Canadian Electricity
Association

Enhancing an Essential Service

Brief to the Council of Energy Ministers

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Canadian Electricity Association

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Canadian Electricity Association
Association canadienne de l'électricité

Overview

Canada's strong and dynamic electricity sector has historically accounted for more than a third of the national energy sector's total contribution to Canada's Gross Domestic Product. This contribution is even more significant than the numbers indicate because our electricity supply and delivery system also provides an important competitive advantage under-pinning the whole Canadian economy. Its standards of reliability, security, and cost-effectiveness are second to none in the world, and have therefore been the stimulus for attracting much economic development. The electricity sector is also an important contributor to Canada's export economy.

The August 14, 2003 power outage in Ontario and eight (8) Eastern U.S. states made the above points all the more clear – demonstrating first-hand to over 50 million people affected by the outage and to others across the continent who observed it just how fundamental Canadian electricity is to our economy and our way of life.

The power outage also provoked a recognition that there are growing pressures facing the electricity sector, many of which CEA and the industry have been bringing forward for discussion over the last several years. For example financial markets have been warning that investment conditions in Canada are less attractive for our sector due to lower rates of return on regulated assets compared to those available in other sectors and in the United States. CEA has addressed itself to this issue as well as to the important concern that Capital Cost Allowance (CCA) rates are also out of line with both current useful life realities and rates in the US.

But beyond these specifics lies a growing concern that the absence of a coherent and shared energy policy perspective has led to a sense of complacency about the electricity sector's ability to continue to deliver on its historic mission: providing Canadians with a vital service and key economic advantage. Recent events have underscored the message that we must re-examine the current state of the electricity system and put the conditions in place for the 21st century version of our past success.

Looking at electricity supply and demand over the next 20 years, already tight supply/demand balances in several regions are likely to be exacerbated. Unless there is significant new investment in generation, transmission, and distribution, more comfortable margins elsewhere will also disappear. Moving forward will require a common agenda by government and industry that builds on our diverse and flexible supply mix, with no conventional or emerging technology excluded, our robust transmission and distribution systems, and demand side management and related energy efficiency strategies.

The member companies of the Canadian Electricity Association (CEA) are committed to working with government on this agenda and, to that end, offer a five-point action plan:

1. Establish An Investment Climate To Ensure Future Electricity Supply
2. Move Government and Industry Towards Smart and Effective Regulation
3. Work to Ensure a Sustainable Future for the Next Generation
4. Foster Innovation and Accelerate Skills Development
5. Build on the Strengths of the Integrated North American System to Maximize Opportunity for Canadians

New policies and actions are urgently needed to ensure a long-term and reliable supply of electricity for all Canadians. With increasing pressures on public funding for health care, education and other governmental priorities, it is important that both public and private utilities have access to domestic and international capital markets to support new electricity infrastructure. A coherent and consistent policy framework will help to attract capital. Similarly, clear and predictable market rules and environmental regulation, such as those associated with climate change, are important factors in creating the conditions necessary to encourage investment. While demand side management can help reduce the amount of new supply needed, it cannot obviate the need for new infrastructure investment to meet the needs of a growing economy and population.

CEA member companies are committed to enhancing the advantage that the essential service of electricity represents to Canada – for our continued economic growth, an ever-improving quality of life, and for a healthy environment.

