

C L I M A T E O F C H A N G E



Keeping Canada Competitive

Comparing Canada's
Climate Change Performance
to other Countries

David Suzuki Foundation

October 1997

Finding solutions

This paper is part of a series of papers produced for the David Suzuki Foundation prior to the Third Meeting of the Conference of the Parties to the UN Framework Convention on Climate Change, scheduled for December 1997 in Kyoto, Japan. *Keeping Canada Competitive: Comparing Canada's Climate Change Performance to other Countries* is intended to provide the reader with an overview of the results of Canada's policies on climate change in comparison with some other key countries in the industrialized world.

The Author

Mr. Doug Russell is a partner and co-founder of GCSI – Global Change Strategies International Inc., an Ottawa-based consulting firm dedicated to working with progressive corporate and public sector organizations to respond to the challenges and opportunities of global change. Prior to moving to the private sector, Mr. Russell was a senior executive in the Canadian government where he led Environment Canada's efforts in the development of Canada's National Action Program on Climate Change, and co-headed the Canadian negotiating team to the UN Framework Convention on Climate Change.

As a partner in GCSI Inc., Mr. Russell has continued to work with companies and governments on the international policy aspects of climate change. Selected clients include the Earth Council, the UN Conference on Trade and Development, Battelle Pacific NW Labs, the Canadian Global Change Program, the North American Commission for Environmental Cooperation, the Auditor General of Canada, and Center Financial Products of Chicago.

Acknowledgements

The author would like to thank all of those who have helped in the preparation of this paper, particularly Robert Hornung, Climate Change Program Director at the Pembina Institute, who collaborated closely throughout the development of the document. Thanks as well to Heather Stewart, who researched volumes of material during the course of the summer. My appreciation is extended to the reviewers of the paper: Dr. John Robinson, Director, Sustainable Development Research Institute, University of British Columbia; Dr. Eric Haites of Margaree Consultants and former Head of the Technical support Unit of IPCC Working Group III; Mr. Jim Bruce, former co-chairman of IPCC Working Group III; Mr. John Dillon of the Business Council on National Issues; and, Lee Failing, Compass Resource Management.

ISBN 1-55054-608-2

David Suzuki Foundation

2211 West 4th Ave., Suite 219
Vancouver, BC, Canada V6K 4S2
Tel: (604) 732-4228
Fax: (604) 732-0752
email: projects@davidsuzuki.org
www.davidsuzuki.org



Keeping

Canada

Competitive

Climate change is a truly global environmental issue. All nations are contributing to climate change and all nations will be affected by it, but these responsibilities and burdens are not equally distributed around the globe.

The nations most likely to be affected by climate change are the developing countries that have the fewest resources to try and adapt to climatic changes. Among the industrialized countries, Canada is one of the countries expected to be most threatened by climate change, particularly Western and Northern Canada. As noted in the first paper of this series, *A Glimpse of Canada's Future*, an increase in global average temperatures of 1-2°C would result in a temperature increase of 5-8°C in Canada's North. Many of the natural resources (forests, agriculture, fisheries) that underpin our economy are likely to be threatened by climate change.

At the same time, Canada is one of the largest emitters of the greenhouse gases that have begun to change our climate. Canada is the 9th largest emitter of carbon dioxide in absolute terms, and one of the largest emitters on a per capita basis (*see Figure 1*). With only ½ of one per cent of the world's population, Canada contributes four times that share, or 2% of global greenhouse gas emissions. Some argue that the high per capita figure is due to Canada's size and climate. Nonetheless, the fact remains that Canadians have a large appetite for energy. In contrast, the developing countries that will be the most severely affected by climate change often produce many times less greenhouse gas emissions per person than Canadians do.

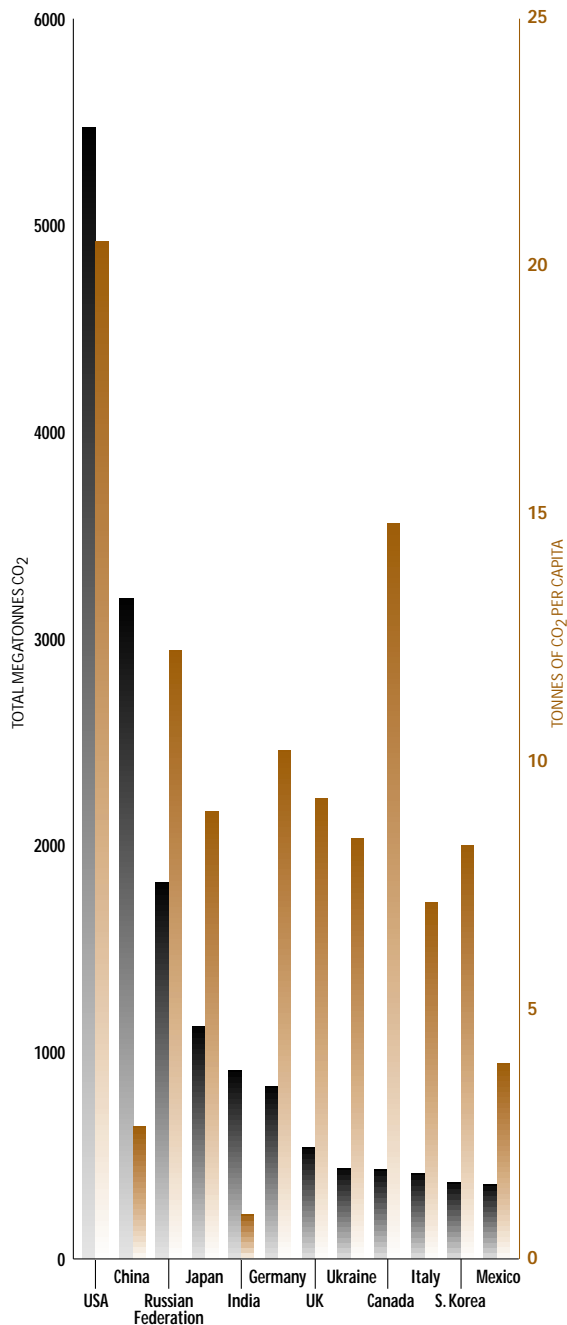


FIGURE 1. TOP DOZEN EMITTERS GLOBALLY – ANNUAL CO₂ EMISSIONS, 1995

SOURCE: Oak Ridge National Laboratory assessment of 1995 data.

Many nations have now begun to take action to reduce their emissions of greenhouse gases. Given the fact that on a per capita basis Canada is a major contributor to the problem, as well as the fact that we are likely to be strongly affected by it, how do our efforts to control greenhouse gas emissions compare with actions taken in other countries?

For Canada, like most other industrialized countries, mitigation of climate change poses fundamental public policy challenges for governments. Solutions must be found that start to significantly decrease greenhouse gas emissions and at the same time protect and enhance sustainable economic development. How Canada responds to these challenges will send a signal to the rest of the world as to how we view our economy and what role we are prepared to play on the international stage in the next millennium.

Policy choices made by governments today will help determine how the world's energy needs will be met in the 21st century and will have an impact on world economics and world politics. Finding the balance between what is politically and economically comfortable now based on today's values and what will be politically and economically acceptable in the global economy of the future requires insight and political will. If the world is to successfully respond to climate change, energy will have to be used much more efficiently; shifts will have to be made from fossil fuels to renewable energy sources; low carbon energy technologies will have to be transferred from the developed world to developing countries; and environmental costs will have to become incorporated in corporate bottom lines. For Canada to keep pace and to remain competitive in an increasingly linked global economy, a proactive domestic program to address climate change is needed, one that positively engages all levels of government and the corporate sector in a search to ensure that the global opportunities associated with climate change are exploited while at the same time minimizing the adverse affects of potential climate change on the country.

The purpose of this paper is to take stock of what has been done to date in Canada, to evaluate our program's performance in relation to those of other countries, to identify approaches and initiatives that have been effective elsewhere and to examine the potential consequences of not keeping pace with other countries' climate change efforts.



1

Canada's commitments

DOMESTIC COMMITMENT

Canada's political commitment to the climate change issue began in 1988 when it sponsored the Toronto conference on the changing atmosphere. Describing climate change as an uncontrolled experiment with unknown consequences, over 300 policy makers and scientists called for nations to reduce emissions of greenhouse gases to 20% below their 1988 levels by 2005.¹ Despite Canada never having officially endorsed this goal, it has been dubbed worldwide as "the Toronto target." In 1990 at a preparatory meeting for the Rio Earth Summit, then Environment Minister Lucien Bouchard committed Canada to stabilize its net emissions of greenhouse gases at 1990 levels by 2000. This political commitment, done without prior consultation with provincial governments, is now accepted as Canada's national target. It is the basis for Canada's National Action Program on Climate Change (NAPCC) and has been confirmed and re-confirmed at numerous federal-provincial meetings of Environment and Energy Ministers since 1993. In 1996, however, Ministers publicly acknowledged for the first time that Canada would not be able to meet its pledge. And today, the federal government is faced once again with a major political challenge related to climate change, having promised in their 1997 Liberal Party Plan to "... redouble our efforts to stabilize emissions of greenhouse gases and to meet targets set through future international negotiations."²

INTERNATIONAL COMMITMENT

When the UN Framework Convention on Climate Change (UN FCCC) was opened for signature in Rio in 1992, Canada was among the first of the industrialized countries to sign and then ratify. The Convention requires industrialized countries to report on the policies and programs they have in place aimed at returning greenhouse gas emissions levels to 1990 levels by the year 2000. In Berlin in 1995, at the first meeting of the Conference of the Parties to the

Framework Convention, it was agreed that these commitments were inadequate to meet the overall objective of the Convention.³ The Berlin Mandate calls on developed countries to set emission limitation and reduction targets for greenhouse gases in time for the third meeting of the Conference of the Parties in December 1997 in Kyoto.⁴ Should the agreement adopted in Kyoto specify legally binding targets, it will be the first such legal requirement for Canada to limit its emissions. To date, like most other countries, Canada's commitments have been political in nature with no legal recourse if they are not met. Even an agreement in Kyoto will be but a first step in the arena of legally binding climate change targets. As such, it is unlikely that the Kyoto agreement will contain any significant sanctions for non-compliance at this stage.

Progress to date

Up to now, Canada's Energy and Environment Ministers have been able to agree on a National Action Program which sets "strategic directions for pursuing the nation's objective of stabilizing greenhouse gas emissions at 1990 levels by 2000."⁵ The Program relies heavily on voluntary action by industry coupled with regular reviews of progress in limiting emissions.

Canada's emissions had risen from 566 megatonnes⁶ in 1990 to 619 megatonnes by 1995, an increase of 9.2%. Between 1990 and 1994 (the only years for which full data sets are available for most countries), Canada's greenhouse gas emissions increased more rapidly than those of most other OECD countries. Only a few industrialized countries (Denmark, Finland, Japan and Portugal) saw their emissions increase more rapidly than Canada's in this period.⁷

In November 1996, a review of the NAPCC concluded that despite the actions in the NAPCC delivering a 37 megatonne reduction from what emissions would ordinarily have been in 2000, Canada will still miss the target by approximately 46 megatonnes and emissions will remain 8.2% above 1990 levels. Further, if no additional actions are taken, most recent projections indicate that by 2010 Canada's emissions will be 18.6% higher than in 1990.⁸

According to the Secretariat of the Framework Convention, the industrialized countries that expected their greenhouse gas emissions to grow more rapidly than Canada's (according to data provided by July 1997) by the year 2000 were: Australia, Finland, Greece, Norway, Portugal, United States, Austria and Spain. Of the 10 industrialized countries that had submitted emission projections through the year 2010, only the USA expected their emissions to grow as quickly as Canada's through that period.⁹

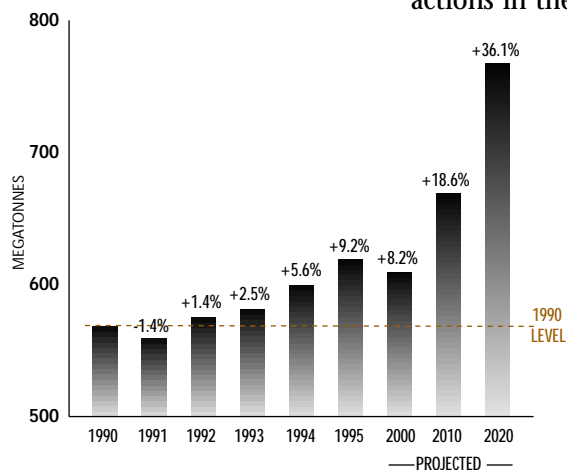


FIGURE 2. CANADA'S GREENHOUSE GAS EMISSIONS, 1990-2020, WITH PERCENTAGE CHANGE FROM 1990 LEVEL

SOURCE: 1990-1995 trends from Canada's National Report to the UN FCCC, 1997. Projections for 2000-2020 from National Resources Canada's Energy Outlook.

Clearly, Canada is having more difficulty controlling its current and projected growth in greenhouse gas emissions than many other industrialized countries. Was the target too ambitious? Are the costs of taking action to reduce greenhouse gas emissions too much for Canadians to bear? On both counts the answer is no.

The international experts that make up the Intergovernmental Panel on Climate Change (IPCC)¹⁰ have concluded that significant “no regrets”¹¹ opportunities to deal with climate change are available in most countries, and that the risk of aggregate net damage due to climate change, consideration of risk aversion and application of the precautionary principle provide rationales for actions beyond no regrets.¹² In Canada, the 1996 Review of the National Action Program on Climate Change noted that “considerable cost-effective potential exists in Canada to improve energy efficiency, substitute less greenhouse gas intensive energy forms and thereby reduce overall greenhouse gas emissions. In addition, these actions can provide multiple benefits through job creation and reductions of other pollutants that contribute to health and local air quality concerns.”¹³ These multiple benefits are discussed in more detail in the David Suzuki Foundation Report *Canada’s Window of Opportunity*.

One package of initiatives that focused on improvements in energy efficiency in Canada’s transportation, building and industrial sectors and increased use of renewables in electricity generation concluded, that if fully implemented through to 2010, more than 550,000 person-years of employment would be cumulatively added to the economy from 1995 to 2000. As well, over the course of 1995-2010, implementation of these measures would have a “minute” impact on the Canadian economy.¹⁴ In the face of these conclusions, then, why has Canada not made a bigger effort to invest in mitigating greenhouse gas emissions?

One reason often cited is that realizing the full benefits of no regrets measures requires government intervention to sort out who foots the bill for improvements that will benefit society as a whole. While the realization of economic benefits associated with reduced operating costs in individual businesses is straightforward and self-motivating, going beyond that narrow definition of no regrets requires political will, which to date has been lacking in Canada.

