

INVESTING IN OUR **SUSTAINABLE** FUTURE



2010 Sustainable Electricity Annual Report



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

**Électricité
durable**
Nous avons le pouvoir^{MD}



**Canadian
Electricity
Association**

**Association
canadienne
de l'électricité**

PURPOSE OF THE SUSTAINABLE ELECTRICITY REPORT

Sustainable Electricity is an industry-wide sustainability program developed and implemented by the electric utility members (generation, transmission and distribution) of the Canadian Electricity Association (CEA). The principle objective of the program is to continuously improve the overall sustainability performance of the industry. This 2010 report, the third of the Sustainable Electricity program, documents the sustainable development performance of CEA member utilities from January 1, 2010 through December 31, 2010. The sustainability initiatives cited in the report are indicative of improvements at individual member utilities, but do not necessarily reflect industry standards, as utilities are at varying stages of progress in policy and program development. The information provided by member utilities for this report is independently verified every five years. Additional information on member performance is available at the CEA Sustainable Electricity website at www.SustainableElectricity.ca.

PERFORMANCE OVERVIEW

Sustainable Electricity seeks to foster synergies between the three pillars of sustainability – environmental, social and economic development. In 2010, CEA member companies achieved modest progress on overall sustainable development performance. Net electricity production declined for the second consecutive year as customer demand remained at lower levels following the 2008 economic downturn. Compared to 2009, net production declined by three percent. On environmental performance, CEA members achieved some successes and

faced a range of challenges. While Sulphur Dioxide (SO₂) emissions declined, Carbon Dioxide equivalent (CO₂ eq), Nitrogen Oxide (NO_x), and priority spills all increased, though just slightly. In an industry driven by long-life capital assets, year-over-year environmental improvements are a difficult challenge to meet. On social performance, there were improvements by CEA utility members in all three major areas under health and safety – all injury/illness frequency rate, lost-time injury frequency rate, and lost time injury severity rate. However, there was a tragic fatality, and this is unacceptable to all CEA members. On economic performance, members faced challenges and reported successes in promoting energy conservation, investing in new infrastructure, and providing reliable service to customers. In 2010, CEA members spent approximately nine billion dollars on generation, transmission and distribution infrastructure, in order to renew aging infrastructure and provide clean, more efficient electricity to Canadians. These new investments included large hydroelectric projects, clean coal, natural gas-fired facilities, wind power sites, transmission inter-connections, and distribution automation installations.

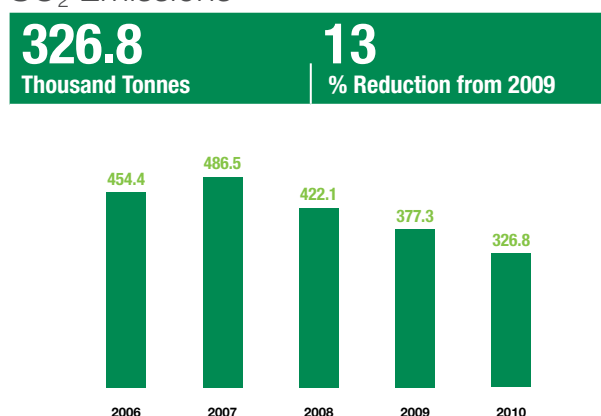
Utilities across the country are facing many challenges from reducing environmental impacts to investing in new infrastructure and attracting skilled workers. CEA members are committed to continual improvement and are making progress on the journey towards achieving social, economic and environmental progress – the pillars of sustainable development.

The information below provides an overview of CEA member performance relative to 2009. Green indicates improved performance; yellow indicates decreased performance; and grey indicates no change.

CO₂ eq Emissions



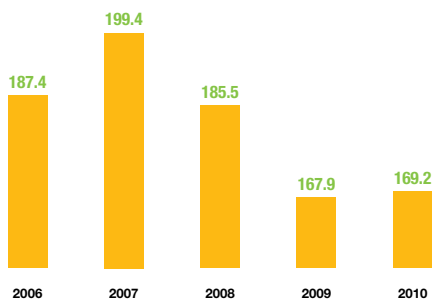
SO₂ Emissions



NO_x Emissions

169.2
Thousand Tonnes

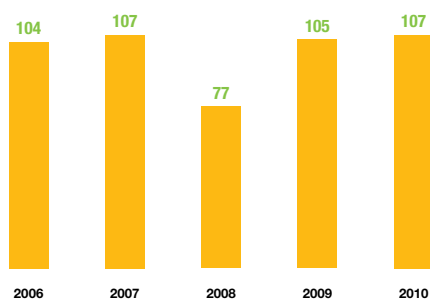
0.7
% Increase from 2009



Annual Priority Spills

107
Annual Priority Spills

2
% Increase from 2009

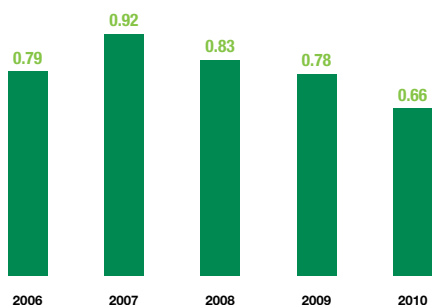


Lost-Time Injury Frequency Rate

CEA Canadian Composite

0.66
Lost-Time Injuries
Per 200,000 Hours

15
% Reduction from 2009

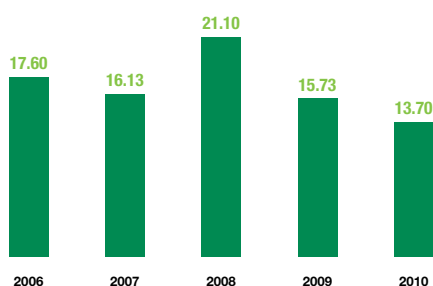


Lost-Time Injury Severity Rate

CEA Canadian Composite

13.70
Calendar Days Lost
Per 200,000 Hours

13
% Reduction from 2009

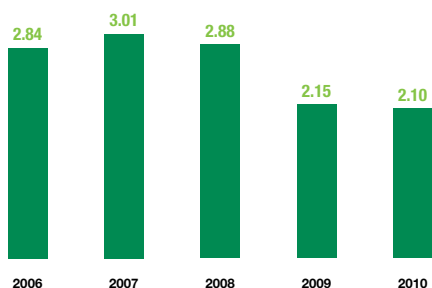


All Injury/Illness Frequency Rates

CEA Canadian Composite

2.10
Injuries Per 200,000 Hours

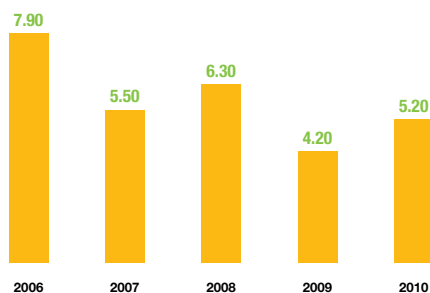
2
% Reduction from 2009



System Average Interruption Duration Index (SAIDI)

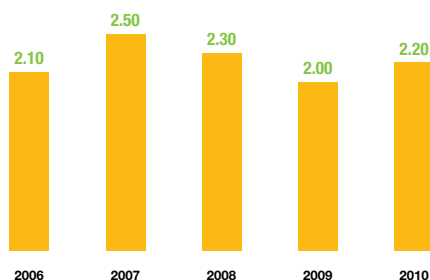
5.2
Duration (Hours)

24
% Increase from 2009



System Average Interruption Frequency Index (SAIFI)

2.2 Interruptions (Per Customer)
10 % Increase from 2009



2010 Investments in New and Refurbished Infrastructure (\$ Billions)

\$9 Billion Investments
0 % Change from 2009

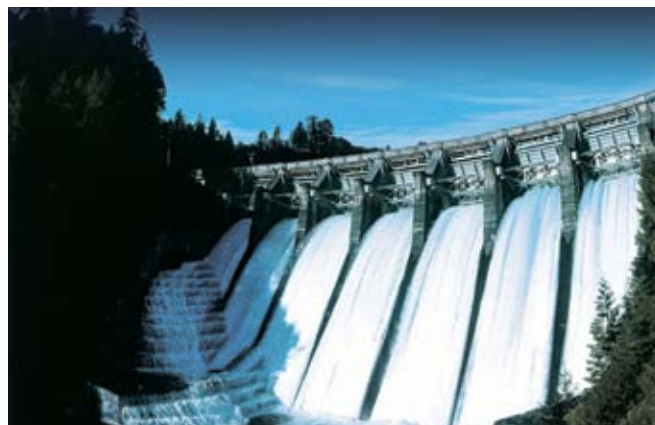


Key Industry Challenges

Investing in Infrastructure: In a recent report, the Conference Board of Canada estimates “the electricity industry will need to invest \$293.8 billion in electricity infrastructure by 2030 to replace existing aging facilities and add new renewable energy.”¹ In 2010, CEA members across Canada invested approximately nine billion dollars in new infrastructure projects, including new generation capacity (large hydro, natural gas, and wind power) and associated transmission and distribution automation technologies. CEA members will continue to invest in new technologies, but they need unwavering government policy commitment, timely regulatory approvals, and stakeholder support to ensure Canadians have an electricity system that is sustainable, reliable, modern, and cost effective.

Electricity Demand: Managing electricity demand growth is a significant challenge with the number of electricity consuming technologies being introduced regularly into the market place. The economic recovery and industry/government plans to electrify traditionally fossil-based technologies – particularly in the transportation sector (for example, electric cars) – will likely result in further increases in electricity demand. To moderate demand growth, CEA member companies will continue to invest in conservation through targeted customer programs, but they will require governments, communities, and consumers to actively participate and support these initiatives.

Climate Change: Significant uncertainty remains on regional, national, and international climate change policies and measures, and CEA generation members continue to work with government to develop a comprehensive plan for emission reductions. Efforts to limit greenhouse gas emissions (GHGs) are expected to affect the costs, market value and



BC Hydro's Ruskin Dam.


risks associated with the evaluation of electricity generation resource options by utilities. While the focus to date has been on mitigating climate change, members are also aware of the risks of the potential physical effects of climate change. While adaptation is still an emerging issue, CEA member utilities, governments, and stakeholders must increasingly turn their focus to strategies for adapting to the effects of climate change.

Human Resources: Attracting qualified skilled workers to the electricity industry remains a challenge, exacerbated by the age of the industry workforce and the impending retirements of experienced utility personnel. CEA member companies are working diligently to expand and improve skills training and apprenticeship funding, and to raise awareness about electricity-related career choices among students and foreign-trained workers.


¹ Conference Board of Canada, Canada's Electricity Infrastructure: Building a Case for Investment, April 2011

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Where the report indicates  more information can be obtained online at www.SustainableElectricity.ca.

CEA Launches the New Sustainable Electricity Company™ Brand

In November 2010, CEA launched the Sustainable Electricity Company brand for generation, transmission and distribution utilities. The brand, primarily based on the **ISO 26000 standard – Guidance on Social Responsibility**, outlines several criteria including third-party verification of criteria implementation by CEA member companies. CEA does not certify companies to the ISO 26000 standard, but brand users must commit to core subjects, issues and related actions and practices. CEA encourages all utilities to adopt, use and adhere to the new Sustainable Electricity Company™ brand as a tangible and visible demonstration of their commitment to sustainability. 



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

Joint Message from the Executives

It is our pleasure to share the third annual Sustainability Report under the CEA Sustainable Electricity program. CEA member utilities are making progress on sustainable development, but many challenges persist, including the reduction of air emissions, priority spills and investing in new infrastructure. These challenges make it even more important that Canada's electricity infrastructure be modernized in order for CEA members to provide environmentally-sound, socially-acceptable and economically-viable electricity to Canadians.

STRATEGIC CONSIDERATIONS

Electricity is fundamental to maintaining prosperity and meeting the needs of Canadians. From hospitals that Canadians depend on for health services, to home appliances, to personal electronics and communications – reliable electricity, available on demand, has never been more critical. In 2010, the global economic downturn continued to impact the overall expansion of the electricity sector. As a result, net electricity fell by three percent compared to 2009 and ten percent compared to 2008. However, with the economy showing signs of recovery, CEA members must continue renewing and modernizing the aging electricity infrastructure while considering the environmental, social and economic realities of their businesses.

Investing in new and innovative infrastructure is one of the greatest challenges facing CEA members. Electricity infrastructure must be reliable and capable of handling a diverse range of fuel supply and demand options, including wind generation and smart grid technologies. The industry needs governments and communities to partner in and support these efforts to ensure a reliable electricity system for generations. This means timely approval of new projects, better investment conditions, and greater acceptance of electricity infrastructure by stakeholders and the general public.

