



Energy Policy Institute of Canada
Institut canadien de politique énergétique

A Strategy for Canada's
Global Energy Leadership
Framework Document

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ENERGY

ENERGY a resource that is essential for the survival of humans on this planet. History illustrates our quest to seek and develop energy to ward off the cold and prepare food. Now energy is essential for everything in our daily lives from homes to vehicles to space exploration.

ENERGY is one of the world's largest industries. Canada is positioned to be an energy superpower.

Canada's rich abundance of resources and its success in building an open and vibrant energy market has created a significant and strategic sector for the Canadian economy. A great deal has been accomplished notwithstanding a complex legislative and regulatory framework encompassing federal, provincial and territorial jurisdiction. The lack of an overarching Canadian energy strategy threatens to impede reaching the full potential of Canada's energy development and our ability to capture a global energy leadership.

Our Strategy for Canada's Global Energy

Leadership will result in the sharing of knowledge with government that is straightforward, accurate, ambitious and insightful with an objective to motivate policy that will maximize the social and economic potential from Canada's energy wealth and Canada's leadership in the world.

A Strategy for Canada's Global Energy Leadership

INTRODUCING THE ENERGY POLICY INSTITUTE OF CANADA

Who We Are

The Energy Policy Institute of Canada ("EPIC") represents the national face of the full spectrum of the Canadian energy industry. We believe that energy is a strategic sector whose prospects are inextricably linked to Canada's prosperity, and that the best way to strengthen the sector's contribution to our society is through collaborative action among producers, distributors and consumers of energy – wherever they reside in Canada.

EPIC's thirty-seven members represent companies that produce, use or have an interest in energy. The institute has forged relationships with a wide range of industry associations and with researchers and academics. The end goal is to create an energy strategy that will guide Canada's pathway as a global energy leader. For more information about EPIC please visit www.canadasenergy.com.

Purpose

The sole purpose and unique interest of the Energy Policy Institute of Canada ("EPIC") is to provide a broad, cross-sectoral, full value chain perspective on a Canadian energy framework and strategy.

Mission

- Engage governments, interested parties and the general public to build a common sense energy strategy for both the production and consumption areas that will deliver economic prosperity and sustainable environmental outcomes while positioning our country as a global leader in energy technology development and innovation.

Goals

- Maximize economic and social value of Canada's energy system through technology, innovation, regulation, marketing, exports and responsible development, production and use of all forms of energy.
- Support action that will help Canada reduce greenhouse gas emissions.
- Enhance Canada's energy future on the international stage. The growth of the energy sector is dependent on Canada's ability to engage the world – through a coherent, open and long term approach – in international energy trade and development of new markets.
- Ensure transparency in all energy related government activities. For Canada's energy sector to grow and prosper in a fashion that strengthens the economy and protects the environment, certainty is needed in energy legislation and regulation. To ensure certainty, transparency is absolutely necessary when governments embark on legislative or regulatory change.
- Engage energy producers and consumers in an effort to achieve these goals.

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Executive Summary

The Energy Policy Institute of Canada (EPIC) represents the national face of the Canadian energy sector¹. Its membership is composed of leaders from across the broad spectrum of energy sources and products, as well as large energy consumers.

Our goal is to maximize energy's contribution to Canada's economic prosperity and social well being and, in doing so, bolster Canada's claim to global energy leadership. We believe a Canadian energy strategy is essential to reaching the country's full potential. In fact, a strong, growing energy sector will contribute financial resources to governments to help address the deficit and contribute to governments ability to manage and ultimately reduce debt. Supported by a Canadian Energy Strategy the energy sector will help in the transition to fiscal sustainability.

We begin from a position of enviable strength. Canada is richly endowed with a full spectrum of energy resources: oil and gas, coal, hydroelectricity, nuclear, wind, solar, hydro, biofuels, and geothermal. We are the fifth largest energy producer in the world, home to the world's second largest oil reserve, and the world's richest uranium deposits. Our energy market is vibrant and open at a time when other energy-exporting countries have nationalized their energy assets and restricted investment flows. With our stable democracy, solid fiscal regime, sound regulatory framework, advanced energy technologies and well-earned reputation as a trusted and reliable trading partner, Canada can offer energy security, especially in relation to the United States, in conjunction with environmental stewardship. Demand for energy is increasing as the world's population grows, becomes more urbanized and standards of living rise in developing nations. Canadian leadership can uniquely contribute to global economic, social and governance improvement.

Notwithstanding these considerable advantages, global energy leadership for Canada is not a foregone conclusion. The global energy market is evolving rapidly, driven by such forces as demographic shifts, the information revolution, technology and environmental constraints.

What needs to be done?

The sheer magnitude of the energy sector means that it spans – and is regulated by – all levels of government. Investment decisions involve social and environmental considerations, both domestically and internationally. Energy trade and carbon regulations are both national and international in scope, as is investment in research and development of new energy technology. Our energy strategy will provide a Canadian perspective on all of these matters.

A comprehensive Canadian energy strategy will enhance regulatory efficiency, quicken the time-to-market for major energy projects, and strike the right balance among economic, social and environmental considerations. Going forward Canada will have to participate in the shaping of international agreements on trade, carbon pricing and investments in technology and shared infrastructure. All of this would benefit from the development of such a comprehensive strategy.

Emphatically, we are not proposing a centralized, top-down program that attempts to either redistribute wealth among regions or authority among governments. We are proposing that the provinces, territories and federal government take concerted action to address the complex and increasingly urgent issues that threaten to impede the full development of our energy potential and that diminish our claim to global energy leadership.

¹ For the purposes of this document the term “energy sector” refers to Canada's substantial and varied energy resources, energy delivery systems, energy consumption and domestic and foreign energy trade arrangements.

RECOMMENDATIONS

The members of EPIC encourage provinces, territories and the federal government to act together to address the complex and increasingly urgent issues that threaten to impede the full development of Canada's energy potential and to ensure Canada's claim to global energy leadership.

Our recommendations rest on the five fundamental pillars of intent (described more fully on page 14):

1. Creating economic opportunity for Canadians.
2. Achieving socially responsible efficiencies in energy production, transportation, and end use.
3. Achieving responsible standards of environmental stewardship, ensuring energy and environmental imperatives are inextricably linked, based on good science.
4. Promoting Canadian energy leadership on the international stage.
5. Ensuring regulatory efficiency and stability, rigour and transparency in all energy-related government activities.

Our proposed Canadian energy strategy encompasses the following key recommendations:

Intergovernmental Relations – Federal, Provincial, Territorial and Municipal

Given the multijurisdictional reality of energy sector policy-making, we believe that a framework for collaboration on energy policy is essential. The objectives of collaboration include ensuring a consistent consultation framework with Canada's Aboriginal Peoples, providing a regulatory framework that ends overlap and duplication, supporting responsible energy development and innovation.

Energy Supply and Security

Canada's energy future depends on maintaining and growing our delivery capabilities and diversifying our international markets beyond the United States. EPIC's recommendations in this area include the promotion of conservation and energy efficiency among energy consumers, expansion of our reserve base, upgrading of Canada's electricity transmission infrastructure, including more interconnection between regions and smart electricity grids within regions; building a new pipeline infrastructure to the West Coast to open up export markets around the Pacific Rim, and developing alternative and renewable forms of energy aligning these new sources with all parts of the energy supply chain.

Relationship with the United States

With more than 99 percent of Canada's oil exports going to the United States (representing more than one-fifth of that country's total imports), the United States is by far Canada's most important energy trading partner. EPIC's recommendations include measures to solidify the Canada-U.S. energy relationship by working towards mutually developed goals and standards for all forms of energy, ensuring cross-border regulatory consistency and reinforcing the message among American audiences that Canadian energy is secure energy.

International Markets (Expanding Canada's Energy Reach)

Diversifying Canada's markets for energy, energy products and technology is a key policy goal. Our recommendations involve the development of infrastructure to export oil and gas to Pacific Rim countries, new energy foreign trade relationships and encouraging foreign direct investment in Canada's energy sector.

Environment

EPIC believes that progress on environmental issues around energy production, consumption, and distribution is essential to the continued success of Canada's energy sector and to our international reputation and leadership. Our recommendations include developing a common vision across federal, provincial and territorial jurisdictions that strikes a balance among environmental outcomes, economic growth and energy security: addressing the issue of carbon pricing from a North American perspective with subsequent global alignment to ensure we maintain our competitive position; and encouraging the orderly turnover of energy industry capital stock so that newer, more environmentally efficient technology resulting in improved environmental outcomes may be introduced.

Innovation

The development and commercialization of energy technology is critical not only to achieving environmental goals for the Canadian energy sector but also to Canada's claim to global energy leadership. Our recommendations include promoting the reduction of carbon and the development of alternate sources of energy, promoting energy technology R&D through the commercialization phase and encouraging exports of energy technology and expertise to the world.

Skilled Workforce / Intellectual Capital

An aging workforce and an underinvestment in training and intellectual capital in the area of energy science and R&D is a threat to the timely development of more advanced technologies and to the Canadian energy sector's overall future growth. EPIC recommends developing strong partnerships between industry and the education sector to equip the Canadian workforce with the required skills for energy jobs, engaging Canada's Aboriginal communities as a viable source of human resource talent, and working with institutions of higher education to strengthen the focus on developing and commercializing new technologies. In addition EPIC recommends the further streamlining of immigration processes to facilitate greater and more timely immigration of skilled energy workers.

Investment

A healthy rate of investment in the energy sector not only boosts regional economic development and employment but also allows Canada to maximize the competitive advantage of its unique energy mix. EPIC recommends establishing an investment climate that attracts Canadian and foreign capital, as well as venture capital for the development of new environmental technology. We recommend Canada view foreign investment in natural resources in the context of larger trade negotiations and agreements. In those Agreements Canada should seek to establish reciprocal rights and protections for Canadian companies investing abroad.

Conservation / Demand Side Management / Energy Efficiency

Greater public awareness of the importance of individual contributions to energy conservation will help Canada reach its environmental goals more quickly. We recommend greater focus on the "demand side" of the energy equation to make consumers aware of the need for conservation and implementation of measures to promote energy efficiency by both producers and consumers.

Energy Literacy

It is recognized that the majority of GHG emissions emanate from downstream use of energy. EPIC believes that there should be increasing emphasis on energy literacy among Canadians so that consumers understand the consequences of energy choice and use across the full energy value chain.

It is our hope that the goals and policy recommendations set out in this document will lead to the development of a single, coherent strategy concerning energy in Canada and Canada's place in the global community so that we will act as responsible stewards of our great natural resources.