I Introduction

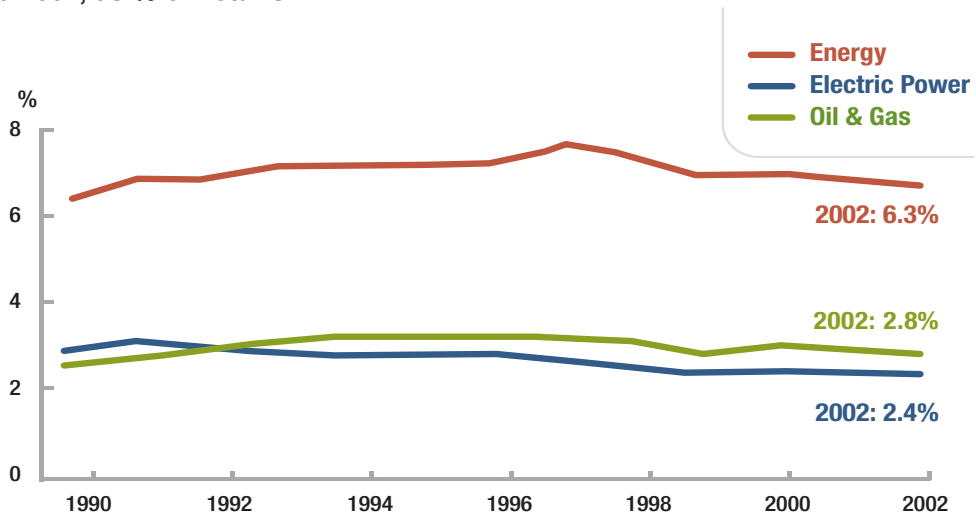
In 2002, electricity sector GDP totalled C$23 Billion: a figure that equates to more that a third of the energy sector's total contribution to GDP, and demonstrates the value of Canada's strong and dynamic electricity sector. The electricity sector is a key driver that underpins and enables growth in other sectors of the Canadian economy while contributing significantly to Canada's export revenues.

Since 1990, electricity demand has grown at a rate of 1.5% per year. The industry has, even considering recent events, been able to meet this demand reliably and cost-effectively. A fundamental reason for its success is that the electricity sector provides a relatively cost effective and reliable source of energy. Since 1992, electricity prices have only increased by 18.3% compared to overall Canadian price increases of 22.8% and energy price increases of close to 50%. This is a significant comparative advantage that benefits all Canadians.

However, no competitive advantage can be maintained without ongoing attention and the close cooperation of government and industry. The Canadian Electricity Association (CEA) believes that our electricity advantage is in danger of slipping. Increasing demand, tightening supply, rising natural gas prices, environmental/climate change obligations, declining reserve margins and other pressures present significant challenges to the sector.

In this Brief, we attempt to highlight an action plan to ensure that we do not lose our advantage. First, we provide the reader with an overview of the demand/ supply outlook. We then turn to a proposed Five-Point action plan to put the conditions in place and take the appropriate actions to meet the continued need for a secure, reliable and affordable supply of electricity to power the Canadian economy.

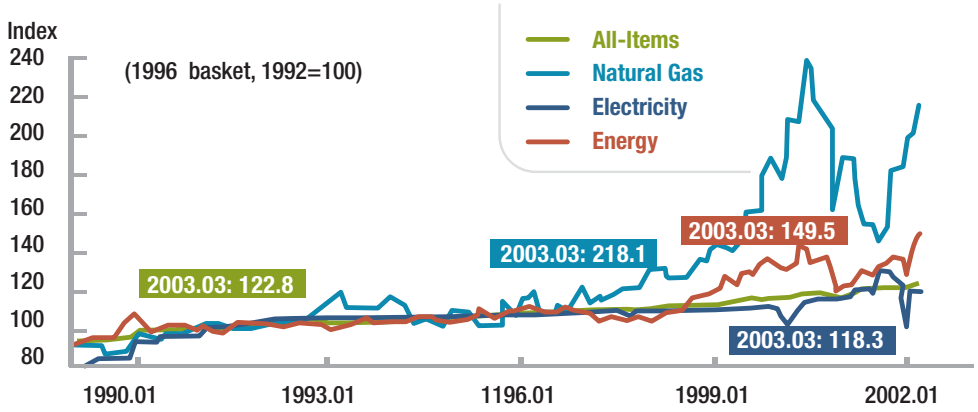
GDP of Selected Canadian Sectors: 1990-2002, as % of Total GDP



Energy consists of **Electric Power**, oil, gas & coal extraction & related services, mfg. & distribution.
Oil & Gas consists of oil & gas extraction & related support services.