Continuing uncertainty surrounding climate change mitigation policy represents another significant risk and challenge. There is an opportunity for governments to establish a policy framework to encourage adoption of innovative technologies with the orderly turnover of existing generation assets. Further development and use of conventional and new clean forms of energy, and carbon capture and storage in certain regions can play a significant role in maintaining diversity of generation and decreasing environmental impact. It is also essential that new transmission interconnections be built to transport electricity from remote generation facilities, particularly related to renewable energy. However, governments must create policy conditions that support these investments and partner with industry on new technological solutions.



From left to right: Chris Huskison, Pierre Guimond, and Will Bridge.

CEA members are also facing the prospect of a skilled-worker shortage at a time of industry renewal and expansion. The industry is working closely with government agencies, educational institutions, and community organizations to meet the human resources challenge and alleviate the shortage of qualified workers. CEA members are equally committed to retaining existing workers and ensuring that the workplace remains diverse and respectful.

2010 PERFORMANCE OVERVIEW

CEA member utilities strive to improve their environmental performance within the constraints of the current regulatory framework and aging infrastructure. Regarding air emissions, CEA members continue to face challenges in making significant progress. While absolute SO₂ emissions declined by just over 13 percent, NO_x and CO₂ eq emissions increased relative to 2009, by 0.7 and 0.9 percent respectively. However, it is important to consider this increase in context; for an industry that operates facilities with long operating cycles, minor year-over-year fluctuations are to be expected. The critical indicator is a long-term emission reduction trend. In that regard, air emissions have steadily declined over the last five years, remaining lower than pre-recession 2008 levels. These reductions will continue as companies start retiring existing facilities and invest in new alternative technologies, including renewable generation. In 2010, CEA members continued to invest in new infrastructure projects including large hydro, more efficient gas turbines, carbon capture and storage, and renewable power such as wind and biomass.

Priority spills and protection of biological diversity are also of concern to CEA member utilities. Since 2006 spills have essentially plateaued. To facilitate an industry standard of continual improvement, CEA members will discuss this issue to find a way forward. On biodiversity, CEA members continued to work in partnership with conservation groups and governments. Again, CEA members are committed to continuing the dialogue with stakeholders to ensure a population-based approach to protecting species.

On social performance, there were challenges and successes. In 2010, CEA introduced several new human resources indicators to ensure members continued to measure progress toward a respectful and fair workplace. Results show that CEA members performed well in terms of programs on diversity, anti-harassment, and anti-discrimination. On health and safety, CEA members again showed progress with another year of reductions in all injury/illness frequency rate, lost-time injury frequency rate, and lost time injury severity rate. However, there was a tragic fatality at a member company; this is unacceptable to all CEA members.

With respect to economic performance, CEA members continued to invest in infrastructure, service continuity and energy conservation. In 2010, CEA members spent approximately nine billion dollars on generation, transmission and distribution infrastructure. On service continuity, significant weather events decreased the level of service continuity, but otherwise, performance continued on the right track. In addition, utilities across Canada partnered with CEA and Natural Resources Canada (NRCan) to invest in the promotion of ENERGY STAR qualified light fixtures.

RESPONSE TO THE PUBLIC ADVISORY PANEL LETTER

CEA members value the advice of the Public Advisory Panel of the Sustainable Electricity program. The Panel made several recommendations related to performance indicators and benchmarks, greenhouse gas mitigation and adaptation, aboriginal relations and partnerships, and innovation. The Panel also recommended improvements in year-over-year member performance, particularly on the environment.

Facilities owned or operated by CEA members have long operating cycles; changes to performance will take time. As these facilities are retired, CEA members will invest in a diverse set of technologies that are best-in-class. In 2010, CEA members continued to invest in large hydro, renewable technologies, new efficient gas turbines, carbon capture and storage, smart grid and automation technologies. There

are many more of these projects awaiting regulatory approval. These investments and innovations will have a profound impact on how the electricity system works in the future. CEA member companies are committed to working with the Panel to build on these successes in the year ahead.

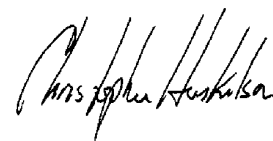
IN CONCLUSION

The electricity industry faces numerous challenges and opportunities. CEA members are determined to meet them with the support of all stakeholders, including governments at all levels. The industry must continue to accelerate its sustainability performance; but it is likewise imperative that governments create the right policy conditions to support innovation and change. We look forward to working with all stakeholders to ensure Canadians continue to receive reliable, sustainable and cost-effective power in the years ahead.

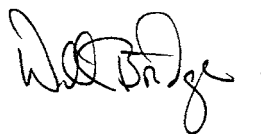
Sincerely,



Mr. Pierre A. Guimond
President & CEO
Canadian Electricity Association



Mr. Chris Huskison
President & CEO, Emera Inc.
Chair, CEA Board of Directors



Mr. Will Bridge
Chief Technology Officer, TransAlta
Chair, Sustainable Electricity

Letter from the Public Advisory Panel

Mr. Chris Huskison
President and Chief Executive Officer, Emera Inc.
Chair, Board of Directors
Canadian Electricity Association

Dear Mr. Huskison,

Public Advisory Panel members of the Sustainable Electricity program are pleased to submit this letter of advice to the Board of Directors of the Canadian Electricity Association. In doing so, we note that our role is to present an informed point of view on the economic, social, and environmental performance of the electricity industry in Canada, and to do so against the backdrop of the principles and indicators that are at the foundation of the program.

Our comments this year are more critical than in previous years, though we acknowledge that Canadian industry has come through difficult economic times. We appreciate and applaud the initiatives that CEA member companies have undertaken; however, we believe that the electricity industry's sustainability performance was weaker in 2010, and we note some troubling performance indicators in the Annual Report. Many of the gains documented were the result of the downturn in the economy. We were concerned to see several negative indicators, such as: a fatality, an increase of two percent in priority spills, and an increase in CO₂ eq emissions of 0.9 percent when electricity production decreased by three percent and several coal-fired power plants were retired.

Panel members believe the Annual Report should convey to Canadians a stronger conviction by CEA members to foster innovation in all performance objective areas. The report should emphasize more strongly the substantial challenges facing the industry and should set out the strategies/actions that are being pursued to engage governments and cooperate with stakeholders and major players to meet sustainability performance objectives. We particularly urge CEA member companies to report more substantively on what has changed with respect to partnerships and measureable outcomes in relations with Aboriginal peoples.

Panel members are concerned about the slow progress of the electricity sector on greenhouse gas emission reductions. In this respect, we urge the electricity industry to more aggressively engage its customers about the new approaches and technologies that will be needed to mitigate investment risk and enhance industry sustainability.

The following specific comments and recommendations are offered to the CEA Board of Directors on future Annual Reports:

- There is no reference in the 2010 report to the use of industry benchmarks. However, some CEA member companies do refer to benchmarks in their sustainability reports. Panel members encourage the CEA to work on developing benchmarks for use in sustainability reporting. A start could be made by including examples of benchmarking by member companies in future reports.
- Panel members note that the Sustainable Development Index (SDI) will only be meaningful if it is measured against something tangible. In this regard, the CEA should continue to establish objectives for key sustainability measures and report annually on progress in achieving the objectives, including annual updates of the SDI. The reports should also document the amount of company/industry total infrastructure expenditures that are being made to meet sustainability performance objectives.



Hon. Mike Harcourt.

A final comment by the Panel is that the need to replace aging electricity infrastructure over the next twenty years – a \$220 billion investment according to the CEA, \$290 billion according to the Conference Board of Canada – must also be reconciled with the need of cities to fund their projected infrastructure deficit (e.g. \$120 billion in sewer, water, waste, roads, public buildings, and so on, according to the Federation of Canadian Municipalities) and the need to meet other demands for infrastructure funding (e.g., transportation and ports). These enormous cost projections suggest to Panel members that Canadian governments, industry and society must re-examine status quo approaches to future infrastructure development and investment needs.

We look forward to further discussion on the issues and concerns that we identify in this year's letter, as well as ongoing discussions on past issues that we have identified.

Yours sincerely,

Hon. Mike Harcourt
Chair, Public Advisory Panel

Key Performance Highlights

Green indicates improved performance and yellow indicates decreased performance.

93%

COMPANIES WITH
AN ISO 14001
EQUIVALENT EMS

4 percent increase from 2009

326.8

SO₂ EMISSIONS
(THOUSAND TONNES)

13 percent decrease from 2009

169.2

NO_x EMISSIONS
(THOUSAND TONNES)

0.7 percent increase from 2009

1501

MERCURY EMISSIONS
(KILOGRAMS)

1 percent decrease from 2009

107

ANNUAL PRIORITY
SPILLS (NUMBER)

2 percent increase from 2009

89.4

CO₂ eq EMISSIONS
(MILLION TONNES)

0.9 percent increase from 2009

930

FOSSIL INTENSITY
(TONNES/GWh CO₂ eq)

4 percent decrease from 2009

CEA member performance environmental

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

Genesee Generating Station in Alberta runs a successful grazing program each year on its reclaimed land, home to over 2,000 cow/calf pairs.

Principle 1: Environment

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



The electric power system is composed of a broad range of generation, transmission and distribution facilities which have varying environmental impacts on air, land and water. CEA member companies understand the impacts of their activities and, through their Environmental Management Systems (EMS), are taking actions to meet regulatory requirements, mitigate risks, and ensure a positive contribution to the environment. In many cases, internal Environmental Management Systems – which CEA made a condition of membership under the predecessor Environmental Commitment and Responsibility Program in 1997 – help identify, monitor and manage the impact of company operations on air, land and water. Members track progress by setting specific objectives and targets that are based on commitment to continual improvement. By the end of 2010, 93 percent of members (27 out of 29) indicated that they had an ISO 14001 equivalent EMS system in place. CEA has already met with the two outstanding companies on the implementation of their respective EMS systems, and it is expected that they will have their systems in place by the end of 2012.

STATUS OF EMS IMPLEMENTATION

	2009	2010
ISO 14001 or equivalent Environmental Management System (EMS)	89 percent	93 percent
EMS audited by an external/internal auditor within the last three years	85 percent	90 percent

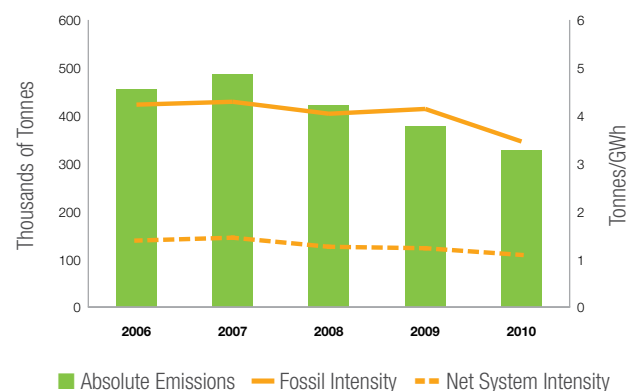
While EMS systems are important in identifying and meeting legal requirements, 24 percent of CEA members received a total of 14 non-compliance orders/notices in 2010. In addition, two member companies incurred non-compliance fines for a total amount of \$43,405. In the case of the first company, a contractor entered a closed area in a transmission right-of-way and the regulator levied a one-time fine for contravention of the policy, although there was no adverse environmental impact. The second company was cited for several infractions of exceeding regulatory limits on various contaminants. Corrective measures were taken and the company was able to reduce the amount of non-compliance fines through subsequent preventative and mitigation measures. While non-compliances vary in offence from incidents of negative environmental impact to administrative violations, meeting federal/provincial/territorial legal obligations are considered a minimum performance requirement and corrective action must be taken. It should also be noted that the vast majority of CEA generation, transmission and distribution members did not incur non-compliance fines and orders/notices in 2010.

AIR QUALITY

Air quality is a significant challenge for CEA member companies operating decades-old thermal facilities. Generation companies producing thermal electricity, responsible for nearly 26 percent of SO₂ emissions and nine percent of NO_x emissions in Canada, have made significant investments in new retrofit technologies such as Selective Catalytic Reduction (SCR) systems to meet regulatory and voluntary air quality commitments in the last two decades. However, many plants are aging and further emission reduction retrofits do not make economic sense given the short remaining lifespan of these assets. In fact, short-to medium-term emission reduction retrofits may run counter to greenhouse gas reduction objectives as these investments will force companies to run existing facilities longer to recuperate capital expenditure. In 2010, SO₂ absolute emissions declined by approximately 13 percent to 326,832 tonnes from 377,383 tonnes in 2009. This was a result of the decommissioning of the remaining coal-fired unit at Grand Lake Generation Station in New Brunswick, plus reductions in coal generation in Nova Scotia and Saskatchewan. The closure of the unit at the Grand Lake Station, commissioned in 1964, will result in the reduction of SO₂ emissions by nearly 22,000 tonnes annually. Overall, SO₂ emissions have decreased by 33 percent relative to 2007.