Political leaders appear to be disengaged for two reasons. First, there has been little public pressure on governments to take action to reduce greenhouse gas emissions. Second, there is strong and well-organized opposition to measures that some, most notably the fossil fuel industry, see as threatening to Canadian industry.

As a result, even though all levels of government will have to take action if Canada is to successfully address climate change, no one government has demonstrated significant resolve to go beyond primarily voluntary measures that make sense for other economic reasons. Just as importantly, federal and

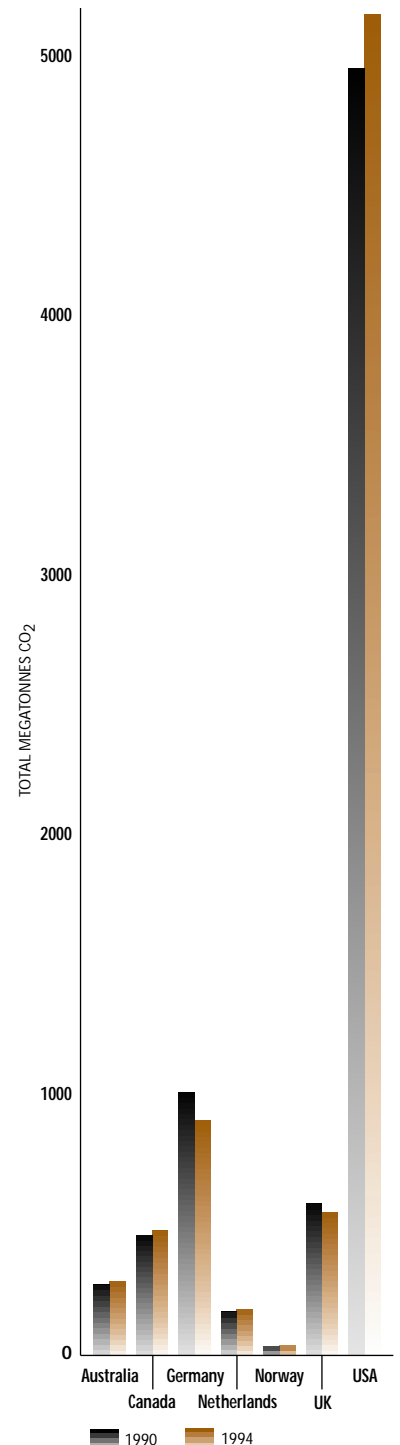


FIGURE 3. CANADA CO₂ EMISSIONS IN COMPARISON WITH SELECTED COUNTRIES, 1990-94

SOURCE: UN FCCC Secretariat compilation based on National Communications, July 1997

provincial ministers of environment and energy have never talked seriously about how to fairly allocate responsibility for meeting the national target at a provincial or sectoral level. And, because climate change as an issue has taken a back seat to employment and economic restructuring concerns during the 1990s, there have been few, if any, repercussions on Ministers for failing to live up to Canada's internationally stated targets.

Canada is not alone on this front. Most other OECD countries have had difficulty mobilizing support for investments in climate change mitigation. International efforts by American led oil and coal lobbies to throw doubts on the science of climate change were extremely effective in raising questions about the validity of climate change in the minds of most corporate and government decision makers. Now that there is a broad scientific consensus that human activities have begun to change the climate, however, these lobbies have changed their tack and have begun to argue that taking action to reduce greenhouse gas emissions will impose unacceptable costs on economies like Canada's.

Citing scientific uncertainty and concerns about the costs of climate change mitigation as the reason for not going beyond actions which immediately help improve the bottom line, and confident in the continuing low level of political will to seriously address the issue, most industries feel comfortable with a go slow approach centred around voluntary measures.

Who is responsible for Canadian climate change policy?

DOMESTIC POLICY

The Canadian Constitution assigns different powers to each of the federal and provincial governments. Dealing effectively with climate change dictates the necessity to carefully navigate the jurisdictional responsibilities within the country. With twelve provinces and territories, each having varying economic and social priorities, finding a solution to climate change means balancing the full spectrum of development concerns of each region of the country. To that end, domestic climate change policy is currently in the hands of a joint federal-provincial council of energy and environment ministers who meet annually to review progress on Canada's climate change commitments and to make adjustments as required. The meetings of these 26 Ministers aim at reaching a consensus. Federal Ministers who participate include the Minister of the Environment and the Minister of Natural Resources, who share the federal responsibility for domestic climate change policy.

Aside from the overall national emissions inventory roll-up there is currently no means for holding various sectors of the economy nor various regions of the

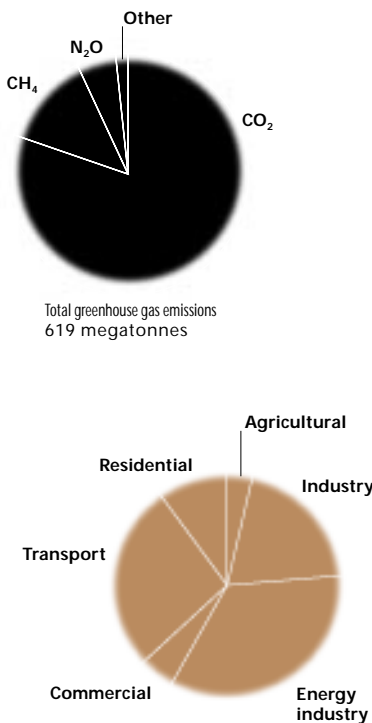


FIGURE 4. CANADA EMISSIONS PROFILE, 1995: BY GAS AND SECTOR

SOURCE: Canada's second national communication to the UN FCCC, July 1997

country accountable for achieving the national target. Assuming there is enough political will to deal seriously with the issue of climate change following Kyoto, a fundamental challenge will be to determine the relative responsibilities of each of the major economic sectors and each province. To date, Ministers of energy and environment have been unable or unwilling to enter into such a discussion. Canada's commitment remains a national one with no regional or sectoral targets. Given that many of the levers for policy action on emissions limitation rest with the provincial governments, forging some sort of agreement on the allocation of targets (i.e. the distribution of burden) will be essential. The overall goal should be to change the nature of the climate change debate from being a win-lose polemic pitting one region of the country against another, to one of shared responsibility and a search for win-win solutions. The debate must be broadened from an energy-environment focus to one that involves all sectors of the economy and engages a wider range of ministers, especially finance ministers.

INTERNATIONAL POLICY

Canada's international positions on climate change are determined by the federal government following extensive consultation with the provincial and territorial governments as well as the major stakeholders who will be affected by either climate change itself or by policy responses designed to mitigate climate change. The Federal Minister of Environment and the Minister of Foreign Affairs and International Trade share the responsibility for Canada's international climate change policy.

Decisions within the federal government on both domestic and international climate change policy are made by Cabinet, supported by interdepartmental committees involving a wide array of ministries including Environment, Natural Resources Canada, Foreign Affairs and International Trade, Finance, Industry, Privy Council Office, Transport, Agriculture, International Development, and Fisheries and Oceans.

Also supporting policy development is a federal-provincial coordinating committee that deals with all air issues, including climate change, ozone depletion, smog, acid rain and hazardous airborne pollutants. Consultations are also held regularly with environmental groups and major industry and business associations.

What is underway?

Canada's Second Report to the UN Framework Convention catalogues close to 200 initiatives underway or planned by various levels of governments in the country. Most are difficult to quantify because they are directed towards raising public awareness and increasing research and development. While such

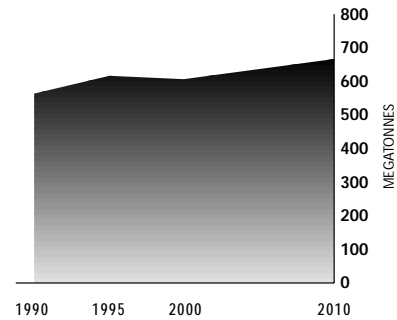


FIGURE 5. CANADA'S GREENHOUSE GAS EMISSIONS

SOURCE: UN FCCC Secretariat
FCCC/SB/1997/6 25 July 1997,
plus second national communications

initiatives have some potential to reduce greenhouse gas emissions in the long-term, they will do little to address climate change in the short and medium term. So what is Canada doing that will reduce greenhouse gas emissions now? While there are some success stories, these are few and far between.

Canada's approach to meeting its stabilization target has been to adopt a series of measures that also produce economic efficiencies, with the centrepiece being the Canadian Voluntary Challenge and Registry Program. Education, research and development and energy efficiency regulations supplement the voluntary measures. Aside from a few small taxes on new vehicles in some provinces, there is little use made of economic instruments.

Most provincial governments are not engaged in dealing proactively with the issue. British Columbia and Quebec have plans aimed at stabilization of emissions at 1990 levels by 2000 but each have reported increases in emissions in 1995 – 16 % for BC and 2% for Quebec. Other provinces whose economies are based on fossil fuel exploration and development are arguing for a go slow approach both domestically and internationally.

Numerous municipal governments have demonstrated leadership by adopting specific reduction targets and mobilizing public action at a grass roots level. Thirty seven Canadian municipalities are profiled in the July 1997 Interim Report by the International Council on Local Environmental Initiatives (ICLEI) as having begun work on climate change, with 15 of the municipalities signed on to reduce emissions by 20% from 1988 levels by 2005. Progress has been slow, partly due to the air of political uncertainty which continues to pervade the entire country on the climate change issue. Toronto, for example, is cited by ICLEI as having mounted an ambitious plan to reduce CO₂ emissions with actual results being “modest to date.”¹⁵

TABLE 1. PROVINCE-BY-PROVINCE TRENDS AND PROJECTIONS

	1990 TOTAL GHG EMISSIONS IN MEGATONNES CO ₂ EQUIV.	1995	2000	2010	2020
		TOTAL + (% CHANGE OVER 1990)			
British Columbia	50.4	58.4 (+16%)	61.2 (+21%)	67.9 (+35%)	75.7 (+50%)
Alberta	160.0	189.0 (+18%)	189.0 (+18%)	192.0 (+20%)	202.0 (+26%)
Saskatchewan	38.9	47.9 (+23%)	47.9 (+23%)	48.6 (+25%)	52.1 (+34%)
Manitoba	17.5	17.4 (-1%)	18.4 (+5%)	19.3 (+10%)	21.3 (+22%)
Ontario	175.0	175.0 (+2%)	179.0 (-5%)	196.9 (+13%)	253.6 (+45%)
Quebec	78.8	80.3 (+2%)	84.5 (+7%)	92.0 (+17%)	104.7 (+33%)
New Brunswick	15.3	17.0 (+11%)	15.1 (-1%)	18.1 (+18%)	20.3 (+33%)
Nova Scotia	18.8	18.6 (-1%)	18.6 (-1%)	21.9 (+18%)	25.0 (+33%)
Prince Edward Island	1.7	1.6 (-6%)	1.7 (-1%)	2.0 (+18%)	2.2 (+33%)
Newfoundland	9.1	8.1 (-11%)	9.0 (-1%)	10.7 (+18%)	12.1 (+33%)

SOURCE: 1990 and 1995 figures from “Trends in Canada’s GHG Emissions 1990-1995”, Environment Canada, April 1997. 2000, 2010 and 2020 figures from “Canada’s Energy Outlook 1996-2020”, Natural Resources Canada, April 1997. Atlantic Provinces projections for 2000, 2010 and 2020 are based on all four taken together as a group.

The absence of clear policy direction at the federal and provincial levels has also been a contributing factor in a less than robust participation by industry in the National Voluntary Challenge and Registry Program. Despite the fact that more than 600 companies are participating in the program, a recent independent review of the results found that only 73 participants had developed a greenhouse gas inventory and made a commitment to implement at least one action in the future to reduce greenhouse gas emissions.¹⁶ Most registrants at this stage have only made pledges to undertake unspecified actions sometime in the future. While it is still early days for the Voluntary Challenge and Registry Program, there is no doubt that calls will mount for demonstrable results in the coming years.

Linked to the absence of clear policy direction is the fact that there are no real back-ups or threats to impose regulations or taxes should the voluntary challenge fail to deliver results. As for the Voluntary Challenge, there have been few positive incentives for companies to participate, despite continued calls by industry for governments to tangibly recognize early actions to reduce greenhouse gas emissions. Provision of early credits against future regulatory or economic instruments would send a positive signal to the business community that early action on climate change has a pay off. Finally, given that no agreement exists for establishing specific targets below the national goal and that no means are in place or being considered to enforce a failure to meet domestic targets, it is small wonder that most companies have chosen to stay on the sidelines until they know the rules of the game.

This is not to say that voluntary measures are not helping to reduce Canada's greenhouse gas emissions nor that they don't have potential to contribute further. In its Voluntary Challenge and Registry (VCR) submission, the Canadian Electricity Association announced that actions by its members would reduce greenhouse gas emissions by approximately 3 megatonnes by 2000. Natural Resources Canada believes that initiatives being considered by upstream oil and gas producers will hold levels of CO₂ emissions stable at 75 megatonnes per year after 2010, despite considerable increases in production.¹⁷ Such examples are, however, the exception. It is clear that Canada will have to go beyond voluntary action if it is to meet its emission reduction objectives.

Where targets or performance standards exist, there are some more encouraging signs of progress. For example, British Columbia's Equipment Energy Efficiency Standards deliver a reduction of an estimated 600,000 tonnes of GHGs annually and their Air Care program involving the testing of up to a million light-duty vehicles yearly has netted annual reductions of greenhouse gas emissions of 113,000 tonnes. Minimum efficiency levels for specified appliances and products sold in Ontario yield CO₂ reductions of 260,000 tonnes per year.

The federal government has recently completed national energy codes that specify minimum levels of thermal performance for commercial and residential

buildings and are in the midst of assisting provincial and municipal governments in their implementation. The Federal Building Initiative is an innovative program designed to assist federal government departments in implementing energy efficiency improvements by financing energy retrofits from future energy savings. Under the program, private sector commitments have been made to invest \$120 million which will yield \$17 million in annual energy savings and significant CO₂ savings. Other federal programs include standards for boilers and efficiency standards for government vehicles.