Source: Statistics Canada, CANSIM II

Canada: Selected Consumer Price Indices: 1990-2002, Monthly Index



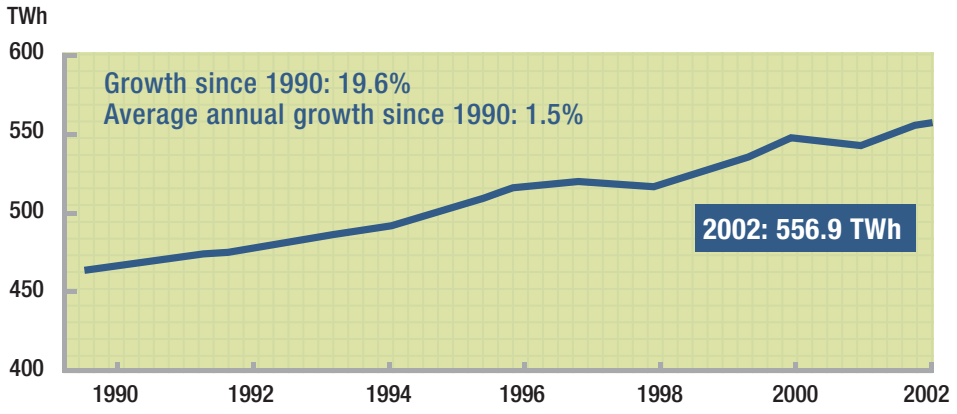
Source: Statistics Canada, CANSIM

Demand and Supply

Since 1990, electricity demand in Canada has risen by 19.6% to 556.9TWh. On average, demand growth has risen by 1.5% every year. Over the same period, due to a combination of structural changes and rising energy efficiency, the electricity intensity of the economy has declined by 13.4% to 569.7 MWh per C$ million in GDP. At the margin, the decline has been even more significant, falling by 63.5% to 238.5 MWh of new demand resulting from every C$ million in additional GDP growth. However, at the same time, Canadian electricity demand per capita has been stagnant to rising. Average per capita electricity demand in 2002 was 17.7MWh per person.

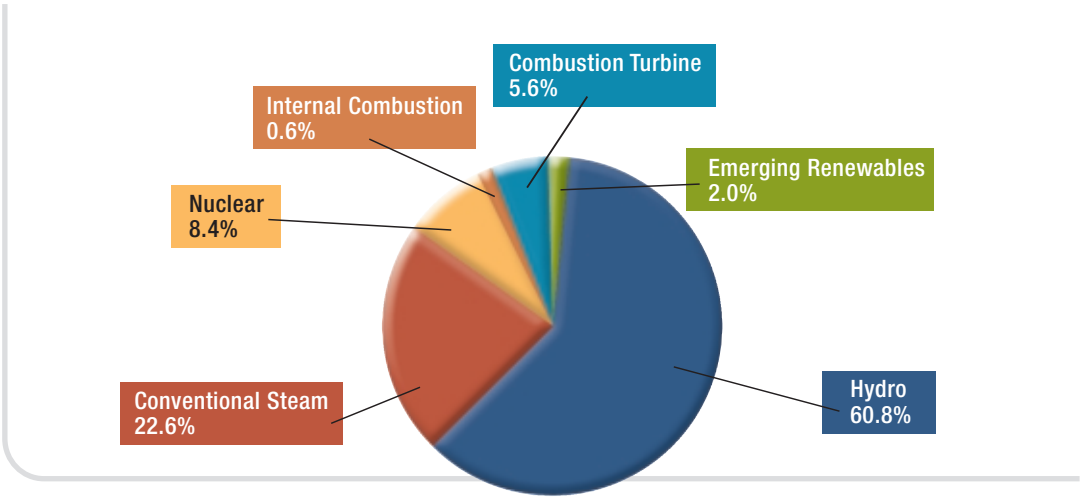
Over roughly the same period, Canadian electrical generation capacity grew by 9.2% or 9000 MW to approximately 107 GW. While the relatively slow growth in capacity

Canadian Electricity Demand: 1990-2002, TWh



Source: Statistics Canada, CANSIM

Canadian Installed Electric Power Capacity by Type: 2002, as % of Total
Total Capacity 2002: 107 GW



Source: Statistics Canada - Electric Power Capability and Load 57-204-XIB, companies, press releases, CIEEEDAC

was in part a natural consequence of overbuilding early in the decade, a supply/demand imbalance is emerging.

