaboration with the Luxembourg Energy Agency, aims to inform people about renewable energy technologies, their possibilities and use. It also serves as an information source on methods to apply for and obtain subsides under the government scheme for the promotion of renewable energy sources.	Energy Prod. (Electricity Generation)	Renewables
Fiscal	**Incentives / Subsidies**	The government introduced in January 2001 a grant scheme to promote the purchase of vehicles producing low CO_2 emissions. The scheme aims to incite people to buy cars with CO_2 emissions below an average value of 95 g/km (corresponding to a fuel consumption of 3-3.5 litres/100km).	Transport (Passenger)	Fossil Fuels

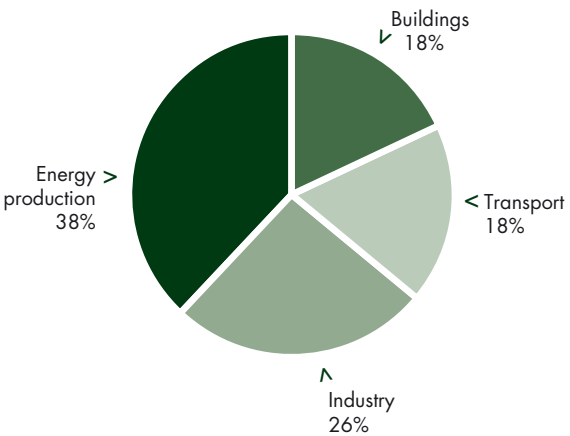
NETHERLANDS

Key Indicators

	1990	1995	2000
TPES (Mtoe)	66.47	73.17	75.80
TPES/Capita (toe per capita)	4.45	4.73	4.76
TPES/GDP (toe per thousand 1995 US$ PPP)	0.22	0.22	0.19
CO_2 Emissions (Mt of CO_2)	159.79	174.48	177.12
CO_2/Capita (t CO_2 per capita)	10.69	11.29	11.13
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.54	0.53	0.45

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Mandates / Standards***	*In the period 2002-2004, a new mandate requires that 50% of the consumption of electricity of all government buildings be derived from renewable energy sources.*	*Buildings (Non-Residential)*	*Electricity*
Tradable Permits	***Emissions Trading***	*In reaction to the proposal from the European Commission on emissions trading and to the proposal from a national independent commission on a domestic trading scheme, the Dutch government has plans to design a national draft allocation plan, to be discussed within the EU.*	*All*	*All*
Fiscal	***Taxes***	*The Dutch government will develop a tax policy measure in order to stimulate climate-neutral energy sources. The goal is to have this policy in place in 2003.*	*Energy Prod.*	*Fossil Fuels*
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Strategic Planning**	The Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM) is responsible for purchasing Certified Emission Reduction Units (CERs) from Clean Development Mechanism (CDM) projects. A special CDM division was established within the ministry as part of the Directorate for International Affairs on 1 April 2001. As public money is involved and procurement rules are applicable, the	All	All

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Institutional Development**	Ministry is not entitled to buy CERs at random from the market. Co-operation will therefore be sought with several types of intermediate implementing organisations. Three separate tracks are currently under development for the acquisition of CERs: • Through multilateral international financial institutions (such as the World Bank, IBRD, IFC and regional development banks), the position and international legal status of which should allow them to approach the market and negotiate the purchase of CERs on behalf of the Netherlands. • Through international tendering by Senter (a government agency), following procedures and conditions set in advance, in accordance with European (and WTO) procurement regulations. • Through private financial institutions, which will be selected through tender.		
Fiscal	**Taxes**	The government has changed the fuel tax on fuel inputs in electricity production into a tax on kWh-output as part of the regulatory energy tax per 1 January 2001.	Energy Prod. (Electricity Generation)	Renewables
Regulatory Instruments	**Mandates / Standards**	Energy labels were introduced in January 2001, indicating the fuel consumption and CO_2 emissions of new passenger cars. These labels report both absolute fuel consumption and relative fuel consumption compared to other types of cars of similar size.	Transport (Passenger)	Fossil Fuels
Fiscal	**Taxes**	Tax deductions for commuting in a private car were eliminated from 1 January 2001. An additional change to the tax code as of that date was aimed at discouraging the personal use of company cars. This change involved differentiation of the income imputed for using a company car for private purposes. The imputed income is now lower for less-than-average personal kilometres, and higher for above-average personal kilometres.	Transport (Passenger)	Fossil Fuels
Tradable Permits	**Project-based Programmes (including CDM and JI)**	The first Certified Emission Reduction Units Procurement Tender (CERUPT) was opened by Senter in November 2001 to purchase CERs from Clean Development Mechanism (CDM) projects in non-Annex I countries.	All	All
Fiscal	**Incentives / Subsidies**	The 2001 tax plan made extra money available (€59 million per year) for stimulating CHP generation, as part of the regulatory energy tax that came into effect on 1 January 2001 (€0.57/kWh).	Energy Prod.	Fossil Fuels
Regulatory Instruments	**Regulatory Reform**	Liberalisation of Dutch market for renewables as from 1 July 2001, supported by a system of green certificates.	Energy Prod. (Electricity Generation)	Renewables
Tradable Permits	**Green Certificates**			

NETHERLANDS (CONTINUED)

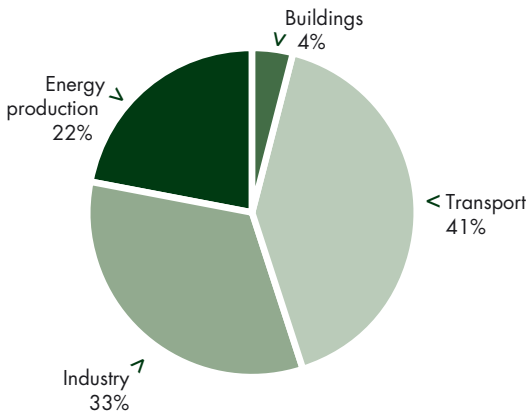
Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Tradable Permits	**Project-based Programmes (including CDM and JI)**	The first contracts for the sale of carbon credits under the first Emission Reduction Units procurement tender (2000) were signed on 17 April 2001. In total up to 3.9 million carbon credits were purchased at an average price of €8.4. The second Dutch government tender to purchase emissions reduction units (ERUs) from companies conducting Joint Implementation projects was announced in December 2001.	All	All
Fiscal	**Incentives / Subsidies**	The 2001 tax plan made extra money available (€27 million per year) for investments in renewables for households such as solar panels and solar boilers.	Buildings (Residential)	Renewables
Fiscal	**Incentives / Subsidies**	The Energy Investment Allowance is a tax reduction for investments in energy efficiency and for-profit renewable energy organisations. The net benefits have been increased from about 11-13% to about 16-18% of investment costs (the precise rate of the benefits depends on the applied tax tariff). The Energy Investment Allowance has been increased from 40 to 55%, as from 1 January 2001.	Industry	All

New Zealand

Key Indicators	1990	1995	2000
TPES (Mtoe)	14.02	16.03	18.63
TPES/Capita (toe per capita)	4.17	4.38	4.86
TPES/GDP (toe per thousand 1995 US$ PPP)	0.26	0.25	0.26
CO_2 Emissions (Mt of CO_2)	22.30	25.60	31.65
CO_2/Capita (t CO_2 per capita)	6.63	7.00	8.26
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.41	0.41	0.44

