



INNOVATING

for a Sustainable Future

2013 Sustainable Electricity™ Annual Report



**Sustainable
Electricity**
It's in our power™

**Électricité
durable**
Nous avons le pouvoir™



**Canadian
Electricity
Association**

**Association
canadienne
de l'électricité**



Images on the front cover:

Upper left – Hydro One crew. *Courtesy of Hydro One Inc.*

Bottom left – New electric vehicle. *Courtesy of Toronto Hydro Corporation.*

Right side – Capital Power Corporation's coal fired, Genesee Generating Station. *Courtesy of Capital Power Corporation.*

On this page: The Yukon Energy's Whitehorse Rapids Generating Station, located in Whitehorse along the Yukon River. This picture was taken on a cold morning during a spillway gate overhaul in 2012.

Photo credit: Jim Petelski; courtesy of Yukon Energy Corporation.

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Purpose of the Sustainable Electricity Annual Report

The 2013 Sustainable Electricity Annual Report is a detailed analysis of the progress made towards sustainability during 2012 by the Canadian Electricity Association (CEA)'s Corporate Utility Members (generation, transmission and distribution).

CEA'S SUSTAINABLE ELECTRICITY PROGRAM

Sustainable Electricity is a mandatory, industry-wide sustainability program developed and implemented by CEA's Corporate Utility Members. The goal of the program is to foster continuous member improvement in the areas of environmental, social, and economic performance. The program also seeks to minimize adverse impacts, and to enhance positive aspects of sustainable development.

Guiding CEA member efforts is a policy for sustainable development and corporate responsibility that is reproduced on page three of this report. Each of the 10 guiding principles of this policy is supported by specific indicators and metrics used to track overall sustainable development performance. This 2013 Annual Report discusses the performance of members during the 2012 calendar year against each of the guiding principles, both quantitatively as well as by describing significant initiatives of member utilities.

Since its inception in 2009, a Public Advisory Panel made up of distinguished and qualified Canadians has provided independent advice to the CEA Board of Directors on the implementation of the Sustainable Electricity program and the performance of CEA member companies. Their letter of advice to the Board can be found on page 11.

An independent verification process is also undertaken each year to verify the information provided by member utilities for the Sustainable Electricity Annual Report. The Verifier's Statement can be found on page 48–49 of this report.

CHANGES FROM PREVIOUS REPORTS

TransAlta Corporation, an electricity generator based in Alberta, is no longer a CEA Corporate Utility Member. To ensure that year-over-year quantitative results remain accurate and meaningful, TransAlta's data from previous years (2008–2011) has been removed from this report so that comparisons of past results with 2012 performance are on the same basis. As a result, all previously reported performance data have changed, including the baseline and annual values in the Sustainable Development Index (SDI).

HORIZON UTILITIES CORPORATION DESIGNATED FIRST EVER SUSTAINABLE ELECTRICITY COMPANY™

For the first time in Canadian history, Horizon Utilities Corporation, an electricity distributor that serves residential, commercial and industrial customers in Hamilton and St. Catharines, Ontario, was designated as a Sustainable Electricity Company™ by CEA following its successful implementation of the brand criteria.

The Sustainable Electricity Company™ brand is a designation for utilities across Canada established by CEA (membership is not a requirement). It goes beyond the requirements of the mandatory Sustainable Electricity program for member utilities and requires interested utilities to commit to the ISO 14001 standard on Environmental Management Systems and ISO 26000 guidance on Social Responsibility. In addition, companies must also pass a third-party external verification to validate the implementation of CEA brand criteria. CEA encourages all utilities to adopt, use and adhere to the new Sustainable Electricity Company™ brand criteria as a tangible and visible demonstration of their commitment to sustainability. For more information, please visit www.SustainableElectricityCompany.ca.



Horizon Utilities' brand designation ceremony, held on April 24, 2013. Pictured from L-R: Channa Perera of CEA, Max Cananzi of Horizon Utilities, and Jim Burpee of CEA. Courtesy of Horizon Utilities Corporation.

Sustainable Electricity: A Policy for Sustainable Development – Corporate Responsibility

The Canadian Electricity Association (CEA) and its member utilities are committed to sustainable development. For CEA members, this means “pursuing innovative business strategies and activities that meet the needs of members, stakeholders and the communities in which we operate today, while protecting and enhancing the human and natural resources that will be needed in the future.”

CEA member utilities will continue to improve their overall sustainable development performance by committing to the following principles:

Environment: Minimize the adverse environmental impacts of our facilities, operations and businesses

Stewardship and Biodiversity: Manage the environmental resources and ecosystems that we affect to prevent or minimize loss and support recovery

Climate Change: Manage greenhouse gas emissions to mitigate the impact of operations on climate change, while adapting to its effects

Health and Safety: Provide a safe and healthy workplace for our employees and contractors

Workplace: Support a fair, respectful and diverse workplace for our employees and contractors

Communications and Engagement: Communicate with and engage our stakeholders in a transparent and timely manner

Aboriginal Relations: Communicate with and engage Aboriginal people in a manner that respects their culture and traditions

Economic Value: Provide economic benefits to shareholders, communities and regions in which we operate

Energy Efficiency: Produce, deliver and use electricity in an efficient manner while promoting conservation and demand-side management

Security of Supply: Provide electricity to customers in a safe, reliable and cost-effective manner to meet current and future needs

Participation in the Sustainable Electricity program is a condition of CEA membership. The CEA Sustainable Electricity program’s Executive Council Chair is accountable for monitoring and reporting progress in implementing this policy on behalf of the CEA Board of Directors.

The CEA member utilities are accountable for implementing this policy within their organizations.

Originally Signed:
Chair, CEA Board of Directors

February 19, 2009

CEA Member Performance at a Glance

Net Generation by Fuel Type (Gigawatt-hours)	2011	2012	Percentage Difference 2011-2012
Coal	43,091	42,957	-0.3
Oil	1,459	1,408	-3.5
Diesel	250	273	9.4
Natural Gas	16,293	16,769	2.9
Hydroelectric	170,497	170,765	0.2
Nuclear	48,626	49,457	1.7
Other Renewables	2,722	3,496	28.5
Total Net Generation	283,077	285,126	0.7
Renewables Purchased from non-CEA Member Companies	5,817	6,552	12.6
Transmission and Distribution Lines	2011	2012	Percentage Difference 2011-2012
Total Length of Distribution Lines (kilometres)	674,734	690,546	2.3
Total Length of Transmission Lines (kilometres)	113,838	115,460	1.4
Environment	2011	2012	Percentage Difference 2011-2012
Total Gross Annual Sulphur Dioxide Emissions (thousand tonnes)	239.73	248.03	3.5
Sulphur Dioxide Net Fossil Intensity (tonnes/GWh)	3.96	4.60	16.0
Sulphur Dioxide Net System Intensity (tonnes/GWh)	0.83	0.87	5.0
Total Gross Annual Nitrogen Oxide Emissions (thousand tonnes)	109.04	96.18	-11.8
Nitrogen Oxide Net Fossil Intensity (tonnes/GWh)	1.78	1.57	-11.6
Nitrogen Oxide Net System Intensity (tonnes/GWh)	0.38	0.33	-12.1
Total Gross Annual Direct Carbon Dioxide Equivalent Emissions from Fossil Generation (million tonnes)	54.41	51.97	-4.5
Carbon Dioxide Equivalent Net Fossil Intensity (tonnes/GWh)	892.09	850.25	-4.7
Carbon Dioxide Equivalent Net System Intensity (tonnes/GWh)	188.40	178.36	-5.3
Number of Priority Spills	97	102	5.2
Total Sulphur Hexafluoride Used for Maintenance Purposes (kilograms)	4,717	5,690	20.6
Companies with an ISO consistent Environmental Management Systems (percent)	87	83	-4.6

Society	2011	2012	Percentage Difference 2011–2012
All Injury/Illness Frequency Rate (injuries per 200,000 hours)	1.99	1.57	-21.1
Lost-Time Injury Frequency Rate (lost-time injuries per 200,000 hours)	0.77	0.50	-35.1
Lost-Time Injury Severity Rate (calendar days lost per 200,000 hours)	15.27	12.13	-20.6
Total Value of Company Charitable Donations (\$ millions)	24.529	33.268	35.6
Companies Producing a Sustainability Report (percent)	52	57	9.6
Companies with Public Education Programs (percent)	90	90	0.0
Companies Operating in Aboriginal Communities that have an Aboriginal Relations Group or Senior Aboriginal Advisory Position (percent)	74	74	0.0
Companies Operating in Aboriginal Communities that have Business Relationships or Partnerships with Aboriginal Communities (percent)	100	100	0.0
Companies with Procedures for Training and Employment of Aboriginal Peoples (percent)	87	87	0.0

Economy	2011	2012	Percentage Difference 2011–2012
Total Capital Expenditure on New/Refurbished Generation Infrastructure (\$ billions/year)	4.455	4.474	0.4
Total Capital Expenditure on New/Refurbished Transmission Infrastructure (\$ billions/year)	3.105	4.285	38.0
Total Capital Expenditure on New/Refurbished Distribution Infrastructure (\$ billions/year)	2.585	3.291	27.3
System Average Interruption Duration Index (SAIDI) Excluding Significant Weather Events (duration in hours)	5.11	4.43	-13.3
System Average Interruption Frequency Index (SAIFI) Excluding Significant Weather Events (interruptions per customer)	2.53	2.48	-2.0
Energy Saved Through Conservation (megawatt-hours)	1,167,053	1,817,623	55.7



The Sustainable Electricity Review Panel, from L-R, (front row): Dr. Blair Feltmate (moderator), University of Waterloo; Natalia Moudrak, Pollution Probe; Liza Horowitz, The Delphi Group; Colin Isaacs, Contemporary Information Analysis (CIAL). L-R (back row): Todd Ernst, Willis Energy Services; Mitzie Hunter, Civic Action Toronto; Dee Patterson, Scotia Bank; Brad Zarnett, Toronto Sustainability Speaker Series; Andrew Craig, Royal Bank of Canada.

ANNUAL REPORT REVIEW PANEL

Keeping abreast of stakeholder concerns and working to continuously improve the annual report are important priorities of CEA and its members. In October 2012, CEA convened a stakeholder panel to review the 2012 Sustainable Electricity Annual Report with the aim of further improving the structure and content of future reports. The panel, composed of individuals with a wide range of sustainable development experience, provided valuable advice and this report reflects some of their recommendations. CEA intends to follow up on the remaining recommendations in future years.

Joint Message from the Executives



The Executives, from L-R: Jim Burpee, President & CEO of CEA; David Morrison, President & CEO of Yukon Energy, and Chair of CEA's Board Committee on Sustainability; and Anthony Haines, President & CEO of Toronto Hydro Corporation and Chair of CEA Board of Directors. Photo credit: Greg Teckles.

We are pleased to report on the progress made by CEA Corporate Utility Members towards sustainability in 2012. This report marks the fifth year of documenting our environmental, social and economic performance, which is an important part of being accountable to our stakeholders and communicating in a timely manner. We are also grateful to the Sustainable Electricity Public Advisory Panel for their review of this annual report and their valuable advice. As this year's report illustrates, the overall sustainable development performance of CEA member companies continues on a positive trajectory, but we have much work to do in some performance areas.

Canada's electricity sector is increasingly becoming de-carbonized with the introduction of new, innovative technologies and smart grid applications. At the downstream level, customers are becoming more engaged in managing their energy consumption. While these innovations are already taking place, CEA members recognize the importance of continuous improvement. We are investigating the potential to set specific long-term sustainability performance targets and objectives to further improve our performance. We also need stakeholders—customers, utility regulators, government decision makers, and non-governmental organizations—to support this work and help us get to the next level on sustainability and innovation.

This year's theme is *Innovating for a Sustainable Future*. The future performance of the sector, especially looking to the 2030–2050 timeframe, will be driven by the level of innovation that is applied. In 2012, CEA commissioned a research paper by the Pembina Institute to identify barriers to innovation in the electricity sector. It identified multiple innovation barriers related to organizational, financial, technological, regulatory and system-wide issues. The reduction and removal of these barriers will be essential for moving us forward and helping us meet the future needs of Canadians.

STRATEGIC CHALLENGES

Canada's electricity sector faces a number of challenges as it pursues environmental, social and economic sustainability, including infrastructure renewal, human resources, Aboriginal relations and community engagement.

Infrastructure renewal and modernization are fundamental to keeping Canada's electricity supply reliable, affordable, and sustainable. Today, Canadians enjoy a high level of reliability; and everyone benefits from an electricity system in which 80 percent of the supply is based on non/low emitting sources. This electricity comes to customers from generating stations, transmission towers, local distribution lines, and other facilities that are urgently in need of renewal and modernization. According to a Conference Board of Canada report, renewing Canada's electricity infrastructure will cost nearly \$350 billion over the next two decades, while also adding an average of \$10.9 billion per year to real Gross Domestic Product and creating an average of 156,000 jobs per year.¹

Attracting qualified, skilled workers to the electricity sector remains the key human resource challenge. In response, CEA and its members are increasing awareness about electricity careers, collaborating with educational institutions, and working with governments on policies to get workers—including women, Aboriginal Peoples and other under-represented groups—into occupations of greatest need in the sector. Improving relationships with communities and Aboriginal Peoples is another key to renewing infrastructure in a timely manner. Many CEA members have had success in engaging communities and Aboriginal Peoples, as well as providing investment and employment opportunities. This will continue to be an important focus area for the sector.

¹ Conference Board of Canada, *Shedding Light on the Economic Impact of Investing in Electricity Infrastructure*, February 2012 <http://www.conferenceboard.ca/e-library/abstract.aspx?DID=4673>

INNOVATING FOR SUSTAINABILITY

While CEA and its members face challenges, we also have many success stories, including becoming more innovative in our quest for sustainability.

For example, CEA members have continued to reduce carbon dioxide emissions by nearly 28 percent since 2008. This has been achieved through a commitment to renewable energy technologies, substitution of coal-fired generation with high-efficiency gas plants or non-emitting technologies, and working with customers to make them more energy efficient. CEA members are also researching and developing innovative technologies such as carbon capture and storage and various other energy storage technologies.


On the distribution side, a commitment to smart meters and smart grid technologies is revolutionizing both electricity operations and customer relationships. A smart grid adds information technology to the existing local electricity grid, making distribution operations more efficient and predictable, and leading to better service reliability and smarter maintenance planning. Smart grids also make it possible to accept intermittent power supplies from solar and wind farms without affecting the power quality we all depend on.

Innovative smart grids encourage new products such as programmable thermostats; energy monitors; smart appliances that cycle off automatically when prices are higher; and electric vehicles charged using low-cost overnight power—making transportation cheaper and cleaner. Residential customers could even become generators, selling power to their utility from solar panels or from the energy stored in their electric vehicles to take advantage of high prices. After a century of little change in the electricity sector, a transformation is underway.

From a societal perspective, CEA members are also adopting innovative approaches to how we deal with our many stakeholders, such as communities, Aboriginal Peoples, and our employees. To maintain the social license to operate, we continually look for new ways to engage the public and show leadership. Innovation is an essential component of continuous improvement. We hope you will read this annual report to see for yourself how CEA members are innovating for a sustainable future.



Jim R. Burpee, P.Eng.
President & CEO
Canadian Electricity Association



Anthony Haines
President & CEO, Toronto Hydro Corporation
Chair, CEA Board of Directors



David Morrison
President & CEO, Yukon Energy Corporation
Chair, Board Committee on Sustainability

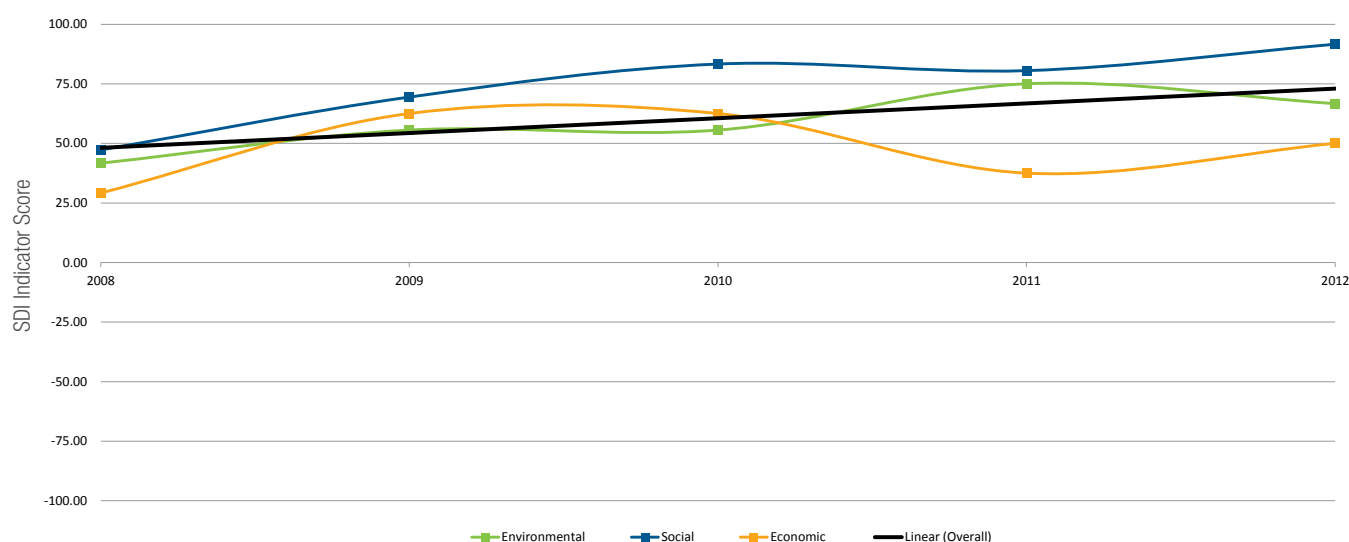
Sustainable Development Index

SUSTAINABLE DEVELOPMENT PERFORMANCE (2008–2012)

The Sustainable Electricity program promotes continual improvement of three integrated components of sustainable development: environmental, social, and economic performance. The Sustainable Development Index (SDI) is a tool developed by CEA and its members to assess whether or not member companies are collectively improving their performance over a five-year period against a baseline from 2004–2005.

