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Sustainable Electricity[™] is a mandatory sustainability program developed and implemented by Corporate Utility Members of the Canadian Electricity Association (CEA). The goals of the program are to integrate sustainability in company operations; foster continuous performance improvement; and advance the public acceptance and support for utility operations through meaningful engagement, collaboration, transparency, and accountability. In that context, this report provides an overview of the sustainability performance of **CEA Corporate Utility Members** in 2014. Thank you to the **Sustainable Electricity Steering Committee Members** for their support in making this report possible. CEA kindly asks that you read this report electronically rather than from a printed copy.

When you see bold underlined text be sure to click for more information. Find out more about CEA and the Sustainable Electricity program here:

www.electricity.ca

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Discover how the electricity sector is delivering value to Canadians.

Leading Through Pivotal Times

Performance Transparency





JOINT EXECUTIVE MESSAGE

We are pleased to report on the progress made by CEA Corporate Utility Members towards sustainability in 2014. These are pivotal times for Canada's electricity sector. The infrastructure that sustains the current electricity system is aging and is in the process of being renewed and modernized. A large portion of our highly skilled workforce is preparing to head into retirement over the next five years as we manage through this knowledge transfer and transition the new workforce to meet the challenges of the future. The energy relationship between utilities and their customers is also evolving from a one-way flow of electricity to a more complex two-way energy flow, challenging traditional utility business models. In addition, regulatory barriers to advancing sustainability and innovation persist. How utilities respond to these challenges will ultimately define the future of the electricity sector.

In order to deliver sustainable, reliable, and cost-effective energy services to Canadians, it will be vital for the sector to address these challenges head on. That means reducing its environmental footprint; renewing and modernizing the electricity system; tapping into colleges and universities for skilled workers; and collaborating at an even greater level with policy makers, regulators, Aboriginal Peoples, and local communities.

Last year's sustainability performance exemplifies the commitment and

perseverance of CEA Corporate Utility Members to addressing these challenges through innovative solutions. On environmental performance, utilities continued to achieve reductions in GHG and air emissions, adding to the substantial reductions achieved over the last decade. The electricity sector is projected to achieve further air emission reductions in the next five years as utilities invest in new technologies, including carbon capture and sequestration, higher efficiency gas turbines, and renewable energy sources such as wind, solar, and biomass.

CEA members are equally committed to advancing the social and economic aspects of sustainability. We're pleased to see that utilities are increasingly engaging local communities and Aboriginal Peoples in project planning through formal stakeholder initiatives. Employee health and safety is another on-going priority, although challenges in this area remain. While there were improvements in the overall number of injuries and their severity in 2014, unfortunately, there were a few tragic employee and public fatalities. The safety of employees, contractors, and the public is of paramount importance to member companies, and they are committed to greater vigilance and performance improvement. On the economic front, utilities are investing billions of dollars in infrastructure renewal and modernization to maintain reliability and better serve customers.

In responding to the challenges of today, it is important to recognize that the efforts of utilities alone will not be sufficient to drive sustainable outcomes. Innovation needs partners. Collaboration needs partners. We want our stakeholders, including governments and regulators, to partner with us to drive the change that will deliver value to Canadians across the country.

We are also grateful to the Sustainable **Electricity Public Advisory Panel** members for their review of utility performance and their valuable advice. In their 2015 annual letter to the CEA Board (published in this report) they noted several areas for performance improvement and policy positioning, notably on carbon pricing and electrification of transportation. Both of these policy suggestions are also consistent with CEA's Vision 2050. CEA and its members look forward to discussing these suggestions with the Panel as part of the journey on continuous improvement.

As you review the sustainability performance of CEA Corporate Utility Members outlined in this report, we hope you will also share your thoughts on how the sector can create a stronger, more efficient electricity system that delivers environmental, social, and economic benefits to all Canadian communities.



The Executives from left to right: Anthony M. Haines, Max Cananzi, and the Hon. Sergio Marchi.



Anthony M. Haines, President and Chief Executive Officer, Toronto Hydro Corporation, Chair, CEA Board of Directors



Max Cananzi, President and Chief Executive Officer, Horizon Utilities Corporation, Chair, CEA Board Committee on Sustainability

March

Hon. Sergio Marchi, President and Chief Executive Officer, Canadian Electricity Association

LETTER FROM THE PUBLIC ADVISORY PANEL

Mr. Anthony M. Haines

President and Chief Executive Officer, Toronto Hydro Corporation Chair, CEA Board of Directors

The members of the Sustainable Electricity program's Public Advisory Panel are pleased to submit this annual letter of advice to the CEA Board of Directors. Our role is to provide the perspective of informed public representatives on the environmental, social, and economic performance of Canada's electricity industry as measured against the principles and indicators of the program.

The Panel continues to be pleased with the progress made by CEA members in 2014 on several fronts. including reductions of greenhouse gases, sulphur dioxide, and nitrogen oxides. Good progress continues to be made on the implementation of environmental management systems, while public and stakeholder engagement is also improving. Health and safety performance is another area in which some progress is being made in terms of total number and severity of injuries, but we note that there were a few tragic employee and public fatalities in 2014.

The main area in which performance has slipped is priority spills, which has increased in each of the past two years and continues to require focused attention. We also note that further progress must be made on developing more meaningful performance metrics related to Aboriginal relations and workplace diversity issues, and we encourage CEA members to focus on these areas in the coming year.

We observe that investment in infrastructure decreased slightly in 2014 despite the need for sustained effort in this regard. It is crucial that the sector continues to invest in infrastructure to ensure system reliability. At the same time, it must also consider issues such as climate change adaptation in investment planning. We understand that energy regulatory agencies across Canada may not accept the critical need by CEA members for funds to support both infrastructure renewal and climate change adaptation planning and implementation. This continues to be a barrier to CEA members fulfilling their Sustainable Electricity program commitments and will ultimately cost Canadians in the long run if the necessary investments are not made.

As CEA members pursue Vision 2050 over the coming decades, the Panel expects to see concentrated efforts to improve performance in all areas of the Sustainable Electricity program and related indicators, and hence improvement in the Sustainable Development Index. Further, we expect to see all CEA member companies branded as Sustainable Electricity Companies, a designation that has already been achieved by several leading utilities. We also publicly encourage non-member companies to consider voluntarily reporting their sustainability information to CEA on an annual basis and to also seek the Sustainable Electricity Company designation, which is available to them irrespective of CEA membership. Our desire is to see all electricity companies in Canada demonstrating holistic and integrated approaches to sustainability and, in turn, for Canada to become recognized as the world leader in this regard. We believe that this goal is within reach.