These successes aside, the bottom line for Canada is one of falling short by 8.2% by 2000 and 18.6% by 2010. Currently, each province is implementing what it feels is best suited for its own circumstances, which works well if there is a clear goal for each jurisdiction and some means of backing it up. To date that has not happened and provinces have been very clear that they view Canada's commitment as a national commitment with no associated provincial or sectoral targets. The National Action Program on Climate Change notes that actions need to be taken by all sectors of Canadian society, including governments, the private sector and the general public. It goes on to say that shared responsibility implies that no one region or economic sector should be unduly disadvantaged by measures intended to reduce the likelihood of climate change.¹⁸ What it stops well short of, however, is assignment of specific accountabilities to any province or sector. Because of the decentralized nature of control over the energy industry, until the provinces accept specific responsibilities and are open to being held accountable for meeting their commitments, Canada as a nation will continue to fall short of its emissions reduction objectives.

Adding to the challenge for the future is the increased appetite for energy on the part of Canada's burgeoning population. With the fastest growing population of the G-7 for the period between 1990 and 1995 (6.5%), and a projection of further increases of 0.9% annually until 2020, Canada will need to implement more aggressive across-the-board measures to hold its greenhouse gas emissions in check.

What is required is a portfolio of measures that actively engages all sectors of the economy and has each region of the country contributing a fair and equitable amount of effort. Determination of what is fair and equitable will necessitate consideration of a wide variety of factors including, among others, each region's or sector's historical emissions, actions underway already, per capita emissions and their special economic circumstances. Although the exact portfolio of measures will likely differ from province to province, measures that could be undertaken include: strengthened and more meaningful voluntary programs, broader use of regulations to establish minimum standards and economic instruments such as a domestic "cap and trade" system or carbon taxes. Many of these measures have been left off the table until now, the results of a very effective industry

lobby. Yet, it is exactly these types of measures that need to be given serious consideration if a clear signal is to be given to the market place, and if Canada is going to keep pace with emerging international initiatives such as emissions trading.

Politicians have to be convinced that there are politically acceptable win-win opportunities associated with a proactive stance on climate change, opportunities that work both for the domestic economy as well as for the trade balance sheet.

Canada's international efforts on climate change

In addition to being an active participant at the international negotiations, Canada has also co-chaired the economic work of the Intergovernmental Panel on Climate Change and until 1996, chaired the Annex I Experts Group to the UN Framework Convention on Climate Change.

In the area of cooperation with other countries, in July 1996, the Canadian Joint Implementation Initiative (CJII) was launched. The CJII office aims to encourage the broad participation of Canadian industries in voluntary international actions to limit greenhouse gas emissions as a complement to their domestic actions. The office acts as a clearinghouse for projects and funding and technical advice on potential joint implementation opportunities for Canadian industry. No credits are officially recognized for participating companies and no government seed funding is made available. To date, response has been modest, with 10 companies participating in the exploration of 15 projects in eight different host countries. In addition, the federal government has concluded four "statements of intent" to cooperate on activities implemented jointly (Mexico, China, Korea, and Latvia).

Canada is beginning to participate in international activities related to emissions trading. As a contributor to the United Nations Conference on Trade and Development's (UNCTAD) project on global emissions trading, Canada participated at the June 1997 launch of a Policy Forum designed to implement, by the turn of the century, a pilot emissions trading program among a select group of Parties to the UN FCCC. Canada also co-sponsored work of the NAFTA's Commission for Environmental Cooperation to explore the possibilities for emissions trading between Canada, the USA, and Mexico.

Active participation in joint implementation and emissions trading pilots will be crucial for Canada in order to gain valuable insight and experience with these key provisions for flexibility in meeting eventual legally binding targets.

Joint implementation

Joint implementation (JI) refers to a provision in the UN Framework Convention on Climate Change that allows countries to cooperate in projects which reduce emissions in the most cost effective way possible. Once operational, JI will provide opportunities for agreements between countries that the emissions reductions achieved in one country (the host country) can be credited partly or wholly to another country (the investor country). To date, crediting has not been officially sanctioned by the Parties to the Framework Convention. Given that, as far as the environment goes, a tonne of CO₂ reduced in India, Brazil or Senegal is the same as a tonne of CO₂ reduced in the USA or Canada. Pure economics says to invest in the actions which can deliver the reductions at the cheapest costs. This is the whole premise behind joint implementation and emissions trading as mechanisms that encourage the most cost effective pursuit of environmental goals. In addition, as developing countries pursue more sustainable growth pathways, the demand for energy efficient technologies will grow. Early identification of potential commercial opportunities through assistance at the governmental level will help companies gain market positioning in what will be a very competitive future energy services market.

TABLE 2. COMPARISON OF SELECTED COUNTRIES' RESPONSES TO CLIMATE CHANGE

	■ Political Engagement & Public Awareness Efforts	■ Accountability Efforts	■ International Efforts	■ Mix of Measures	■ Emissions Projection 1990-2000	■ Kyoto Target Proposal	■ Overall Grade/ Comments
Germany	Numerous efforts in place. Political level engaged at highest level.	Strong federal government; little done to allocate responsibility lower.	Moderate level of initiatives in place; primary focus on JI rather than emissions trading.	Balanced approach including voluntary agreements, subsidy removal, and regulation.	-14%	7.5% reduction from 1990 levels by 2005; 15% reduction by 2010 (EU Proposal).	B Although reunification has played a major role, political will and ability to embrace a variety of measures has led to real reductions.
United Kingdom	Modest level of effort directed at public awareness. Political level engaged at highest level.	Strong national government; few efforts to allocate responsibility to different regions/sectors.	Next to none because emissions targets being met domestically.	Restructuring of the energy industry has been primary vehicle. Smaller contributions from fuel tax and voluntary programs.	-10%	7.5% reduction from 1990 levels by 2005; 15% reduction by 2010 (EU Proposal).	B UK made some very tough choices in energy liberalization, but did so mindful of the environmental impacts.
Netherlands	High profile public issue; extensive public awareness campaigns; annual reports to Parliament engages political leaders.	Sectoral targets fully developed and agreed upon with government.	Strong supporters of JI, credible JI program in place.	Voluntary agreements with targets and penalties for non-compliance, taxes and regulations all are being used.	-2%	7.5% reduction from 1990 levels by 2005; 15% reduction by 2010 (EU Proposal).	C+ Netherlands' performance to date (+5.6% by 1995) has not reflected the breadth of measures in place. Groundwork is strong and potential exists for good performance through to 2010.
United States	Public only beginning to get engaged via efforts of White House. President Clinton actively involved.	Accountabilities to be determined by both the Administration and Congress. Recent work on a cap and trade system may help determine sectoral responsibilities.	Well developed international program, including bilateral support to country studies and JI initiatives. Leaders in emissions trading.	Up to now, primary reliance on voluntary actions. Move to a cap and trade system may add incentives for further actions.	+13%	Return to 1990 emissions levels between 2008 and 2012; reduce emissions below 1990 levels in the five year period thereafter.	D US fossil fuel industry preventing progress on emission reductions. Congress will dampen the efforts of the Administration, as evidenced by restricted financial support for the 1993 Clinton plan.
Norway	Limited public education programs; limited political engagement at high levels.	Individual sectors not held accountable.	Leaders in promotion of international approaches such as JI.	Heavy reliance on carbon taxes, but many exemptions given in first application which has lowered results.	+11%	Reduction of 10% for all of Annex I countries, but on a differentiated basis.	D Although tax measures are in place, there is still a large gap to be filled. Need to get at exempt sectors of the economy.
Canada	Few resources dedicated to public awareness. Political level not particularly engaged.	No attempts to allocate responsibility below national level. Little to no accountability.	Supporters of JI and emissions trading. Weak JI program.	Primary reliance on voluntary measures, lack of incentives for early action is hampering performance.	+8.2%	No proposal made yet.	D- No political will evident to deal with the problem. Regional tensions must be addressed.
Australia	Public concerned about economic costs of action. Political level actively engaged in seeking non-binding, differentiated commitments at Kyoto.	No sectoral or state targets have been established.	Interested in JI and emissions trading (with no caps).	Voluntary measures predominant.	+10%	Opposed to a "flat rate" legally binding target. Wants commitments based on national circumstances.	F Australia has decided to concentrate on ensuring its fossil fuel interests are protected. Likely to continue increasing emissions for some time to come.



2

What other countries are doing

THE FOLLOWING PART OF THE PAPER LOOKS AT HOW SOME OTHER KEY industrialized countries are faring in their effort to reduce greenhouse gas emissions. Some of the factors considered in choosing which countries to include in this review included: their influence on Canada’s competitiveness, their type of governance, the degree of commitment shown by their national government on climate change, and the approach they have taken to the issue. Efforts have been made to choose a balanced sample including both those countries which are making progress and those countries which are having difficulty in meeting their targets.

The ensuing discussion is largely based on material submitted by these countries in 1997 to the UN Framework Convention on Climate Change. These “national communications” are mandatory for all industrialized countries and describe all actions taken by the reporting country to meet its commitments

TABLE 3. PROJECTIONS AND TRENDS FOR SELECTED COUNTRIES (MEGATONNES CO₂ EQUIVALENT – ALL GHGS INCLUDED)

	1990	1995	2000	2010
	TOTAL + (% CHANGE OVER 1990)			
Australia	409.0	430.0 (+1%)	450 (+10%)	n/a
Canada	566.0	619.0 (+9.4%)	609 (+8%)	669 (+19%)
Germany	1210.4	1070.7 (-11.5%)	1038 (-14%)	979 (-19%)
Netherlands	215.4	236.2 (+9.7%)	211 (-2%)	218 (+1%)
Norway	54.0	54.9 (+1.6%)	60 (+11%)	64 (+18%)
UK	711.6	664.5 (-6.6%)	639 (-10%)	675 (-5%)
USA	5,740.9	6137.0 (+6.9%)	6482 (+13%)	7228 (+26%)

SOURCE: UN FCCC document FCCC/SBI/1997/19/Add.1, October 9, 1997. Differences between the inventory base level and the level used for projection of emissions are due to temperature adjustments. The UN Secretariat has added the following disclaimer to the Netherlands’ numbers: “ ... The Dutch projection figures are to be updated by the end of 1998, and should therefore be interpreted with caution.”

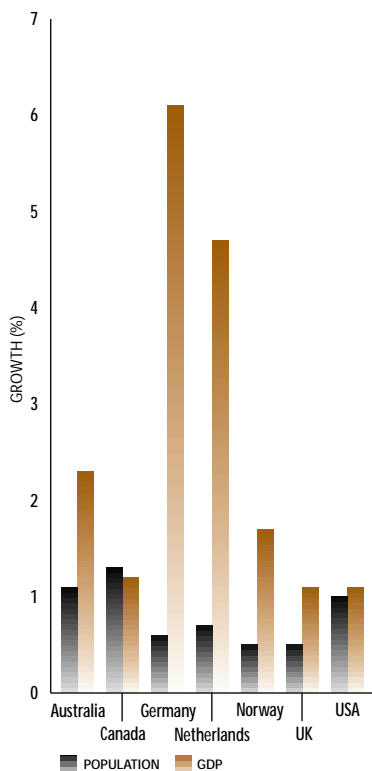


FIGURE 6. AVERAGE ANNUAL GROWTH, 1990-94

SOURCE: UN FCCC Secretariat compilation based on National Communications, July 1997

under the Convention. Highlighted countries include the United States, Australia, the United Kingdom, Norway, Germany, and the Netherlands. Included for each is, among other things:

- description of their political and domestic legal commitments as applicable;
- overview of the results they have achieved to date;
- the overall approach they are taking to the issue (e.g. voluntary, regulatory, taxes, etc.); and,
- specific measures that have worked well that could be considered for Canada.

It should be noted that each country has made its own choices as to which measures are appropriate to account for their own national economic, social and political circumstances. Measures that make sense and are successful for one country may not work in another for numerous reasons. It is noteworthy that no one country has been able to deliver a plan that contains all elements of “the best of the best” measures that in theory are possible.

Finally, it is typical that most national communications to the UN FCCC represent a delicate balance between a number of competing interests. Many of the reports range in excess of 200 pages. In a short summary paper such as this, it is impossible to capture all the nuances applicable to each country.

TABLE 4. CANADA IN COMPARISON WITH SELECTED COUNTRIES, 1990 & 1994

	CO ₂ EMISSIONS* (kilotonnes)	POPULATION	PER CAPITA CO ₂ (tonnes)	GDP (million US\$)	CO ₂ /GDP (tonnes/\$1,000)
1990					
Australia	273,123	17,086,000	16.0	294,530	0.93
Canada	464,000	26,522,000	17.5	542,000	0.82
Germany	1,014,155	79,479,000	12.8	1,640,060	0.62
Netherlands	167,550	14,943,000	11.2	283,670	0.59
Norway	35,544	4,242,000	8.4	115,350	0.31
UK	583,747	57,237,000	10.2	975,512	0.60
USA	4,960,432	249,975,000	19.8	5,489,599	0.90
1994					
Australia	285,501	17,840,000	16.0	324,400	0.88
Canada	482,000	29,251,000	16.5	568,067	0.89
Germany	904,500	81,407,000	11.1	2,046,100	0.44
Netherlands	175,200	15,382,000	11.4	336,800	0.52
Norway	37,785	4,337,000	8.7	123,200	0.31
UK	552,895	58,375,000	9.5	1,018,600	0.54
USA	5,168,855	260,651,000	19.8	6,649,800	0.78

SOURCE: UN FCCC Secretariat compilation based on National Communications, July 1997

*NOTE: The CO₂ emissions shown in this table are for carbon dioxide emissions only. Other tables and figures in this document include all greenhouse gases expressed as CO₂ equivalent.

As such, the examples quoted here should be taken as illustrative rather than comprehensive. For a more complete picture of individual countries, readers are urged to refer to the actual national communications as referenced in this document.

United States of America

Current Commitment: Commit to the binding and realistic target of returning to emissions of 1990 levels between 2008 and 2012; commit to reduce emissions below 1990 levels in the five year period thereafter.¹⁹

OVERVIEW

The USA is Canada's largest trading partner and as such their decisions on any given issue exert a great deal of influence in Canadian policy decisions. The Clinton Administration has embraced climate change as a major environmental issue, but like Canada, is having great difficulty in stabilizing its greenhouse gas emissions at 1990 levels by 2000. The October 1993 Climate Change Action Plan tabled by President Clinton forecast that the USA would be on track to return their emissions to 1990 levels by 2000. Their July 1997 report to the UN cites two reasons why they now will miss their target by 12.9%:

- the original analysis used to develop their 1993 plan overestimated fuel prices and underestimated economic growth and electricity demand; and,
- the US Congress has not fully funded the programs in the 1993 Program.²⁰

Measures that are in place will reduce emissions by 279 megatonnes, or about 29% of what is needed to deliver on stabilization by 2000. The Report now admits that even the most draconian measures would be insufficient to reverse the growth in greenhouse gases to return them to 1990 levels by 2000 and goes on to state that new efforts are focusing primarily on post-2000 initiatives.

