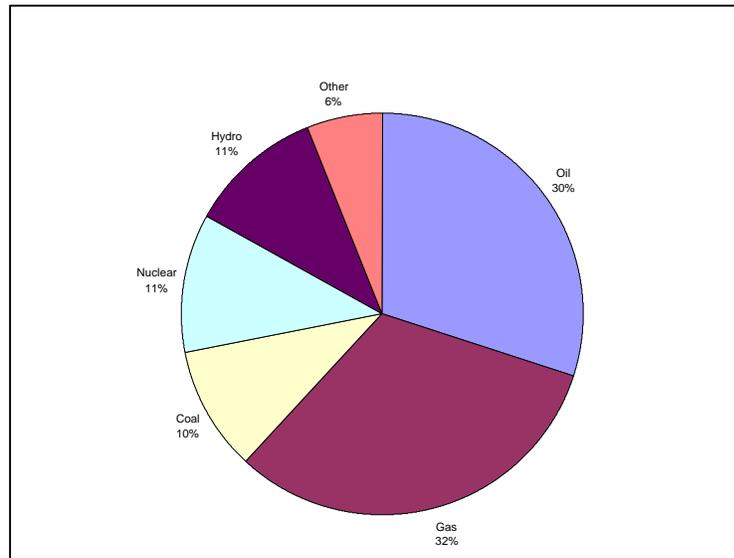


# ENERGY OVERVIEW AND NATIONAL ENERGY POLICY

**Figure 3. Total Primary Energy Demand 1996 (12.2 Quads)**



**Table 1. 1996 Energy Snapshot<sup>i</sup>**

Energy Consumption per Capita: 374 million Btu	Energy Related Carbon Emissions: 141 million metric tons
Energy Consumption per Unit GDP: 25.7 thousand Btu (1993)	Net Energy Exports: 5.1 Quads
“Kyoto Commitment”: 6% reduction from 1990 levels by 2008-2012	Energy Related Carbon Emissions per Capita: 4.7 metric tons

## Energy Overview

The world’s fifth largest energy producing country, Canada has a large and diverse energy resource endowment. Canada is a net exporter of natural gas, coal, hydropower-generated electricity, and uranium. Its exports of gas and electricity flow primarily and increasingly to the United States.

Energy accounts for a substantial portion of Canada’s economic activity. In 1996, for example, the energy sector constituted 7% of GDP and 12% of total Canadian investment.<sup>ii</sup> On a provincial basis, however, the economic relevance is disparate, with energy accounting for as much as 25% of economic activity in Alberta—which produces nearly two-thirds of Canada’s energy. British Columbia, Saskatchewan, Quebec, and Ontario are also major energy producers.<sup>iii</sup> The provincial governments have jurisdiction over the energy resources in their respective territories, with the exception of those

located on federal lands and in offshore areas, which are managed by the federal government.<sup>iv</sup>

Since 1980, energy demand in Canada has grown, on average, by 1.7% annually; projections indicate that total energy demand is likely to grow by 23% from its 1996 level of 12.2 quads between 1995 and 2020. Canada's fuel mix is also evolving with the continued energy growth (Figure 3, previous page). For example, while overall energy demand has grown by 29% since 1980, demand for natural gas has grown by 77%. Gas now accounts for nearly 34% of primary energy demand.<sup>v</sup> Greenhouse gas emissions from energy production have grown by 9% since 1990, effectively guaranteeing that Canada will not meet its greenhouse gas reduction commitment under the Framework Convention on Climate Change—a return to 1990 emissions levels by 2000.<sup>vi</sup>

Although Canada's energy and carbon intensities have declined steadily since the early 1970s, they are high compared with other OECD countries. This is due, in large part, to the country's large land area, dispersed population, abundant energy resources, cold climate, and energy-intensive industrial base.<sup>vii</sup> Canada is the most energy-intensive of the industrialized countries.<sup>viii</sup>