WHY WE NEED A CANADIAN ENERGY STRATEGY

Canada is richly endowed with energy resources. Complementing this natural resource bounty are such intangible assets as our open economy and strong commitment to free market principles, stable democracy, our proximity to the world's largest energy market and our reputation as a secure, and reliable energy exporter. We also believe that dedicated pursuit of innovation will lessen the environmental impact of energy production, transportation and consumption.

As the fifth largest energy producer in the world, the Canadian energy story has to this point been undeniably one of success. Yet the future is far less clear. Driven by domestic and international forces and the changing role of energy in our daily lives, the Canadian energy sector is undergoing rapid and massive transformation.

At home, energy has become the nexus for such issues as climate change, urban planning and transit policy, residential and urban construction, manufacturing and R&D. Energy utilities and producers and governments at all levels are involved in initiatives to improve conservation and to design and build the green communities of the future.

As a major energy-producing country, and home to the world's second largest oil reserve, third largest natural gas reserve, and richest uranium deposits it is equally important to look at the Canadian energy story in a global context. Global demand for energy is forecast to grow by 36 percent between 2008 and 2035, driven largely by population growth from 6.7 billion today to 9 billion by 2030, increasing migration of people to large urban centres and rising living standards, particularly in developing countries.² This growth will take place primarily in Asia and around the Pacific Rim. Therefore it is important that Canada expand and diversify its energy markets by reaching into these growing economies to better secure our exports of energy.

The issue of global access to secure, reliable, sustainable, and affordable energy is becoming more acute. According to Pierre Gadonneux, chair of the World Energy Council, "Along with climate change and security of supply, the inequalities in access to energy within and among countries are the three major challenges facing the energy sector."³ It is estimated that one and a half billion people today lack access to electricity and modern energy services. In sub-Saharan Africa, more than three-quarters of the population have no electricity.⁴ For these people, coal, oil and gas are the most affordable, accessible and deliverable energy today to generate the power they desperately need.

In the face of growing global demand, the issue of energy security has become more critical and calls for a more coordinated response. Not long ago, energy security was defined as maintaining security of supply and reducing threats posed by a statist, closed-market approach in many energy-exporting nations, as well as international terrorism. Today, the definition has broadened to include environmental, economic, social and cultural issues. Energy security is now firmly tied to social and developmental goals as Canada and its energy trading partners look to technologies and integrated energy systems as a means to drive economic renewal while achieving environmental goals.

² World Energy Congress special supplement in the Globe and Mail, Tuesday, April 15th, 2010

³ *Ibid*

⁴ *Ibid*.

Our energy relationship with the United States necessitates a national strategy. Canada is both the largest single supplier of energy products and services to the U.S. and the largest foreign consumer of their energy products and services. Our ecosystems and environment are also shared. Achieving energy objectives and a strong, competitive North American economy in a responsible and sustainable way must occur in an integrated, collaborative way.

We need to benchmark our climate change targets and strategy to the U.S. in order to maintain the competitiveness of our energy and other industrial sectors, as well as to guard against protectionist border actions. Canadians know too well the perils of the softwood lumber dispute and, more recently, threatened boycotts of Canadian energy products from the oilsands. Policy coordination with the U.S. should ultimately include a North American market and pricing of carbon. While the prospect of developing a North American energy framework among numerous jurisdictions (ten provinces, three territories and the U.S. federal Government and various states) is daunting and probably a long way off, Canada should develop a cohesive strategy now that can be adapted as the U.S. and potentially other energy trading partners begin to engage. Waiting for the US and others to develop policies that could profoundly affect Canadians in every corner of the country is a highly risky approach.

There is another cross-border dimension that is rarely discussed but equally cogent. The energy business itself – at least for those countries with open energy markets – is increasingly international. Americans and other foreign investors have large stakes in Canadian energy companies, and vice versa. This globalization of the industry has benefitted Canada enormously and given us the opportunity to parlay our wealth of resources, embrace open markets, technology advantage and systems expertise into a position of international energy leadership. But global companies and investors are frustrated by the risks, costs and uncertainty of policy and regulatory fragmentation. A Canadian energy strategy would strengthen investor confidence. Canada can grow its share of the global market by emphasizing renewable energy technologies as well as fossil fuels with a reduced environmental footprint.

To an ever-increasing extent, the competitiveness of Canada's economy will be linked to our ability to produce goods that are not only more environmentally friendly, but are also produced with less environmental impact. At the national level, there is a real risk that certain countries (e.g. the United States, the European Union) may introduce low-carbon standards for goods or energy resources that would shut out Canadian exports. At the retail level, customers at home and abroad are determining the environmental impact of their purchases over the entire product lifecycle. A Canadian energy strategy would help us preserve and grow our share of the global market by focusing on energy technologies that will meet this rising demand for both oil and gas energy sources as well as a growing suite of renewable energy products. An energy strategy would guide an efficient long term transition to a lower carbon economy in Canada and internationally.

What would a Canadian energy strategy look like? Clearly, it must include a disciplined and even handed approach to fossil fuels and nuclear, but would also incorporate the diversification of the energy mix to include economically efficient use of renewables like wind, solar, hydro and biofuels. It would embrace efforts by government and industry to promote energy efficiency through improvements in transportation within the country and internationally, building codes, agricultural technologies, appliance standards and other framework initiatives to help reshape the energy efficiency of the economy and enable the technological transformation of Canada's capital stock where improved environmental outcomes may be demonstrated. An energy strategy would support a balanced approach to strengthening the economy, improving the environment and turning environmental stewardship into economic advantage.

Finally, it would recognize Canada's global role and responsibility for enabling better access for developing countries to the energy resources that are necessary to raise living standards for their people.

It is our belief that a "Canadian Energy Strategy" would benefit all Canadians, contributing positively to productivity, our standard of living, jobs and a continuous affordable secure supply of energy.

Given that the Constitution of Canada gives provinces full jurisdiction for energy supply as well as ownership and control of energy resources, and in view of the lingering resentment and bad memories among western provinces of the disastrous and long-defunct National Energy Program, it is fair to ask, "Is a national strategy possible?"

We at EPIC believe it is both possible and necessary. And we are not alone in this belief:

"Canada has abundant resources; we need to be strategic in how we sustainably extract, develop, process, transmit, market and use these resources. Working together makes us better."

- The Canadian Senate Standing Committee on Energy, the Environment and Natural Resources, from a report released in June 2010 that calls for a comprehensive, sustainable energy strategy.

"[We need] a coherent national energy framework that makes the most of our opportunities to develop clean energy solutions and position Canada for leadership internationally."

- Clean Growth 2.0 – Canadian Council of Chief Executives, November 2010

"We need a made-in-Canada solution that works for all of us. The rest of the world is out in front of us and this is a very pressing issue."

- Newfoundland and Labrador Energy Minister Kathy Dunderdale, addressing Canada's Council of Energy Ministers at the World Energy Congress in Montreal, September 2010.

"If Canada is to be a clean energy superpower and have energy production as a large component of its economy, we should have the public debate necessary to build and maintain a broad social consensus. Without an explicit consensus on energy, we will continue to fall short on objectives.

- Pierre Guimond, President and CEO, Canadian Electricity Association

Indeed, it is telling that the impetus for a national strategy is coming mostly from outside of government – from energy companies who have an enormous stake in getting this right, and from policy think tanks, economic and industry councils, educational institutions and non-governmental organizations. This suggests that it is time for new approaches to complex issues that affect every Canadian. It is time to put aside memories of past failures and focus on future needs and opportunities.

Energy is key to our economic progress, as well as an essential ingredient in the daily life of every Canadian. To derive maximum benefit from this enormous potential we need a long term approach to energy development and energy use. At the same time the world is in the midst of seismic shifts and changes driven by globalization, demographic shocks, the information revolution, and security risk.

Either we act deliberately and strategically to adapt to global change, or our future will be shaped for us. Shaping our own future means leadership; strong, focused and deliberate leadership, consistently applied in the years ahead. Global forces are powerful and, to make a difference Canada will have to play to its strengths. Energy is one our greatest strengths,

An energy strategy is a tool through which Canadians can shape their long term future and place in the world.

The members of the Energy Policy Institute of Canada recognize the scope and difficulty of the task ahead. We also understand that, due to the multijurisdictional reality of energy policy-making in Canada, there is no current 'home' for energy discussions – particularly from the perspective of designing the framework for a national strategy. That is why we assembled some of the country's best thinkers on energy issues and asked them to describe a path forward. For the past year, this group has worked together to define a set of pillars upon which to build a Canadian energy strategy and to identify the key elements that would comprise the strategy.

FUNDAMENTAL PILLARS

These pillars are designed to support and guide the development of a Canadian Energy Strategy. They take into account that fossil energy is a non-renewable resource and therefore, it is important that they address the intergenerational challenges presented by that fact. This strategy must ensure fairness amongst generations and provide for the long term future well being of Canadians for generations to come.

An energy strategy must be designed to guide the development, processing, distribution and consumption of Canada's suite of energy resources for at least the next two decades. Turnover of capital stock and application of improved technology must be central to this strategy enabling Canadians to achieve improved environmental outcomes without sacrificing their standard of living.

1. CREATING ECONOMIC OPPORTUNITY

Recognizing energy's crucial role in creating and enhancing economic opportunity, it is vital that Canada operate with an open, competitive energy marketplace, consistent trading rules and an efficient and effective regulatory system. Energy development can lead to technological advances through innovation and increased productivity, making Canada competitive in the global community, while ensuring energy access and security for all Canadians.

2. ACHIEVING SOCIALLY RESPONSIBLE EFFICIENCIES IN ENERGY PRODUCTION, TRANSPORTATION, AND END USE

The production and delivery of energy is an industrial activity, while energy itself is a public good. It is the lifeblood of the Canadian economy and a mainstay of our way of life. It lights our buildings and streets, keeps us warm in winter and cool in summer, powers our factories and businesses, fuels our transportation system, creates countless jobs, provides investment opportunities and boosts our export earnings. Tax revenue from energy production supports the hallmark social programs that improve our lives and define Canadian society: our health care system, social safety net and equalization programs, for example.

Given this centrality to our lives, energy must be developed and used in a socially responsible fashion. An integral part of social responsibility is ensuring timely and effective consultation, including with Canada's Aboriginal Peoples so that their historic interests are respected, while energy resources are developed.

3. ACHIEVING RESPONSIBLE STANDARDS OF ENVIRONMENTAL STEWARDSHIP, ENSURING ENERGY, ENVIRONMENTAL AND ECONOMIC IMPERATIVES ARE INEXTRICABLY LINKED, BASED ON GOOD SCIENCE.

