THE **POWER** OF INNOVATION

Sustainable Electricity Annual Report 2009

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Canadian Electricity Association | Association canadienne de l'électricité

SUSTAINABLE ELECTRICITY PROGRAM AND THE PURPOSE OF THIS REPORT

Launched February 19, 2009, Sustainable Electricity is an industry-wide sustainability initiative developed and implemented by the electric utility members of the Canadian Electricity Association (CEA). The program, conducted under the strategic guidance of the CEA Board of Directors, addresses the three components of sustainability—environment, society, and the economy—and enables the electricity industry to take a holistic approach to managing its impacts and securing its collective future. The 2009 report, the second under the Sustainable Electricity program, provides an overview of the sustainable development performance of CEA member utilities from January 1, 2009 to December 31, 2009. While this report provides a snapshot of overall sustainability performance, more information can be obtained through individual CEA member company websites and the CEA Sustainable Electricity website at **www.SustainableElectricity.ca**.

2009 PERFORMANCE HIGHLIGHTS

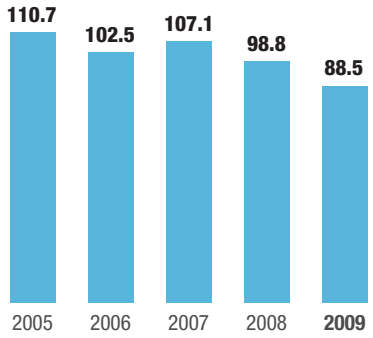
The global economic downturn made 2009 a challenging year for the electricity industry. The industry saw a nine percent decline in overall production as customers reduced their demand for electricity in response to the economic situation. The decline in generation, especially the 17 percent decrease in coal-fired generation across Canada due to lower demand, resulted in a significant reduction in air emissions. With the economic recovery, electricity generation and associated emissions may increase in the years ahead. However, CEA members are committed to continuous improvement and delivery of positive environmental, social and economic outcomes for stakeholders. While utilities across the country are facing many challenges, from renewing their existing capital stock to attracting skilled workers, the overall sustainable development performance of CEA members continued to improve in 2009.

KEY SUSTAINABLE DEVELOPMENT TRENDS

CO_2e EMISSIONS

88.5 Million Tonnes

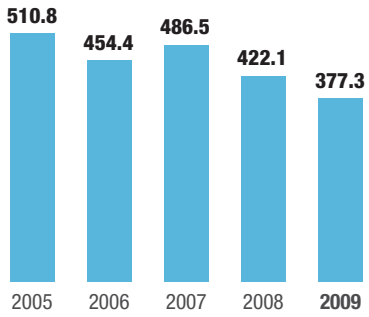
10.5 % Reduction from 2008



SO_2 EMISSIONS

377.3 Thousand Tonnes

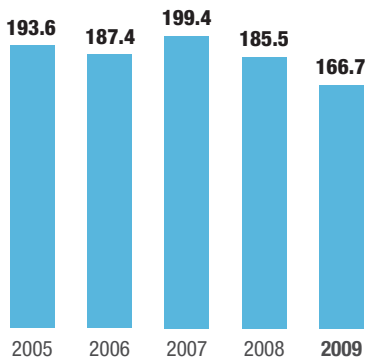
10.6 % Reduction from 2008



NOx EMISSIONS

166.7 Thousand Tonnes

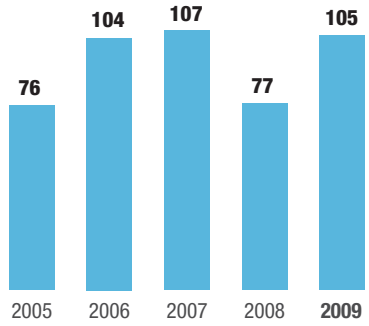
10.1 % Reduction from 2008



ANNUAL PRIORITY SPILLS

105 Annual Priority Spills

36.4 % Increase from 2008

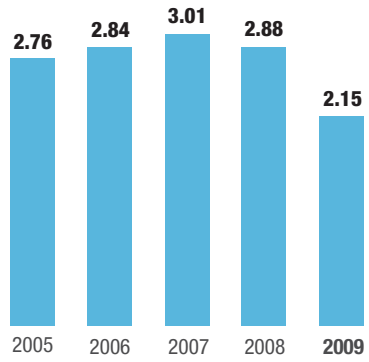


ALL INJURY/ILLNESS FREQUENCY RATES

CEA Canadian Composite

2.15 Per 200,000 Hours

25 % Reduction from 2008



LOST-TIME INJURY FREQUENCY RATES

CEA Canadian Composite

0.78 Per 200,000 Hours

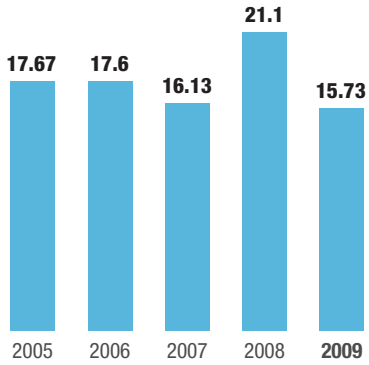
5 % Reduction from 2008

LOST-TIME INJURY SEVERITY RATE

CEA Canadian Composite

15.73 Per 200,000 Hours

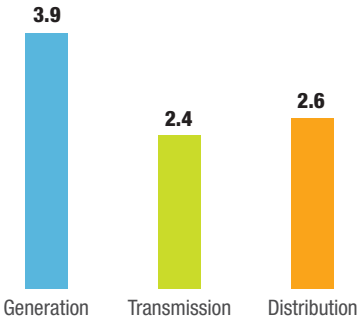
25 % Reduction from 2008



2009 INVESTMENTS IN NEW AND REFURBISHED INFRASTRUCTURE ($ Billions)

$9 Billion Investments

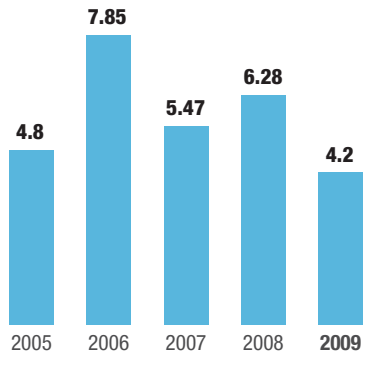
32 % Increase from 2008



SYSTEM AVERAGE INTERRUPTION DURATION INDEX (SAIDI) CEA Canadian Composite

4.2 Duration (Hours)

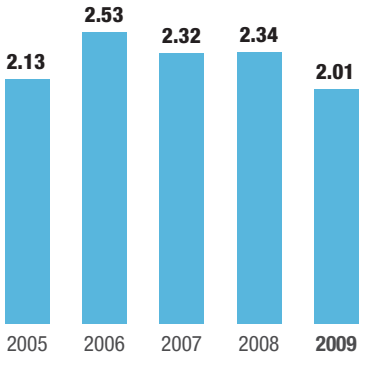
33 % Reduction from 2008



SYSTEM AVERAGE INTERRUPTION FREQUENCY INDEX (SAIFI) CEA Canadian Composite

2.0 Interruptions (Per Customer)

14 % Reduction from 2008



KEY INDUSTRY CHALLENGES

Electricity Demand: Anticipated future growth in demand is a significant challenge facing CEA members. In general, electricity use has become more efficient due to energy efficient appliances, light bulbs, and other conservation initiatives and programs. However, economic recovery, growing numbers of electrical devices per household, new computing and internet technologies, and plans to electrify traditionally fossil-based technologies, particularly in the transportation sector (e.g. electric cars and other hybrid vehicles), will result in further increases in electricity demand. CEA members will continue to push for greater energy efficiency and conservation by customers, but that alone is unlikely to result in significant reductions in demand growth. In fact, Canada's National Energy Board (NEB) projects that electricity demand in Canada will grow by 8.5 percent between 2010–2020.[1] In order to meet this demand, CEA members must make significant investments in the next few decades, which will likely impact electricity rates.

Infrastructure Investments: Much of the existing electricity infrastructure in Canada is aging and needs to be replaced over the next decade in order to maintain system reliability and meet rising demand. The International Energy Agency (IEA) estimates that Canada will need an additional 74 gigawatts of capacity by 2030 to meet both system demand growth and plant retirement needs[2]—an addition equal to more than half of our existing electricity capacity. Notwithstanding the economic downturn in 2009, Canadian utilities must invest now, as large-scale electricity infrastructure takes many years to build—often requiring upwards of 10 to 15 years from project design to actual commissioning. Canada is not the only country requiring infrastructure investment, and this means our electricity industry must also compete globally for scarce resources, including capital, construction materials, and skilled labour.

Climate Change: Addressing climate change is one of the biggest environmental challenges facing CEA members, especially thermal electricity generation companies. Despite the uncertainty surrounding the future regulatory framework, CEA members are continuing to invest in alternative energy including hydro, nuclear, and emerging renewables in anticipation of future regulations. However, there must be a balance between reducing carbon emissions and providing safe, reliable and cost-effective power to consumers. Failure to achieve that balance will have profound cost implications for Canadians as utilities pass through compliance costs to residential, industrial, and institutional customers. While the focus to date has been on mitigating climate change, the industry is also aware of the need to adapt to climate change given the impact that temperature change and extreme weather events can have on electricity generation, transmission, and distribution facilities.

Human Resources: Attracting qualified skilled workers to the electricity industry remains the key human resource challenge, especially given the impending new capital investment cycle. This challenge is further exacerbated by the retirements and attrition of experienced utility personnel from the baby boom generation. Based on employer estimates, nearly 30 percent of the current electricity workforce is expected to retire between 2007 and 2012,[3] including those in operationally critical positions. Given this growing challenge, CEA member companies are working diligently to expand and improve skills training and apprenticeship funding and to raise awareness about electricity-related career choices to attract students, foreign trained workers and non-traditional communities to jobs in the industry.

1. National Energy Board, 2009 Reference Case Scenario: Canadian Energy Supply and Demand to 2020, 2009
2. International Energy Agency, *World Energy Outlook 2008*
3. Electricity Sector Council, *Powering Up The Future: 2008 Labour Market Information Study*

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SUSTAINABLE ELECTRICITY ANNUAL REPORT – REVIEW PANEL

On March 16, 2010, the Canadian Electricity Association convened a Panel to review the 2008 Sustainable Electricity Annual Report. The panel, comprised of individuals with a wide range of sustainable development experience, provided valuable advice to the CEA on the structure, content, and style of the annual report. This 2009 report reflects most of their recommendations. CEA intends to follow-up on all recommendations in future reports.

Panel members from left to right (front row): Richard Paton, Chemistry Industry Association of Canada; Blair Feltmate, University of Waterloo; Channa Perera, CEA; David Oulton, Sustainable Electricity Public Advisory Panel Member. **Left to right (back row):** Stacey Sauvé, Accurate Design; Afshin Matin, Environment Canada; Michelle Turner, CEA; Karla Heath (formerly of Stratos); Ted Ferguson, Delphi Group; Doug Jackson, Accurate Design; Louisa Hood, CEA; and Karen Kun, *Corporate Knights* Magazine.

Joint Message from the Executives

The Canadian Electricity Association (CEA) and its member utilities are proud to present the 2009 Sustainable Electricity Annual Report. Since the launch of the Sustainable Electricity program in February 2009, CEA members have adopted measures to improve their sustainable development performance. While there is more to accomplish, the process has begun. CEA members recognize the value of pursuing sustainable practices and are committed to becoming leaders in corporate responsibility.

STRATEGIC CONSIDERATIONS

The electricity industry is operating in a challenging environment. In 2009, the global economic downturn impacted Canada, affecting all major economic sectors, including electricity. The industry saw a considerable decline in demand as businesses and consumers reduced their consumption. While the economic downturn is temporary, the electricity industry must plan ahead to meet the challenges of tomorrow. As the industry looks forward, it must invest in new infrastructure to renew its aging capital stock; address climate change and greenhouse gas emissions; and ensure it continues to have the skills, processes, and organizations in place to provide reliable electricity to Canadians. These are long-term challenges that CEA members take seriously, and they are committed to developing comprehensive solutions by working with stakeholders, including government.

Investing in new infrastructure is one of the greatest challenges facing CEA members. Large-scale electricity infrastructure takes many years to build, often requiring upwards of 10 to 15 years from project design to actual commissioning. The International Energy Agency estimates that to meet electricity demand in 2030, Canada must invest approximately $238 billion (2007 dollars) in electricity generation, transmission, and distribution to maintain a reliable supply. CEA members are up to the challenge, but stakeholders must partner with the industry to ensure a reliable electricity system for generations ahead.

Continuing uncertainty surrounding climate change mitigation policy, both domestically and internationally, represents another challenge. There is an opportunity for government to establish a policy framework to encourage adoption of innovative technologies with the orderly turnover of existing capital stock. Further development and use of new hydropower, nuclear, natural gas, emerging renewables, and carbon capture and storage technologies could all play significant roles in maintaining diversity of generation in the Canadian system. It is also essential that new transmission interconnections are built to transport bulk electricity from remote generation facilities, particularly related to non-low emitting sources. However, government must create policy conditions that support these investments and, where appropriate, partner with industry and other countries to collaborate on technological solutions.

There is also a role for government to help the industry alleviate the prospect of a severe national shortage of qualified workers: close to 30 percent of the current electricity workforce is expected to retire within the next few years. The industry needs the support of government and other stakeholders to ensure it can attract the skilled employees that will be required to provide this essential service to Canadians.

2009 PERFORMANCE HIGHLIGHTS

CEA member utilities continue to improve their environmental performance. Absolute air emission levels did improve in 2009, but this was in large measure due to lower generation levels and some investments in retrofit technologies. More significant changes will require new investments in innovative technologies over the longer term. This will take time, but the industry is investing in technologies such as carbon capture and storage and emerging renewable power. CEA members are also mindful of their impact on biodiversity. Given the large scale of electricity operations, challenges continue to persist in terms of protecting aquatic and terrestrial species at risk. However, as this report demonstrates, the industry is taking all precautions possible and is working with stakeholders to ensure that species populations and their habitat are conserved.

CEA members are also proud of their performance on corporate social responsibility. On health and safety, the industry reported no employee fatalities during 2009. However, there were still injuries to employees and contractors, which the industry is working to eliminate through new safety procedures. In 2009, CEA member companies also continued to improve their performance on consulting stakeholder groups, engaging Aboriginal Peoples in business relationships, and diversifying the electricity industry workforce.

The industry's economic performance results were also good. New infrastructure investments, system outage reliability, and energy savings all improved. Energy efficiency remains a priority for the industry, both in its own operations and in programs offered to customers. Members continue to work with governments and other energy partners to explore best practices and deploy new technologies to maximize the potential of existing capacity.