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Strategic Planning***	*The government is currently developing a policy package to reduce New Zealand's GHG emissions in line with international obligations. It is undergoing a consultation process to establish New Zealand's strategy regarding the issues involved. Advice is provided by a number of working groups involving officials from ten government departments and one Crown agency.*	*All*	*All*
	Consultation			
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Strategic Planning**	New Zealand's first National Energy Efficiency and Conservation Strategy was prepared as a requirement of the Energy Efficiency and Conservation Act 2000. The strategy's purpose is to promote energy efficiency and conservation and renewable energy, and to move New Zealand towards a sustainable energy future. It provides strong direction, spanning all parts of the economy, and a rich agenda for action, engaging both the public and private sectors. The strategy promotes practical ways to make energy efficiency and conservation and renewable energy mainstream solutions and is organised around policies, objectives and targets, supported by a set of means (or measures). Five action plans for government, energy supply, industry, buildings and appliances, and transport will help achieve the strategy's targets.	Buildings (All)	All
Voluntary Agreements	**Weak VA**			

NORWAY

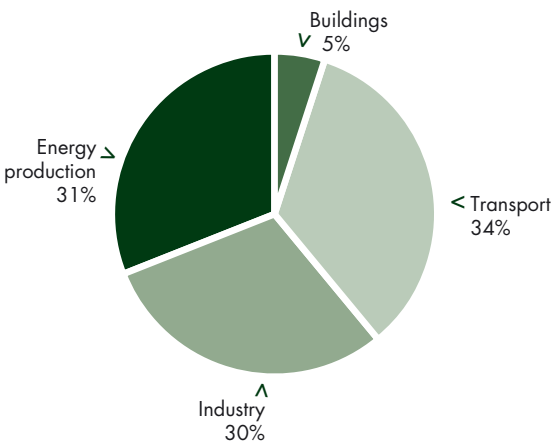
N

Key Indicators

	1990	1995	2000
TPES (Mtoe)	21.45	23.46	25.62
TPES/Capita (toe per capita)	5.06	5.38	5.70
TPES/GDP (toe per thousand 1995 US$ PPP)	0.25	0.23	0.22
CO_2 Emissions (Mt of CO_2)	28.53	32.72	33.58
CO_2/Capita (t CO_2 per capita)	6.73	7.51	7.48
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.34	0.32	0.28

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Policy Processes and Outreach	***Strategic Planning***	*As from 1 January 2002, the different user-driven energy R&D programmes in the Research Council of Norway were organised into a new R&D programme called: "Energy, Environment, Building and Construction" (EMB). The programme (2002-2009) will have a yearly budget of NOK 180 million. The EMB programme will cover the following areas:* *• Energy: energy systems, large hydropower systems, new renewable energy sources, end-use energy technologies, including the use of natural gas in the energy system.* *• Environment: environmental technology, environmental aspects related to the sectors in the programme, technology for reducing CO_2 emissions; particular attention is being given to R&D projects examining technologies for power generation from natural gas with decarbonisation and CO_2 capture and sequestration (ocean storage, geological formations, biological fixation).* *• Building and construction industry: all aspects of building and civil-engineering construction and architecture, except for offshore construction.*	*All*	*All*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Tradable Permits	***Emissions Trading***	*In June 2001, the former government released a White Paper on climate change, presenting policies and measures to reduce national emissions of GHGs. Particular emphasis was put on outlining a proposal for a broad domestic emissions trading system covering about 80% of the emissions from 2008, to be compatible with the international emissions trading system under the Kyoto Protocol. The system is based on the recommendations of the commission of experts appointed to devise an emissions trading system, although final decisions have not been made on all the issues discussed by the commission. As a general rule, the emissions quotas should be sold, but in order to avoid carbon leakage, it may be necessary to provide quotas free of charge for some industries for a limited period of time.*	*Transport* *Industry (Manufacturing)* *Energy Prod. (Electricity Generation)*	*All*
		policies and measures taken over the year 2001		
Fiscal	**Incentives / Subsidies**	In 2001, Norway awarded a grant to BP Alaska to study capturing CO_2 generated by combustion sources. BP operates the CO_2 capture project, a consortium comprised of BP, Texaco, Chevron, Norsk Hydro, Royal Dutch/Shell, Statoil and Suncor Energy. This consortium is contributing US$ 8.8 million to the project, which also receives funding from the European Union and the United States. Beginning in June 2001, the project explores the capturing of CO_2 generated by various fuels and combustion processes and sequestering it in unmineable coal seams and saline aquifers. This project is an example of a government-private sector partnership to develop new technology to meet environmental concerns.	Energy Prod. (Refining)	Fossil Fuels
Policy Processes and Outreach	**Outreach / Information Dissemination**	The Energy Efficiency Network for Buildings (EENB) published its third report in 2001. Through formalised co-operation, participants such as private owners of commercial buildings, house-building co-operatives, local authorities and buildings administrators exchange information and experience on energy-efficient projects. Participants are obliged to submit information on their consumption of energy in buildings for use in a national statistics database.	Buildings	All
Fiscal	**Incentives / Subsidies**	Subsidies for energy efficiency and renewables come from a fee on the transmission tariffs and from ordinary grants over the state budget. The government has granted NKr 280 million in the budget for 2002 and the income from the fee is stipulated at NKr 200 million. The income is directed to a new energy trust that was established on 1 January 2002. Enova (see below) will be in charge of this trust, which will secure a long-term financial frame over the years to come. Enova will use the money to reach government objectives, which include: • Reaching an annual increase in the use of central heating based on new renewable energy sources, heat pumps and waste heat by 4 TWh/year by 2010.	All	Renewables Electricity

NORWAY (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		• Constructing wind generators with a production capacity of 3 TWh/year by 2010. • Limiting energy use considerably more than would be the case if developments were allowed to continue unchecked. In 2002 approximately NKr 100 million should be used for work tied directly to energy efficiency.		
Tradable Permits	**Project-based Programmes (including CDM and JI)**	In December 2001 Norway and Romania signed a bilateral Climate Change Agreement on project co-operation for reduction of GHGs. This is the first bilateral Joint Implementation project under the Kyoto Protocol in which Norway is taking part, allowing for transfer of credits. The Emission Reduction Units (ERUs) that Norway will receive as payment for the investment can be used to fulfil the Norwegian Kyoto commitment. In Romania the project will contribute to reduce local air pollution and to improvements in the heating systems in the city of Fagaras, in addition to reducing emissions of GHGs	All	All
Policy Processes and Outreach	**Institutional Development**	On 27 March 2001 the Norwegian Parliament approved the establishment of a new public enterprise for promoting energy savings, new renewables and environment-friendly natural gas solutions. The name of the new enterprise is Enova. It is situated in the city of Trondheim. Enova has been operating fully from 1 January 2002. The new enterprise took over work previously divided between the Norwegian Water Resources and Energy Directorate (NVE) and the electricity companies through voluntary action.	All	Electricity Renewables
Regulatory Instruments	**Mandates / Standards**	Energy labels for refrigerators, freezers and combination models, washing machines and tumble dryers has been introduced following the European Union directives on the subject. Standards and labelling of lamps came into force in January 2001.	Buildings (Residential)	Electricity

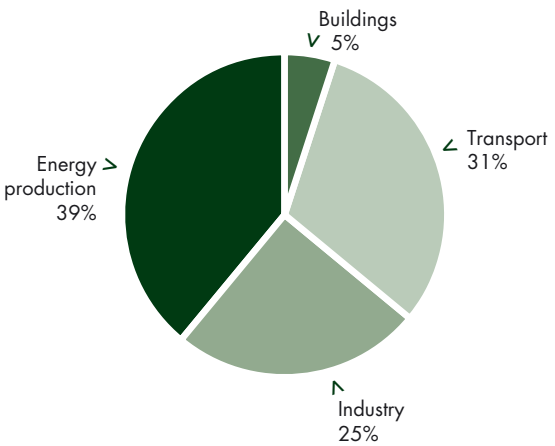
PORTUGAL

Key Indicators

	1990	1995	2000
TPES (Mtoe)	17.16	19.99	24.61
TPES/Capita (toe per capita)	1.73	2.02	2.46
TPES/GDP (toe per thousand 1995 US$ PPP)	0.14	0.15	0.15
CO_2 Emissions (Mt of CO_2)	39.61	48.76	59.61
CO_2/Capita (t CO_2 per capita)	4.00	4.92	5.96
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.32	0.36	0.36