In thinking ahead to what those measures might be, it is useful to consider elements of the USA market economy. It is a system based on property rights and a reliance on the market as a means of allocating resources. The government plays a role in addressing market failures and promotion of social welfare, although in the current political climate, interventions are made cautiously. The USA say outright in their report to the UN that "... the strong political and economic preference is to undertake such [greenhouse gas limiting] controls through flexible and cost-effective programs, including voluntary programs and market instruments, where appropriate."²¹ One demonstration of this approach is the USA's aggressive pursuit of international and domestic emissions trading schemes as one of the key means for dealing with climate change after 2000.

It is likewise important to understand the system of governance in the USA. Like Canada, the political and institutional systems participating in the

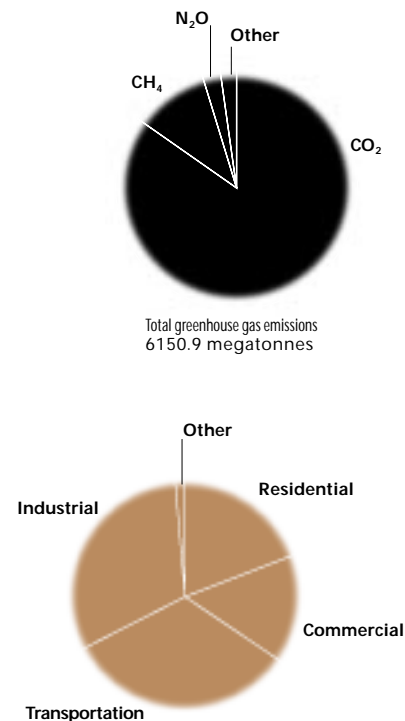


FIGURE 7. UNITED STATES EMISSIONS PROFILE, 1995: BY GAS AND SECTOR

SOURCE: Second Report to the UN FCCC, July 1997

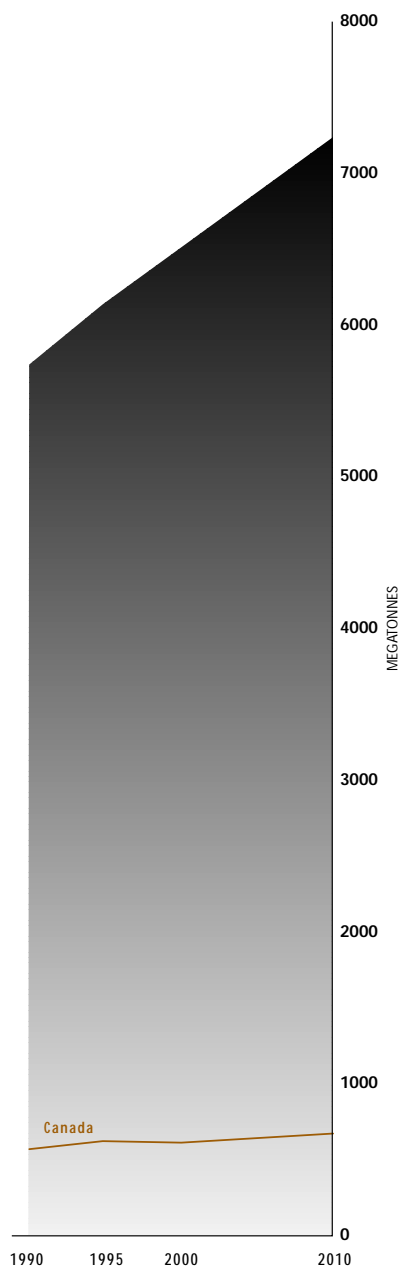


FIGURE 8. USA GREENHOUSE GAS EMISSIONS

SOURCE: UN FCCC Secretariat
FCCC/SB/1997/6 25 July 1997,
plus second national communications

development and implementation of climate protection policies span federal, state and local governmental jurisdictions. Federally, the US Government is divided into three separate branches: the executive branch which includes the Office of the President and the departments and independent agencies, the legislative branch or Congress which includes the Senate and House of Representatives, and the judicial branch, comprising the US court system. The Executive Branch speaks for the country in international matters and sets domestic policy direction. However, when it comes to ratifying treaties and delivering on international commitments that have budgetary implications, the Congress has a major say as evidenced by the approximate 45% budgetary reductions suffered by the 1993 Clinton Climate Change Program. Finally, the judiciary branch, which is often overlooked in the climate debate, provides the legal recourse if the country fails to live up to its commitments. The individual's freedom to legally challenge the government in these cases makes it necessary for the executive branch and Congress to be very certain that they can deliver on a legally binding commitment before signing on the bottom line. It is partly for this reason that the President's call in July 1996 for a legally binding emissions limitation and reduction target at Kyoto was seen as a major decision on behalf of the Administration.

State and local governments also exert influence over the passage, initiation, and administration of environmental, energy, natural resource, and other climate-related programs, with each of the States having significant autonomy in its approach to implementation of environmental regulation and management activities. For example, responsibility for regulation of electricity production and distribution lies with state and local public utility commissions. Regulation of building codes and hence energy efficiency of buildings, are also controlled at state levels.²² While the federal government has not required state governments to adopt a climate change mitigation target, twenty states have completed or are developing climate action plans. In addition, forty one cities have joined the Cities for Climate Protection Campaign. None of these plans have been explicitly reflected in the final calculations of US emissions reductions, although many of the emission reductions likely to be achieved are captured in assumptions about the adoption of federal initiatives at the state and local level.

WHAT IS UNDERWAY IN THE USA?

Domestic

While the underlying philosophy of climate change response in both the USA and Canada has been voluntarism, the USA has chosen a more disaggregated approach. Canada relies largely on a big single open-ended program, the Voluntary Challenge and Registry Program. The USA, in addition to broad based

programs such as Climate Challenge and Climate Wise, has a broad range of specific voluntary initiatives addressing buildings, lighting, motors, natural gas, agriculture, methane, PFCs, etc. Many of these programs also have more stringent requirements than Canadian programs. For example, Green Lights participants must agree to have an audit done of their lighting systems and agree to implement any actions that meet a previously identified standard of cost-effectiveness.

In its 1997 Report to the UN, the USA highlights a number of initiatives that have delivered emission reduction results:

- The MOTOR CHALLENGE program for promotion of the adoption of a systems approach to developing, purchasing, and managing motors, drives, and motor-driven equipment, thereby increasing energy efficiency, enhancing productivity, and improving environmental quality. The program has reduced greenhouse gases by 5.8 million tonnes.
- Over 2300 partners in the ENERGY STAR Buildings and Green Lights²³ programs have invested over \$1 billion in energy efficiency improvements, saving over \$250 million on their energy bills in 1996. By 2010, these programs are expected to save energy costs of \$11.3 billion along with 88 million tonnes of greenhouse gas emissions.
- In 1996, partners in EPA's Natural Gas STAR program reduced methane leakage from natural gas pipelines by over 3.67 million tonnes of carbon equivalent.
- Companies representing nearly 10 percent of US industrial energy, and utilities representing over one-half of US electricity generation use, have pledged to reduce greenhouse gas emissions through the Climate Wise and Climate Challenge programs, respectively. By 2010, Climate Wise is expected to deliver 13.6 million tonnes of greenhouse gas emissions reductions, while the Climate Challenge will deliver over 161 million tonnes by 2000.²⁴
- As part of the new initiatives underway, the USA will develop and implement new fuel cell technologies based on capture and re-use of methane, to generate, by 2010, 3.5 million tonnes of greenhouse gas savings.
- The Rebuild America program, part of the Department of Energy's Commercial Buildings Program, is designed to accelerate cost-effective, energy efficient investments in public housing and commercial and multifamily buildings. In 2000, Rebuild America partnerships will retrofit 2 billion square feet of commercial and housing floor space, putting \$3 billion into local economies and creating annual energy savings of \$650 million. Greenhouse gas emissions savings by the year 2010 are expected to be in the order of 32.3 million metric tonnes.

International

The USA is also looking aggressively at overseas opportunities. In 1991, while the Framework Convention was still being negotiated, the US established a \$25 million bilateral assistance fund to assist developing countries in determining their current emissions of greenhouse gases, and to examine means by which reductions could be achieved. This Country Study Fund afforded US companies a unique glimpse into the economies of a number of key developing countries and opened the door for win-win investment opportunities for American companies. To date, the program has supported work in 55 countries of which 18 have decided to move to the next phase in developing National Action Plans on Climate Change.

Following hard on the heels of the success of this program came the US Initiative on Joint Implementation, a pilot project begun in 1993 to encourage US organizations to implement projects internationally that reduce, avoid or sequester emissions of greenhouse gases. The guidelines established during this pilot program have been influential in setting high standards for the broader international community under the UN FCCC's pilot program on Activities Implemented Jointly (AIJ). And, in June 1997, at the UN General Assembly's Special Session on the Environment, President Clinton announced a \$2 billion redirection of US Aid towards climate change initiatives in developing countries.

This support for developing countries is not entirely altruistic. Like Canada, the USA needs to search out some flexibility in meeting its emissions reduction targets. The effective use of JI and other market mechanisms not only provides reductions at lower costs, it also positions USA companies to take advantage of market opportunities for energy efficient technology sales in other countries.

Germany

Current Commitment: "The Federal Government is aiming to reduce CO₂ emissions by 25% by the year 2005 (based on the reference year 1990)."²⁵

Under the EU Ministers' Agreement of February 1997, they are also expected to maintain the level of CO₂ at 25% lower than 1990 levels by 2010.

OVERVIEW

Much has been said and written about Germany's commitment to reducing emissions of greenhouse gases. Prior to the fall of the Berlin Wall, the government of West Germany had pledged to make aggressive reductions in CO₂ emissions – a 25% reduction of CO₂ emissions from 1987 levels by 2005. Many now point to the reunification of the former East and West Germany as the main reason why emissions are being reduced. In the later 1980s, the

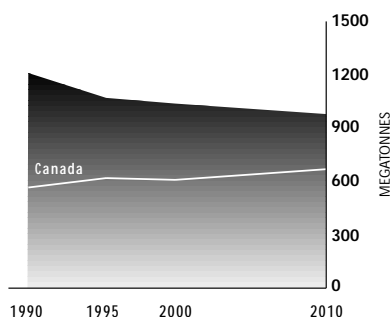


FIGURE 9. GERMANY GREENHOUSE GAS EMISSIONS

SOURCE: UN FCCC Secretariat
FCCC/SB/1997/6 25 July 1997,
plus second national communications

East German economy was buoyant and greenhouse gas emissions peaked; but as the 1990s began, former communist countries headed into an economic tailspin, with drastic reductions in economic activity. This in turn resulted in less energy being used and consequently fewer greenhouse gas emissions.

But that is only part of the story. When one factors out the reductions that resulted from reunification, the measures in the federal climate change policy are forecast on their own to deliver real CO₂ reductions of between 8.6 and 11.5% over 1990 levels by 2005. Although this still leaves Germany 8% to 10% short of meeting its national goal, it is fair to say that Germany's actions are projected to have a greater relative effect on emission levels than actions taken in most other countries.

Why is it that Germany can make this type of political commitment and deliver the programs needed to meet it? Since October 1994, protection of the natural basis for life (environmental protection) has been enshrined as a state aim in the constitution of the Federal Republic of Germany. Consequently, the state is charged with protecting the environment for present and future generations, by means of its legislative, executive, and judicial bodies. This commitment on the part of the government comes in response to a much stronger political voice on environmental issues in Germany than is the case in North America. From Chancellor Kohl downward, there is a firm commitment to address climate change. It was not surprising, then, that the first major international meeting to be held in the re-unified Germany was the first meeting of the Conference of the Parties to the UN FCCC in April 1995, which delivered the Berlin Mandate to guide negotiations on what next steps the world should take to address climate change. Nor was it surprising to see the leadership role on climate change played by Chancellor Kohl at the June 1997 Denver Summit of G-8 leaders.

This political leadership has manifested itself in three concrete approaches being followed by the German government:

- a commitment to spend money on programs to reduce emissions;
- extensive use of the tax system; and
- the fact that the regulations and voluntary agreements negotiated tend to be more results oriented with more aggressive targets than those of other countries, notably Canada and the United States.

Responsibility for climate change response rests primarily with the federal government. An interministerial working group has been in operation since June 1990, charged with identifying the potential for reduction of greenhouse gas emissions and proposing measures to tap this potential. The group is led by the Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety and includes the economics, transportation, regional planning and urban development, education, science and research, and agricultural and forestry

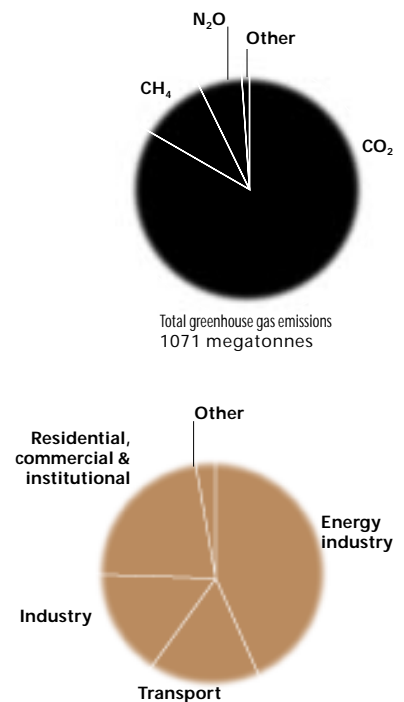


FIGURE 10. GERMANY EMISSIONS PROFILE, 1995: BY GAS AND SECTOR

SOURCE: Second National Communication to the UN FCCC, July 1997

ministries. They have submitted four reports to their Federal Cabinet, who in turn have approved a portfolio of some 130 measures for implementation. Of these 130 measures, 45-50 are classified as economic instruments (taxes, tax breaks, incentives, etc.) and 30-35 are denoted as regulatory in nature. Most are aimed at improving energy efficiency and promoting switches to less polluting forms of energy production. There are only a handful of voluntary measures in the program.

WHAT IS UNDERWAY IN GERMANY?

Domestic

Without doubt, one significant reason for the emissions reduction, particularly in eastern Germany, has been that the process of economic transformation has enhanced the efficiency of nearly all aspects of production in the economy. Inefficient competitors in the marketplace have been forced to go out of business. Those who remain, however, have been forced to improve their efficiencies and the federal government has instituted a number of programs to facilitate this transition.