Two issues in particular have captured the attention of Canada's energy industries in recent years. First, the continued low world oil prices had a major impact on the profits of Canadian oil companies, whose earnings reached a four-year low in 1998. Second, mergers and acquisitions accelerated during 1998, fueled by the ongoing restructuring and deregulation of the Canadian energy industries and by similar merger activities among U.S. energy companies, many of which have large Canadian holdings.<sup>ix</sup> Each of these factors has played a role in dampening private sector energy R&D investments, which, after falling slightly in the early 1990s, remained flat at approximately \$500 million in real terms since 1992.<sup>x</sup>

## **Energy Policy**

Canada's energy policy has three overarching goals. First, it aims to implement a framework that promotes the long-term development and stewardship of Canadian energy resources. Second, it seeks to ensure that the environmental impacts of energy development, transport, and use are adequately and responsibly addressed, and that environmental objectives are integrated into all policies and programs. Third, energy policy seeks to ensure that current and future generations of Canadians have secure access to adequate supplies of reasonably priced energy and that measures are taken to ensure the efficient use and conservation of existing resources.<sup>xi</sup> The Energy Policy Branch of Natural Resources Canada is the lead federal agency in energy policy and international energy issues.

In recent years, two specific issues have become prominent on the energy policy agenda in Canada, as in many other OECD countries. First, the government is continuing its efforts to liberalize and deregulate the energy industries, after decades of heavy

regulation and government controls. Second, global climate change, given its far-reaching implications for energy and the environment, has earned a prominent position on the Canadian energy policy agenda.

*Energy Restructuring.* The Canadian government is pursuing its energy policy goals primarily through the use of market-based mechanisms. Canada has shifted its energy policy away from government intervention and toward a market-oriented approach over the past decade. During that time, for example, the government has eliminated ownership restrictions in the upstream oil and gas industries, deregulated oil and gas pricing, and reduced federal energy taxes. It has also eased oil, gas, and electricity export restrictions, eliminated fuel substitution subsidies, and relaxed terms for foreign investment throughout the energy sector.

Canada's energy industries—particularly oil and gas—have already been deregulated; restructuring of the electric utility industry, which was initiated later than reforms in other energy industries, is now under way. Since Canada's Constitution gives the federal government relatively little authority over electricity in Canada, electricity reform is largely within the jurisdiction of the provincial governments. The structure of the electricity industry varies significantly among the provinces, reflecting, for example, regional differences in natural resource endowments, and the extent of provincial, private, and municipal ownership of power production assets. Nuclear power, inter-provincial and international energy flows remain regulated by federal agencies (Canada's Atomic Energy Control Board for nuclear power and National Energy Board for non-nuclear energy). Given the complexities of governance of the electricity industry in Canada, the restructuring of electric power is proceeding at a less even pace than the deregulation of other energy industries. Electricity supply is, for the most part, still dominated by large, provincial monopoly utilities, which account for nearly 85% of Canada's generating capacity.

Nonetheless, deregulation of the electricity industry is proceeding in Canada, driven in large part by the expectation that increased competition will lower electricity costs and permit closer integration with U.S. energy networks. Competition has been introduced in the generation business in some provinces (such as Alberta and British Columbia) and is under consideration in several others. Regulatory barriers to broader grid access have hindered liberalization in the inter-provincial transmission business. Wheeling typically occurs between utilities only, limiting the participation of non-utility generators and consumers.<sup>xii</sup>

Alberta's Electric Utility Act of 1995 created a competitive market in generation, instituted location-based rates, and created a power pool for spot trading in electricity. Ontario's electricity deregulation plan represents part of an ambitious effort to integrate the Canadian and U.S. power grids into one competitive market and to spur competition and exports of electric power to the United States. New U.S. rules now allow Canadian companies the opportunity to market directly to customers in the United States. Two Canadian electric utilities -- in Alberta and British Columbia -- already have been given permission by the U.S. Federal Energy Regulatory Commission to do so. Ontario Hydro

and Hydro-Québec, however, have not yet been granted such permission by FERC because of fears that these companies' monopoly positions in Canada would give them an unfair advantage over U.S. power producers.