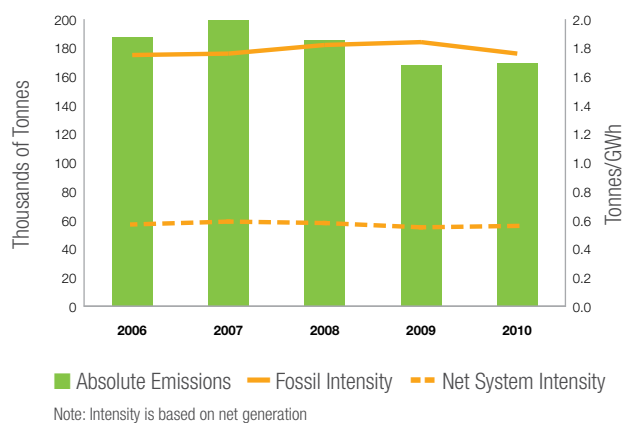
Fossil fuel SO₂ emissions intensity (tonnes per unit of electricity produced) decreased from 4.14 tonnes/GWh in 2009 to 3.46 tonnes/GWh in 2010 (Figure 1). The reduction in SO₂ fossil intensity is again attributable to the shutdown of the coal-fired unit in New Brunswick and the use of

figure 1 | SO₂ Emissions and Intensity



Note: Intensity is based on net generation

figure 2 | NO_x Emissions and Intensity



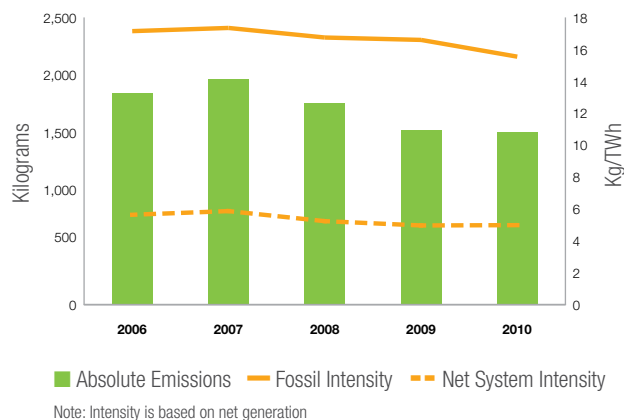
facilities with higher combustion efficiencies. NO_x emissions, however, increased slightly by 0.7 percent compared to 2009 levels, though still remained much lower than 2008 and 2007 levels. NO_x emissions increased at a few utilities in Alberta, Ontario and Nova Scotia, due in part to increases in thermal generation. However, fossil-fired NO_x intensity declined to 1.76 tonnes/GWh in 2010 from 1.84 tonnes/GWh in 2009 (Figure 2).

Plant decommissioning and investment in newer, more efficient technologies in the next five-to-ten years will have a significant impact on air emission reductions. But CEA generation members will require greater regulatory certainty and better investment conditions to accelerate the pace of progress. In October 2010, the federal/provincial/territorial governments agreed to move forward with a new air quality management system, and CEA generation members look forward to the development of a realistic and achievable air quality action plan, in 2011.

MERCURY

As significant sources of mercury emissions in Canada (26 percent), CEA member companies are working to reduce mercury releases to meet regulatory and voluntary performance objectives. In fact, mercury emissions have decreased 24 percent since 2007. In 2010, CEA members emitted 1501 kilograms of mercury, slightly less than the 1521 kilograms emitted in 2009. While there is some variability in emissions across member companies, the reduction in 2010 represents an overall improvement of one percent from 2009. This is the lowest amount emitted since utilities began reporting to CEA in 2006 (Figure 3).

figure 3 | Mercury Emissions and Intensity

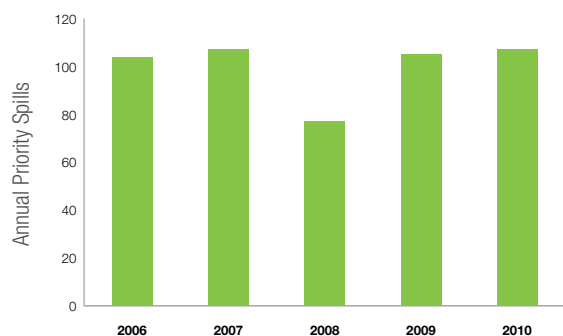


PRIORITY SPILLS

The electricity industry uses a large amount of petroleum-based products in its electrical equipment. The number of spills that occur each year depends on factors such as weather conditions, transformer reliability, age of existing assets and incidents of vandalism. CEA tracks spills classified as priority spills – major spills, which contain petroleum products or polychlorinated biphenyls (PCBs) and spills that enter a body of water – given the potential adverse environmental impacts. In 2010, CEA members had 107 priority spills compared to 105 priority spills reported in 2009 (Figure 4).

The spills in 2010 were largely attributable to transformer and other substation equipment failures, extreme weather conditions and vandalism. In one instance, severe flooding from a ruptured dam swept away a portion of an overhead distribution line including a pole-mounted transformer. Vandalism at substations also contributed to transformer damage and oil leaks. In each case, companies took immediate action to remediate the affected sites, including removal of contaminated soil, and implementation of oil spill containment programs. Spills that have resulted from extreme weather or vandalism will require rethinking around the existing engineered and administrative controls that are in place. As such, CEA will be working with members to further identify strategies for reducing annual priority spills.

figure 4 | Annual Priority Spills





TransAlta's wind facility turbine near Pincher Creek, Alberta.

PCB MANAGEMENT

Polychlorinated biphenyls (PCBs) are a group of organic compounds 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. In 2010, the amount of high-level PCBs taken out of service increased by 77 tonnes and the amount of low-level PCBs taken out of service increased by 588 tonnes from 2009 levels (Figure 5). The amount of low-level PCBs taken out of service has increased steadily for a number of years, with a total of 3,978 tonnes of low-level PCBs taken out of service since 2007.

However, the amount of low-level PCBs sent for destruction decreased significantly from 8,297 tonnes in 2009 to 1,448 tonnes in 2010 (Figure 6). The relatively high level in 2009 was primarily due to remediation activity at the former Federal Pioneer property in Saskatchewan, currently owned by SaskPower. CEA members continue to reduce the level of high- and low-level PCBs in service, and are developing strategies for long-term handling, decontamination and disposal of equipment containing PCBs.

figure 5 | PCB Management – PCB Material Taken Out of Service

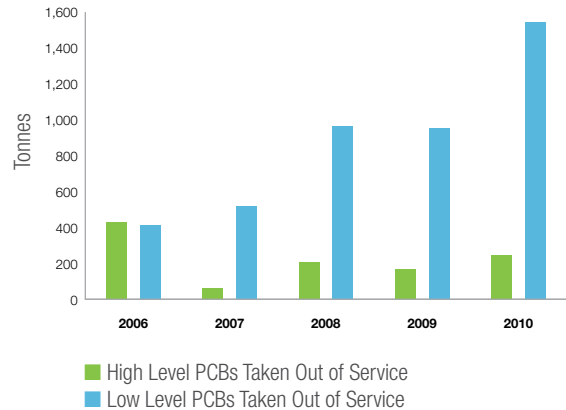
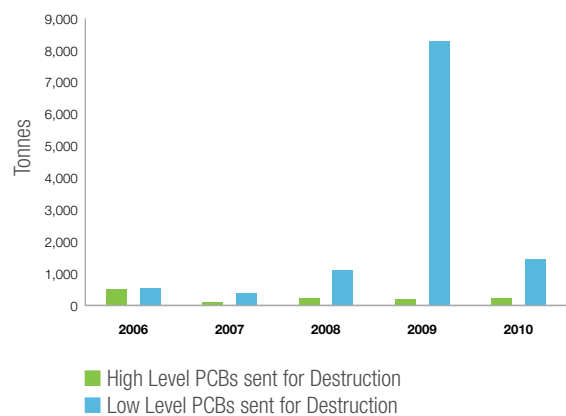


figure 6 | PCB Management – PCB Material Sent for Destruction





Supporting B.C.'s ecosystems;
BC Hydro.

Mitigating Environmental Impacts: 2010 CEA Member Initiatives

ATCO Power Invests in Mercury Abatement Technology: ATCO Power's Battle River and Sheerness stations installed and conducted testing on mercury-capture equipment in compliance with new mercury-capture requirements. ATCO Power plans to use activated carbon injection technology to capture at least 70 percent of the mercury contained in coal.

Hydro Ottawa's Environmental Sustainability Strategy: In 2009, Hydro Ottawa initiated the development of a new environmental sustainability strategy. As part of this strategy, the company established three priority areas: reduction of GHG emissions; green procurement and supply chain management; and building a culture of environmental sustainability within the organization. In 2010, the company initiated action in each of the priority areas, which resulted in Hydro Ottawa implementing an anti-idling policy, purchase of hybrid vehicles, energy efficiency improvements at several facilities and office buildings, development of a green procurement policy and an online tool to create a culture of environmental responsibility within the organization.

Ontario Power Generation Shuts Down Coal Fired Units: Ontario Power Generation decommissioned four coal units in 2010 (units 3 and 4 at Nanticoke and units 1 and 2 at Lambton). This action is part of OPG's managed approach to phasing out coal by the end of 2014. The early closure of the Lambton and Nanticoke units will remove surplus generating capacity and save customers approximately \$200 million in operating and maintenance costs between late 2010 and the end of 2014.

For more industry initiatives: www.bceia.ca

Principle 2: Stewardship and Biodiversity

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



2010

was the International Year of Biodiversity. At the Conference of the Parties to the Convention on Biological Diversity (COP 10) in Nagoya, Japan, governments from around

the world agreed to renew their pledge to reduce the global rate of biodiversity loss. This is an important commitment as a large part of the Canadian economy is tied to natural capital. Conservation associated with identifying species at risk and habitat protection is increasingly shifting toward a holistic-systems approach that reflects consideration of climate change, water quality and stakeholder coordination.

CEA member companies recognize this shift and have been working to integrate these considerations into routine activities (environmental assessments) and company initiatives. For example, **Ontario Power Generation's (OPG)** unique tree planting program attempts to address both biodiversity and climate change. Since its introduction in 2000, OPG and its conservation partners, have planted approximately 4.4 million native trees and shrubs matched to site conditions, on approximately 2,200 hectares of land. Over 500,000 native trees and shrubs were planted in 2010 by OPG's various planting partners, which include conservation authorities, stewardship councils and the Long Point World Biosphere Reserve. These restoration efforts are focused on strategic locations which include some of the most biologically imperiled regions in Canada. They will also help enhance the resiliency of woodland ecosystems to withstand the effects of climate change, while also naturally sequestering CO₂ over the lifetime of those trees, helping to mitigate global warming.

CEA members continue to take these measures both individually and in partnership with local organizations. Alongside these efforts, CEA continues to work closely with the federal government to support stewardship activities under the Species at Risk Act (SARA), Migratory Birds Convention Act (MBCA) and the Fisheries Act (FA). In 2010, the CEA made several submissions to the federal government containing recommendations for improving compliance provisions while supporting species and conservation objectives. For instance, on SARA, CEA and member utilities, in partnership with other industry associations and environmental groups, developed and presented legislative amendments during the Five-Year Review of the Act by Parliament. CEA and its members will continue to work with interested stakeholders and the federal government to achieve meaningful species conservation objectives and regulatory certainty.



OPG through its many conservation partners have planted approximately 4.4 million native trees and shrubs on 2,200 hectares of land in the highly fragmented landscape of southwestern Ontario. Pictured are Steve Hounsell, Ontario Power Generation (left) and Paul Gagnon (right) from the Long Point Region Conservation Authority.

In 2010, CEA also introduced several new indicators to track member performance on biodiversity. The results tracked against those new indicators are highlighted below:

INTEGRATING BIODIVERSITY CONSIDERATIONS

Companies with a responsible individual to steer all activities on biodiversity	45 percent
Companies with measurable biodiversity objectives that are monitored and adjusted every 2–3 years	48 percent
Companies that publish activities and achievements on biodiversity in an annual report	62 percent
Companies that inform suppliers about the company's biodiversity objectives and engage them to integrate similar objectives	14 percent
Companies that explore the potential for cooperation with stakeholders with the aim of deepening dialogue and improving the corporate management system vis-à-vis biodiversity	55 percent



TransAlta's Horseshoe hydro facility located near Exshaw, Alberta.