The most significant reductions have been achieved through the substitution of obsolete procedures and products, especially in chemical process manufacturing. This system transformation has dictated a more efficient – and hence cleaner – energy supply. A number of specially-targeted, environmentally motivated measures have been implemented in eastern Germany, including, among others, significant financial and technological support for:

- substantial reductions in the use of lignite as an energy source;
- district heating systems fed by combined heat and power stations;
- energy-oriented renovation and modernization of buildings;
- restructuring of heating systems; and
- economic modernization.

In addition to the measures aimed primarily at eastern Germany, a number of other initiatives have been implemented since 1994 that are beginning to make a difference:

- The elimination of subsidies to the western Germany hard coal industry will make natural gas a cheaper alternative to coal, much of which is now being used for electricity generation, the single largest source of greenhouse gas emissions in Germany;²⁶
- German industry's declaration on climate protection, which commits them to produce plans aimed at reducing greenhouse gas emissions from their operations, is expected to deliver 35.2 million tonnes of emissions reductions by 2000 (approximately 3.5% of the national reduction goal).
- The German Automobile industry's 1995 voluntary commitment to reduce average fleet fuel consumption to levels that are unprecedented

elsewhere in the world, with a goal of reducing average consumption of fuel by 25% from 1990 levels by 2005 and a pledge to update the target to 33% reductions in 2000. This means that fuel standards of the German automakers will be near 5.0 L/100 km in contrast to Canada's voluntary standard of 8.2 L/100 km.

- Emissions-oriented taxes for heavy utility vehicles (1994) and for automobiles (1997);
- Financial incentive programmes for energy conservation and renewable energy development coupled with targets for amounts of renewable energy capacity – on this front, it is interesting to note that in 1995, Germany installed more wind powered capacity than any other country in the world (498 megawatts). Equally interesting is that the second largest amount of wind capacity was installed in India (383 megawatts) – primarily using German technology.²⁷
- Passage of the Energy Feed Law which guarantees all producers of renewable energy a set price for the electricity they produce has been instrumental to the expansion of the renewable energy industry in Germany.

While numerous measures have been implemented at the federal level, many *Länder* and local authorities are assuming increased responsibility for climate protection. In March 1995, the *Länder* approved a resolution in the Bundesrat that supports the federal government's objectives regarding climate change. That said, there are significant differences in population, energy sources, infrastructure, and the like that makes each *Länder* unique, not unlike the situation with each of Canada's provincial governments.

What is left unsaid in the German National Communication is whether and how these differences will be accounted for in future actions on climate change.

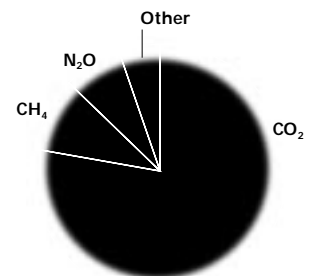
The Netherlands

Current Commitment: The Netherlands has a political commitment to achieve a 3% reduction in CO₂ emissions from 1990 levels by 2000, a 10% reduction in methane emissions by 2000, and a stabilization of nitrous oxide emissions by 2000.²⁸ Under the EU Ministers' Agreement of February 1997, the Netherlands committed itself to a 10% reduction of CO₂ from 1990 levels by 2010.

OVERVIEW

The Netherlands has been actively involved in emissions mitigation activities since the late 1980s, using a combination of regulatory, economic instruments and voluntary measures. Climate objectives have been integrated into sectoral policies, most notably in the energy, transport, agriculture and waste sectors.

In 1995, Canada installed 0.6 megawatts of wind energy capacity.



Total greenhouse gas emissions
238.7 megatonnes

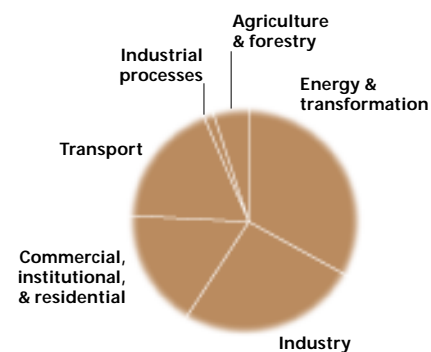


FIGURE 11. NETHERLANDS EMISSIONS PROFILE, 1995: BY GAS AND SECTOR

SOURCE: Second Netherlands' National Communication to the UN FCCC, April 1997

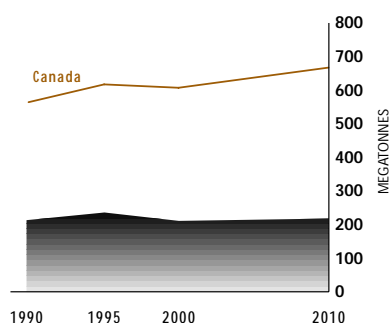


FIGURE 12. NETHERLANDS GREENHOUSE GAS EMISSIONS

SOURCE: UN FCCC Secretariat
FCCC/SB/1997/6 25 July 1997,
plus second national communications

This sectoral approach to setting and defining accountability for emissions reduction targets distinguishes the Netherlands from just about all other countries. Clear targets have been established for emissions reductions as well as for secondary indicators such as energy efficiency (i.e. improve energy efficiency by one-third on the year 2020 compared to 1990) and renewables (i.e. increase the share of renewable energy to 10% of total energy consumption by 2020). Progress towards meeting environmental goals, including climate change targets, is closely monitored and, under the Environmental Protection Act of 1993, annual environmental policy plans must be presented to Parliament.

Despite this, the Netherlands has seen annual increases in energy consumption from 1980 to 1995 ranging from 0.8% to 3.4% due primarily to increased electricity consumption by households and increased volumes of traffic. Total energy use during this 15 year period increased by 42%, exceeding the growth of GDP, which had been 31%.

Electricity generation has increased by 16% from 1990 to 1995, mainly supplied by increased co-generation. New coal fired power plants went into operation in 1993 and 1994 and while their efficiency had improved from 38 to 41%, increased CO₂ emissions resulted. On the renewables front, progress towards the 10% target of total energy consumption by 2020 has been slow – currently 1.6% of the Netherlands' total energy consumption is attributable to renewables.

Room also exists for improvements in the industrial sector which is relatively energy intensive in terms of energy use per dollar production value when compared to other European countries. This is particularly acute in the chemical industry which has an energy intensity three times that of Germany, the United Kingdom and Denmark.

Against these economic realities, concern for the environment among the public rates almost as high as unemployment and crime.²⁹ In 1995, polls indicated that 60% of the population of the Netherlands was willing to pay higher prices for environmentally friendly products and over 40% were willing to pay higher taxes for programs directed at the environment. As for mobilizing support for climate change, a low-lying country such as the Netherlands will be affected by potential sea level rise, a tangible threat that is known and understood by the populace. Public awareness efforts have thus fallen on fertile ground.

Regarding governance, the Netherlands is a constitutional monarchy with legislative powers vested in the national government, 12 provincial governments, and 625 municipalities. At the national level, the Minister for Housing, Spatial Planning and the Environment is responsible for climate change legislation and policy development. Other Ministers are responsible for integrating

environmental policy targets and endorsing the annual National Environmental Policy Plan within their respective fields. The formulation of policy, followed by concrete measures, and finally implementation, takes place in conjunction with relevant “target” or stakeholder groups, most of whom interact with the government through national associations.

Broadly speaking, the costs of reducing energy-related CO₂ emissions in the Netherlands to this point has been negative to zero. Policy measures are designed to induce those forms of energy-saving which are economical in their own right but would not fully occur if the market is left to itself. However, in its latest communication, the government has signaled that the limits of these “no-regrets” measures is drawing close and that further steps will likely begin to incur costs.³⁰ Included in that approach is likely to be more use of economic and regulatory instruments.

WHAT IS UNDERWAY IN THE NETHERLANDS?

Domestic

The Netherlands’ sector-oriented approach, which combines clear performance standards, associated accountabilities, and reporting requirements has been used in the development of Long Term Agreements (LTAs) between the government and a number of industry associations. These voluntary agreements (or “covenants”) are more stringent than either the Canadian or USA programs. Indeed, many North American observers consider them to be more “regulatory” than “voluntary.” Failure to live up to the agreement can result in charges under Dutch civil law.

Long Term Agreements are signed by the sectoral association, individual firms and the Minister of Economic Affairs. Included in each agreement are the overall negotiated target (always defined in terms of energy efficiency), the energy conservation strategy, the Ministry’s role, energy-savings plans for individual firms, monitoring provisions, and the duration of the agreement. A separate organization reporting to the Ministry of Economic Affairs – the Netherlands Organization for Energy and Environment – is charged with establishing, implementing and monitoring the Long Term Agreements.

The 37 long term voluntary agreements in the industrial, service and agricultural sectors are delivering results due primarily to the clear negotiated targets and the monitoring program to assure accountability. The agreements currently cover more than 90% of industry primary consumption. The average target of the LTAs in the industrial sectors is a 20% improvement in energy efficiency from 1989 levels by the year 2000. Since the LTAs were introduced in 1989 in the energy sector, a 9% improvement in energy efficiency has been accomplished in the period 1989 to 1994. For its part, the government assures some

consistency and protection from new regulations and also provides financial and technical support in exchange for voluntary participation. Unlike the non-binding nature of the Canadian and US voluntary programs, each LTA is a legally binding contract under Dutch civil law.³¹

In the area of economic instruments, the Netherlands passed a bill in 1995 called the "Regulatory Energy Tax" which is applied to natural gas and electricity consumption. The tax is additional to the environmental tax that already exists on all fossil fuels. The Regulatory Energy Tax will raise energy prices 15% to 20% and is being phased in over a three year period from 1996 through 1998. Since the tax is intended to induce energy conservation, any revenues it generates are being recycled back into the economy through relief in other taxes. Use of renewable energy is exempted from the tax.

Another economic measure used by the Netherlands encourages investments in both energy conservation and renewable energy through a number of provisions in the corporate income tax. An energy investment tax credit was introduced in 1996 and free depreciation of some energy and environmentally friendly investments has been possible since 1994. The government has set aside a budget of 22 million guilders (~11 million \$US), increasing to 35 million guilders (~18 million \$US) by 2000 for the energy related part of the program. The budget for energy related project write-offs will be starting in 1997 at 125 million guilders (~63 million \$US). In total, along with other related projects, the Netherlands invested over 350 million \$US on renewables and energy conservation in 1996.³²

Perhaps most important of the initiatives is the assignment of differentiated energy efficiency targets to individual sectors of the economy. For example, the chemicals sector, by far the largest energy user in 1989, has an efficiency target of 20% by 2000. Refineries have a target of 10% by 2000, and the paper industry has a 20% efficiency target. Philips, one of the major multinationals based in the Netherlands is expected to show a 25% improvement in energy efficiency by 2000. Having a clearly defined, measurable target backed up by civil law in the form of the Long Term Agreements provides the policy stability and overall direction needed for individual firms in each sector to make informed investments.

In the residential and service sector, energy conservation in new buildings is being sought through, for example, tougher insulation standards, setting limits for the allowable energy use for heating and hot water in homes and other buildings, and demonstration projects and fiscal incentives for ultra high energy efficient construction. The Dutch are betting on quality improvement in new construction spurring on market trends to improve existing buildings, including their energy efficiency. As well, energy conservation in existing dwellings

will be stimulated through LTAs with rental agencies in the social housing sector and with relevant larger organizations. For example, an energy efficiency target for institutional health care has been pegged at 30% for 2000, for Schipol Airport, 28% by 2000, and for secondary vocational education institutions, 30% by 2000.

International

In the area of international programs, the Netherlands decided in September 1995 that Activities Implemented Jointly (AIJ) would not be used to meet targets established for 2000, but that the Netherlands would actively advocate the use of joint implementation for any future obligations (post 2000) under the UN FCCC. To present a clear picture of the results of their efforts on joint implementation, a “dual accounting system” has been established to separate domestic actions from international actions. A Pilot Phase Programme on AIJ was established in 1995 to last until 2000, with a commitment for annual progress reports to both the Netherlands’ parliament as well as to the UN Framework Convention on Climate Change. The programme is aimed at projects in both developing countries and the countries of central and eastern Europe. The private sector is encouraged to participate in the program by a number of incentives including:

- permission for Dutch companies to use certified emission reduction or sequestration efforts as part of future agreements with the government of the Netherlands;
- access to a special budget for the life of the Programme of approximately US\$29 million designed for grants to businesses wishing to pursue AIJ opportunities in non-OECD countries;
- special fiscal assistance on a case-by-case basis by use of the already existing fiscal provision for free depreciation of environmentally sound capital goods.

Like numerous other countries, Canada included, a special office has been established in the Netherlands to provide advice and coordination related to AIJ initiatives. As well, the Netherlands has continued to operate its Foundation for the Joint Implementation Network, which was established in 1994 to assist in documenting projects, disseminate up to date information via a quarterly newsletter and the Internet, and to organize and conduct conferences in Central and Eastern Europe to expand the dissemination of experiences with AIJ. To date, the Netherlands has projects underway in Ecuador, Uganda, Czech Republic, the Russian Federation (2), Hungary (2), Bhutan, and Romania. Initiatives are also scheduled to begin in 1997 in Morocco, Bolivia, China, Peru, Honduras, and India.

The United Kingdom

Current Commitment: The United Kingdom has a political target of a 10% reduction in total greenhouse gases from 1990 levels by 2010. This is also the target that they have agreed to as part of the European Union's burden sharing formula, approved by EU Environment Ministers in February 1997.

OVERVIEW

In the United Kingdom, liberalization of the energy markets has been the major contributor to the gains being made in reducing CO₂. Liberalization has provided incentives to improve efficiency at all stages of energy production, transmission, distribution and supply. Energy market liberalization has encouraged electricity generators to invest in efficient, combined cycle gas turbine technology which has a much lower carbon intensity than the coal fired power plants which are being replaced. In 1998 the market liberalization will be completed when all consumers will have the choice to contract with any electricity supplier for their power needs. Consumers wishing to purchase environmentally friendly electricity will be able to do so directly. There has also been a major restructuring of the coal industry as part of the privatization and removal of subsidies and almost all of the electricity generation and supply industry has now been privatized.

Many observers feel it was easy for the UK to reduce emissions and that it was largely because of one or two key measures in energy market reform. This is true, but the choices made by the United Kingdom in implementing the liberalization are important. In some countries, electricity market restructuring initiatives have meant coal plants being run into the ground due to increased trade opportunities (their operating costs are lower than the cost of new natural gas capacity) and shrinking opportunities for demand side management and renewable energy initiatives, all leading to potentially higher greenhouse gas emissions. Deregulation in the United Kingdom, however, involved phase out of subsidies for coal, removal of barriers for the use of natural gas and the creation of incentives for renewables and non-fossil energy sources (nuclear) thereby delivering the larger emissions reductions that they are currently recording.