RESPONSE TO THE PUBLIC ADVISORY PANEL LETTER (2008)

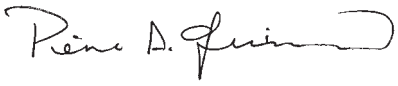
CEA members value the advice of the Public Advisory Panel of the Sustainable Electricity program. In the 2008 Annual Report, the Panel made some excellent recommendations to the industry related to benchmarking, climate change, stakeholder engagement, innovation culture, and transparency. While it acknowledges the importance of implementing these recommendations, the industry must also deal with numerous structural challenges. CEA members operate in diverse regulatory and market environments. Resource endowments and strategic priorities also tend to differ from region to region. However, the industry is making progress on many areas identified by the Panel. The industry is exploring the development of a sustainable development index (SDI) to measure the overall sustainable development performance of CEA members based on existing performance metrics. On innovation and climate change, CEA members are increasingly investing in new innovative technologies such as carbon capture and storage, wind, biomass, and highly efficient gas fired generation. On stakeholder engagement and transparency, CEA members continue to engage and partner with many local groups and organizations to ensure industry actions are in the best interest of the communities it serves. CEA members are leading in each of these areas, in their own ways, and are committed to working with the Panel to build on these successes.

IN CONCLUSION

The electricity industry faces numerous challenges, but is determined to meet them today and in the future by focusing on innovation and sustainable development. The industry can and must continue to accelerate its sustainability performance; but it is likewise imperative that government create the right policy conditions to support innovation and change in the industry. We look forward to working with you—our stakeholders—to further improve the overall sustainability of the industry in the year ahead!

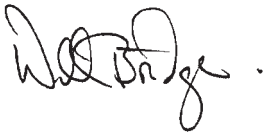
Thank you for your interest in the Canadian Electricity Association (CEA) and its member companies.

Sincerely,



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

Mr. Karl Smith
President & CEO, FortisAlberta
Chair, CEA Board of Directors



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

Letter from the Public Advisory Panel

Mr. Karl Smith
President and CEO, FortisAlberta
Chair, Board of Directors
Canadian Electricity Association

Dear Mr. Smith

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. We thank you for your response to our letter last year, and we look forward to engaging in ongoing discussions on the issues that we identified. We also appreciate the support received over the past year from Channa Perera, Director of Sustainable Development at CEA, and thank you for helping us understand the challenges your sector faces.

Panel members were pleased that the CEA made a commitment to become a sustainability leader through the launch of the Sustainable Electricity program in 2009. We welcome the release of your second Sustainable Electricity Report and are pleased to comment on your achievements. Our task is also to provide you with views on ways in which your program can be further advanced in the future.

This year we focus our attention on five areas: sustainable development indicators (and benchmarks), greenhouse gas mitigation, climate change adaptation, innovation culture, and relationships with Aboriginal Peoples. We appreciate the progress made in 2009 by CEA companies on Sustainable Electricity, and we continue to encourage CEA member companies to improve their performance within the conventional projections of increasing electricity demand. However, Panel members also believe that fundamental changes in Canada's approach to sustainability are required, and that meaningful shifts in government policies and people's behaviour could affect the three identified key industry challenges of meeting demand, investing in infrastructure, and

developing human resources for the years ahead. It is in this context that we offer comments and recommendations to the CEA for inclusion in the 2009 Sustainable Electricity Annual Report.

SUSTAINABLE DEVELOPMENT INDICATORS (AND BENCHMARKS)

Panel members are pleased that the CEA is making progress on developing a Sustainable Development Index (SDI) and we reiterate our statement in last year's letter that called for member utilities to set performance targets and to establish benchmarks on key indicators. We feel it is important for the suite of indicators be expanded to include biodiversity, water use and land-use changes. In particular, we note that the United Nations (UN) declared 2010 to be the International Year of Biodiversity—a celebration of life on earth and of the value of biodiversity for our lives. The UN invited the world to take action in 2010 to safeguard the variety of life on earth. In this regard, we are pleased that CEA member companies are collectively evaluating the merits of developing an industry-level quantitative performance indicator based on the UN Convention on Biological Diversity.

GREENHOUSE GAS MITIGATION

Panel members were very pleased to see a 10.5 percent reduction in CO_2e emissions in 2009. However, we note that emissions of GHG and other pollutants declined largely because the demand for electricity fell as the global economy declined. Also, lower coal-fired electricity generation in Ontario contributed to the emissions reduction.

Furthermore, it is the Panel's view that as Canadian urban centres and communities reform to lower their GHG emissions and save money on infrastructure expenditures, CEA members may face significantly different electricity demand projections than are currently forecast. In this regard, we challenge CEA members to look seriously at future scenarios that could move Canada away from Business-as-Usual electricity growth projections. We would also like to see CEA keep comprehensive accounting of GHG emissions and provide detail explanations on emission trends. Alongside comprehensive accounting of GHG emissions, we believe that CEA members should also provide more information in the Sustainable Electricity Annual Report on the percentage of investment devoted exclusively to renewable energy.

CLIMATE CHANGE ADAPTATION

Panel members are pleased to note that nearly 63 percent of CEA member companies had a plan in place in 2009 to adapt to the impacts of climate change. We would like to see this percentage rise to 100 percent in future years. It is our view that climate change poses significant threats to the electricity sector and that early attention to this issue and preparation for potential impacts will prove to be a valuable asset.

INNOVATION CULTURE

The Panel believes that an "innovation culture" is not just an imperative for the electricity sector, but also something that will have to be embraced by all Canadians as we head into an uncertain future. CEA companies should be leaders in the creation of a new innovation culture and should aim to inspire others to follow. The place to start is at the highest level of management within CEA companies—the Chief Executive Officers (CEOs) should encourage and support innovation throughout their companies.

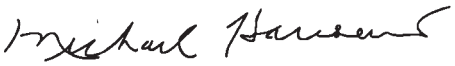
ABORIGINAL RELATIONS AND PARTNERSHIPS

Panel members are pleased that CEA members are working with Aboriginal Peoples to address their impacts on traditional land uses, resources, and the lives of Aboriginal Peoples. The Panel is encouraged that CEA members are exploring indicators that will help monitor the progress made with Aboriginal Peoples. This will help determine results and will enable the Panel to know how much progress has been made. We continue to encourage best practice sharing through the annual report and through relevant CEA committees (i.e. Aboriginal Relations Task Group).

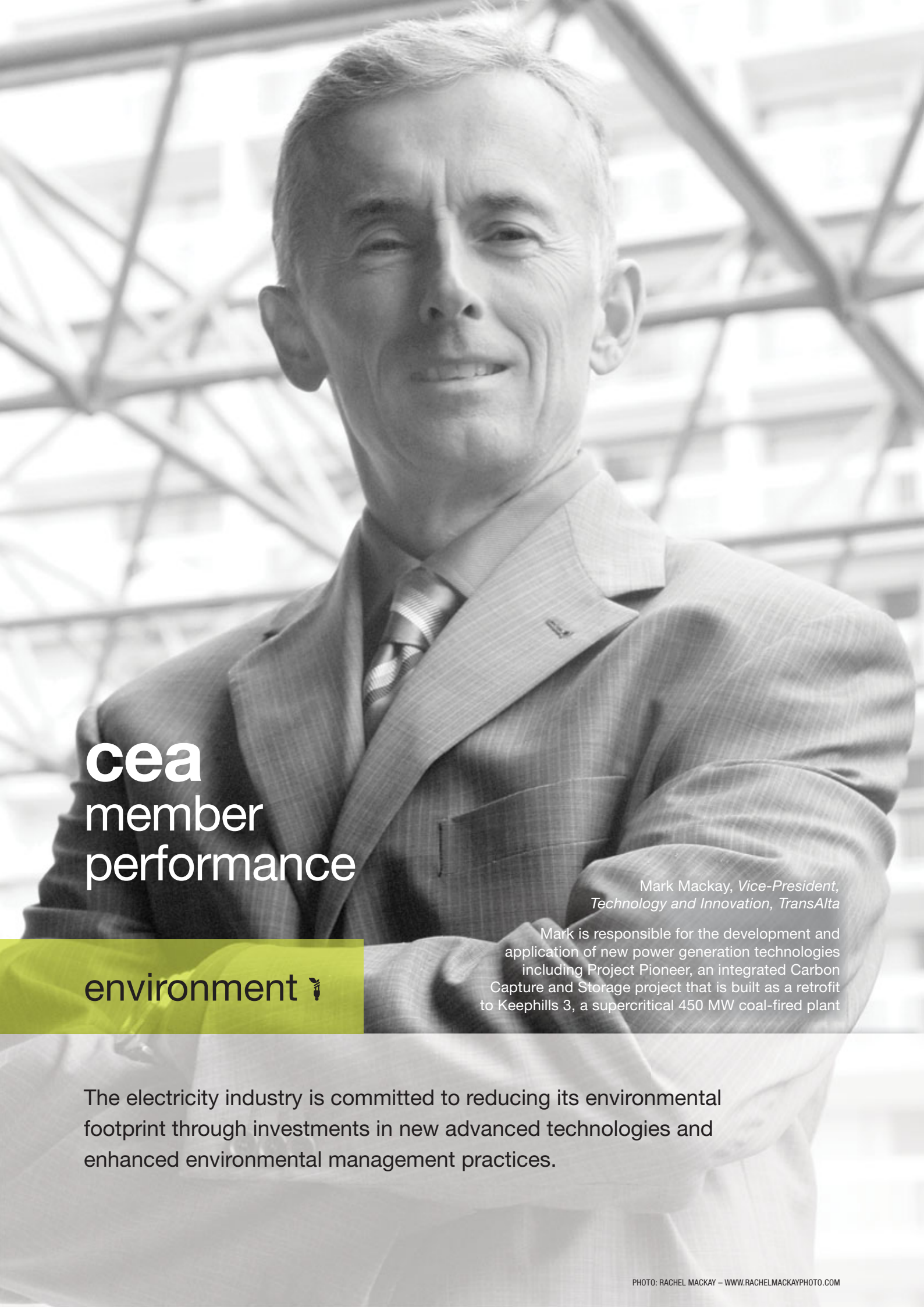
CONCLUSION

In closing, we look forward to meeting with the Sustainable Electricity Executive Council and the Board of Directors of the CEA to discuss our comments and recommendations. We appreciate the frank and informative discussions we have had with CEA staff and member companies, and we thank you for the efforts you are making to advance sustainable electricity in Canada.

Yours sincerely,



Hon. Mike Harcourt
Chair, Public Advisory Panel



cea member performance

environment

Mark Mackay, *Vice-President, Technology and Innovation, TransAlta*

Mark is responsible for the development and application of new power generation technologies including Project Pioneer, an integrated Carbon Capture and Storage project that is built as a retrofit to Keephills 3, a supercritical 450 MW coal-fired plant

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

PHOTO: RACHEL MACKAY – WWW.RACHELMACKAYPHOTO.COM

CASE STUDY // THE POWER OF INNOVATION:

TransAlta's Project Pioneer

TransAlta Corporation takes innovation and new technology development seriously. It recognizes the need for innovation in response to growing concerns about climate change and anthropogenic greenhouse gas emissions from coal-fired power generation facilities. Despite an uncertain policy and regulatory environment, TransAlta has committed to investing in innovation and finding a global solution to greenhouse gas emissions. 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. It will involve the transportation and storage of CO_2 in both geological sequestration and enhanced oil recovery.

The initiative brings together Alstom, a global leader in energy technology with expertise in chilled ammonia carbon capture, Capital Power Corporation, Enbridge, the Government of Alberta, and the Government of Canada. Based on collaboration and partnership, the project is an innovative model for the electricity industry to build on and deploy internationally.

The chilled ammonia process was chosen because it can be used to retrofit TransAlta's existing coal-based generating facilities in Alberta. It is viewed as the most promising and lowest cost approach to CCS, with further development expected to be applied to other emission sources. Alstom's chilled ammonia process cools and cleans flue gas, absorbs and separates the CO_2 stream, and compresses the CO_2, cools it and converts it to a supercritical liquid phase suitable for pipeline transportation and storage. This innovative process will also result in NOx, SO_2 and mercury emission levels that are 60 to 80 percent lower than those produced by other coal plants.

In 2009, Project Pioneer received a commitment of over $770 million in funding from federal and provincial governments. The funding is part of the government of Canada's $1 billion Clean Energy Fund, and the government of Alberta's $2 billion fund for CCS projects.

Looking Forward

In 2010, preliminary front end engineering and design (FEED) studies will take place. The project will be one of the world's first fully integrated CCS installations for coal-fired power plants, and is expected to be in operation in 2015. Once operational, it will have the potential to remove one million tonnes of carbon dioxide annually from the Keephills 3 facility.

Project Pioneer Timeline:

- 2010 – FEED and Development work
- 2011 – Detailed Engineering begins
- 2012 – On-site construction begins
- 2014 – Construction slated for completion
- 2015 – Fully operational to deliver capture target

According to the Canada-Alberta ecoENERGY CCS Task Force report, CCS technology could allow Canada to cut its greenhouse gas emissions by as much as 600 million tonnes a year by 2050 (including electricity, oil and gas, and transportation) without losing critical economic services and value. By retrofitting coal fleets across the country, CCS has the potential to make coal a carbon-neutral fuel.

377,372
Tonnes SO_2 Emissions

Principle 1: Environment

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

The electricity system requires a broad range of facilities, infrastructure, operations, and land uses. Fortunately, Canada is abundant in non-low emitting sources, including hydro and nuclear; and the electricity industry is becoming more innovative in its production and delivery of this essential service to customers across Canada and parts of the United Sates. As part of their commitment to innovation, CEA members continue to invest in new emerging technologies, including wind, biomass, solar energy, district energy systems, carbon capture and storage, and smart grid applications such as smart meters (more information on new emerging renewable capacity additions and investments will be provided in the 2010 Annual Report). Over time, these applications will help reduce the industry's environmental footprint. Moreover, CEA members are proactively implementing environmental management systems, procedures, and measures to reduce, manage, and control environmental effects beyond what is mandatory under existing Federal, Provincial, and Territorial laws, regulations, and operating permits. To truly move forward, industry and government must partner to ensure that the objective of low environmental impact is realized in a timely and cost-effective manner. The federal government, for example, has set a very ambitious objective of producing 90 percent of Canada's electricity from non-low emitting technologies by 2020. In order to achieve that level of electricity from non-low emitting sources, federal, provincial, and territorial government support and incentives will be needed for industry to undertake investments in research, development, and demonstration (R, D & D) of new technologies.

AIR QUALITY

Air quality is a concern for many Canadians, and continues to be a challenge for CEA members dealing with existing capital investments made many decades ago. Generation from coal remains one of the largest electricity sector contributors to air emissions, but coal has also been a relatively stable, abundant, and cost-effective source of energy. The challenge for the thermal portion of the electricity sector is to mitigate the impacts from coal generation through new innovations and the application of new and retrofit technologies.