*Climate Change.* Canada was among the first countries to ratify the 1992 Framework Convention on Climate Change (FCCC), under which it committed itself to reducing its greenhouse gas emissions to 1990 levels by the year 2000. Moreover, Canada is a signatory of the 1997 Kyoto Protocol to the FCCC, and aims to reduce its greenhouse gas emissions to a level 6% below that of 1990 within the time period 2008-2012.<sup>xiii</sup> However, given rapid growth in energy use during the 1990s, Canada is unlikely to meet these commitments. According to Natural Resources Canada's (NRCan) most recent forecast, for example, carbon dioxide emissions from secondary energy use will exceed 1990 levels by 13% in 2000.<sup>xiv</sup>

The recent growth in Canada's greenhouse gas emissions diverts attention from a host of actions that the government has taken to promote energy efficiency and renewable energy in response to the threat of global climate change. For example, the government estimates that without the energy efficiency measures implemented throughout the 1990s, energy use would have grown by 15% rather than 11.4% between 1990-1996. These reductions in energy intensity are also estimated to have cut Canada's energy-related greenhouse gas emissions by almost 4%.<sup>xv</sup> Many of these efficiency gains have been realized as a result of actions taken under Canada's Energy Efficiency Act, which came into force in 1993. The Energy Efficiency Act gives the federal government the authority to make and enforce regulations concerning efficiency and alternative energy sources. It uses a variety of policy instruments, including codes and standards, energy labeling, R&D initiatives, and voluntary programs involving industry to promote greater energy efficiency. The Act plays an important role in the implementation of actions set out in the National Action Program on Climate Change, Canada's strategic plan for achieving greenhouse gas emissions reductions.<sup>xvi</sup>

The Canadian government estimates its total investment in climate change technology development, energy efficiency and renewable energy programs, and climate science at approximately \$55 million annually. NRCan has established an office of energy efficiency to oversee several new incentive programs instituted by the federal government to improve energy efficiency in buildings, to educate consumers, and to promote the development and use of renewable fuels. In addition, in its 1998 budget, the Canadian government announced that \$40 million annually over the next three years would be used to spur early action on climate change.<sup>xvii</sup>

In addition, the Canadian government sponsors a Renewable Energy Development Initiative (REDI), a three-year, \$12-million initiative managed by NRCan to stimulate market demand for commercially reliable, cost-effective renewable energy systems. REDI is principally a market conditioning activity rather than an R&D program. The primary objective of REDI and the Renewable Energy Strategy is to reduce greenhouse gas emissions from fossil energy sources. REDI began in April 1998 and will run through March 2001. Three types of systems will be targeted for support under the

initiative: active solar air heating systems; ground-source heat pumps; and high-efficiency/low-emissions biomass combustion systems. Under REDI, NRCan will work with the renewable energy industry to develop and implement marketing strategies; provide an incentive to encourage business to gain experience with certain renewable energy systems (ground-source heat pumps are not eligible for this incentive); and support further development of the industry infrastructure.

Climate change has fueled a vigorous debate in Canada surrounding the matter of legislative versus voluntary response strategies. Canada's energy industries, led by Alberta's powerful fossil fuel interests, have thus far successfully lobbied against regulatory reform, convincing the government to favor voluntary emissions cutbacks. For example, the federal government's Voluntary Challenge and Registry urges organizations to adopt cost-effective measures to reduce greenhouse gas emissions. The government then publicizes the commitments and achievements of participants.<sup>xviii</sup> The federal government also signed a Memorandum of Understanding in January 1995 with the Canadian Association of Petroleum Producers for a voluntary program of emissions control. Canadian environmentalists have strongly criticized the agreement as being short on specifics, citing a lack of firm targets or estimates for future emissions reductions. Although the government has stated that mandatory measures to reduce greenhouse gas emissions might be instituted later, if voluntary programs prove insufficient, political leaders have also indicated that they do not foresee considering gasoline or carbon taxes as climate change policy options.<sup>xix</sup>