The SDI is composed of 24 indicators (for a complete list, see **Table 1**), each of which is assigned a score between +100 and -100 annually based on performance benchmarked relative to the baseline and the standard deviation of the data set. The major categories of environmental, social, and economic performance contribute one-third each to the SDI calculation. As **Figure 1** illustrates, the overall sustainable development performance of CEA member companies continues to improve (linear regression line), although individual performance categories (environmental, social, and economic) have fluctuated over the last five years within the positive score range of the Index.

Figure 1 | Sustainable Development Index (SDI)



	2008	2009	2010	2011	2012
Metrics with the Greatest Positive Contribution	Public Education Programs	Member Sustainability Reporting	Sulphur Dioxide Emissions	Carbon Dioxide Emissions	Carbon Dioxide Emissions
	Company Aboriginal Relations Positions	Infrastructure Investment	Energy Conservation	Sulphur Dioxide Emissions	Infrastructure Investment
Metrics with the Greatest Negative Contribution	System Average Interruption Duration Index	Priority Spills	Priority Spills	System Average Interruption Duration Index	Priority Spills
	System Average Interruption Frequency Index	Charitable Donations	System Average Interruption Frequency Index	System Average Interruption Frequency Index	System Average Interruption Frequency Index

Note: the metrics noted in the above table are a sample of positive and negative performance for any given year.

SUSTAINABLE DEVELOPMENT INDEX: PERFORMANCE TRENDS (2008–2012)

Environmental

While overall environmental performance has fluctuated over the last five years, metrics related to air emissions, especially sulphur dioxide, nitrogen oxide, and carbon dioxide have improved relative to the baseline, primarily due to changes in the generation fuel mix and retirement of coal-fired facilities, particularly in Ontario. Priority spills and sulphur hexafluoride (SF₆)—a greenhouse gas with a high Global Warming Potential—did increase, contributing to a lower score in the Index, including in 2012. Priority spills remain a major concern and have increased by 32.5 percent relative to the baseline. Use of SF₆ in electrical equipment, while small, also contributed to the decline in performance both in 2010 and 2012. CEA members continue to track and report annual SF₆ emissions to Environment Canada under a Memorandum of Understanding under the Sustainable Electricity program.

Social

Social performance has shown the greatest improvement relative to the baseline over the last five years due to improvements in health and safety, Aboriginal relations and community donations. Performance in several of these areas declined in 2011, but recovered in 2012, resulting in the best overall social performance score since 2008.

Economic

The economic performance of CEA members is influenced by two major performance areas—level of investments in infrastructure and reliability of the electricity system. While infrastructure investments have helped improve the overall economic performance of CEA members, system reliability remains a major issue. While reliability performance metrics—System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI)—improved in 2012, they scored lower in the Index in previous years. With investments in infrastructure renewal and modernization, reliability performance is expected to further improve in the years ahead.

Table 1 | Sustainable Development Index Indicators

Environmental	Social	Economic
<ul style="list-style-type: none"> Nitrogen Oxide emissions (tonnes) Nitrogen Oxide intensity (net system) Sulphur Dioxide emissions (tonnes) Sulphur Dioxide intensity (net system) Carbon Dioxide equivalent emissions (tonnes) Carbon Dioxide equivalent intensity (net system) Priority spills Sulfur Hexafluoride emissions (tonnes) Implementation of Environmental Management Systems (%) 	<ul style="list-style-type: none"> All Injury/Illness Frequency Rate (per 200,000 hours) Lost-Time Injury Frequency Rate (per 200,000 hours) Lost-Time Injury Severity Rate (calendar days lost per 200,000 hours) Total value of annual company charitable donations (\$) Companies producing sustainability reports (%) Companies with public education programs (%) Companies with Aboriginal Relations group or positions (%) Companies with partnerships with Aboriginal Peoples (%) Companies with procedures for training and employment of Aboriginal Peoples (%) 	<ul style="list-style-type: none"> Total capital expenditures on generation infrastructure (\$/yr) Total capital expenditures on transmission infrastructure (\$/yr) Total capital expenditures on distribution infrastructure (\$/yr) System Average Interruption Duration Index (hours) System Average Interruption Frequency Index (per customer) Total Energy saved through external energy conservation initiatives (megawatt-hours)

CEA INVESTIGATES BARRIERS TO INNOVATION AND SUSTAINABILITY

In 2012, CEA commissioned a research paper, *Innovation for Sustainable Electricity in Canada: Barriers*, by the Pembina Institute. The paper identified several barriers to advancing innovation and sustainability in the electricity sector.

Key Barriers:

Internal/organization	Policy and regulatory	Technology	Finance and cost	Systemic
<ul style="list-style-type: none"> Uncertainty about the role of utilities as innovators Challenges in articulating the business case for innovation 	<ul style="list-style-type: none"> Lack of clear and strong federal and provincial policies on innovation and sustainability Excessive regulatory focus on low electricity rates 	<ul style="list-style-type: none"> Higher costs for new technologies and approaches, relative to incumbent (including learning effects, networks, regulatory systems) 	<ul style="list-style-type: none"> Financing needs are inadequately addressed (high capital costs, cash flow volatility, long maturation time) 	<ul style="list-style-type: none"> Canada lacks push for innovation at highest levels of government

Following the completion of the paper, CEA hosted an internal workshop in March 2013 to develop a national strategy on innovation for the electricity sector. The workshop provided a forum to discuss the barriers and solutions to innovation in the context of existing and emerging commercial risks to the sector. CEA is in the process of developing an action plan to address these barriers in 2014 and beyond.

Key Industry Challenges

Canada's electricity sector faces five long-term challenges on its journey towards sustainability.

Innovating for Sustainability

Innovating for sustainability is one of the biggest emerging issues facing the electricity sector. The sector is facing unprecedented risks including infrastructure renewal, regulatory and policy changes, societal license to operate, and organizational human resource requirements. These must be addressed within the context of an industry that is transitioning to greater use of information technology and smart grid applications, renewable technology integration, electrification of transportation, and the development of more decentralized forms of generation. To address these issues effectively, CEA members and stakeholders must overcome regulatory, policy, technology, systemic and internal barriers to innovation.

Infrastructure Investment

Infrastructure investment continues to be crucial. According to a report by the Conference Board of Canada, "investment in electricity infrastructure from 2011 to 2030 will total an estimated \$347.5 billion (in current dollars)."² Investment in infrastructure renewal and modernization will ensure a continued reliable supply of electricity, considerable benefits to the Canadian economy including job creation, and the adoption of advanced technologies that benefit customers. The sector is seeking the support of decision makers, regulators, communities, and other stakeholders to ensure timely investment in infrastructure renewal and modernization.

Regulatory Efficiency

As the electricity sector begins to renew its infrastructure, an efficient regulatory environment is a prerequisite to success. While the federal government introduced several legislative amendments to existing environmental laws in 2012, electricity projects are often faced with a number of often duplicative federal and provincial regulations. Timely regulatory approvals are essential to help keep electricity affordable, reliable, and to ensure the sector continues to create economic value. Governments must ensure clarity, consistency, and predictability of legislation and regulations. This is particularly important in areas such as species protection and air emissions.

Climate Change

Climate change is a challenge for Canada's electricity sector in two ways: first, the need to reduce the sector's carbon footprint; and second, the need to adapt to the physical effects of climate change on its electricity system. Currently responsible for about 13 percent of CO₂ equivalent emissions³, the electricity sector is working to reduce its carbon emissions by investing in renewable and other non-emitting electricity generation sources; through a major carbon capture and storage demonstration project; and by promoting energy efficiency and conservation. However, Canadian legislative/regulatory regimes governing climate change and other air emissions must be predictable, realistic and achievable based on capital turnover and best available technology.

Human Resources

Canada's electricity sector has a major demographic challenge, with an aging workforce and the looming retirement of a large percentage of its skilled and experienced employees. By 2016, about 45,000 new workers (more than 40 percent of the current workforce) will be needed⁴, many with specialized skills in areas such as smart grid applications. To attract the qualified and skilled workers that it needs, the electricity sector is raising awareness about electricity careers among Canadians; and is ensuring that current employees have the skills and training required to maintain a reliable electricity system.

² Conference Board of Canada, *Shedding Light on the Economic Impact of Investing in Electricity Infrastructure*, February 2012 <http://www.conferenceboard.ca/e-library/abstract.aspx?DID=4673>

³ Environment Canada, *National Inventory Report (1990-2011), Canadian Government's Submission to the UN Framework Convention on Climate Change*, April 2013 http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php

⁴ Electricity Sector Council, *Power in Motion 2011: Labour Market Information Study Full Report*, 2012

Letter from the Public Advisory Panel

Mr. Anthony Haines
President and Chief Executive Officer, Toronto Hydro Corporation
Chair, Board of Directors, Canadian Electricity Association

Dear Mr. Haines:

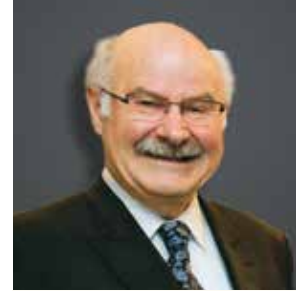
The Public Advisory Panel members of the Sustainable Electricity program are pleased to submit this annual letter of advice to CEA. We understand that our role is to present an informed public representative point of view on the environmental, social, and economic performance of the electricity industry in Canada measured against the principles and indicators that are the foundation of the program.

The Panel is pleased with the overall progress made by CEA members on sustainable development. Over the past five years, CEA members have made significant progress in reducing their environmental impact, especially air pollutants and greenhouse gas emissions. The formation of a working group on climate change adaptation by CEA to help members understand and manage the risks of climate change to their operations is a notable positive step. The achievements of the energy conservation programs and the \$12.050 billion investment in electricity infrastructure are viewed by the Panel as positive steps in ensuring a sustainable and reliable supply of electricity to Canadians.

Each year the substance and quality of the Sustainable Electricity Annual Report has improved. It can be further enhanced in the future if additional details, where possible, can be provided for performance trends associated with areas such as Aboriginal relations, infrastructure investments, conservation and renewable energy. Further, whereas the report database now has a lengthy series of observations for many data sets, additional comments on trends and their implications would be useful. As part of this improvement process, CEA members should also undertake an assessment of current Aboriginal relations indicators. As currently structured, those indicators are not measurable, and do not effectively communicate whether or not the sector is successfully engaging Aboriginal Peoples. The Panel looks forward to having further discussions with CEA to help develop such measurable indicators in the year ahead.

The five-year trend in the Sustainable Development Index (SDI) for priority spills and system reliability indicators (SAIDI and SAIFI) are noted to be somewhat negative. The Panel questions whether this trend foreshadows the future in these areas, and whether the sector is sufficiently focusing on operational efforts and investments to enhance these areas.

The CEA's investigation of the potential to set specific sustainability performance targets and objectives is a positive development which, if implemented, will allow the industry to benchmark its performance against international sustainable development standards and measures. The Panel continues to encourage development of such targets.



Hon. Mike Harcourt

This year's theme, *Innovating for a Sustainable Future*, is fully supported by the Panel, as innovation is the foundation of sustainability. It is imperative that the sector understands and acknowledges that it is in a transformative period and that innovation is essential to provide solutions for continuing and new challenges. The Pembina Institute paper commissioned by CEA in 2012 is a notable first step in identifying barriers to innovation by the sector. The Panel applauds CEA in taking an industry lead in promoting innovation for a sustainable future.

As part of the innovation agenda, I was particularly pleased to participate in CEA's workshop on innovation and sustainability at this year's Canadian Association of Members of Public Utilities Tribunals Conference. The Panel notes that innovation will be a topic, as part of the Canadian Energy Strategy, at the Council of Federation meeting in July 2013. It encourages CEA to provide input to the Council attendees.

We appreciate the opportunity to provide this letter of advice and look forward to continuing our discussion with the Board of Directors on the comments and concerns that we have raised herein and to actively work with the CEA in promoting innovation for sustainability.

Yours sincerely,

Hon. Mike Harcourt
Chair, Public Advisory Panel
CEA Sustainable Electricity Program

Key Performance Highlights

Green indicates improved performance and orange indicates decreased performance (relative to 2011)

83

COMPANIES WITH AN ISO 14001 EQUIVALENT ENVIRONMENTAL MANAGEMENT SYSTEM (PERCENT)

4.6 percent decrease from 2011

248.03

SO₂ EMISSIONS (THOUSAND TONNES)

3.5 percent increase from 2011

96.18

NO_x EMISSIONS (THOUSAND TONNES)

11.8 percent decrease from 2011

740

MERCURY EMISSIONS (KILOGRAMS)

12.6 percent decrease from 2011

102

ANNUAL PRIORITY SPILLS (NUMBER)

5.2 percent increase from 2011

51.97

CO₂ eq EMISSIONS (MILLION TONNES)

4.5 percent decrease from 2011

50

COMPANIES WITH PLANS TO ADAPT TO THE IMPACTS OF CLIMATE CHANGE (PERCENT)

6.4 percent increase from 2011

50

COMPANIES WITH MEASURABLE BIODIVERSITY OBJECTIVES (PERCENT)

0 percent change from 2011

CEA member performance environmental

The electricity sector is committed to reducing its environmental footprint through investments in advanced technologies and enhanced environmental management practices.



Brilliant Dam and Powerhouse on the Kootenay River is owned by Columbia Power Corporation and operated by FortisBC. Courtesy of FortisBC.



Principle 1: Environment

Minimize the adverse environmental impacts of our facilities, operations and businesses

Reduction of environmental impacts of sector operations is a priority for CEA members. Similar to other capital-intensive sectors, electricity generation, transmission, and distribution can contribute to negative environmental impacts. While some impacts are inevitable during large-scale infrastructure development and maintenance operations, utilities make a significant effort to minimize such impacts through effective compliance with all applicable laws and regulations, as well as through the implementation of best management practices.

Use of standards, such as ISO 14001 Environmental Management System (EMS), is also crucial in identifying a utility's environmental aspects and in setting objectives, targets and programs to improve its overall environmental performance. As **Table 2** illustrates, by the end of 2012, 83 percent of CEA Corporate Utility Members had an ISO 14001 or equivalent EMS in place (equivalent systems must cover all elements of ISO 14001). This is a reduction from 2011 because two companies identified that they have gaps in their EMS and were only in partial conformance with the standard. Work is currently underway to correct these gaps at these two utilities. This level of conformance with ISO 14001 is a major achievement by CEA member companies in their quest for responsible management of environmental issues.

Table 2 | Status of EMS Implementation

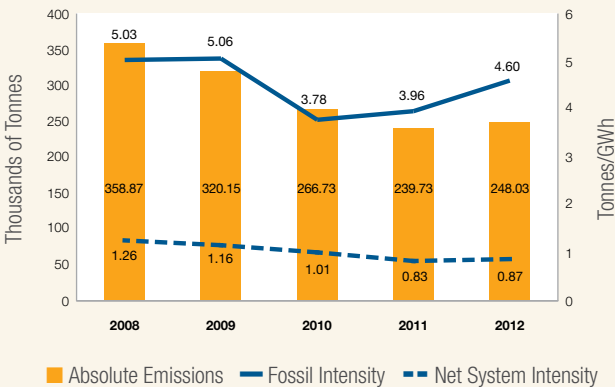
	2011	2012
ISO 14001 or equivalent Environmental Management System	87 percent	83 percent
EMS audited by an external/internal auditor within the last three years	80 percent	87 percent

While the sector takes all necessary steps to minimize environmental impacts, there are exceptions. In 2012, three CEA member companies reported five non-compliance fines for a total of \$24,437 for violating applicable federal/provincial/territorial laws and regulations. There were no fines in 2011. In addition, in 2012 there were 11 non-compliance notices and orders. While non-compliance orders and notices range in offence from incidents of negative environmental impact to administrative violations, meeting legal obligations is considered a minimum performance requirement. The companies that received notices and/or orders took immediate action to meet all immediate compliance requirements and prevent future violations.

AIR EMISSIONS: OVERALL TRENDS

The electricity sector as a whole is responsible for about 25 percent of sulphur dioxide (SO₂) emissions and 10 percent of nitrogen oxide (NO_x) emissions in Canada.⁵ In 2012, CEA member companies were responsible for approximately 248.03 thousand tonnes of SO₂, an increase of 3.5 percent from 2011 levels. While overall coal-fired generation in Canada declined, a few CEA member utilities increased their coal-fired generation in 2012, contributing to the increase in SO₂ emissions. While year-over-year emissions will continue to fluctuate, the overall five-year trend is encouraging. Compared to 2008 levels, SO₂ emissions of CEA member utilities have decreased by 30.9 percent. Both the fossil and the net system intensity of SO₂ emissions increased from 2011 to 2012, but it is still much lower relative to five years ago. Major drivers behind this decrease have been Ontario's coal unit shutdown, a transition to lower-emitting fuels (including natural gas), and investments in pollution-prevention technologies. **Figure 2** shows the SO₂ emissions of CEA member companies over the past five years, as well as fossil and net emissions intensity.

Figure 2 | SO₂ Emissions and Intensity

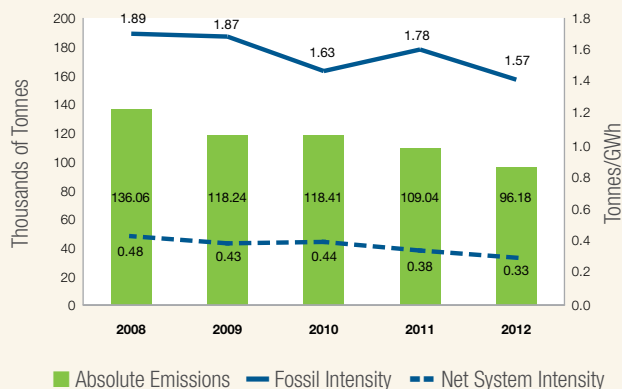


Note: System and fossil intensity figures are based on net generation of existing CEA generation companies. The above system intensity (all generation sources) would be even lower if all electricity producers in Canada were included.