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Fiscal	**Incentives / Subsidies**	In 2001, the payback tariffs for renewables have been increased (up to 25% for wind energy), in order to develop more electricity generation under the special regime for co-generation and renewables.	Energy Prod. (Electricity Generation)	Renewables (All) Electricity (CHP)
Regulatory Instruments	**Mandates / Standards**	Energy efficiency requirements for fluorescent lighting ballasts were adopted according to EU directive.	Buildings (Residential, Non-Residential)	Electricity

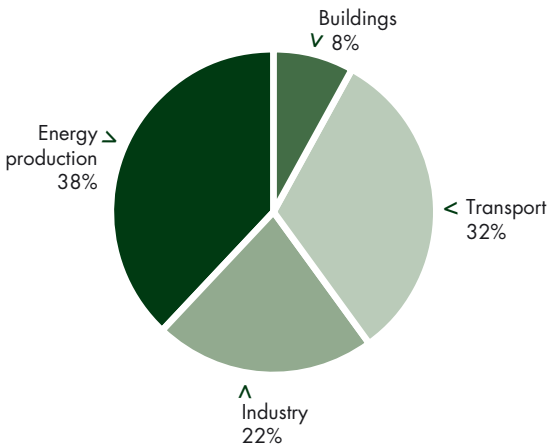
SPAIN

Key Indicators

	1990	1995	2000
TPES (Mtoe)	90.53	103.12	124.88
TPES/Capita (toe per capita)	2.33	2.63	3.13
TPES/GDP (toe per thousand 1995 US$ PPP)	0.16	0.17	0.17
CO_2 Emissions (Mt of CO_2)	206.51	235.30	284.69
CO_2/Capita (t CO_2 per capita)	5.32	6.00	7.13
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.37	0.39	0.40

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Institutional Development**	Within the renewables action plan 2000-2010, biomass is one of the most important elements, although in the first year after the approval, no action had been implemented. An interministerial commission has been created to promote a package of measures and to remove barriers to development of this renewable energy source.	All	Renewables (Biomass)
Policy Processes and Outreach	**Institutional Development**	The Climate Change Prevention Office, under the Ministry of the Environment's General Directorate for Environment Quality and Assessment, was created by a Royal Decree 376/2001 in April 2001. In November 2001 it was redefined by Royal Decree as the "National Climate Council". It is responsible for developing the Spanish climate change strategy for subsequent approval by the government.	All	All

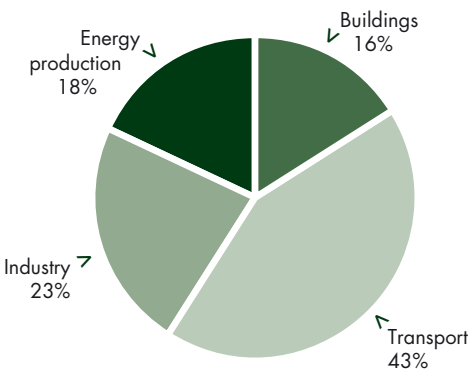
SWEDEN

Key Indicators

	1990	1995	2000
TPES (Mtoe)	46,67	49,92	47,48
TPES/Capita (toe per capita)	5.45	5.66	5.35
TPES/GDP (toe per thousand 1995 US$ PPP)	0.27	0.28	0.23
CO_2 Emissions (Mt of CO_2)	51.17	53.75	51.99
CO_2/Capita (t CO_2 per capita)	5.97	6.09	5.86
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.30	0.31	0.26

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Tradable Permits	***Green Certificates***	*A committee proposal for a quota-based Swedish certificate system to promote production of electricity from renewable energy sources was published in 2001 (SOU 2001:77). Such measures are planned to replace the operational support currently in place by 2003, and a proposal will be included in the energy policy bill of 2002.*	*Energy Prod. (Electricity Generation)*	*Renewables*
Voluntary Agreements	***Strong VA***	*On 31 August 2000, the Swedish government decided to appoint a negotiator with the task of proposing a programme for long-term agreements for energy efficiency in the energy-intensive industry. The purpose is to achieve the effective use of energy and a cost-effective reduction of GHG emissions. During the fact-finding process, the negotiator kept regular contacts with the industries involved and also made preparations for the notification of the programme to the European Commission. On 31 October 2001, the negotiator submitted a report to the government, which includes guidelines for a programme of long-term agreements; it was published in 2001 (Ds 2001:65). Proposals for implementation will be included in the energy policy bill of 2002.*	*Industry (Manufacturing)*	*Fossil Fuels (Electricity)* *Renewables*
Regulatory Instruments	***Regulatory Reform***	*The Swedish government is preparing an Energy Policy Bill to present to Parliament in spring 2002. The bill will contain further measures to promote energy efficiency and electricity production from renewable energy sources. The intention is to propose a new approach, better adapted to the market, to promote both efficiency and renewables.*	*Energy Prod.*	*Renewables* *Fossil fuels*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Fiscal	***Taxes***	*A new law granting tax breaks to employees who receive alternative-fuel cars from their employers as part of remuneration packages was approved on 12 December 2001 by the Swedish Parliament as a way to promote the number of environment-friendly vehicles on Swedish roads. It took force on 1 January 2002. Under the new law, the taxable benefit is reduced by 40% for cars wholly or partially powered by electricity compared with the taxable benefits associated with petrol-driven cars. The taxable benefit is reduced to 20% for cars fuelled by biogas.*	*Transport (Passenger)*	*All*
Fiscal	***Incentives / Subsidies***	*The Swedish government proposed in the budget bill for 2002 that a programme of support for Local Climate Investment Programmes should be introduced in 2002 as a replacement for the Local Investment Programmes initiated in 1997. The programme has been allocated a budget of SKr 900 million for a three-year period, beginning in 2002. The measure is designed to support local governments' investments aimed at reducing GHG emissions in Sweden.*	*All*	*All*
Policy Processes and Outreach	***Strategic Planning***	*On 30 November 2001 the Swedish government presented its Climate Bill (prop. 2001/02:55) to Parliament. The bill formulates a climate strategy for the future. The national goal proposed for reductions in GHG emissions in Sweden is 4% on 1990 figures by 2010.*	*All*	*All*
		policies and measures taken over the year 2001		
Voluntary *Agreements*	**Strong VA**	The Eco energy municipality programme was started in March 2001; 70 municipalities applied for participation and ten were selected for the first year of the programme. The responsibility of the municipalities is to decide an energy policy, engage in a continuous improvement process and carry out measures to improve energy efficiency and introduce renewable energy sources. The municipalities will be offered seven different educational packages.	All	All
Fiscal	***Incentives / Subsidies***			

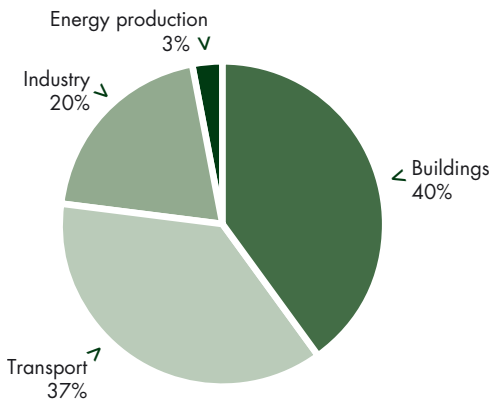
SWITZERLAND

Key Indicators

	1990	1995	2000
TPES (Mtoe)	25.06	25.27	26.60
TPES/Capita (toe per capita)	3.73	3.59	3.70
TPES/GDP (toe per thousand 1995 US$ PPP)	0.14	0.14	0.13
CO_2 Emissions (Mt of CO_2)	40.61	40.67	41.69
CO_2/Capita (t CO_2 per capita)	6.05	5.78	5.80
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.22	0.23	0.21