A factor that is frequently ignored is transmission capacity. Current out of province transfer capacity is very small in proportion to overall generation capacity and at most transfer points interties are running very tight. Greater interconnection would make for better functioning markets, better system reliability, and enhanced potential to meet many environmental goals. However, today's transmission system was not built to meet all the different market requirements now facing it. Given the difficulty of siting large generation near large populations, and the nascent status of distributed generation, it is extremely difficult to envisage meeting domestic need in the next five years without new transmission capacity both on existing rights of way and on new ones.

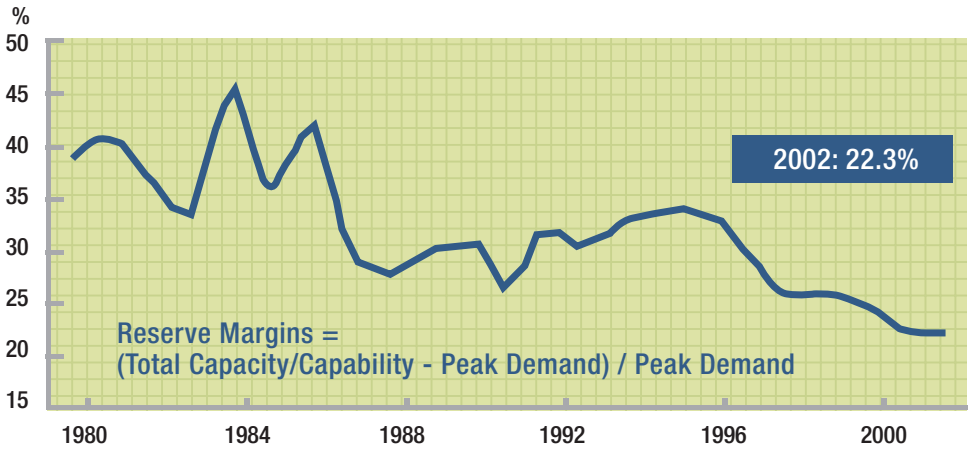
Similarly, today's distribution systems are being asked to accommodate higher levels of flow and complex new flow patterns as cogeneration and small scale self generation emerges. Many new technologies are being developed and deployed such as electronic "smart" meters and advanced power electronics. Even communications can now flow over power lines. But the realization of the full potential of the system requires aggressive investment, a clear policy framework and efficient regulatory approaches.

Today, Canada's supply/demand situation is in balance but tenuously so. Both demand growth and plant retirements will need to be matched by new generation and transmission capacity.

In order to meet domestic demand growth, to replace aging plants and to respond to export opportunities in the United States, Canada will need to develop all types of electricity resources. This forces us to underscore several realities:

- A diverse and flexible supply mix, with no conventional or emerging technology excluded, is needed to ensure sufficiency and price stability.

Canada: reserve Margins for Electric Power Generation: 1980-2002, %



Source: Statistics Canada

- As recent events have demonstrated, robust transmission and distribution systems are critical to deliver reliable and secure electricity to Canadians.
- Demand side management and related energy efficiency strategies need to be supported to ensure the most effective use of our electricity system.

As the power outage of August 14, 2003 highlighted, a reliable and secure supply of electricity is a critical and strategic issue for Canada's economic and social future.