The Hon. Mike Harcourt

Finally, the Panel urges CEA members to develop and agree upon a clear policy statement or declaration on carbon pricing. This has become a significant issue in Canada and requires policy makers to work together to implement pricing in a manner that properly serves Canadians and the world. We also believe CEA members should work together on a clear policy statement on the role the electrification of transportation will play in the evolution of the electricity sector in Canada.

Michael Harrow

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



INDUSTRY ROUNDTABLE: PERSPECTIVES ON SUSTAINABILITY

CEA invited four senior electricity sector leaders to share their thoughts on what it will take to build a sustainable electricity system that can reliably meet the current and future energy needs of all Canadians.

Q: What is the most important thing for Canadians to understand about the future of the country's electricity system?

- LETHBRIDGE: Renewing and modernizing the electricity system will require a meaningful conversation about how electricity rates are set, and the role that governments and regulators play in the process. We want to ensure policy and regulatory decisions allow for greater innovation and sustainability that will benefit our customers over the long term.
- CLARK: Canada has an electricity system that ranks among the best in the world, powering our society and our economy. Yet the existing electricity supply and delivery infrastructure is aging and new facilities are needed to meet changing demands. More than ever, the well-being of Canada will depend on a secure, reliable, sustainable supply of electricity.

FREHLICH: The role of the electricity system is evolving faster than ever before. In the past, it was relatively straightforward: generating power in central locations and transmitting that power through wires to customers. It was a one-way network from supplier to consumer. That is quickly changing to become a two-way, consumeroriented "Internet of electricity" that is giving Canadians greater choices and control over how power is supplied and consumed.

ARSENAULT: Canadians should know that the electricity system of the future will be an intelligent, end-to-end system that leverages many new technologies. It will also require utilities to work in partnership with their customers. An engaged customer who looks beyond their own bill will be key to shaving peaks, offsetting new builds, and enhancing renewable integration.



Ave Lethbridge, Executive Vice President and Chief Human Resources and Safety Officer, Toronto Hydro Corporation



Dennis Frehlich, Executive Vice President and Chief Operating Officer, AltaLink



Colin Clark, Chief Technical Officer, Brookfield Renewable Energy Group



Lynn E. Arsenault, Vice President of Customer Service, New Brunswick Power Corporation



What do you expect from your electricity company? Share your thoughts **@CDNelectricity**.

Q: What is being done — or needs to be done — to help facilitate that conversation with your customers?

CLARK: Considering the complexity of the electricity system, which can be quite mysterious to the public and government alike, making a case for renewed investment can be difficult. To tackle that problem, the sector needs to use solid facts and communicate effectively, engaging in a two-way dialogue with all of our stakeholders to ensure the future of the industry is directly informed by public opinion. FREHLICH: Because it's easy to take electricity for granted, the sector needs to do a better job explaining the value of electricity and how the grid will deliver that value by enabling a different future. As we begin to decide how sustainable we want our electricity to be, the choices made today will define the role of the grid for decades to come. ARSENAULT: At the same time, we have to recognize that value will not be the same for everyone. The sector will need to better understand what different types of customers value in order to provide choices that are easy to access and understand.

Q: What regulatory or policy changes will be needed for the system to evolve and accommodate new technologies and new business models?

CLARK: As the environmental, social, and economic landscape changes, utilities can no longer apply the traditional model upon which we built the system. New policies must take into account longer development lead times and the increased cost of investment. New business models must balance the advantages of new technologies with the remaining value of existing systems. Regulators must also weigh the overall benefits of prudent investment against the overall cost impact on customers. FREHLICH: The challenge will be to make regulatory and policy changes in a way that both enables the future and respects past investment decisions. Changes will need to be integrated across supply, consumption, and transportation; policy will need to provide consumers with greater choice and flexibility, and encourage and help industry to work out the technical and economic value of new technologies. ARSENAULT: What will need to be considered and enhanced is performance-based regulation that ensures utilities are remunerated for the efforts to leverage energy efficiency, demand response, and distributed generation to their maximum potential. The regulators' support will be key to shifting our business model to become energy service providers that empower people's lives.

Q: How is the CEA's Sustainable Electricity program contributing to the achievement of the above?

LETHBRIDGE: I love the notion of the triple bottom line: providing economic, environmental, and social benefits, without having to trade one for the other. That speaks to innovation in a way everybody can recognize, leading to better decisionmaking. CEA's Sustainable Electricity program provides a unified platform for starting a strategic conversation with stakeholders. Utilities can learn from each other and compare best practices, which raises the bar for the entire sector and benefits all Canadians.

CLARK: The Sustainable Electricity program is particularly effective because it provides guiding principles for sustainability that are reinforced by key sustainability performance indicators, reviewed by an independent Public Advisory Panel, and verified by an external verifier. Sustainable development is an imperative for every enterprise in Canada. The electricity sector cannot expect to meet the challenges of the future without addressing sustainability and working in partnership with its stakeholders. FREHLICH: It's keeping our industry focused on the long-term goal of sustainability by setting out a balanced path of social, environmental, and economic measures. Our collective commitment to progressing as an industry and challenging ourselves to demonstrate measurable progress in these areas will continue to drive us toward achieving a sustainable electricity grid into the future.

Q: In what ways do you think the electricity sector is delivering value to Canadians?

LETHBRIDGE: Today, there's the core work that utilities do: keeping the lights on and delivering a safe, reliable supply of electricity right to our customers' doors. We do that really well. Where we will bring the most value to Canadians, though, is by looking at the longer term and planning to meet the electricity needs of both today and tomorrow in a sustainable way.

FREHLICH: The electricity sector delivers real value to Canadians every second of every day. It will be instrumental in delivering value into the future by providing lower carbon electricity, more options to use greener transportation such as electric vehicles, and the ability to store electricity when the price is low and use it later when needed. I'm sure there is untapped value we haven't even dreamed of yet. ARSENAULT: We're delivering value by providing reliable electricity at low rates from mostly non-emitting sources. Unfortunately, most of this is taken for granted as an invisible commodity.

MATERIALITY ASSESSMENT OF SUSTAINABILITY ISSUES

2014 marked the five-year anniversary of the Sustainable Electricity program, providing an opportunity to reflect on the foundations of the program and work to further consolidate the achievements and improve its core elements. This review included the commissioning of a materiality assessment to ensure the focus of the program and the Annual Report reflect the sustainability issues that are most important to national electricity sector stakeholders. Based on stakeholder input, the following material sustainability issues were identified for the sector (**Figure 1**).

Figure 1 Materiality Matrix



The matrix provides guidance on the most important sustainability issues to stakeholders and the business impacts of those issues. CEA used this matrix to further refine the program's Sustainable Development—Corporate Responsibility Policy and the performance indicators. Some of the new performance indicators emerging from the materiality assessment are still being developed and will be reported on in future years.