Protecting Our Biological Diversity: 2010 CEA Member Initiatives

Columbia Power Corporation's Fish Habitat Structure:

Columbia Power Corporation (CPC) completed the installation of the final fish habitat structure on the Slocan River as part of the Brilliant Facility Expansion Fish Compensation Plan. Fish structures were selected as a means to increase the amount of habitat available for adult and sub-adult rainbow trout in the system. In addition, CPC also contributed \$25,676 toward riparian restoration projects in the Slocan Valley.

ENMAX Bow River Stabilization Project: ENMAX Power Corporation successfully completed a riverbank stabilization project along the banks of the Bow River. Vegetated riprap, a permanent structure comprised of rock and vegetation, was built to protect transmission and distribution infrastructure from future erosion. The project not only stabilized the shoreline bordering ENMAX Power's Substation 32, but also helped revitalize the environment along the riverbank. A study assessing the fishery in the Bow River adjacent to the project concluded the riprap is likely to improve fish habitat.

FortisAlberta's Birds of Prey Partnership: As part of FortisAlberta's multi-year partnership with the Alberta Birds of Prey Centre, the company designed and constructed a power line demonstration area at the Centre to show the devices and other technology built into its system that help keep birds safe by deterring and protecting them from power lines and poles. Power line contacts by wildlife account for approximately 20 percent of power outages in FortisAlberta's service area, highlighting the need to develop ways to operate the system in an environmentally-responsible manner.

Manitoba Hydro's Spawning Enhancement Project: Manitoba Hydro constructed three shoals immediately downstream from the powerhouse at the Pointe du Bois Generating Station to evaluate methods for creating spawning habitat for lake sturgeon. Lake sturgeon are known to spawn in fast, turbulent water, whether in rapids or downstream from falls areas. Manitoba Hydro will monitor the shoals during the spawning season to gather information about lake sturgeon spawning and the creation of suitable spawning habitat.

New Brunswick Power Signs MOU to Protect Fish and Fish Habitat: The Department of Fisheries and Oceans Canada (DFO) and NB Power signed an agreement to improve fish habitat on the St. John River. The agreement is focused on identifying, prioritizing



A view of severe bank erosion on the Slocan River. Riparian restoration work, funded by Columbia Power Corporation, is intended to slow and even repair damage to riparian areas.



ENMAX Power completed a riverbank stabilization project along the banks of Calgary's Bow River in 2010, creating a permanent structure of rock and vegetation to protect power transmission and distribution from future erosion, while creating an attractive natural habitat for wildlife.

and developing approaches to mitigate impacts to fish and fish habitat from NB Power hydroelectric facilities. Other stakeholders will continue to be engaged in St. John River habitat and fisheries management consultation processes, which are focused on broad St. John River water system issues.

For more industry initiatives: www.cca.ca

Principle 3: Climate Change

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



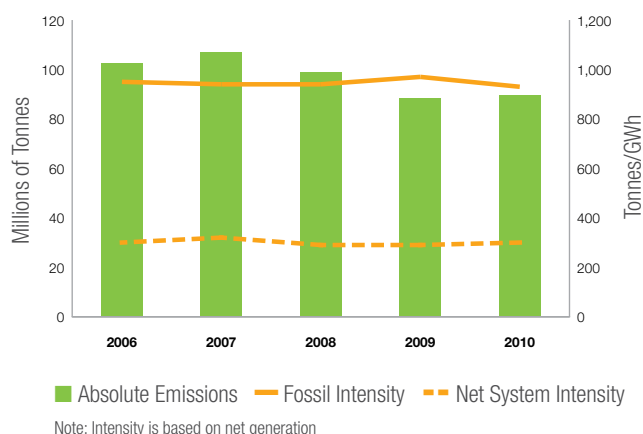
CLIMATE CHANGE MITIGATION

Climate change mitigation remains a priority for CEA members. Despite continuing national, regional and international policy uncertainty on climate change, CEA members are pursuing significant investments in new generation options – including large hydro, clean coal, and renewables – to reduce their overall carbon footprint. Some of the new hydro clean-energy projects include the proposed 900-megawatt Peace River Site C facility in British Columbia, the 200-megawatt Wuskwatim facility in Manitoba, and the 3,074-megawatt Lower Churchill (Gull Island and Muskrat Falls) generation project in Labrador. The industry is also pursuing Carbon Capture and Storage (CCS) technologies, particularly in Western Canada. These projects include Boundary Dam CCS demonstration project in Saskatchewan, and Keephills 3 CCS project in Alberta. Members across Canada are also investing in wind generation, which currently accounts for 4,588 MW of installed capacity. These investments, along with various government programs, will have a tremendous impact on the overall electricity supply options and GHG emissions. For example, Ontario's Feed-In-Tariff program for renewable technologies and the proposed decommissioning of Ontario Power Generation's existing coal-fired facilities by 2014 will significantly reduce GHG emissions in Ontario.

The electricity industry is currently responsible for about 14 percent of national GHG emissions. In 2010, absolute CO₂ eq emissions from fossil fuel power plants increased slightly by 0.9 percent from 88.5 Mt to 89.4 Mt (Figure 7). While minor, the increase was principally due to an increase in fossil fuel generation in some parts of Canada, including Alberta and Ontario. However, absolute CO₂ eq emissions in 2010 remained 9.5 million tonnes lower than 2008 pre-recession level. In addition, CO₂ eq emitted per net fossil generation decreased to 930 tonnes/GWh from 970 tonnes/GWh. The decrease in fossil fuel intensity is attributable to varying intensity rates of coal and natural gas facilities across Canada, and the use of relatively low-intensity facilities in 2010. While the year-over-year trend will continue to fluctuate over the short-to-medium term, new investments and plant decommissioning over the long-term will reduce the industry's overall contribution to GHG emissions in Canada.

To ensure existing assets are not stranded and to enable electricity companies to plan investments for the future, it is important that the federal government provide regulatory and policy-certainty on electricity

figure 7 | CO₂ Emissions and Intensity



sector GHG emissions. Such regulations must provide certainty for long-term investments in various generation technologies, including new gas-fired generation. It is also critical that policies for reducing CO₂ from electricity-generating facilities be aligned and consistent with policies to address air pollutant emissions. The government must also ensure that regulatory and permitting processes are efficient in order to enable new infrastructure to be constructed in a timely and cost-effective manner, so that companies can continue to provide affordable electricity to Canadians.

In 2010, the federal government proposed the development of a regulation that would require coal-fired electricity-generating units to either meet a natural gas emission standard at the end of economic life or to be shut down. CEA members are actively engaging the federal government to ensure this regulatory framework is developed in a manner that would result in real emissions reductions without resulting in undue economic impacts on the industry and on rate payers.

CLIMATE CHANGE ADAPTATION

Adaptation to climate change is still an issue for CEA members, who are taking steps to address the adverse impacts, risks and vulnerabilities associated with potential changes such as temperature and rainfall patterns. Studies show that climate change is already having a measurable impact in Canada through permafrost

degradation, reduced ice and snow cover, coastal erosion, forest fires and heat waves. Exposure to extreme weather events, such as floods, droughts, and wild fires, could impact the reliability of generation, transmission and distribution networks and electricity system resiliency. Climate change presents a number of physical, legal and market-based risks to the electricity industry; several CEA members have initiated steps to develop specific strategies to understand the impacts and deal

with the potential vulnerabilities. CEA members also participate in various organizations such as the Ouranos Consortium, the Climate Change Adaptation Project (Canada), and the Institute of Electrical and Electronics Engineers (IEEE) to further advance understanding of climate impacts, and to develop appropriate standards for improving the reliability of new infrastructure.

Addressing Climate Change: 2010 CEA Member Initiatives

Horizon Utilities' Vehicle Replacement Strategy: Horizon Utilities continued its commitment to sustainable procurement by reducing vehicle fleet emissions. By the end of 2010, 10 percent of Horizon Utilities' vehicle fleet was comprised of hybrid vehicles, an increase of two percent from the previous year. One of the 2010 additions was a single-bucket hybrid and plug-in combination vehicle – Horizon's first vehicle of this kind.

Northwest Territories Power Corporation's Diesel Replacement Strategy: NWTP's use and consumption of diesel fuel is continuing to decline and now accounts for only 15 percent of total power generation. The decreased reliance on diesel-generated power has allowed the company to reduce CO₂ eq emissions by 71 percent from 133,395 tonnes in 1990 to 39,305 tonnes in 2010.

Nova Scotia Power Meets Caps on GHG Emissions: Through new capital investments and alternative technologies, Nova Scotia Power achieved greater emission reductions than its provincial emission cap of 9,700,000 tonnes of CO₂ eq. Emissions from thermal generating stations decreased to 9,250,000 tonnes – the lowest since 1999 and a drop of 850,000 tonnes or nine percent from 2007. With new renewable capacity additions, Nova Scotia is well on its way to achieving a 25 percent reduction in CO₂ eq emissions by 2020.

TransAlta Invests in Project Pioneer: Project Pioneer is a fully integrated carbon capture and storage (CCS) project that will be built as a retrofit to Keephills 3, a supercritical 450-megawatt (MW) sub-bituminous coal-fired power plant currently under construction by TransAlta and Capital Power Corporation. The project will see the transportation and storage of CO₂ in both geological sequestration and enhanced oil recovery. The project, one of the world's first fully integrated CCS projects for coal-fired power plants, is expected to be in operation in 2015.

For more industry initiatives: www.cem.ca



Horizon Utilities' single-bucket hybrid and plug-in combination vehicle purchased in 2010. Hybrid electric vehicles combine conventional and electric propulsion systems to achieve better fuel economy and reduce emissions.



TransAlta's Keephills coal-fired facility in Wabamun, Alberta.



CASE STUDY // ENVIRONMENT

ENMAX INVESTING IN GENERATE CHOICE™ FOR CUSTOMERS

ENMAX Corporation and our subsidiaries are exploring generation options for residential customers as part of our efforts to power the future and redefine the role of utility.

ENMAX continues to be a leader in exploring new innovative power sources to generate electricity that are reliable, sustainable and cost-effective. In 2010 ENMAX launched Generate Choice™, a new line of home-based technologies that provide homeowners the opportunity to reduce their carbon footprint by using electricity from renewable sources such as solar panels and micro-wind turbines. To complement the program, ENMAX Energy secured funding from the Climate Change and Emissions Management Corporation (CCEMC), an independent, not-for-profit organization.

After several years of research and pilot testing to perfect these offerings, ENMAX is now in full commercial mode and ready to start installing these innovative renewable power tools on rooftops and in backyards across Alberta. After signing up for a long-term lease, homeowners pay a minimal start-up cost and a low monthly rental fee. ENMAX Energy is responsible for all material, installation and equipment costs as well as the maintenance and warranty coverage. While Generate Choice™ is not intended to save the consumer money, it does offer environmentally-preferable power. The approach of leasing the equipment to customers on a long-term basis helps to offset what can be prohibitive cost-barriers for equipment purchase and installation. The reduction of a customer's energy bill will depend upon the type and number of solar panels and/or wind turbines installed on the property relative to typical energy requirements.

The public launch of the program encompassed a promotional campaign during November and December 2010, with the focus on educating Albertans on the value of solar and wind energy, and activating them through a like-minded online community for driving interest in these new products. The campaign components included print, radio ads, online advertising, unaddressed mailers, bill inserts and messaging on www.enmax.com. The initial response to the Generate Choice™ offer

has been overwhelmingly positive, with 15,000 potential customers expressing interest in leasing power generation equipment within the program's first two months.

Looking Forward

ENMAX's vision of sustainability balances economic, social and environmental considerations. The Generate Choice™ program directly responds to the needs of Albertans to support environmental initiatives – without impacting their day-to-day lives – by offering simple, affordable and maintenance-free solutions for generating their own solar and wind power at home. ENMAX Energy sees an energy future where renewable technologies, micro-generation and natural gas-fired power plants play a pivotal and progressive role in power generation.



Key Performance Highlights

Green indicates improved performance.

0.66

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

15 percent decrease from 2009

13.70

**LOST-TIME INJURY
SEVERITY RATE
(CALENDAR DAYS LOST
PER 200,000 HOURS)**

13 percent decrease from 2009

2.10

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

2 percent decrease from 2009

97%

**COMPANIES WITH
EMPLOYEE WELLNESS
SUBSIDIES/INVESTMENTS**

first year reporting (2010)

100%*

**COMPANIES WITH BUSINESS
RELATIONSHIPS/
PARTNERSHIPS WITH
ABORIGINAL COMMUNITIES**

**Represents the 23 CEA members that indicated that Aboriginal engagement was a relevant issue for company activities and operations.*

first year reporting (2010)

CEA member performance **social**

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

Principle 4: Health and Safety

Provide a safe and healthy workplace
for our employees and contractors



CEA

member utilities have a long-standing commitment to protect employees, contractors and the general public from injuries and fatalities. CEA members understand that providing a safe environment requires a continuous effort.