Of the 94 percent of generation utilities that reported NO_x emissions, there has been a decrease of 11.8 percent from 2011 to 96.18 thousand tonnes in 2012. Several companies contributed to the decrease including BC Hydro, ATCO Power, Capital Power, TransCanada, New Brunswick Power, and Nova Scotia Power. Relative to 2008, CEA member companies have reduced their NO_x emissions by 29.3 percent, including a decrease of NO_x fossil net intensity by 16.7 percent. **Figure 3** shows the NO_x emissions of CEA member companies over the past five years, including emissions intensity levels.

5 Environment Canada, *National Pollutant Release Inventory*, 2011
<http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=B85A1846-1>

Figure 3 | NO_x Emissions and Intensity



Note: System and fossil intensity figures are based on net generation of existing CEA generation companies. The above system intensity (all generation sources) would be even lower if all electricity producers in Canada were included.

AIR EMISSIONS: POLICY FRAMEWORK

CEA and its members are continuing to work with governments and other stakeholders on the proposed Air Quality Management System (AQMS). Building on the principles of the Comprehensive Air Management System proposed by a multi-stakeholder group (including CEA) in 2010, the Canadian Council of Ministers of the Environment (CCME) agreed to begin the development of an AQMS in 2011, which is now entering its final phase of development. The five air management elements of the AQMS include developing the Canadian Ambient Air Quality Standards (CAAQS), the Base Level Industrial Emissions Requirements (BLIERs), provincial and territorial air zones, federal regional air sheds and a mechanism to collaborate on mobile source emissions.

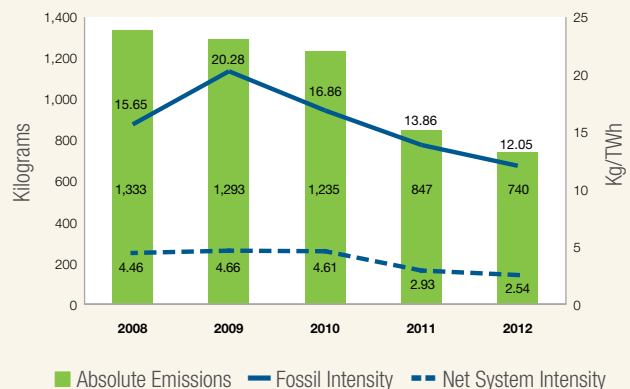
The electricity sector remains committed to the principles of the AQMS, but wants to ensure that the elements of the proposed system are realistic and achievable, especially in the application of additional BLIER requirements for existing coal-fired units regulated under the federal greenhouse gases (GHG) regulation. A non-duplicative regulatory system that is predictable, timely and efficient will have lasting benefits for communities and will ensure that electricity customers continue to get reliable, sustainable, and affordable power at a time when the electricity sector is making major investments in infrastructure.

MERCURY

The electricity sector, responsible for about 33 percent of mercury emissions in Canada⁶, is continuing to make progress in emission reductions. In 2012, CEA member mercury emissions were 740 kilograms, 12.6 percent lower than in 2011. From 2008–2012 CEA members have achieved a 44.5 percent decrease in mercury emissions (**Figure 4**) through the reduction of coal-fired generation and the application of innovative technologies such as Activated Carbon Injection systems. Investments in mercury abatement technologies will continue as companies work toward meeting the Canada-Wide Standard for Mercury from coal-fired power plants.

CEA and its members are also supportive of the United Nations Environment Program (UNEP) process to address global mercury emissions, under which the UNEP Intergovernmental Negotiating Committee recently agreed on a legally binding Convention on further reducing global mercury emissions (the Minamata Convention), including mercury emissions from coal-combustion in developing countries.

Figure 4 | Mercury Emissions and Intensity

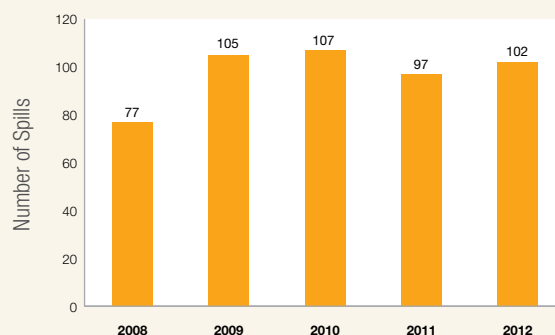


Note: System and fossil intensity figures are based on net generation of existing CEA generation companies. The above system intensity (all generation sources) would be even lower if all electricity producers in Canada were included.

PRIORITY SPILLS

Priority spills continue to fluctuate annually and are a challenge that the sector will have to address. Priority spills are defined as a petroleum spill that is over 500 litres, contains over one gram of polychlorinated biphenyls (PCBs), and any volume of petroleum based or PCBs contaminated substance that enters a water body. Since 2011, priority spills increased by 5.2 percent (**Figure 5**). While generally companies take steps to prevent major spills through regular inspection, risk assessment, and replacement of aging equipment, spills do occasionally occur as a result of extreme weather conditions, aging transformers, fires, and incidents of vandalism. In such situations, companies respond according to all applicable procedures and regulatory requirements to minimize any adverse environmental impacts and remediate and restore affected areas. CEA member companies are also investing in various oil containment strategies and technologies to further reduce these spills, but more work must be undertaken to improve performance.

Figure 5 | Annual Priority Spills

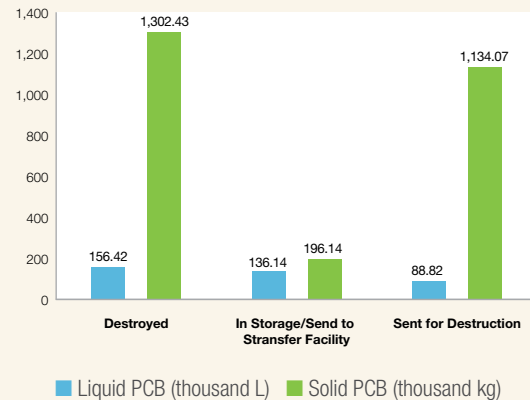


⁶ Environment Canada, *National Pollutant Release Inventory*, 2011
<http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=B85A1846-1>

PCB MANAGEMENT

PCBs are a group of organic compounds historically used as coolants and lubricants in transformers, capacitors, and other electrical equipment. Due to their potential adverse impacts when released into the environment, PCBs require special handling, storage, and disposal measures. CEA members are working diligently to meet the new federal regulations on the release, manufacture, import/export, sale, destruction, and use of products containing PCBs, and are committed to complying with the regulations. For example, Manitoba Hydro continued to identify all bushings that contain or may contain 500 parts per million or more of PCBs in 2012 with the intent to replace or end of the use of these bushings by December 2014 as required by these regulations. In 2012, CEA introduced new performance metrics to track member progress towards regulatory compliance. **Figure 6** shows a baseline of PCB's destroyed, in-storage, and sent for disposal either in liquid or solid forms in 2012, as per the regulatory requirement. Future performance reports will highlight the progress made on this issue on a year-over-year basis.

Figure 6 | PCB Management



Brilliant bridge crossing the Kootenay River near Castlegar just downstream of the Brilliant Dam. *Courtesy of FortisBC.*

How CEA Members are Minimizing their Environmental Impacts

ATCO Electric Phases out PCBs from its Distribution System

In 2012, ATCO Electric completed the phase out of equipment greater than 50 milligram/kilogram of PCB oils from its distribution system, which is well ahead of the 2025 regulatory deadline. Following an extensive testing program to inventory all equipment that contained PCB oils, ATCO Electric worked diligently to replace the identified equipment. In the coming years, ATCO Electric plans to remove the equipment that has less than 50 mg/kg of PCBs as part of its routine maintenance/replacement program to ensure accidental releases of PCBs to the environment are eliminated.

EPCOR Utilities Inc. Using New Technology to Detect Potential Oil Leaks

EPCOR is using a new technology for rapid and more accurate detection of oil leaks in underground oil-filled electrical transmission cables. It is using thermocouples (sensors that measure temperature) placed in the ground and on the transmission pipe to monitor both the temperature in the ground and on the pipe. Temperature helps determine the amount of oil in the pipe. By predicting the flow of oil in the pipe and comparing it to what is happening at a particular moment (through the new instrumentation), it is possible to see a leak develop when the two trends deviate. This results in better detection of leaks and repairs.



Wind turbines in the community of Ramea, Newfoundland and Labrador. *Courtesy of Nalcor Energy.*

Newfoundland and Labrador Hydro's Wind-Hydrogen-Diesel Energy Project

Many coastal isolated communities in Canada's easternmost province rely on diesel-fuelled generation systems for electricity. To reduce diesel generation and emissions, Newfoundland and Labrador Hydro commissioned an innovative wind, hydrogen and diesel integrated project in the community of Ramea. During 2012, commissioning work was completed on the energy-management system and the project moved into the operational phase. Operational data will play an important role in determining how this technology can be effectively used in other isolated communities.

Nova Scotia Power is Moving Ahead with a Number of Renewable Energy Projects

Some of the renewable energy projects include partnerships with well-established Nova Scotia companies on three wind projects: a 78 megawatt (MW) and a 24 MW project southwest of Windsor, collectively known as the South Canoe Wind Project, as well as the 13.8 MW Sable Wind Project. Nova Scotia Power is a minority partner (49 percent) in all three projects. In addition, Nova Scotia Power affiliate Maritime Link is seeking regulatory approval for a proposed undersea cable that would connect the electrical grids of Nova Scotia and Newfoundland, and enable the transmission of renewable electricity from the proposed Muskrat Falls hydroelectric dam in Labrador.

Ontario Power Generation Converting Coal-Fired Station to Biomass

Ontario Power Generation is proceeding with the construction of the \$170-million Atikokan Generation Station (GS) biomass conversion project. With a generating capacity of more than 200 MW, Atikokan GS will be one of the largest 100 percent biomass-fuelled plants in North America, providing renewable electricity generation sourced from

sustainably-managed forests. Creating about 200 construction jobs, the project includes plant modifications to provide peak-generating capacity and the construction of a fuel storage and handling system that can manage up to 90,000 tonnes of biomass fuel annually. The project is expected to be completed in 2014.

Saint John Energy Uses Sorb Web to Capture Oil Spills

To protect a stream and wetland near a new substation, Saint John Energy purchased and installed a Sorb Web secondary-oil-containment system around the power transformer. It is designed to contain 110 percent of the oil volume of the power transformer and has a 25 year life. The Sorb Web system works by allowing non-hydrocarbon liquids such as rain to flow through the Sorb Web material, but traps any hydrocarbon liquids, which cause the membrane to gel and stop the flow of hydrocarbon.

Saskatoon Light and Power's Landfill Gas Generating Project

Its first generation project in 100 years, Saskatoon Light and Power has started construction of a new Landfill Gas-to-Energy Project at the Saskatoon Landfill that will generate 1.6 MW using the landfill methane. The project will remove over 45,000 tonnes of greenhouse gas emissions from the landfill (equal to taking about 9,000 vehicles off the roads each year), improve air quality while reducing odours at the Landfill, and generate enough power for 1,300 homes. The plant will be operational in January 2014.

SaskPower Spills Database Aids Tracking and Reporting

A new Spill Incident Database is helping SaskPower better manage its environmental performance by centrally tracking and monitoring all spill incidents. The database was implemented in 2012 and is proving to be an efficient tool for tracking and reporting. It includes location and type of spill, root cause analysis and corrective and preventative actions. The company uses the database for both reportable and non-reportable spills.



Biomass conversion construction activities at Ontario Power Generation's Atikokan Generating Station, which will be one of the largest capacity 100 per cent biomass fuelled power plants in North America. *Courtesy Ontario Power Generation.*

Principle 2: Stewardship and Biodiversity

Manage the environmental resources and ecosystems that we affect to prevent or minimize loss and to support recovery



Electricity sector operations have varying levels of impact on ecosystems and biological diversity and CEA members are committed to minimizing these impacts and preserving the environment. While many endangered species and plants are protected under federal and provincial legislation, CEA members make a considerable effort to ensure the conservation of these species and plants near their generation facilities and transmission right-of-ways. Since 2010, CEA members have been reporting their biodiversity performance against a series of indicators supported by a business declaration under the UN Convention on Biological Diversity. While these indicators do not directly measure the impacts on species and their habitat, they provide important insights into how companies are managing biodiversity issues in their daily activities.

Since the introduction of these metrics in 2010, integration of biodiversity considerations by CEA member companies has increased considerably. While certain companies have been leaders in this area for some time, others are just starting programs to address this issue. As a sector, the performance in this area keeps improving steadily. As **Table 3** illustrates, performance in 2012 improved in several areas compared to the previous year, including: analysis of corporate activities on biodiversity; management coordination of issues related to biodiversity; engagement of suppliers; and improved partnerships with stakeholders. This change in performance is attributable to greater integration of biodiversity considerations by Capital Power Corporation and Columbia Power Corporation. Integration of these considerations will allow companies to identify their biodiversity and ecosystem impacts and address them effectively in the future.

CEA members work closely with all levels of government, conservation authorities and other stakeholders on issues such as biodiversity conservation, water quality and other ecosystems-related issues. In 2012, Ontario Power Generation (OPG) became the first Canadian organization to receive the *Pollinator Advocate Award* from the Wildlife Habitat Council (WHC) in recognition of its efforts to improve the habitat for pollinating insects on OPG lands, and in other community locations, and for its efforts to educate the public. In addition, 14 of the company's sites are Wildlife at Work certified by the WHC, and six sites are Corporate Lands for Learning certified by the Council.

Along with these initiatives, CEA and its members are actively working with the federal government on issues associated with *the Fisheries Act*, *Species at Risk Act*, and the *Migratory Birds Convention Act*, primary pieces of federal legislation dealing with aquatic and terrestrial species. While the sector is very supportive of species conservation, there are concerns regarding these Acts. Key concerns include: the inability to obtain permits, the lack of socio-economic considerations during recovery planning, and the lack of clarity surrounding key definitions and the interpretation of these Acts. Conservation agreements have been identified as the preferred means to link stewardship to compliance; however, government emphasis has been placed on enforcement of prohibitions.

Table 3 | Integration of Biodiversity Considerations into Company Activities

	2011	2012
Analyze corporate activities with regard to their impacts on biodiversity	73 percent	80 percent
Responsible individual within the company to steer all activities in the biodiversity sector and report to the Management Board	53 percent	60 percent
Measurable biodiversity objectives that are monitored and adjusted every two to three years	50 percent	50 percent
Publish activities and achievements on biodiversity in an annual report	60 percent	60 percent
Inform suppliers about the company's biodiversity objectives and engage them to integrate similar objectives	30 percent	30 percent
Explore the potential for cooperation with stakeholders with the aim of deepening dialogue and improving the corporate management system vis-à-vis biodiversity	70 percent	73 percent

Access roads built entirely of snow and ice to protect the ground in the sensitive sand dune area. Courtesy of AltaLink Management Inc.



How CEA Members are Managing their Impacts on Ecosystems and Biodiversity

AltaLink Uses an Icy Solution to Protect Sand Dune Areas

The construction of a new transmission line in southern Alberta needed an innovative approach by AltaLink to reduce potential environmental impacts. The Casills to Bowmantown Transmission Project is a 131 kilometre line that crosses a sensitive sand dune area. Since construction traffic and activities can cause vegetation loss, soil rutting and erosion without proper mitigation, AltaLink waited until the winter months to begin the project. To protect the dunes, AltaLink built access roads entirely of snow and ice to protect the ground underneath.

ATCO Electric's Avian Protection Program

ATCO Electric was one of the first utilities in Canada to formalize an avian protection initiative. In 2012, ATCO Electric retrofitted existing power line structures in southeastern Alberta to reduce the number of bird electrocutions. This retrofit will also improve the reliability of electricity supply to customers as bird-caused outages are significantly reduced. The affected birds include hawks, owls, ravens and sparrows. The project scope included installation of covers for transformer bushings, lightning arrestors, cutouts, conductors and guy-strain insulators, as well as the installation of perch deterrents. Most of the southeastern region of ATCO Electric's service area has already benefited from this multi-million dollar retrofit, which will be expanding to the north in 2013.

FortisAlberta's Integrated Planning Reduces Land Use

In 2012, FortisAlberta began an integrated planning project with the Alberta government and the Pengrowth Energy Corporation for three projects in Judy Creek, Alberta with the goal of aligning disparate regulatory processes through early engagement and coordination of proposed linear developments. FortisAlberta's plan proposed to overlap a typical 15-metre distribution power line right-of-way entirely with a parallel access road and pipeline, effectively negating the need for new clearing to accommodate the electricity-service installation. FortisAlberta and Pengrowth achieved a reduction in the overall cleared footprint of 1.5 hectares per kilometre of linear development, reducing the new footprint for the three projects by 4.5 hectares, approximately the size of eight football fields.

Hydro One Develops Biodiversity Solution Using Geographic Information Systems

Hydro One has created a Biodiversity Advisory Committee to develop policies, guidelines and mechanisms to evaluate biodiversity-related initiatives. One initiative is the development of a Geographic Information Systems (GIS) solution to document commitments made by lines of business to promote biodiversity. This GIS solution encourages the sharing of information to ensure commitments made by one line of business to promote a biodiversity project will not be contravened by other lines of business during the execution of their work activities.

Newfoundland and Labrador Hydro Protects UNESCO Site

The rebuilding of an 18.5 kilometre distribution line along the foothills of the Tablelands within Gros Morne National Park, A UNESCO World Heritage Site, created special challenges for Newfoundland and Labrador Hydro. The original line, built in 1968, traverses a unique habitat along one of the most spectacular view planes within the province. Reconstructing the original line would result in prolonged customer outages, significant environmental risk, and a two-year construction period. Instead, Newfoundland and Labrador Hydro decided to rebuild the existing line adjacent to the main road to Trout River and avoid damaging the surrounding ecosystem and the World Heritage Site.



ATCO Electric contractors erect one of more than 30 ferruginous hawk nest platforms in southeastern Alberta. Courtesy of ATCO Electric.