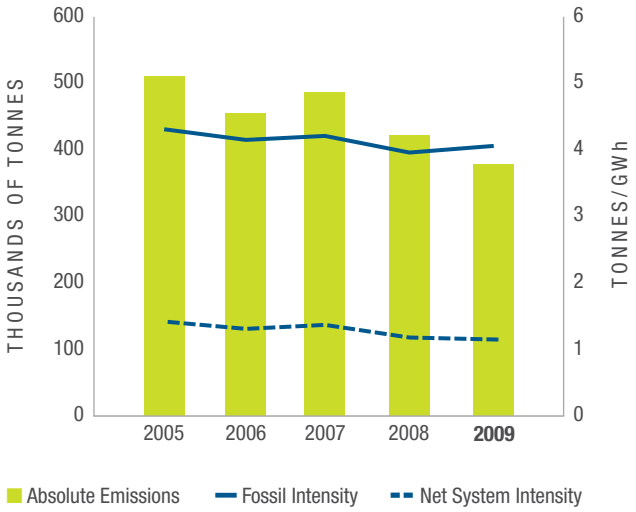
CEA members support a comprehensive federal/provincial/territorial approach to reducing air emissions based on ambient air quality standards specific to each region. Over the years, CEA member utilities have made significant investments in new retrofit emission reduction technology, such as Low NOx burners and Selective Catalytic Reduction (SCR) systems to meet existing regulatory standards and voluntary commitments aimed at improving ambient air quality in local areas. For example, Nova Scotia Power installed Low NOx Combustion Firing System (LNCFS) at Lingan, Trenton, and Point Tupper generating units, resulting in NOx emissions nearly 4,000 tonnes below its provincially regulated emission cap of 21, 365 tonnes in 2009. Although these retrofit technologies can be undertaken in the short term to achieve air pollutant reductions, the most significant, cost-effective reductions can be made over the longer term with the turnover of existing capital stock.

166,744
Tonnes NOx Emissions

105
Priority Spills

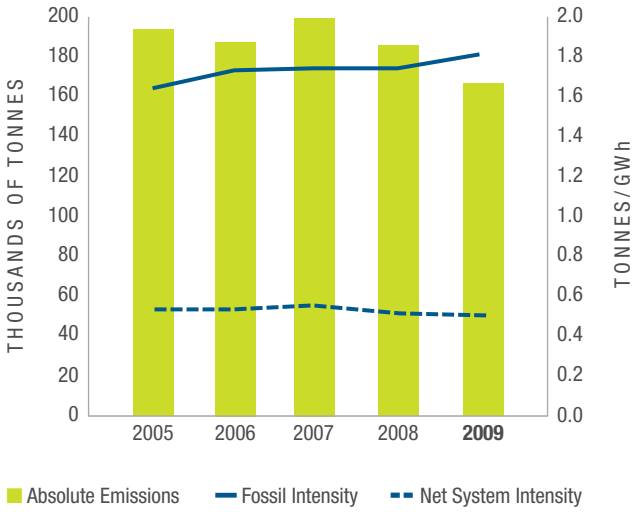
1,521
Kg Mercury Emissions

figure 1 | **SO_2 EMISSIONS AND INTENSITY**



Note: Intensity is based on net generation

figure 2 | **NOx EMISSIONS AND INTENSITY**



Note: Intensity is based on net generation

Since 2005, absolute SO_2 emissions from fossil fuel generation plants have been declining due to a combination of factors, including increased utilization of lower sulphur coal and installation of retrofit emission abatement technologies such as Flue Gas Desulphurization (FGD) systems. In 2009, SO_2 emissions declined by 10.6 percent to approximately 377,372 tonnes from 422,112 tonnes in 2008. Absolute reduction was due in large measure to lower coal-fired generation in Ontario, where both coal-fired generation and SO_2 emissions fell by more than 50 percent from the previous year. However, fossil fuel SO_2 emissions intensity (tonnes per unit of electricity produced) increased from 4.04 tonnes /GWh in 2008 to 4.14 tonnes/GWh in 2009. (Figure 1). The increase in SO_2 fossil intensity is attributable to increased use of higher intensity coal facilities and lower combustion efficiencies. The increase in coal generation was necessitated by low water levels for hydropower and reductions in other types of generation including natural gas, which has a lower overall intensity.

Absolute gross NOx emissions decreased approximately 10 percent compared to 2008 levels (Figure 2). The drop in absolute NOx emissions in 2009, to approximately 166,744 tonnes from 185,552 tonnes, was again primarily due to lower coal generation in Ontario—although several other provinces also contributed to the decline. While absolute emissions declined as companies reduced production from coal-fired units, actual emission performance rates of some facilities at CEA member companies contributed to a slight increase in fossil-fired NOx intensity from 1.76 tonnes/GWh in 2008 to 1.83 tonnes/GWh in 2009.

figure 3 **MERCURY EMISSIONS AND INTENSITY**

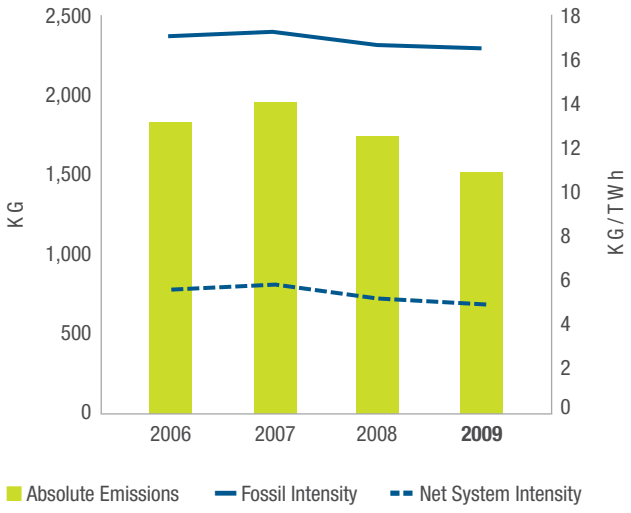
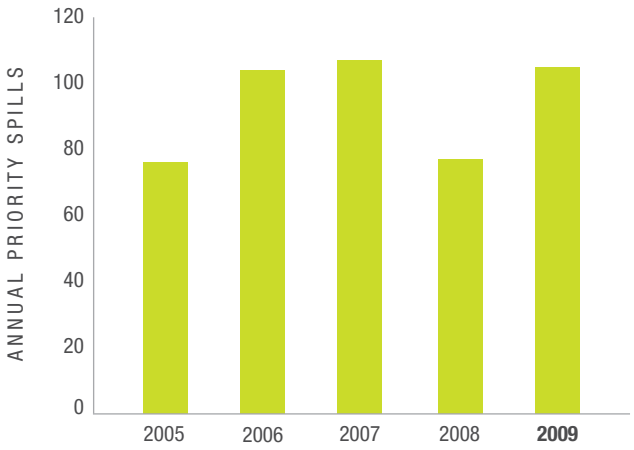


figure 4 **ANNUAL PRIORITY SPILLS**



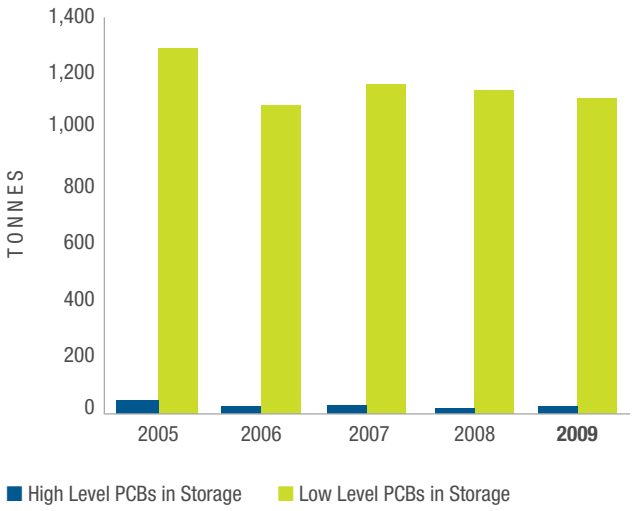
MERCURY

Mercury is a naturally occurring metallic element that is released into the environment through both human and natural activities. As mercury is contained in coal to varying degrees, burning coal to produce electricity can release the element into the environment. As one of the largest sources of mercury emissions in Canada, CEA members with coal facilities recognize the need to manage these emissions effectively. In the early part of the decade, CEA and eight coal-fired member utilities came together to develop a three-year program to advance research and measurement of mercury from coal-fired operations. The findings provided information critical to establishing a Canada Wide Standard for mercury emissions from coal-fired facilities, and finding cost-effective and efficient options for managing mercury emissions over the long-term. In 2009, CEA members emitted 1,521 kilograms of mercury. While there was some variability across CEA member companies in 2009, this represents an overall improvement of 13 percent from 2008. This is the lowest amount emitted since utilities began reporting to CEA in 2006 (Figure 3).

PRIORITY SPILLS

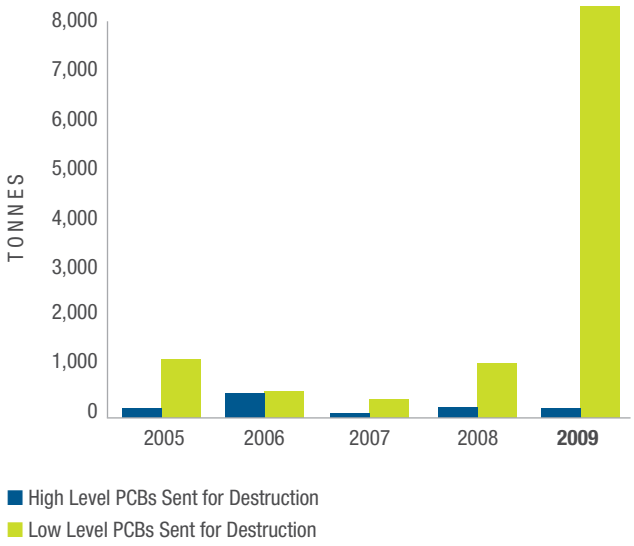
The electricity industry uses a large amount of petroleum-based products in its electrical equipment. The number of spills depends on many factors, including weather conditions, transformer reliability, age of assets, and preventive maintenance activities. While all types of spills are important, CEA tracks spills classified as priority spills—major spills, which contain petroleum or polychlorinated biphenyls (PCBs) and spills that enter a body of water—given the potential adverse environmental impacts. In 2009, CEA members had 105 priority spills compared to 77 priority spills reported in 2008 (Figure 4). The increase in spills was limited to a few CEA member utilities, but in each occasion, these CEA member companies took immediate action to remediate the affected sites.

figure 5 **PCB MANAGEMENT – PCB MATERIAL IN STORAGE**



Note: Values for low level PCBs include 850 tonnes of PCBs in storage from BC Hydro's clean up of its Rocky Bay site, which was initiated in 2005. This material was not included in previous ECR reports.

figure 6 **PCB MANAGEMENT – PCB MATERIAL SENT FOR DESTRUCTION**



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 effects if released into the environment, PCBs require special handling, storage, and disposal measures. In 2009, the amount of high level PCBs in licensed utility storage facilities increased by 5 tonnes and the amount of low level PCBs declined by 30 tonnes from 2008 levels (Figure 5). As per new federal regulations on PCBs, CEA members continue to reduce the level of PCBs in service.

The amount of low level PCBs sent for destruction increased significantly in 2009, from 1,103 tonnes to 8,296 tonnes due mainly to remediation activity at the former Federal Pioneer Ltd. (FPL) property in Saskatchewan, which is currently owned by SaskPower (Figure 6). In 2009 SaskPower initiated a $7.4 million cleanup of contaminated soil located in an on-site storage cell. SaskPower continues to gather information on the remaining impacts outside of the former storage cell so that next steps may be developed.

Industry Success Stories

Columbia Power Land Reclamation Initiative: In 2009, Columbia Power furthered the development of the Arrow Lakes and Brilliant lands reclamation areas by planting 1500 trees, over-seeding disturbed areas, and control of invasive plant species. When Arrow Lake Generation Station was first constructed, dredged river materials were deposited on the land and compacted. Through the incorporation of bio-solids, waste from a local pulp mill, fertilization, and the selection of appropriate hardy plant species, the land was reclaimed into very productive foraging habitat. Monitoring indicates that the trees are now rooted and well established with new growth every year.

Reclaimed land near Arrow Lakes Generating Station, Columbia Power Corporation.

Nova Scotia Power Invests in Mercury Abatement Technologies: In 2009, NSPI installed mercury abatement equipment on seven of its solid-fuel fired power generating units. The mercury abatement equipment at each unit consists of a front end sorbent enhancement additive and sorbent injection upstream of the particulate control device. The front end-additive is applied directly to the fuel prior to combustion to aid in oxidation of mercury, as oxidized mercury is more readily captured. Injection of powdered activated carbon into the flue gas occurs upstream of the particulate control device (i.e. ESP or baghouse) and aids in the capture of mercury by providing binding sites for the mercury to adhere. The mercury-laden activated carbon is collected in the particulate control device along with the fly ash and disposed of in a NSPI managed ash landfill.

FortisAlberta line crews at work.

FortisAlberta PCB Reduction Plan: in 2001, FortisAlberta developed a plan to identify the PCB content of oil-filled equipment, particularly those located within “sensitive areas” such as drinking water treatment plants and schools. By the end of 2009, and in compliance with federal regulations, oil-filled equipment between 50 mg/kg and 500 mg/kg had been removed from sensitive areas, with the exception of three units. These units are scheduled for replacement during 2010. Although present legislation allows utilities to continue the use of pole top transformers containing PCBs in concentrations of 50 mg/kg or greater until 2025, FortisAlberta has chosen to ensure that the company’s entire inventory meets this condition by the end of 2014.

Hydro Ottawa Develops a Formal Sustainability Strategy: In 2009, Hydro Ottawa initiated an Environmental Sustainability Strategy. The process included identification and quantification of direct and indirect environmental impacts e.g. energy, air pollution, greenhouse gases, water and waste. The priority areas established by the company’s executive included reducing the company’s carbon footprint through improvements in fleet and facilities and in non-hazardous waste management and recycling; developing environmental criteria for procurement; and building a culture of environmental sustainability in Hydro Ottawa’s business practices and workforce. This Strategy supplements the work already commenced on the reduction of fleet emissions, including the use of biodiesel, ethanol, hybrids and the installation of battery inverted technologies to minimize engine running time in selected operational vehicles.

CEA HOSTS THE INDUSTRY ASSOCIATION SUSTAINABILITY LEADERSHIP DIALOGUE

In October 2009, CEA hosted the 2nd industry association sustainability leadership dialogue. The bi-annual sessions, moderated by Stratos Inc., provide industry associations an opportunity to share and exchange ideas on sustainable development. The session hosted by CEA focused on the role of government in promoting sustainable development, brand identification, stakeholder communication and social media. CEA looks forward to continuing this dialogue with industry peers in 2010.