CEA members have implemented rigorous health and safety management systems to help reduce the potential for harm to employees and contractors. CEA member initiatives in 2010 included publishing member best-practices in key areas of health and safety management – Management Commitment, Job Observations, Hazard Identification, Work Planning and Contractor Management. In addition, member utilities continue to address electrical safety through the implementation of CAN/ULC S801, *Standard on Electrical Utility Workplace Electrical Safety for Generation, Transmission, and Distribution*. Other priority areas include: safety training programs for employees and contractors; employee participation in safety improvement initiatives; new worker identification programs at worksites; and enhanced safety communications.

In 2010, health and safety performance of CEA members continued to improve significantly. The CEA composite (all categories) all injury/illness frequency rate was 2.10 injuries per 200,000 hours worked in 2010, a decrease of two percent from 2009. The lost-time injury frequency rate for all utilities was 0.66 injuries per 200,000 hours, a 15 percent decrease from 2009 and a steady decrease of 28 percent relative to 2007 (Figure 8). The lost-time injury severity rate in 2010 was 13.70 calendar days lost per 200,000 hours worked, a 13 percent decrease over 2009 (Figure 9). This consistent decline is attributable to a focus on injury-prevention programs, enhanced safety training and education, and hazard recognition and identification procedures.

Although CEA member companies are collectively performing well, incidents do occur and members are committed to reducing the risks to employees and contractors. As in other industries, the greatest contributors to injuries in the electricity industry come from over-exertion (resulting in musculoskeletal disorders), falls from elevation and being struck by objects. Prevention programs to address these risk areas are being put in place. However, in 2010, there was a fatality at a CEA member company and corrective action has been taken to prevent such incidents in the future.

Changes in the utility industry continue to present challenges that impact safety from highly advanced utility technologies and ever-increasing system automation, to an aging workforce and the recruitment of new workers into an extremely technically-challenging industry. However, companies are continuing to invest in initiatives to promote a safety culture and reduce harm. The commitment of CEA member utilities to individual safety performance improvement has had, and will continue to have, a very positive influence on the electricity industry in Canada and the quality of life of all Canadians.

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

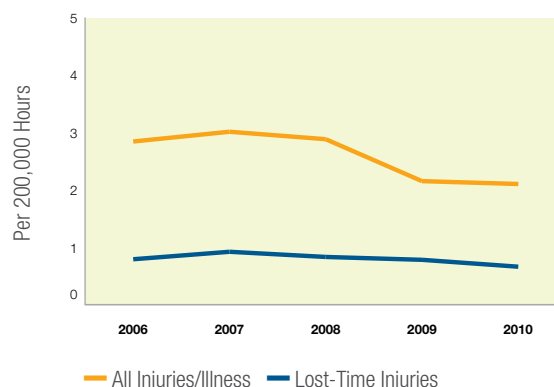
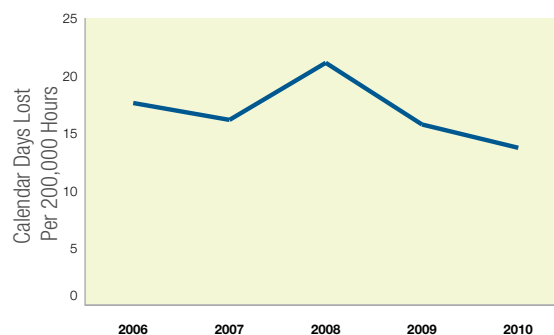


figure 9 | Lost-Time Injury Severity Rate



PROVIDING A SAFE AND HEALTHY ENVIRONMENT FOR THE PUBLIC

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

CEA members, both collectively and individually, are also working with the first responder community (police, fire, paramedics) to raise awareness and promote electrical safety. In early 2010, the CEA Occupational Health and Safety (OHS) Task Group supported an initiative in collaboration with the Royal Canadian Mounted Police (RCMP) to produce a safety awareness video to educate law enforcement, fire and EMS personnel about safety around high voltage electrical utility systems. The first goal of the video, **“Electricity ... The Invisible Killer”**, is to increase the level of awareness of law enforcement, fire and paramedics of high voltage electrical equipment and facilities hazards that require additional cautionary measures to be taken when responding to any emergency. The second goal is to reduce the number of incidents involving the injury of first responders in emergencies involving high voltage electrical hazards.

A web portal – electricity.ca/theinvisiblekiller – is available for police, fire and EMS providers.

In addition, CEA's OHS Task Group introduced a number of new pilot indicators to track commitments to reducing public electrical contacts. With sixteen companies reporting in 2010, public fatalities accounted for only 0.1 percent within their area serving nearly 20 million Canadians. In addition, 100 percent of the responding companies indicated that they had a public electrical education program and a commitment to ongoing partnerships with external agencies that contribute to the prevention of public safety incidents.

For more information: www

Wade Gillespie: SaskPower's CEA Lifesaver Award Nominee

Wade Gillespie knows the importance of First Aid training. It was back in 1994 when he was witness to a vehicle incident when he was first able to draw upon his training. Since that time Wade has taken First Aid/CPR/AED training six times as part of his safety training at SaskPower.

During a weekend recreational hockey tournament in Biggar, Saskatchewan on the afternoon of March 13, 2010, Wade noticed his teammate lying on the ice with a member of the opposing team standing over him. At first glance, it looked like his teammate had taken a check. It was when the opposing team member yelled “does anyone know first aid” that he knew something was seriously wrong and jumped out onto the ice to investigate.

Upon doing a scene survey, Wade discovered that his teammate wasn't breathing and had no pulse – he quickly asked someone to call 911 and then asked the other person if he knew first aid. Yes, was the response. Wade then took charge, having the other person do compressions while he did the breathing. Following the administration of CPR and AED by Wade, his teammate was breathing again.

There have been many positive outcomes since this incident, the least of which is not only did his teammate survive and was able to have multiple bypass surgery, but also that the Landis recreational hockey team and the Landis rink have both acquired AEDs of their own.

Read more about this story and other lifesaver award recipients online: www



Wade Gillespie,
District Operator, SaskPower.



From left: volunteer firefighter Bobby Chandler, Maritime Electric Power Line Technicians, Grant Boswell and Scott Lowther.

Ensuring the Health and Safety of Employees and Contractors: 2010 CEA Member Initiatives

AltaLink New-Hire Safety and Environment Orientation: To educate new-hires, contractors and current employees on AltaLink's safety and environment procedures, the Safety Management Improvement (SMI) team has developed AltaLink's first-ever new-hire safety and environment orientation. Through interactive video clips with Scott Thon, President & CEO, and AltaLink's other safety and environment champions, employees are taken through a series of modules. The modules provide a brief overview of key points and include links to the related policies. "We provide an essential service that delivers secure heat and light for Albertans but we do it by transporting a potentially dangerous commodity – electricity," says Scott Thon.

ATCO Electric Works with First Responders: ATCO Electric supports many Alberta fire departments in communities both in and around its service areas. As a part of this support, ATCO Electric provides electrical safety awareness training to volunteer firefighters and first responders.

In August 2010, ATCO Electric employees presented power line safety awareness at the Northeastern Alberta Firefighter Conference. These electrical safety courses are specifically designed to educate firefighters about hazards they may encounter when dealing with electrical systems.

TransAlta New Worker Identification Program: To help identify new workers, prevent injuries during the initial work period, and set a higher standard of safety, TransAlta initiated a New Worker Identification Program in 2010. The program is being integrated into the comprehensive orientation program that all field employees take when starting employment. A colored hard hat, such as the green hard hat used in the Renewable fleet, signifies the worker is new to the position and may need extra assistance and/or guidance to work safely on the site.

For more industry initiatives: www.cea.ca

Principle 5: Workplace

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



CEA

member companies recognize the importance of employees to business success and are committed to promoting a diverse workplace and ensuring that work environments are free

of discrimination and harassment. Many member companies strive to create a workforce that reflects the diverse populations of the communities in which they operate, and to create an inclusive corporate culture where all employees are valued and have equal and fair access to opportunities.

In 2010, CEA introduced several new indicators to measure diversity, harassment and discrimination. Over 90 percent of CEA members have anti-discrimination and anti-harassment programs, and all companies have internal venues to report harassment. Most companies operate employee wellness initiatives, including on-site fitness facilities and fitness re-imbursement programs to maintain physical and mental well-being; family assistance programs to provide counselling and referral services; illness prevention and knowledge awareness programs; flexible working hours; and community volunteerism. However, results also show that improvements can be made to increase female and minority representation in company governance bodies. As of 2010, only about one quarter of senior executives were female, and many companies did not track minority representation.

While retention of existing employees is essential, attracting new employees is also a major focus for CEA member companies. The workforce needs of the electricity industry continue to evolve. For instance, the trend towards smart grid applications will place greater emphasis on the integration of measurement, communications and

information technology than traditional electricity system requirements – requiring more adaptable and highly-skilled employees. Transitioning effectively to this new workforce will require a combination of knowledge retention, training, development programs, succession planning and focused employee recruitment/retention programs. Given this growing challenge, CEA member companies are working diligently to support skills training of existing and new employees (through initiatives such as tuition re-imbursement programs), and to raise awareness about electricity-related career choices to attract students, foreign-trained workers and non-traditional communities to jobs in the industry.

CEA member companies with:

Employee wellness subsidies/investments	97 percent
Reimbursements for fitness facilities/programs	72 percent
Employee illness prevention and knowledge awareness programs (e.g. onsite flu shot clinics, cholesterol screening, smoking cessation)	93 percent
Employee newsletter or intranet site communication	100 percent
Confidential family assistance programs (e.g. counseling services)	100 percent
Ergonomic assessment program	90 percent
Support for employee volunteer initiatives	93 percent
Flexible working hours	93 percent



Matt Wilson (left) and Dan Karslake are two power line technician pre-apprentices based in Kelowna.

Investing in Our Employees: 2010 CEA Member Initiatives

FortisBC Invests in Its Future Workforce: FortisBC developed the Residential Energy and Efficiency Works training program, or REnEW, which supports the growing energy efficiency and retrofit industry by creating a much-needed pool of skilled workers. The program teaches people who face barriers to employment the fundamentals of energy-efficient technologies and workplace safety. In turn, the City of Kelowna acknowledged the innovative program with a Community Spirit Award.

TransCanada Named as a Top Employer: Workforce diversity is integral to TransCanada's strategy for growth. The goal is to ensure that TransCanada's workforce reflects the diversity of the communities in which it operates. TransCanada works closely with a wide range of community-based organizations that foster diversity, including The Calgary Region Immigrant Employment Council, which assists in creating mentoring opportunities for new Canadians. In 2010, TransCanada was declared one of the "Best Employers of New Canadians" and was added to the "Canada's Top 100 Employers" list.

For more industry initiatives: www



TransCanada employees at the Head Office, Calgary, Alberta.

Principle 6: Communication and Engagement

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



Meaningful communication and engagement with stakeholders is vital for CEA member companies. With the turnover of existing assets and the construction of new infrastructure, it has become even more important for CEA members to engage Aboriginal Peoples, local communities, land owners, governments, suppliers and other groups in the communities in which they operate. CEA members use various media to communicate and engage different types of stakeholders, including face-to-face town hall meetings; classroom presentations; traditional and social media; and partnerships with local community organizations. Some of the outreach initiatives include discussions around energy efficiency, conservation, electrical safety, and issues associated with building new generation, transmission and distribution infrastructure in communities.

For instance, when **AltaLink** was given the task of finding a potential route for a 500 kV DC transmission line between the Genesee and Langdon areas in Alberta, it held 23 open houses, 15 information sessions and thousands of one-on-one consultations. AltaLink had more than 4,500 discussions with stakeholders about the project, conversations that were critical in determining the route with the lowest overall impact. AltaLink used the input gathered from stakeholders during two stages of consultation and the results of in-depth studies and fieldwork to identify preferred and alternate routes. Consultation with stakeholders is ongoing and will continue as the project progresses.

Similar to AltaLink, CEA member companies are increasingly using consultation and public engagement to acquire invaluable local community knowledge to help them manage project risks/challenges. In 2010, 90 percent of CEA members had a formal process for responding to stakeholder concerns.

Partnering with Communities and Stakeholders: 2010 CEA Member Initiatives

Nalcor Energy Churchill Falls Promotes Safety Culture

to Youth: To promote Nalcor's commitment to public safety, Youth Centre staff at Churchill Falls encouraged young drivers to take part in a monthly contest, "Back It Up," promoting Nalcor Energy's backing up policy. This initiative helps to promote safer driving practices, and in turn, a safer community. The "Back It Up" campaign is meant to raise awareness on the importance of stepping back and ensuring that every situation is safe.