♦ Environment 📃 Social 🔺 Economic

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New Sustainable Development—Corporate Responsibility Policy

CEA MEMBER PERFORMANCE HIGHLIGHTS



ENVIRONMENT

	2014	2013	PERCENTAGE DIFFERENCE		2014	2013	PERCENTAGE DIFFERENCE
Total gross annual sulphur dioxide emissions (thousand tonnes) ^{2, 3}	218.05	241.52	-9.7% 💙	Total gross annual direct carbon dioxic equivalent emissions from fossil generation (million tonnes) ^{2.3}	de 47.26	50.16	-5.8% 💙
Sulphur dioxide net fossil intensity (tonnes/GWh) ⁴	3.95	4.09	-3.4% 💙	Carbon dioxide equivalent net fossil intensity (tonnes/GWh) ⁴	855.70	848.88	0.8% 人
Sulphur dioxide net system intensity (tonnes/GWh) ^{3,4}	0.78	0.85	-8.2% 💙	Carbon dioxide equivalent net system intensity			3 7%
Total gross annual nitrogen oxide emissions (thousand tonnes) ^{2,3}	101.10	105.63	-4.3% 💙	(tonnes/GWh) ^{3.4}	170.00	176.54	-5.7~
Nitrogen oxide net fossil intensity (tonnes/GWh) ⁴	1.81	1.79	1.1% 人	Number of priority spills ³ ————————————————————————————————————	151	129	17.1~
Nitrogen oxide net system intensity (tonnes/GWh) ^{3,4}	0.36	0.37	-2.7% 💙	for maintenance purposes (kilograms) ³	4,673	6,617	-29.4% 🗸
Total gross annual mercury emissions (kg)	567.84	672.69	-15.6% 💙	Companies with an ISO 14001:2004 consistent environmental management systems (per cent) ³	87	87	0% 0
Mercury net coal-fired intensity (kg/TWh) ⁴	14.33	15.69	-8.7% 💙	² The 2014 natural gas generation and SO ₂ , share of Ontario Power Generation Inc. in I (Windsor). Other owners, TransCanada (Po remaining 50 per cent of generation and a	NO _x , and CO ₂ e Portlands Energy rtlands) and ATC ssociated air em	missions includ y Centre (Toron O Power (Brigh hissions.	le 50 per cent ownership to) and Brighton Beach nton) did not report the
Mercury net system intensity (kg/TWh) ⁴	2.04	2.37	-13.9% 💙	 ³ These indicators are included in the Sustainable Development Index (SDI). ⁴ Intensity calculations are based on total emissions divided by net fossil and system gene 			

Improved performance Decreased performance

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SOCIETY

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	2014	2013	PERCENTAGE DIFFERENCE
All injury/illness frequency rate (injuries per 200,000 hours) ^{3, 5}	1.59	1.72	-7.6% 💙
Lost-time injury frequency rate (lost-time injuries per 200,000 hours) ^{3, 5}	0.70	0.73	-4.1% 💙
Lost-time injury severity rate (calendar days lost per 200,000 hours) ^{3, 5}	16.73	19.49	-14.2% 💙
Companies with a commitment to non-discrimination (per cent)	97	_	- 0
Companies with a formal stakeholder engagement policy (per cent) ³	90	77	16.9% 人
Companies with diversity programs (per cent)	57	37	54.1% 人
Companies that report on sustainability performance (per cent) ³	/ 67	57	17.5% 人
Companies with procedures requiring early consultation or engagement with Aboriginal communities (per cent) ³	100	100	0%
Companies with procedures for ensuring training and employment opportunities are provided to Aboriginal employees (per cent) ³	ng 67	63	6.4% 🔥

ECONOMY

2013 2014 PERCENTAGE DIFFERENCE Total value of company charitable -18.3[%] 33.696 donations (\$ millions)³ 27.517 Total capital expenditures on new/refurbished generation -21.8% 5.246 infrastructure (\$ billions)³ 4.104 Total capital expenditures on new/refurbished transmission 5.8% infrastructure (\$ billions)³ 6.034 5.704 Total capital expenditures on new/refurbished distribution **-9.3**[%] infrastructure (\$ billions)³ 2.988 3.295 System Average Interruption Duration Index (SAIDI) excluding significant -13.6% weather events (duration in hours)^{3, 6} 5.9 5.1 System Average Interruption Frequency Index (SAIFI) excluding significant weather events -8.0% (interruptions per customer)^{3, 6} 2.5 2.3 Total energy saved through energy 1,688,946 **-35.6**% 1,087,445 conservation initiatives (MWh)

⁵ These figures also include Hydro Quebec's safety performance related to generation, transmission, and distribution operations.

These figures also include data from the City of Red Deer Electric Light and Power, Enersource Hydro Mississauga, Hydro-Québec, Newmarket-Tay Power Distribution Ltd., Northland Utilities, Oshawa PUC Networks, PowerStream Inc., St. Thomas Energy Inc., Veridian Connections, Waterloo North Hydro, ATCO Electric Yukon, and London Hydro.

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SUSTAINABLE DEVELOPMENT INDEX (SDI)

CEA uses an innovative Sustainable Development Index (SDI) to measure the overall sustainability performance of its Corporate Utility Members. The SDI provides a high-level overview of sustainability performance for the last five years against a baseline of 2008–2009. The SDI is calculated as a score between -100 and +100, determined by the level of performance in the three sustainability pillars (environmental, social, and economic) relative to the baseline. While the individual sustainability trends have fluctuated over the years, the overall performance of CEA Corporate Utility Members continues to stay in the positive score range of the SDI as shown in **Figure 2** below.



View of Brookfield Renewable Energy Group's Aubrey Hydro Station in Ontario. Photo courtesy of Brookfield Renewable Energy Group.

Figure 2 Sustainable Development Index, 2010–2014 Performance Relative to 2008–2009 Baseline



Table 1 Sample of Performance Indicators with Greatest Positive and Negative Contribution to the Sustainable Development Index

	2010	2011	2012	2013	2014
Aetrics with the Greatest Positive Contribution Bengagement with Aboriginal Communities during Project Planning and Development		Sulphur Dioxide Emissions	Charitable Donations	Sulphur Dioxide Emissions	Sulphur Dioxide Emissions
	Investment in Generation Infrastructure	Investment in Generation Infrastructure	Investment in Generation Infrastructure	Investment in Generation Infrastructure	All Injury/Illness Frequency Rate
Metrics with the Greatest Negative Contribution	Priority Spills	System Average Interruption Duration Index	ISO Consistent EMS	Priority Spills	Priority Spills
	Formal Stakeholder Engagement Policy	System Average Interruption Frequency Index	System Average Interruption Frequency Index	System Average Interruption Duration Index	System Average Interruption Duration Index

Note: Since the previous report, the SDI baseline of 2007–2008 has been changed to 2008–2009 to better reflect the sector's sustainability performance over the last five years.