Left to Right: Gord Kurbis, Pulse Canada; Kim McCaig, Canadian Energy Pipeline Association; George Greene, Stratos; Dave Finlayson, Canadian Fertilizer Institute; Paula Dunlop, Canadian Gas Association; Georgina Wainwright Kemdirim, Industry Canada; Michelle Turner, CEA; Channa Perera, CEA; Smita Bhatia, Chemistry Industry Association of Canada (CIAC); Karla Heath, formerly of Stratos; Robert Campanelli, Real Property Association of Canada; Richard Paton, CIAC; Brian Wastle, CIAC; Allan Jones, Canadian Chlorine Chemistry Council.

Principle 2: Stewardship and Biodiversity

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

MAKING PROGRESS ON BIODIVERSITY

Existing and new electricity generation, transmission, and distribution operations have the potential to adversely affect both aquatic and terrestrial species and their habitats. CEA members recognize this issue and have been working to support conservation efforts and protect endangered species and their habitat in cooperation with a wide range of stakeholders, including local community organizations, conservation groups, and Aboriginal Peoples. For instance, Ontario Power Generation partners with the U.S. Wildlife Habitat Council, which is dedicated to assisting corporate landowners in the development of programs that protect, conserve, and enhance wildlife habitat and biodiversity.

Many CEA members also have proactive plans and procedures in place to mitigate biodiversity loss and support recovery of endangered and/or threatened species at or near their operations. For example, BC Hydro has implemented a 12-year, $33 million research and monitoring program to recover Columbia River White Sturgeon under its Water License Requirements Program. This program will fill critical knowledge gaps in basic biological information at various life history stages, describe habitat used at different life stages, and determine how habitat is affected by fluctuating river flows. Results from this research will provide a framework for evaluating and developing adaptive management strategies for white sturgeon in the Columbia River and elsewhere.

Despite best efforts, some impact to species and their habitat as a result of industry operations are unavoidable. To ensure conservation and recovery of both aquatic and terrestrial species and to provide regulatory certainty to industry, CEA members are actively working with the federal government on a wide range

Woodland Caribou, a threatened species under the Species At Risk Act and the Manitoba Endangered Species Act. Manitoba Hydro is currently studying the impact on Woodland Caribou during the planning and development of transmission and generation facilities.

of acts, including the Species at Risk Act (SARA) and the Fisheries Act (FA). In 2009, CEA members worked collectively to identify amendments to SARA under the Five Year Review initiated by the federal government. CEA members also believe that the Fisheries Act needs to be modernized to ensure consistency in the application of fish and fish habitat provisions, and to ensure the industry has an effective mechanism to obtain authorizations for its activities.

In addition, CEA member companies are collectively evaluating the merits of developing an industry-level quantitative performance indicator based on a proposed Business Leadership Declaration for the Implementation of the United Nations Convention on Biological Diversity. Progress on this indicator will be reported in the 2010 annual report.

PROTECTING FISH: MODERNIZING THE FISHERIES ACT

Passed into law in 1868, the *Fisheries Act* (the *Act*) is one of the most significant pieces of federal legislation for natural resource development in Canada. The *Fisheries Act* structures the federal government's constitutional mandate to manage the coastal and inland fisheries. In the 1970's, fish and fish habitat protection provisions were added to the *Act*. These prohibit the destruction of fish by means other than fishing, or harming fish habitat, without ministerial authorization. However, under the *Act*, authorizations are entirely discretionary. As a result, these provisions are applied on a case-by-case basis, and providing clear and consistent decisions has been a challenge for the department and industry.

CEA-DFO MOU As a result, CEA signed a Memorandum of Understanding (MOU) with DFO in 2002. The MOU sought to streamline and clarify the application of the *Act* to the electricity industry. Through the MOU, electricity utilities have worked cooperatively with DFO to share information and develop policies around the application of the *Act*. The work of CEA under the MOU has helped further the policy discussions within DFO and promoted more collaboration with industry across the country. The MOU has resulted in a number of successes. In 2007 SaskPower signed a Protocol Agreement with the Saskatchewan Watershed Authority, the Ministry of Environment, and DFO with the intent of clarifying the application of the federal *Act* and other legislation to SaskPower facilities. This agreement has helped foster greater communication among the regulators and SaskPower, and created a cooperative working relationship that is open and transparent.

***Challenges with the* Act** The MOU has made it apparent that many of the challenges facing those affected by the *Act* are the result of the wording of the legislation, particularly its habitat provisions. Over the past few years, there have been several attempts to modernize the *Act* in a meaningful way. Previously tabled bills to renew the *Act* (most recently Bill C-45 and Bill C-32) failed to address the concerns of the electricity industry, as they did not address the habitat provisions. CEA holds that legislative changes could solve its concerns and believes the time is right to pursue those changes. CEA has drafted proposed language for a renewed *Act* that would clarify the purpose and application of the law in order to restore its focus as a piece of resource legislation, to permit operation of existing projects affected by it under a clear legal regime, and to provide certainty as to the legal process for new projects.

While CEA pursues legislative changes, it will continue to work with the department as it develops policy statements that seek to clarify the application of the *Act*. The MOU work plan also includes greater regional engagement with department officials and utilities. Such engagement will encourage the regional application of nationally-developed policies.

Industry Success Stories

AltaLink Invests in Bird Collision Mitigation: In 2009, AltaLink installed more than 500 bird markers along a portion of its transmission line running through Lois Hole Provincial Park and Big Lake, a high risk area for bird collisions with power lines. The installation of the bird flight diverters (BFDs) and Firefly bird markers provides enhanced visibility of the line to help reduce the frequency of bird collisions. Both the Firefly and the BFD have been shown to reduce collisions by 60 to 90 percent. In addition to the bird markers, AltaLink installed signage in the park to provide local residents and visitors with information on the bird markers and its avian protection plan, the first of its kind amongst Canadian utilities.

AltaLink's north field crew installs bird markers along a portion of its transmission line that runs through Lois Hole Provincial Park in Central Alberta.

ATCO Electric Avian Protection Initiative: In 2009, ATCO Electric undertook a proactive initiative to change lighting standards for its telecommunication towers to reduce the potential for avian collisions. While this has not been a problem for ATCO Electric, it recognized that in some regions in Canada and the United States this is a major problem. In addition to changing lighting standards, the company plans to install a camera at its tallest tower to monitor avian collisions. Daily inspections will also be undertaken to determine if any collisions have taken place.

Osprey and spotted Joe-Pye-weed in Brookfield Renewable Power's Garden River First Nation reserve transmission right-of-way.

Brookfield Renewable Power's Corridors for Life Program: This program was developed to promote environmental stewardship and protection of known Species at Risk along the right-of-way (ROW) in the Algoma Region in Ontario. Under the Corridors for Life program, Brookfield Power developed a list of plant types suitable for native species such as wood turtles and monarch butterflies in the region. A new vegetation management manual, which includes Tradition Ecological Knowledge (TEK), has been developed to promote a community of low-growing shrubs and wildflowers under all power lines that are compatible with Species at Risk and other local wildlife.

SaskPower Partners with the Conservation Community: Each year SaskPower contributes approximately $115,000 to Ducks Unlimited for initiatives designed to support the conservation of ducks, migratory birds and their habitats. In 2009, the sponsorship was directed at protecting lands that are located in areas where habitat loss has already occurred and continues to occur; restoration of wetland; development of wetland and field resource materials for teachers, and the production of interpretive material for existing DU projects. SaskPower also provided funding for Nature Saskatchewan's Stewards of Saskatchewan (SOS), Last Mountain Lake Bird Observatory and the Plant Watch programs.

Left: SaskPower supports natural habitat diversity and preservation through such initiatives as its constructed wetland.

88.5	970	290	63
MT CO_2e Emissions	Tonnes/GWh CO_2e Fossil Intensity	Tonnes/GWh CO_2e System Intensity	% Companies with Adaptation Plans

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 is one of the greatest environmental challenges facing the electricity industry. Despite continuing uncertainty on future regulatory approaches, CEA members are investing in new technological innovations to deal with climate change. For example, as noted elsewhere in this report, TransAlta is moving ahead with Project Pioneer, a fully integrated carbon capture and storage (CCS) project that will be built as a retrofit to Keephills 3. Ontario Power Generation (OPG) is proceeding with biomass co-firing of coal-fired units given the significant greenhouse gas reductions vis-à-vis existing coal-fired generation. CEA members are also pursuing significant new investments in large hydro, nuclear, wind, tidal power, biomass, energy efficiency, and conservation programs to reduce their overall carbon footprint.

In addition to proactive company investments, federal/ provincial/territorial and international policy directions will also have an impact on the future fuel mix. In Ontario, for example, the provincial government has mandated the phase-out of coal-fired facilities and their replacement with a combination of renewable electricity, nuclear and conservation efforts. Internationally, the major industrialized economies agreed in principle to reduce GHG emissions based on national targets and objectives in 2009 at the United Nations Conference of the Parties in Copenhagen, Denmark. Although the details of the new framework remain to be seen, the electricity industry welcomes the new international direction on climate change. A combination of these initiatives, along with new cost-effective technologies and capital stock turnover will drive changes in the fuel mix—and the ultimate reduction in electricity industry GHG emissions in the future.

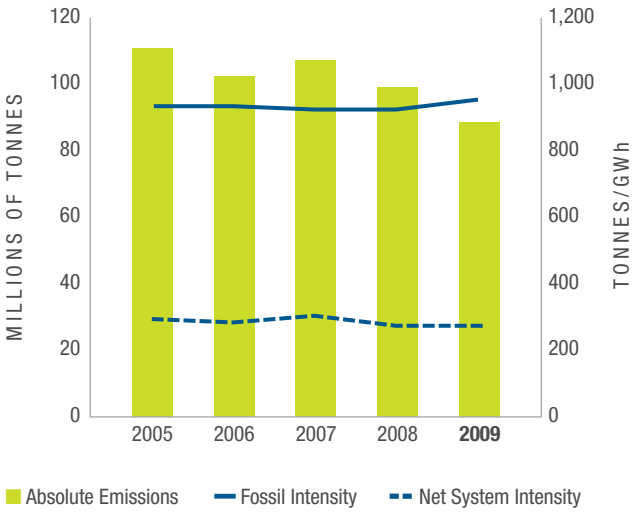
These investments will not be without a cost to customers. Over past decades, Canadian electricity prices have remained relatively low compared to those in many industrialized and emerging economies. But significant compliance costs associated with existing provincial and future federal climate change regulations, and the impending capital stock renewal required, will cause electricity prices to increase as companies pass through investment and compliance costs. CEA members are committed to working with all orders of government to find the best approach to reducing GHG emissions generated by the electricity sector, while continually ensuring a secure, reliable supply of competitively-priced electricity. Failure to achieve the right balance between reducing carbon emissions and providing safe, reliable, and cost-efficient power could have profound implications for consumers and businesses in Canada. Action on climate change should ensure competitiveness of the Canadian economy, and should be aligned with our trading partners.

In 2009, absolute CO_2e emissions from fossil fuel plants declined 10.5 percent compared to the previous year (Figure 7). The drop in absolute CO_2e emissions was due to a combination of factors, including lower demand for electricity and decline in coal-fired generation across the country. The biggest decline was in Ontario, where both coal-fired generation and emissions fell by over 50 percent as a result of a combination of technology, economic and government policy drivers. Overall, coal-fired generation by CEA member companies decreased from 94,000 GWh in 2008 to approximately 78,000 GWh. However, as the economy improves and the demand for electricity increases, GHG emissions may increase as companies increase their production

from existing fossil-fired facilities. CO_2e emission intensity remained relatively consistent with the previous year. Net system intensity remained at 290 tonnes/GWh, while CO_2e emitted per net fossil generation increased to 970 tonnes/GWh from 940 tonnes/GWh. The increase in fossil intensity is attributable to varying intensity rates of coal and natural gas facilities across Canada, and the use of relatively high intensity facilities in 2009.

The first phase of Summerview wind farm, located near Pincher Creek Alberta, has been in operation since 2004. The second phase, Summerview 2, brought the combined installed capacity to 136 megawatts and will provide, on average, a total of 395,000 megawatt hours per year—enough electricity to meet the annual needs of approximately 55,000 homes, while offsetting 257,000 tonnes of CO_2.

figure 7 | **CO_2e EMISSIONS AND INTENSITY**



Note: Intensity is based on net generation

CLIMATE CHANGE ADAPTATION

CEA members are gradually taking steps to address the adverse impacts, risks, and vulnerabilities associated with climate change. Studies show that climate change is already having a negative impact in Canada through permafrost degradation, reduced ice and snow cover, coastal erosion, forest fires, and heat waves. Exposure to extreme weather events could affect the reliability of transmission and distribution networks across Canada, leading to unanticipated risks of brownouts and blackouts. CEA members are starting to integrate these issues into their existing planning processes. For instance, BC Hydro is taking specific actions to adapt to climate change, including: sponsorship of a study by the Pacific Climate Impacts Consortium to model hydrologic impacts to BC Hydro watersheds; ongoing collaboration with the Western Canadian Cryospheric Network to model hydrologic impacts to glacier-fed BC Hydro watersheds; improvement of the storm resiliency of distribution assets to protect them from severe weather conditions; and collaboration with provincial and municipal authorities to improve access to data to mitigate hazards and threats related to extreme weather events, including forest and brush fires, storms, and floods.

A company's ability to manage climate change risks and opportunities will depend on its adaptive capacity. Many CEA members are now in the process of building new infrastructure for the decades ahead, and it is important that the industry is able to put in place measures to adapt to climate change. CEA and its members encourage all stakeholders, especially government, to equally focus their attention on addressing adaptation to climate change. By the end of 2009, nearly 63 percent of CEA member companies had a plan in place to adapt to the impact of climate change.

Industry Success Stories

ATCO Electric Hybrid Utility Bucket Truck: ATCO Electric introduced the Alberta utility industry's first hybrid maintenance vehicle to its fleet. The hybrid bucket truck represents fewer carbon emissions, reduced fuel consumption, quieter operation and longer service life/performance when compared to a traditional diesel powered bucket truck. The diesel/electric hybrid's reduced fuel consumption can reduce carbon monoxide, nitrous oxide and particulate matter by up to 70 percent. Typical usage of a conventional bucket truck would also result in 16.8 metric tonnes per year of CO_2 being produced. The bucket truck has been deployed to Grande Prairie, Alberta and represents a first step in ongoing plans for ATCO Electric.

ATCO Electric unveils Western Canada's first hybrid maintenance vehicle at its Grande Prairie office on March 20, 2009.

BCTC Wind Forecast Study: As part of the climate change adaptation program, BCTC performed a wind forecast study to project wind speed change in British Columbia in the 2050–2100 time frame. Using this data, BCTC developed a set of thematic maps, which were then overlaid with the transmission system maps to identify areas prone to risk from adverse or extreme weather events. This information is currently being linked with asset databases to assist with asset management. Over the long-term, the initiative is expected to improve system reliability and reduce maintenance cost through identification of assets in high-risk areas.