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<sup>i</sup> DOE/EIA, "Country Brief: Canada," ([www.eia.doe.gov/emeu/cabs/canada.html](http://www.eia.doe.gov/emeu/cabs/canada.html)); Natural Resources Canada, Canada's Second National Report on Climate Change ([http://www1.ec.gc.ca/cgi-bin/foliocgi.exe/climate\\_e/query%3D\\*/doc/%7Bt2%7D?](http://www1.ec.gc.ca/cgi-bin/foliocgi.exe/climate_e/query%3D*/doc/%7Bt2%7D?)).

<sup>ii</sup> Natural Resources Canada, *Report to Parliament on the Administration and Enforcement of the Energy Efficiency Act* (<http://oee.nrcan.gc.ca:80/annual/chap1.htm>), ch.1.

<sup>iii</sup> DOE/EIA, "Country Brief: Canada," (<http://www.eia.doe.gov/emeu/cabs/canada.html>).

<sup>iv</sup> International Energy Agency *Energy Policies of IEA Countries: Canada 1996 Review* (Paris: IEA, 1996), 21.

<sup>v</sup> Natural Resources Canada, *Energy Outlook Canada 1996-2020* ([Http://nrnl.nrcan.gc.ca:80/es/etf.reports.htm](http://nrnl.nrcan.gc.ca:80/es/etf.reports.htm)).

<sup>vi</sup> Government of Canada, *Canada's Second National Report on Climate Change*, Environment Canada 1997, p. 20.

<sup>vii</sup> International Energy Agency *Energy Policies of IEA Countries: Canada 1996 Review* (Paris: IEA, 1996), 31.

<sup>viii</sup> Natural Resources Canada, "Energy in Canada Overview," briefing document provided by the Office of Energy Policy, April 1999.

<sup>ix</sup> DOE/EIA, "Country Brief: Canada," (<http://www.eia.doe.gov/emeu/cabs/canada.html>).

<sup>x</sup> Natural Resources Canada, Office of Energy Research and Development, "A Review of Canadian Energy Research and Development Expenditures 1983-1995," September 1997.

<sup>xi</sup> International Energy Agency, *Energy Policies of IEA Countries: Canada 1996 Review* (Paris: IEA, 1996), p. 22.

<sup>xii</sup> DOE/EIA, "Country Brief: Canada," (<http://www.eia.doe.gov/emeu/cabs/canada.html>).

<sup>xiii</sup> Natural Resources Canada, "Beyond Kyoto—Addressing Climate Change in the 21<sup>st</sup> Century," <http://www.climatechange.nrcan.gc.ca>.

<sup>xiv</sup> Natural Resources Canada, "The State of Energy Efficiency in Canada," (1997), p. 4.

<sup>xv</sup> Natural Resources Canada, "The State of Energy Efficiency in Canada," (1997), Minister's Foreword.

<sup>xvi</sup> Natural Resources Canada, *Report to Parliament on the Administration and Enforcement of the Energy Efficiency Act, 1995-96* (Ottawa: Minister of Public Works and Government Services Canada, 1997).

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<sup>xvii</sup> Natural Resources Canada, “Message from the Minister,”

<http://www.climatechange.nrcan.gc.ca/english/html/feature/minister.html>

<sup>xviii</sup> Natural Resources Canada, *Report to Parliament on the Administration and Enforcement of the Energy Efficiency Act, 1995-96* (Ottawa: Minister of Public Works and Government Services Canada, 1997), pp. 4-5.

<sup>xix</sup> International Energy Agency, *Energy Policies of IEA Countries: Canada 1996 Review* (Paris: IEA, 1996), p. 100.