Newfoundland Power Contributes to Cancer Care:

Newfoundland Power contributed over \$200,000 to improving cancer care in Newfoundland and Labrador through its corporate charity, The Power of Life Project. Together with in-kind support, annual corporate donations, contributions from customers and employees, and employee-driven fundraisers, The Power of Life Project has provided over two million dollars towards in-province research, treatment and awareness initiatives to date.

SaskPower's Farm Electrical Safety: Each year, SaskPower undertakes extensive awareness campaigns promoting electricity safety on the farm. In 2010, the company ran two campaigns – one during spring seeding and one during fall harvest – to remind farmers of electrical safety risks and what to do if they contact a power line or come across a downed line. To augment the advertising campaigns and enhance understanding of electrical hazards on the farm, the company provided safety demonstrations throughout the year using a live electrical display with actual power equipment.

For more industry initiatives: www.cemco.ca

Principle 7: Aboriginal Relations

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



Given the large-scale operations of CEA member utilities, the potential exists for impacts on the lives of Aboriginal Peoples. CEA member utilities recognize these potential impacts and are committed to working closely with Aboriginal Peoples based on trust and respect for Aboriginal culture and traditions. Although the level of engagement with Aboriginal Peoples differs across the country – depending on Aboriginal communities in the region and regulatory issues pertaining to formal business partnerships – CEA members are now proactively consulting, working with and utilizing the traditional knowledge of Aboriginal Peoples in the planning and development of new electricity projects.

For instance, during Stage 2 of BC Hydro's Site C Clean Energy Project, a proposed third hydroelectric dam on the Peace River, the company initiated engagement with 41 Aboriginal groups. Engagement ranged from sharing information with Aboriginal groups about the project, to negotiating consultation agreements where more in-depth discussions were required about potential project effects. In many cases, the input provided has led to better environmental, social, and economic outcomes for both member companies and local Aboriginal Peoples. In addition to

consulting these communities on new electricity projects and operations, CEA members are also working closely with these communities to ensure long-term prosperity through joint venture projects, employment opportunities, training, education and other capacity-building measures.

In 2010, 79 percent of CEA members indicated Aboriginal relations are a relevant issue for company activities and operations. The figures below are reflective of those companies with operations in Aboriginal areas:

Companies with business relationships or partnerships with Aboriginal communities	100 percent
Companies with procedures requiring early consultation or engagement with Aboriginal communities during project planning and development	96 percent
Companies with procedures or practices to ensure that training and employment opportunities are provided to Aboriginal employees	83 percent
Companies with an Aboriginal Relations group or senior Aboriginal advisory position	70 percent



The Lac Seul Generating Station (White Pine Narrows in Ojibway) in northwestern Ontario is OPG's newest hydroelectric station.



Signing ceremony marking feasibility stage of Pehonan Hydroelectric Project with Brookfield Renewable Power and First Nations partners.

Engaging Aboriginal Communities: 2010 CEA Member Initiatives

Brookfield Renewable Power's Pehonan Hydroelectric Project:

Brookfield Renewable Power and its partners, the James Smith Cree Nation, Peter Chapman Cree Nation, the Chakastapaysin Band of the Cree and Peter Kiewit Sons Co., reached an agreement with SaskPower to launch the feasibility stage of the Pehonan Hydroelectric Project, located on the Saskatchewan River. Development of the project would increase Saskatchewan's installed renewable generation capacity by approximately 250 megawatts and enable First Nation partners to be involved in the development and ownership of a major electricity asset providing a sustainable benefit stream for future generations. The project is at the feasibility stage to determine social, technical and environmental viability.

Manitoba Hydro-Keewatinohk Sipi Partnership Fund: The Keewatinohk Sipi (Northern Rivers) Partnership Fund was established as part of Manitoba Hydro's ongoing commitment to assist Northern communities located on "developed waterways" and to further sustainable development. The Fund provides non-profit groups in these communities with financial support for waterway projects that enhance communities in traditional and/or domestic resource harvesting activities; support cultural activities and recreational activities; and support extra-curricular education activities and programs for youth. In 2010, funding was provided for a number of projects including

programming for the Northlands First Nation Youth Camp, upgrades to existing plant facilities of the Grand Rapids Fishermen's Coop, and arena enhancements for Shamattawa First Nation.

Yukon Energy Partners with Na-Cho Nyak Dun (NND) First Nations Community: Yukon Energy developed a project agreement for the Mayo B project with the First Nation of Na-Cho Nyak Dun (NND). The agreement outlines economic opportunities for the NND First Nation including priority hiring of qualified NND citizens, a full-time NND liaison for the duration of the project, funding for their participation in environmental studies and review of the study results and proposed mitigation. In addition, Yukon Energy provided funding for a legacy benefit that comprised of the construction of a new store in the community that will be owned and operated by the First Nation. The Project Agreement also allows for the NND to make an investment in the project, therefore allowing them to become financial partners with Yukon Energy.

For more industry initiatives: www.saskpower.ca



BC Hydro's "Power the Games Tour" visited more than 100 communities across the province, engaging more than 350,000 British Columbians.



CASE STUDY // SOCIAL

BC HYDRO WORKING WITH COMMUNITIES TO POWER 2010 WINTER OLYMPIC AND PARALYMPIC GAMES

BC Hydro's sponsorship of the 2010 Winter Olympic and Paralympic Games focused on creating a lasting legacy by assisting the Vancouver Olympic Organizing Committee (VANOC) in staging the most sustainable Winter Games ever. BC Hydro fulfilled this role by providing reliable clean electricity to the Games, championing conservation, and supporting the hundreds of BC Hydro employees that contributed to making the Vancouver 2010 Winter Olympic and Paralympic Games a success.

BC Hydro was the official utility provider for reliable clean electricity during the 2010 Games, and brought the world the cleanest Olympics ever. The 2010 Games had the lowest carbon dioxide emissions from power generation in the history of the modern Games – fewer than 2,000 tonnes. This was roughly one-tenth of the emissions of previous Olympic Winter Games, which relied on diesel-based generation. BC Hydro also used the 2010 Winter Games to build awareness for its Power Smart programs that encourage electrical energy conservation across the province. BC Hydro asked British Columbians to join Team Power Smart and to set and achieve a 10 percent electrical conservation target. With over 200,000 members signed up by the launch of the 2010 Winter Olympic Games, if they all showed leadership and reduced their consumption by 10 percent, the electricity conserved would power the 27 days of competition at the Games. The Power Smart Village, BC Hydro's free family celebration and education site, showcased the company's commitment to conservation, sustainability and new smart technologies to the world. Over 213,000 visitors learned about energy conservation, innovation in technology and B.C.'s energy future through interactive stations. Some of the highlights included: a Conservation Lab, an interactive audio-visual experience about conservation, a "Home of the Future" made of recycled freight containers featuring energy-efficient appliances, smart metering technology, electric vehicle and solar garage and recharging battery; and Club Energy, a sustainable dance floor where energy produced by dancing was used to help offset the energy needed to power the Power Smart Village.

Hundreds of BC Hydro employees were involved in making the Games a success. From employees working on infrastructure projects prior to the Games, to the volunteers that represented BC Hydro on the world stage, the company was involved every step of the way. Dozens of employees contributed in temporary secondment roles with VANOC during the months leading up to, during and following the Games. These employees, volunteers and secondees played important roles as ambassadors of BC Hydro, the province and the country. At the end of the Games, the Power Smart Village was sustainably dismantled and the Home of the Future was donated to Atira's Women's Resource Society in Vancouver's Downtown Eastside for temporary housing for women and families at risk. At the Olympic venues, conservation measures implemented ranged from energy-efficient lighting to improved heating, ventilation and air conditioning systems. These measures were intended to save more than 18 GWh of electricity annually – enough to power 1,600 homes for a year.

Looking Forward

BC Hydro has engaged in knowledge transfer programs with the International Olympic Committee and other utilities to share experiences about its efforts to power the Games, its sustainability philosophy and its sponsorship activities. In addition, BC Hydro has built support for its Power Smart programs and encouraged conservation across the province to further advance its goal of acquiring 66 percent of incremental resource needs from the most cost-effective resource option available to us – conservation.

Key Performance Highlights

Green indicates improved performance and yellow indicates decreased performance.

\$5.6

**EMPLOYEE COMPENSATION
(BILLIONS)**

10 percent increase from 2009

\$9

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

0 percent change from 2009

1195

**ENERGY CONSERVATION
(GWh)**

1.5 percent increase from 2009

93%

**COMPANIES WITH A
COMMUNITY INVESTMENT
PROGRAM**

first year reporting

\$28

**CHARITABLE DONATIONS
(MILLIONS)**

27 percent increase from 2009

5.2

**SYSTEM AVERAGE
INTERRUPTION
DURATION INDEX (SAIDI)
DURATION (HOURS)**

24 percent increase from 2009

2.2

**SYSTEM AVERAGE
INTERRUPTION
FREQUENCY INDEX (SAIFI)
INTERRUPTIONS
(PER CUSTOMER)**

10 percent increase from 2009

CEA member performance **economic**

The electricity industry'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



E

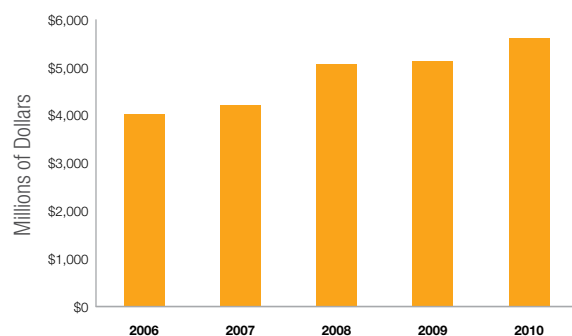
lectricity is a major driver of the Canadian economy and a fundamental requirement for the prosperity and quality of life of all Canadians. From health services to communication requirements, Canadians depend on reliable, cost-effective electricity. CEA members strive to provide this essential service as reliably as possible, but appropriate conditions for investment will be essential in the years ahead to ensure continued system reliability. While CEA members work toward delivering on this key mandate, they also contribute to the economy in many other ways, including employee compensation, payments to investors and governments, donations to local charities, and other long-term community investments.

In 2010, total employee compensation (salary plus benefits) at CEA member companies was \$5.6 billion (Figure 10). Recognizing that many employees purchase goods and services locally, this increase, accounting for an additional \$500 million to the Canadian economy (relative to 2009), provides a substantial transfer of wealth back to the communities in which member companies operate. As such, 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.

In addition, CEA member utilities continue to invest in communities in which they operate. In 2010, CEA members and their employees contributed over \$28 million to registered charities across the country, an increase of 27 percent over 2009 (Figure 11). Donations went to the United Way, environmental initiatives and organizations, arts and culture, safety and injury prevention programs, youth initiatives, local hospitals, and to other local community activities. In addition, many companies go beyond direct monetary donations by encouraging their employees to engage in outside volunteer activities during work hours.

figure 10 | Annual Employee Compensation

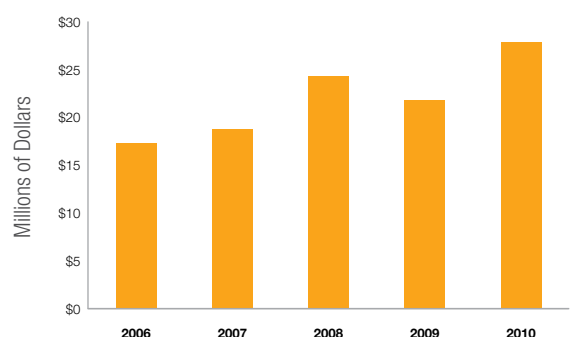
\$5.6 Billion Employee Compensation



Note: Total compensation includes T4s and T4As

figure 11 | Annual Charitable Donations

\$28 Million Charitable Donations



Making a Difference in the Community: 2010 CEA Member Initiatives

Capital Power Supports Honda Edmonton Indy: Capital Power was a bronze level sponsor of the Honda Edmonton Indy, and also partnered with the local Military Family Resource Center to match sales of 'Yellow Ribbon' merchandise in support of military personnel. The 12 employees and their families that volunteered during the weekend were also eligible to contribute their volunteer hours toward the 35 hours required to receive an additional \$300 Capital Power Empowering Communities Volunteer Grant to a non-profit organization of their choice.