SDI PERFORMANCE SUMMARY (2010–2014)

Environment

CEA members' environmental performance over the last five years has been generally positive, driven primarily by continued emissions reductions through decommissioning of coal units in several provinces, shift to high-efficiency natural gas fired facilities, and investments in renewable sources such as wind, solar, and biomass. As shown in **Table 1**, one area that continues to have a negative impact on the SDI is priority spills, although the majority of these spills are limited to a few member companies. While these companies take immediate action to clean-up affected areas, there are on-going challenges, including aging equipment, severe weather, and in some cases, vandalism. These companies are working to reduce the number of priority spills through new investments, including in secondary spill containment systems.

Social

Of the three pillars, CEA members' performance since 2010 has been strongest in the social pillar of the SDI, except for brief decline in performance in 2013. Performance in this area rebounded in 2014 due to a reduction in the number of employee-related injuries and the severity of those injuries. Formalized commitments to engaging Aboriginal communities and stakeholders also helped improve the overall score in the social category of the SDI.



Economic

CEA members' economic performance has seen the greatest fluctuation over the last five years, primarily due to the unpredictable frequency and duration of outages, as well as varying levels of investment in new and refurbished infrastructure based on project cycles. While outage frequency and duration have had a significant impact on the economic score of the SDI in previous years, both frequency and duration levels improved in 2014 over the previous year, but compared to the SDI baseline, the performance still had a negative contribution (**Table 1**).

ENVIRONMENTAL PERFORMANCE

Delivering value by mitigating environmental impacts

CEA members are committed to reducing adverse environmental impacts by investing in emission abatement technologies, renewable energy sources, ecosystem management, and enhanced environmental management practices. These measures, along with partnerships with stakeholders, can lead to positive outcomes for communities and their environment.







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"By fall, there were encouraging signs that the aspens had established on site and would continue to grow."

> Eckehart Marenholtz Registered Professional Forester

CAPITAL POWER

From coal mine to farmland: Delivering value through reclamation

The Genesee Mine near Warburg, Alberta, has fuelled Capital Power Corporation's coal-fired Genesee Generating Station for more than two decades. As portions of the mine reach their end of life, Capital Power is committed to returning the land to a mix of productive farmland and wildlife habitat, restoring the local landscape to pre-mining conditions so that it can be used once again by people and animals alike.

Capital Power's ongoing reclamation plan for the mine includes not only reforestation but also the re-establishment of wetlands and creeks, the creation of wildlife corridors, and the renting of reclaimed land to local farmers. The biggest challenge facing this project, however, is the fact that the mine was built on former farmland: its previous agricultural use introduced a number of undesirable weed species, which can hinder the success of large-scale tree plantation. To address this challenge, Capital Power began co-funding reforestation research and tree-planting projects at the University of Alberta in 2008. That investment paid off last year with the establishment of the East Wetland: a native-species wetlands area within the reclaimed portion of Genesee Mine, where more than 30,500 trees have been planted on 7.5 hectares of land.

The East Wetland also serves as a field trial for adapting various reforestation systems to the unique soil conditions around the mine, important research vital to creating a natural area that will one day develop into a native forest. Treatments being tested include weedsuppressing ground cover (such as wood mulch salvaged from land-clearing operations and biodegradable horticultural film mulch) and the use of large planting stock such as poplar poles and bareroot aspens.

After the first growing season in 2014, the trees have established very well. Clear differences have also been noted among the tested treatments, with the salvaged wood mulch providing both the best weed suppression and the most natural-looking soil surface. Mother Nature also helped.

"We had good conditions and consistent rains throughout the summer," says Eckehart Marenholtz, Registered Professional Forester and a Capital Power reforestation consultant. "By fall, there were encouraging signs that the aspens had established on site and would continue to grow."

Going forward, the East Wetland will provide valuable information for developing a natural-area reforestation system at Genesee Mine as well as other similar reclamation projects across the country. What's more, as wildlife returns to the area and local farmers are able to use the reclaimed land to grow crops such as canola, barley, wheat, and alfalfa, this project will deliver increasing value to the area's ecosystems and economy.



Over 30,500 trees were planted onto lowlands and uplands surrounding a lake as part of Capital Power's Genesee Mine Reclamation project. A salvaged wood mulch plot with the lake in the background shows the aspen and white spruce trees one month after planting. *Photo courtesy of Capital Power Corporation.*



A tree planter from Chickadee Reclamation plants bare-root aspen saplings as part of Capital Power's innovative reclamation initiatives (Genesee Generating Station is shown in the background). *Photo courtesy* of Capital Power Corporation.

PRINCIPLE 1: Environmental stewardship

Manage facilities and operations through a risk-based approach that avoids or minimizes impacts on the environment (air, land, and water), and supports ecosystem protection and conservation of biological diversity.

Environmental Management Systems and Regulatory Compliance

Implementation of Environmental Management Systems (EMS) consistent with ISO 14001:2004 is a mandatory requirement of the CEA Sustainable Electricity program given it is an effective framework for identifying and managing environmental impacts of the sector. By the end of 2014, 87 per cent of CEA Corporate Utility Members had an EMS in place that conformed to the ISO 14001:2004 standard—the same percentage as reported in 2013 (Table 2). CEA members without a fully conformant EMS are either fine-tuning their existing system or working to implement a new system. CEA expects the remaining companies to fully implement their new systems in the next few years.

An EMS also provides a framework for identifying legal environmental requirements. In 2014, only one CEA member company reported a non-compliance fine for violating federal/provincial/territorial laws and regulations. However, several member companies received an additional nine non-compliance notices and orders for minor infractions, which they took immediate action to rectify.

Air Emissions

The electricity sector's contribution to national air emissions is steadily declining, helping to reduce smog and its associated health impacts. Relative to 2000, the electricity sector's sulphur dioxide (SO_2), nitrogen oxide (NO_x), and mercury emissions have all declined by just over 50 per cent. As of 2013 (latest available data from

	2013	2014
CEA Corporate Utility		
Members with ISO 14001:	87 %	87 %
2004-consistent EMS		

Figure 3 SO₂ Emissions and Intensity



Environment Canada), the electricity sector was responsible for 22.6 per cent of SO_2 emissions (277.90 thousand tonnes), 7.8 per cent of NO_x emissions (161.02 thousand tonnes), and 22.6 per cent of mercury emissions (895.08 kg) in Canada.⁷

In 2014, CEA Corporate Utility Members were responsible for 218.05 thousand tonnes of SO₂, 101.10 thousand tonnes of NO_X and 567.84 kg of mercury, a reduction of 9.7 per cent, 4.3 per cent, and 15.6 per cent relative to 2013 performance levels, respectively (**Figures 3, 4, and 5**). The net system intensity (all generation types) also dropped slightly for all air emissions, although NO_X fossil intensity increased slightly due to use of higher-emission intensive units for meeting peak demand.