All forms of energy must be developed in a responsible manner that minimizes impacts on the environment, including climate change, air quality, water, land, habitat and human health. While stewardship of current energy assets and the development of cleaner, less carbon-intensive and more efficient energy infrastructure is vital, a comprehensive approach to energy sustainability must also include the promotion and facilitation of conservation among energy producers and end-users, whether individual consumers, businesses or public sector entities.

4. PROMOTING CANADIAN ENERGY LEADERSHIP ON THE INTERNATIONAL STAGE.

The growth of the energy sector is dependent on Canada's ability to engage – through a coherent, open and long term approach – in international energy trade and development of new markets.

5. ENSURE REGULATORY EFFICIENCY AND STABILITY, RIGOUR AND TRANSPARENCY IN ALL ENERGY-RELATED GOVERNMENT ACTIVITIES.

For Canada's energy sector to grow and prosper in a fashion that strengthens the economy and protects the environment, certainty is needed in energy legislation and regulation. To ensure such certainty, government transparency is required when it embarks on legislative or regulatory change. The regulatory framework guiding energy and infrastructure development must ensure that decisions are based on sound, long-term engineering, economic and environmental assessments.

KEY ELEMENTS OF A CANADIAN ENERGY STRATEGY

1. INTERGOVERNMENTAL RELATIONS

We begin with intergovernmental relations, which include the federal, provincial, territorial and municipal levels of government. Given the multijurisdictional reality of energy sector policy-making (including environmental reviews and regulations), a framework for collaboration in this area is an essential condition in the process of framing a Canadian energy strategy.

Background

Sections 92 and 92A of the *Constitution Act* (1867) give provinces exclusive jurisdiction over resources and the production and distribution of energy. Section 109 of the *Constitution Act* (1982) and the 1930 *Natural Resources Transfer Agreements* give provinces ownership over the extraction and commercialization of natural resources within their boundaries, including energy resources, except that uranium mining is regulated through the Canadian Nuclear Safety Commission. The importance and vastness of natural resources north of 60° cannot be underestimated. While significant jurisdiction over natural resources has devolved to Yukon by the federal government, it still has a significant role in resource development in Canada's north.

While provincial ownership and jurisdiction apply within each province, the federal government plays a major role in the energy sector generally. The federal government has jurisdiction over international treaties; has taxation powers at every stage of the energy life-cycle; funds programs and provides incentives, including those specific to a region; and has jurisdiction over interprovincial and international trade. Through statutes like the *Species at Risk Act* and the *Fisheries and Oceans Act*, the federal government plays a critical role in protecting the environment. There is also a significant municipal involvement in energy distribution and dealing with end-use consumers.

Implications

The Canadian federal system has led to many types of divided and shared jurisdiction over energy resources, infrastructure and use. Intergovernmental relationships are a defining quality of Canadian energy policy. And it should be noted the revenue from energy production and sales flows through the Canadian economy in the form of equalization and block transfer payments targeted at healthcare and social programs.

Important aspects of energy involve both senior levels of government through shared regulation or negotiated agreements: environment and equalization.

Asymmetrical regional distributions of supply and demand largely define how provinces approach their energy policies, and drive the federal-provincial dynamic.

Energy project development involves a legal duty to consult affected First Nations as a result of court decisions. The parameters of the obligation are being tested in further court cases.

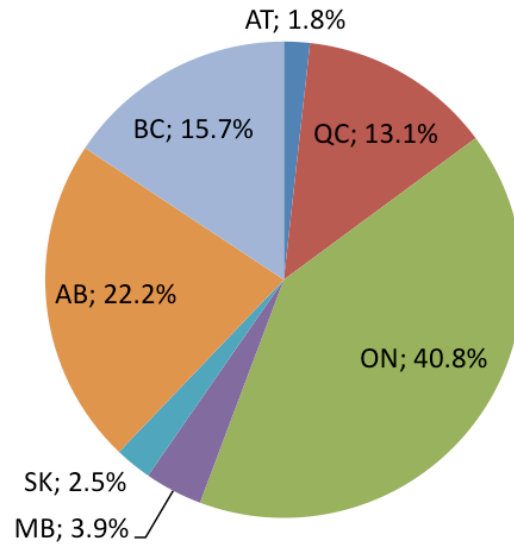
Provincial regulation of energy development is unique to each province. Market structures vary from straightforward to very complex.

Local governments control important long term determinants of energy use but have relatively little responsibility for energy policy.

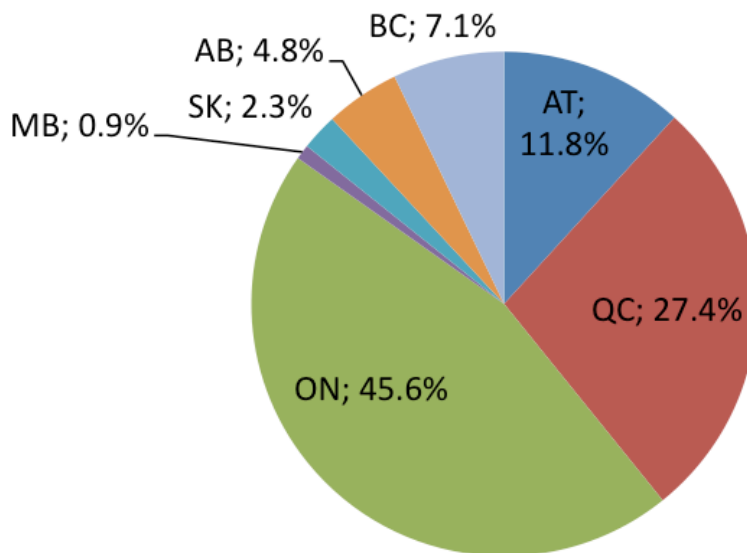
Interdependency

The charts below show the provincial shares of natural gas and petroleum products consumed by the manufacturing sector (excluding energy production). Ontario's manufacturing sector is in absolute terms the most vulnerable to natural gas and oil product price increases.

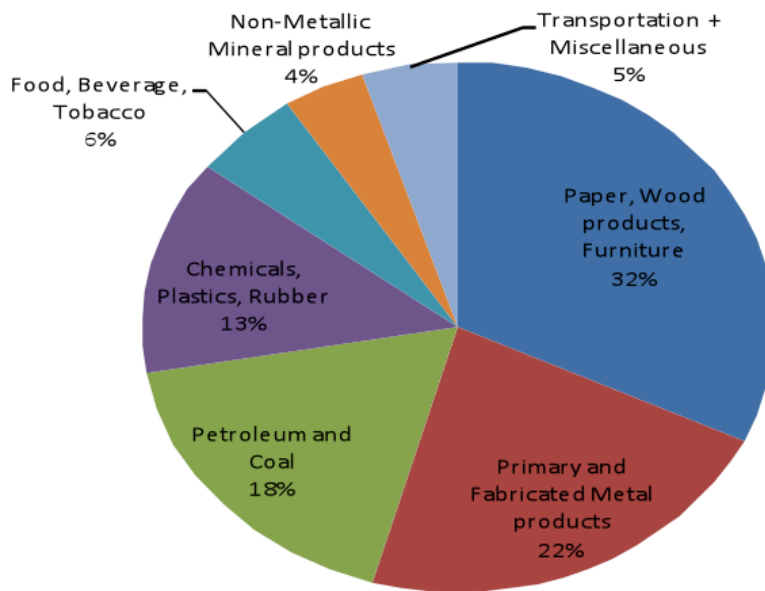
PROVINCIAL SHARES OF MANUFACTURING SECTOR CONSUMPTION NATURAL GAS, 2008



PROVINCIAL SHARES OF MANUFACTURING SECTOR CONSUMPTION REFINED PETROLEUM PRODUCTS, 2008



ENERGY FUEL CONSUMPTION OF MANUFACTURING SECTOR, 2009⁵



Tax Contributions to Governments:

It is estimated that the oil and gas industry contributed \$19 billion to government revenues in 2009 and \$26 billion in 2008.⁶

Government revenues from federal, provincial and territorial income tax on the energy sector were \$7.5 Billion in 2005. That amount represented more than 15 percent of federal, provincial and territorial income tax paid by corporations that year

The federal government collects approximately \$5 billion from its excise tax on motor fuels (gasoline, diesel and aviation fuel), another \$1.6 billion in GST revenue from motor fuel purchases, and \$1.5 billion in GST revenue from heating fuel purchases annually.

Collectively, the provincial governments collect approximately \$8 billion per year from excise taxes on gasoline and diesel.

Hydro-Quebec paid \$2.17 billion in dividend to the Quebec government in 2009; BC Hydro did not pay a dividend in 2009 but paid \$288 million in 2008.

⁵ Source: Statistics Canada, CANSIM 128-0006

⁶ The natural resources industry directly employed 481,500 people in October 2010 leading to significant federal and provincial tax revenues.

Cities

80% of Canadians and this number is increasing, live and work in urban areas and where it is estimated that more than one third of all energy consumption in Canada takes place.

Research has identified that key determinants of energy use in cities are in the design of the city itself, including attributes such as population density, land use, zoning, and transit and road planning. Decisions about these attributes affect key determinants of energy use.

There have been many studies in the past 20 years on density versus sprawl, or “location efficiency.” Higher density is associated with less energy use. The studies typically show savings of 20-40% in urban transportation energy as density doubles.

Status Quo Risks

We face complex challenges that are already placing strain on the current policy framework, and this pressure is growing steadily. Our multi-jurisdictional environment results in duplication of approval processes and overlapping and contradictory regulations, with no net benefit. Major projects are delayed or shelved entirely, thereby limiting economic growth and employment. Costs escalate, weakening our competitiveness against other energy-exporting countries. Lack of policy coordination erodes investor and public confidence and is an impediment to international energy trade. Regulatory delay is a cost to government, in terms of regulatory staff time, deferral of revenues and jobs. Finally, regulatory overlap among governments and within departments introduces a risk in project oversight and the potential that environmental concerns will not be adequately addressed.

Opportunities

With harmonization or a single regulatory window and not necessarily one provided by the federal government, regulatory timeframes will be expedited, environmental oversight enhanced and potential disputes mitigated. More timely decisions on major projects will make our economy stronger and more competitive. It would also increase employment, revenues and general economic prosperity. Finally, progress on an energy strategy could have a positive influence on long-standing efforts to reduce or eliminate interprovincial trade barriers.

It is important to recognize that energy development is a fundamental building block of our economy and reaches into every sector of our industrial base. It is a vital source of research and innovation in our society.