Newfoundland and Labrador Hydro (Nalcor) Responds to Hurricane Igor: Hydro responded to the needs of hundreds of Newfoundlanders and Labradorians after hurricane Igor left many residents in challenging situations. Hydro provided a \$20,000 donation to the Canadian Red Cross through the Igor Benefit Concert and a \$2,500 donation to the Help for Home Radiothon. Hydro is also supporting the Canadian Red Cross Prepared Campaign with a \$50,000 donation over five years to support ongoing disaster management efforts in the province.

Saint John Energy Sponsors "Partners Assisting Local Schools" or PALS: This program allows employees to use one paid hour per week to visit a school and mentor a child, assist with after school programs or volunteer in other ways. In addition, staff regularly volunteers for local charities and in 2010 participated in Bowl for Kid's Sake, Hike for Hospice and the Cancer Society's Daffodil campaign.

SaskPower's United Way Campaign Commitment: SaskPower raised \$371,000 in employee and corporate matching funds for the United Way in 2010, surpassing its target of \$345,800. In accordance with its values, SaskPower provides approximately \$1.5 million in annual support to non-profit organizations across the province. These contributions support hundreds of events, activities and initiatives – as well as select capital projects – and contribute to the quality of life enjoyed by the people of Saskatchewan.

For more industry initiatives: www.cea.ca



Efficient and reliable supply of electricity; BC Hydro.

Principle 9: Energy Efficiency

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



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commitment to sustainability also means ensuring that everyone continues to use energy more efficiently. CEA members have always been at the forefront of energy efficiency and conservation through initiatives such as old refrigerator removal and exchange programs to lower air conditioner levels during peak summer demand. New technologies such as smart meters enable time-of-use pricing for electricity, encouraging the consumption of electricity at off-peak hours. CEA utilities likewise promote conservation programs for their larger commercial, industrial, and direct customers, as these measures also have the benefit of moderating the investment required for new infrastructure and help develop a culture of conservation. With nearly 60 percent of electricity distribution companies reporting in 2010, energy saved through conservation efforts accounted for 1195 GWh, a 1.5 percent increase from 2009. In addition to tracking information on energy saved through

conservation efforts, CEA is working with members to better track information on internal energy efficiency.

In 2010, the CEA, Natural Resources Canada and utilities from across Canada partnered to invest in the promotion of ENERGY STAR qualified light fixtures. While energy efficiency and conservation programs have long focused on the use of efficient light bulbs, this campaign focuses on moving Canadians along the efficient lighting continuum by taking advantage of additional electricity savings. To qualify for ENERGY STAR, residential light fixtures must consume at least two-thirds less energy than conventional fixtures. Some regions of Canada have been executing energy-efficiency market transformation programs for years, while others are just beginning. Having electric utilities lead the ENERGY STAR light fixture initiative, given their local knowledge of the retail community and direct access to customers, has been a key success factor.

PowerShift Atlantic: Bringing Wind Power and Energy Efficiency to Atlantic Canada



PowerShift Atlantic is a four-year Clean Energy Fund project focused on finding more effective ways of integrating wind energy into the Maritimes electricity system. The goal is to engage customers, both residential and commercial, to shift their power consumption and better follow the variations of wind generation with minimal disruption. "With one of the best wind resources in Canada, there is a great deal of potential for wind energy in the Maritimes," said Michel Losier, PowerShift Atlantic Program Director. "One of the most exciting aspects of this project is how the entire region has recognized this potential together and made such a strong commitment to working in a completely collaborative way towards a common goal."

The research project is led by NB Power in partnership with Nova Scotia Power, Saint John Energy, Maritime Electric Company Limited, the New Brunswick System Operator, the University of New Brunswick, Natural Resources Canada, the Government of New Brunswick and the Government of Prince Edward Island. PowerShift Atlantic is the first project of its kind in Canada, and one of 19 Clean Energy Fund projects currently underway nationwide.



Creating a Culture of Conservation: 2010 CEA Member Initiatives

Hydro One Lighting and HVAC Retrofit Projects: Hydro One initiated lighting and HVAC retrofit projects at ten of its service centres and related facilities. The 155,000 square foot Central Maintenance Services (CMS) facility in Pickering underwent a complete lighting retrofit, with 724 energy efficient light fixtures installed by the end of 2010. This resulted in an initial reduction of over 230,000 kWh compared to 2009. As part of Hydro One's Greener Choices program, new service centre facilities to be built will be designed to the "Leadership in Energy and Environmental Design" (LEED)-Silver standard.

Maritime Electric LED Island-Wide Retail Instant Rebate Program: Maritime Electric introduced an LED Holiday Lighting Rebate Program for its residential customers. Coupons were broken down into three different series to track distribution/redemption rates for different channels. Over 6,400 customers participated in the program, resulting in 110,000 kWh of energy savings and the achievement of 71KW of savings in peak demand for electricity.

Hydro Ottawa's Electricity Retrofit Incentive Program: Hydro Ottawa presented the University of Ottawa with \$136,000 for its participation in the Electricity Retrofit Incentive Program (ERIP). The upgraded cooling plant at the University will reduce electricity consumption by 25 percent, while increasing the pumping capacity of the plant. It is expected to reduce annual energy consumption by nearly 1.5 million kWh, saving \$145,000 in electricity costs and reducing GHG emissions by nearly 320 tonnes.

Toronto Hydro Electric System Invests in Electric Car Research: Toronto Hydro, in collaboration with Mercedes-Benz Canada, announced the launch of a pilot electric vehicle program for automotive retail customers. As one of the first production electric vehicles available in the country, the "smart for two" electric drives will play an integral role in this pilot project, which has been named the Toronto Hydro Smart Experience. The goal of the initiative is to study the driving patterns, charging habits and impact on the electricity grid of 15 Toronto-area 'lead ambassadors' who will participate in this unique pilot program.

For more industry initiatives: www.cea.ca

Principle 10: Security of Supply

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



Ensuring security of supply is one of the most important mandates of CEA member companies. As the Conference Board of Canada noted recently, the electricity industry will need to invest \$293.8 billion in the next two decades to replace aging infrastructure and meet increased demand for electricity. This challenge is exacerbated by the growing shortage of skilled labor and new environmental and permitting requirements. The electricity industry needs governments to take these constraints into consideration and ensure they provide a framework to support new infrastructure investments that are essential to Canada's continued prosperity.

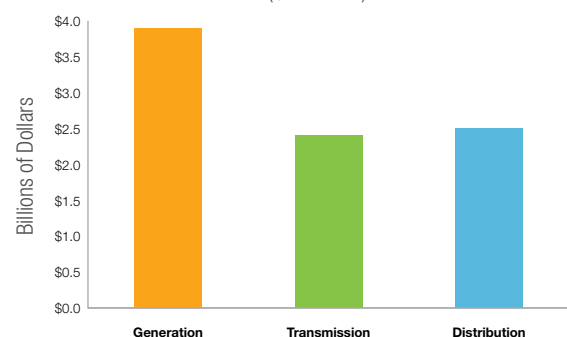
As CEA members invest in new infrastructure, they are considering a range of technologies including nuclear, large hydro, gas turbines, coal with carbon capture and storage and renewable technologies such as wind. Wind power capacity is expected to grow significantly in the next decade. In 2010, installed wind capacity accounted for 4,558 megawatts, with Ontario making up the bulk of that existing capacity, followed by Quebec and Alberta. **Brookfield Renewable Power**, for instance, commissioned the 51-megawatt Gosfield wind farm in Essex County, Ontario in 2010, and also began construction of an adjacent 166-megawatt wind farm in the same community. The combined potential energy will be sufficient to power over 70,000 homes. The National Energy Board (NEB) projects that these types of investments will result in the growth of wind capacity in Canada to 16,400 megawatts by 2020.² 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.

In 2010, CEA members invested approximately \$3.9 billion in generation, \$2.4 billion in transmission, and \$2.5 billion in distribution equipment, for a total investment of approximately \$9 billion (Figure 12). While this is still lower than the Conference Board of Canada forecasted need of infrastructure spending, there are several major projects waiting for regulatory approvals. CEA members need governments and stakeholders to partner and support investment efforts to ensure a reliable electricity system for generations ahead. This means timely approval of new projects, better investment conditions, greater acceptance of electricity infrastructure by stakeholders and the general public.



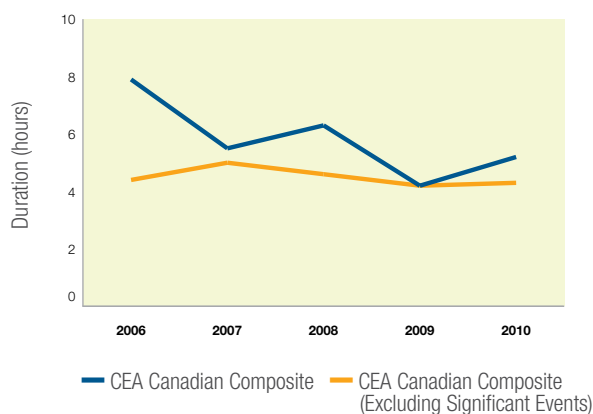
Wind turbine at Brookfield Renewable Power's Gosfield Wind Farm in Essex County, Ontario.

figure 12 | 2010 Investments in New and Refurbished Infrastructure (\$ Billions)



² National Energy Board, 2009 Reference Case Scenario: Canadian Energy Demand and Supply to 2020

figure 13 | System Average Interruption Duration Index (SAIDI)

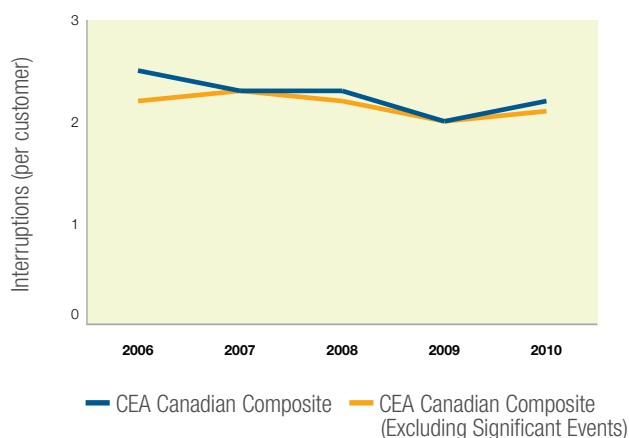


SERVICE INTERRUPTIONS TO CUSTOMERS

There are many contributing factors to service interruptions, including damage to power lines caused by high winds, contact with trees, lightning and other adverse weather events. In 2010, when significant events such as severe weather were factored in, the System Average Interruption Duration Index (SAIDI) for customers served was 5.2 hours per year, an increase of 24 percent over the 2009 levels (Figure 13). The System Average Interruption Frequency Index (SAIFI), which measures the average number of interruptions per customer, also increased to 2.2, from 2.0 in 2009, an increase of approximately 10 percent (Figure 14). Some of the significant events in 2010 included Hurricane Igor and Hurricane Earl. Excluding those significant events, SAIDI and SAIFI were 4.3 hours per year and 2.1 interruptions per customer, respectively. This is an important consideration because when significant events were excluded, SAIDI and SAIFI increased only by two and five percent respectively in 2010.

Nonetheless, every second counts in the effort to restore power to customers after an unplanned outage, and CEA members are investing in innovative technologies to assist with power restoration. In 2010, **EPCOR Utilities** installed Geographic Information System (GIS) solutions in emergency response trucks to provide work crews with up-to-date information on EPCOR's water and power assets. "It shows pretty much everything a crew needs to isolate the problem and restore power or water without wasting time," says Bill Friedrich, Senior Manager of Distribution and Transmission Underground Operations. CEA members are committed to maintaining service continuity by investing in these innovations as well as ensuring their systems are resilient under extreme weather conditions.

figure 14 | System Average Interruption Frequency Index (SAIFI)



GIS brings EPCOR's information database to the field – where it is needed! Picture by Darwin Mulligan.



Newfoundland Power Restores Power Following Hurricane Igor

Newfoundland Power successfully restored power to over 106,000 customers within 5 days of Hurricane Igor hitting the island portion of the province in September 2010. Over the last 10 years, Newfoundland Power has strengthened the electricity system, effectively cutting outage time in half, reducing average outage time from 5.7 hours per customer in 1999 to 2.5 hours in 2009. The strength of the electrical system minimized damage resulting from Igor, enabling a safe and speedy response. The storm left over 100 communities isolated or in states of emergency and many major roadways impassable. A critical component of the restoration effort included updating customers using both traditional and social forms of media. Crews from other utilities helped to restore power, using helicopters, off road vehicles, boats and line trucks to transport people and equipment. In addition to those involved with the restoration of power, Newfoundland Power worked closely with emergency service responders such as fire departments, police, hospitals, the Red Cross and municipal leaders in the affected areas. In the wake of the worst hurricane to hit Newfoundland and Labrador in 75 years, the Company met restoration times on or before schedule with zero injuries!