Canadian Electricity Generation by Region and Type

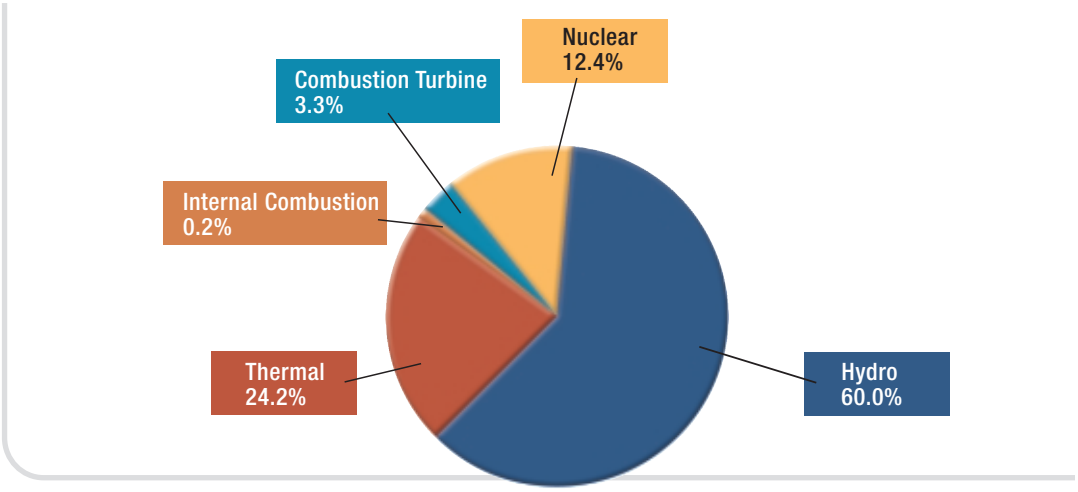
Canadian electricity generation is highly diverse, a significant factor in its success. Furthermore, regional differences in generation mixes are considerable – a fact that policymakers must consider in developing policies such as Canada's response to climate change.

Overall, Hydro power accounts for about 60% of all Canadian electricity production while coal fired thermal power generation represents about 24% of Canada's production. Nuclear power represents about 13% of production and (mostly natural gas fired) combustion turbine plants represent about 3 % of production.

Since 1990, the largest structural change in the production mix has been a decline in nuclear power's share of production (2.4%), largely due to the refurbishment of Ontario's fleet. A decline in the share of Hydro production (2.9%) has corresponded to increases in combustion turbine and conventional thermal generation (2.6% each).

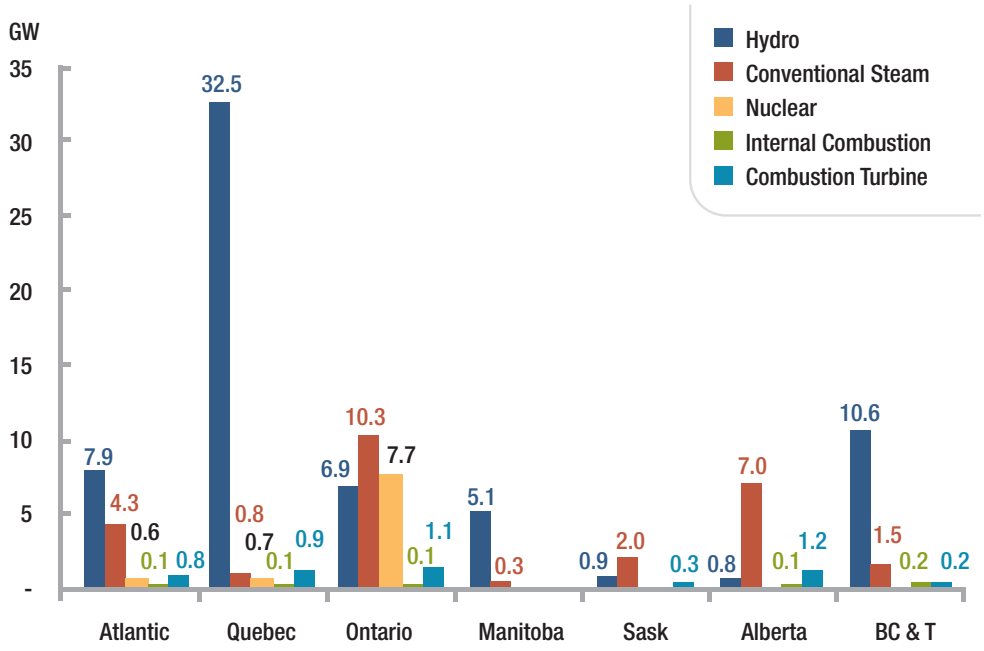
Hydro resources continue to be predominant in Quebec, British Columbia, Manitoba and Newfoundland and Labrador. Alberta, Saskatchewan and Nova Scotia rely heavily on coal for electricity generation. Ontario and New Brunswick have the most diverse portfolios of generation sources, with PEI receiving the bulk of its supply from New Brunswick.