Recommendations

Federal / Provincial / Territorial / Municipalities:

- Design a Canadian energy strategy as a federal-provincial-territorial-municipal construct.
- Ensure an effective framework for consultation combined with a consistent engagement framework with Canada’s Aboriginal Peoples.
- Align energy policies at the federal, provincial and territorial levels to promote the growth of all aspects of the energy industry to ensure its continuation as a major driver of Canada’s economy.

- Drive long-term pan-Canadian economic growth through investment in economically and environmentally desirable energy infrastructure as a priority by federal, provincial and territorial governments.
- Improve coordination between and within governments.
 - The silos that occur among jurisdictions overseeing the same project, and between different regulatory agencies within a single jurisdiction, need to be addressed. For example, energy efficiency is a field within which federal-provincial-territorial coordination is essential.

Municipal:

- Ensure that municipalities are actively engaged in discussions that affect the demand side of the energy strategy as they play a crucial role in educating consumers and reducing demand.
 - Municipalities have significant impact on end-use energy demand through their conservation programs as well as urban design, planning, infrastructure, transportation and enforcing energy-efficient building codes for housing, office and industrial buildings.

Regulatory Process:

- Provide a regulatory environment that during the pre-permitting, data gathering phase protects the public interest, yet is flexible enough to provide expedient approval and permitting of energy projects.
- Streamline Canada's regulatory processes to end overlap, duplication and delays which can negatively impact Canada's competitiveness and productivity. This could be accomplished by implementing a one-project, one-process review to end duplication in regulatory regimes within one level of government and between governments but does not necessarily hand over regulatory control to the federal government.
- Design regulatory processes that enable, rather than impede, responsible energy development and innovation. Explore accepting technical certification/regulatory approvals achieved through other comparable national/sub-national regulators.
- Rigorously review regulatory process timelines and effectiveness, and establish benchmarks or targets for those parameters that are under the control of the regulator, as part of an accountability framework for regulatory performance and ensure publication of transparent criteria for acceptance or rejection of projects.
- Compare Canadian Energy regulatory processes with international energy regulatory systems in order to discern best practices.
- Design the permitting process so that it focuses on project impacts which would cause unacceptable environmental results. If they do not exist, then commitments to codes, standards and practices should allow the project to proceed.

2. ENERGY SUPPLY AND SECURITY

Background

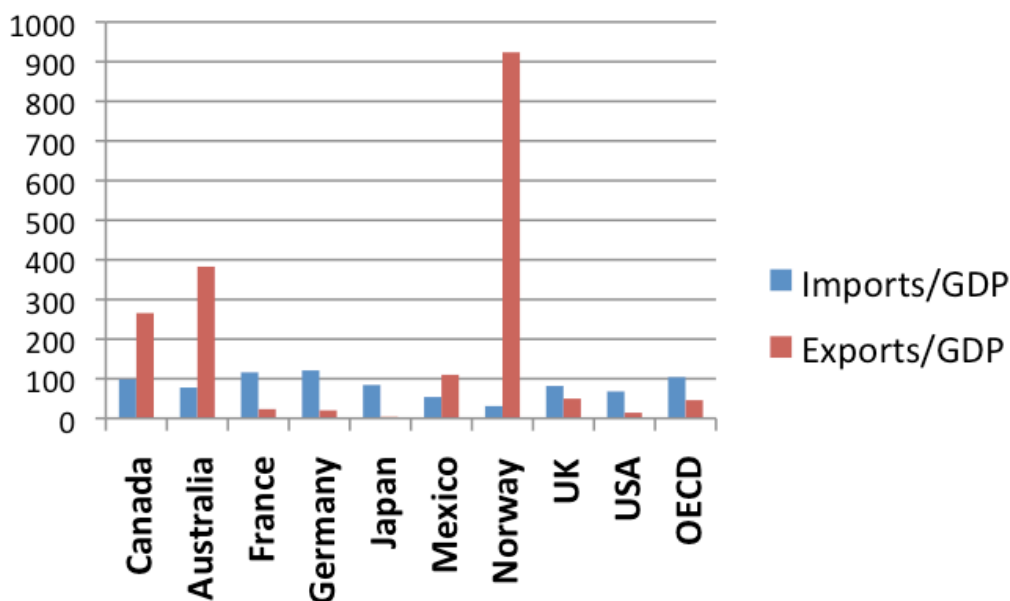
As a large energy producer with a highly trade-dependent economy, Canada is exposed to the geopolitics and international economics of energy. Securing the supply chain across the energy spectrum is crucial to this energy strategy.

The effects of an energy policy depend on a country's trade position, in absolute terms and relative to its size. Producing energy creates both wealth as well as environmental and social impacts. Importing energy increases trade deficits, reduces domestic production and may reduce energy security. Countries heavily dependent on exports or imports are subject to macroeconomic effects from energy price uncertainty due to geopolitics and international market shifts, as well as to exchange rate variability.

Key factors that affect international competitiveness in energy supply include costs of labour, materials and capital, technology deployed, political risk, fiscal regimes, royalties and the physical quality and accessibility of the resource. Regulatory factors include the direct cost to firms of regulations themselves, the costs of participation and the costs of delays in the process — both operating costs and interest — and uncertainty in the outcomes. Investors considering which country to invest in, consider the efficiency of the regulatory process as a key factor. Even the expectation of regulatory uncertainty can change a decision to apply for a project. Regulatory delay is also a cost to government regulators, both direct, in terms of regulatory staff time, and potentially indirect in terms of deferral of revenues and jobs to the government.

The chart below shows Canada's total trade in energy (physical quantities) relative to some OECD countries with which Canadian energy policy may be compared. Within the OECD, only Canada, Australia, Mexico, Denmark and Norway were net energy exporters in 2008. Canada, unlike European countries, is a major net exporter of energy. This chart illustrates the largest net exporter of energy; Canada must optimize its presence in both the North American and global markets.

TOTAL ENERGY IMPORTS AND EXPORTS, SELECTED OECD COUNTRIES, 2008 ⁷



⁷ Source: IEA Key World Energy Statistics 2010: www.iea.org/textbase/nppdf/free/2010/key_stats_2010.pdf

2.1 Energy Security & Modernization of our Energy Infrastructure

Background

As a result of its vast geography, Canada has a particularly infrastructure-intensive energy system:

In much of the country electricity resources tend to be located far from load centres, which creates a reoccurring problem, as energy is lost over the transmission lines.

There are 580,000 kilometers of pipeline of all kinds in Canada including almost 110,000 kilometers of transmission pipelines — 86 000 km are natural gas pipelines and 23 000 km are crude oil pipelines. Canada has the largest transmission pipeline for crude oil in the world.

Canada's ability to export natural gas overseas is constrained by the availability of LNG export terminals. The only existing liquefaction terminal on the North American continent is Kenai LNG in Alaska, which is not connected to Canadian sources. Eastern Canada can import LNG at the re-gasification terminal in Saint John, and through some terminals in the American northeast.

Over 99% of Canada's oil exports go to the US through a variety of pipelines linking oil producing areas to key market hubs.

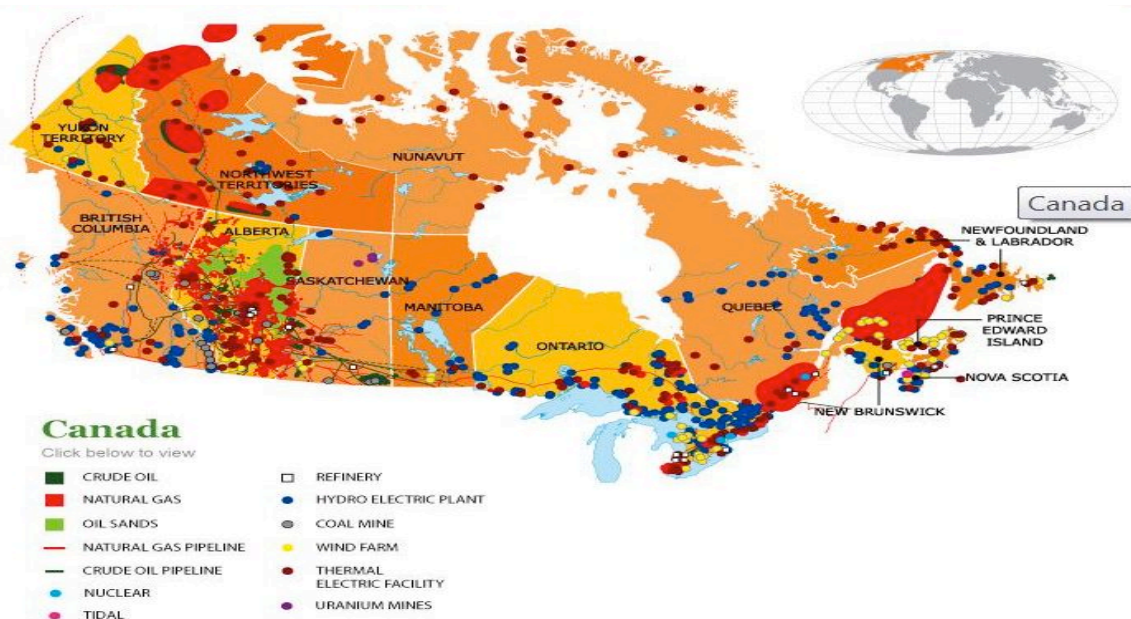
Canada is a leader in the use of ultra-high voltage transmission lines to reduce losses over long distances. We have export capacity from the hydro dominated provinces however, there is limited capability to transmit power between regions within the country.

Canada is the world's 2nd largest producer of uranium (contributing 23% of global production according to Natural Resources Canada).

Canada possesses advanced nuclear technology capabilities, one of the world's largest pools of nuclear engineering expertise and has exported these technologies and skills around the world.

Canada has a significant installed base of nuclear power, representing 16% of current generating capacity.

While Canada is a large and growing net oil exporter, crude oil imports satisfy more than half of domestic oil refinery demand. Refineries in Western Canada run domestically produced crude oil, refineries in Quebec and the eastern provinces run primarily imported crude oil and oil from east coast offshore.



The chart below (courtesy of the Canadian Centre for Energy Information) illustrates where the principal types of infrastructure are located.

Status Quo Risks

Energy infrastructure is critically important to securing Canada's energy future. Today most of Canada's oil and gas is sold to the United States. While Canada's relationship with our neighbor to the south remains strong, there is a lack of diversity in energy markets. Energy infrastructure such as pipelines or transmission lines, that do not effectively facilitate trade with the U.S. or other markets including the Pacific Rim, will limit economic growth and opportunity. In addition, according to the IEA, Canada is behind half of our G-8 and G-20 competitors in making the investments required to strengthen our infrastructure and support transition to lower carbon economic drivers.

