National Energy Framework – A Vision for the Future

Canada's future economic growth and prosperity will depend on our ability to remain competitive in an increasingly global marketplace.

Canada is one of the few OECD countries that is not only a consumer of energy, but an exporter as well. Canada faces a bright energy future from a variety of sources – crude oil, natural gas, clean coal, hydroelectricity, nuclear, wind, solar, and other alternatives. As the brightest Canadian minds turn to research, development and inventing new technologies, this country's prospects are vast and yet available at competitive global prices. With the reserves in the oil sands recently upgraded to be comparable to Saudi Arabia's reserves, and what is potentially the world's largest natural gas field, Canada's energy future is secured. Indeed, Canada is the world's third largest natural gas producer and seventh largest crude oil producer. Increasing oil sands production is expected to make Canada the world's fourth largest crude oil producer within ten years. And Canada has the world's third largest reserves of uranium.

Over the past four decades, the energy sector has contributed in the range of six to ten percent of Canada's GDP. In 2006, the oil and gas industry contributed an estimated $27 billion to government revenues in the form of royalty payments, bonus payments and income taxes. Our crude oil and natural gas trade surplus contributed 80 per cent of Canada's merchandise trade balance in 2006.

Canada and the United States have benefited from a long-standing continental approach to resource development and trade. To ensure that Canadians continue to realize the positive and mutual benefits of this relationship continues, Canada must ensure its resources are developed in the most competitive manner possible.

Part of this positioning will require addressing overall competitiveness as an energy supplier. Some significant challenges include:

- The need for and cost of mitigation of adverse environmental effects of energy developments such as the oil sands:
- Unique environmental constraints such as the need for GHG reductions.
- Complex regulatory environment involving multiple jurisdictions that creates long lead times for energy projects.
- Increasing difficulty accessing land for petroleum exploration and development; and for electricity transmission infrastructure.
- Skilled labour shortages in the energy industry, especially for oil sands projects and in remote areas.
- Low water reservoir levels that have severely curtailed electricity exports from major hydroelectric provinces including Quebec, British Columbia and Manitoba.

Despite these challenges, Canada has the advantage of being a politically stable source of energy supply with geographic proximity to the huge U.S. market. It is vital that Canada continue to develop its energy potential and for us to continue to be a world leader in energy production, while at the same time ensuring a stable and secure energy supply for Canadian industry and the people of Canada.

Energy Efficiency

Canadian businesses have been working for many years to improve their energy efficiency whenever possible – by saving energy businesses also save money. Since

1975, the Canadian Industry Program for Energy Conservation (CIPEC) has been a unique industry-government partnership that is committed to promoting and encouraging energy efficiency improvements and reductions in greenhouse gas (GHG) emissions through voluntary action across Canada's industrial sectors. Sponsored by Natural Resources Canada, CIPEC is made up of 25 sector task forces that involve more than 45 trade associations.

Through CIPEC, the mining, manufacturing and construction sectors have voluntarily met and exceeded annual targets to reduce their energy intensity. Upstream oil and gas companies have implemented projects to reduce greenhouse gas emissions by millions of tonnes. And electrical utilities have dramatically increased their alternative energy production.

Total energy saved by CIPEC industries in 2005 translates into fuel cost savings of $3.9 billion and represents substantial environmental benefits. Indeed, had CIPEC industries not improved their combined energy intensity by an average of 0.7% per year between 1990 and 2005 Canada's greenhouse gas emissions would have been 33.7 megatonnes higher in 2005.

Improved energy efficiency saved Canadian industry approximately $3.9 billion on purchased energy in 2005, this represents enough energy to heat almost 43% of Canadian households for one year. In 2005, through effective energy management improvements, the manufacturing, mining, and construction, sectors involved in CIPEC improved their energy efficiency by 26.1%. In 2005, CIPEC sectors reduced their energy intensity by 10.5% compared with 1990, this represents an average saving of 0.7% per year.

CIPEC:

Conserving energy not only can save money but it also results in lower greenhouse gas emissions. Industry will continue to work towards improving energy efficiency, but unfortunately much of the "low hanging fruit" has been picked. It will be more difficult and more expensive for existing businesses to find substantial improvements in their processes moving forward.

A Continental Context for an Energy Policy

Canada and the United States have benefited from a long-standing continental approach to resource development and trade. As the energy needs of both countries continue to grow, it will be increasingly important to consider energy from a continental perspective. It is clear that the U.S., a major importer of Canadian energy, will not be constrained by any single energy form or source and that each must compete for its place. Consequently, federal and provincial governments must recognize the competitive nature of U.S. energy policy and ensure that Canada is appropriately positioned to compete in the North American marketplace.