Canadian Electric Power Generation: 2002, as % of Total
2002: 576.4 TWh



Source: Statistics Canada *Industry Canada Survey 2151*

Canadian Installed Capacity by Province: 2000, GW



Source: Statistics Canada - Electricity Capability and Load 57-204-XIB

II Electricity Supply and Demand in Canada: Looking Towards 2020

In 2001, CEA developed a "Bird's-Eye View" (BEV) of the supply and demand situation in Canada. The BEV was based on a review of data from the last several decades, a composite of the three most commonly used existing outlook models (MARKAL, NRCAN, NEB) and a survey of CEA members to update, correct and validate what is in those outlooks.

The BEV concluded that:

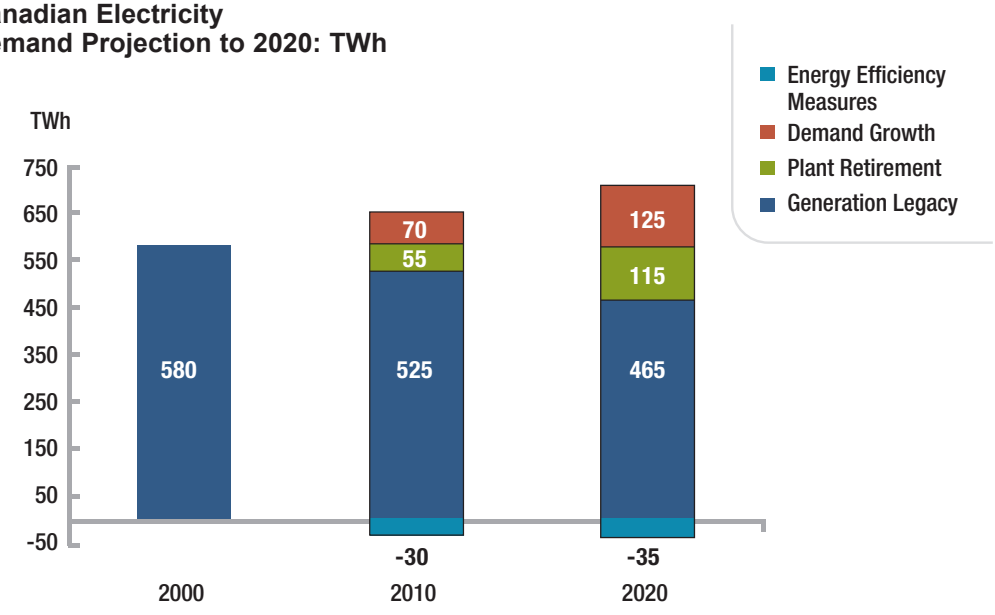
- By 2020, demand will be about 670 TWh with 205 TWh coming from new plants which represents 35% of year 2000 production;
- New demand, plant replacements and exports require new investment of over 20,000 MW per decade to 2020.

Interestingly, in June 2003, The National Energy Board (NEB) released new demand projections that suggested that demand would grow more quickly than the CEA's BEV projection. The NEB projected that demand would reach 817TWh in 2020, a 21% increase over the BEV projection.

The trend for electricity demand growth in Canada (and the US) continues to show a consistent slow decline in the electricity intensity of the economy. While this suggests that demand growth will continue at a pace less than that of GDP as we continue to be more efficient in our use of electricity, it also means that we still need more electricity year over year. CEA believes it is reasonable to project demand growth between 1 to 1.5% per year for the foreseeable future.

This means significant investment is required to meet that demand, and to meet it reliably. The right signals need to be in place to stimulate new investment in generation, transmission and distribution infrastructure – up to $150 billion worth over the next two decades. At the same time, efforts need to be undertaken to make demand more efficient. To that end, the Canadian electricity industry is planning to spend $1 Billion over the next few years on

Canadian Electricity Demand Projection to 2020: TWh



Source: CEA/GCSI 2001 - Average of MARKAL, NRCAN 1999, and NEB 1999 Models

demand side management programming to shape load and improve energy efficiency and government can be a key partner in helping industry to do more.