Hydro One's new SF_6 Strategy: In 2009, Hydro One developed a new strategy to manage SF_6 (GHG with a high Global Warming Potential) releases into the atmosphere through increased focus on emission tracking, reporting, and repairs. The strategy aims to address known SF_6 leaks through immediate scheduling of repairs, replacement of aging SF_6 equipment known to chronically leak due to poor design, and preferential purchase of equipment that exceeds industry standards for equipment leak rates i.e. <0.5 percent annually. These measures will be further bolstered through increased staff awareness and training.

Joyce McLean, *Manager, Strategic Affairs, Toronto Hydro*

Joyce led the social housing initiative for Toronto Hydro in partnership with the Social Housing Services Corporation (SHSC), and Green Light on a Better Environment (GLOBE).

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 Peoples and communities in the vicinity of its operations.

CASE STUDY // THE POWER OF INNOVATION:

Toronto Hydro's Community Champions Program

Toronto Hydro understands that actively engaging residents on conservation issues in the social housing sector is a challenge and requires thinking "outside the box". The applied culture of conservation programs has a direct and measurable impact on the environment, as well as considerable economic and social benefits. Toronto Hydro partnered with the Social Housing Services Corporation (SHSC) and Green Light on a Better Environment (GLOBE) to establish the Community Champion program, which reinforces the value of incorporating sustainability solutions into social housing. The partnership, which targeted nearly 94,000 social housing units in Toronto, has three main elements: a light bulb change-out program; a Community Champion program engagement initiative; and staff training.

Toronto Hydro funded incentives for the light bulb change-out program were designed to promote energy conservation and influence behaviour by replacing incandescent light bulbs with energy efficient, compact fluorescent lighting (CFLs) inside apartments in the city's social housing buildings, including housing co-operatives and shelters. By the end of 2009, 80 Community Champions and 170 individuals, including housing providers, board members, and staff were trained on how to conserve energy and engage their peers. This resulted in a 2.8 MW reduction in demand. More importantly, providing CFLs created an opportunity for Toronto Hydro and GLOBE to engage residents in a conversation about conservation. The Community Champion program was conceived to help educate those tenants willing to talk to their neighbours and peers about energy efficiency and conservation.

In the Community Champion program's inaugural year, 13 individuals attended 14 hours of training sessions led by two instructors committed to sustainability at Toronto-based Seneca College's "Centre for the Built Environment". The expert conservation instructors were specifically recruited to help develop and deliver the training. These passionate leaders built an education program using face-to-face and highly interactive activities to engage a diverse range of participants with vastly different age and education levels, language backgrounds, and special needs. The training covered three main topics: Energy Conservation 101, Community Action, and Conservation and Planning for Action. Volunteer resident leaders learned how to develop conservation plans that fit their individual communities—real solutions for specific people who live in specific places. Following the training, the Community Champions formed their own conservation committees to develop, promote, and execute their plans, with the express purpose of engaging their neighbours on energy conservation.

The success of the Community Champion program is demonstrated by the increased interest and active support residents offered throughout this program and beyond. Not only are residents changing their own behaviours, they are often the source of new ideas and active suggestions to increase awareness and build the foundation for sustainable communities.

This program has given many tenants hope and a belief that their voice matters. Recognizing this, GLOBE staff has spread conservation awareness throughout Toronto's social housing infrastructure. The Community Champion program started out with only a small number of participants, but classes are now sold out almost a year in advance. The efforts of the program will only be fully realized as the tenant leaders continue to emerge to challenge and inspire their community, completing a circuit of sustainability.

2.15
All Injury/Illness Frequency Rate per 200,000 hours

Principle 4: Health and Safety

Provide a safe and healthy workplace for our employees and contractors

The electricity industry has a long-standing commitment to protect its employees, contractors, and the general public from electricity-related injuries and fatalities. CEA members have always aimed to achieve the highest level of health and safety performance, and have been collectively tracking their performance for many years through the CEA Occupational Health and Safety (OHS) program. OHS performance at CEA corporate utilities and associate members is tracked under four main categories: Group I, over 2300 employees; Group II, 301—2300 employees; Group III, under 300 employees; and Group IV, CEA associate members.

The collective effort to measure OHS performance is part of an integrated approach to improving the overall safety culture at member utilities. Likewise, a notable feature in CEA's composite safety performance is its members' ongoing strategic commitment to continuous improvement in safety and their ability to sustain an overall downward trend in incident frequency and severity. Some of the existing risk mitigation programs at member utilities include: hazard identification and risk management programs; health and safety communications with workers to enhance awareness of safe work practices; employee participation in safety improvement initiatives; and worker safety training to ensure all employees are fully qualified to undertake assigned tasks. These measures were further enhanced in 2009 when CEA and member utilities published the CEA Guide on Electric Utility Workplace Electrical Safety for Generation, Transmission and Distribution—which was the seed document for the development of a National Standard of Canada published by the Underwriters Laboratories of Canada (CAN/ULC S801) (see side bar).

figure 8a **ALL INJURY/ILLNESS & LOST-TIME INJURY FREQUENCY RATES**

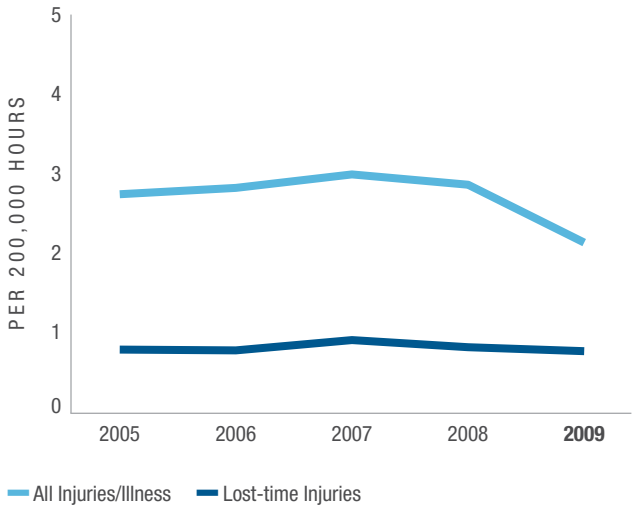
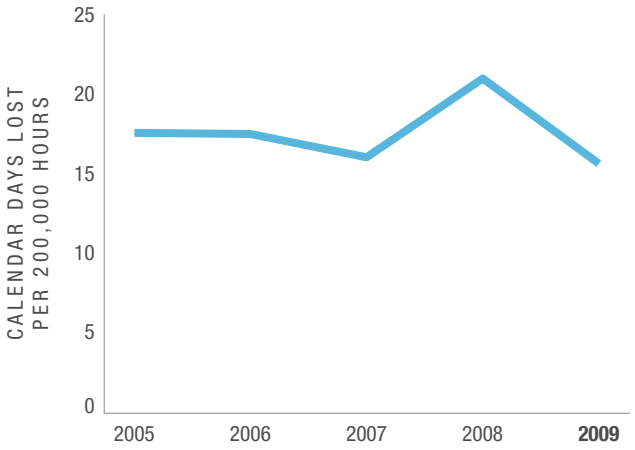


figure 8b **LOST-TIME INJURY SEVERITY RATE**



0.78

Lost-Time Injury Frequency Rate per 200,000 hours

15.73

Injury Severity Rate per 200,000 hours

In addition, CEA members recognize and actively promote safety in their communities. These public safety measures are usually delivered through classroom presentations, print advertising, and media campaigns. For example, in 2009 Hydro **One Networks** delivered electrical safety presentations to students in 135 elementary schools in Ontario. It used its Hazard Hamlet electrical hazard simulators to educate children about ways to protect themselves from dangers posed by electrical facilities and to encourage the safe use of electricity.

The CEA composite (all company categories), consisting of 39 reporting utilities, all injury/illness frequency rate was 2.15 injuries per 200,000 hours worked in 2009, a decrease of 25 percent from 2008 (see Figure 8a; see Figure 9a for peer grouping statistics). This decline is attributable to various factors, including: zero employee fatalities in 2009 compared to four in 2008; improved focus on injury prevention programs; enhanced safety training, education, and hazard recognition and identification procedures. The lost-time injury frequency rate was 0.78 injuries per 200,000 hours, a 6 percent decrease from 2008 (Figure 8a; see Figure 9b for peer grouping statistics). The injury severity rate in 2009 was 15.73 calendar days lost per 200,000 hours worked, a 25 percent decrease over 2008 (Figure 8b; see Figure 9c for peer grouping statistics). The decline in the injury severity rate and total number of lost days in 2009 is also a significant reversal from 2008, when total lost days due to injuries increased by 30 percent relative to 2007.

As in other industrial operations, the greatest volume of injury incidents in the electricity industry is due to over-exertion, falls from elevation, and being struck by objects. These incidents can be even more dangerous in the electricity industry given the high-risk operational environments as this high performing industry of over 67,000 employees' works in excess of 1 billion hours annually. Although CEA members

CEA AND MEMBERS TAKES A LEADERSHIP ROLE IN THE NEW ELECTRICAL SAFETY STANDARD

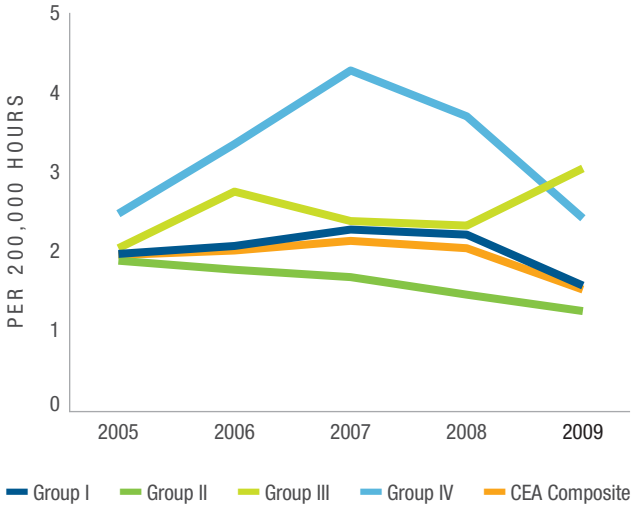
CAN/ULC-S801-10, Standard for Electric Utility Workplace Electrical Safety for Generation, Transmission and Distribution

Canadian electrical utilities have long been recognized as leaders in workplace electrical safety, with well established practices and procedures. Standards and guidelines related to work practices, methods for live working, tools, equipment, and devices for work on or near energized electrical systems are of great importance to CEA members and the electric utility industry. With significant contributions from CEA and its member utilities, the First Edition of CAN/ULC-S801-10, Standard for Electric Utility Workplace Electrical Safety for Generation, Transmission and Distribution, as a National Standard of Canada, was recently published. This standard will raise the bar on workplace electrical safety practices in the industry, while maintaining a cost-effective and reliable energy supply for Canadian consumers.

The Standard applies to the construction, operation, maintenance, and replacement of electric utility systems used to generate, transform, transmit, distribute, and deliver electrical power or energy to consumer services or their equivalent.

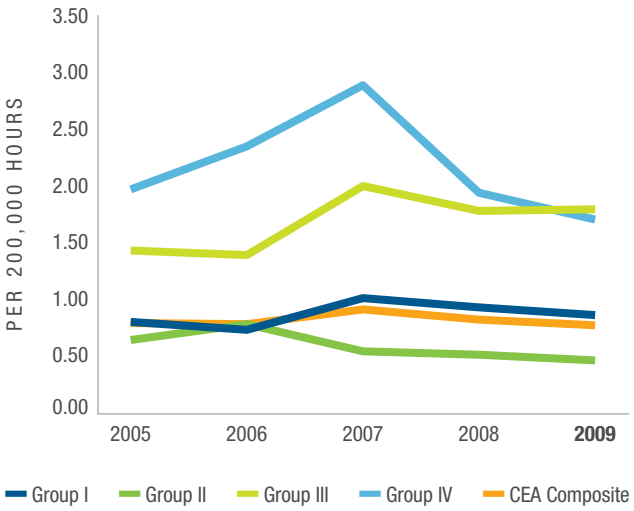
The CEA encourages all utilities to lead in safety by implementing CAN/ULC-S801-10.

figure 9a ALL INJURY/ILLNESS FREQUENCY RATE PEER GROUPINGS



CEA (all Utilities) all injury/illness frequency rate fell 25.41% in 2009 with a decrease of 22.31% since 2005. Group I Utilities all injury/illness frequency rate fell 28.92% in 2009 with a decrease of 20.19% since 2005. Group II Utilities all injury/illness frequency rate fell 14.16% in 2009 with a decrease of 33.57% since 2005. Group III Utilities all injury/illness frequency rate rose 30.74% in 2009 with an increase of 49.13% since 2005. Group IV Utilities all injury/illness frequency rate fell 47.09% in 2009 with a decrease of 21.11% since 2005.

figure 9b LOST-TIME INJURY FREQUENCY RATE PEER GROUPINGS

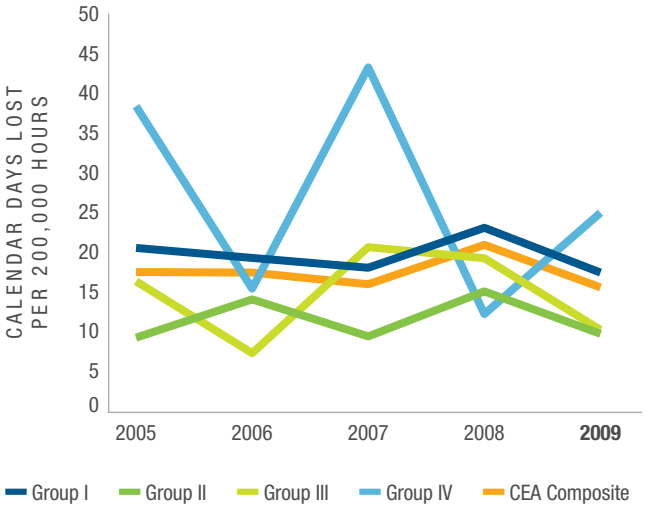


CEA (all Utilities) lost-time injury frequency rate fell 5.31% in 2009 with a decrease of 2.13% since 2005. Group I Utilities lost-time injury frequency rate fell 4.03% in 2009 with an increase of 6.19% since 2005. Group II Utilities lost-time injury frequency rate fell 9.34% in 2009 with a decrease of 27.93% since 2005. Group III Utilities lost-time injury frequency rate rose 1.2% in 2009 with an increase of 25.93% since 2005. Group IV Utilities lost-time injury frequency rate fell 29.45% in 2009 with a decrease of 30.39% since 2005.

are collectively performing well, incidents do occur. Changes in the utility industry continue to present challenges that could have an impact on safety: from highly advanced utility technologies and ever-increasing system automation, to an aging workforce and the recruitment of new workers. However, companies are continuing to invest in initiatives to promote safety culture, hazard identification, and other risk mitigation initiatives. CEA members, through the Occupational Health and Safety (OHS) Task Group, continue to actively network and share best practices to broaden the collective knowledge and encourage continued performance improvement by all.