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Regulatory Reform***	*The draft Nuclear Energy Law has been submitted by the government to Parliament. The draft allows the possibility of building new nuclear power plants, with no legal time-limit on the operating licenses. The reprocessing of nuclear fuel is not permitted except for existing contracts, which can be fulfilled. It contains a concept of monitored long-term geological disposal (combining elements of final disposal and reversibility), a funding system for decommissioning and waste-management costs, simplified licensing procedures and the general possibility of appeal. This law is used by the government to counter two "public initiatives", the first one aiming to ban the construction of new nuclear power plants until 2010 and the second one demanding the closure of all nuclear power plants after 30 years of operation. The result of the vote can have a considerable influence on the strategy to be adopted for achieving GHG reductions. In fact, the substitution of the nuclear power plants for other technologies could have an impact on the GHG balance of Switzerland.*	*Energy Prod. (Electricity Generation)*	*Nuclear*
Policy Processes and Outreach	***Strategic Planning***			

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Fiscal	**Taxes**	The Heavy Vehicle Fee, in force since January 2001, is a tax related to distance and weight and is intended to internalise costs of freight transport, including costs of effects on health and the environment. The maximum charge is set at SF 0.02 per km-tonne in 2001 and will increase to SF 0.03 in the future. The tax will raise SF 1,500 million and will be used for investments in rail infrastructure. One-third of the revenues will go to the cantons. The tax revenue for 2001 is approximately SF 750 million. The first visible effects of the new tax are a stabilisation of distances travelled by trucks linked to the improvement of the road-freight system (logistics, use of vehicles, increase of weight limits, etc.).	Transport (Freight)	Fossil Fuels (Oil)
Voluntary Agreements **Fiscal**	**Weak VA** **Incentives / Subsidies**	The Swiss Energy action plan started in January 2001, following on the Energy 2000 programme. The objectives of SwissEnergy are to reduce the consumption of fossil fuels, to stabilise the consumption of electricity and to increase the contribution of renewables to the energy supply. The targets will be reached in extensive co-operation with the cantons and the private sector. Voluntary agreements, funding measures favouring energy savings, promotion of renewables, dissemination of research information are the main elements of SwissEnergy. The aim is to achieve a 10% reduction of consumption of fossil fuels, an increase of less than 5% of electricity consumption, and an increase of consumption of renewable energy.	All	All
Voluntary Agreements	**All**	The two-stage mechanism of the law on CO_2 provides for the opportunity to meet the stipulated reduction targets by means of voluntary action only, thereby avoiding the CO_2 tax which may be introduced at the earliest in 2004 on a subsidiary basis. In July 2001 guidelines for voluntary action by industry were released in correlation with the 2000 CO_2. Law and the Energy Law. The guidelines describe the relevant target values and how they can be determined, according to the remaining reduction potential of each industry, taking into account any measures already taken over the last decade and growth perspectives for the future.	Industry	All

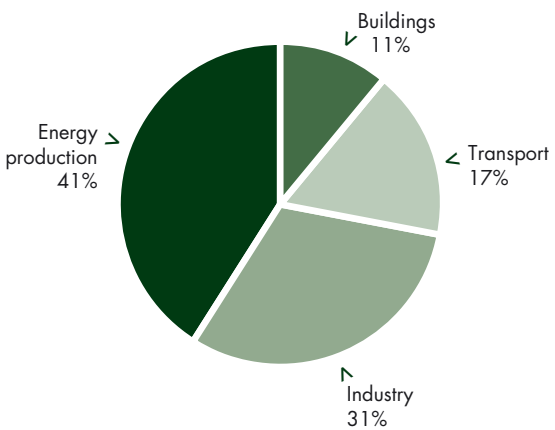
TURKEY

Key Indicators

	1990	1995	2000
TPES (Mtoe)	52.65	61.40	77.10
TPES/Capita (toe per capita)	0.94	1.00	1.15
TPES/GDP (toe per thousand 1995 US$ PPP)	0.18	0.18	0.18
CO_2 Emissions (Mt of CO_2)	128.80	155.43	204.08
CO_2/Capita (t CO_2 per capita)	2.29	2.52	3.05
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.43	0.45	0.49

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Mandates / Standards***	*A regulation on the energy labelling of refrigerators is being prepared by the Ministry of Industry and Trade.*	*Industry (Manufacturing)*	*Electricity*
Regulatory Instruments	***Mandates / Standards***	*A draft regulation on the efficiency of outdoor lighting was prepared and submitted to the Ministry of Energy and Natural Resources for consideration.*	*Buildings (Residential, Non-Residential)*	*Electricity*
		policies and measures taken over the year 2001		
Policy Processes and Outreach	**Strategic Planning**	Within the framework of the Project on "Energy-Environment in Turkey", studies analysing alternative scenarios for the reduction of GHG emissions originated from activities taken in co-ordination with the World Bank in 2000. First, the "base case" scenario for current projections for energy demand and supply has been studied and CO_2 emissions were estimated. The "base case" scenario will be the reference point; others involving various alternatives, such as increasing energy efficiency, improving fuel quality, application of advanced technologies, transmission and distribution losses, etc., are currently being analysed.	All	All

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Strategic Planning**	Under the co-ordination of the Scientific and Technological Research Council of Turkey, working groups have been established to define technological options linked to energy efficiency and renewable energy. One of the major objectives of all the working groups is to assess available energy solutions and determine possible deployment strategies for new and renewable energy sources. As a result of these studies, a strategy will be prepared and submitted to the Prime Minister's High Council of Science and Technology for approval.	Energy Prod.	All

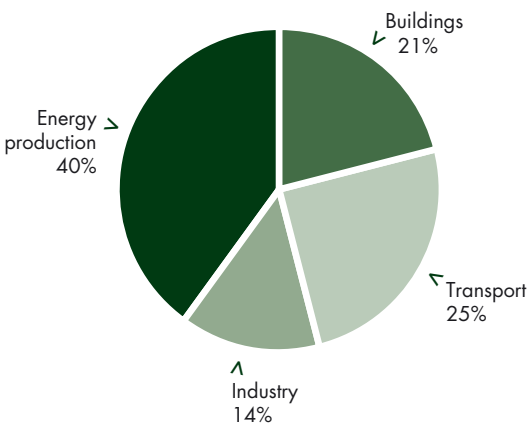
UNITED KINGDOM

Key Indicators

	1990	1995	2000
TPES (Mtoe)	212.41	224.27	232.64
TPES/Capita (toe per capita)	3.69	3.83	3.89
TPES/GDP (toe per thousand 1995 US$ PPP)	0.21	0.20	0.18
CO_2 Emissions (Mt of CO_2)	559.89	532.64	531.47
CO_2/Capita (t CO_2 per capita)	9.73	9.09	8.89
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.56	0.48	0.42

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Mandates / Standards***	*The United Kingdom is preparing to implement the proposed EU Buildings Directive, published in May 2001, which aims to improve energy efficiency in buildings. It covers the setting of minimum requirements for new large buildings, the use of energy-performance certificates whenever buildings are constructed, sold or rented and regular inspections of boilers and air-conditioning systems. Energy certification of buildings will lead to increased awareness of energy performance and energy efficiency in buildings. The EU law may come into force in 2002.*	*Buildings (Residential, Non-Residential)*	*All*
Regulatory Instruments	***Mandates / Standards***	*The Building Regulations Part L sets standards for energy efficiency in new and existing buildings (it applies to new building work in England and Wales). Amendments published in 2001 will be in force early in 2002, but a review of the regulations is under way. Carbon savings of 1.3 Mt/annum from both business and domestic sectors by 2010 are envisaged in UK regulation.*	*Buildings*	*All*