The continued decline in air emissions is a result of a number of factors, including the decommissioning of coal-fired units in several provinces (with Ontario making the largest contribution), increased use of natural gas in Alberta, Ontario, and Nova Scotia, and greater integration of renewables into the overall national fuel mix. CEA and its electricity generation members are continuing to work with federal, provincial, and territorial governments to further strengthen the regulatory framework for air emissions. As existing plants are retired and new technologies become more economically viable, utilities will begin investing in advanced facilities and processes to further reduce their emissions. Ontario Power Generation Inc. (OPG), for example, converted two of its coal-fired plants to biomass, which releases approximately 75 per cent less NO_x than coal and produces virtually no SO₂ emissions. Others, such as ATCO Power, continue to deliver incremental emission reductions at existing operations through combustion optimization projects while continuing to evaluate optimal future power generation solutions.

Ecosystem Protection and Biological Diversity

CEA Corporate Utility Members are taking proactive action to understand, minimize, and manage the potential environmental impacts associated with their operations through collaboration with government, conservation authorities, Aboriginal groups, academia, and other stakeholders. In 2014, this included implementing avian protection plans to reduce bird collisions with power lines, partnering









Absolute Emissions — Fossil Intensity -- Net System Intensity



Figure 6 Annual Priority Spills



Ontario Power Generation's Atikokan Biomass Station is the largest capacity 100 per cent biomass fueled plant in North America. *Photo courtesy of Ontario Power Generation Inc.*

with conservation groups such as Ducks Unlimited Canada to restore wetlands and other wildlife habitats, and using innovative new construction techniques to reduce the space and structures required for transmission line rights-ofway. Along with these efforts, CEA and its members continue to work closely with the federal government and other stakeholders to improve the regulatory framework around species conservation and environmental assessment.

Priority Spills

Priority spills are defined as a petroleum spill that is over 500 litres, contains over one gram of polychlorinated biphenyls (PCBs), and any volume of petroleumbased or PCB-contaminated substance that enters a water body. Given their potential for adverse environmental impacts, CEA closely tracks the number of spills reported by its members each year and the actions taken to remediate them. As **Figure 6** shows, a total of 151 priority spills were reported in 2014, an increase of 17.1 per cent over 2013.

As these spills can result from a wide variety of causes ranging from aging transformers and leaking equipment to weather-related incidents and acts of vandalism, preventing them entirely remains a challenge despite the use of proactive inspections and assessments. Fortunately, the majority of these spills are contained to just a few member companies and, in every instance, these companies respond according to all applicable procedures and regulatory requirements to ensure a proper cleanup and minimize any adverse environmental impacts. To reduce the total number of spills and mitigate their impacts, CEA members are phasing out older equipment, investing in emergency spills response training, and installing secondary liquid containment systems.

PRINCIPLE 2: CLIMATE CHANGE MITIGATION AND ADAPTATION

Mitigate greenhouse gas emissions from facilities and operations, and adapt to the adverse effects of climate change on electricity infrastructure.

Greenhouse Gas Emissions

Currently responsible for approximately 12 per cent of GHG emissions in Canada, the electricity sector has reduced its carbon footprint significantly-about 45 million tonnes (Mt) since 2000.8 The elimination of more than 7,000 MW of coal-fired electricity by OPG alone has helped the sector reduce nearly 25 Mt of GHG emissions per year, making it one of the largest climate change initiatives ever undertaken in North America. In fact, 99.7 per cent of the electricity OPG produces now is free of GHG and air pollutants, helping to maintain the emission reductions achieved through its coal-plant retirement strategy. OPG and other member utilities from across the country are also making significant investments in new generation facilities, including large as well as run-of-river hydro, wind, solar, biomass, natural gas, and carbon capture to reduce their overall carbon footprint. For instance,

SaskPower's 120 MW Boundary Dam Carbon Capture and Storage (CCS) facility came into operation in 2014, which also helped decommission an aging 65 MW Unit at the Boundary Dam Station.

In 2014, CO₂eq emissions from CEA Corporate Utility Members decreased to 47.26 Mt, a reduction of 5.8 per cent from 2013 (**Figure 7**). The CO₂eq net system intensity also decreased to 170.00 tonnes/GWh from 2013 levels, a reduction of 3.7 per cent. However, the CO₂eq net fossil intensity increased slightly (0.8 per cent) to 855.70 tonnes/GWh from 2013 levels. While the year-over-year trend will continue to fluctuate in the short term, new investments in low-emitting generation, purchase of renewable energy from other suppliers, combined with plant retirements will further reduce the sector's contribution to GHG emissions.







Seven Sisters Generating Station on the Winnipeg River. *Photo courtesy of Manitoba Hydro.*



Hydro Ottawa employee works to safely remove tree branches that have fallen on power line wires. *Photo courtesy of Hydro Ottawa*.

Climate Change Adaptation

Climate change and extreme weather events will continue to have a profound impact on the long-term reliability and resiliency of Canada's electricity generation, transmission, and distribution networks. Specifically, seasonal variability in precipitation, temperature, evaporation, and lake levels—and their divergences from normal ranges—are the key elements of concern. In 2014, 63 per cent of CEA members identified climate change as an enterprise risk issue. To address this issue, CEA members are currently working on a sector-specific template for developing climate change adaptation plans. Several member companies also took steps in 2014 to assess the potential vulnerabilities unique to their own operations, such as the increased risk of declining glaciers and snowpack in British Columbia or more severe winter storms in the Atlantic provinces. In addition, some members are working with government and academic partners to research various climate change scenarios and their implications for future energy demand in their service areas.



A progressive approach to vegetation clearing at Columbia Power

When a transmission line is cleared, vegetation is typically cut to ground level, leaving only grassland behind. For the Waneta Expansion Project, Columbia Power Corporation cleared the 10-km line in a way to directly benefit local wildlife and species at risk. Instead of clearing all trees and shrubs, only the largest trees were removed and the shrub layer was left largely intact across the length of the line. Wildlife trees were either retained or created wherever possible. This approach ensured habitat for a number of rare species in the Waneta area including yellowbreasted chats, western skinks, and rubber boas. As an added bonus, all listed plant species were flagged prior to clearing and protected during construction, resulting in no-net-loss to the number of rare plants along the line.



Rubber boa, a listed reptile, on the Waneta Expansion transmission line. *Photo courtesy of Wendy Horan*.

Ontario Power Generation makes a substantial commitment to bio-energy

Ontario Power Generation Inc. (OPG) is leading the way in generating energy from renewable, plantbased biomass. The Atikokan Generating Station was converted from coal to biomass in July 2014 making it the largest 100 per cent biomass-fuelled plant in North America—followed by the Thunder Bay Generating Station in January 2015. OPG also invested in the new BioEnergy Learning and Research Centre at Confederation College in Thunder Bay, which provides renewable power to the college while offering opportunities for hands-on training and applied research in bio-energy.