III Governments and Industry – A Common Agenda

As stated earlier, the electricity sector is a key driver that underpins and enables domestic growth in other sectors of the Canadian economy while contributing to Canada's export economy.

Moving forward, governments and industry need to cooperate within the context of a comprehensive policy framework to develop and implement a common agenda that promotes policy certainty, predictability and investor confidence. The member companies of the Canadian Electricity Association (CEA) are committed to working with government on this agenda. To that end, the CEA has developed and is currently implementing a five point plan:

1. Establish An Investment Climate To Ensure Future Electricity Supply

- Capital Cost Allowance (CCA) rates – particularly for generation assets – need to be higher and more realistic. The U.S. is moving to update its depreciation rates, and Canada should be moving to keep our industry competitive.
- There needs to be adequate rates of return on capital investments for regulated assets such as Canadian transmission and distribution systems – to permit effective upgrading and expansion where necessary.

2. Move Government and Industry Towards Smart and Effective Regulation

- Policies and regulations must reflect operating realities and take into account the many other regulated aspects of energy facing the sector. Appropriate mechanisms for coordination and "single-window" approaches are needed.
- Smart, effective and timely regulation and administrative process for projects – such as a more clear and efficient authorization process under the Fisheries Act – are required to bring new projects on-line more quickly, to enhance the ability of domestic supply to meet demand, and to support more efficient operation of existing facilities.

3. Work to Ensure a Sustainable Future for the Next Generation

- Environmental initiatives must be undertaken in the context of an overarching and well-informed energy policy framework to ensure industry obligations are realistic, balanced and equitable.
- Long-term climate change policies must recognize the North American nature of the electricity sector and factor in current and future sources of supply and technological options available during the first commitment period (2008-2012) and beyond.
- Demand-side management and energy efficiency measures need to be supported to ensure the most efficient use of our electricity system.

4. Foster Innovation and Accelerate Skills Development

- Aggressive action is required to encourage the adoption of new technology such as automated distribution technologies, clean coal and CO2 capture and sequestration. These and other technologies present a unique opportunity for Canada to support innovation and establish technology leadership.
- Industry/government collaboration on the Human Resources Sector Review for the electricity industry will help ensure continued access to a skilled labour force.

- Accelerated development of operating systems and training of operating personnel is important to support the continued reliable and efficient operation of the electricity system.

5. Build on the Strengths of the Integrated North American System to Maximize Opportunity for Canadians

- Canada must maintain a strong domestic electricity system while strengthening its role within North American institutional arrangements for ensuring system reliability, critical infrastructure protection, and efficient large regional wholesale markets.
  - Canadian companies are active in the North American Electric Reliability Council (NERC) as well as in North American regional transmission organizations (RTO's). These relationships should continue and be strengthened.
  - The Canadian electricity sector should continue its coordinated approach to critical infrastructure protection and its close work with Canadian and North American critical infrastructure protection agencies.

IV Moving the Agenda Forward

Electricity is a fundamental component of the Canadian social fabric and a basis for economic competitiveness. In the information age, the provision of reliable and secure electricity is all the more critical. There are a number of factors currently at play that threaten the electricity sector. Moving forward, governments and industry need to cooperate to develop and implement a common agenda that focuses on creating an environment that will ensure Canada's competitive electricity advantage within a North American context.

Such an environment must foster enhanced generation, transmission and distribution systems and encourage innovation in supply, delivery, and demand side management.

In the modern economy the electricity advantage will continue to rest in some measure on price, but reliability and power quality will grow in importance. In a free trade environment, input cost advantage can only be sustained based on a comparative advantage in natural, financial, and human resources, including the ability to attract and retain capital and people. Governments need to create business conditions that accomplish this and where regulation is necessary, to ensure that the rules are fair, effective and well co-ordinated across jurisdictions. If supply growth does not keep pace with demand, prices will steadily increase and availability will become an issue. The end result will be that system reliability – and so too our comparative electricity advantage – will steadily decline.

Government needs to focus on the electricity agenda and move aggressively towards specific actions to maintain Canada's electricity advantage. The member companies of the Canadian Electricity Association are working with government to help Canada maintain its electricity advantage – for our continued economic well-being, for a constantly improving quality of life and for a healthy environment.