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Regulatory Instruments **Fiscal**	**Regulatory Reform** **Incentives / Subsidies**	The Energy Efficiency Commitment is a major policy to encourage consumers to make energy efficiency improvements. This includes measures such as insulation, energy efficient boilers, appliances and light bulbs; it may include micro CHP in the future. It will place an obligation on the suppliers of gas and electricity to make energy efficiency improvements through measures provided to their domestic customers. The focus is on low-income consumers. The overall target for improvements in energy efficiency is 62 fuel-standardised terawatt (TWh) hours and is expected to save 0.4 MtC per year by 2005. Together with other policies (on residential energy efficiency, for example), the estimate of total savings is 2.6-3.7 MtC by 2010 and 4.5 MtC by 2020.	Buildings Energy Prod.	All
Regulatory Instruments **Fiscal**	**Regulatory Reform** **Taxes**	Following extensive consultation with business, the government introduced the Climate Change Levy in April 2001. The levy, a new energy tax that adds about 15% to typical energy bills, applies to energy used in the business and public sectors. Revenues are recycled to levy payers via a 0.3% cut in employers' National Insurance contributions and £120 million of additional support for energy-saving measures. It is estimated that the levy, including the exemption for renewables and CHP, will save 2 MtC by 2010.	All	All
Policy Processes and Outreach **Tradable Permits**	**Institutional Development** **Project-based Programmes (including CDM and JI)**	A Climate Change Project Office has been launched to encourage investment in efforts to cut GHG emissions overseas and take advantage of new opportunities and markets in low-carbon technology. It will support the Joint Implementation and Clean Development Mechanisms established under the Kyoto Protocol. It will also focus on awareness-raising and building effective partnerships with principal stakeholders and increased engagement with international bodies.	All	All
Policy Processes and Outreach **Fiscal**	**Institutional Development** **Incentives / Subsidies**	The Carbon Trust was established on 1 April 2001. The Trust is an independent, not-for-profit company set up by government to promote energy efficiency in non-domestic sectors. The three objectives of the Trust are: • To help the United Kingdom meet its ongoing targets for reductions in CO_2 and other GHG emissions. • To improve the competitiveness of UK industry through resource efficiency. • To support the development of a sector of industry that capitalises on the innovation and commercial value of low- and zero-carbon technologies.	All	All
Fiscal	**Incentives / Subsidies**	A £50m two-year programme to promote community heating (the linking of several buildings to a central heat source) through financial assistance in the form of grants, is intended to help install new schemes and refurbish obsolete infrastructure and equipment. The programme aims to	Buildings (Community Use)	All

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		increase the development and installation of community heating schemes by addressing two key barriers: a lack of investment capital and a lack of knowledge of how to deliver the benefits of community heating. It is estimated that the programme overall could save 0.9 MtC by 2010 and contribute 130 MW to the government's CHP target for 2010.		
Regulatory Instruments	**Mandates / Standards**	The Renewables Obligation on Energy Supply is part of the UK government's commitment to achieving the 10% target for energy to be produced from renewable sources by 2010. It will provide an obligation on all licensed electricity suppliers in England and Wales to supply 10% of their output from such sources. Compliance will be monitored by an independent agency. The obligation will be based on a system of certificates. By 2003, 5% of UK electricity requirements will be met by renewables, rising to 10% in 2010. This measure will save 2.5 MtC by 2010 and 7.5 MtC by 2020.	Energy Prod. (Electricity Generation)	Renewables (Electricity)
Tradable Permits	**Green Certificates**			
Fiscal	**Taxes**	The policy aim of the Exemption from Climate Change Levy for Good Quality CHP (combined heat and power) is to increase industry's take-up of CHP – a key energy efficiency technology with emissions 30% lower than conventional generation (0.8 MtC saved for each 1 GW_e). Electricity from Good Quality CHP (CHP production that is energy-efficient in operation) is exempt from the UK Climate Change Levy where that electricity is consumed on site or sold direct to other consumers. This measure will deliver emissions reductions, increase the uptake of CHP by industry and enhance business competitiveness since CHP has significant efficiency advantage over other forms of generation. The UK government has set a target of at least 10,000 MW_e of installed capacity by 2010 (currently 4,700 MW_e).	Energy Prod.	Electricity (CHP)
Voluntary Agreements	**Strong VA**	DEFRA (Department for Environment, Food and Rural Affairs) has negotiated energy efficiency or carbon-saving targets with industry-sector associations. Companies that have joined in the negotiated sector agreements receive 80% discount from the Fiscal Taxes Climate Change Levy in return for working towards their targets. At the end of 2001, over 40 of these "umbrella agreements" had been signed.	Industry	All
Fiscal	**Incentives / Subsidies**	Using experience gained in other EU countries, the UK introduced on 1 April 2001 a system of Enhanced Capital Allowances (ECA). While most capital expenditure in the UK can be written off against taxable profits on a reducing-balance basis, investments eligible under ECA will be allowable against taxable profits at 100% in the first year. The scheme initially covers eight technologies. The list is updated monthly and technologies reviewed annually.	All	All

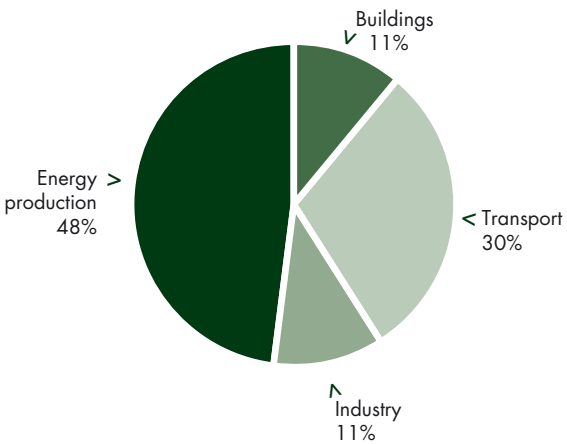
UNITED STATES

Key Indicators

	1990	1995	2000
TPES (Mtoe)	1,927.24	2,088.12	2,299.67
TPES/Capita (toe per capita)	7.71	7.94	8.35
TPES/GDP (toe per thousand 1995 US$ PPP)	0.30	0.28	0.26
CO_2 Emissions (Mt of CO_2)	4,825.71	5,108.66	5,665.44
CO_2/Capita (t CO_2 per capita)	19.30	19.42	20.57
CO_2/GDP (kg CO_2 per 1995 US$ PPP)	0.74	0.70	0.63

Sources: IEA – *CO_2 Emissions from Fuel Combustion (2002 Edition), Energy Balances of OECD Countries (2002 Edition).*

CO_2 Emissions by Sector in 2000



Country Actions in 2001

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures planned over the year 2001		
Regulatory Instruments	***Mandates / Standards***	*On 25 January 2001, the California Air Resources Board decided to impose on car-manufacturers the mandatory introduction of electric and other clean vehicles on the local market by 2003.*	*Transport (Passenger)*	*Renewables (Fuel Cells)* *Electricity* *Hydrogen*
Fiscal	***Incentives / Subsidies***	*In April 2001, the President submitted to Congress a proposal for $4,273 million in state grants to improve the Energy Efficiency of Low-Income Households. Households that qualify for the Weatherization Assistance Program may be eligible for several energy-efficient services that include installing insulation and ventilation fans and insulating water-heater systems.*	*Buildings (Residential)*	*Electricity*
Policy Processes and Outreach	***Strategic Planning***	*The City of Chicago, in association with Mexico City, plans to join the Chicago Climate Exchange (CCE). The cities will set goals for emissions reduction and use the CCE to achieve them.*	*All*	*All*
Regulatory Instruments	***Mandates / Standards***			