The Ontario Power Generation BioEnergy Learning and Research Centre, the first of its kind in Ontario, provides bio-energy students at Confederation College with hands-on training in their field. *Photo courtesy of Ontario Power Generation Inc.*

Making history with SaskPower's carbon capture and storage project

The carbon capture and storage (CCS) project at SaskPower's Boundary Dam Power Station is the world's first commercial-scale CCS process installed in a coal-fired plant. By taking an old facility nearing its end of life and rebuilding it with CCS technology, SaskPower can produce electricity that is 10 times cleaner than traditional coal plants. As the CCS process ramps up to full operation, it will capture 90 per cent of carbon dioxide and 100 per cent of sulphur dioxide, which can then be re-used for industrial and research purposes.



Interior of SaskPower's carbon capture and storage (CCS) facility, Boundary Dam Power Station. *Photo courtesy of SaskPower*.





A wetland assessment led to the discovery of a protected bird species at EPCOR's Lambton Substation. *Photo courtesy of EPCOR Utilities Inc.*



Manitoba Hydro conducts research on Lake Sturgeon. Photo courtesy of Manitoba Hydro.

ENMAX achieves emission reductions through investments in solar photovoltaic power

As of December 2014, ENMAX Corporation has installed more than 1,600 kW of solar power capacity on homes and businesses across Alberta that's over a quarter of all grid-connected solar in the province (by capacity) according to Alberta Electric System Operator (AESO) tracking. With the commercial and residential projects deployed to date, it is estimated that over 36,000 tonnes of CO₂e reductions will be achieved across the province over the combined lifetime of these systems.

EPCOR takes extra measures to safeguard rare bird species

Before construction began on upgrades to Lambton Substation, an environmental assessment discovered something unexpected: the nearby wetlands were home to pied-billed grebes, a protected species. To ensure the birds' safety, EPCOR Utilities Inc. worked with environment, regulatory, and engineering teams to develop and enforce certain measures during construction, including completing disruptive activities during mandated periods, eliminating the use of loud diesel generators, and creating a spotting program for employees to report any interactions with the birds.

Relocating an entire FortisAlberta power line to protect greater sage-grouse

For the greater sage-grouse, power lines pose a grave threat: they provide perches for predatory raptors, which drive the grouse out of its natural habitat. To support grouse conservation and recovery efforts, when individual poles near the town of Manyberries needed replacement, FortisAlberta Inc. took the extra step to completely relocate and rebuild the entire power line—118 poles and 15.4 km of line —out of the grouse's critical habitat and to the nearby roadside.

Manitoba Hydro conducts research on Lake Sturgeon

Manitoba Hydro's Lake Sturgeon Stewardship and Enhancement Program helps protect this species by increasing knowledge of populations affected by hydroelectric development, advancing understanding of sturgeon ecology, and studying the effectiveness of conservation efforts. In 2014, the program supported a stocking program in the Nelson River and conducted studies on the survival of stocked sturgeon. Manitoba Hydro also funded research on sturgeon habitat suitability, juvenile movement, and area requirements.

Saint John Energy implements new system to guard against oil spills

To reduce the risk of a major spill, Saint John Energy installed a new oil containment system during the refurbishment of its Union Street Substation. While water can pass through the polyvinyl blanket and barrier boom system, hydrocarbons are immediately captured and solidified upon contact. The system is capable of holding 125 per cent of the volume of oil housed in the company's largest power transformer, allowing for greater flexibility when retrofitting existing substations.

STAKEHOLDER AND COMMUNITY ENGAGEMENT

FortisBC goes above and beyond in responding to priority spills

In September 2014, a tractor-trailer hit one of FortisBC Inc.'s distribution poles, spilling 110 litres of non-PCB transformer oil onto an organic apple orchard in the heart of the Okanagan. Although it was a third-party incident, the utility responded quickly to dig out the contaminated area, replace the soil, and plant five new trees. Throughout the process, it worked closely with the farm's owner to ensure the remediation efforts would still allow the orchard to meet the strict requirements for organic certification.

Cutting emissions through Horizon Utilities' Smart Commute program

For Horizon Utilities Corporation, reducing emissions starts at home by encouraging its employees to walk, cycle, carpool, and take public transit through its Smart Commute program. In 2014, it introduced dedicated carpool parking spots, built three new bicycle shelters, and installed three electric charging stations to support the increasing number of electric and hybrid vehicles in its fleet. As a result of these efforts, employees avoided 46,757 kg of emissions and saved \$138,000 in commuting costs.

Newfoundland Power relocates osprey nests from power lines

Newfoundland Power Inc. is dedicated to reducing the impact of its operations on local wildlife and their habitat. This can be seen, for example, in its treatment of ospreys that occasionally construct nests on its utility poles. After employees found several nests during transmission line maintenance in 2014, the company worked closely with local wildlife officials to construct dedicated platforms and relocate the nests to these safer locations.

TransCanada assesses environmental impact of Energy East pipeline

To better understand the potential environmental impact of a project the size and scope of its proposed Energy East pipeline, TransCanada performed fieldwork and analysis in 180 municipalities across six provinces, involving more than 900 specialists including wildlife biologists, vegetation ecologists, atmospheric scientists, archaeologists, and soils scientists. In addition to contributing to its own environmental assessment, the data was also provided to provincial databases so it can be used by other scientists and researchers across Canada.



Left to right: Joseph Almeida, Director, Supply Chain Management at Horizon Utilities Corporation, accepts the Metrolinx Smart Commute Employer of the Year 2014 Award from Adam Arnold, Smart Commute Hamilton. *Photo courtesy of Horizon Utilities Corporation.*



SOCIAL PERFORMANCE

Delivering value by building stronger, healthier communities

As responsible corporate citizens, CEA members deliver real value to their people and communities by creating diverse and respectful workplaces, promoting employee well-being, and providing opportunities for skills development and training. Engaging directly and transparently with stakeholders, including Aboriginal Peoples, also helps ensure CEA members have a positive social impact wherever they do business.



"It is extremely fulfilling to share my knowledge of the trade and the electrical industry with the next generation".

Jeff Meek Retired Hydro Ottawa power line technician

HYDRO OTTAWA

Where retirement marks the start of something new: Creating opportunities for older workers

Over the next decade, the electricity sector will face an unprecedented wave of retirements. Hydro Ottawa, for example, expects more than 40 per cent of its workforce to retire by 2024. To retain the knowledge and experience of its older workers (who often have specialized skills and add value to customer relationships), the utility created a program to engage those employees after retirement. Doing so ensures operational capacity and ongoing value to customers in the face of shifting workforce demographics.