INNOVATIVE MEASURES TO MANAGE THE IMPACTS FROM SECTOR OPERATIONS ON FISH AND FISH HABITAT: HABITAT BANKING

With the priority of governments and the electricity sector being focused on improving the regulatory system for the review and approval of development projects, there is a demand for innovative ways to achieve the balance of economic development and the conservation of species and habitats.

In the Budget 2012, the Government of Canada announced its commitment to make fundamental changes to the federal laws applied to the review and permitting of development projects. On July 6, 2012, the *Jobs, Growth and Long-term Prosperity Act*, aimed at implementing Budget 2012, became law. Part 3 of the Act amended legislation applied to the review and permitting of development projects across Canada, including the *Fisheries Act*. In amending the *Fisheries Act*, the government signalled its intent to adopt a “more sensible and practical approach to protecting Canada’s fisheries” by moving away from “habitat protection” to “fisheries protection”.

The shift is primarily enabled by combining sections 35 and 32 into a new section 35, which requires that no person shall carry on any work, undertaking or activity that result in “serious harm” to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. Serious harm to fish is defined as the death of fish or any permanent alteration to, or destruction of, fish habitat. However, this will only apply to fish and fish habitat that provide for the sustainability and ongoing productivity of commercial, recreational or Aboriginal fisheries. The shift is also driven by new statutory factors that must be considered in making decisions to approve serious harm to fish including whether there are measures and standards to avoid, mitigate or offset serious harm to fish that are part of the protected fisheries.

These changes to the *Fisheries Act* provide project proponents with the opportunity to adopt innovative measures to manage the impacts of their development projects on fish and fish habitat, including the offsetting of serious harm to fish through use of Habitat Conservation Banking (HCB). HCB (also referred to as conservation banking, biodiversity banking, conservation banking, or habitat banking) was first introduced by the Department of Fisheries and Oceans Canada (DFO) in its operational policy on fish habitat compensation (*2002 Guide to Fish Habitat Compensation*) as an option to offset unavoidable residual impacts to fish habitat after all measures had been taken to avoid and mitigate such impacts. HCB represents a widely-used effective and efficient means of offsetting authorized unavoidable residual losses of species and their habitats and ecosystem services associated with development projects, while delivering beneficial conservation outcomes.

The concept was first introduced in the United States in the mid-1980s, and it has been adopted by other countries such as the United Kingdom, Australia, France and Germany. While research on HCB in Canada has been focused to date on offsetting unavoidable residual harm to fish habitat, habitat-banking programs in other countries have demonstrated that the concept can be more broadly applied (to such areas as wetlands, species at risk, wildlife and their habitats). The practice is evolving, and further policy guidance, regulations and management tools are required to further advance the concept of habitat banking in Canada as a practical and viable option for addressing offset requirements under the *Fisheries Act*.

A key component of Habitat Conservation Banking is an agreement that establishes a value of credits that proponents purchase from the Habitat Bank to offset unavoidable “serious harm to fish” (as defined in the amended *Fisheries Act*) from development projects that meet the requirements for obtaining an authorization under section 35 of the amended *Fisheries Act*. A Habitat Banking Agreement would represent a formal agreement to establish a bank site or purchase credits from an existing bank site.

CEA, in collaboration with other industry associations, environmental organizations and DFO, has been supportive of research studies and workshops on the application of HCB under the amended *Fisheries Act*. CEA continues to monitor the development and operationalization of offsetting and HCB in Canada, and sees it as a potentially useful tool for protecting habitat.



Fish swimming in British Columbia's bountiful ecosystem.
Courtesy of BC Hydro.

Principle 3: Climate Change

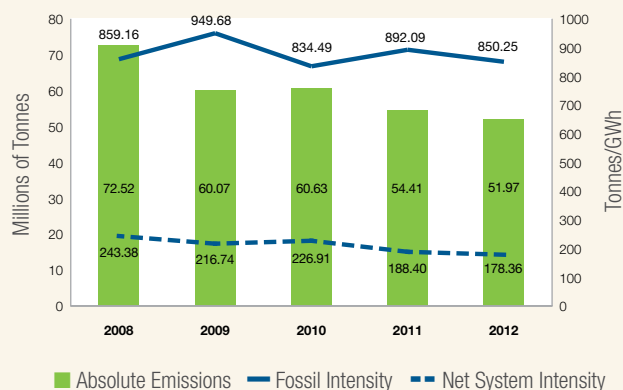
Manage greenhouse gas emissions to mitigate the impact of operations on climate change, while adapting to its effects



CLIMATE CHANGE MITIGATION

Climate change remains a major sustainability issue for the electricity sector. Currently responsible for about 13 percent of carbon dioxide equivalent (CO₂ eq) emissions in Canada, the electricity sector emissions profile continues to improve. In 2012, CEA member CO₂ eq emissions were at an all-time low of 51.97 million tonnes, a reduction of 4.5 percent from 2011 (**Figure 7**). Both the fossil and system emissions intensity levels also improved relative to the previous year due to slight changes in the fuel mix. With new investments in innovative clean technologies, renewable generation, smart grid applications and customer energy conservation, CO₂ emissions will continue on a downward trajectory. CEA members across Canada are investing or partnering with independent power producers on renewable generation. In 2012, CEA members either generated or purchased just over 10,000 gigawatt-hours of electricity from wind and other renewable sources. With the sector moving to a lower carbon future, it is well-positioned to advance CO₂ reductions in other sectors, such as transportation. With increased investment in electric vehicles and associated infrastructure, the electricity sector in Canada will play a crucial role in the reduction of overall Canadian emissions over the long-term.

Figure 7 | CO₂ eq Emissions and Intensity



Note: System and fossil intensity figures are based on net generation of existing CEA generation companies. The above system intensity (all generation sources) would be even lower if all electricity producers in Canada were included.

In 2012, the federal government finalized the regulation on the reduction of CO₂ emissions from coal-fired generation. The regulation will require all existing coal-fired electricity generation units, upon reaching the end of economic life (50 years), to meet a CO₂ emission standard of 420 tonnes per gigawatt-hour. New units will also be required to meet this standard; however, it will not apply to these units until 2025, provided they are carbon capture and storage ready. The regulation will come into effect on July 1, 2015.

CLIMATE CHANGE ADAPTATION

While the focus over the last decade has been on climate change mitigation, adaptation has become one of the biggest emerging issues for the electricity sector. Canadian and international research indicates that climate change is affecting Canada's provinces and territories through permafrost degradation, reduced ice and snow cover, coastal erosion, forest fires, reduced water levels, and temperature fluctuations. This is a concern for many CEA members. Exposure to extreme weather events is expected to impact the reliability and resiliency of Canada's generation, transmission, and distribution networks. Seasonal variability of precipitation, temperature, evaporation, and lake levels are the key elements of concern. All stakeholders, including governments, must work to address this issue on a more urgent level.

CEA is working with member utilities to further raise awareness of this issue and encourage them to integrate climate adaptation into their daily operations. In 2012, CEA formalized a working group on climate adaptation that is currently working to understand risk assessment tools and the vulnerabilities of their operations to climate change. Several member companies also continue to work with organizations such as the Ouranos Consortium, the University of Waterloo (Climate Change Adaptation Project: Canada), the WeatherWise Partnership, the Institute of Electrical and Electronics Engineers, the Pacific Climate Impacts Consortium, and others, to further advance the understanding of climate impacts and develop appropriate standards and tools for existing and new electricity infrastructure.

In 2012, only 50 percent of CEA member companies had plans to adapt to the impacts of climate change, or analyzed potential vulnerability of their operations to climate change, and while 53 percent have developed partnerships with external organizations (**Table 4**). Even fewer companies published their activities and achievements in reference to adaptation in their company reports. There is much room for improvement in this area and CEA is working with members to further raise awareness of this issue. Failure to adapt to climate change may impact the resiliency of the electricity system in the future.

Table 4 | Integration of Climate Change Adaptation Issues

	2011	2012
Companies with plans in place to adapt to the impacts of climate change	47 percent	50 percent
Companies that conduct research or analysis to assess potential vulnerability to climate change and to identify adaptation strategies	50 percent	50 percent
Companies that identify/publish activities and achievements in reference to adaptation in the company's annual, environment, and/or corporate social responsibility report	43 percent	40 percent
Companies that explore the potential for cooperation with institutions, non-governmental organizations, and/or government institutions with the aim of deepening dialogue and continuously improving the corporate management system vis-à-vis climate adaptation	47 percent	53 percent

How CEA Members are Managing Greenhouse Gas Emissions and Adapting to Climate Change

BC Hydro Assessing Climate Change Impacts

BC Hydro is assessing the potential effects of extreme weather and long-term changes in climate on the organization's business operations. From 2007 to 2011, BC Hydro partnered with the Pacific Climate Impacts Consortium and the Western Canadian Cryospheric Network to understand how the water supply and timing of runoff might change out to 2050 for three key British Columbia watersheds. The study results were made public in 2012, and the company is now integrating the results into its decision making and long-term planning.

City of Medicine Hat Invests in Solar Thermal Project

City of Medicine Hat Solar Thermal Project intends to harness solar energy and integrate it within the City's natural gas-fired power plant to reduce air emissions and fuel consumption while responding to day-time spikes in energy demand without burning additional fossil fuels. The project, expected to reduce CO₂ emissions by 600 tonnes per year, is located directly adjacent to a city owned 204 MW gas-fired combined-cycle power station and will consist of multiple solar collector assemblies (SCAs) designed to focus and concentrate the sun's light. These SCAs are parabolic-shaped mirrors erected in the solar field, focusing the sun's rays, converting that energy to steam and then connecting it to the City's existing electrical generation system. The project is the first of its kind in Canada and will be the highest latitude solar thermal project in the world. Having already completed the regulatory approvals in 2012, the construction is currently underway. Final commissioning is expected in fall 2013.

Horizon Utilities' Climate Change Adaptation Strategy Report

In 2012, Horizon Utilities teamed up with Navigant Consulting to produce a report detailing climate change scenarios, potential impacts on the company, and strategies to address these impacts over the next 20 years. The report presents recently-prepared climate-change data and findings, and an adaptation strategy designed to minimize the risk to Horizon Utilities' electric delivery system. The report also frames key issues and offers an action plan designed to implement the strategy. The action plan highlights changes in infrastructure, operations and procurement.

Manitoba Hydro Assessing the Carbon Footprint of Major Projects

Manitoba Hydro is working with the Pembina Institute to assess the life-cycle GHG implications of planned major generation and transmission projects. The methodology accounts for GHG emission impacts throughout the life of a project, including emissions associated with construction components and materials; construction activities and equipment operation; land clearing and other land-use change impacts including reservoir creation; and operation and maintenance throughout the life of the project. These assessments demonstrate that the GHG emissions associated with hydro projects are very small and comparable with those of wind projects.

SaskPower is Leading Development of Carbon Capture and Storage

SaskPower is leading the development of the world's largest post-combustion Carbon Capture and Storage (CCS) project—the first in the world to fully integrate CCS technology with commercial-scale coal-fired generation. Construction of the Boundary Dam Integrated Carbon Capture and Storage Demonstration Project continued throughout 2012, and is on schedule for commercial operation on April 1, 2014. The project will reduce CO₂ emissions by up to 90 percent, capturing one million tonnes of post-combustion CO₂ emissions every year.

Toronto Hydro Portable Work Site Leads to GHG Emission Reductions

Toronto Hydro created a new portable work site to minimize the time and distance that large construction vehicles must travel to construct capital projects. Their two project crews reported directly to the new site, which was very close to the work being completed. The benefits achieved were

a reduction in carbon footprint through a reduction in emissions from Toronto Hydro vehicles, as well as reduced fleet reactive maintenance and fuel costs, all stemming from reduced driving time.

Yukon Energy Studying Effects of Climate Change on Glaciers

In 2011, Yukon Energy partnered with scientists from the Yukon's Northern Climate ExChange, the University of Alberta and the Yukon Geological Survey to research the impacts of climate change on the glaciers that feed its largest hydro generating station. The research identified a number of information gaps, suggesting that more study be done on the large and potentially-sensitive Llewellyn Glacier. In 2012, the researchers installed two monitoring stations in the Fantail River basin—the headwaters of the Yukon River. The stations will record information such as air temperature, precipitation and solar radiation. With this network of long-term weather stations, the researchers will be able to recognize the differences between climatic changes and year-to-year or cycle-to-cycle weather variations.



Interior of Boundary Dam Power Station Unit #3 during the rebuild work undertaken to integrate the unit with the Carbon Capture Facility. Courtesy of SaskPower.



Marked nestling Ferruginous Hawks.
Photo credit: Melynda Johnson; courtesy of AltaLink.



CASE STUDY: ENVIRONMENT

ALTALINK WORKS TO RECOVER FERRUGINOUS HAWKS

Twenty years ago, a Ferruginous Hawk soaring above the Alberta prairies was a common sight. Today Ferruginous Hawks are an endangered species, with numbers estimated at 643 breeding pairs, down from 1,700 breeding pairs just two decades ago. The loss of native prairie habitat from industrial and agriculture development is believed to be one reason for the decline.

Ferruginous Hawks sometimes nest on transmission line structures. While the presence of the lines themselves does not harm Ferruginous Hawks, construction activities for new facilities may have an impact, especially when they are breeding, nesting and fledging. AltaLink is in the midst of a busy construction period and recognizes its construction activity in southern Alberta overlaps areas of Ferruginous Hawk habitat. The company is committed to protecting natural areas and wildlife, and has been conducting stewardship activities to aid in the recovery of Ferruginous Hawks in southern Alberta.

Since Ferruginous Hawks were designated as endangered under the Alberta Wildlife Act in 2006, AltaLink has played a critical role in the protection and recovery of the species. In 2007, it represented Alberta's electric utilities on the Ferruginous Hawk Recovery team made up of researchers, industry and community stakeholders. The team was tasked with evaluating whether the species could be recovered and, if so, to develop a recovery plan to bring back the number of hawks to a sustainable threshold.

In 2010, following publication of the recovery plan, AltaLink provided \$75,000 to the Alberta Conservation Association's MULTISAR (Multiple Species at Risk) group to perform a detailed Ferruginous Hawk population inventory. As part of the inventory, biologists assessed nesting sites in 142 study area plots throughout southern Alberta. The inventory results found that the population was low but stable compared to a previous inventory taken in 2005; however, the population was significantly lower than in the 1990s. This indicated there was a lot of work to do to ensure a sustainable Ferruginous Hawk population.

The availability of nesting sites is a major factor contributing to the endangerment of Ferruginous Hawks. To help with this, AltaLink partnered with two not-for-profit groups, MULTISAR and Operation Grasslands Community, to install nesting platforms to aid in the recovery of the Ferruginous Hawk population. Since 2008, AltaLink has donated equipment, materials and labour for the installation of 13 nesting platforms.

AltaLink's most recent Ferruginous Hawk recovery effort is a funding partnership with the University of Alberta research group, Raptor Ecology and Conservation Team (REACT). AltaLink has committed \$300,000 over three years to better understand the biology and ecology of the hawk. The project started in 2010 and is now entering the third and final year of the study. REACT is evaluating all life-history stages of the hawk that occur in Canada (such as nesting, rearing, and post-fledging) and will build a habitat suitability map that will be used to predict areas of suitable and preferred habitat within the grassland region of Alberta.

Through the use of satellite telemetry, the research group is also looking at home range use to determine how hawks react to existing and new development. In addition, REACT is investigating the behaviour of nesting hawks and how disturbances affect behaviours in the nest area.

All the data REACT collects will be instrumental in determining significant factors in the decline of the hawk. Once the factors are determined, the information will assist governments and industry in developing best-practice management plans and will be a crucial component for the federal government when identifying critical habitats for the hawk.

AltaLink is proud to be a partner in Ferruginous Hawk research in Alberta. Ferruginous Hawks are an iconic prairie species. With industry, government and land managers working together, this hawk will be soaring over the plains for generations to come.

Key Performance Highlights

Green indicates improved performance and orange indicates decreased performance (relative to 2011)

57

COMPANIES THAT PRODUCE A SUSTAINABILITY/CORPORATE SOCIAL RESPONSIBILITY OR SIMILAR REPORT (PERCENT)

9.6 percent increase from 2011

77

COMPANIES WITH A FORMAL STAKEHOLDER ENGAGEMENT POLICY OR DOCUMENTATION PROCESS (PERCENT)

5.5 percent increase from 2011

1.57

ALL INJURY/ILLNESS FREQUENCY RATE (INJURIES PER 200,000 HOURS)

21.1 percent decrease from 2011

0.50

LOST-TIME INJURY FREQUENCY RATE (LOST-TIME INJURIES PER 200,000 HOURS)

35.1 percent decrease from 2011

12.13

LOST-TIME INJURY SEVERITY RATE (LOST-TIME INJURIES PER 200,000 HOURS)

20.6 percent decrease from 2011



CEA member performance

social

The electricity sector's sustainable development strategy includes nurturing quality relationships with its employees and external stakeholders. The sector strives to ensure that it provides a safe and respectful workplace for employees, while building quality relationships with Aboriginal Peoples and communities in the vicinity of its operations.



Hydro One's crews aid in storm restoration efforts.
Courtesy of Hydro One Inc.

Principle 4: Health and Safety

Provide a safe and healthy workplace
for our employees and contractors



CEA member companies have demonstrated a long-standing commitment to the health and safety of their workers and to members of the public in the communities in which they operate. Recognizing the inherent risks associated with their business, member companies strive for excellence in health and safety by continually reducing risk factors to minimize injuries to workers and the public. This commitment has been achieved through strong leadership at the executive and operational levels, as well as through the development, implementation, and continuous refinement of respective occupational health and safety management systems in accordance with national and international standards.

In 2012, health and safety performance of CEA member utilities improved in all major safety categories. The All Injury/Illness Frequency Rate improved for the fifth consecutive year, while the Lost-Time Injury Frequency Rate and Lost-Time Injury Severity Rate improved significantly compared to the previous year. In addition, there were no employee fatalities in 2012, an important achievement for CEA member companies. The improved performance can be attributed to improved safety culture, enhancements in training, better internal communications, and more comprehensive incident investigation processes to promote lessons learned. These efforts are also supported through on-going collaboration of members through the CEA Occupational Health and Safety Committee (OHSC).