UNITED STATES (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	***Advice / Aid in Implementation*** ***Outreach / Information Dissemination***	*The United States is developing a web-based information system for reporting on indicators of energy intensity. Indicators will be defined by sector (e.g., Buildings, Industrial, Transportation, Power) and further defined for different categories of end use within each sector. One example would be a "space heat use and efficiency indicator" (defined, for example, as space heat energy per unit of home floor-space). An operational tracking system is expected to be in place by spring 2002.*	*All*	*All*
RD&D	***Technology Development***	*The US Department of Energy (DOE) will spend $51 million to begin testing cleaner burning technologies at eight coal-fired power plants to reduce emissions. In addition to the federal spending, private companies will contribute another $61 million for the "clean coal technology" pilot programme to cut emissions, increase reliability and improve waste removal. The DOE aims to cut emissions from power plants by 50% to 70% in 2005, and to reduce emissions by 90% in 2010.*	*Energy Prod. (Electricity Generation)*	*Fossil Fuels (Coal)*
Fiscal	***Taxes***	*A US legislation was proposed in March 2001 to extend the federal wind-energy production tax credit (PTC) for five years. The PTC provides a 1.5 cent/kWh tax credit (adjusted for inflation) for electricity produced using wind resources.*	*Energy Prod. (Electricity Generation)*	*Renewables (Wind)*
Policy Processes and Outreach	***Advice / Aid in Implementation***	*The State of California is in the process of creating a California Climate Action Registry to help companies and organisations that want to register their GHG emission levels.*	*Industry*	*All*
Policy Processes and Outreach	***Institutional Development***	*In March 2001 the Department of Energy announced it would create a global warming institute to study economical ways to curb CO_2 emissions and ameliorate climate change. The Joint Global Change Research Institute is a collaboration between the Pacific Northwest National Laboratory and the University of Maryland.*	*All*	*All*
Regulatory Instruments	***Mandates / Standards***	*The US government is examining possible changes in CAFE (Corporate Average Fuel Economy) programmes, as it applies to all light-duty vehicles, including consideration of changes in the form of the standards and the development of voluntary fuel-economy improvement targets higher than the current standards.*	*Transport (Passenger)*	*Fossil Fuels*
Fiscal	***Incentives / Subsidies***	*San Francisco voters have approved plans to issue a $100 million revenue bond to install 10 megawatts of solar and 30 megawatts of wind power generation on city property. Final approval for the project will come from bond investors who will decide if the project is economically feasible.*	*Energy Prod. (Electricity Generation)*	*Renewables*

UNITED STATES (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
		policies and measures taken over the year 2001		
Regulatory Instruments	**Regulatory Reform**	In June 2001 legislation was signed in Illinois creating the Illinois Resource Development and Energy Security Act. The legislation states as an explicit goal that at least 5% of energy production and use in the state be derived from renewable forms of energy by 2010 and at least 15% by 2020. But it does not include an implementation schedule, compliance verification, or credit-trading provisions.	Energy Prod. (Electricity Generation)	Renewables
Policy Processes and Outreach **RD&D**	**Strategic Planning** **Research Programmes**	The US Department of Energy is engaged in several activities aimed at enhancing capability to perform performance evaluation and benefits analysis of the US R&D and deployment programmes. These include: • Examining ways of enhancing R&D benefits assessment (to go beyond merely investigating direct realised energy and economic savings). • Examining and applying methodology for evaluation of voluntary deployment programmes. • Preparing a performance-evaluation strategic plan for energy efficiency and renewable energy.	All	All
Regulatory Instruments	**Mandates / Standards**	In August 2001, the President signed an Executive Order regarding energy-efficient standby-power devices. The order directs federal agencies to purchase products that use no more than one watt in their standby mode. If such products are not available, agencies shall purchase products with the lowest standby-power wattage. Agencies shall adhere to these requirements where cost-effective and practicable.	Buildings (Non-Residential)	All
Fiscal	**Incentives / Subsidies**	In 2001, the Department of Energy awarded a $5 million grant to BP Alaska to study capturing CO_2 generated by combustion sources. BP operates the CO_2 capture project, a consortium comprised of BP, Texaco, Chevron, Norsk Hydro, Royal Dutch/ Shell, Statoil and Suncor Energy. This consortium is contributing $8.8 million to the project, which has already received grants from the European Union and Norway. Commencing in June 2001, the project will explore capturing CO_2 generated by various fuels and combustion processes and sequestering it in unmineable coal seams and saline aquifers. This project is an example of a government-private sector partnership to develop new technology to meet environmental concerns.	Energy Prod. (Refining)	Fossil Fuels
Regulatory Instruments	**Mandates / Standards**	In May 2001, Massachusetts issued a rule requiring major coal- and oil-fired power plants to meet stringent new air-emissions standards by 2008. The new standards will require power plants to cut average carbon dioxide emissions by 10%. Power plants have the choice between switching fuels, changing generation technologies or trading emissions-reductions credits with other plants. They can also invest in "off-system" reductions like lowering the output of CO_2 from other industries or from trucks and buses, or sequestering CO_2 by planting.	Energy Prod. (Electricity Generation)	Fossil Fuels (Coal, Oil)

UNITED STATES (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach	**Strategic Planning**	The National Energy Policy was presented by the US government in May 2001. The key proposal related to climate change is $10 billion in tax credits for energy conservation and renewables, including $6.3 billion in new credits to encourage the use of hybrid and fuel-cell vehicles and otherwise promote environment-friendly technologies. The key points in the proposed initiatives are the following: • Increase funding for energy assistance to low-income customers in response to higher energy prices. • Review performance of energy efficiency R&D programmes with the expected outcomes to revise funding priorities and make more use of public-private partnerships. • Expand the Energy Star Program (expand current buildings programme, develop the labelling programme to include additional appliances and products, strengthen DOE public education programme on energy efficiency). • Set higher efficiency standards for appliances. • Increase efforts to conserve energy in federal facilities. • Promote CHP with initiatives such as investment tax credit for CHP projects. • Consider increase of fuel efficiency standards (CAFE). • Provide tax credits for hybrid and fuel-cell vehicles. • Promote policies for congestion mitigation technologies. • Promote fuel-cell buses and establish a national priority for improving the energy intensity of the US economy.	All	All
Fiscal	**Incentives / Subsidies**	The "Kerry" Climate Change Amendment – an amendment offered by Senator John F. Kerry, to the budget resolution, FY 2002, to add $4.5 billion to the existing federal budget for climate change measures over ten years – was accepted in April 2001.	All	All
RD&D **Voluntary Agreement**	**Research Programmes** **Weak VA**	In May 2001, a scientific co-operation agreement on the development of renewable energy sources (solar energy and hydrogen) and energy efficiency was signed between the United States and the European Union.	Energy Prod. (Electricity Generation)	Renewables (Solar) Hydrogen
Regulatory Instruments	**Mandates / Standards**	In 2001, the Nevada legislature modified a renewable portfolio standard originally established in 1997. The minimum amounts were revised to increase by 2% every two years, starting with a 5% renewable energy requirement in 2003 and achieving a 15% requirement by 2013 and each year thereafter. Not less than 5% of the renewable energy must be generated from solar.	Energy Prod. (Electricity Generation)	Renewables
RD&D **Policy Processes and Outreach**	**Technology Development / Demonstration Projects** **Strategic Planning**	On 11 June 2001, the President directed the Secretary of Commerce, working with other agencies, to set priorities for additional investments in climate change research, review such investments, and to improve co-ordination among the various federal agencies. The initiative also calls for providing resources to build climate observation systems in developing countries and encourage other developed nations to match the American commitment.	All	All

UNITED STATES (CONTINUED)

Policy Type	Classification	Policy Description	Sector (Sub-sector)	Energy (Sub-category)
Policy Processes and Outreach **Regulatory Instruments**	**Strategic Planning** **Mandates / Standards**	Under the Climate Change Action Plan 2001, approved on 27 August at the Annual Conference of New England Governors and Eastern Canadian Premiers in Westbrook, New Brunswick, the governors of the six US New England states, alongside the premiers of five eastern Canadian provinces signed the unique bilateral agreement and committed the region to cut GHG emissions to 1990 levels by 2010 and by at least 10% below 1990 levels by 2020.	All	All
Policy Processes and Outreach **Voluntary Agreements**	**Strategic Planning** **Weak VA**	The US Environmental Protection Agency (EPA) has launched the Combined Heat and Power Partnership to promote co-generation as an alternative to conventional electricity generation. The EPA's partnership will be with seventeen large companies, cities and state governments, and non-profit groups. Partners in the programme agreed to work with the EPA to develop and promote projects. The EPA will publicise their efforts and support accelerated development of the selected projects.	Energy Prod. (Electricity Generation)	Electricity (CHP)
Regulatory Instruments	**Mandates / Standards**	In January 2001, the Department of Energy established four new energy efficiency standards for appliances. These new standards for washing machines, water-heaters, residential heat pumps and central air-conditioners are expected to save consumers and businesses more than $19 billion over the next 30 years.	Buildings (Residential, Non-Residential)	Electricity

Annexes

Annex 1

DIRECTORY OF WEB SITES

The following table contains some useful web sites for energy and environment agencies within national governments as well as the Internet addresses of national and international organisations in energy-related fields.