Canada has one dominant customer – the United States – for its energy exports.⁸ However, there is a growing appetite for energy among some of the world's fastest growing economies (China recently surpassed Japan as the world's second largest economy). Canada's current pipeline grid, which is primarily focused on U.S. markets, does not have the capacity to supply these potential new customers. New infrastructure that would eliminate this delivery 'bottleneck' would greatly reduce the risks inherent in having essentially one customer and would provide Canada with far greater control over its energy future.

Opportunities

A secure energy future will be one in which energy policy and investments in environmental protection are fully integrated to the benefit of all Canadians. By maximizing the potential of our entire energy system, we will ensure that all Canadians benefit from access to energy. Modernizing our production and delivery infrastructure will benefit the environment through deployment of the latest and best technologies to reduce environmental impacts and improve energy efficiency. Modernization also includes harmonizing regulations that govern energy infrastructure.

Recommendations

Oil and Gas:

- Ensure the security and diversification of markets for Canada's energy exports to economies around the Pacific Rim; e.g. China, Japan, India, South Korea.
- Promote energy security to enable cost-effective supply, reducing dependence on imports of fuel (especially in Eastern Canada).
- Promote conservation and energy efficiency, which support the goal of energy security as the most secure barrel of oil is the one not used.
- Develop natural gas infrastructure to facilitate its wider use as a transportation fuel and consider converting natural gas into a liquid which could be used as a transportation fuel.

⁸ "Over 99% of Canada's oil exports go to the US through a variety of pipelines linking oil producing areas to key market hubs." *Canada's Energy Circumstances*, page 14

- Ensure Canada remains at the global forefront of energy innovation in order to ensure long term energy security and stability.

Electricity:

- Modernize Canada's electricity transmission infrastructure to join centers that are distances apart and from this the development of regionally coordinated markets and smart grids will begin to take shape.
 - Several provinces are currently facing the need to invest billions of dollars in upgrading their transmission grids. A coordinated approach (i.e. a 25-year national reconstruction plan) could create economies of scale to reduce costs for provinces, maximize employment potential and expand financing opportunities. Investments in electricity transmission and distribution grids are labour intensive and create employment in construction trades, skill trades and among those who provide goods and services to utilities. An improved and modern smart grid would also enhance the capacity of provinces with surplus electricity to export it interprovincially and internationally, thereby creating a larger and more reliable and efficient North American electricity market. Investment in distribution infrastructure can also facilitate greater use of electricity in the transportation system.
- Promote more distributed generation, both to decrease transportation losses and to provide backup flexibility in case of emergencies.
- Continue to invest in technologies such as carbon capture and storage that will allow Canada to continue to use its vast thermal resources (coal and natural gas) to deliver low carbon, affordable electricity.
- Integrate nuclear options including maintenance of the required nuclear research infrastructure into the overall strategy for meeting future domestic energy demand.
- Support continued viability of an internationally competitive Canadian nuclear industry to participate in the global nuclear renaissance, strengthening Canada's contribution to low-carbon power generation.

Renewable and Alternative Energy:

- Develop, implement and market alternative and renewable forms of energy as well as low carbon alternatives, and ensure alignment of these new sources with all parts of the energy supply chain. Programs that encourage this can be found in BC Hydro's Clean Power RFP and NRCAN's Canmet ENERGY program.
 - It should be noted that the renewal of electricity transmission infrastructure is critical to unlocking the energy potential from renewable resources such as wind, solar, hydro or biomass energy and should be done where the economics justify transmission reinforcement.
 - A North American price on carbon should enhance the development of renewable and alternative sources of energy.
- Evaluate capacity for local production of renewable transportation fuels.

- Evaluate shifting needs and priorities for infrastructure requirements including research, development and training/educational infrastructure that enable and accelerate adoption of alternative and renewable forms of energy.

Overall:

- Promote enhanced forecasting and optimization modeling throughout the energy value chain from production to consumption, identifying and prioritizing the required infrastructure requirements for all forms of energy. Seek to optimize opportunities from all sources of energy.
- Develop diverse, reliable affordable energy choices which enhance Canada's long term energy security.
- Ensure proper planning for modern infrastructure and ensure a sound investment climate to reduce uncertainty and shorten the long lead time necessary for planning and building of energy infrastructure.

2.2. Relationship with the United States

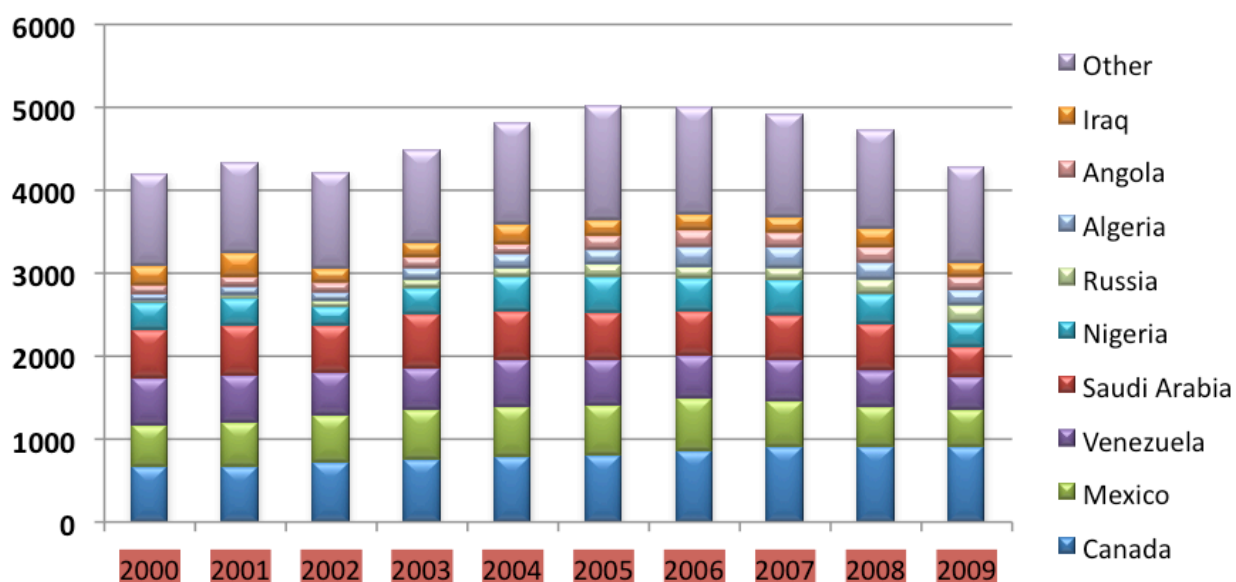
Background

The chart below shows US oil imports by country for 2000 – 2009. Canada has been the largest source of US oil imports since 1999 and reached 21% of imports in 2009. The vast reserves in Canadian oil sands, in particular, are viewed by US authorities as a long term secure supply whose share of US oil imports is expected to grow at the expense of imports from geopolitically risky countries.

In 2009 Canada exported 8.96 bcf/d to the U.S. making up 87% of total U.S. natural gas imports or 14.5 percent of total U.S. natural gas supply. In electricity Canada provided 98% of U.S. electricity imports.

A counteracting concern in the US is that the production of crude oil from oil sands is more GHG-emission-intensive than many US sources of crude oil. Well-to-wheel comparisons typically show 5-15% greater emissions from oil-sands-derived gasoline than from gasoline from conventional oil. However, approximately 78% of life-cycle emissions from conventional oil are from combustion of the gasoline itself.

COMPOSITION OF US OIL IMPORTS 2000- 2009 (Million Barrels)



Status Quo Risks

With 99%⁹ of Canada's oil exports destined for the U.S., Canada's energy trade relationship with the United States is both a major benefit to our economy and a substantial risk if the relationship erodes in any way. While NAFTA does provide some measure of security of access, the Canada-US softwood lumber dispute clearly demonstrated Canada's vulnerabilities even under this free trade agreement. Under NAFTA, for that security of access Canada cannot arbitrarily restrict the flow of energy or charge more for exports to the U.S. than charged for domestic consumption. The U.S. Government is on a long-term path towards reducing its dependence on fossil fuels through developing alternative and renewable sources.

⁹ *ibid*

The risks are evident: trade barriers may be erected against the import of oilsands products from Canada, as well as against energy-intensive goods; Canada's competitive advantage in energy is eroded and our economy weakened. Even in a 'best-case' scenario (i.e. no new trade barriers, no corporate or consumer boycotts), U.S. efforts to transform into a renewable energy economy will over an extended period of time tie Canada to a declining market for its energy exports. There is also the issue of the capacity of our current oil and gas pipeline grid to the U.S.

Overall, the deficiencies of our current energy infrastructure and over-dependence on the U.S. market may result in serious economic and political consequences should we not take maximum advantage of Canada's unique place in the global energy supply chain.

Opportunities

The opportunities for Canada vis-à-vis its energy relationship with the United States are two-pronged: first, to solidify our position as their number one supplier of energy; and second, to diversify our energy markets beyond the U.S. in order to encourage growth and investment in our economy and to fully leverage our geopolitical position as a secure, stable energy exporter. The world needs all the sources of energy that Canada can supply.

On the first front, Canada can solidify its relations with the U.S. through active participation in the Clean Energy Dialogue that was initiated by President Obama and Prime Minister Harper. More specifically, we can share technology (e.g. carbon capture and storage) and experience with our American partners, and develop shared utility corridors for pipelines and electricity transmission lines.

US electricity transformation could lead to increased investment in Canada. Opportunities to diversify our energy markets beyond the U.S. are discussed in Section 2.1 above and recommendations are listed in Section 2.3.

Recommendations

A Canadian Energy Strategy must advance the primacy of the Canada-U.S. energy relationship by working towards mutually developed responsible energy goals, focusing on coordination and integration of regulations (including those governing goods and services involved in energy), and identifying and developing strategic relationships with U.S. legislators and policy-makers.

Specific recommendations:

- Build on aspects of the Clean Energy Dialogue – carbon capture and storage, renewable energy development and cleaner engines.
- Promote the joint piloting and commercialization of new technologies, linking industry research facilities and government energy laboratories.
- Ensure regulatory consistency between Canada and the U.S. that allows for open trade in energy, specifically electricity from renewable sources in North America.
- Treat all forms of energy similarly in trade with the U.S., including hydro, clean coal and biofuels.
- Work toward synchronized approval processes for new nuclear reactor designs in both countries.
- Streamline the permitting and construction of new energy infrastructure between Canada, the U.S., and existing trade partners.
- Ensure that the unique environmental requirements and sources of energy found in individual states and provinces are considered in the development of relations between Canada and the United States on a federal level
- Support American efforts at reducing U.S. dependence on oil supplied by non-North American sources by encouraging the importation of Canadian energy. This will ultimately strengthen U.S. energy and economic security.