As well, as a partner in NAFTA, it is important for Canada to consider the needs and resources of Mexico. All three NAFTA countries are dealing with similar issues and wish to ensure that their citizens have secure and economical sources of energy. All three countries are energy producers and wish to ensure that there are competitive markets for their resources. Electricity and fossil fuels move both ways across the Canada-United States border and across the United States-Mexican border.

Canada needs a federal/provincial energy framework clearly spelling out a future energy vision within which Canada will continue to play a leadership role in ensuring North American energy security. This framework must consider the needs and resources of all

three NAFTA partners as well as the aboriginal/first nations people throughout the continent.

Canada is the largest source of foreign energy to the United States. In total for 2006, Canada exported to the United States 2.3 million barrels per day (bbl/d) of oil and petroleum products (11 percent of U.S. supply), 3.6 trillion cubic feet of natural gas (16 percent of U.S. supply), and 41.2 billion kilowatt-hours of electricity (1 percent of U.S. supply).

Key Challenges for Canada's Energy Future

In 2004, Canada was the fifth-largest producer of energy in the world. Since 1980, Canada's total energy production has increased by 81 percent, while its total energy consumption has increased only by 40 percent; in contrast, total world energy production increased by 54 percent during 1980-2004.

According to a Statistics Canada study, Canada ranked almost equal to the United States for top place among the G-8 nations in terms of per capita energy consumption in 2002. Canadians consume nearly three times as much energy as Italians, who ranked last among the G-8 nations. Our high energy use is because of our long travel distances, our long winters, and an economy based partly on high energy consuming industries, such as mining, forestry, petrochemical, pulp and paper, aluminum smelters, refining and steel manufacturing.

The energy industry is in a period of transition and there are many challenges to deal with in the years going forward. Much of the electricity production infrastructure created during the post-war construction boom between 1950 and 1980 is now reaching the end of its useful life and will require replacement or refurbishment within the next few years. This will require large capital expenditures and policy certainty for those making those expenditures.

Most of the easily accessible oil, natural gas and hydro resources have been developed – future development will for the most part be in less accessible and more costly areas such as offshore or in the far north.

With respect to energy efficiency, much of the "low hanging fruit", particularly among larger businesses has been "picked". This is less true among small/medium businesses, individuals and governments which continue to have opportunities for energy consumption improvements.

Canada is blessed with vast energy reserves:

- About 40 billion barrels of conventional crude oil remain to be produced.
- Oil sands reserves are estimated to be 175 billion barrels (the second largest petroleum deposit in the world behind Saudi Arabia).
- Proven remaining conventional natural gas reserves are about 136 trillion cubic feet (TCF).
- Coalbed methane gas is estimated to be in excess of 167 TCF.
- More than 8 billion tonnes of proven conventional coal reserves.
- Large Hydro Electric capacity, large-scale and run-of river, including significant untapped potential (almost unique in the OECD in that respect).
- The world's third largest reserves of uranium.

Energy supply and demand, by fuel type -- Canada (in terajoules*)						
	2005					
	Coal	**Crude oil**	**Natural gas**	**Natural gas liquids (NGL's)[1]**	**Primary electricity, hydro and nuclear**	**Refined petroleum products**
Production	**1,400,510**	**5,632,426**	**7,249,864**	**655,787**	**1,608,679**	**4,698,812**
Exports	659,604	3,541,286	4,065,937	238,667	156,701	974,502
Imports	485,984	2,072,258	364,396	13,901	70,836	632,419
Energy availability	1,272,253	4,507,067	3,543,097	464,973	1,522,814	4,246,431
Transformed to electricity by utilities	1,077,414	.	280,645	.	.	162,748
Transformed to electricity by industry	40	0	67,097	.	.	16,908
Transformed to coke and manufactured gases	125,549	.	.	.	.	.
Transformed to refined petroleum products	.	4,507,067	26,393	60,001	.	.
Transformed to steam	10	.	24,681	.	0	5,929

generation						
Net supply	**70,237**	**0**	**3,144,277**	**404,972**	**1,522,814**	**4,123,000**
Producer consumption	5,753	0	714,460	28,607	152,343	453,721
Non-energy use	10,748	.	162,015	321,344	.	487,277
Energy use, final demand	**53,737**	**0**	**2,267,811**	**108,311**	**1,936,667**	**3,128,725**
Total industrial	52,811	.	896,562	52,213	858,572	265,357
Total transportation	.	.	200,000	10,274	15,321	2,163,173
Agriculture	.	.	19,784	7,023	36,894	144,934
Residential	921	.	646,600	12,311	543,551	92,737
Public administration	5	.	22,420	0	50,313	63,340
Commercial and other institutional	0	.	482,444	26,490	432,017	399,183