Australia

Agency/Authority	Internet Address
Australian Greenhouse Office	http://www.greenhouse.gov.au
Environment Australia	http://www.ea.gov.au/
Department of Foreign Affairs, Investment, and Trade	http://www.dfat.gov.au/environment/climate/
Department of Agriculture, Fisheries and Forestry Australia	http://www.affa.gov.au/
Geoscience Australia	http://www.agso.gov.au/mreb/ee/

Austria

Agency/Authority	Internet Address
Austrian Council on Climate Change	http://www.accc.gv.at/
Austrian Energy Agency	http://www.eva.ac.at/(en)/index.htm
Federal Environment Agency	http://www.ubavie.gv.at/
Ministry of Science and Transport	http://www.bmbwk.gv.at/
Federal Ministry of Agriculture, Forestry, Environment and Water Management	http://www.lebensministerium.at/

Belgium

Agency/Authority	Internet Address
Federal Department of the Environment	http://www.environment.fgov.be
Federal Planning Bureau	http://www.plan.be
Ministry of Economic Affairs	http://www.mineco.fgov.be
The Energy Administration of the Walloon Region*	http://mrw.wallonie.be/dgtre
The English pages of the Flemish Region	http://www.flanders.be/
The Environment Institute of Brussels-Capital*	http://www.ibgebim.be/
The Flemish Institute for Technological Research	http://www.vito.be/english/index.htm

Canada

Agency/Authority	Internet Address
Government of Canada Climate Change Web Site	http://www.climatechange.gc.ca/
Environment Canada	http://www.ec.gc.ca/
Office of Energy Efficiency	http://oee.nrcan.gc.ca/
Office of Energy Research and Development	http://www.nrcan.gc.ca/es/oerd/
Department of Foreign Affairs – CDM and JI Office	http://www.dfait-maeci.gc.ca/cdm-ji
Climate Change Voluntary Challenge and Registry	http://www.vcr-mvr.ca/

Czech Republic

Agency/Authority	Internet Address
Ministry of the Environment	http://www.env.cebin.cz/_nav/_index_hp_en.html
Czech Power Company	http://www.cez.cz/

Denmark

Agency/Authority	Internet Address
Danish Ministry of Environment and Energy	http://www.mem.dk/ukindex.htm
Danish Energy Authority	http://www.ens.dk
Danish Environmental Protection Agency	http://www.mst.dk/homepage/
Ministry of Foreign Affairs	http://www.um.dk/english/

European Union

Agency/Authority	Internet Address
European Climate Change Programme	http://europa.eu.int/comm/environment/climat/home_en.htm
European Commission DG – Energy & Transport	http://europa.eu.int/comm/dgs/energy_transport/index_en.html
European Commission DG – Environment	http://europa.eu.int/comm/dgs/environment/index_en.htm
European Environment Agency	http://www.eea.eu.int

Finland

Agency/Authority	Internet Address
Ministry of Trade and Industry	http://www.vn.fi/ktm/index.html
Ministry of the Environment	http://www.vyh.fi/eng/moe/moe.html
Environmental Administration	http://www.vyh.fi/eng/orginfo/organisa/organisa.htm
Finnish Environment Institute	http://www.vyh.fi/eng/fei/fei.html
Finnish Energy Industry	http://www.energia.fi/eindex.html

France

Agency/Authority	Internet Address
French Agency for Environment and Energy Management (ADEME)	http://www.ademe.fr/
Inter-ministerial Task Force on Climate Change (MIES)*	http://www.effet-de-serre.gouv.fr
Ministry of the Environment	http://www.environnement.gouv.fr/
Ministry of the Economy, Finance and Industry	http://www.minefi.gouv.fr/
International Research Centre on Environment and Development (CIRED)	http://www.centre-cired.fr/
Institute of Energy Policy and Economics (IEPE)	http://www.upmf-grenoble.fr/iepe/

Germany

Agency/Authority	Internet Address
Federal Ministry of Economics and Technology	http://www.bmwi.de/
Federal Environment Ministry	http://www.bmu.de/index1.htm
Federal Environment Agency	http://www.umweltbundesamt.de/index-e.htm

GREECE

Agency/Authority	Internet Address
Hellenic Ministry of the Environment, Physical Planning, and Public Works	http://www.minenv.gr
Ministry of Foreign Affairs	http://www.mfa.gr/
Ministry of the Interior, Public Administration, and Decentralisation	http://www.ypes.gr/
Ministry of Labour and Social Affairs*	http://www.labor-ministry.gr/
Ministry for Development	http://www.ypan.gr
Institute for Environmental Research and Sustainable Development	http://www.meteo.noa.gr/

HUNGARY

Agency/Authority	Internet Address
Ministry of Economic Affairs – Energy Office	http://www.gm.hu/kulfold/english/index.htm
Ministry for the Environment*	http://www.ktm.hu/

IRELAND

Agency/Authority	Internet Address
Department of the Environment and Local Government	http://www.environ.ie/
Environment Protection Agency	http://www.epa.ie/
Ministry of Finance	http://www.irlgov.ie/finance/
Department of Public Enterprise	http://www.irlgov.ie/tec/
Department of Foreign Affairs	http://www.irlgov.ie/iveagh/

ITALY

Agency/Authority	Internet Address
National Agency for the New Technologies, Energy, and the Environment*	http://www.sede.enea.it/
Ministry of the Environment*	http://www.minambiente.it/Sito/home.asp
Environmental Protection Agency*	http://www.aicq.it/ampa/manuale/present.htm
Italian Regulatory Authority for Electricity and Gas	http://www.autorita.energia.it/
Ministry of Industry*	http://www.minindustria.it
Manager of the National Transmission Grid*	http://www.grtn.it/

Japan

Agency/Authority	Internet Address
Agency for Natural Resources and Energy (ANRE)	http://www.enecho.meti.go.jp/
Ministry of Environment	http://www.env.go.jp/en/index.html
Ministry of Foreign Affairs	http://www.mofa.go.jp/index.html
Ministry of Economy, Trade and Industry (METI)	http://www.meti.go.jp/english/index.html
Ministry of Finance	http://www.mof.go.jp/
Ministry of Land, Infrastructure and Transport	http://www.mlit.go.jp/english/index.html
Ministry of Agriculture, Forestry and Fisheries	http://www.maff.go.jp/index.html
Ministry of Public Management, Home Affairs, Posts and Telecommunications	http://www.soumu.go.jp/english/index.html
Japan International Co-operation Agency	http://www.jica.go.jp/english/
Central Research Institute of Electric Power Industry	http://criepi.denken.or.jp/index.html
Federation of Electric Power Industries	http://www.fepc.or.jp/english/index.html
Japan Federation of Economic Organizations ("Keidanren")	http://www.keidanren.or.jp/index.html
Ministry of Education, Culture, Sports, Science and Technology	http://www.mext.go.jp/english/index.htm
National Institute for Environmental Studies	http://www.nies.go.jp/index.html
Institute of Energy Economics of Japan	http://eneken.ieej.or.jp