2.3. International Markets (Expanding Canada's Energy Reach)

Recommendations

A Canadian Energy Strategy must promote the growth of Canada's energy industry by diversifying our markets for products and technology beyond North America, all the while maintaining a productive and mutually beneficial relationship with our main customer, the United States.

Specific recommendations:

- Encourage the development of infrastructure to export oil and natural gas to the growing markets of the Pacific Rim.
- Expand government/industry support and mechanisms for the development of these new foreign trade relationships.
- Focus our trade on innovative/alternative technological advancements developed in Canada which could be exported to developing countries to pilot innovations and use new Canadian technologies on a large scale in an effort to address environmental challenges both in Canada and abroad
- Encourage value added manufacturing where economically prudent, as part of the energy value chain to enhance the suite of products that are produced in Canada as a result of our energy resources which can be exported, adding value to Canada's energy production
- Pursue the removal of trade barriers to both goods and services used in or by the energy industry.
- Recognize the purchasing power/investment opportunities of foreign investment in Canada's energy sector and actively seek out potential partnership opportunities.
- Stress the economic benefits of energy exports to all members of society and position our energy sector as part of a global energy value chain, addressing the issue of energy poverty in developing countries.

3. ENVIRONMENT

Background

GHG

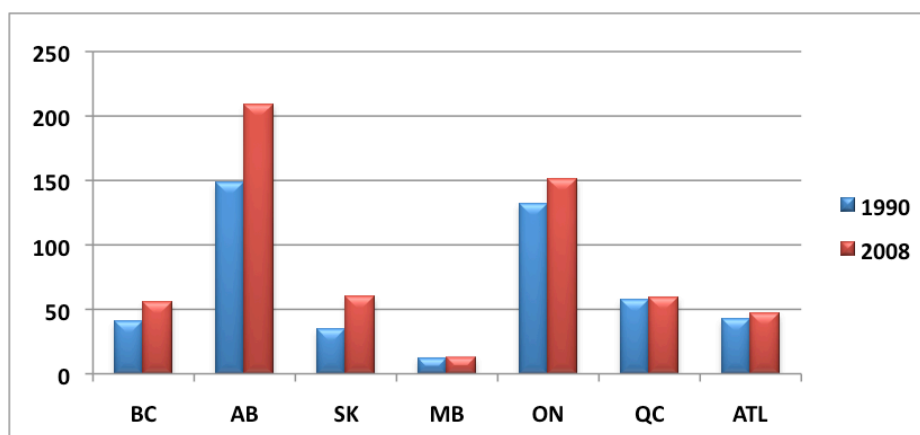
Eighty-one percent of Canada's total greenhouse gas (GHG) emissions are from the production and consumption of energy. Total exports accounted for approximately 30% of Canada's GDP in 2009¹⁰. Further, 25% of Canada's total exports in 2009 were energy products; implying 7.5% of Canada's GDP in 2009 was directly comprised of energy exports.¹¹ Emissions occur in all stages of the petroleum fuel cycle and in most electricity generation. Emissions are lower where nuclear, hydro, wind and/or solar are in use. Of energy-related emissions in 2008, 20% were in electricity generation, 27% in fossil fuel production and mining, and 53% due to combustion of consumer fuels. In 2008, 65% of Canadian crude oil production, approximately 50% of natural gas production and 9% of electricity generation was exported.¹² Approximately 27% of Canada's total energy production was exported in 2008.¹³

National energy-related GHG emissions grew by 27%, while Canadian GDP grew by 60% from 1990 to 2008.¹⁴

Energy supply sectors, both electricity and fossil fuels, and transportation are the largest sources of both emissions and emissions growth.

The chart below shows energy-related GHG emissions by province in 1990 and 2008 (million tonnes)

GREENHOUSE GAS EMISSIONS BY PROVINCE 1990 AND 2008 (MILLION TONNES)



¹⁰ Imports, exports and trade balance of goods on a balance-of-payments basis, by country or country grouping. Statistics Canada. <http://www40.statcan.ca/l01/cst01/gblec02a.htm>.

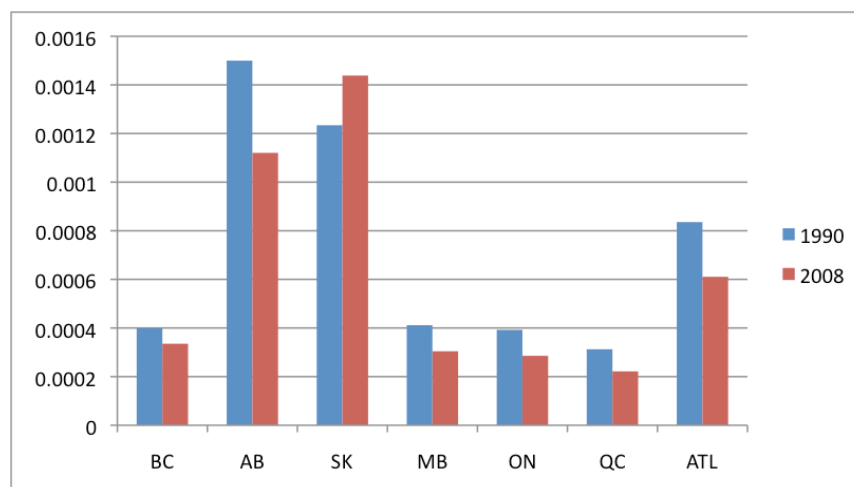
¹¹ Canadian Energy Facts – National Energy Board August 2010

¹² National Energy Board – Canada's Energy Future: Infrastructure Changes and Challenges to 2020

¹³ Centre for Energy – Canada's primary energy production is 19.3 quadrillion BTUs and consumption is 14 quadrillion BTUs.

¹⁴ Statistics Canada – Chained 2002 dollars

GREENHOUSE GAS EMISSIONS BY PROVINCE / GDP 1990 AND 2008 (GHG EMISSIONS: MILLION TONNES, GDP: MILLIONS CHAINED 2002 DOLLARS)



Implications

The asymmetrical distribution of emissions by province is largely due to different resource endowments that led to different energy supply industry sizes and structures. This does not imply that an emission reduction plan can exclude low-emission-growth sectors — they are still substantial emitters and may have low-cost reduction opportunities. However it does suggest that any plan must address energy supply- and transportation-related emissions head-on, and that doing so will affect provincial economies unevenly if the economic impacts are not redistributed.

Air

In 2007 the energy supply industry emitted 6.9% of total particulates, 46.8% of SOx, 35.1% of NOx, 33.2% of VOCs, 1.2% of lead, 2.6% of cadmium and 34.2% of mercury emitted from all sources, excluding open sources (e.g. particulates from road dust) and natural sources.

Land Use

Hydroelectric reservoirs, coal, oil and gas production operations, wind farms and transmission lines are among the larger uses of land. For illustration:

Hydro-Quebec’s five largest reservoirs supply 35% of generation capacity and cover 12,267 sq.km, about 65% of the area of Lake Ontario

602 sq.km of land have been disturbed by Alberta oil sands activity, about 80% of Calgary’s area of 726.5 sq.km. It should be noted that 65 km² is under active reclamation. All disturbed land is required to be reclaimed.

Water

Producing one barrel of bitumen in oil sands mining operations requires between 2-3 barrels of river water per barrel of synthetic crude oil. In SAGD [Steam Assisted Gravity Drainage - a type of *in situ* extraction] up to half a barrel of fresh water is required to produce each barrel of bitumen.

Water usage has been reduced considerably over the last few years and its use is subject to intensive monitoring.

Ontario Power Generation reported 13,807 million cu.m. of cooling and service water use in 2008. The City of Toronto used 481 million cu.m. in 2008.

Status Quo Risks

In view of the clear and compelling risks Canada faces on the environmental front, the status quo in this area is not an option. Energy production in sensitive environmental areas faces physical constraints that would stop or severely curtail production, in particular, the availability of water. Canada's long term ability to develop its resources demands that solutions to environmental issues are tackled as a high priority. Our fossil fuel exports are facing the threat of new trade barriers based on the possibility they may exceed future new regulations concerning carbon content. As previously noted, there is also the risk that these barriers could extend to Canadian manufactured goods that have energy-intensive inputs. As we develop alternative forms of energy, we must be cognizant of new, emerging environmental issues and manage them pro-actively.

The other major threat is to Canada's international reputation and leadership in global affairs. Our voice may be weakened due to perceptions abroad of our environmental performance.

Opportunities

The opportunities in this area include lending substance to our claim to global leadership among energy-producing countries by balancing the development of non-renewable and renewable energy. From a trade perspective, improved environmental performance would substantially reduce international pressures on our energy sector and the threat of boycotts, customer resistance and trade barriers.

The development of improved energy technologies leverages existing Canadian energy expertise, provides stimulus to home-grown R&D and attracts new intellectual and financial capital to our growing energy companies.

Substantively addressing key environmental issues will reduce the risk arising from potential physical constraints, as well as improve societal acceptance of energy production and use.

Given that more than one-third of energy consumption takes place in Canadian cities, there are ample opportunities to advance conservation and energy efficiency goals by incorporating energy-saving strategies and emission controls into city planning.

Finally, there are opportunities to accentuate and communicate the positive aspects of Canada's environmental performance. Canada is already a world leader in environmental regulation, oversight and stewardship. In this regard, we need to encourage all of our customers to consider the relative environmental value of competitive energy supplies from other producer countries.

EPIC recognizes that pursuant to the Copenhagen Accord, Canada has committed to reducing GHGs by 17 percent of the 2005 levels by 2020 and the recommendations in this Report will help Canada attain that goal.

Recommendations

3.1 Environmental Outcomes

- Strike a balance among environmental outcomes, economic growth and energy security/reliability through a common vision across federal and provincial jurisdictions, as well as industry, as to what responsible resource development looks like. Develop a best practice standard for environmental stewardship that provides for a consistent, transparent and credible regulatory system across all jurisdictions.
- Recognize Canada's special responsibility to the world as a steward of the country's huge and diverse energy assets through the promotion of energy conservation.
- Encourage the orderly and efficient turnover of capital stock in industry so that more environmentally efficient technology is introduced that results in positive environmental outcomes.
- Address environmental impacts in a comprehensive manner, including energy production effects on climate change, water, land, habitat, air quality and human health.

3.2 Urban Planning

- Encourage the design of cities to lower energy consumption.
 - The most effective route to a low carbon future is through energy conservation and efficiency in buildings, industry and transportation, maximizing value out of every unit of energy consumed.