While some of these market liberalization measures were already being, or would have been, implemented for other policy reasons, they will not, on their own accord deliver all the results needed. Further measures have been put in place or are planned which are aimed at keeping trends below 1990 levels. This will not be simple, due to forecast large emissions increases in the transport sector. As well, in the energy markets, the continued reduction in emissions could be partly offset by price reductions following introduction of full competition in the electricity sector.

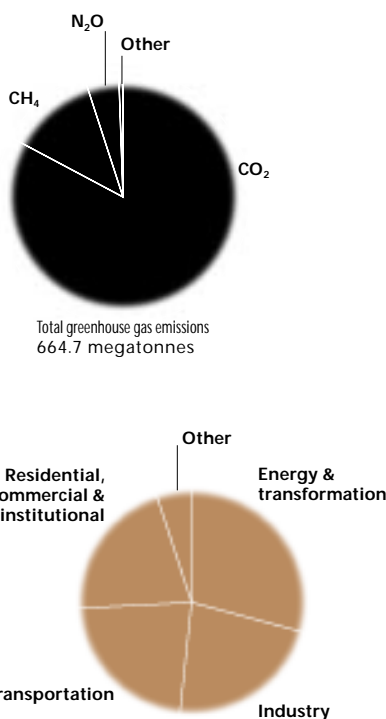


FIGURE 13. UNITED KINGDOM EMISSIONS PROFILE, 1994: BY GAS AND SECTOR

SOURCE: UK Second Communication to the UN FCCC, February 1997

Energy intensity has been declining most recently due to a combination of structural changes in the economy, changes in technology and the greater efficiency with which energy is converted, distributed, and used. Technical estimates show, however, that there remains considerable scope in all economic sectors for further improvements in energy efficiency.

The UK issued a full report in January 1997 on the progress it is making in reducing CO₂ emissions. It concludes that there is a wide range of cost effective precautionary measures to reduce greenhouse gas emissions that could be taken now to avoid the need for mitigation or adaptation in the future, which typically can prove to be more costly. As such, the UK Programme embraces a portfolio of measures, primarily economic instruments, regulatory and deregulatory programs. The portfolio is rounded out by some voluntary and public awareness measures.

The Department of the Environment leads the UK efforts within the national government. A specific Global Atmosphere Division within the Department coordinates the UK Programme, its research and its contributions to the UN FCCC process. Other Departments involved in implementing the Climate Change Programme include the Department of Trade and Industry, the Department of Transport, the Ministry of Agriculture, Fisheries and Food, the Overseas Development Administration, the Forestry Commission, and Her Majesty's Treasury.

WHAT IS UNDERWAY IN THE UNITED KINGDOM?

Domestic

As noted earlier, the switch to cheaper and cleaner natural gas from the UK North Sea production fields has had the most impact on reducing CO₂ emissions, and is projected to contribute close to 73 megatonnes of CO₂ reductions by 2000, amounting to 56% of total CO₂ reductions. Outside of reform in energy markets, the UK is relying largely on voluntary programs and fiscal instruments to generate reductions. Other measures that have been implemented include:

- Market incentives for new and renewable energy sources, working towards a target of 1,500 megawatts of new capacity by 2000, is expected to make up approximately 10% of the forecast reductions;
- Increase in road fuel duties of approximately 5% per year from 1993 onwards is expected to deliver 11 megatonnes or 8.5% of projected reductions;
- The Energy Efficiency Best Practices Programme, an information and awareness initiative will deliver reductions in the order of 12.8 megatonnes;
- Regulations, building standards, and labeling activities will contribute savings of 5.9 megatonnes by 2000;

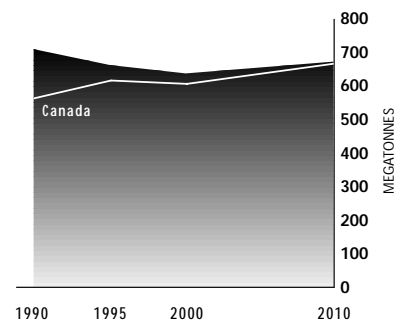


FIGURE 14. UK GREENHOUSE GAS EMISSIONS

SOURCE: UN FCCC Secretariat
FCCC/SB/1997/6 25 July 1997,
plus second national communications

- An Energy Savings Trust, a fiscal incentive aimed at residential buildings will deliver 0.5 megatonnes or about 1.4% of the forecast CO₂ reductions;
- Emissions targets have been established for public sector buildings, and will contribute 0.8 megatonnes of CO₂ reductions;
- A tax on residential fuel will raise domestic fuel prices and is forecast to result in approximately 0.4 megatonnes of reductions.

Regarding other greenhouse gases, in 1995 the UK implemented a National Waste Strategy for England and Wales containing regulatory and fiscal measures which will reduce methane emissions by approximately 20% by 2000. This comprehensive strategy is by far the largest contributor to reductions in methane in the UK. Other initiatives include voluntary programs to utilize waste gas from coal mines for energy production and to control leakage from gas pipelines.

For nitrous oxides, regulatory limits under the 1990 Environmental Protection Act, forecast to be implemented in 1998, will deliver an approximate 60% reduction in nitrous oxide emissions by 2000. This represents a required 95% cut in emissions of nitrous oxide from the manufacture of adipic acid which is used in the production of nylon.³³

International

Unlike the United States, Canada and the Netherlands, The United Kingdom has not mounted a formal international program on Joint Implementation related to climate change, owing primarily to the fact that they feel they will be able to meet their international commitment through actions at home. There is, however, interest among the United Kingdom industry in the notion of emissions trading and representatives of the power sector have been in attendance at a variety of international workshops on the subject.

Norway

Current Commitment: Regarding CO₂, Norway's current target is to limit emissions so they do not exceed the 1989 level in the year 2000.³⁴

OVERVIEW

Norwegian climate change policy is anchored on the principle that all policies, both international and domestic, should be based on a comprehensive approach (taking into account all greenhouse gases) and be as cost-effective as possible. Norway feels that coordinated international efforts and the development of international economic measures are essential in dealing with the greenhouse effect.³⁵

Norway's economy is small and open with exports and imports constituting a relatively high share of GDP, approximately 50%. Norway fears that

international action to reduce greenhouse gas emissions may alter the external framework for the Norwegian economy and result in changes to the prices of important commodities.

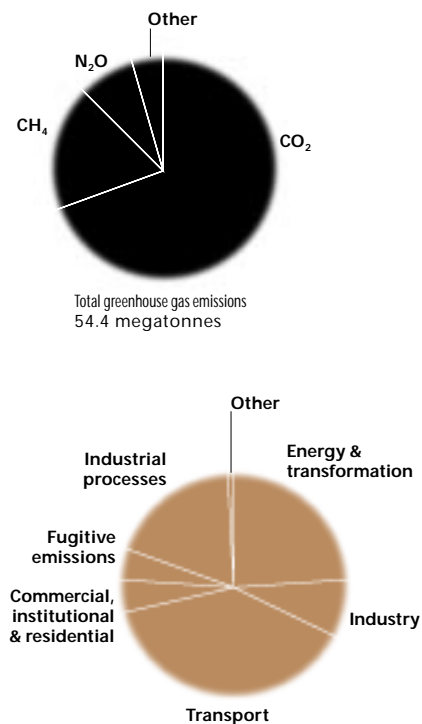
The petroleum sector (including both production and transport of petroleum) accounted for 23% of total CO₂ emissions in 1995. Norway has a situation not unlike Canada with regard to its sales of natural gas to the United States in that pipeline transport of natural gas to the European continent is energy demanding and therefore produces CO₂ emissions. At the same time, if that natural gas is used to contribute to a reduction of CO₂ emissions in another country by virtue of switching fuel sources from coal or oil to cleaner natural gas in the importing country, a reduction in the region's emissions occurs. Norway wants this recognized in the determination of future international emissions limitation or reduction targets.

Electricity production in mainland Norway is based almost entirely on hydropower, which does not cause CO₂ emissions. Norway claims, then, that it has little opportunity to reduce CO₂ emissions from electricity production via fuel switching (i.e. coal to natural gas).

Norway's approach to emissions limitation has been, and will continue for the foreseeable future to be, the use of taxation. Norway has, for a number of years, been in the forefront in introducing economic instruments to enhance the efficiency of environmental policies, with an emphasis of curbing emissions to the air. Norway considers itself to be an instigator in the area of environmental taxes,³⁶ is one of the few countries which have introduced CO₂ taxes, and has done so in such a way that the overall tax level on fossil fuels is considerably higher than in most other countries. Norway claims that their experience with CO₂ taxes has been positive, but recognizes that closer coordination between countries will be needed to enhance the effect, and extend the application, of such taxation schemes. Projections of the environmental and employment effects of the tax were presented to the Green Tax Commission in 1996. At a modest tax level, the impacts both on emissions and on the economy are small. If the tax were to be applied across more sectors and ramped up in value over a period of years, there would be increased emissions reductions, with minimal economic impact, depending on the choices made for reinvestment of revenues.³⁷

With the electricity production and gas pipeline sectors offering few options for reduction of CO₂ there is a lot of pressure for emissions reductions in the road transport sector, which is the largest single contributing sector to high emissions within the country. However, Norway's relatively low population density and mountainous geography limit public transport options outside cities.

Given that the Norwegian government believes it has a limited number of options open domestically to mitigate climate change, it is not surprising that Norway has an active international program to develop and design options for



**FIGURE 15. NORWAY
EMISSIONS PROFILE, 1995:
BY GAS AND SECTOR**

SOURCE: Second national Communication under the UN FCCC, April 1997

joint implementation and emissions trading. Norway championed the concept of joint implementation in the negotiations leading to the signature of the Framework Convention on Climate Change and has continued to fund international research into system design in search for cost effective, market-based offshore solutions. Norway has been very active developing partnerships with the World Bank and the Global Environment Facility of the World Bank, UNEP and UNDP towards finding specific joint implementation projects in which to invest. Not dissimilar from the USA approach, Norway recognized at an early stage the potential value of international offsets and the market positioning that could be gained by an early entry into the field.

The Ministry of Finance plays a prominent role in the design of the tax measures, and numerous other departments have responsibilities for implementing sector-specific initiatives. Overall coordination for the domestic agenda is the responsibility of the Environment Ministry. On the international front, the Environment Ministry heads the Norwegian delegation supported by the Ministry of Foreign Affairs.

WHAT IS UNDERWAY IN NORWAY?

Domestic

As noted earlier, the Norwegians rely heavily on taxes to deliver CO₂ emissions reductions. In fact, in September 1996, the Green Tax Commission concluded:

“... the majority of the Commission finds no reason to recommend the use of other policy instruments than taxes to reduce CO₂ emissions.”³⁸

In the April 1997 Norwegian report to the UN Framework Convention on Climate Change, they attribute their tax scheme as being responsible for altering the projected growth of CO₂ emissions from what they would have been without such a scheme. The environmental tax system, which consists primarily of product taxes, has been associated with a steady decrease in national gasoline consumption, but the exact effect of the tax has been difficult to pin point. Similarly, the CO₂ tax is believed to have contributed to the development of more energy efficient production and transport of oil and gas, with the development of more efficient gas turbines making the single most significant contribution to the reductions. The CO₂ tax contributes to a reduction of emissions in several ways including:

- reduced demand for fossil fuels because of higher prices relative to those of other goods;
- changes in the sectoral composition of the economy;
- changes in energy intensity; and
- changes in the energy mix.

Other measures in the energy sector include the Energy Act, which entered into force in January 1991 and established the general terms and conditions

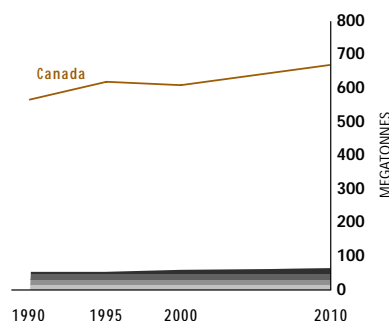


FIGURE 16. NORWAY GREENHOUSE GAS EMISSIONS

SOURCE: UN FCCC Secretariat
FCCC/SB/1997/6 25 July 1997,
plus second national communications

designed to ensure more efficient use of hydropower. The Act has also brought about deregulation and keener competition in the power sector. From 1991 to 1996, the growing competition led to a reduction in power prices, but in 1996, lower water levels in the reservoirs led to steep price increases and thus more switching to heating oil in the industrial sector.

In the transport sector, gasoline taxes are more than 70% higher in 1997 than in 1990 and consumption of gasoline dropped by more than 8% during the period 1990 to 1995. The purchase tax on cars is among the highest in the world and has, since 1996, been differentiated according to weight, engine output and engine volume. As well, the government is currently considering a revised policy on road pricing which would see increased use of toll roads. To encourage research and development in the field of alternative fuels, funds have been allocated by the government towards projects to use natural gas in buses and to develop and test hybrid electric-powered vehicles.

In the industrial sector, hydro-electricity and bio-energy have, to a large extent, replaced fossil fuels as an energy source. This has been especially prevalent in the pulp and paper industry, which, like its Canadian counterparts, is turning to the use of tree bark and other biological waste products as fuel sources. A voluntary network, the Industrial Energy Efficiency Network, has grown since 1989 to include over 80% of total energy use in Norwegian domestic industry, but this network seems to be primarily for information sharing and inventory development, with no specific mention being made of specific emissions targets for the individual members of the group.

In the residential, commercial and institutional sector, efforts are focusing on raising public awareness concerning the options available to improve energy efficiency and reduce operating costs. The government has allocated NOK 153 million (~24 million \$US) for energy efficiency measures in 1997, and a further NOK 96 million (~15 million \$US) to energy efficient equipment and systems and renewable energy.

International

Norway has long been an advocate for international cooperation in the form of joint implementation and emissions trading. Towards that end, they have been very active in the provision of funding and technical support to international efforts aimed at development of criteria for the proper monitoring, verification, validity and long term effectiveness of such measures. Norway has participated in a number of pilot projects on JI with the World Bank and the Global Environment Facility. Two projects in particular, the Poland Coal-to-Gas Boiler Conversion Project and the Mexico ILUMEX³⁹ Project were helpful in defining JI criteria and demonstrating first-hand some of the practical pitfalls that occur in actually implementing JI projects. Further projects in the AIJ phase have been entered into with Costa Rica and Burkina Faso with more planned before 2000.