SAFETY PERFORMANCE: ALL INJURY/ILLNESS FREQUENCY RATE

In 2012, the AIF Rate was 1.57 injuries per 200,000 hours worked, a decrease of 21.1 percent from 2011. Since 2008, the rate has decreased by 46.4 percent (**Figure 8**). CEA members continue to focus on hazard identification, risk assessment and reduction, diligent safety training and education, and advanced risk control procedures in their quest for zero employee injuries.

SAFETY PERFORMANCE: LOST-TIME INJURY FREQUENCY & LOST-TIME SEVERITY RATES

The Lost-Time Injury Frequency Rate for all members was 0.50 injuries per 200,000 hours, a 35.1 percent decrease from 2011 (**Figure 8**). The Lost-Time Injury Severity Rate also decreased to 12.13 calendar days lost per 200,000 hours worked, a 20.6 percent decrease compared to 2011 (**Figure 9**).

Figure 8 | All Injury/Illness & Lost-Time Injury Frequency Rates

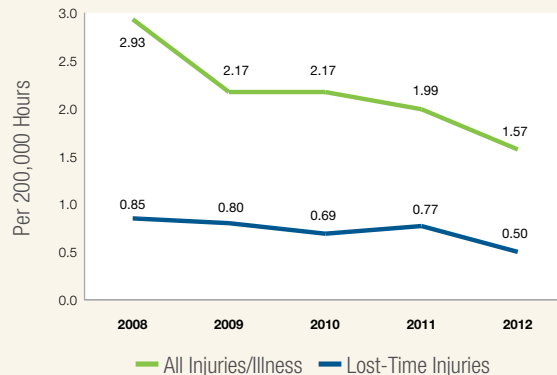
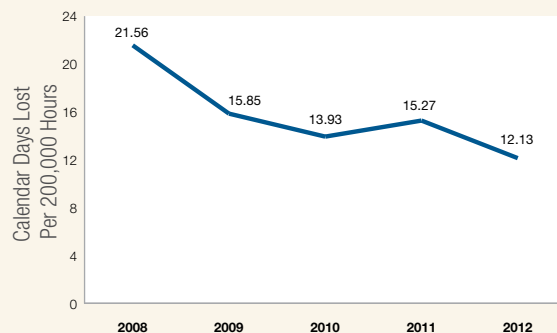


Figure 9 | Lost-Time Injury Severity Rate



In addition to the general focus areas noted above, CEA members have achieved these improvements in workplace health and safety statistics through their commitment to leading edge programming based on the following four specific success strategies:

Building Better Health and Safety Management Systems:

CEA members maintain mature risk-based health and safety management systems consistent with external standards (e.g., OHSAS 18001, CSA Z1000). These systems drive continuous improvement through Plan-Do-Check-Act management processes that reduce risk and ultimately result in fewer injuries. Examples of recent innovative improvements implemented by CEA members to further develop their management systems include more effective communications on health and safety responsibilities; increased worker training; the implementation of software systems to improve workplace inspections and access to procedures; more effective audits (including third-party audits) and corrective-action programs and improved return-to-work processes for injured workers.

Reducing Health and Safety Risks in the Workplace and in the Community: The electricity sector has traditionally identified exposure to electrical energy, working at heights and driving as the most significant sources of safety risk. These risks have been mitigated through effective prevention programming, and today these sources contribute a low number of injuries relative to the historical record. In fact, over the last five years worker injuries have typically resulted from over-exertion/repetitive motion involving the musculoskeletal system, slips and trips, or impacts with equipment and tools. CEA members have now turned attention to the reduction of risks associated with these injuries. They have established new preventive programming which increases employee awareness of musculoskeletal risks through training and communications; conducted ergonomic assessments; undertaken task/activity re-design and implemented employee-based ergonomic changes; provided employee fitness support; and responded to early signs of pain or discomfort.

Building a Strong Safety Culture: CEA members recognize that achieving safety excellence requires the buy-in and engagement of all employees. This fosters individual ownership and a broad-based commitment to safety. CEA members are implementing progressive programs based on psychological research and information from employee perception surveys. Examples include programs to develop enhanced supervisory leadership skills; raise all employees' awareness of their safety accountabilities; increase employee involvement in the reporting of safety-related issues and events; improve conversational skills used in discussions to resolve safety issues; and recognize safety leaders for their positive safety actions. There is also a focus on addressing the challenges of a changing workforce through redesigned new-employee orientation and mentoring programs.

Working Together as an Industry to Improve: CEA members have long understood that achieving health and safety excellence is a sector-wide effort. CEA's Occupational Health and Safety Committee (OHSC) provides a network of experienced health and safety professionals dedicated to developing strategies and initiatives that will improve the overall health and safety performance of the sector. Over the last five

years, one of the most notable achievements was the development of the *CAN/ULC-S801 Standard on Electrical Utility Workplace Electrical Safety for Generation, Transmission and Distribution* for use by all utilities in Canada. CEA members are continuing to address electrical safety issues through the implementation of this standard.

PROVIDING A SAFE AND HEALTHY ENVIRONMENT FOR THE PUBLIC

CEA members are committed to the reduction of risks associated with public contact with electrical equipment. Members actively promote public safety in their communities through communication campaigns targeted at all sectors of the public who may be exposed to electrical equipment, including emergency responders, children and the general population at home or in the workplace. In one initiative, CEA members collaborated with the Royal Canadian Mounted Police (RCMP) to produce a video, *Electricity...The Invisible Killer*, to educate first responders (police, fire, paramedics) about safety around high-voltage electrical utility systems.

While all utilities are committed to the reduction of public contact with electrical equipment, eliminating public electrical contacts altogether remains a challenge. Members promote public safety in their communities through initiatives such as classroom presentations, special safety events and media campaigns. In fact, many CEA member companies allocate significant resources to public safety awareness, including power line safety, dangers of metal theft, dangerous water and thin ice at hydroelectric reservoirs, and meter reader safety.

The OHSC has introduced a number of pilot indicators to track commitments to reducing public electrical contacts. According to those indicators, 90 percent of member companies had a public electrical education program and a commitment to ongoing partnerships with external agencies that contribute to the prevention of public electrical safety incidents. In 2012, there were three cases of public electrical accidents, compared to two in 2011.

How CEA Members are Protecting the Health and Safety of Employees, Contractors and the Public

AltaLink's Safety AI Keeps Safety Top of Mind

He's tall, two-dimensional and AltaLink blue. His name is Safety AI and he is AltaLink's new initiative aiming to keep safety top of mind. Safety AI is updated monthly with stickers resembling hazard symbols. The stickers are a snapshot of the location and frequency of injuries reported each month. When injuries are trending, it will be obvious by looking at Safety AI—if Safety AI's hands are covered in hazard symbols, it would reveal a pattern and should get employees asking

questions about the hazards and how best to prevent these injuries. Safety AI is getting AltaLink's employees to think about injuries and hazards, rather than just focusing on statistics.

ENMAX Safety Programs Improve Performance

Following a disappointing safety performance year in 2011, ENMAX put more emphasis on taking personal accountability for safety. The tools used include: Personal Accountability for Safety symposiums;



Safety advisor performing a contractor inspection.
Courtesy of Newfoundland Power Inc.

continuous review and improvement of work methods and procedures, including observation and mentoring; and a special focus on hazards facing meter readers (which resulted in no recordable injuries in 2012 for this work group). The result of all these initiatives: a reduction in Total Recordable Injury Frequency from 40 in 2011 to seven in 2012; a decrease in the overall severity of injuries in 2012; and no public injuries in 2012.

EPCOR Crews are Armed for Excavation Safety

When working in an excavation deeper than 1.5 meters, retrieving an injured employee can be complicated. EPCOR ensures the walls are cut back and a shoring system is installed. But rescuing someone from a cave-in is still difficult which led EPCOR employees to come up with an innovative idea—*What if a rescue davit arm could be attached to the existing shoring panels?* A manufacturer and local distributor met onsite and settled on a design that could fit into the shoring box's hollow corner post. The arm was then built, tested and made available to all construction crews to use. This innovative new rescue arm could save a life one day.

Newfoundland Power Determined to Reduce Electrical Contacts

In the past three years there have been more than 250 contacts with energized power lines in Newfoundland and Labrador, with 80 percent made by heavy construction equipment. In 2012, Newfoundland Power partnered with other utilities, construction, safety and industry associations as well as operator-training colleges and the Occupational Health and Safety regulator on a safety campaign focused on the prevention of contacts. The Public Contact Prevention Working Group is now working with industry and safety associations to raise electrical safety and power line hazard awareness; assisting and supporting instructors where heavy equipment operators are trained; introducing training into the curriculum of additional industrial training programs; and helping train first responder groups.

Ontario Power Generation Drives Continual Improvement in Safety

OPG has reduced the number of annual workplace injuries to a point where it is consistently performing in the top quartile among comparable Canadian utilities. In 2013, OPG continues to focus its attention on two important safety improvement areas: situational awareness and Work Protection (lockout/tagout). Improving situational awareness allows workers to identify and control hazards resulting from changing or unexpected conditions arising in the workplace. OPG is also working to raise the profile of situational awareness tools and is encouraging workers to use these tools to prevent injuries resulting from changing workplace conditions. OPG's Work Protection Code ensures that hazardous energy is controlled when workers are working on equipment and OPG continues to make improvements to the Code to ensure employees are protected from contact with hazardous energy while working.

Toronto Hydro's Management Systems Lead to Major Improvements

Toronto Hydro-Electric System Limited recently achieved certification of its Integrated Environment, Health and Safety Management system to international standards—ISO 14001 and OHSAS 18001. The company has also begun using software to support aspects of the Integrated Management System including document control, inspections and incident reporting and investigation. To aid in the tracking and trending of safety inspection, an inspection module was developed. Inspections help improve safety culture by providing the opportunity to discuss safety openly and candidly; confirm that team members are doing what they are trained to do; recognize safe practices; and identify, reduce and correct at-risk actions and conditions before they lead to injury. In 2012, over 14,000 documented safety inspections were completed.

Principle 5: Workplace

Support a fair, respectful and diverse workplace for employees and contractors



CEA members are committed to attracting and retaining a diverse workforce, promoting employee wellness, and developing necessary skills for employee and company success. Many CEA members were recognized in 2012 with awards for being among *Canada's Top 100 Employers*, *Canada's Top Family-Friendly Employers*, *Canada's Best Diversity Employers*, *Best Employers for New Canadians*, *Canada's Outstanding Employers*, and other similarly prestigious awards.

DIVERSITY

CEA member companies strive to have an inclusive workplace where all employees are treated with respect, and without discrimination, harassment or violence. This goes beyond a commitment to complying with all federal/provincial/territorial employment laws and regulations—the ultimate goal is to have a fully-representative workforce. In 2012, 83 percent of members indicated that they have a commitment to workforce diversity, although only 43 percent have a formal diversity program. Further, 97 percent of members indicated that they have anti-discrimination and anti-harassment programs, the same as in 2011, and all companies have internal venues to report such incidents. There remain areas for further improvement, such as representation of female and minority groups in company management and governance bodies. For example, as of the end of 2012, only about 25 percent of senior company executives were female, and 9 percent were from minority groups. Both of these are minor improvements over 2011, but more remains to be done to increase representation of women and minorities.

WELLNESS

CEA members understand that promoting employee wellness benefits everyone, including the companies and their employees and families. Nearly all members now have programs in place designed to support sustainable employee lifestyles. As **Table 5** illustrates, CEA member companies now have many employee wellness initiatives, including employee illness prevention and knowledge awareness programs, family assistance programs, counselling and flexible work hours. By supporting better personal health practices and healthy workplace environments, CEA member companies contribute to reducing the financial burden associated with rising health care costs, lost productivity and health care treatment.

Table 5 | Employee Wellness Initiatives

	2011	2012
Employee wellness subsidies/investments	100 percent	100 percent
Reimbursements for fitness facilities/programs	77 percent	77 percent
Employee illness prevention and knowledge awareness programs (e.g. on-site flu shot clinics, cholesterol screening, smoking cessation)	97 percent	100 percent
Employee newsletter or intranet site communication	100 percent	100 percent
Confidential family assistance programs (e.g. counselling services)	100 percent	100 percent
Support for employee volunteer initiatives	97 percent	97 percent
Flexible working hours	93 percent	93 percent

TRAINING AND DEVELOPMENT

The effective training and development of employees is growing in importance as large numbers of electricity sector employees begin to retire and new employees, with new skills, are hired. Apprenticeship programs, workshops, online learning, tuition reimbursement programs, partnerships with educational institutions, and other training and development initiatives will continue to be critical for ensuring employees have the right skills and knowledge. In 2012, CEA members spent an average of 42 hours per employee on trades/technical/safety training for field-related employees.

As discussed earlier in the section on electricity sector challenges, recruitment of new, skilled employees will be increasingly crucial as the sector continues to evolve and transition to new ways of producing and delivering electricity. Smart grid applications that include greater integration of renewable generation; new energy conservation and efficiency technologies; and advances in electricity distribution automation, communications and information technologies will require more adaptable and highly-skilled employees. As CEA members begin transitioning to this new workforce, the focus will be on knowledge retention, training, development programs, succession planning, recruitment and employee retention programs.



Utility worker at EPCOR Utilities' Technologies group.
Courtesy of EPCOR Utilities Inc.

How CEA Members are Investing in Employee Diversity, Wellness and Training

ATCO Electric Provides Training to Protect Historical and Archaeological Resources

The Hanna Region in southeastern Alberta is rich in natural history. To ensure the area and its historic resources are preserved during construction of the Hanna Region Transmission Development, ATCO Electric developed a comprehensive Historic and Archaeological Resources Protection Plan and training program for employees and contractors. The plan was developed in coordination with one of Canada's leading archaeological consulting companies. As a result, more than 140 historical resources were identified and protected by October 2012, a significant contribution to Alberta's registry of historical resources.

BC Hydro Focuses on Aboriginal Employment and Education

BC Hydro's goal is to have a workforce fully representative of the British Columbia labour market by 2017. In the past six years, since the Aboriginal Education and Employment team was established and the goal was set, over 150 new Aboriginal employees have been sourced and recruited by BC Hydro's Aboriginal Education and Employment team. Many of these new Aboriginal employees are in occupational areas, including Skilled Crafts and Trades, Apprenticeships, Trades Management and Engineers & Technologists; increased focus on recruiting for Management, Supervisory and Professional roles is planned for the coming year.

ENMAX Wins Award as an Employer of Persons with Disabilities

ENMAX was recently presented with the *Alberta Business Award of Distinction* as an Employer of Persons with Disabilities. The award recognizes a business demonstrating creative practices in hiring, training, and developing employees with disabilities. ENMAX stood out for its employee assistance program, ergonomic assessments, adjustable work stations and wheelchair accessibility. It was also recognized for partnering with non-profit organizations to offer paid work experience for individuals experiencing barriers—such as persons with disabilities, visible minorities, Aboriginal Peoples and women.

Hydro Ottawa Creates an Intranet Innovation Portal for Employees

Hydro Ottawa's new social Intranet was introduced in 2012. The site provides employees with a single source for current and accurate employee news and resources. Employee forums, comment functionality and employee profiles empower every employee to share, connect and contribute. One specific employee forum, titled *Innovate!*, is a dedicated space where employees can share any idea about something that Hydro Ottawa can change, introduce, stop, or improve. Colleagues are able to view each other's suggestions, comment on them, and like them. The company monitors this page to ensure ideas drawing the most interest and enthusiasm from people are brought to the President and Chief Executive Officer's attention for consideration.

Manitoba Hydro Program Places Aboriginal Trainees

At the end of 2012, the Aboriginal share of Manitoba Hydro's workforce was 17 percent, a figure slightly higher than Aboriginal representation in the Manitoba population. Major contributors to this outcome have been Manitoba Hydro's Aboriginal Pre-Placement Training programs, and the Aboriginal Line Trades Training program. The pre-placement training programs provide on-the-job training, academic upgrading, mentorship and guidance. As a result, Aboriginal candidates acquire the skills and competencies to successfully transition into Manitoba Hydro's technical trades training programs, leading to achievement of Technician/Journeyman status. The pre-placement programs hired a combined total of 29 new trainees in 2012. Twenty-six of these candidates successfully completed their pre-placement training and were selected for the Power Electrician, Operating Technician or Line Trades Training Programs at Manitoba Hydro.

Maritime Electric's Wellness Programs Achieve 30 Percent Participation

By making wellness programs fun and helpful to employees, Maritime Electric engaged almost a third of its employees in a voluntary wellness initiative. Its 2012 Employee Wellness Program included eight-week Boot Camps where 34 employees lost a total of 782 inches. During the 10-week Weight Watchers at Work programs 28 employees dropped 252 pounds. The 54 employees who participated in a 10-week Walking Challenge walked an average of 44,000 steps. Finally, 17 female employees benefited from a 10-week-yoga program especially for women.

Nalcor Energy Invests in Hearing Protection and Awareness at Churchill Falls

According to the Public Health Agency of Canada, 10 percent of Canadians suffer from hearing loss. To ensure employees are aware of hazards, Nalcor Energy Churchill Falls engaged a health and safety consulting firm to develop and complete a noise-monitoring program at its worksites. More than 250 noise-level readings were collected at all facilities, when equipment and job tasks were being performed. Results of the findings were reviewed with employees during monthly safety meetings and are available on the local computer network. Sharing results with employees is an important step in keeping them educated, and to increase awareness about the importance of hearing protection.

Ontario Power Generation Develops High Potential Skills Development Program

Forty-seven employees at OPG nuclear generation stations were selected for a High Potential Skills Development program piloted in 2012. The goal is to accelerate the development of emerging and high-potential leaders to maximize their individual and organizational potential, while networking among other participants and mentors. The program is a four-part workshop facilitated by trained volunteers accompanied by a mentor/leader. Modules are conducted for a half day per month for four months. Modules include: Creating a Career Mindset, Communicating-Up the Organization, Developing Political Savvy, and Expanding Your Networks. The pilot program was deemed a success, and will continue with the next group of emerging leaders.