3.3 Trade

- Ensure that any new environmental measures enable Canada to withstand adverse trade barriers such as low-carbon fuel standards and border measures targeting high-carbon imports.

3.4 Greenhouse Gases

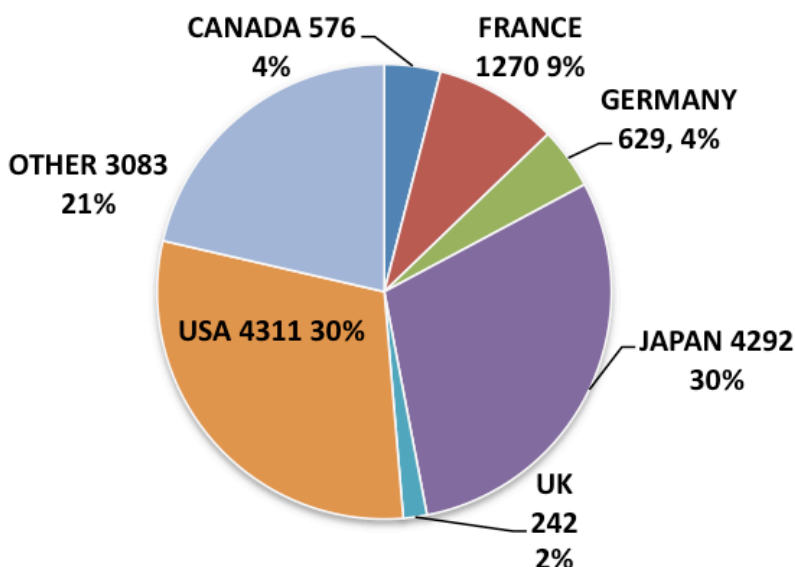
- Advance opportunities for fuel switching in energy efficient vehicles.
- Address carbon emission pricing on a North American basis, with subsequent global alignment to ensure broad based global reductions. This could begin with a modest price per tonne and increase gradually as we gain experience. It should be broadly applied across the economy and to consumer end use.
- Revenue raised should be deployed to fund reductions in other taxes and support the development of new technologies.
- Revenue distribution should be rationalized on a regional basis to avoid an undue cost burden to any particular region.
- Carbon pricing should not merely penalize high carbon industries but ensure the incentive for companies to upgrade and adopt new technologies.

3. INNOVATION

4.1. Technology

Background

The chart below shows shares of the total energy R&D budgets (in US\$ millions) for members of the International Energy Agency and as estimated by the IEA. The average of 2007 and 2008 is shown. Almost all of the world's energy R & D is done in IEA countries. Canada's overall 4% share of the two-year average can be compared to its 11.5% overall share of IEA total energy production or 3.5% of world energy production.¹⁵ However, the current method of measurement of investment does not take into account the amount invested by energy companies in their laboratories and in field experiments. This amount is roughly 1 billion dollars annually.



Status Quo Risks

Technology already plays a significant role in the global energy sector, and that role will grow significantly in the future. If Canada becomes a follower rather than a leader, we will have to import energy technology. We will lose the benefit of lower costs from locally developed, low carbon technologies, as well as forgo the significant economic benefits associated with innovation in energy technologies.

The risk for Canadian energy producers, especially those involved in resource extraction, is that current technologies will become obsolete, thus increasing the energy sector's vulnerability to regulations, sanctions and boycotts.

We emphasize that leadership in this area includes the commercialization of energy technologies. Without this critical step, research may continue here, especially at the university level, but development and commercialization will occur outside Canada. The Government of Canada's IRAP program is significantly critical in supporting commercialization. We support this program and encourage a focus on energy technologies.

¹⁵ OECD/IEA Energy Technology RD&D Budget (2010 Edition)

Opportunities

A vibrant and growing energy technology sector will stimulate the creation of new wealth-creating “innovation clusters” in Canada spanning industry, government and the educational sector. Such clusters become a ‘self-fulfilling prophesy’ by attracting the best talent from within Canada and from abroad to study and work in the sector. Given the particular challenges faced by energy-intensive oil sands operations, we have the opportunity to develop targeted solutions (e.g. CCS) that nonetheless have wider applications in other industries and can be exported.

Importantly, the development and commercialization of energy technology will improve the ‘social license to operate’ for energy-intensive Canadian producers and will help mitigate efforts by opponents of Canadian energy to block our exports.

A diversity of reliable and affordable energy choices enhances Canada’s long-term energy security.

Recommendations

- Promote the reduction of carbon from fossil fuels and the continuous development of alternate sources of energy through the discovery and implementation of transformative technology.
- Incent full use and continual development of technologies that improve energy efficiency of energy systems.
- Incent energy technology research and development as commercialization in this area will underpin Canada’s energy exports, thereby contributing to our future economic growth. However, the market will determine which technologies are commercialized.
- Encourage exports of energy technology and expertise to the developed and developing world, perhaps through tax incentives, thereby creating new markets and reinforcing our reputation as a global energy leader.
- Encourage, more government-industry partnerships to drive investment into new energy technologies.
- Address the necessity for venture capital for the development of technology, and develop a tax strategy to attract more venture capital to Canada.
- Develop demonstration projects that support emerging energy technologies to speed up their adoption.
- Develop milestones for technology paths as indicators of their future promise and, as potentially successful technology innovations emerge, consider how best to accelerate development and adoption through demand-pull policies, regulations and other incentives.
- Eliminate interprovincial and national trade barriers that inhibit development of new technologies.

4.2. Skilled Workforce / Intellectual Capital

Background

Direct employment in the energy industry in Canada in 2008 was 363,000 people, or 2% of the labour force. It is estimated that total direct, indirect and induced employment in the oil and gas industry alone is 500,000.

Status Quo Risks

The Canadian energy sector faces a serious and growing shortage of skilled labour as our workforce ages. This will continue to dampen economic opportunity. The lack of sufficient numbers of workers also impacts productivity in the sector by overburdening the current workforce.

The lack of human resources at the upper levels of energy science and R&D (i.e. an 'intellectual capital shortage') has the potential to slow down technological and scientific discoveries in this area and increase Canada's dependence on importing new technologies. If we cannot find, train and recruit the knowledge workers that this industry requires, we cannot be an energy leader.

Opportunities

The opportunity is to build an unparalleled workforce with the proper training and education – both formative and continuing – to guide the energy sector through the transformative period ahead. Addressing more immediate concerns regarding endemic shortages of skilled workers and solving this problem will help to ensure that no new project is shelved or over budget or expansion plans abandoned due to an inability to attract sufficient workers. Canadian leadership in the area of energy innovation, improvements in energy extraction, transportation, use, and conservation will have a very positive impact on recruitment in the energy sector, positioning it as an innovative and socially responsible world-leading employer.

Recommendations

- Equip the Canadian workforce to take advantage of technical energy jobs through continuous improvement in technical skills and education – stressing strong partnerships between industry and the educational sector.
- Engage Canada's Aboriginal communities, especially in remote areas, as a viable source of human capital in the energy industry.
- Provide the necessary levels of funding to ensure our educational institutions deliver thought leadership and stress research into new technologies and new sources of energy.
- Ensure our educational institutions provide the necessary skills in environmental risk management to enable both the regulatory system and industry to effectively manage the development of all forms of energy.
- Promote open access to energy industry employment, including continuous reduction of interprovincial barriers to labour mobility.
- Encourage the streamlining of the immigration system to encourage immigration to Canada of foreign workers, skilled in the energy area.

4.3. Investment

Background

The energy industry is capital-intensive. For example, the oil and gas extraction business is the largest private sector investor in Canada and was responsible for \$34.5 billion in investment, or 25% of non-residential capital investment in 2009 (2008- 28%).

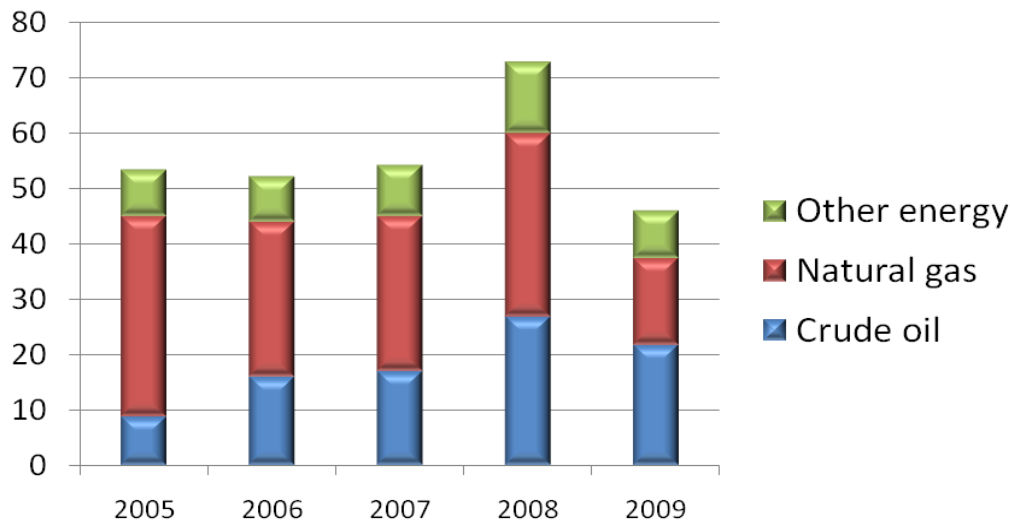
The energy supply sector accounted for approximately 7% of Canada's GDP in 2009. The 7% figure underestimates the potential scope of a whole-system energy strategy, which would affect vehicles, buildings and equipment that use energy as well as everything that provides energy.

Revenues of upstream oil and gas were \$100 billion as opposed to \$65 billion for auto manufacturing.

A July 2009 study by the Canadian Energy Research Institute (CERI) estimates direct and indirect economic impacts of the Canadian oil and gas industry over the next 25 years. The results depend on projections of upstream oil and gas investment, including all conventional oil and gas, oil sands and coal bed methane in Alberta and shale/tight gas in BC, as well as a number of major capital projects, namely the Enbridge Gateway pipeline project, the Kitimat LNG liquefaction project, the Quebec LNG re-gasification terminal, the Mackenzie Valley pipeline project and Nova Scotia's Deep Panuke offshore project. The total national GDP impact over the 25 years from all investments is \$3.6 trillion based on \$1.1 trillion of investment. Of the GDP impact, only \$60 billion is due to the major capital projects above.