EMERGENCY PREPAREDNESS

Ensuring sound operation of the electricity system is critical for the Canadian economy. If physical and information technology facilities, networks, services and assets are disrupted or destroyed, serious impacts could be felt on the health, safety, security and economic well-being of Canadians. Facilities of CEA members are crucial for supporting other elements of Canada's critical infrastructure. Without electrical power, the functioning of each of the critical infrastructure sectors, including public safety, healthcare and finance would be significantly compromised, if not brought to a standstill altogether.

CEA members are proactively developing emergency preparedness plans. With 97 percent of the companies reporting, 96 percent of CEA members had pandemic and natural disaster plans, and 89 percent had business continuity plans in place. This is a significant level of commitment from CEA members to ensure the security and supply of electricity to Canadians from coast-to-coast.



Military Road in St. John's, September 21, 2010, the day that Hurricane Igor struck Newfoundland.



FortisAlberta Power Line Technician Travis Phillips performs hot line work.



CASE STUDY // ECONOMIC

FORTISALBERTA: BALANCING RELIABILITY VS. COST OF SERVICE

Customers depend on reliable electricity; investing in the distribution system is core to FortisAlberta's commitment to its customers. At the same time, the Company recognizes the need to maintain an appropriate balance between reliability initiatives and cost of service. Customer feedback in 2010 continued to reinforce the need to focus on reliability and quality of service. In 2010, customers experienced on average 1.67 hours without electricity after major outages caused by extreme weather conditions were factored out, compared to 1.82 hours in the previous year.

In the past, FortisAlberta evaluated reliability-driven upgrades at a "system" level. In 2010, the Company began to pay increased attention to smaller customer segments that had been exposed to an inordinate number of service interruptions. Traditional methods of evaluating "system" reliability for these customers may have diluted visibility of their outage experience by including them with the larger majority of satisfied customers on the feeder. In 2010, 38 locations with greater than 50 customers experiencing six or more sustained outages were identified within FortisAlberta's distribution network to determine the cause of outages and find solutions.

FortisAlberta formed a cross-functional team in 2010 to review and improve reliability for its customers. One of the team's key deliverables was to prioritize areas with high outages and expedite reliability plans. Several reliability initiatives were developed including provision of alternate backup feeds and the introduction of a new program to strengthen power lines in locations susceptible to severe events such as storms. "The number of customers experiencing multiple outages is high and needs to be addressed if we are to get to the next level in customer satisfaction" says Phonse Delaney, Vice President, Operations and Engineering.

FortisAlberta's strong reliability performance to date is the result of an effective maintenance program, continual improvement in the distribution system and locally-based, skilled employees who can quickly

respond to outages. Enhanced work methods and preparation reduced the duration and number of pre-planned interruptions per customer by seven percent and 16 percent respectively in 2010, compared to the previous five year average. Over time, productivity gains have been made as a result of capital investment, including technology investment, an emphasis on employee training and development, and strong performance in safety, reliability and customer service. Through improvements to business processes and a continued focus on cost management, the Company was able to reduce controllable operating costs while providing reliable service to a growing customer-base during 2010.

Looking Forward

FortisAlberta continues to respond to customer feedback by analyzing and tracking feeder performance, utilizing "live line" work where possible, effective coordination of maintenance projects, and most importantly, investing more in reliability and capital projects. Customers are notified about the work through newspaper ads and articles and in some cases, letters mailed to their homes. The Alberta Utilities Commission has recently initiated a process to reform utility rate regulation in Alberta. The Commission has expressed an interest in having all regulated distribution utilities apply a performance based ratemaking (PBR) formula to distribution service rates commencing in 2012. A PBR regime creates incentives for a utility to improve efficiencies and to share in economic and/or other benefits with customers. "Sustainable management of customer concerns, such as reliability, and balancing environmental, social and economic considerations, will ensure ongoing success for FortisAlberta as we move toward regulatory change," says Karl Smith, President and CEO, FortisAlberta.

Looking Forward

CEA members are committed to continuous improvement and sustainable development. While CEA members have diverse regulatory and market constraints, new and innovative business practices are continually addressing air emissions, priority spills, workplace injuries and stakeholder needs – with the timeless goal of ensuring Canadians have reliable, sustainable and cost-effective electricity.

CEA is working with members to finalize an overall Sustainable Development Index (SDI). Under direction of the CEA Sustainable Electricity Executive Council and the Public Advisory Panel, CEA expects to feature an inaugural SDI in the 2011 Sustainable Electricity Annual

Report. The SDI will enable CEA and other stakeholders to determine whether the CEA membership is collectively tracking better or worse in reference to key aspects of environmental, social and economic performance. The SDI will be the first quantitative sustainable development measure to be reported by any industry sector within Canada.

In 2011, CEA will also conduct a gap analysis of its head office policies and measures against ISO 26000 (Guidance on Social Responsibility) requirements. CEA hopes this will lead to steadily improving performance and a model of social responsibility and sustainability for member companies to emulate.



BC Hydro's W.A.C. Bennett Dam.

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In addition to the Sustainable Electricity Steering Committee, CEA would like to acknowledge the contribution made by the members of the Sustainable Electricity Executive Council, Dr. Blair Feltmate (University of Waterloo), Devin McCarthy, Irene Hawkings, and other CEA staff in the production of this annual report.

Industry at a Glance

Environment	2006	2007	2008	2009	2010	Percentage Difference 2009–2010
Total Gross Annual SO ₂ Emission (tonnes)	454,489	486,559	422,112	377,383*	326,823	-13 percent
Total Gross Annual NO _x Emission (tonnes)	187,432	199,407	185,552	167,907*	169,169	+0.7 percent
Total Gross Annual Mercury Emission (kilograms)	1,840	1,967	1,751	1,521	1,501	-1 percent
Total Gross Annual Direct CO ₂ eq Emissions from Fossil Generation (tonnes)	102,500,887	107,147,272	98,896,801	88,535,560	89,357,885	+0.9 percent
Number of Priority Spills	104	107	77	105	107	+ 2 percent
Total SF6 Used for Maintenance Purposes (kilograms)	6613	8328	6812	5704	6475	+13 percent
PCBs Low-Level Taken Out of Service (tonnes)	414.62	516.06	962.34	955.77	1,544.00	+61 percent
PCBs High-Level Taken Out of Service (tonnes)	426.81	62.38	208.08	169.12	246.53	+46 percent
Total Gross Annual PM ₁₀ Emissions (tonnes)	9008	9657	10542	7957	7660	-4 percent
Companies with an ISO consistent EMS (percent)	N/A	N/A	88	89	93	+4 percent
Society	2006	2007	2008	2009	2010	Percentage Difference 2009–2010
All Injury/Illness Frequency Rate (injuries per 200,000 hours)	2.84	3.01	2.88	2.15	2.10	-2 percent
Lost Time Injury/Illness Frequency Rate (injuries per 200,000 hours)	0.79	0.92	0.83	0.78	0.66	-15 percent
Lost Time Injury Severity Rate (calendar days lost per 200,000 hours)	17.60	16.13	21.10	15.73	13.70	-13 percent
Companies with Public Education Programs (percent)	N/A	N/A	96	93	93	0 percent
Companies with a Process for Responding to Stakeholders Concerns (percent)	N/A	N/A	93	83	90	+8 percent
Companies with an Aboriginal Relations Group or Senior Aboriginal Advisory Position (percent) (if the company operates in Aboriginal communities)	N/A	N/A	N/A	N/A	70	N/A
Companies with Business Relationships or Partnerships with Aboriginal Communities (percent) (if the company operates in Aboriginal communities)	N/A	N/A	N/A	N/A	100	N/A
Economy	2006	2007	2008	2009	2010	Percentage Difference 2009–2010
Total Value of Company Charitable Donations (\$ millions)	17	18	24	22	28	+27 percent
Energy Saved Through Conservation (MWh)	N/A	N/A	689, 837	1,177,908	1,195,387	+1.5 percent
Total Capital Expenditure on New/Refurbished Generation Infrastructure (\$ billions/year)	1.1	2.4	3.1	3.9	3.9	0 percent
Total Capital Expenditure on New/Refurbished Transmission Infrastructure (\$ billions/year)	0.5	1.0	1.8	2.4	2.4	0 percent
Total Capital Expenditure on New/Refurbished Distribution Infrastructure (\$ billions/year)	1.1	1.3	1.8	2.6	2.5	-3.8 percent
System Average Interruption Duration Index (SAIDI) Duration (hours)	7.9	5.5	6.3	4.2	5.2	+24 percent
System Average Interruption Frequency Index (SAIFI) Interruptions (per customer)	2.5	2.3	2.3	2.0	2.2	+10 percent

* Differences in some figures from the 2009 report are attributed to the incorporation of amended information provided by CEA members

About the Canadian Electricity Association (CEA)

The Canadian Electricity Association (CEA) is the voice of the Canadian electricity industry, promoting electricity as the critical enabler of the economy and Canadians' expectations for an enhanced quality of life. CEA members generate, transmit and distribute electrical energy to industrial, commercial, residential and institutional customers across Canada every day. From vertically integrated electric utilities, to power marketers, to the manufacturers and suppliers of materials, technology and services that keep the industry running smoothly – all are represented by this national industry association.

About the Electricity Generation, Transmission, and Distribution Industry

Electricity is a fundamental driver of the Canadian economy: nearly everything we use in modern life requires electricity – whether it is a computer, a television, a washing machine or a medical device such as an MRI at a hospital. In most cases, there is no alternative to electricity. The Canadian constitution makes regulation of electricity a provincial responsibility, though the federal government has a major impact on the industry through its regulatory authority on energy and environmental issues. CEA utility members were traditionally made up of integrated companies encompassing functions from generation to customer distribution, but this historical model is changing in several jurisdictions. In many cases, the integrated companies are increasingly functionally unbundled to accommodate wholesale and some retail competition.

To download the electronic version of the 2010 Sustainable Electricity Annual Report, please visit:
www.SustainableElectricity.ca

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An Electricity Industry Perspective on Smart Grid

The evolution of the utility grid infrastructure moves along a technology path that traditionally has been quite flat, narrow and largely uniform worldwide. The standard toolbox for moving electrons from generation plants to homes, businesses and industry includes components such as power lines, cables, substations, transformers and switches, controlled and monitored by systems such as Supervisory Control and Data Acquisition (SCADA). Improvements are made incrementally as the system ages, vendor margins are made on volume, and one distribution grid looks much like another.

Smart grid innovation, however, has added an entirely new set of tools that has split this steady momentum into a number of different smaller paths, each with unique stakeholders, rate of progress and overall promise. A lot of good work is happening (for example, that of the National Institute of Standards and Technology's Smart Grid Interoperability Panel and the Standards Council of Canada's Smart Grid Task Force) to ensure that technology pathways will eventually either converge or at least interoperate. But Canadian utilities recognize that among the full complement of stakeholders, they, as system operators, are in the best position to design and implement the smart grid as an integrated system appropriate for customer priorities, legacy infrastructure, geography and other needs.

The smart grid is a suite of information-based applications made possible by increased automation of the electricity grid, as well as the underlying automation itself. This suite of technologies integrates the behaviour and actions of all connected supplies and loads through dispersed communication capabilities to deliver sustainable, economic and secure power supplies.

The key objectives of the smart grid include: increased grid resilience and reliability; improved environmental performance; and operational efficiencies including workplace safety and asset management. Supporting these objectives are such innovative advances as demand management systems, smart switches, automated substations, geographic information systems (GIS) and, perhaps the most widely known new suite of technologies, smart meters (AMI). These technologies facilitate the integration of electric vehicles (EVs) and distributed generation (DG), allow for better customer visibility and control of electricity usage, optimize utility field operations and asset management, and improve reliability. Each is on its own development path, but will eventually be integrated by utilities into the grid system as a whole.

Due diligence for sound investments – choosing the right path to develop and integrate at the right time – includes an assessment of the technological landscape to limit future obsolescence, as well as a cost/benefit analysis that places value on customer service and innovation in support of smart grid objectives. Each facilitated application is clearly a benefit in and of itself – so long as there is customer uptake – but each also comes at a cost. Canadian utilities understand this balance between investment costs, integration challenges and operational and customer benefits. Aided by pilot projects, stakeholder networking and sharing of best practices, CEA members continue to be pragmatic in designing the suite of technologies best suited to their specific circumstances.

Disclaimer: This report is prepared with information from CEA Corporate Utilities Members, excluding City of Medicine Hat, Oakville Hydro Corporation (new member), and Saskatoon Light & Power.

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