Australia

Current Commitment: Australia is arguing that any future commitments under the UN FCCC should not be legally binding and should be based on fair and equitable burden sharing. No targets are now proposed, although prior governments had made a political commitment to stabilize greenhouse gas emissions at 1988 levels by the year 2000 and reduce them by 20% by 2005 with the caveat that “the Government will not proceed with measures which have adverse economic impacts nationally or on Australia’s trade competitiveness in the absence of similar action by major greenhouse gas producing countries.” The current government does not subscribe to this commitment.

OVERVIEW

Australia’s economy is highly energy intensive. In addition to being the world’s largest coal exporter, Australia is heavily dependent on exports of raw and partly processed commodities including liquefied natural gas and aluminum smelted with coal-fired electricity. Electricity generation accounts for nearly half of energy related CO₂ emissions, the highest proportion among OECD countries, reflecting Australia’s heavy reliance on coal for power generation.⁴⁰ Coal combustion accounts for as much as 40% of the country’s total CO₂ emissions.

Between 1973 and 1991, total energy consumption in Australia grew, on average, by 2.5% a year, while population increased by 1.5% a year. Although Australia has reduced the energy intensity of its manufacturing sector since the 1970s, it has done so a far slower rate than other OECD countries. In fact, the IEA in 1996 estimated that Australian energy intensity will not reach the average level of OECD countries until 2010.⁴¹

Australia’s National Greenhouse Response Strategy, which was published in 1995, indicates that the government is either developing or considering a number of initiatives for greenhouse gas reduction. Examples are a comprehensive alternative fuels strategy, various energy efficiency measures, removal of impediments to free trade in natural gas and increased support for renewables. Since Australia has lagged behind most other OECD countries in improving energy efficiency since the 1970s, there are numerous opportunities for low cost, no regrets measures to be implemented.

Progress to date has, however, been limited. In 1995, the Australia Institute expressed the view that “Australia’s excess of emissions over the target of the Framework Convention’s aim to return emissions to 1990 levels by 2000 is likely to be far greater than has been admitted by the Commonwealth Government.”⁴²

In the international climate change negotiations, Australia has repeatedly stated that it does not support legally binding emissions reduction targets.

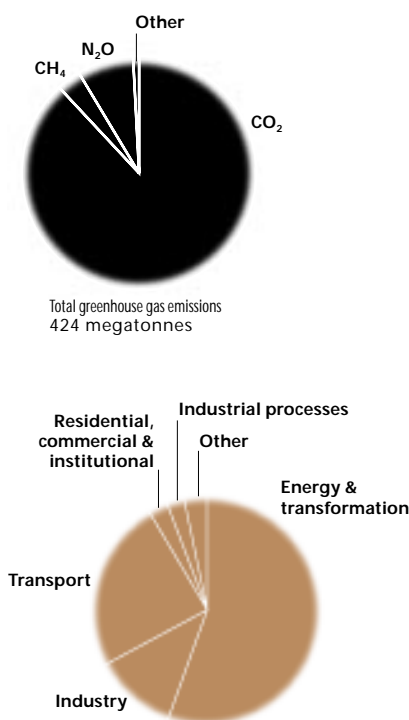


FIGURE 17. AUSTRALIA EMISSIONS PROFILE, 1994: BY GAS AND SECTOR

SOURCE: UN FCCC Secretariat 1997
Compilation; Sector profile based on 1994
Australian National Report

At the second meeting of the Conference of the Parties to the UN Framework Convention on Climate Change in Geneva, July 1996, Australia refused to endorse the Ministerial declaration on the grounds that the text included a mention of legally binding targets. In addition, Australia has also indicated that it will not sign an agreement that contains “across-the-board” targets for developed countries, since it considers such an approach inequitable. In place of a uniform target, Australia advocates the negotiation of differentiated country commitments based on individual country circumstances so as to ensure that an equitable level of burden is placed on all countries. Economic indicators they have proposed for consideration include population growth, GDP per capita growth, emission intensity of GDP, emissions intensity of exports and fossil fuel intensity of exports, all with a view towards having Australia’s obligations lower than would otherwise be the case if an “across-the-board” target were to be applied.

There are two motivations for Australia’s resistance to uniform legally binding emissions reduction targets. The first deals with the internal costs of being forced to reduce domestic coal production and consumption. The second deals with the potential trade and balance of payments losses should Australia’s trading partners substantially reduce their coal imports in response to increased emission reduction commitments. Given that the majority of Australia’s coal exports is being sold to countries which don’t yet have emissions reduction targets, one would be led to believe that the costs of changing domestic consumption of coal is the predominant factor in their positioning.

Australia has invested a great deal of time and effort in the past two years promoting the conclusions of its Megabare economic model which predicts heavy economic losses associated with greenhouse gas reductions. Funded partially by the fossil fuel industry, the results have made their way into the capitals of most OECD countries. The model forecasts economic losses for a number of OECD countries, including Canada and the United States. The extent to which this strategy is effective in bringing other countries on board to the idea of differentiated targets will be known after the Kyoto round of negotiations.

Australia and Canada share similar jurisdictional issues related to climate change policies. The Commonwealth of Australia consists of a federation of eight self-governing States and Territories, each of which has its own government. In addition, prior to the formation of separate governments for each of the States and Territories in 1901, communities had been encouraged to form local governments with the consequence being over 900 local governments in Australia. The three levels of government each play a role in the determination of policy, with most of the constitutional authority over natural resources resting with the State and Territorial Governments. Like Canada, to date, there has been no determination of emissions reductions accountabilities at the State or Territorial level.

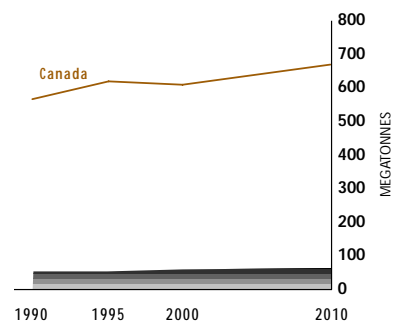


FIGURE 18. AUSTRALIA GREENHOUSE GAS EMISSIONS

SOURCE: UN FCCC Secretariat
FCCC/SB/1997/6 25 July 1997,
plus second national communications

WHAT IS UNDERWAY OR PLANNED IN AUSTRALIA?

Domestic

The National Greenhouse Response Strategy of 1992 provides the framework for action on climate change in Australia. It comprises a set of general principles, sectoral strategies, mechanisms for monitoring and assessing progress, and arrangements for periodic review and continuing development of the strategy. As part of the Strategy, Australian governments agreed that first phase measures would give particular attention to energy transformation, distribution and use. Included in the strategy are:

- structural reform of the electricity sector (see below for more details);
- removals of impediments to free and fair trade in natural gas within Australia;
- pricing energy to better reflect economic, social and environmental costs;
- setting minimum energy performance standards for appliances and equipment;
- improving fuel efficiency on new motor vehicles.

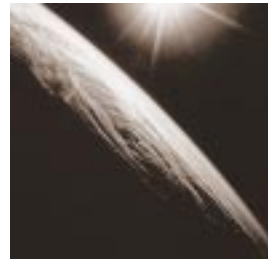
The reform of the electricity supply industry has been underway since 1991. However, unlike in the United Kingdom, where restructuring led to significant CO₂ emissions reductions, in Australia's case, the control which the federal government has over the restructuring choices is limited. Thus, traditional economic concerns at the state level such as employment, regional development, and delivering cheap power to consumers, have resulted in continued approval of new coal-fired power stations. The important role of the states is illustrated by the case of the government of Victoria, which has given priority to maximizing revenue from the sale of power stations as well as reducing consumer prices. This has resulted in the continued operation of several old, inefficient brown coal plants which could have been retired and replaced by natural gas fired power plants.

Like Canada, a centrepiece in the Australian plan is a voluntary challenge program. Called "the Greenhouse Challenge", it aims to encourage corporations to reduce greenhouse gas emissions in their operations. As of September 1997, 42 corporations had signed cooperative agreements committing themselves to specific greenhouse gas reduction measures. More enthusiasm has come from the heavy industrial sector where large amounts of energy are used. Additional efforts are now underway to encourage State and Territorial governments to sign on. To date, there have been no quantitative indications given of the effectiveness of Australian voluntary initiatives, although their 1997 National Communication to the UN FCCC is expected to contain such estimates. In fact, it has been noted by the UN FCCC Secretariat in December 1995 that it is very difficult to assess Australia's progress on emissions reductions.⁴³

International

The 1994 Australian report to the UN FCCC lists a number of activities related to capacity building and foreign aid flows that broadly involve climate change. Although Australia supports the concept of joint implementation, there was, in 1994, no specific measures related to JI in their report, aside from noting that Australia is exploring opportunities for sustainable activities in the Asia-Pacific region that could act as pilot JI projects.

Australia has indicated it supports the principle of emissions trading, but has stopped short of endorsing any trading scheme involving a uniform emissions cap across a number of countries. In total, there is not a very robust international focus in Australia's climate change response strategy.



3

The costs of Canada not keeping pace

SHOULD CANADA DECIDE TO CONTINUE WITH ITS GO SLOW APPROACH, AND either not sign at Kyoto, adopt less assertive targets than other countries, or continue to put little effort into implementation, there will be both short and long term impacts on Canada's competitiveness, international reputation, and future role in climate change negotiations.

THE ECONOMICS

There have been several macro-economic studies conducted recently that are interpreted by their sponsors as demonstration that Canada's competitiveness will suffer if measures are taken to stabilize greenhouse gas emissions at 1990 levels by 2010. Results indicate a loss of GDP in the range of 0.5% to 2.3% over projected growth.⁴⁴ In other words, if the Canadian economy is projected to grow at approximately 2% per year from now until 2010, the impact of taking measures to stabilize emissions will still result in economic growth being some 27.7% to 29.5% (instead of 30% if nothing were done). Given that normal economic projections have a margin of error that is often greater than the absolute losses being predicted here, is this type of information reliable enough on which to make long term investment decisions particularly when other studies present a different picture?⁴⁵ In addition, virtually all studies ignore the costs associated with not taking action, such as the costs of adapting to future climatic change.

Nonetheless, for the sake of argument, let's assume that the most pessimistic forecasts are correct. Canada would, based on these projections, then presumably wish to protect its economic self interest by continuing with only economically profitable measures implemented on a voluntary basis. But does this scenario reflect an accurate assessment of Canada's economic self interest? The same models which predict an overall loss of GDP also show that there are some sectors of the economy that would gain from a proactive response to climate change, namely the service sector, manufacturing and electricity production.⁴⁶

COMPETITIVE ADVANTAGES

There are competitive advantages in moving proactively on climate change including, among others:

- making Canada more energy efficient;
- reducing other costs: lower greenhouse gas emissions will produce multiple benefits such as reduced air pollution in urban areas;
- developing new technologies and expertise for which there will be a large export market; and
- avoiding stranding new capital in high emission industries in an increasingly efficient world.

Canada should be developing a strategy that exploits the economic opportunities associated with an assertive climate change policy while at the same time ensuring that those sectors of the economy which may be negatively affected in the short term are compensated in an overall effort to have all sectors and regions of the country shouldering a fair and equitable share of the burden.

Canada must also be mindful of the need to keep pace with competitors regarding energy efficiency. Table 4 (*page 14*) shows the trends from 1990 to 1994 of CO₂ emissions per \$1000 of GDP for a number of OECD countries.

Two points are noteworthy:

- Canada, Australia, and the United States all have high emissions of CO₂ per unit output (almost double) in comparison to Japan, Germany and the United Kingdom.
- Emissions per unit output for Canada have been increasing while most other OECD countries, including the United States and Australia, have been decreasing.

Should this trend continue, Canada will lose ground to its major competitors, except in traditional niche market areas. For Canada to stay truly competitive internationally, more attention needs to be paid to increasing energy efficiency and thereby lowering costs of production. Setting firm limits on CO₂ emissions is one way to encourage improvements in energy efficiency.

EXPORT MARKETS

In considering next steps, Canada should focus on anticipating alternative development paths with a view towards meshing our climate change policies with the appropriate market niches of the future. Building on our proven strengths in the energy field, next steps on climate policy need to capitalize on emerging opportunities. In 1994, Industry Canada commissioned a report on business opportunities associated with climate change. The report⁴⁷ looked at 237 Canadian companies claiming to have expertise in dealing with climate change and concluded that there are five areas on which to concentrate future efforts:

- energy efficient management in utilities;
- energy efficient buildings, particularly housing and retrofits of large buildings;
- industrial energy efficiency projects including energy efficiency audits and coal combustion technologies;
- renewable energy technologies, particularly bio-energy and small hydro; and,
- national energy efficiency and training programs.

Canadian business needs to have a clear policy signal on climate change to make the investments needed to capitalize on opportunities in these areas. If the technologies or the methods are not proven at home, they will be difficult to sell on the international market.

In addition to building on existing strengths, Canada must recognize that in response to the increasing global integration of the world's economies, high wage, resource-based industrialized economies like Canada's must move towards a future increasingly based on higher information content goods and services. The information economy implies that, at the margin, information is substituted for natural resources. The kinds of energy efficiency and fuel switching measures required to reduce greenhouse gas emissions turn out to involve the kinds of distributed point-of-use technologies that are also integral to the information economy. In general, these technologies require advanced design and management of energy demand and supply, and the use of sophisticated control systems. They tend to be relatively small scale and applied at the point of use, thus reducing infrastructure and distribution costs.

All of these characteristics have important implications for international trade. As rapidly industrializing economies develop infrastructure and respond to the growth management and environmental concerns associated with double digit economic growth rates and rapid population growth, they will be looking for technologies that meet their needs for improved services in ways that don't exacerbate environmental and demographic pressures. This offers strategic trade opportunities to those countries who can develop, test, and market such technologies. Selling small scale distributed energy supply technologies, energy efficient technologies that improve service using less energy, transportation technologies, and growth management strategies that reduce the waste and air quality impacts of growing urban populations are all ways of reducing global emissions while at the same time capitalizing on a lucrative market opportunity.

From this point of view, the move to environmentally benign, energy efficient and information intensive technologies implied in a strong greenhouse gas emission reduction strategy may also form a fundamental plank in Canadian competitiveness strategy for the global economy. Such a strategy affords a host of win-win opportunities that Canada cannot afford to miss.