The Retiree and Older Worker Engagement Program, also known throughout Hydro Ottawa as the Prime Time Program, was launched in 2014. Embracing older workers' growing interest in redefining the latter stages of their careers, the program helps individuals make a positive transition into retirement while also identifying ways for retirees to keep contributing to Hydro Ottawa. Among other elements, the Prime Time Program:

- equips managers to talk openly and honestly with their teams about retirement plans and shaping the last years of their careers;
- gives greater clarity about how to transfer knowledge before employees retire (e.g., by allowing for a transition period of up to six months where departing employees work closely with the people replacing them); and
- provides information sessions for future retirees on financial planning, post-retirement benefit coverage and other topics, as well as opportunities for workers to discuss retirementrelated concerns and explore their readiness for retirement from a psychological and social transition perspective.

The Prime Time Program was recognized with a 2014 Best Employers Award for 50-Plus Canadians from the Workplace Institute. That year, 29 per cent of the utility's temporary and part-time positions were filled by returning retirees with the skills necessary to immediately perform an operational or supporting role. This includes, for example, having retired power line technicians work as instructors as part of Hydro Ottawa's partnership with Algonguin College.

Jeff Meek is one such instructor. The Hydro Ottawa retiree has returned to teach in Algonquin's Power line Technician Diploma Program, and says his new role is a rewarding one.

"It is extremely fulfilling to share my knowledge of the trade and the electrical industry with the next generation," he says.

Hydro Ottawa partners with Algonquin College to deliver the Power line Technician Diploma Program. Photo courtesy of Hydro Ottawa.



Picture snapped at a Hydro Ottawa Prime Time Program meeting. *Photo courtesy of Hydro Ottawa*.



PRINCIPLE 3: Employee, contractor, and Public Health and Safety

Provide a safe and healthy workplace for employees and contractors, and promote public safety.

Employee Safety

CEA members have a long-standing commitment to continually improve their safety performance and protect the wellbeing of employees and contractors. While challenges remain, they strive to create an injury-free workplace through the following strategies:

 maintaining health and safety management systems consistent with international and national standards such as Occupational Health and Safety Assessment Series (OHSAS) 18001; CAN/ULC S801: Standard on Electric Utility Workplace Electrical Safety for Generation, Transmission, and Distribution; and CSA Z1000.

- building a strong safety culture among all employees, with a focus on improving communications and incident investigation processes to promote lessons learned.
- working together through the CEA Occupational Health and Safety Committee to develop new strategies for improving workplace health and safety, including the development of leading indicators to further minimize or prevent safety incidents.

These strategies have helped reduce the overall number of safety injuries within CEA member companies. As **Figure 8** shows, the all injury/illness frequency rate improved for the fifth consecutive year in 2014, decreasing by 25.7 per cent from 2010. The lost-time injury frequency rate (**Figure 8**), and the lost-time injury severity rate (**Figure 9**) also improved,









with the latter improving by 14.2 per cent relative to 2013. Many of the injuries that do occur are related to over-exertion (resulting in musculoskeletal disorders), falls from elevation, and being struck by objects. Prevention programs to address these risk areas are being put in place.



Capital Power Corporation's Island Generation Facility is located in Campbell River, British Columbia. The 275 megawatt combined cycle natural-gas fired facility is the single-largest power generation facility located on Vancouver Island. *Photo courtesy of Capital Power Corporation.*

While performance in these areas is moving in the right direction, unfortunately, there were two tragic employee fatalities in 2014. One employee came into electrical contact while working on a downed power line and another was involved in a vehicle collision. The affected companies are working to further strengthen their safety procedures in order to prevent these tragic incidents.



CEA tracks and monitors the safety record of its member utilities and recognizes their achievements through the annual CEA Occupational Health and Safety Awards. CEA also recognizes any employee of a CEA member utility who was involved in a lifesaving attempt or acted to prevent further harm to someone who was injured or in need of immediate help with the Lifesaver Awards. In this picture, Erik Tippett (middle), of ENMAX, is presented his CEA Lifesaver Award by Members of Parliament, the Honourable Deepak Obhrai (left), and the Honourable Jason Kenney (right). Mr. Tippett was awarded for saving an elderly woman who had fallen, was in a state of shock, and was stuck outside in freezing weather.

Public Safety

CEA members are committed to reducing the risks of public contact with power lines and other electrical equipment. In 2014, this included developing power line safety training programs for first responders, delivering electrical safety seminars to local businesses, hosting workplace safety sessions with local high school students, and promoting emergency preparedness in communities. However, there were six public fatalities in 2014. These were related to workers from other sectors (e.g. construction) coming into electrical contact during projects as well as individuals attempting to steal copper from electrical facilities. CEA member companies are committed to preventing public fatalities and have taken steps to educate and raise awareness of electrical safety.

PRINCIPLE 4: HUMAN RESOURCES AND WORKPLACE

Support fair recruitment, training, and talent retention processes that meet the needs of company operations while ensuring ongoing employee satisfaction, well-being, and diversity.

Workplace Diversity

CEA Corporate Utility Members are committed to workplace diversity and creating an environment where all employees are treated with respect and without discrimination, harassment, and violence. In 2014, 57 per cent of member companies reported having diversity programs, and 97 per cent reported a commitment to nondiscriminatory employee practices. However, member companies do recognize that they still have a long way to go in terms of improving the representation of women in management and governance bodies, and improving the tracking and measuring of visible minorities in the workplace.

Employee Health and Well-Being

Through the implementation of a wide range of health promotion, disease prevention, and crisis intervention programs—in 2014, these included 'active living' campaigns, employee alcohol and drug programs, confidential counselling and support for employees and their families, and mental health awareness initiatives—CEA members continue to help their people achieve healthier, more sustainable lifestyles, ultimately reducing the financial burden associated with healthcare costs and lost productivity.

Training and Apprenticeships

As the electricity sector's business model continues to evolve in response to new technologies and customer requirements, employee training and development remain critically important for both individual and company success. To build up the skills of their current teams as well as those of the next generation of electricity workers, in 2014 CEA members continued to rely on apprenticeship and youth mentorship programs, personal development plans, professional accreditation opportunities, scholarships and tuition subsidies, and partnerships with post-secondary institutions, with a particular focus on attracting women and Aboriginal Peoples to the trades.



PRINCIPLE 5: STAKEHOLDER ENGAGEMENT AND TRANSPARENCY

Communicate and engage with stakeholders and partners in an open and transparent manner for all proposed and established operations and activities.