The commitment of CEA utility members 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 9c LOST-TIME INJURY SEVERITY RATE PEER GROUPINGS



CEA (all Utilities) lost-time injury severity rate fell 25.42% in 2009 with a decrease of 10.99% since 2005. Group I Utilities lost-time injury severity rate fell 24.27% in 2009 with a decrease of 15.02% since 2005. Group II Utilities lost-time injury severity rate fell 35.23% in 2009 with an increase of 5.06% since 2005. Group III Utilities lost-time injury severity rate fell 0.19% in 2009 with an increase of 17.39% since 2005. Group IV Utilities lost-time injury severity rate rose 64.3% in 2009 with a decrease of 47.34% since 2005.

Industry Success Stories

ATCO Power's Safety Performance: In 2009, Sheerness Generating Station employees continued to define excellence in safety for ATCO Power. The station achieved nine years (representing more than 3.1 million hours of labour) without a single lost-time incident. This milestone is a reflection of the commitment to planning and effectively managing hazards in the workplace. ATCO Power's goal is to eliminate all work related incidents within their power stations and office environments.

Newfoundland and Labrador Hydro's Back It Up campaign: In December 2009, Newfoundland and Labrador Hydro, a Nalcor Energy Company, launched a new public safety campaign called Back it Up. The campaign helps people make safer decisions at work and at home. To support the campaign, Hydro launched a website, HydroSafety.ca, which provides tips and videos to help people learn more about being safe in their day-to-day lives.

Above: Members of the ATCO Power Emergency Response Team practicing their firefighting skills at the Sheerness Generating Station in Hanna, Alberta.

Right: Ad for Newfoundland and Labrador Hydro's Back it Up safety campaign.

Principle 5: Workplace

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

Human resources is one of the biggest challenges facing CEA members. The Canadian electricity industry is now facing the prospect of building new infrastructure and integrating new innovative technologies with an increasingly insufficient supply of qualified skilled workers. This low supply of skilled workers is coming at the same time as impending retirements and attrition of experienced utility personnel. Based on employer estimates, nearly 30 percent of the current electricity workforce is expected to retire within the next few years, including those in operationally critical positions. Adding to the complexity of the problem is the likelihood that the workforce required in the decade ahead will need to have a different skill set than the current workforce, due to changing technology, societal needs, and regulatory standards. For example, smart grid applications will place a far greater emphasis on the integration of measurement, communications, and information technology. 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 expand and improve skills training and apprenticeship funding, 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 are also committed to promoting a diverse workforce and ensuring that their work environments are free of discrimination, harassment, and barriers to advancement. In 2009,

approximately 82 percent of CEA member companies had an active policy or program in place to support diversity in the workplace. Many of these 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 addition, many CEA companies are partnering with various local organizations to attract underrepresented groups in to the electricity industry. For example, **Hydro Ottawa** actively participates in Hire Immigrants Ottawa (HIO), a United Way initiative that supports skilled immigrants and their potential employers. The program matches internationally trained individuals to employment opportunities commensurate with education and experience. Hydro Ottawa's President and Chief Executive Officer is the Co-chair of the Employer Council of Champions for Hire Immigrants Ottawa.

CEA and its members are currently developing a comprehensive list of human resources indicators to measure industry workplace related performance going forward. Some of these indicators will include equal opportunity and diversity measures, investments in skills and technical training, and employee wellness initiatives. Some of these indicators will be added to the next reporting year.

Industry Success Stories

Hydro One Diversity Calendar: To celebrate diversity and inclusiveness, Hydro One published its fourth diversity calendar in 2009. All employees receive a copy of the calendar each December. The calendar attempts to answer the questions: What is diversity? How does a diverse and inclusive workforce improve a business? Why is it important to embrace diversity? Employees are asked to get their child, niece or nephew (17 years old or younger) to draw a picture that, to them, captures the idea of diversity and write a brief description of what diversity means to them. The submissions that best reflect diversity are used for the Hydro One Employee Diversity Calendar.

OPG's Revised Diversity Policy: In 2009, OPG revised its Diversity and Human Rights policy, underscoring the importance of diversity, equity and inclusiveness at OPG. The Policy re-emphasizes OPG's commitment to have a workforce representative of the communities in which it operates and aligns with its obligations under the federal *Employment Equity Act*. Moreover, the Policy provides overall direction on how OPG and its employees must conduct themselves in ways that are inclusive and respectful, creating work environments that are based on principles of dignity, equity and respect.

62%
Companies Reporting on Sustainability

Principle 6: Communication and Engagement

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

Corporate sustainability is also about building links to key stakeholder communities. For CEA members, this means engaging their customers, communities, land owners, governments, investors, suppliers and many other groups in the communities in which they operate. Meaningful engagement of communities and other stakeholders is essential for meeting the challenges of tomorrow—building new infrastructure, becoming more innovative, and attracting skilled employees. Today, from the executive level to front line workers, all understand that there is much to be gained from reaching out to stakeholders and seeking their feedback on key issues relevant to company operations.

Companies use various media to communicate and engage different types of stakeholders, and community outreach is becoming more important as the industry begins to invest in new infrastructure across the country. Community stakeholder engagement takes place in many formats, including face-to-face town hall meetings, classroom presentations, print and social media, and via partnerships with local community organizations. Some CEA member outreach initiatives include discussions around energy efficiency, conservation, development of new generation stations, and transmission and distribution lines.

An example of stakeholder outreach is the public consultation work for the Heartland Transmission Project in Alberta's Capital Region. EPCOR and AltaLink worked in partnership to identify a preferred route for a 500 KV transmission line between Edmonton and the growing Heartland industrial area northeast of the city. During 2009, the project team mailed three newsletters to 240,000 residents, held a web survey and sent 55,000 stakeholder packages to residents within 1 km of each of the four potential routes. The team also conducted approximately 3,000 one-on-one consultations, set-up six information centres, held seven open houses attended by about 1,100 people, and took part in numerous community and local council meetings. In 2009, 76 percent of CEA member companies had a "formal" stakeholder engagement policy or a documented process—significant in terms of engaging stakeholders and addressing their concerns in a meaningful manner.

Proactive reporting of corporate social responsibility is also becoming a key source of information for stakeholders. While almost all CEA member companies report their environmental performance in some format, in 2009, 62 percent of CEA member companies reported that they produce information on sustainable development, either through a standalone annual report or via their website. This is a significant achievement and the CEA expects this to rise over-time as members fully implement the Sustainable Electricity program.

93%
Companies with Public Education Programs

76%
Companies with Formal Stakeholder Engagement

83%
Companies with a Formal Process to Respond to Stakeholder Concerns

Industry Success Stories

Horizon Utilities Wins the Company of the Year Award for SD Reporting: Horizon Utilities was honored in 2009 with the prestigious Company of the Year Award by the Ontario Energy Association (OEA) for taking the ground-breaking step of being the first electricity distribution company in Ontario to publish a Sustainability-Based Annual Report. This report focuses on the social, environmental and economic dimensions of the company's business and benchmarks its performance against the rigorous Global Reporting Initiative™ (GRI), an international standard for sustainability.

Blain Godin, Work Methods and Safety Coordinator (Acting) with NB Power, assisted Keswick Ridge School students in building wind turbines as part of the FACES program.

Nalcor-Energy Churchill Falls Recycling Program: Nalcor-Energy Churchill Falls provided the community of Churchill Falls with a recycling drop off facility which is accessible to residents at all times. This facility resulted in a 46 percent increase of charitable income for the local Lion's Club recycling initiative in the first six months. Additionally, the corporation supplied a number of recycling bins in various areas of the community and workplace environment.

Newfoundland Power's High Line Hazard Kit: Children and members of community groups learn about electrical safety through Newfoundland Power's High Line Hazard Kit. Newfoundland Power retirees visit schools and community groups across the province, teaching electrical safety. The High Line Hazard Kit demonstrates potential hazards in and around the home in a fun and interactive way. In 2009, the company reached approximately 3,000 school children with the electrical safety message.

New Brunswick Power Reaches Out through the FACES program: In 2009, NB Power piloted the Families and Communities Enriching Schools (FACES) Program in partnership with local school districts. The FACES program is a partnership that families, the business community and service agencies have established with local schools to offer support in the form of volunteers and/or financial assistance. As part of this partnership, NB Power employees are being encouraged to volunteer to help educate and engage students on the importance of energy, conservation, safety and potential career opportunities.

Principle 7: Aboriginal Relations

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

INNOVATION IN ABORIGINAL ENGAGEMENT AND PARTNERSHIP

Over one million people in Canada identify themselves as Aboriginals. Many of them live on reserves or have traditional lands directly or indirectly impacted by electricity infrastructure development and operations of Canada's electric utilities. The Canadian electricity industry is committed to building solid and mutually beneficial relationships with Aboriginal communities based on trust, respect and understanding.

Today, electric utilities work in close cooperation with Aboriginal communities out of respect for Aboriginal Peoples and culture. Their input is an integral component of successful project development, operation and mitigation of impacts. CEA members are committed to informing and consulting Aboriginal communities at an early stage with respect to planned activities and projects that will have an impact on them, and are incorporating traditional knowledge and community input into project reviews and planning.

CEA members are also focused on providing employment, contracting, educational and other capacity building opportunities for Aboriginal Peoples, businesses and communities. As one of the fastest growing segments of Canada's population, Aboriginal communities represent an important source of future workers for the industry. A prime example of an electric utility working cooperatively with local Aboriginal Peoples and businesses is British Columbia Transmission Corporation's (BCTC) Aboriginal Business Development Program. It identifies and promotes business opportunities between qualified Aboriginal businesses, BCTC, and its major suppliers. Its Skill Builder Training Initiative is a collaboration between industries to provide skills training to Aboriginal Peoples that could lead to meaningful employment.

Formation of business partnerships is another way in which electric utilities and Aboriginal Peoples are both benefiting from electricity industry projects and operations. A growing number of CEA members are providing Aboriginal communities the opportunity to take an equity stake in their projects. An excellent example of such an arrangement is the Wuskwatim Generation Project, a $1.3 billion project being developed under an equity partnership between Nisichawayasihk Cree Nation and Manitoba Hydro.

In addition to individual member activity, CEA coordinates an Aboriginal Relations Task Group, which enables members to share experiences and best practices in the area of Aboriginal Relations. The Sustainable Electricity Steering Committee intends to work closely with the Task Group to further develop new indicators for measuring performance on Aboriginal engagement. CEA is an active member of the Canadian Council for Aboriginal Business (CCAB), a national nonprofit organization which helps facilitate sustainable relations between the Canadian business sector and First Nation, Inuit, and Metis people. CEA is also a member of the Conference Board of Canada's Council on Corporate Aboriginal Relations (CCAR), an executive network that helps corporate Aboriginal relations executives build relationships with Aboriginal groups and businesses across Canada.

On the Aboriginal Relations floor (14th floor) of Manitoba Hydro Place, a medicine wheel inspired carpet mosaic is installed to honour indigenous traditions and spirituality. It is a symbol of welcome, healing and it represents peaceful interaction among all living things.

Official Signing Ceremony for the OPG-Lac Seul First Nation (LSFN) Partnership December 19, 2008. Front row sitting, left to right: Chief Clifford Bull, LSFN; John Murphy, Executive VP Hydro, OPG. Standing, left to right: Hon. George Smitherman (former Minister, Ontario Ministry of Energy and Infrastructure (MEI); Gina Lawson, LSFN Youth Chief; Sam Manitowabi, LSFN General Manager Obishikokaang Development Corporation; Jake Epp, Chairman, OPG.

Industry Success Stories

BC Hydro Wins Corporate Knights Award for Aboriginal Relations: In 2009, Corporate Knights magazine's inaugural Aboriginal Ranking of extractive companies awarded BC Hydro first place in the utility category, citing its long-term vision and progressive approach to Aboriginal Relations. BC Hydro was the first utility to seek progressive aboriginal relations status and earned a silver designation from the Canadian Council of Aboriginal Businesses in early 2010.

BCTC's Aboriginal Relations Outreach (ARO) program: This program focuses its support on programs and initiatives that benefit BC's Aboriginal communities. Although the support includes a range of programs benefiting a wide group of aboriginal peoples, most efforts to date have focused on aboriginal youth—a group that is growing significantly faster than all other youth groups in Canada. In 2009, the ARO program provided support to several initiatives including educating families on the long-term social and health benefits of quality early childhood development programs.

Ontario Power Generation (OPG) Partners with Aboriginal Peoples: In 2009, Moose Cree First Nation members voted in favor of ratifying the Amisk-oo-Skow Comprehensive Agreement. The agreement recognizes past impacts of OPG facilities and provides the basis for a new relationship between Moose Cree First Nation and OPG. The agreement is an important step in a proposed partnership between Moose Cree First Nation and OPG to redevelop four generating stations along the Lower Mattagami River between Kapuskasing and James Bay. Furthermore, the new Lac Seul/Obishikokaang Waasiganikewigamig Generating Station in Ear Falls was declared in-service in February 2009. Through a partnership agreement with OPG, Lac Seul First Nation has a 25 percent equity stake in the generation station.

TransAlta's Aboriginal Bursary Program: TransAlta's Aboriginal Bursary Program supports Aboriginal youth from across Alberta, helping them develop skills and abilities through post-secondary education. The program annually awards up to seven bursaries to Aboriginal students enrolled in two-year college or four-year university undergraduate programs at recognized Alberta post-secondary institutions. Recipients are eligible for up to $3,000 for the school year in which they apply. Additionally, TransAlta offers up to three awards in the amount of $1,000 each for those in a trades program. In the 2009/2010 application year, TransAlta awarded seven students scholarships ranging in studies from Bachelor of Science in Biochemistry to Bachelor of Arts program majoring in Native Studies and Psychology.

cea member performance

economic

Tom Akerstream, *Corporate Facilities Department Manager, Manitoba Hydro*

Tom was involved in the planning and construction of Portage 360, one of the most sustainable office buildings in modern history.

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.

CASE STUDY // POWER OF INNOVATION:

Manitoba Hydro's State-of-the-Art Head Office

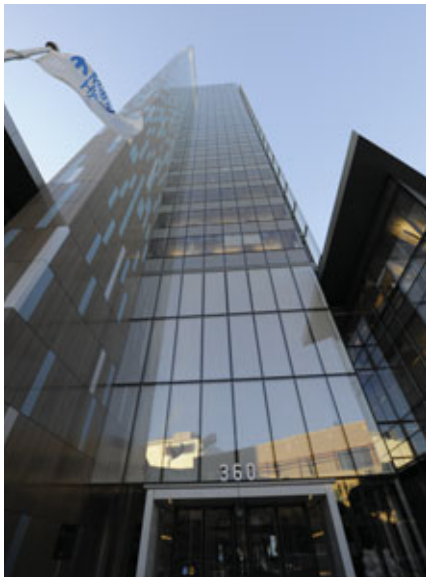
In 2009, Manitoba Hydro made 360 Portage Avenue its new Head Office in downtown Winnipeg. The 360 metaphor was invoked to represent a new way of thinking when it came to the planning, design, and construction of the state-of-the-art building. It meant looking at impacts holistically—the full 360 degrees—and perfectly illustrated Manitoba Hydro's desire to develop a Head Office that is highly energy efficient. The existing buildings on the site where Manitoba Hydro Place now stands were deconstructed in 2005, with a commitment to divert construction waste from landfill. Ninety-five percent of the building materials were salvaged for re-use and recycling. Manitoba Hydro Place makes use of many of these materials.