Luxembourg

Agency/Authority	Internet Address
Ministry of Economic Affairs – Energy Direction	http://www.etat.lu/SEE/
Ministry of the Environment*	http://www.mev.etat.lu/

Netherlands

Agency/Authority	Internet Address
Ministry of Housing, Spatial Planning, and the Environment	http://www.vrom.nl/international
The Netherlands Agency for Energy and the Environment (NOVEM)	http://www.novem.org/
Ministry of Economic Affairs	http://www.ez.nl/
Ministry of Transport, Public Works and Water Management	http://www.minvenw.nl/cend/dco/home/
Energy Research Centre of the Netherlands	http://www.ecn.nl/main.html
National Institute of Public Health and the Environment (RIVM)	http://www.rivm.nl/en

New Zealand

Agency/Authority	Internet Address
Ministry of Economic Development	http://www.med.govt.nz/
Ministry of the Environment	http://www.mfe.govt.nz/
Energy Efficiency and Conservation Authority	http://www.eeca.govt.nz/
New Zealand Climate Change Programme	http://www.climatechange.govt.nz/sp

Norway

Agency/Authority	Internet Address
Ministry of the Environment	http://www.odin.dep.no/md/engelsk/index-b-n-a.html
Norwegian Pollution Control Authority	http://www.sft.no/english/
Ministry of Petroleum and Energy	http://www.oed.dep.no/
Institute for Energy Technology	http://www.ife.no/

Portugal

Agency/Authority	Internet Address
Ministry of Industry – Energy Direction*	http://www.dge.pt
Directorate-General for the Environment*	http://195.22.0.189/arvore.html
Environment Institute*	http://www.ipamb.pt/
National Laboratory for Civil Engineering	http://www-ext.lnec.pt/index.phtml

Spain

Agency/Authority	Internet Address
Ministry of Economy*	http://www.mineco.es/
Ministry of the Environment*	http://www.mma.es/index.html
Ministry of Sciences and Technology*	http://www.mcyt.es/
National Commission for Energy	http://www.cne.gob.ni/
Institute for Energy Diversification*	http://idae.qsystems.es/home.asp
Research Centre for Energy, Environment and Technology	http://www.ciemat.es/eng/index.html

Sweden

Agency/Authority	Internet Address
Ministry of the Environment	http://miljo.regeringen.se/
Ministry of Industry, Employment and Communications	http://www.industry.ministry.se/
Swedish Energy Agency	http://www.stem.se/
Swedish Environmental Protection Agency	http://www.environ.se
Ministry of Foreign Affairs	http://www.utrikes.regeringen.se

Switzerland

Agency/Authority	Internet Address
Swiss Federal Department for the Environment, Transport, Energy and Communication	http://www.uvek.admin.ch
Swiss Federal Office of Energy	http://www.swiss-energy.ch
Swiss Agency for the Environment, Forests and Landscape (BUWAL)	http://www.buwal.ch/e/themen/umwelt/klima/index.htm

Turkey

Agency/Authority	Internet Address
Ministry of Environment*	http://www.cevre.gov.tr
Ministry of Energy and Natural Resources*	http://www.enerji.gov.tr/
Ministry of Foreign Affairs	http://www.mfa.gov.tr/
State Planning Organization	http://www.dpt.gov.tr
Directorate-General of Meteorology	http://www.meteor.gov.tr
State Institute of Statistics	http://www.die.gov.tr

United Kingdom

Agency/Authority	Internet Address
Department of Trade and Industry – Energy section	http://www.dti.gov.uk/energy/index.htm
Department for Environment, Food & Rural Affairs	http://www.defra.gov.uk/environment/index.htm
Environment Agency	http://www.environment-agency.gov.uk/

United States

Agency/Authority	Internet Address
Department of Energy	http://www.energy.gov/
Environmental Protection Agency – Climate Change Site	http://www.epa.gov/globalwarming/
State Department – Climate Change Site	http://www.state.gov/g/OES/climate
National Oceanic and Atmospheric Administration	http://www.eis.noaa.gov/
Global Change Research Information Office	http://www.gcrio.org/

International / Intergovernmental Organisations

Agency/Authority	Internet Address
Asian Pacific Energy Research Centre (APERC)	http://ns.ieej.or.jp/aperc/
Energy Charter	http://www.encharter.org/index.jsp
Intergovernmental Panel on Climate Change (IPCC)	http://www.ipcc.ch/
International Energy Agency (IEA)	http://www.iea.org/
International Institute for Applied Systems Analysis (IIASA)	http://www.iiasa.ac.at/
Organisation for Economic Co-operation and Development (OECD)	http://www.oecd.org/
United Nations Development Programme (UNDP)	http://www.undp.org/
United Nations Environment Programme (UNEP)	http://www.unep.org
United Nations Framework Convention on Climate Change (UNFCCC)	http://www.unfccc.int/
Country Information with Links to National Web Sites	http://www.unfccc.int/resource/country/
Reviews of National Communications	http://www.unfccc.int/resource/idr.html
Table of National Communications	http://www.unfccc.int/resource/natcom/index.html
United Nations Industrial Development Organization (UNIDO)	http://www.unido.org/
United Nations Sustainable Development (UNSD)	http://www.un.org/esa/sustdev/
World Bank – Global Climate Change	http://www.worldbank.org/climatechange/
World Energy Council (WEC)	http://www.worldenergy.org/wec-geis/

** Web Site not available in English.*

Annex 2

Glossary

CDM	Clean Development Mechanism
CHP	Combined heat and power production; sometimes, when referring to industrial CHP, the term "co-generation" is used
CNG	Compressed natural gas
CO_2	Carbon dioxide
ERU	Emissions reduction unit
FCCC	Framework Convention on Climate Change
GHG	Greenhouse gas
GJ	Gigajoule, or one joule × 10^9 (a joule is a unit of energy)
GVM	Gross vehicle mass
GW	Gigawatt, or one watt × 10^9
GWh	Gigawatt-hour
HFO	Heavy fuel oil
IBRD	International Bank for Reconstruction and Development
IFC	International Finance Corporation
JI	Joint Implementation
LFO	Light fuel oil
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas; refers to propane, butane and their isomers, which are gases at atmospheric pressure and normal temperature

Mt	Million tonnes
Mtoe	Million tonnes of oil equivalent
MW	Megawatt of electricity, or one watt × 10^6
MWh	Megawatt-hour, or one megawatt × one hour, or one watt × one hour × 10^6
NG	Natural gas
NGO	Non-governmental organisation
PPP	Purchasing power parity
PV	Photovoltaics
R&D	Research and development
RD&D	Research, development and demonstration
RES	Renewable energy source
SMEs	Small and medium-sized enterprises
TJ	Terajoule, or one joule × 10^{12}
TPES	Total Primary Energy Supply
TW	Terawatt, or one watt x 10^{12}
TWh	Terawatt-hour, or one terawatt x one hour, or one watt × one hour × 10^{12}
UNFCCC	United Nations Framework Convention on Climate Change
VA	Voluntary Agreement
WTO	World Trade Organization

Annex 3

Units and Conversions

To:	**TJ** Terajoule	**Gcal** Gigacalorie	**Mtoe** Million tonnes of oil equivalent	**MBtu** Million British thermal units	**GWh** Gigawatt-hour
From:	Multiply by:				
TJ	1	238.8	2.388×10^{-5}	947.8	0.2778
Gcal	4.1868×10^{-3}	1	10^{-7}	3.968	1.163×10^{-3}
Mtoe	4.1868×10^{4}	10^{7}	1	3.968×10^{7}	11.630
MBtu	1.0551×10^{-3}	0.252	2.52×10^{-8}	1	2.931×10^{-4}
GWh	3.6	860	8.6×10^{-5}	3412	1

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