. : not available for any reference period.
1. Includes propane, butane and ethane produced by gas plant.
Sources: Statistics Canada, CANSIM, table (for fee) 128-0009 and Catalogue no. 57-003-X.
Last modified: 2007-06-01.

http://www40.statcan.ca/l01/cst01/prim72.htm

* a terajoule is equivalent to the energy in approximately 161 barrels of oil or 34 tonnes of coal.

Key Principles for a National Energy Framework

In developing a framework for energy use and production in Canada, the federal government should be guided by certain principles in order for the framework to be fair to Canadians in every region of the country. These principles should include:

- Do not rush implementation of new technologies before they are economicly or technically feasible. New technologies are being developed and will come down in cost over time. For example, coal gasification will greatly improve the overall emissions performance of coal-fired thermal electricity generation, but will not be available for use on a large scale until at least 2012.
- Focus on solutions that are doable, sensible and timely.
- Set a framework that identifies and addresses considerations that must be acknowledged for each potential energy source and not engage in the business of picking winners and losers.
- Focus on coordination and harmonization of regulatory requirements among departments and jurisdictions at all levels of government.
- Create a competitive fiscal environment characterized by continued fine-tuning of both tax and non-tax arrangements such as capital cost allowance (CCA) rate adjustments for energy infrastructure that reflect the useful life of the assets.
- Focus on the opportunities that are created for new markets.
- Give proper consideration to Public Private Partnerships (P3) as a way to finance and operate energy-production infrastructure.

It is important to note that energy production is generally in the provincial jurisdiction. Cooperation and coordination with the provinces and territories is essential. It is vital that we avoid a piecemeal approach to energy development.

Development of All Energy Sources

It is vitally important to ensure a stable, diverse and flexible energy supply which includes environmentally sound, cost-efficient uses of all available economic energy sources. A focus on one or more specific fuels could cause demand to rise above available supply, causing economic problems – for example, a rush to convert coal-fired production to natural gas could quickly outrun natural gas supply (and/or the capacity to move the gas to where it is needed). This would be a serious problem for both those that currently use natural gas as an energy source as well as those that require natural gas as a feedstock for non-energy uses.

Governments should facilitate exploration for and development of natural gas and oil reserves (including offshore resources) throughout Canada in a manner which minimizes the effect that development of these resources could have on the environment. Canada's growing economy and population means that we will need lots of energy from many different energy sources – ensuring a diversity of energy supply will lead to the stability of our energy supply.

Nuclear energy will continue to be an important part of the energy mix through it's ability to provide reliable low emission base load power for the electricity grid, especially with the increasing political pressure to reduce the number of fossil-fuel electricity generation plants.

The federal government has been looking at opportunities to provide incentives and support for the development of renewable energy as a possible example of "clean" energy. Most provinces have adopted or are considering a "renewable energy portfolio", which is a target for the percentage renewable energy is to be of total energy production. This can help our growing environmental technologies industry if planned wisely. The development of renewable energy is expensive and some technologies require subsidization and/or price support pending the maturation of the technology and economies of scale. Most renewable energies come with their own environmental impacts as well – there are not any energy options that have no environmental impact. Again, the need for balance is key. This situation will improve over time as new technologies are developed and commercialized.

Wind and solar are alternatives to fossil fuels but tend to be expensive and are intermittent sources of electric power (production varies due to time of day, season, weather, etc). Limited in their ability to provide low-cost, reliable base load capacity, greater use of alternative energy sources will need to be combined with nuclear/large-scale-hydro/fossil fuel generation to ensure constant supply.

"Clean energy" is going to be a major focus for electricity generation and new fuels. It is important that energy that is classified as "clean" or "low emission" should be defined by the quantified emissions and the actual life cycle impact on the environment, not by fuel type or political correctness.

Emissions should be considered on a life cycle basis (including emissions related to the building of the infrastructure, operating emissions and emissions resulting from decommissioning at end-of-life). Emissions that are captured and not released to the environment should not be considered as emissions (for example, CO_2 capture and sequestration or safe nuclear waste storage).

A system of offsets should be allowed for any emission management system – the goal is overall reduction of emissions. If emissions can be offset by reduced emissions (or emissions capture) elsewhere, the overall effect on the environment is neutral. Depending on the type of emission, it may be required that the offset be within the particular air/watershed (for instance, while NO_2 emissions have a local impact, CO_2

emissions do not -- a requirement to offset CO_2 emissions locally is not necessary nor is it desirable).