The building is the most energy efficient office tower in North America, expected to use 65 percent less energy than a comparable office tower of conventional design. To maximize energy efficiency, heating, cooling and ventilation are split into two distinct functions: heating and cooling provided by the geothermal system; ventilation is provided by a combination of the solar chimney, winter gardens, and building design. The building boasts the largest geothermal system ever built in Manitoba, with a total of 280 wells. The heat energy extracted from the ground in winter will be replaced in summer, making the balanced system fully sustainable over the long term. Ventilation is achieved through the south side winter gardens. These spaces are six stories in height and act like a lung, providing 100 percent pre-conditioned fresh air, 24 hours a day, 7 days a week.

Employees working at 360 Portage Avenue enjoy one of the healthiest and most vibrant workspaces in the world, and their presence contributes to a renewed energy in downtown Winnipeg. Fitness classes are offered during the lunch hour, with easy access to fitness facilities within walking distance of the office, most via the skywalk system. There are many options for employees to be active during work hours and options for a healthy lifestyle.

From the beginning of this project, the company was committed to ensuring construction workers comprised a minimum of 20 percent equity members (women, Aboriginal Peoples, persons with disability and visible minorities). In keeping with its commitment to employment equity, Hydro exceeded its target, achieving 26 percent equity hiring, with the majority of equity members in the construction workforce being Aboriginal.

Another priority for the downtown headquarters was to ensure the building featured a hospitable environment for the Aboriginal community. Commencing October 2005, Elders and young Aboriginal professionals were consulted on the design of Manitoba Hydro Place. Comments included the importance of the building having a "heart". It was suggested that water may be the heart and life force of the building. The water features in the main gallery area represent this life force. As a result of these consultations, a number of features that reflect an Aboriginal presence were incorporated into the design of Manitoba Hydro Place, especially for the 14th floor, where Hydro Aboriginal Relations Division is located. One such initiative was the planting of sweet grass—a tall, wild grass that is used as a sacred plant in Aboriginal ceremonies—on the third floor green roof.



Manitoba Hydro's new head office—360 Portage Avenue.

$5.1
Billion Employee Compensation

$22
Million Charitable Donations

Principle 8: Economic Value

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

The electricity industry is a major engine of the Canadian economy, contributing over $24 billion to the Canadian Gross Domestic Product (GDP).[4] The core service in itself—production and delivery of electricity—is vital to the prosperity and quality of life of all Canadians. For example, the August 2003 electricity blackout in Southeastern Ontario and the Northeastern United States contributed to a 0.7 percent decline in Canada's GDP during that month, along with a net loss of 18.9 million work hours.[5] This illustrates the importance of a reliable electricity system, both to the economy and to our quality of life. While CEA members strive to meet this core mandate, they contribute to the economy in many other ways, including new investments, employee compensation, payments to investors and governments in the form of dividends, donations to local charities, and other long term community investments.

In 2009, total employee compensation (salary plus benefits) at CEA member companies accounted for over $5.1 billion, an increase of approximately 1 percent over 2008 (Figure 10). Appropriate compensation is a key to attracting and retaining skilled employees needed to provide reliable and safe electricity to communities across the country. This is becoming even more important as the industry faces major qualified labour shortages in the years ahead. In addition, CEA member utilities continue to invest in communities in which they operate. In 2009, CEA members invested $21.8 million to registered charities across the country, a significant amount, though a 10 percent decrease over 2008 due to the economic downturn (Figure 11). Many of these donations went to the United Way, to support environmental initiatives and organizations, arts and culture, safety and injury prevention programs, to youth initiatives, to food banks, local hospitals, and to other local community activities. In addition, many companies go beyond direct monetary donations and allow their employees to volunteer during work hours at local events (e.g. Vancouver Winter Olympics).

figure 10 **ANNUAL EMPLOYEE COMPENSATION**

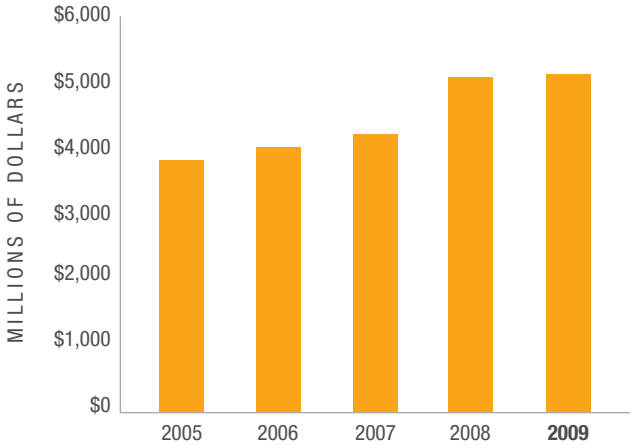
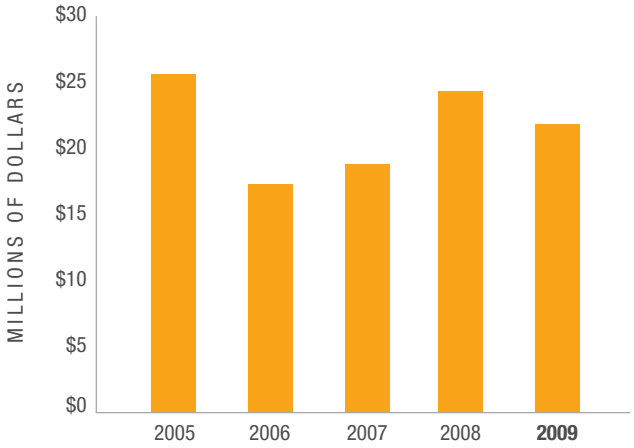


figure 11 **ANNUAL CHARITABLE DONATIONS**



Note: Total compensation includes T4s and T4As

4. Statistics Canada, Energy Statistics Handbook, Fourth Quarter 2009
5. US-Canada Power System Outage Task Force, Final Report, Natural Resources Canada and the US Department of Energy, Sept, 2006

Industry Success Stories

ATCO Power's EPIC Campaign: In 2009, ATCO Power employees participating in its annual EPIC (Employees Participating in Communities) campaign pledged $120,968 to their favorite charities. ATCO Power also expanded its corporate matching program to include registered human health and wellness charities, animal welfare organizations, and educational institutions. The decision was also made to match funds raised from events as President, Rick Brouwer said at the wrap-up of the campaign, "The company will match event funds despite our economic challenges because community support is vital to ensuring healthy communities—and we all benefit from that." With the ATCO Power match, employees raised $267,767 which is a 44 percent increase over the 2008 campaign.

Capital Power Partners with the Art Gallery of Alberta (AGA): In 2009, Capital Power entered into an extraordinary three-year partnership with the AGA. This visionary initiative, *Capital Powered Art*, provides financial support to make world-class art available to Albertans. Under the partnership, Capital Powered Art will fund more than ten national and international exhibitions at the AGA over the next three years.

Manitoba Hydro Funds Northern Training and Employment Initiative: The Hydro Northern Training and Employment Initiative is a multi-year, $60 million training initiative designed to prepare northern Aboriginal Peoples for employment opportunities on Manitoba Hydro's Wuskwatim generating station, which is currently being constructed, and its proposed Keeyask generating station. Since its inception, over 2,100 northern Aboriginal Peoples have received training related to a variety of occupations such as carpenters, electricians, truck drivers and heavy equipment operators. Over 50 percent of these individuals have already obtained employment experience. The initiative is administered by the Wuskwatim and Keeyask Training Consortium.

TransAlta's United Way Campaign: The United Way provides TransAlta employees and retirees the opportunity to strengthen their communities and support those most in need. Each year, the company matches employee and retiree donations dollar for dollar. In 2009, over 75 percent of TransAlta employees participated under the theme "Get Caught Caring". Thanks to generous employee donations and the dollar-for-dollar match, TransAlta raised over $1.3 million—receiving the United Way "Thanks a Million Award" in the process.

Principle 9: Energy Efficiency

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

CEA members and governments have made energy efficiency and conservation a key priority. The industry has always been at the forefront of energy efficiency and conservation, but delivery and consumption of electricity is increasingly being done via innovative new technologies. For example, by year-end 2009, **Toronto Hydro** had installed approximately 631,000 "Smart" meters and had notified approximately 500,000 customers of the transition to new provincially regulated Time-of-Use ("TOU") rates. Implementation of TOU rates is seen as a key strategy in helping reduce energy consumption in Ontario, as it will encourage consumers to switch their energy use to off-peak periods. Toronto Hydro also developed a comprehensive section on its website that allows customers to see how much electricity they use, how much it costs, and how much they may be able to save by consuming energy during off-peak periods. The website also identifies energy saving tips that may result in lower electricity bills.

Other conservation initiatives by CEA members include: old refrigerator removal programs; exchanges of old Christmas lights for LEDs; and programs to turn down air conditioners during periods of peak summer demand. While these public and residential customer initiatives have more visibility, CEA utilities also promote conservation programs for their larger commercial, industrial, and direct customers. In 2009, CEA members achieved an annual savings of 1.2 TWh from conservation programs (Figure 12). CEA members also achieved approximately 182 GWh from internal energy savings, an increase of 31 percent over 2008 (Figure 13). This is primarily a reflection of energy saved within generation stations and equipment, which increased by 38 percent over 2008. Utilities also managed to increase energy savings from their office buildings in 2009, by 12 percent, which is largely due to Manitoba Hydro's new energy efficient head office in Winnipeg.

figure 12 **ENERGY SAVED THROUGH CONSERVATION INITIATIVES**

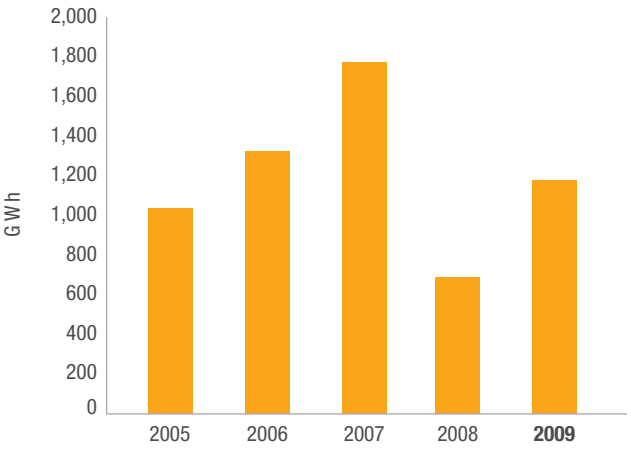
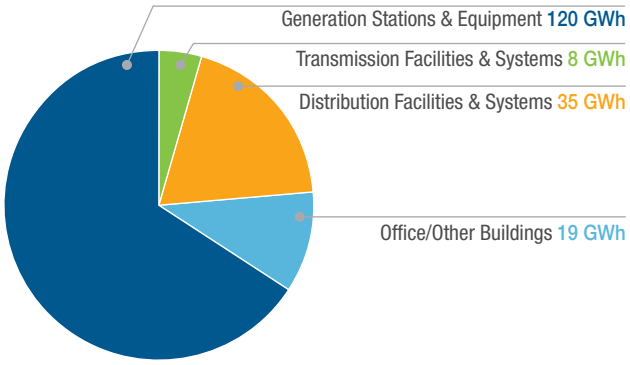


figure 13 **2009 INTERNAL ENERGY EFFICIENCY (GWh)**



PROMOTING INNOVATION THROUGH ENERGY EFFICIENCY

Energy efficiency will play a much larger role in a sustainable, secure energy future for Canada. Energy policy discussions and climate change mitigation strategies have focused on supply side solutions. Conservation and demand management strategies have played a lesser role—until now. The electricity industry is entering an era of unavoidable rising costs resulting from extensive infrastructure refurbishment; greater use of renewable supply options and Smart Grid deployment. As the era of cheap abundant electricity passes, the demand side of the equation will take centre stage and conservation and energy efficiency programs will be relied upon to help soften the impact of rising prices on electricity customers. In order to achieve the significant demand reduction required, innovative programs and approaches will be needed. There will be greater reliance on electric utilities as strategic partners in innovation—on both regional and national levels. Communities will look to their electric utility to help them manage their energy consumption as some 40 communities in BC have already looked to BC Hydro and their Sustainable Communities program for strategies and support. National level partnerships between electric utilities, governments, retailers, distributors, and manufacturers result in innovative approaches to conservation. Among these is the campaign to promote Energy Star Qualified light fixtures that is currently being spearheaded by CEA and Natural Resources Canada and due to roll out across Canada in October of this year. Backed by innovation and leadership from the electricity industry, conservation and energy efficiency programs are set to become part of the fabric of Canada's energy future.

Maritime Electric Powerline Technician Troy Worth working in Charlottetown, Prince Edward Island, overlooking the harbor.

Industry Success Stories

Maritime Electric Winter Challenge Program: in 2009, Maritime Electric introduced its Winter Challenge program, which is an energy conservation program that challenges residential customers to use at least 10 percent less electricity during the month of December versus the previous year. Nearly 20 percent of Maritime Electric's customers participated (8,566 customers) in the program in 2009, achieving an energy savings of 1,450 MWh. Customers that were successful received a 10 percent credit on their February electricity bill (effectively providing the equivalent of a 20 percent savings to the customer).

Right: Brenna Mae Gallant and Watty, the Winter Challenge mascot, browse the Winter Challenge website at the program launch.

ENMAX EcoRebate Program: In 2009, ENMAX initiated a pilot EcoRebate program to all ENMAX employees. The pilot program provided rebates to employees when they purchased specific energy-efficient products for their own personal use. In addition to rebates on large appliances, rebates were also available to employees who wanted to purchase or rent eligible alternative energy technologies, such as micro-wind turbines and solar photovoltaics for their homes. In 2009, 139 ENMAX employees took advantage of the EcoRebate program, purchasing a total of 234 energy efficient products. The initiative led to a total energy savings of 43 MWh of electricity, 860 GJ of natural gas, 1.7 million litres of water, 92 tonnes of CO_2equivalent. The program has been extended for another year and the goal is to eventually commercialize residential scale renewable energy systems.