Hydro One's crews aid in storm restoration efforts.
Courtesy of Hydro One Inc.

Principle 6: Communication and Engagement

Communicate with and engage our stakeholders in a transparent and timely manner



Engaging with stakeholders is increasingly recognized as a key business imperative and a necessity for maintaining the social license to operate in communities. Electricity sector stakeholders include, but are not limited to, customers, land owners, suppliers, community leaders, and non-governmental organizations. They are interested in a variety of electricity-specific issues such as new infrastructure development, environmental impact mitigation, community economic development, energy conservation, and public electrical safety. CEA member companies use a variety of methods to communicate and engage with stakeholders, including: face-to-face meetings, town hall and other community meetings, classroom presentations, traditional and social media, advertisements, company annual reports, and partnerships with local community organizations.

CEA members are committed to timely and transparent communication with stakeholders, including sharing of information about proposed projects and their potential environmental, social, and economic impacts. As **Table 6** illustrates, CEA member companies continue to develop policies and procedures to engage stakeholders in local communities. In fact, all CEA members now have a documented process for responding to stakeholder concerns, and a high percentage of companies have formal stakeholder engagement policies. This engagement is becoming more and more important as the sector invests in new infrastructure in local communities and engages customers on energy management. While performance has remained

somewhat constant over the last two years, CEA member companies have come a long way in developing processes to identify and work with stakeholders since this information was initially tracked in 2010.

Table 6 | Stakeholder Engagement Initiatives

	2011	2012
Companies with a formal stakeholder engagement policy or documented process	73 percent	77 percent
Companies with a process for identifying stakeholder concerns and opportunities	90 percent	93 percent
Companies with a documented process for responding to stakeholder concerns	83 percent	100 percent
Companies that have a permanent stakeholder advisory committee or group	53 percent	57 percent
Companies with a process in place to ensure continual improvement of stakeholder engagement	67 percent	70 percent



Aerial view of the Darlington New Nuclear Project.
Courtesy of Ontario Power Generation.



Wind turbine in the Halkirk Field.
Courtesy of Capital Power Corporation.

How CEA Members are Partnering with Communities and Stakeholders

Capital Power Uses Blade Signing to Thank Communities

Capital Power commissioned two wind-energy facilities in 2012—the 142-MW Quality Wind Project near Tumbler Ridge, British Columbia, and the 150-MW Halkirk Wind Project in Halkirk, Alberta. To demonstrate appreciation to the two small towns for their immense support of the wind-energy projects, Capital Power celebrated with blade signing events. The company delivered massive wind turbine blades, nearly four school buses long, to the communities of Tumbler Ridge and Halkirk, and invited the community to sign them. The blade-signing events included site tours, children's activities, safety demonstrations and, of course, lots of great food. The unique signing events were enjoyed by people of all ages. Attendance exceeded expectations, with approximately 1,000 attending the Quality Wind event and about 1,700 at the Halkirk event.

Hydro One Mobile Application a First for a Canadian Utility

Finding another way to reach its customers, Hydro One launched a free mobile application for smartphones in 2012 that provides up-to-date power outage information. Hydro One is the first Canadian utility to put a mobile outage tracking application in its customers' hands, and it had 38,663 downloads in 2012. The application includes a map showing planned and unplanned power outages, cause of outage (if known), estimated restoration times and crew status, an outage summary table, and the ability to search for the customer's current location. Outage data is updated every 15 minutes. In addition, the application also provides Hydro One news, contact information and links to other Hydro One resources including its Twitter feed.

Hydro Ottawa Supports Community through *Brighter Tomorrows Fund*

Hydro Ottawa's *Brighter Tomorrows Fund* is a targeted-investment fund designed to support frontline agencies that serve people who are homeless, or at risk of being homeless, to invest in small-scale energy-efficient technologies or products. Specifically, the fund supports small-scale capital projects such as the replacement of old windows, the installation of high-efficiency heating and cooling systems or the procurement of new and more energy-efficient appliances. The fund helps agencies reduce energy costs, improve

their facilities and provide more comfortable living spaces. The *Brighter Tomorrows Fund*, using corporate matching dollars from Hydro Ottawa's annual United Way workplace campaign, provided more than \$85,000 in grants to seven agencies for seven separate projects in 2012. During the first year of the program in 2011, more than \$134,000 was granted to 12 agencies for 17 separate projects.

Ontario Power Generation's Darlington New Nuclear Project Approvals Mark Firsts

More than three years of study, extensive public and stakeholder engagement, and thousands of pages of documentation culminated with the successful completion of key project milestones in 2012 when the federal government approved the Darlington New Nuclear Project Environmental Assessment (EA) and issued the site preparation licence. An independent joint review panel undertook an exhaustive review of OPG's submissions, including over 12 months of detailed technical reviews, involving reviews by federal, provincial and municipal government departments and agencies. They also held 17 days of public hearings and sought the views of the public, First Nations and Métis communities, non-governmental organizations, industry, and other stakeholders. OPG responded to all requests for additional information on the project and OPG's plans for managing potential environmental effects. The federal government's EA approval for new nuclear and the Licence to Prepare the Site are firsts in Canada marking an important milestone, not only for OPG, but for the entire nuclear industry.

TransCanada Develops New Zenergy Infrastructure Game

Public Awareness is the largest stakeholder outreach program at TransCanada. In addition to education, fun is also on the menu. Throughout 2012, TransCanada used an innovative, tablet-based application, called Zenergy, to engage and educate the public on the challenges of developing energy infrastructure. Primarily built for TransCanada to educate primary grade to high school-aged children, the game requires players to balance the demand for electricity while minimizing environmental impacts. The application has been used in many settings including tradeshows and community events.

Principle 7: Aboriginal Relations

Communicate with and engage Aboriginal Peoples in a manner that respects culture and traditions



CEA member companies are working collaboratively with Aboriginal Peoples and their communities to achieve meaningful environmental, social, and economic outcomes. While the degree to which this collaboration occurs differs from company to company, these relationships have often resulted in mutual benefits and innovative solutions, as illustrated by the sector initiatives noted on the following page. Over the years, CEA members have invested in joint ventures, skills training, community development, sustainable procurement strategies, and use of traditional knowledge in project planning and construction as a way to engage Aboriginal Peoples. These partnerships have led to economic development in Aboriginal communities, and will continue to grow as CEA members invest in infrastructure renewal and modernization. CEA is also working with its members to identify public policy options for attracting Aboriginal workers to the electricity sector.

Some CEA member companies are more advanced in their relations with Aboriginal Peoples than others, but companies with operations in Aboriginal areas understand the importance of having positive relationships with Aboriginal Peoples based on trust and respect. As **Table 7** indicates, the majority of CEA companies that identify Aboriginal relations to be a relevant issue have senior Aboriginal relations employment positions; consult Aboriginal Peoples in project planning and development; develop formal business partnerships; and provide training and employment opportunities. While overall performance did not change from last year, these still represent essential indicators of a company's commitment to Aboriginal engagement. However, CEA understands the limitations of these performance indicators and plans to work with members to further improve these to better capture the benefits of Aboriginal collaboration.

Table 7 | Aboriginal Relations

	2011	2012
Companies with an Aboriginal relations group or senior Aboriginal advisory positions	74 percent	74 percent
Companies with procedures for requiring early consultation or engagement with Aboriginal communities during project planning and development	96 percent	96 percent
Companies with business relationships or partnerships with Aboriginal communities	100 percent	100 percent
Companies with procedures or practices to ensure training and employment opportunities for Aboriginal employees	87 percent	87 percent

The above figures are based on 77 percent of companies that indicated Aboriginal relations to be a relevant issue for company activities. CEA uses the term Aboriginal Peoples to refer to First Nations, Métis, Inuit, Cree and other indigenous peoples within Canada.



Keeyask Hydropower Limited Partnership's (KHLPP) Generation Project meeting. Courtesy of Manitoba Hydro.



BC Hydro has signed a number of agreements with First Nations to provide training, contracting, jobs and other economic opportunities. *Courtesy of BC Hydro.*

How CEA Members are Successfully Engaging Aboriginal Peoples

BC Hydro Signs Agreements with First Nations

In 2012, BC Hydro reached a number of key agreements with First Nations. After 18 years of negotiation, the company signed a historic agreement with the St'át'imc that provides economic opportunities and financial benefits related to the operation of the Bridge River system. The company also entered into a landmark agreement with the Upper Nicola Band, the Okanagan Nation Alliance, and the Nlaka'pamux Nation Tribal Council on the construction of the Interior to Lower Mainland Transmission Line; and another agreement with the Kitsumkalum First Nation to provide training, contracting, jobs and other economic opportunities related to the construction of the Northwest Transmission Line.

FortisBC and First Nations Pursue Energy Efficiency

FortisBC signed a memorandum of understanding with the British Columbia First Nations Energy and Mining Council (FNEMC), making energy self-sufficiency for First Nations communities a priority. It is the first time a privately-held energy company has signed such an agreement. Under the terms of the agreement, the FNEMC and FortisBC agree to co-operate in developing energy opportunities for British Columbia First Nations communities, including increasing energy efficiency on First Nation land and paving the way to hire a certified energy auditor to assist communities with energy-efficiency programs.

Manitoba Hydro and First Nations File an Innovative Environmental Impact Statement

July 6, 2012 was a monumental day for Manitoba Hydro and its Aboriginal partners. That was when the Keeyask Hydropower Limited Partnership's Generation Project Environmental Impact Statement (EIS) was filed. The document was the outcome of years of work by Manitoba Hydro, along with its partners who belong to the Keeyask Cree Nations (Tataskweyak Cree Nation, War Lake First Nation, York Factory First Nation, and Fox Lake Cree Nation). Manitoba Hydro and the Keeyask Cree Nations (KCN) created a two-track approach in the production of the EIS. Equal weight was given to the KCN's evaluations of the environmental impact of the

project, based on the Cree worldview, as well as the technical science evaluation. This approach has the KCN participating meaningfully in the evaluation of the project in their ancestral lands, and reflects a just and equitable agreement between the partners.

Northwest Territories Energy Corporation Collaborating with First Nations and Métis

A unique ownership structure promises to create significant long-term business opportunities in the South Slave region of the Northwest Territories. This is an area where economic growth has been limited. The Taltson Hydroelectric Expansion Project is a project of the Dezé Energy Corporation, owned equally by the Akaicho Energy Corporation, the Métis Energy Company Ltd., and the Northwest Territories Energy Corporation. The project will increase capacity at Taltson without flooding or otherwise damaging the environment. The project would add a new power plant to the existing 18 MW Taltson Twin Gorges plant and create many new employment opportunities. The project continues to move ahead with studies, planning and preconstruction work.

Ontario Power Generation Completes Best Practice Aboriginal Training Program

OPG completed an Aboriginal training program during 2012 for its Lower Mattagami Re-development Project in association with Sibi Employment and Training, which administered the program and its funding. The initiative was funded by OPG and the federal Aboriginal Skills and Employment Partnership program. Over the two-and-a-half-year program, Sibi developed a database of more than 1,400 First Nation and Métis clients and exceeded all of its training and employment targets, with over 200 clients employed on a preferential basis on the project. The Sibi program is seen as a best practice, creating linkages between various levels of government, First Nation and Métis communities, construction unions, local training institutes, and OPG and its contractors.



BC Hydro power line worker safely makes repairs to a line. *Courtesy of BC Hydro.*



CASE STUDY: SOCIAL

BC HYDRO BUILDING A SAFETY ACCOUNTABILITY CULTURE

Following the tragic death of an electrician in 2010, BC Hydro scrutinized its safety performance. Research showed that a serious safety incident occurred on average every six months. In response, BC Hydro formed a Safety Taskforce, which found that some safety incidents, rule violations and near misses were going unreported because employees feared blame and reprisals for honest mistakes or system failures. As a result of this under-reporting, valuable information on safety issues and improvement opportunities were missed.

BC Hydro's Safety Taskforce recommended, among other improvements, that the company adopt a Just Culture approach to safety management and reporting. Originated by James Reason of the University of Manchester, and later fine-tuned by American system safety engineer David Marx and Patrick Hudson of Leiden University, Just Culture improves operational safety and performance by emphasizing learning rather than blame. Just Culture recognizes that errors and risk-taking will occur, and sees safety incidents as opportunities to learn. It balances personal and organizational accountability and has no tolerance for reckless behaviour. Employees trust that they will be treated fairly.

Just Culture is well suited to the electricity industry, where risks are plentiful and the potential for extreme injury or death is high. With a Just Culture approach, a safety incident is thoroughly investigated to determine whether the cause was human behaviour, a system failure or organizational deficiency, or a combination of factors. Behaviour is identified as human error (an honest mistake), at-risk behaviour or reckless behaviour. Appropriate actions are taken to correct each type of behaviour, ranging from coaching, mentoring and training, to discipline where warranted.

IMPLEMENTING JUST CULTURE

BC Hydro started implementing Just Culture in 2012. Along with the Just Culture principles, BC Hydro developed a set of Life Saving Rules that identify the rules that pose the greatest risk of injury or death if violated. A strong partnership with BC Hydro's unions—IBEW and COPE—has been critical for the development, and endorsement, of the Just Culture principles and the Life Saving Rules. The parties have set the expectation that employees follow the rules and stop work when they cannot comply. Courage to Intervene training has also been put in place for all employees to support them in fulfilling the Life Saving Rules and the Just Culture principles. Employees are encouraged to report any safety incidents and to intervene where necessary to stop an unsafe act or condition or if they observe someone unfit for work.

Training started in fall 2012 and has so far reached over 1,500 employees, including management, union leaders, occupational safety and health specialists, human resources staff, managers, crew leaders and front-line employees. Training will continue through 2013.

Although it is too soon to see a rise in the number of reported incidents, there has been vigorous discussion at the training sessions as well as during company-wide safety conference calls. As Just Culture becomes entrenched, and as employees trust that they will be fairly dealt with and see that underlying system conditions are being fixed, BC Hydro expects to see more reporting of incidents and near misses. As Uli Bergmann, the Safety Taskforce's implementation team lead, put it, "we want to foster an environment where all employees and contractors feel comfortable reporting incidents and unsafe acts or conditions, so that we will have as much information as possible to improve the systems to support worker safety."

Key Performance Highlights

Green indicates improved performance and orange indicates decreased performance (relative to 2011)

\$5.653

**EMPLOYEE COMPENSATION
(BILLIONS)**

4.9 percent increase from 2011

\$12.050

**INVESTMENT IN NEW
AND REFURBISHED
INFRASTRUCTURE
(BILLIONS)**

18.8 percent increase from 2011

1,817

**ENERGY CONSERVATION
(GIGAWATT-HOURS PER YEAR)**

55.7 percent increase from 2011

\$33.268

**CHARITABLE DONATIONS
(MILLIONS)**

35.6 percent increase from 2011

4.43

**SYSTEM AVERAGE
INTERRUPTION DURATION
INDEX (SAIDI)
DURATION (HOURS)
(EXCLUDING SIGNIFICANT
WEATHER RELATED EVENTS)**

13.3 percent decrease from 2011

2.48

**SYSTEM AVERAGE
INTERRUPTION FREQUENCY
INDEX (SAIFI)
INTERRUPTIONS
(PER CUSTOMER)
(EXCLUDING SIGNIFICANT
WEATHER RELATED EVENTS)**

2.0 percent decrease from 2011

CEA member performance

economic

The electricity sector's sustainable development strategy ensures that the industry provides value to the communities in which it operates through reliable and cost-effective supply of electricity, appropriate compensation of its employees, and contribution to communities.



Principle 8: Economic Value

Provide economic benefits to shareholders, communities and regions in which the industry operates

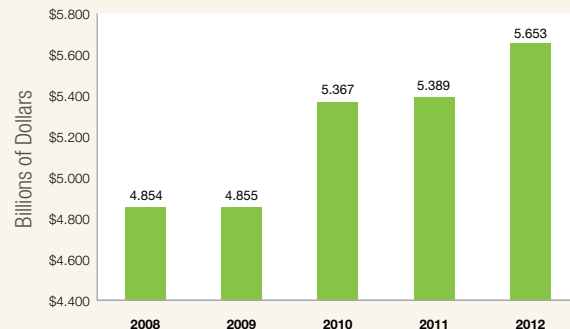


The electricity sector is a major contributor to the Canadian economy through its revenues, employment, and payments to governments. This contribution will continue to grow as the sector renews its infrastructure and responds to greater electricity demand by residential, industrial and public sector customers. In 2012, CEA member investments in infrastructure were approximately \$12.050 billion, an increase of approximately 18.8 percent over 2011. About 37 percent of the investment was in electricity generation projects; 36 percent in electricity transmission; and 27 percent in electricity distribution. In addition to ensuring the safety and reliability of the electricity system through investments in new and existing infrastructure, these investments by CEA member companies create jobs and economic activity in communities across Canada.

In 2012, total employee compensation (salary plus benefits) at CEA member companies was \$5.653 billion, 4.9 percent increase over 2011 levels (**Figure 10**). Recognizing that many employees purchase goods and services locally, this increase provides a substantial transfer of wealth back to the communities in which member companies operate. The increase can be attributed to temporary contract staff, employee overtime and the hiring of additional staff due to a declining workforce, as well as higher living allowances, wages and retirement incentives. The economic contribution of the sector does not end there. In 2012, total value of payments to governments by CEA member companies accounted for \$5.332 billion, up from \$3.107 billion in 2011. These payments contribute immensely to national and local economic growth as the money is recycled back in to the economy.