Regulatory Approval Processes

A big challenge to developing new sources of energy is uncertainty in regulatory approvals and processing times. An example of this is the Mackenzie River pipeline project which has been tied up by various regulatory approval processes. The single most important factor in compressing cycle times is the level of parallel or concurrent, rather than sequential, processes. Regulators must make an unequivocal commitment to concurrency. For example, to improve the process, an environmental impact and facilities design and construction review could be run in parallel, rather than in isolation. What is needed is a firm commitment to regulate in a smarter way.

Budget 2007 created the Major Projects Management Office to offer a single window on the federal regulatory process for industry, and improve overall accountability by monitoring and reporting on the performance of federal regulatory departments. This is a positive development and we hope that this Office is given the resources to help ensure that these large projects are not held up by a lack of coordination.

A Framework for Innovation

Government regulations should be designed to avoid disincentives to innovative approaches to improving environmental performance. For example, combining electricity generation and heat production into one facility (co-generation) will usually create more emissions that either activity would generate individually, but less than both would create together through separate projects.

A key component of an energy framework would be a system that allows for the selling of excess energy (particularly, but not limited to, electricity) to other users. For example, an electricity grid could allow for residential users that produce their own power to send electricity surplus back to the grid, while permitting them to draw from the grid when their needs go above their own production. This is quite important for promoting the development of small scale and distributed energy production, particularly renewable/clean energy such as wind, small hydro and solar. Allocation of emissions in the case of multiple people/companies sharing one energy source is an issue that needs to be addressed.

To achieve the most innovative solutions, support should be explicit for public-private partnerships to develop new energy production infrastructure.

The World Commission on Environment and Development (Brundtland Commission) defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. The need to balance future development with safeguarding the environment is one of the most important lessons that we have learned over the past few years. But it is important to remember that it is a balance.

One of the key competitive advantages that Canada has had over many of its major trading partners is access to reliable, low cost energy, both electricity and fossil fuels. Canada’s future economic growth and prosperity will depend on our ability to remain competitive in an increasingly global energy marketplace. Our energy needs will continue to rise over the coming years due to a growing economy and population. Efforts toward energy efficiency and conservation can slow, but not stop, the rate of growth in demand without seriously hurting the economy.

Recommendations

That the federal government:

1. Maintain and strengthen Canada's market-based approach to energy, recognizing that decisions about the use of energy, the choices of energy forms for different applications, and the development of energy resources are best made through market forces including, in particular, free and open access to international energy markets and access to a full domestic basket of energy choices.
2. Ensure that regulatory policy is consistent with a market-oriented approach to energy. Among other items, this would involve setting clear and consistent environmental performance standards for energy production. While enabling the development of mitigation technologies and commercially viable renewable energy production, regulatory policy should not specify or prefer particular energy choices. All energy forms should be free to compete as long as environmental standards can be met.
3. Promote continued improvement in energy efficiency in all the major energy consuming sectors – residential, commercial, transportation, business and industry.
4. Aggressively develop and implement policies that will encourage the manufacturing of alternative energy generating products and components in Canada.
5. Provide long term policy certainty that allows for planning and development of and investment in major energy producing undertakings.
6. Consider all potential fuels and energy sources in neutral manner -- any policies promoting "clean power" should do so by specifying a consistent emission standard and not arbitrarily include/exclude specific forms of energy production.
7. Allow for emissions trading that permits the offsetting of energy production emissions by emissions credits purchased from other projects or industries.
8. Continue efforts to streamline the approval process for the development of energy projects and infrastructure in Canada through strategic regulation and legislative reform in cooperation with the provinces and territories, establishing (where appropriate) co-jurisdictional panels to rationalize review and approval processes. The Canadian Council of Ministers of the Environment (CCME) could provide a forum for developing a framework for intergovernmental cooperation.
9. Ensure that federal, provincial and territorial jurisdictions are respected in the development and negotiation of any international energy agreements.
10. Recognize the importance of energy in the relationships with our major trading partners.
11. Work in collaboration with industry, law enforcement agencies and all levels of government to assure the security of Canada's energy industry assets.
12. Continue to support the Canadian Industrial Program for Energy Conservation (CIPEC) through which large gains in energy efficiency have been achieved over the past 30 years.
13. Develop policies, in cooperation with provincial and territorial governments, to satisfy the critical need for skilled labour in the energy industry.