FortisBC Embraces the BC Provincial Energy Plan: FortisBC PowerSense program celebrated its 20th anniversary in 2009. Energy saved through the program in 2009 surpassed expectations, with customers achieving energy savings of approximately 30 gigawatt hours (GWh)—enough to power 2,400 homes for a year. In order to meet BC's conservation goals, FortisBC is developing a comprehensive, long-term demand-side management plan and plans to enhance the existing PowerSense program.

President Eric Marr assisted by Saint John Energy mascot "Les Watts" and Mayor Ivan Court hands out a Home Energy Conservation Kit to an energy conscious customer.

Saint John Energy's Home Energy Conservation Program: In 2009, Saint John Energy introduced its "Home Energy Conservation Kit" or HECK giveaway. Customers pre-registered to receive a free bin full of energy saving products such as window kits, draft stop, insulating spray foam and several other items. Committee members then went to four locations across the city to distribute the kits to customers. In total, 1,000 kits were picked up or delivered to customers.

$9
Billion Invested in Infrastructure

100%
Companies with Pandemic Plans

96%
Companies Planning for Natural Disasters

4.2
Hours System Average Interruption Duration Index for Customers

Principle 10: Security of Supply

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

Consumers often take electricity supply and reliability for granted. But this is a major preoccupation of CEA members mandated to provide electricity in a reliable manner. This mandate is now increasingly tested, as the industry is facing a shortage of skilled workers, aging infrastructure, increasing demand for electricity, shrinking reserve margins, integration of new types of generation technology, new environmental regulations, and standards set by the North American Reliability Council (NERC) on cyber security and vegetation management—among others. As reliability of supply is stretched to the limits, the industry is looking to government and other stakeholders to help maintain and enhance the conditions under which CEA members can ensure system reliability and a sustainable future for Canadians. As projected by the National Energy Board and the International Energy Agency, the industry anticipates an increase in demand for electricity as the population and the economy grows, and through greater electrification of industries such as transportation and commercial scale integration of electric plug-in vehicles.

At the end of 2009, Ontario Power Generation's Niagara Tunnel was 54 percent of its way through its 10.4 kilometre journey under the City of Niagara Falls. When complete (year end 2013) the tunnel will provide Ontario with 1.6 TWh of additional energy per year for over 90 years.

As the industry works to promote reliable and cost-effective electricity to meet current and future needs, all technological innovations will be considered. This will include both large, centralized power plants—including advanced nuclear reactors, carbon capture and storage (CCS) capability, and higher efficiency natural gas-fired combined cycle facilities—as well as renewable and distributed generation facilities such as hydro, wind, solar, geothermal, tidal, and biomass. Although many of the small-scale technologies are becoming cost-competitive, CEA members are facing inherent issues, including limited transmission infrastructure to deliver electricity from remote communities where many renewable energy facilities are located. The industry needs the support of all stakeholders to ensure that it has the ability to invest in these generation technologies and build new transmission and distribution infrastructure to maintain the reliability and cost effectiveness of supply.

In 2009, CEA members invested approximately $3.9 billion in generation, along with $2.4 billion in transmission and $2.6 billion in distribution equipment, for a total investment of approximately $9 billion (Figure 14). This is a significant investment in the Canadian economy at a time of a severe economic downturn. What this also reflects is that the industry's commitment to maintain and enhance the reliability of the electricity system, both now and in the future.

figure 14 **2009 INVESTMENTS IN NEW & REFURBISHED INFRASTRUCTURE**

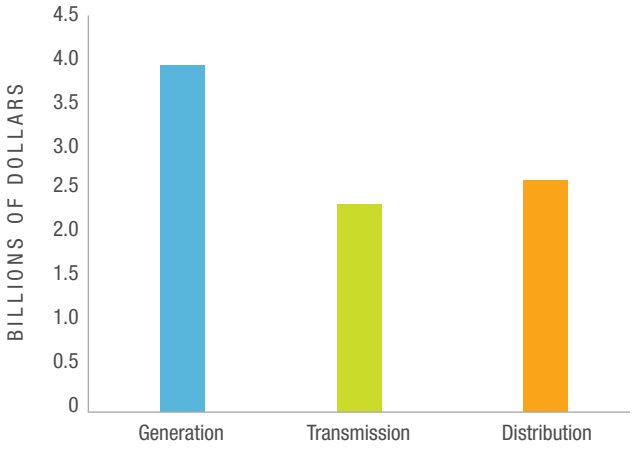
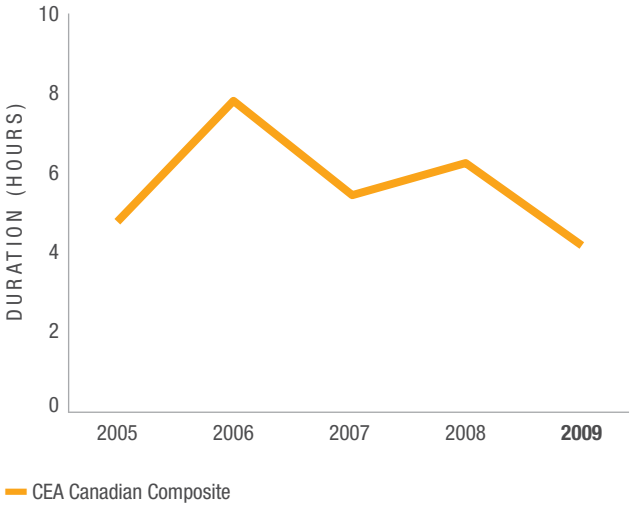


figure 15 **SYSTEM AVERAGE INTERRUPTION DURATION INDEX (SAIDI)**



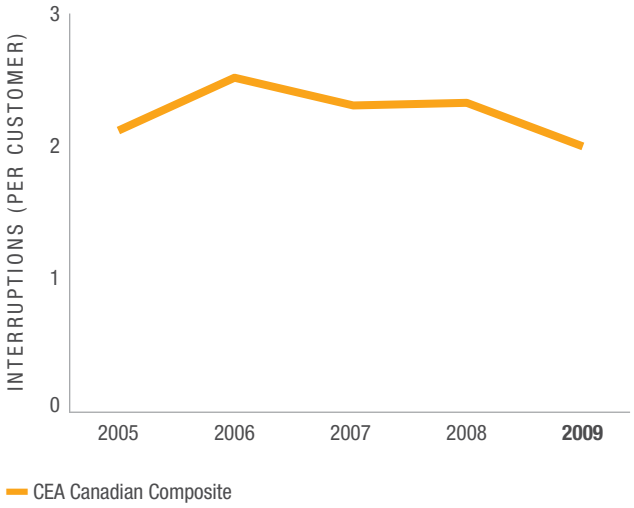
EMERGENCY PREPAREDNESS

The electricity industry is part of Canada's critical infrastructure. If physical and information technology facilities, networks, services, and assets owned and operated by CEA members are disrupted or destroyed for any reason, it could have a serious impact 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 (but not limited to) safety, healthcare, finance and transportation services would be significantly compromised, if not brought to a standstill altogether. So CEA members are proactively developing emergency preparedness plans. In 2009, all CEA member companies had pandemic plans; 96 percent of members had natural disaster plans; 82 percent had terrorism 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-to-coast.

SERVICE INTERRUPTIONS TO CUSTOMERS

While investment in new electricity infrastructure is crucial for meeting future needs, maintenance of the existing system and avoiding customer service interruptions is also important to CEA members. CEA annually collects reliability data to track distribution system performance. There are many contributing factors to service interruptions, including scheduled outages for the purpose of construction and preventative maintenance, plus damage caused by contact with trees, lightening, and adverse weather events. In 2009, the System Average Interruption Duration Index (SAIDI) for customers served was 4.20 hours per year, a decrease of 33 percent over the 2008 level of 6.28 hours. SAIDI has decreased by 12.5 percent since 2005 (Figure 15).

figure 16 | **SYSTEM AVERAGE INTERRUPTION FREQUENCY INDEX (SAIFI)**



The System Average Interruption Frequency Index (SAIFI), which measures the average number of interruptions per customer, also declined in 2009. The average number of interruptions per customer per year in 2009 was 2.01, a decrease of approximately 14 percent over the 2008 level of 2.34. SAIFI has decreased approximately 6 percent from 2005. (Figure 16).

Overall, the reliability of the Canadian distribution system has shown significant improvement in 2009. The CEA Service Continuity Committee has examined the issue of reliability and determined that utility efforts in addressing problems with defective equipment and trees/vegetation maintenance were successful. That, combined with a relatively mild year in terms of weather, resulted in significant improvements from 2008 to 2009.

MESSAGE FROM CHANNA S. PERERA

Director, Sustainable Development, Canadian Electricity Association

Two thousand and nine, in many ways, was a significant year for CEA member companies. In February, CEA members took the unprecedented step in the journey toward sustainable development by launching the CEA Sustainable Electricity program. In August, members retroactively reported on their overall sustainable development performance for previous years. As this performance report illustrates, CEA members are continuing on their journey toward becoming leaders of sustainability through the delivery of positive environmental, social, and economic outcomes for Canadians. I am encouraged by the CEA member achievements to date, and I look forward to another positive year ahead. To further assist us in this process of continuous improvement, I encourage you, our stakeholders, to provide feedback on this report and our overall sustainable development performance via e-mail at perera@electricity.ca.

Sustainable Electricity:

A Policy for Sustainable Development – Corporate Responsibility

The Canadian Electricity Association (CEA) and its member utilities are committed to sustainable development, which for us 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 Peoples 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.

Approved by:

Karl Smith
Chair, CEA Board of Directors

February 19, 2009


OPENHYDRO
NOVA SCOTIA POWER

CASE STUDY // POWER OF INNOVATION:

Harnessing the Tides – Nova Scotia Power's Tidal Project

Nova Scotia Power (NS Power) recognizes the role of innovation and integration of renewable energy capacity into its fuel mix. In November 2009, NS Power and its tidal technology partner OpenHydro successfully deployed the first commercial scale tidal turbine in Minas Basin. The turbine has a capacity of 1 MW, considered a minimum commercial size. This in-stream tidal turbine is part of a multi-phase research and development strategy to explore the potential role of tidal energy in Nova Scotia's renewable energy mix.

NS Power has 25 years experience in the Bay of Fundy—having built and operated the Annapolis Tidal Station since 1984—and is the first of several companies to test new tidal power turbine technologies in the Bay of Fundy. NS Power is a partner in the Fundy Ocean Research Centre for Energy (or FORCE), a consortium of some of the world's leading researchers, scientists, developers and regulators who are committed to explore the potential of a cleaner, renewable source of energy—straight from the Bay of Fundy, in Nova Scotia's backyard. Other FORCE partners are planning to test different tidal generating technologies over the next few years.

The OpenHydro machine is the largest in-stream tidal turbine ever tested in Canadian waters. The OpenHydro unit was selected by Nova Scotia Power because of its simplicity, including no lubricating oils and a simple design that would further minimize any impact on the environment. Its design provides for full deployment and recovery of the turbine—two key measures of the current demonstration project. "We will learn many important things about the Open Hydro unit, and the tidal regime in the Minas Passage during this demonstration project," said Mark Savory, Vice President Technical and Construction Services for Nova Scotia Power. "These learnings will help us make decisions about how to harness the power of the tides."

Mark Savory,
Vice-President, Construction Services, Nova Scotia Power Inc.

Mark is leading the innovative tidal demonstration project for Nova Scotia Power along with its tidal technology partner, OpenHydro.

Moving Forward

Important research data is being collected to determine the feasibility of tidal energy. The results of this demonstration project and continuing research will give NS Power the information it needs to assess the effectiveness of different tidal technologies, number of turbines that can be put into the Bay of Fundy, and any environmental considerations. NS Power believes that in the future there is potential to have 200 to 300 of these units strategically located throughout the Bay of Fundy, but further research must follow. Mark Savory concluded, "there is still a lot to learn but we're excited that we have been able to put a turbine in the water because that means we're one step closer to understanding the potential of tidal energy." Harnessing the tides is within reach and the company is committed to exploring innovative technologies to meet the needs of present and future generations.

Industry at a Glance

ENVIRONMENT	2009	2008	2007	2006	2005
Total Gross Annual SO_2 Emission (tonnes)	377,372	422,112	486,559	454,489	510,894
Total Gross Annual NOx Emission (tonnes)	166,744	185,552	199,407	187,432	193,636
Total Gross Annual Mercury Emission (kilograms)	1,521	1,751	1,967	1,840	N/A
Total Gross Annual Direct CO_2eq Emissions from Fossil Generation (tonnes)	88,535,560	98,896,801	107,147,272	102,500,887	110,703,823
Total kg of SF6 Used for Maintenance Purposes (topping up)	6,196	6,859	8,328	6,613	6,424
Number of Priority Spill	105	77	107	104	76
Companies with an ISO consistent EMS (%)	89	88	N/A	N/A	N/A
SOCIETY	**2009**	**2008**	**2007**	**2006**	**2005**
All injury/illness frequency rate (injuries per 200,000 hours)	2.15	2.88	3.01	2.84	2.76
Lost time injury/illness frequency rate (lost time injuries per 200,000 hours)	0.78	0.83	0.92	0.79	0.80
Lost time injury severity rate (calendar days lost per 200,000 hours)	16	21	16	18	18
Companies with public education programs (%)	93	96	N/A	N/A	N/A
Companies with a process for responding to stakeholders concerns (%)	83	N/A	N/A	N/A	N/A
Companies with an Aboriginal Affairs group or senior Aboriginal advisory positions (%)	68	64	N/A	N/A	N/A
Companies with business relationships or partnerships with Aboriginal communities (%)	79	69	N/A	N/A	N/A
ECONOMY	**2009**	**2008**	**2007**	**2006**	**2005**
Total value of company charitable donations ($millions)	22	24	18	17	26
Total annual internal energy efficiency savings (GWh/yr)	182	139	N/A	N/A	N/A
Total energy saved through Conservation programs (TWh)	1.2	0.7	N/A	N/A	N/A
Total capital expenditure on new/ refurbished generation infrastructure ($billions/yr)	3.9	3.1	2.4	1.1	1.2
Total capital expenditure on new/refurbished transmission infrastructure ($billions/yr)	2.4	1.8	1.0	0.5	0.5
Total capital expenditure on new/ refurbished distribution infrastructure ($billions/yr)	2.6	1.8	1.3	1.1	1.0
System Average Interruption Duration Index (SAIDI) Duration (hours)	4.2	6.3	5.5	7.9	4.8
System average Interruption Frequency Index (SAIFI) Interruptions (per customer)	2.0	2.3	2.3	2.5	2.1

ABOUT THE CANADIAN ELECTRICITY ASSOCIATION (CEA)

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 includes all facets of the electricity industry, from generation, transmission and distribution companies to manufacturers and suppliers of materials, technology and services. CEA members include provincial crown corporations, municipal utilities and investor-held companies.

For additional copies of the Highlights Summary or full report, contact Channa Perera or view it online at **www.SustainableElectricity.ca**.

For a listing of all Sustainable Electricity Steering Committee Members, please visit **www.SustainableElectricity.ca/members**.

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