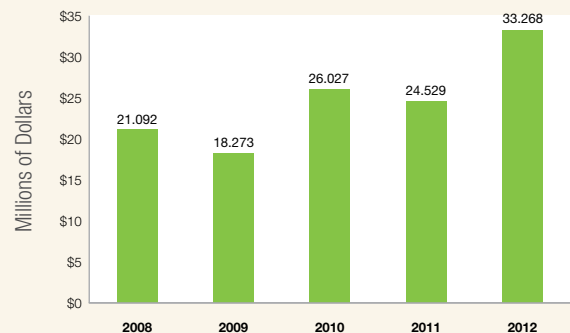
CEA member companies also strive to be good corporate citizens and contribute to the economic and social development of the communities in which they operate. In 2012, CEA members contributed \$33.268 million in charitable donations, 35.6 percent higher than in 2011 (**Figure 11**). These contributions support many charities and initiatives, such as the United Way, arts and culture, safety and injury prevention programs, youth initiatives, local hospitals, and other local community activities. In addition, many companies go beyond direct monetary donations by encouraging their employees to engage in outside volunteer activities. These investments help enrich local communities across the country.

Figure 10 | Annual Employee Compensation



Note: Total compensation includes T4s and T4As

Figure 11 | Annual Charitable Donations





OPG partners with Scientists in School and local schools to set a record in the Guinness Book of World Record for the Largest Practical Science Lesson. Over 150 schools across Canada participated in this historic record breaking event. *Courtesy of Ontario Power Generation.*

How CEA Members are Making a Difference in their Communities

ATCO Power EPIC Campaign Enjoys Strong Participation

ATCO Power's employee-led EPIC campaign raised just over \$250,000, after corporate matching, in support of local charities, the Heart and Stroke Foundation, and fellow co-worker causes. The campaign achieved the highest involvement to date from the company's power stations, joining the Calgary and Edmonton offices with dedicated committee representatives and events. The 2013 campaign will introduce a new element where donations made towards a co-worker taking part in an eligible fundraising event could be submitted year-round for matching under ATCO Power's EPIC program.

EPCOR Community Essentials Council Focuses on Basic Necessities

As a provider of power and water to more than a million people, it is a natural extension for EPCOR to support communities by helping to provide life's essentials. The EPCOR Community Essentials Council brings together community leaders and EPCOR employees each quarter to allocate up to \$100,000 to worthy initiatives, for a total of \$400,000 annually. It is part of the company's community investment strategy, which focuses on three pillars: water (not only nourishment, but also water conservation and stewardship), energy (including shelter and safety, as well as energy conservation), and education (promoting skills development for vulnerable populations as well as environmental stewardship).

Nova Scotia Power Promotes Fire Safety

Each year, Nova Scotia Power spends \$1.4 million in shareholder funds within local communities. In 2012, Nova Scotia Power focused much of its giving on safety issues through a program targeted to the province's many volunteer fire departments. The company provided approximately \$200,000 to over 35 fire departments, to help promote safety within their communities. The funds also helped purchase ad space in local publications to help the fire departments recruit new volunteers to continue their important work.

Ontario Power Generation Helps Make Communities Stronger and More Sustainable

Through its Corporate Citizenship Program (CCP), OPG demonstrates its commitment to the well-being of the communities in which it operates. OPG believes that being an engaged community member is essential to being a good corporate citizen and neighbour. In 2012, OPG provided community investment support (charitable, non-profit, and in-kind support) to over 1,100 grassroots, host-community initiatives in the program focus areas of education, environment and community, as well as support for First Nations and Métis initiatives. These grassroots partnerships are diverse and include; educational enrichment programs, wildlife and habitat restoration, environmental education, health and safety, arts and culture, and youth amateur sport initiatives along with other local causes. Grassroots community partnerships help to build stronger and more sustainable communities.

Toronto Hydro's Employee Matching Program

Toronto Hydro encourages employees to give back to their communities. In a 2011 employee feedback survey, 85 percent of employees said it was 'very important' to work at a company that supported community involvement. As well, 63 percent of employees said they were 'likely' or 'very likely' to participate in a matching program. Toronto Hydro then developed a Matching Program in which employee financial donations to a registered charity and fundraising efforts are matched to a maximum of \$200 per year. The company used a number of ways to communicate about the program, since more than a third of employees work outside without easy access to e-mail. The Matching Program was well received in 2012, with 186 employees taking advantage of the program—a total of 12 percent of employees, exceeding the initial target of 10 percent. Toronto Hydro donated over \$21,000 to various charities—\$6,000 more than its goal.

IMPROVING SUSTAINABILITY AND REDUCING COSTS THROUGH SUPPLY CHAIN MANAGEMENT

Part of providing value back to customers is ensuring supply chain efficiencies, sustainability, and reducing purchasing costs. In 2012, several CEA member companies worked to identify supply chain efficiencies in their operations.

Oakville Hydro Corporation Benefits From Purchasing Group Membership

Oakville Hydro Corporation has been successful in increasing its efficiency and buying power, sharing information, and reviewing specifications to improve standardization on material specifications by participating in purchasing groups. The utility is already part of the Halton Co-Operative Purchasing Group (includes Halton hospitals, municipalities, region, police, board of education, and others). It is also working with other neighbouring Ontario Local Distribution Companies (Halton Hills, Milton, Enersource, Hydro One Brampton, and Burlington) to establish a regional purchasing group. During 2012, Oakville Hydro Corporation collaborated with six other utilities to provide common specifications for manufacturing requirements and worked closely with cable manufacturers to reduce lead times, costs and minimum order quantities.

Hydro Ottawa Works to Green its Supply Chain

Hydro Ottawa continued tracking the relative proportion of purchase orders placed with firms in the National Capital Region and the province of Ontario to demonstrate an environmental commitment to reducing its carbon footprint by contracting with more local vendors, thereby avoiding unnecessary transportation for goods and services. The amount of goods and services procured from local suppliers in 2012 was 31 percent of total dollars spent, up from 28 percent in 2011.

Horizon Utilities Develops and Implements a Sustainable Supply Chain Management Strategy

Following the adoption of the ISO 26000 guidance standard on Social Responsibility by Horizon Utilities Corporation in 2012, the Supply Chain Management department formally adopted a new vision and strategy on supply chain sustainability to bring it in line with leading sustainable supply chain practices in Canada and worldwide. Recognizing the potential to influence and drive innovation and sustainability of suppliers and consumer organizations, Horizon Utilities engaged Ernst & Young to conduct a Sustainable Supply Chain Gap Assessment with the aim of developing and implementing a Sustainable Supply Chain Management Strategy as the framework for continual improvement. Implemented in late 2012, the Sustainable Supply Chain Management Strategy is supported by a five year implementation plan with specific objectives, targets and measurements. The new plan has already resulted in the development and implementation of a corporate Sustainable Design and Procurement Policy, as well as modifications to current procurement documents, practices and processes during the first year of implementation.

SaskPower Benefits from Collaboration with Utilities and Developers

A provincial first-of-its-kind partnership between SaskPower, SaskTel and SaskEnergy, along with Shaw and Access Communications, will see homebuilders and developers designing and installing the utilities for their own subdivisions. SaskPower provides the specifications for material, construction standards, and engineering standards that the developers follow. Once complete, SaskPower performs an inspection of the facilities and takes ownership of them. The utility has taken part in pilot projects in Regina and Saskatoon. Developers benefit by controlling the schedule and costing; they can now include the gas, communications, power and cable utilities into the design of the subdivision, improving aesthetics; and with all utilities placed in one trench, the utility footprint on the overall subdivision design is reduced. SaskPower benefits by reducing its material purchasing and associated overhead costs; and also by reducing SaskPower employee labour, so that resources can be diverted to other high-value work.

Principle 9: Energy Efficiency

Produce, deliver and use electricity in an efficient manner while promoting conservation and demand-side management



Internal energy efficiency and customer conservation programs are often the most low-cost investments available to ensure Canada's electricity needs are met reliably, affordably, and sustainably. Canadian electricity distribution companies have become increasingly effective in helping their customers use less electricity and save money on electricity bills. The energy conservation programs delivered by CEA member utilities resulted in a saving of 1,817 gigawatt-hours during 2012, a 55.7 percent increase over the previous year. This particular increase was mainly driven by BC Hydro through its Power Smart program. The Power Smart program continues to be a recognized leader in promoting conservation and efficiency, through increased public awareness of conservation and incentives for using energy efficient products and technologies.

Some barriers to new energy conservation investments remain, including regulatory support and funding for new program delivery to end-users of

electricity. CEA is working with governments and regulators to overcome these barriers. Increasing support for energy conservation investments can help to reduce the need for short-to-medium term capital required for new infrastructure development, help customers reduce their electricity bills, increase the competitiveness of business and industry, and also have a direct environmental benefit.

Many CEA member companies are investing in the energy efficiency of their own operations. Members achieved savings of 117 million kilowatt-hours in 2012, 11.4 percent below what they achieved in 2011. Savings resulted from ensuring high levels of energy efficiency in new buildings, retrofitting existing buildings, installing energy-efficient equipment (such as computers), and upgrading the efficiency of turbine runners and transformers. The Manitoba Hydro head office building is an excellent example of how members are investing in the energy efficiency of their business operations.



EPCOR employee working to install LED lights in Edmonton. Courtesy of EPCOR Utilities.



Toronto Hydro employees participating at an event to promote energy conservation.
Courtesy of Toronto Hydro Corporation.

How CEA Members are Creating a Culture of Energy Conservation

EPCOR Moving Edmonton to LED Street Lighting

To improve energy efficiency, the City of Edmonton commissioned EPCOR Technologies to evaluate the feasibility of LED street lighting. EPCOR began with the conversion of two neighbourhoods in 2011, achieving the expected energy reduction while maintaining pre-installation light levels where possible. By the end of 2012, it installed close to 13,000 LED luminaires in 33 neighbourhoods. Energy savings so far have topped 700 megawatt-hours, equalling a 495 tonne reduction in carbon dioxide emissions. Future plans include replacing all remaining 90,000 luminaires with LED lights; installation of LED luminaires in new residential subdivisions; and testing the dimming of LED street lights during evening hours when deemed safe, to reduce energy consumption and light pollution.

FortisBC Performs an Eco-vention

When Rossland residents learned they used almost 40 percent more electricity than the average British Columbia home, they asked FortisBC to help them with an eco-vention. FortisBC responded by offering residents a free home-energy assessment, the starting point to access up to \$12,000 in provincial and federal home energy-efficiency rebates. Small businesses could also access a free energy-efficient-lighting upgrade. Information sessions, a dedicated coordinator available to answer questions, low cost loans through a local credit union, local contractors, and a local online news portal all helped to increase interest. Close to 250 Rossland residents received a home-energy assessment and undertook efficiency measures, significantly reducing their annual energy use by more than 2,220 gigajoules of natural gas and almost 1.5 million kilowatt-hours of electricity. In addition, greenhouse gas (GHG) emissions have been reduced by up to 338

tonnes annually, and about \$1.5 million of economic activity has benefited the local economy. An energy diet is planned for the city of Kamloops in 2013.

Hydro One's Energy Efficiency Begins at Home

Hydro One's Greener Choices Program helps promote energy efficiency, GHG reductions and environmental awareness among employees. A key program element is to make its own facilities more energy efficient. In 2012, energy audits were undertaken at four Operating Centres, lighting retrofits were conducted at 10 facilities, and heating, ventilation and air conditioning retrofits were conducted at four locations. Electricity savings from these 2012 retrofits are projected to be 270,000 kilowatt-hours annually. Since the Greener Choices Program was initiated in 2008, 52 facilities have undergone energy retrofits. This not only reduces operating costs, it also helps meet internal GHG reduction targets, and creates a better work environment.

Toronto Hydro Closing in on Conservation and Demand Management Targets

In 2012, Toronto Hydro invested approximately \$28.3 million in conservation and demand management programs, achieving an estimated energy savings of almost 117 million kilowatt-hours and total demand reduction of 53,200 kilowatts (unaudited). The company has achieved 79 percent of its energy savings target, which is to achieve 1.3 billion kilowatt-hours of energy savings between January 1, 2011 and December 31, 2014. During 2012, it hosted 21 community events, discussing conservation with more than 57,000 people; and reached 130 representatives from commercial, institutional, multi-residential, academic and hospitality markets at its information sessions on conservation incentive programs.

Principle 10: Security of Supply

Provide electricity to customers in a safe, reliable and cost-effective manner to meet current and future needs

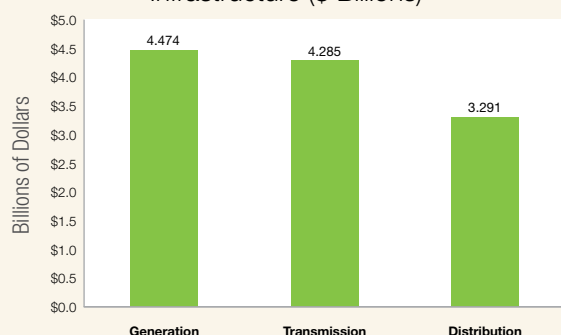


ENHANCING SYSTEM SUPPLY

Ensuring a safe, reliable, and a cost-effective electricity system to meet current and future electricity supply needs is a major pre-occupation of CEA member companies. Utilities must constantly plan in order to ensure there is a reliable electricity system in place to meet the daily demands of customers. This includes maintaining and refurbishing existing assets and investing in new infrastructure. In 2012, CEA members invested approximately \$4.474 billion in generation, \$4.285 billion in transmission, and \$3.291 billion in distribution equipment (**Figure 12**). CEA members are keeping up with the required investments to meet infrastructure requirements, but there are still many major projects under construction or awaiting regulatory approval, which make up one of the largest expansions of electrical infrastructure in Canada.

As CEA members invest in new infrastructure, they are considering a range of technologies including nuclear, large hydro, gas turbines, coal with carbon capture and storage and renewable technologies, such as wind, solar and biomass. Wind power capacity is expected to grow significantly in the next decade. In 2012, installed wind capacity accounted for about 6,500 MW, with Ontario leading in terms of that existing capacity, followed by Quebec and Alberta. Although technologies such as wind are becoming cost-competitive, CEA members are also facing inherent issues, including limited transmission infrastructure to deliver electricity from remote communities where many renewable energy facilities are located.

Figure 12 | 2012 Investments in New and Refurbished Infrastructure (\$ Billions)



SERVICE RELIABILITY

Many factors contribute to service interruptions, including aging infrastructure, contact with trees, and damage to power lines and equipment caused by high winds, lightning, and other adverse weather

events. In 2012, service reliability and the duration and frequency of outages improved. The duration of outages for customers served was 4.43 hours per year (excluding significant weather events), a decrease of 13.3 percent compared to 2011 performance (**Figure 13**). The frequency of interruptions, again excluding significant events, per customer also decreased slightly in 2012, from 2.53 hours in 2011 to 2.48 hours in 2012, a decrease of 2.0 percent (**Figure 14**). Increased investments in infrastructure renewal and modernization, enhanced tree trimming programs along right-of-ways, and investments in new technologies such as Geographic Information Systems and smart grid automation should lead to greater long-term reliability of the electricity system.

Figure 13 | System Average Interruption Duration Index (SAIDI)

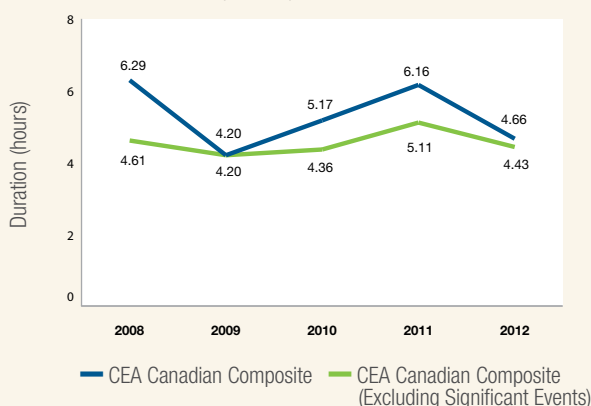
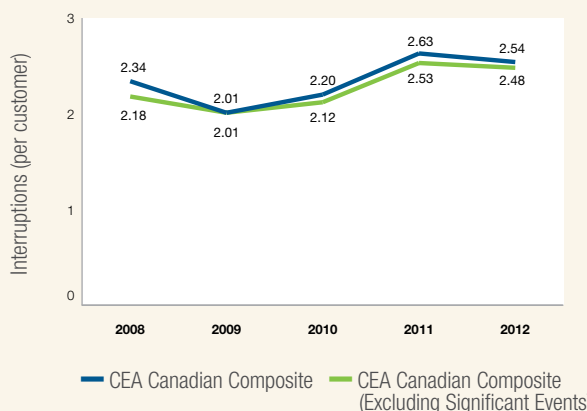


Figure 14 | System Average Interruption Frequency Index (SAIFI)





Inside the Gordon M. Shrum generating station a worker conducts repairs to aging equipment. *Courtesy of BC Hydro.*

How CEA Members are Investing in a Secure & Reliable Supply of Electricity for Canadians

BC Hydro Renewing Gordon M. Shrum Hydro Station

The Gordon M. Shrum generating station is a cornerstone of BC Hydro's system, supplying about 24 percent of the company's installed generation capacity. Now more than four decades old, the station requires significant investments to renew aging equipment. The extensive work to upgrade the station involves several different projects. These include: installation of new turbines for Units 1 to 5 of the 10-unit station; refurbishment of Units 6 to 8, increasing the plant capacity by 90 MW; replacement of 12 transformers; rehabilitation of the station service; and replacement of the station fire alarm system.

Hydro One Brings Bruce-to-Milton Line into Service

The Bruce-to-Milton transmission project is a 176 kilometre, 500 kilovolt double-circuit line adjacent to the existing 500 kilovolt line, using an expanded transmission corridor. Both circuits run from Bruce Power's Bruce

A and Bruce B nuclear stations to Milton Switching Station. The new transmission line provides more than 3,000 MW of additional transmission capacity to reliably transmit the output from all eight units from the Bruce Power site and about 1,700 MW of committed and potential wind generation in Bruce and surrounding counties. The total generation in the area could eventually reach 8,100 MW. The cost of the project was over \$700 million. The first circuit was energized on May 7, 2012 and the second was energized on May 14, 2012. The project was completed in June 2012.