CERI estimates that the \$1.1 trillion projected oil and gas industry investment over the next 25 years would provide \$409 billion of federal taxes and \$282 billion of provincial taxes over the period. Approximately 14% of the tax revenue is accrued outside of BC, Alberta and Saskatchewan, all of which will grow substantially over the next 20 to 25 years.

The chart below shows the net value (exports minus imports) of energy exports in billions of dollars for the years 2005-2009.



Energy stocks represent approximately 27% of value of the TSX composite, second only to financials at 30% (2008 data).

Status Quo Risks

Any diminution of investment in Canada's energy sector would have serious consequences on the sector's future growth potential, its ability to address environmental risks and contribution to the Canadian economy and social programs. It would result in a growing productivity gap with competitors and a failure to capitalize on potential new markets in swiftly developing countries like China, India and Brazil. Rapid growth in these countries attracts capital away from developed countries including Canada. Lower investment would also inhibit the transition to new technologies, thereby further eroding export opportunities.

Overall, the impact on the Canadian economy would be economically devastating resulting in less innovation in the critical area of energy technology, a slower pace of development for new energy projects and a reduction in energy exports.

Opportunities

Increased investment will allow us to maximize the competitive advantages afforded by Canada's unique energy mix. It will ensure that new energy sources are developed at the required pace to meet growing world demand. By further expanding the suite of energy sources, we will boost our exports of energy technology and skills. Finally, a healthy rate of investment in the energy sector is a major contributor to regional economic development by creating significant direct and indirect employment opportunities and new sources of tax revenues for local governments.

Recommendations

- Establish an investment climate that attracts capital from within Canada as well as foreign direct investment in order to continue to develop all forms of energy, as well as new energy technology to reduce environmental impacts
- Foreign direct investment in the energy sector can bring important benefits in terms of markets, technologies, research and partnerships. Canada should complete negotiations of Foreign Investment Promotion and Protection Agreements, or their equivalent, with all countries making direct investments in Canada's natural resource sectors. In those Agreements Canada should seek to establish reciprocal rights and protections for Canadian companies investing abroad.
- Improve the regulatory regime so it becomes an enabler rather than a barrier to investment and the adoption of new technology. Provide regulators with the ability to forbear when it makes sense to do so.
- Promote certainty and predictability in energy policy at all levels, in order to support long-term investment decisions.
- Develop policies that attract technologically neutral and fuel source neutral investments in energy.
- Drive national and regional economic development through investments in energy technology.

5. CONSERVATION DEMAND SIDE MANAGEMENT / ENERGY EFFICIENCY / ENERGY LITERACY

Background

Energy Efficiency Basics:

Energy efficiency can be considered an energy resource.

By definition, energy efficiency investments reduce losses while leaving the amount of energy service unaffected. Energy efficiency is thus considered a form of energy resource because the desired energy service outcome is the same whether a unit of energy is saved or supplied.

Energy efficiency is a key part of the economic equation.

Energy efficiency investments that have a lower life-cycle cost than new supply improve the productivity of the economy because the money saved is re-invested. For example, California has led North America in electricity efficiency standards and programs for the past four decades. Household-oriented electricity efficiency measures alone are estimated to have saved \$56 billion from 1972 - 2006 and created about 1.5 million FTE jobs. Per capita electricity consumption remains at its 1970 level while the US average has increased by 50%.

The economic potential for energy efficiency depends on costs of new energy supply.

Different countries may have different costs of new energy supply and therefore different values of energy savings. Those values are the basis of economic potential. If a country systematically keeps its consumer energy prices below the cost of new energy supply, it will tend to operate at a reduced level of economic efficiency, as well as energy efficiency.

Reducing losses at the point of end-use has compound benefits.

Energy losses compound at every stage of transformation from natural resource to energy service. For example, energy is lost in oil extraction, pipelines, refineries, and tanker trucks before gasoline is used in a car. This implies that energy savings at the point of use also compound as losses are reduced upstream.

Barriers:

Consumer decisions include psychological factors. For example, consumers have apparently very high discount rates; that is, they discount the value of future fuel bill savings much more than their financial circumstances appear to warrant. Other barriers include:

Knowledge: Some consumers lack the technical ability to evaluate options or the information may be hard to find

Technology risk: Consumers are averse to trying new things, even if commercially proven

Availability: the energy-efficient product or its servicing is difficult to find or training is inadequate

Technology lock-out: the market is controlled by a small number of large firms protecting the status quo

Restrictive codes and standards: prescriptive building safety or structural integrity codes that disallow efficiency measures even when they can be accommodated or have no adverse effects

Inefficient taxation: property taxes based on only on property value, rather than location, do not reflect the costs of providing new infrastructure and contribute to urban sprawl.

Instruments:

The main instrument types are: regulation, programs, market instruments, and information.
Typical examples:

Regulations: building codes, appliance standards, vehicle fleet fuel economy standards

Programs: high-efficiency appliance rebates, retail and distributor promotions, performance contracting, low-interest loans

Market instruments: tax exemptions and reduced rates, accelerated capital cost allowances, two-part pricing

Information: energy audits, advertising, school and community programs

Status Quo Risks

The transportation and building sectors have significant energy efficiency potential. Without long-term goals and milestones for achieving these efficiencies, the opportunity to improve efficiency may be lost due to the slow turn-over of buildings and the cost of retrofitting later. Additionally, there is a high cost to replacing technology in the transport sector, including aircraft and marine vessels, as well as the costs and scale required to modify the transport infrastructure. There is reluctance among Canadians to use alternative fuels for transportation which may aid in the lowering of emissions. Without clear signals as to future regulations or policy, the investment required to optimize energy efficiency in these sectors will not materialize.

Energy efficiency represents an effective form of energy resource. At present, there is a disconnect among Canadians with respect to the importance of their individual contributions in the areas of conservation and energy efficiency, and the role they play in reducing energy waste. This is significant given that the majority of Canada's GHG emissions occur at the consumption level of the "wells to wheels" energy cycle. This lack of public understanding of the aggregate impact of individual actions to conserve energy results in a consensus view that responsibility for improvement of Canada's environmental performance rests disproportionately with the energy sector. Thus the further development of energy resources is seen as either detrimental to the environment or is under-valued in terms of its contribution to our standard of living.

Opportunities

With greater public awareness of the demand side of the energy equation as it relates to conservation and energy efficiency, there is an opportunity to achieve environmental goals more quickly. A related benefit would be broader public awareness of the relationship between Canada's overall environmental performance against targets (e.g. for GHG reduction) and its ability to increase its energy exports to existing and new markets, thereby adding considerable wealth to our economy and raising our standard of living. Energy efficiency represents an effective form of energy resource.

Canadians are the largest per capita energy consumer in the world. Even with our vast distances and cold climate, it is still possible to reduce energy consumption.

Recommendations

5.1. Conservation / Demand-Side Management

- Educate and engage both energy producers and the public concerning energy efficiency and conservation. Focus on public education both inside and outside of Canada by proactively disseminating information and clarifying misinformation.
- Utilize mechanisms to focus on the end-use, demand side of the energy equation, including the use of full and marginal cost pricing.
- Address energy demand reduction/conservation as a benefit and engage Canadians as consumers in support of the environmental advantages of conservation.

5.2. Energy Literacy

- Promote energy literacy by creating public awareness of the benefits of conservation and energy efficiency and the economic impact of large spikes in energy demand (e.g. during a heat wave).
 - Consumers should understand that their individual choices influence energy infrastructure decisions by government (base load generation vs. peaking plant, renewable energy vs. fossil fuel vs. nuclear, investment in new transmission lines, etc.) and affect environmental results.
- Broaden the energy dialogue within Canada by constructive engagement through key “touch points”: in the workplace or household, through opinion leaders and stakeholders, through the broader business community, with the goal of establishing Canada as the world leader in energy literacy by 2025.

5.3. Energy Efficiency

- Engage both energy producers and consumers concerning the benefits of employing energy efficiency in all facets of their activities.
- Use the regulatory process to promote consumer product efficiency standards as well as investment in smart meters for households, microgrids, home solar and small geothermal, resulting in a positive impact on household consumption and utilization rates.
- Educate energy consumers on energy-efficient consumption at home; i.e. using the right fuel, in the right application, at the right time.

CALL TO ACTION

We live in a changing world and must recognize the risks to Canadian prosperity by allowing our economic, energy and environmental futures to be defined by divisions within our borders and changing realities outside our borders. Maintaining the status quo has significant costs for our quality of life. There is another way forward.

A Canadian energy strategy will:

- Unite the country rather than divide it along energy fault lines. It will stimulate a new era in federal, provincial, territorial, and municipal collaboration, leading to greater coordination in policy and program efforts benefitting Canadians and the private sector, thereby contributing to a stronger federation.
- Reinforce our national and regional economic strengths as an innovative, competitive energy producer and exporter, building jobs and growth for Canadians;
- Unlock the research and innovation necessary to foster Canada's enormous potential in energy technologies, and open up new avenues for prosperity in a low-carbon world;
- Attract investment for the building of necessary infrastructure, development of both fossil and alternative fuels;
- Highlight the central importance of energy conservation and efficiency to achieving positive environmental outcomes. And it will contribute responsibly and meaningfully to national and international climate change solutions that reduce greenhouse gases emissions.
- Protect and enhance Canada's international voice and brand as it relates to energy

With a Canadian energy strategy, we have a coherent vision upon which to develop effective, long term strategies.

With a Canadian energy strategy, we are a policy maker in the area of energy and the environment.

The Energy Policy Institute of Canada calls upon all levels of government to consider the case for "A Strategy for Canada's Global Energy Leadership" as outlined in this document, as well as the merits of the framework we have put forward and commit to collaborative action in partnership with energy industry and Canadians to maintain energy policy as a key priority for Canadian economic prosperity.

NEXT STEPS

“A Strategy for Canada’s Global Energy Leadership” has been distributed to a variety of government officials at the federal, provincial, territorial and municipal levels of government, as well as to a number of key energy sector opinion leaders and concerned citizens. EPIC will follow up with these recipients to elicit their feedback on the overall concept and approach.

In the first half of 2011, a more comprehensive document will be created that will clearly outline the specific elements of a Canadian Energy Strategy and make specific recommendations. This document will draw upon a research paper, commissioned by EPIC and entitled “Canada’s Energy Circumstances”, that describes Canada’s unique combination of resources, both fossil fuels and renewables, demands, infrastructure needs, social and environmental priorities, and trade competitiveness and governance systems.

The creation of this document will require a more definitive evaluation of the matters recommended

The publication of the second framework document will be supported by a government contact program and a public awareness campaign to encourage discussion and debate, with a view towards building a strong consensus around the need for a Canadian Energy Strategy.