INTERNATIONAL REPUTATION

The message conveyed by Canada at Kyoto will set the tone for how the country is viewed by the international community. Once looked to as a leader in environmental diplomacy, Canada's performance in recent years has brought into question its commitment to follow through on the promises it has made. In the face of polls showing Canadians not wanting to be seen as shirking environmental responsibilities, it appears that Canada is poised to align itself more closely with those countries, such as Australia, who are seeking differential treatment for their emissions limitation commitments. Should this occur, there will likely be more damage done to Canada's already fading environmental image. This may spill over into other international negotiations such as acid rain, control of persistent organic pollutants, hazardous wastes, ozone depletion and forest conservation, to name but a few. As well, Canadian companies looking for export opportunities in the ever-expanding environmental services and technologies sector may find fewer doors open to them based on a perception that Canada as a whole is not taking environmental issues as seriously as others.

Pursuing competitiveness following Kyoto

If one were to assume that Kyoto will deliver a deal, it will likely look something like this:

- A legally binding target of stabilization to a reduction of 5% by 2010, with any further reductions in the OECD countries to be differentiated, based on individual national circumstances;
- Joint implementation and emissions trading made available for Parties to the Kyoto Protocol;
- A negotiating process is launched aimed at establishment of new commitments for developing countries.

Under this type of scenario, Canada must stiffen its resolve to deal with a number of key policy areas:

Incentives to make improvements domestically

A strong domestic target is important in providing a signal that forces Canada to exceed the current pace of implementation of emissions-limiting measures and allowing us to make the changes needed to participate in the future energy market. Without the pressure of significant legally binding targets, Canadian industry and provinces will likely continue to pursue implementation of measures at the same pace as the past number of years and run the risk of further investments in long-lived carbon intensive infrastructure that will make it

more difficult for Canada to meet future emission reduction commitments. Canadian industry itself has said that it would be more attentive to making progress under the voluntary program if there was a clear indication that Canada was serious about climate change and would be willing to provide some form of credits for early action.

Credibility with developing countries

The Kyoto Protocol will not result in any additional commitments for developing countries, despite the high likelihood that sometime early in the new century, their greenhouse gas emissions will be higher than those of the industrialized world. What is possible to emerge is the launch of further negotiations aimed at having developing countries begin to limit the growth of their emissions. For such a process to be successful, a credible target on the part of the industrialized countries is needed, one that demonstrates that the industrialized world is willing to take the lead in responding to climate change. For Canada to effectively participate in such discussions, it will be important to make greater progress towards the agreed emissions targets than we currently are achieving.

Taking advantage of the flexibility provisions of the Protocol

It is expected that a deal emerging from Kyoto may provide Parties to the Protocol the opportunity to undertake joint implementation projects as a means of reaching their target. Similarly, but at a more infantile stage, emissions trading will likely be given a nod for further experimentation. Canada must be prepared to participate actively in the development of these mechanisms not only for the opportunity to access less expensive emissions reduction options, but, more importantly, to gain market position for future energy markets in the developing world. Already there are plans underway involving a private sector-public partnership to launch a voluntary pilot international emissions trading program by the turn of the century. The USA and Canada have both strongly supported the work of the group. Continued participation in these types of ventures will be crucial for both Canadian government and industry.

The way forward: some suggestions for keeping Canada competitive

The following suggestions are made as concluding remarks. While it would be impossible for Canada to adopt all measures that have been profiled in this paper, there are a number of fundamental initiatives that could be undertaken to help Canada remain competitive and to capitalize on climate change related opportunities that will present themselves in the coming three or four years:

- 1 Raise public awareness of all aspects of the issue and bring climate change into the Canadian political agenda.
- 2 Sign on to the deal at Kyoto and work towards the establishment of new domestic national emission reduction targets for 2010, 2020, and 2030.
- 3 Develop a clear national plan to achieve the Kyoto target; one that includes performance measurements and reporting milestones to encourage appropriate and timely adjustments.
- 4 Push for new negotiations to begin after Kyoto aimed at strengthening international targets for all countries, not just the industrialized world.
- 5 Negotiate a federal-provincial agreement that defines an equitable share of the burden among regions and various economic sectors, with accountability provisions front and center in the final agreement.
- 6 Make maximum use of market based instruments, including an examination of carbon taxes as part of broader ecological tax reform.
- 7 Eliminate remaining subsidies on fossil fuel exploration activities.
- 8 Make maximum use of the so-called flexibility provisions in the climate change negotiations to gain experience with joint implementation and international emissions trading.
- 9 Strengthen voluntary approaches by including mandatory monitoring, reporting and actions.
- 10 Credit early efforts by companies under the Voluntary Challenge and Registry. These credits should also apply to joint implementation projects.
- 11 Increase efforts on international business development opportunities such as trade missions for environmental protection and sale of Canadian technologies.
- 12 Set a renewable energy target for Canada and tilt the tax playing field to promote investments in energy efficiency and renewable energy.

Pursuing a competitive future for Canada necessitates examining all options very closely from a number of different perspectives. There is no one simple answer to a challenge as broad as the one posed by climate change. Rather, a portfolio of measures backed up by consistent and clear policy making at all levels of Canadian government will be required if Canada is to both meet its environmental and economic objectives.

NOTES

1. Conference statement, "The Changing Atmosphere: Implications for Global Security", Toronto, June 1988.
2. Securing Our Future Together: Preparing Canada for the 21st Century; Liberal Party of Canada.
3. Article 2 of the Convention states that "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, ..., stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system."
4. The actual text of the Berlin Mandate calls upon developed countries to set "quantified limitation and reduction objectives (QELROs) within specified time frames, such as 2005, 2010, and 2020." The terminology of QELROs was introduced to avoid the aversion that the United States had at the time to the word "targets."
5. Canada's National Action Program on Climate Change, February 1995, pp 8-11.
6. Expressed in megatonnes of CO₂ equivalent. Note: 1 tonne=1000 kg, 1 megatonne=1,000,000 kg.
7. UNFCCC Document: FCCC/SB/1997/6.
8. 1996 Review of Canada's National Action Program on Climate Change, p. 24.
9. UNFCCC Document: FCCC/SB/1997/6. The ten countries are: Canada, Finland, Germany, Iceland, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom.
10. The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental forum that was jointly established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) to assess the scientific information related to the various components of the climate change issue and to formulate realistic response strategies for the management of the climate change issue. It comprises over 2000 scientists from over 100 countries and routinely reports on its findings to the world community.
11. The IPCC defines "no regrets" as "those [measures] whose benefits, such as reduced energy costs and reduced emissions of local/regional pollutants, equal or exceed their cost to society, excluding the benefits of climate change mitigation."
12. IPCC Second Assessment – Climate Change 1995: A Report of the Intergovernmental Panel on Climate Change, WMO and UNEP, Dec. 1995, p. 45.
13. 1996 Review of Canada's National Action Program on Climate Change; National Air Issues Coordinating Committee, November 1996, p. 21.
14. Rational Energy Program: Analysis of the Impact of Rational Measures to the Year 2010; Climate Action Network, September 1996.
15. Local Government Implementation of Climate Protection – Interim Report; International Council for Local Environmental Initiatives – July 1997, p 36.
16. Corporate Action on Climate Change: 1996 – An Independent Review, Pembina Institute, April 1997.
17. Canada's Second National Report on Climate Change: Actions to Meet Commitments under the United Nations Framework Convention on Climate Change; Government of Canada, May 1997 pp. 37-38.
18. Canada's National Action Program on Climate Change, 1995, p. 10.
19. Remarks by President William Clinton on global climate change, October 1997.

20. Actual appropriations in 1995 and 1997 were 53% of what was originally called for in the 1993 Action Program.
21. Climate Action Report: 1997 Submission of the United States of America Under the UN Framework Convention on Climate Change; Department of State, July 1997, p. 6.
22. Comparably speaking, the US Federal government has more authority over climate change issues than does the Canadian federal government. For example, the US federal government will usually set minimum standards or performance requirements, but then provide states with the flexibility to determine the best way to meet those. This is not usually the case in Canada.
23. Green Lights is a voluntary program run by the US Environmental Protection Agency that focuses on overcoming informational and other barriers preventing energy-efficient investments in lighting. On average, investment in new energy efficient lighting cut electricity consumption in half and provides a 35% rate of return via reduced energy billings.
24. The US Climate Challenge makes use of the guidelines for voluntary reporting developed under 1605(b) of the Energy Policy Act of 1992. These guidelines are much more stringent than the guidelines under which companies report to the Canadian Voluntary Challenge and Registry Program.
25. Second Report of the Government of the Federal Republic of Germany Pursuant to the United Nations Framework Convention on Climate Change, July 1997, p. 5.
26. Current plans are to reduce subsidies from about 10 billion DM in 1996 to about 5.5 billion DM in 2005.
27. "Views on World Markets – Canada" – A presentation to the Annual Conference of the American Wind Association, Denver, June 24, 1996 – Jeff Passmore, President, Canadian Wind Energy Association.
28. The Netherlands is one of a handful of Annex I countries to establish separate commitments for separate gases.
29. National Institute of Public Health and the Environment, 1996.
30. Second Netherlands National Communication on Climate Change Policies – prepared for the Conference of the Parties to the UN Framework Convention on Climate change – April 1997, pp. 58-62.
31. Demand Side Efficiency: Voluntary Agreements with Industry; Annex I Experts Group on the UN FCCC, "Policies and Measures for Common Action", Working Paper 8; December 1996 pp21-23.
32. In program related spending, ~100 million \$US was spent on energy conservation initiatives while ~48 million \$US was spent on renewables. The remainder of the total of \$US 350 million went to tax breaks and other fiscal incentives.
33. It should be noted that the changes in adipic acid production is not unique to the United Kingdom. Other industrialized countries, including Canada, should see similar reductions.
34. In their 1994 Communication to the UN FCCC, Norway goes on to say that the target is "preliminary and will be considered in the light of further studies, technological advances, developments in the international energy markets, and international negotiations and agreements." Their 1997 Communication makes no reference to a specific target for 2000.
35. Norway's Second National Communication Under the UN Framework Convention on Climate Change, April 1997, p. 31.

36. "Policies for a Better Environment and High Employment – A Summary of the Norwegian Green Tax Commission", Oslo, September 1996, pp 157-171.
37. *ibid.*, pp. 143-147.
38. *ibid.*, p. 163.
39. The ILUMEX Project was designed to replace incandescent light bulbs in numerous Mexican organizations with new high-efficiency light bulbs.
40. Australia's National Report Under the UN Framework Convention on Climate Change, September 1994.
41. International Energy Agency (IEA), 1996, "Energy Policies of IEA Countries: 1996 Review" (Paris/OECD).
42. "Australia's Greenhouse Strategy: Can the Future be Rescued?", Australian Institute discussion paper #3, February 1995.
43. "In Depth Review of the National Communication of Australia", United Nations Framework Convention on Climate Change, December, 1995.
44. Howatson and Campfens, "The Economic Impact on Canada of Greenhouse Gas Emissions Reductions: A Comparative Review" The Conference Board of Canada, July 1997.
45. Bottom up studies tend to conclude that actions to reduce greenhouse gas emissions can result in job creation and economic growth, while at the same improving environmental quality.
46. See ABARE (Australian Bureau of Agriculture and Resource Economics) results from the Megabare model runs for Canada.
47. "An Industry Canada Action Plan: Canadian Environmental Industries and Climate Change Business Opportunities", Woodbridge and Associates, April 1994.

CLIMATE OF CHANGE: THE DAVID SUZUKI FOUNDATION'S NEW REPORT SERIES

A Glimpse of Canada's Future

Written by Ellen Battle and Bill Stipdonk of Metrix Consulting and by Dr. David Suzuki, this report examines the ways Canada could be affected by climate change. Some of the topics covered include: how the greenhouse effect works, and how a warmer world will affect the social, economic and environmental fabric of Canada.

The Role of Government

A Briefing Paper to the Honourable Paul Martin, September 29, 1997

Canadian energy production and consumption are currently subject to taxation rules and government programs which interfere with the nation's ability to meet its greenhouse gas reduction targets. In this report, Michael Margolick of ARA Consulting Group shows how Canada's economy is currently structured to encourage ever-greater energy consumption, and therefore higher emissions of greenhouse gases. The report also presents a rationale for a plan to reduce greenhouse gas emissions.

Canada's Window of Opportunity

This report examines how a lowering of greenhouse gases would affect Canada's social, economic, and environmental goals. Specifically, the authors outline the benefits of switching to cleaner, less harmful energy sources. Suggestions for strategies which would help Canada make the transition to a sustainable future are also included. Authored by Ralph Torrie and Dr. Amory Lovins, this report provides readers with a snapshot of how Canada might prosper in a low-carbon future.

Taking Charge: Personal Initiatives

Written by Pembina Institute climate change director Robert Hornung, this report shows how the actions of individuals and communities can affect climate change. Examining everything from personal purchasing habits, daily behaviour, and lifestyle choices, to official community plans and growth strategies (development permits, zoning bylaws, etc.), the authors show how local actions can significantly cut Canada's rate of greenhouse gas emission.

Keeping Canada Competitive

Since the 1992 Rio Earth Summit, few countries have lived up to the agreed goal of stabilizing greenhouse gas emissions at 1990 levels. Here in Canada, it is estimated that emissions are already between 8 and 13% above 1990 levels – one of the worst records of any developed nation. Canada's former chief negotiator Doug Russell, (with contributions from Pembina Institute's Robert Hornung) review how Canada's performance has compared with other countries, and examine the implications of Canada's failure to keep pace with international efforts to reduce greenhouse gas emissions.

Canadian Solutions

In the final report of the series, we will analyse the commitments Canada makes in Kyoto at the Conference of Parties and propose an action plan to fulfill those commitments. Written by the David Suzuki Foundation, this report will propose policies for Canada's municipal, provincial, and federal levels of government. The report will also suggest ways that individuals can get involved in promoting proactive climate change policies.



This report is printed on Arbokem, which is 45% agri-pulp, 43% post-consumer waste paper, and 12% calcium carbonate filler. Arbokem is manufactured by a totally chlorine and effluent free agri-pulp process.

Design: Alaris Design
Printing: Western Printers

Finding solutions in science and society

The goal of the David Suzuki Foundation is to study the underlying structures and systems which cause environmental crises and then work to bring about fundamental change. We do this in four ways:

Research: The David Suzuki Foundation seeks out and commissions the best, most up-to-date research to help reveal ways we can live with nature.

Application: We support the implementation of ecologically sustainable models – from local projects, such as habitat restoration, to international initiatives, such as better frameworks for economic decisions.

Education: We work to ensure the solutions developed through research and application reach the widest possible audience, and help mobilize broadly supported change.

Advocacy: We urge decision makers to adopt policies which encourage and guide individuals and businesses, so their daily decisions reflect the need to act within nature's constraints.