Toronto Hydro Continues Major Investments in Infrastructure

Since 2006, Toronto Hydro has invested approximately \$2 billion to modernize its distribution assets. In 2012, the company completed the third largest capital plan in its history, and invested almost \$290 million, primarily in infrastructure upgrades. Of this total, just over \$235 million was invested in the Toronto Hydro Distribution System.

Newfoundland Power Investments Making a Difference

Over the past five years, Newfoundland Power has invested more than \$350 million to enhance the province's electricity system. During this time, the number of outages decreased by approximately 30 percent. In 2012, approximately \$80 million was invested to upgrade and strengthen the electricity system. Nearly 40 percent of this investment was related to the replacement of out-dated or deteriorated equipment; 35 percent was dedicated to providing service to new customers, as well as meeting the associated requirement for increased system capacity; and the remaining 25 percent was invested in additions to the electricity system.

Nova Scotia Power Achieves Best Outage Performance Ever

In 2009, Nova Scotia Power began a \$100 million investment plan to improve customer reliability in response to increased challenges such as stronger and more frequent storms, aging equipment, and other factors. This investment continues to be over and above the roughly \$60 million spent each year on system maintenance and improvements, and focuses on targeting the leading causes of outages in various areas—namely vegetation management and replacing and upgrading equipment. In 2012, outage frequency and duration were reduced to 1.81 outages and 3.06 hours, respectively. This is the best result Nova Scotia Power has recorded.

Columbia Power, with partners FortisBC and Columbia Basin Trust Invest in the Expansion of the Waneta Hydroelectric Dam

The Waneta Expansion, currently under construction, will see the addition of a second powerhouse downstream of the Waneta Dam on the Pend d'Oreille River south of Trail, British Columbia. Located immediately downstream from the Waneta Dam and its existing powerhouse, the expansion project will share the existing dam's hydraulic head and generate power from flow that would otherwise be spilled. The design for the Waneta Expansion is such that water will be conveyed through two 10.5 m diameter tunnels from the Waneta forebay into a two-unit powerhouse being built on the right bank of the Pend d'Oreille River below the Waneta Dam. Two Francis turbine units will produce up to a combined maximum capacity of 335 MW. Output from the units will be stepped-up to 230 kV at the powerhouse and delivered to BC Hydro's Selkirk Substation through a new 10 km transmission line. The project is anticipated to be in service in early 2015.



The Waneta Expansion Project, currently under construction, on the Pend d'Oreille River south of Trail, British Columbia.
Courtesy of Columbia Power Corporation.

SMART GRID IMPLEMENTATION

A smart grid includes the installation of smart meters and the adoption of time-of-use pricing for electricity. These encourage customers to shift some of their consumption of electricity to off-peak hours when electricity is at a lower price. This power shifting saves money for customers on their bills, and decreases strain on the electricity system, resulting in reduced requirements for new facilities. The overall result is reduced system costs and a minimized environmental impact.

Smart grids also feature the addition of automation and communications technology to the distribution system. This has many benefits: improved system operation and maintenance; quicker power restoration

following outages; the ability to accept intermittent power supplies such as from wind and solar generation; and the adoption of new technologies benefiting customers, such as power monitors, smart appliances, and electric vehicle charging.

CEA members are now installing smart meters and investigating smart grid investments which will benefit both electricity customers and electricity systems across Canada. Ontario has converted almost all electricity customers to smart meters and time-of-use pricing. During 2012, CEA members across Canada installed more than 790,000 smart meters.



Toronto Hydro has converted 99.7 percent of its meter population to Smart or Interval Meters.
Courtesy of Toronto Hydro Corporation.

How CEA Members are Installing Smart Grid Technologies to Better Serve Customers

Hydro One's Smart Grid Initiatives Well Established

Ontario is the first jurisdiction in North America to equip every home and small business with a smart meter. Hydro One has installed a total of 1,219,151 smart meters as of December 31, 2012; 1,089,726 customers have been notified of their switch to Time-of-Use (TOU) pricing; and 1,087,301 customers are now consuming power on TOU prices. Hydro One also continues its Advanced Distribution System trial, modernizing its distribution system and realizing its vision of a smarter grid.

New Brunswick Power Partners With Siemens on Smart Grid Development

New Brunswick Power (NB Power) has entered into a multi-year agreement with Siemens Canada to integrate smart grid technology into the province's electrical system and to create a Centre of Competence, with an estimated staff of 40, based in Fredericton, New Brunswick. As part of the initiative, the two companies will work

together to accelerate the benefits of NB Power's Reduce and Shift Demand strategy. The new technology will help NB Power to understand customer usage in real time and by collaborating with customers to reshape electricity demand on the electricity system.

Toronto Hydro Smart Meter Installation Virtually Complete

Toronto Hydro has converted 99.7 percent of its meter population to Smart or Interval Meters. The new meters capture, validate and process 5-minute, 15-minute and 60-minute interval data daily for over 665,000 meter points. In addition to traditional revenue meters, Toronto Hydro also captures and processes interval data for transformer smart meters, bi-directional meters used for solar panel electricity generation (energy used and energy generated) and electric vehicle charging stations. Toronto Hydro also supports individual metering for condominiums and has over 31,000 individually metered suites.

EMERGENCY PREPAREDNESS

In addition to investing in new and renewed infrastructure to maintain high levels of supply reliability, CEA members have also developed plans for other types of emergencies. For example, 90 percent of members have pandemic plans, 87 percent have plans in place to cope with natural disasters, and 90 percent have business continuity plans

in place. Planning for emergency situations reflects how important the electricity sector is to the functioning of Canada's economy and the comfort and convenience of its citizens. Industries, businesses, farms, hospitals, homes and much of Canada's critical infrastructure depends on electricity. CEA member companies understand how important electricity is to virtually every aspect of the lives of Canadians, making emergency preparedness a critical business priority.

How CEA Members are Prepared for Emergency Situations

Brookfield Renewable Energy Group a Key Player in Major Emergency Exercise

In several municipalities along Québec's Lièvre River, an exceptional flood or dam break could put lives in danger and cause significant damage. There are 12 dams and 3 reservoirs along the Lièvre. Six dams are managed by the Government of Quebec, four by Brookfield Renewable Energy Group, one by Boralex and one by Algonquin Power. For over 10 years, the dam managers have worked with municipalities and the Quebec government to plan emergency measures in case of unusually high flood levels or a dam break. In September 2012, 160 people were mobilized in the Outaouais and Laurentian regions for an emergency exercise that was planned by Ministry of Public Security staff of the two regions, dam managers, municipalities and Services Québec. The participants, who gathered in 11 emergency coordination centres, put their intervention plans to the test. The exercise showed that participants were prepared to act collectively and quickly, and also revealed areas needing improvement.

ENMAX Responds Well During Alberta Power Supply Emergency

On July 9, 2012, electricity demand across Alberta soared to a new summertime record at the same time as several generating units experienced forced outages due to high ambient temperatures. As conditions worsened, the Alberta Electric System Operator (AESO) declared levels 1, 2, and 3 Energy Emergency Alerts, requiring utility companies to restrict electricity supply. In response, ENMAX Power began a series of controlled power outages, affecting 56,000 customers. Over a period of about three hours, power was sequentially cut to seven different areas in Calgary and the surrounding region, for up to 30 minutes in each area. ENMAX Power drew on its robust emergency management tools and trained, experienced system operators. In the post-event examination, the company identified communications improvement opportunities, including clarifying responsibilities with the AESO. One improvement was the launch of a social media outage program in late 2012, which includes posting public outage notifications on the company website.



The Lièvre River in Quebec. There are 12 dams and 3 reservoirs along the Lièvre. For over 10 years, the dam managers have worked with municipalities and the Quebec government to plan emergency measures in case of unusually high flood levels or a dam break. *Courtesy of Brookfield Renewable Energy Group.*



Manitoba Hydro's head office in downtown Winnipeg is LEED Platinum certified.
Courtesy of Manitoba Hydro.



CASE STUDY: ECONOMIC

MANITOBA HYDRO PLACE: LEED® PLATINUM CERTIFIED

Manitoba Hydro's head office at 360 Portage Avenue in downtown Winnipeg embodies the company's commitment to energy efficiency and sustainability. Integrating advanced technologies with time-tested environmental concepts, Manitoba Hydro Place is considered the first of the next generation of sustainable buildings.

In May 2012, Manitoba Hydro Place received Platinum Certification for its adherence to Leadership in Energy and Environmental Design (LEED) standards by the Canada Green Building Council (CaGBC). Platinum is the highest certification available under the LEED program. Manitoba Hydro Place is the most energy-efficient office tower in North America and the only one in Canada to receive this prestigious rating so far.

Compared to conventional office towers of its size, Manitoba Hydro Place has achieved almost 70 percent reduction in energy use, from over 300 kilowatt-hours per square metre to under 85 kilowatt-hours per square metre—this unprecedented reduction has resulted in estimated energy savings of over \$750,000 annually.

Completed in 2009 at a cost of \$283 million, the 64,568 square metre building has 22 storeys, and houses 1,900 workers. Designed for a climate where temperatures can fluctuate by 70°C annually, it is a model for climatic-responsive design. Two weather stations monitor ongoing conditions and send instructions to more than 30,000 control points to optimize comfort and energy efficiency. There are more than 15,000 supplemental sensor points that provide assistance to maximize the building's performance. The building's energy management system is monitored daily to ensure superior occupant comfort and to maximize performance.

The design team used leading-edge Power Smart* technologies maximizing passive systems and minimizing active mechanical systems, resulting in a healthy workplace environment, superior energy efficiency, urban revitalization, unparalleled sustainability and architectural excellence. All this was achieved cost effectively.

BUILDING FEATURES

The building's form and orientation maximize low-grade solar thermal energy; minimize heat loss to the north; utilize wind for cooling and ventilation; and use sunlight for natural lighting. South-facing winter gardens maximize solar energy during the winter months. A solar chimney provides natural ventilation for the entire structure with minimum energy usage and optimum recovery of waste heat. Narrow floor plates with high ceilings and floor-to-ceiling glazing allow for natural lighting for almost 80 percent of standard office hours; a geothermal system consisting of 280 wells, each 122 meters deep, provides the heating and cooling.

An advanced computerized building-management system ensures that the building's passive and active systems work together for maximum efficiency, resulting in a building that responds to—and takes advantage of—the surrounding environment and natural processes. Although originally designed with the goal of attaining a LEED Gold certification, in operation the building has proven to be even more energy efficient and sustainable than expected, resulting in the LEED Platinum certification.

The building's flexible, modern design meets the company's needs today, while retaining the flexibility to adapt to new work environments in the future. Employees now work in a comfortable, healthy and productive workplace that also encourages use of public transit and active transportation. More than 70 percent of head office employees now commute to and from work by bike, bus, or as part of a carpool—compared to 95 percent using a single vehicle before their relocation to Manitoba Hydro Place.

** Manitoba Hydro is a licensee of the Trademark and Official Mark.*

CEA Verifier's Statement



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May 30, 2013

Re: 2012 Sustainable Electricity Independent Verification Assurance Statement

Sustainable Electricity is a mandatory industry-wide sustainable development program developed and implemented by the electric utility members of the Canadian Electricity Association (CEA). The program seeks out synergies between the three factors of 'sustainability'—environment, social, and economic—enabling the electricity sector to take a holistic approach to managing its activities.

The Independent Verification process is a core element of the Sustainable Electricity program and is conducted by an independent, qualified assessor, in accordance with CEA independent verification protocols. This is to attest that Duerden & Keane Environmental Inc. (D&K) successfully completed on-site independent verification of the following companies in 2012:

TransAlta (past CEA member), Capital Power Corporation, SaskPower, Saskatoon Light and Power, Yukon Energy, Northwest Territories Power Corporation. In accordance with the verification protocols, D&K Environmental Inc. utilized the following framework to ensure data integrity and conformance with the program requirements.

The Scope of the Verification:

- The degree of adherence to the CEA Policy on Sustainable Development—Corporate Responsibility
- Consistency and accuracy of information provided to CEA on key performance indicators
- Conformance with CEA's requirement for an ISO 14001 consistent Environmental Management System (EMS)

Verification Procedure:

- Interviews with senior company executives on the strategic direction/issues related to sustainable development, as well as their commitment to the principles of the Sustainable Electricity program
- Interviews with other appropriate company representatives to verify information provided to CEA
- Document reviews and cross referencing of information for consistency and accuracy (e.g. annual reports, websites, information reported to government agencies)
- Review of data collection procedures
- Testing of calculations performed for specific key performance metrics
- Review of environmental management system elements and procedures, including internal/external audits and minutes from management reviews

Verifier Conclusions:

- High-level of understanding and commitment to the principles of the Sustainable Electricity program by senior company executives and staff
- High degree of consistency between information provided to CEA and published in other reports

- Some minor deficiencies in reporting
- Significant conformity with the CEA EMS requirement, although some gaps were identified at several companies

To ensure all companies conform to the requirements of the Sustainable Electricity program, the same verification approach will be utilized at the following CEA member companies (in the order of scheduled external verifications):

- Manitoba Hydro
- Hydro One Inc.
- Toronto Hydro-Electric System Limited
- Horizon Utilities Corporation
- Oakville Hydro Corporation
- Ontario Power Generation
- Brookfield Renewable Energy Group
- Hydro Ottawa Holding Inc.
- Maritime Electric Company Limited
- New Brunswick Power Holding Corporation
- Newfoundland Power Inc.
- Nalcor Energy
- Saint John Energy
- Nova Scotia Power Inc.

AltaLink, ATCO Electric, ATCO Power, BC Hydro and Power Authority, Columbia Power Corporation, ENMAX Corporation, EPCOR, FortisAlberta, FortisBC, and TransCanada were verified in 2011.

We would like to thank CEA for the opportunity to perform the verifications in 2012, and we look forward to the next round of verifications in October 2013.

For Duerden & Keane Environmental Inc.,



Colin Duerden
B.Sc., Ph.D., EP-EMS(LA), EP-CEA



Sue Keane
B.Sc., M.Eng., EP-EMS(LA), EP-CEA

2013 CEA Sustainable Electricity Award Winners

Through annual sustainability awards, CEA recognizes companies that are innovative in their approach to the environmental, social and economic aspects of their operations. The award applications are evaluated by the independent Public Advisory Panel, chaired by the Honourable Mike Harcourt, former Premier of British Columbia.

The 2013 award winners are the following:

ENVIRONMENTAL COMMITMENT AWARD

Horizon Utilities Corporation

In Recognition of the Energy Density Mapping Pilot Project. The Energy Density Mapping is an innovative pilot program in Horizon Utilities' service territory of Hamilton and St. Catharines, Ontario. The project correlates an individual customer's electricity consumption with individual building attributes (e.g., square footage, age of buildings and additions, air conditioners, heating type, etc.), and demographic data (e.g., population by neighbourhood, number of households and average income) to be used in a geographic information system. The resulting electric consumption density maps show which customers have the greatest consumption based on standard metrics, such as kilowatt-hours per square metre; building age and attribute information; and business types and demographics. This permits Horizon to better focus its energy efficiency and conservation initiatives.

SOCIAL RESPONSIBILITY AWARD

Brookfield Renewable Energy Group

In Recognition of the Integrated Public Outreach Initiative for Mitigating Power Structure Failure in the Lievre River Watershed.

The Lievre River Watershed hosts six power generation stations and adjacent dam structures, which, in the event of failure, could present significant environmental and safety challenges to the nearby community. The extent of extreme flooding or rupture of these structures is such that conventional emergency planning, as currently prescribed in regulation, would be inadequate. In 2012, Brookfield Renewable Energy Group began working closely with its partners to develop and disseminate a step-by-step resident emergency plan video and complete a multi-agency emergency planning exercise. This initiative has improved and harmonized the emergency response planning among municipalities, first-responder agencies and power dam operators; and informed residents of individual and organizational roles in the event of an extreme flooding or dam failure.

ECONOMIC EXCELLENCE AWARD

BC Hydro

In Recognition of the Lead by Example Internal Energy Efficiency and Conservation Initiative. BC Hydro's *Lead by Example* program was developed to integrate conservation and energy efficiency into the projects, policies and practices of all of its business units. Sustainable facilities, empowered staff, and conservation policies and practices are the key tenets of *Lead by Example*. Commitment to the principles of the program has contributed to a five percent reduction (11 gigawatt-hours) in energy consumption at BC Hydro since 2010. Through *Lead by Example*, BC Hydro has developed a Green Team network of more than 350 staff members dedicated to introducing and improving environmentally-sound practices at the company. *Lead by Example* has also helped BC Hydro champion conservation as a key part of the company's culture, attract and retain exceptional talent, improve operations and maintenance objectives, meet environmental obligations, and enhance the reputation of the company.



Left to right: Anthony Haines (left), President & CEO, Toronto Hydro, and Chair of CEA's Board of Directors; David Morrison, President & CEO, Yukon Energy, and Chair of CEA's Board of Directors Committee on Sustainability; Ian Kerr, Chief Operating Officer, accepting the award on behalf of Brookfield Renewable Energy Group; and Jim Burpee, President & CEO, CEA. Photo credit: Greg Teckles.

BC Hydro's President & CEO, Charles Reid with the statue. Photo credit: Greg Teckles.



Left to right: Anthony Haines (left), President & CEO, Toronto Hydro, and Chair of CEA's Board of Directors; David Morrison, President & CEO, Yukon Energy, and Chair of CEA's Board of Directors Committee on Sustainability; Neil Freeman, Vice President, Business Development, accepting the award on behalf of Horizon Utilities Corporation; and Jim Burpee, President & CEO, CEA. Photo credit: Greg Teckles.

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Sustainable Electricity Steering Committee Members

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The Canadian electricity sector is committed to providing sustainable and innovative solutions to meet the needs of communities. Learn more about the sector's commitment to Sustainable Electricity™ at www.SustainableElectricity.ca.



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The Calgary Energy Centre is a 320 MW natural gas-fuelled combined cycle generation facility on the northern boundary of Calgary. In combined cycle turbine technology, natural gas fuels a combustion turbine that produces both electricity and heat. The heat is then captured to produce even more electricity through a steam turbine.
Courtesy of ©ENMAX Corporation.

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