Engaging with stakeholders on issues that directly affect them in an open and transparent manner is of paramount importance to CEA Corporate Utility Members. These utilities are now engaging customers, communities and stakeholders on a variety of issues ranging from new infrastructure projects, energy conservation, environmental impact mitigation, community development, and public electrical safety. For instance, recognizing the importance of consulting with their communities and sharing information about the potential environmental, social, and economic impacts of new infrastructure developments, 90 per cent of CEA members now have a formal policy in place for stakeholder engagement, up from 77 per cent in 2013. Whether through public meetings, classroom presentations, facility tours, social media, or traditional marketing (including corporate annual reports), CEA members are constantly improving the way they communicate with customers, landowners, suppliers, community leaders, non-governmental organizations, and other key stakeholders. Furthermore, 67 per cent of CEA members reported on sustainability performance, either through an annual report or online, in 2014, up from 57 per cent in 2013 (**Table 3**).

Table 3 Stakeholder Engagement

	2013	2014
The company has a formal	77%	90%
stakeholder engagement		
policy, including a process		
for identifying stakeholder		
concerns and opportunities		
The company reports on	57%	67%
sustainability performance,		
either through an annual		
report or online		



TransCanada is one member company that continues to demonstrate a commitment to strengthening Community, Aboriginal and Native American Relations. *Photo courtesy of TransCanada.*

PRINCIPLE 6: Aboriginal engagement

Build mutually beneficial relationships with Aboriginal Peoples and communities based on trust and respect.

CEA members are working to build positive relationships with Aboriginal communities. While the degree to which this collaboration occurs differs from company to company, these relationships often result in mutual benefits and innovative solutions, including the creation of joint business ventures that ensure Aboriginal communities and businesses directly benefit from infrastructure development projects. Utilities also continue to invest in training and apprenticeship opportunities for Aboriginal students, sustainable procurement strategies, and the use of traditional knowledge in project planning and construction. These partnerships will continue to grow as CEA members further invest in infrastructure renewal and modernization across the country.

Of the 83 per cent of CEA members that identified Aboriginal relations as a relevant issue for their operations in 2014, all of them have procedures to engage Aboriginal communities during project planning and development, and two-thirds have policies ensuring Aboriginal employees are given equal access to training and employment opportunities (**Table 4**). Based on the materiality assessment that was commissioned in 2014, CEA is currently working with members to develop new performance indicators in this area to better communicate member efforts on Aboriginal engagement. Table 4 Aboriginal Engagement⁹

	2013	2014
Aboriginal relations a relevant issue for the company	77%	83%
The company has procedures for engaging with Aboriginal communities during project planning and development ¹⁰	100%	100%
The company has procedures to ensure training and employment opportunities are provided to Aboriginal employees ¹⁰	63%	67%

9 CEA uses the term Aboriginal to refer to First Nations, Métis, Inuit, Cree, and other indigenous peoples within Canada.

10 Figures are based on 83 per cent and 77 per cent of companies that indicated Aboriginal engagement to be a relevant issue for company activities in 2014 and 2013, respectively.



Siksika Nation partners with **ATCO Electric on youth** mentorship program

In 2014, ATCO Electric worked with Siksika First Nation to develop and implement a year-long pilot project to provide Aboriginal youth with real-life work experience. ATCO Electric trained Siksika Nation's chosen candidates to safely erect structures, operate and repair equipment, and perform other tasks critical to building and maintaining transmission infrastructure. After the pilot program was completed, the company hired two of the participants on a temporary, full-time basis.

Hydro One introduces Women in **Engineering scholarship**

Hydro One Inc. has a long history of supporting young women wishing to pursue studies in Science, Technology, Engineering, and Mathematics (STEM). In 2014, this support grew even further with the launch of the new Women in Engineering scholarship, which is open to all female engineering students attending a university in Ontario. A total of 13 students received \$5,000 scholarships last year, which also includes a co-op work term.

Building a stronger workplace safety culture at EPCOR Utilities

In 2014, EPCOR Utilities Inc. refocused its efforts to ensure safety is always top of mind. To change unsafe behaviours and promote a culture of safety, it created a recognition program awarding points (which can be redeemed online for gifts) to employees demonstrating safe work practices. To further engage employees, EPCOR now encourages frontline workers to participate in incident investigations. It also hosted more than 300 employees and contractors for a workshop on working safely with underground infrastructure.



EPCOR demonstrates safety techniques at its Underground Hazard Awareness Day. Photo courtesy of EPCOR Utilities Inc.





Labourer Daniel Spring Chief was one of two participants in ATCO Electric's pilot program who has now joined ATCO Electric for the long term. Photo courtesy of ATCO Electric.

Employee uses the infrared detector. Photo courtesy of Toronto Hydro Corporation.

Improving worker safety at Toronto Hydro with infrared cameras

In 2014, Toronto Hydro Corporation sought to improve the way its workers assess hazards and risks before entering confined spaces (for example, by determining the likelihood a spliced power line will produce a dangerous arc flash). After reviewing best practices across North America, it opted to incorporate forward-looking infrared cameras into all confined entry space tests, working with a forensic laboratory to calibrate the infrared images and train its crews on how to use the new equipment.



Using drones to make inspections safer for BC Hydro engineers

Inspecting the canal that diverts water to the Kootenay Canal Generating Station used to involve lowering an engineer down with ropes or flying over it with a helicopter. That changed in September 2014, when BC Hydro and Power Authority began using drones to take detailed video and photos of the canal's entire length. In addition to eliminating safety risks to execute this hazardous work, drones also make it easier and more affordable to inspect other assets such as dams and power poles.

Strengthening the Northern workforce through Northwest Territories Power Corporation apprenticeships

Northern Canada faces a shortage of local skilled workers, creating significant competition for trades and technical resources as well as a smaller pool of local candidates for employers such as the Northwest Territories Power Corporation (NTPC). To promote skills development and help create a sustainable Northern workforce for the long term, NTPC has invested \$1 million in a new apprenticeship program and provides valuable work experience opportunities by hiring summer students in various departments throughout the territory.

Oakville Enterprises boosts public awareness of electricity safety risks

Oakville Enterprises Corporation's safety program focuses on both employee and public safety. In 2014, it co-presented a power line safety seminar for local businesses and trades, highlighting hazards, regulations, and guidelines to help prevent injuries when working near electrical equipment; and worked with the non-profit MySafeWork to co-host three young worker safety awareness sessions at area high schools. For its own employees, Oakville Enterprises often brings in guest speakers as part of its Stayin' Alive program to reinforce the importance of injury prevention.

Capital Power facilitates safety rescue training in Campbell River

Capital Power Corporation has formed a unique partnership with the Campbell River Fire Department to improve each other's safety rescue skills. In the massive turbine hall at the Island Generation facility, firefighting crews work with Capital Power's Emergency Response Team to practice rescue manoeuvres that would be enacted in an emergency situation. In turn, the firefighters can also work on their tie-offs, harnessing, and other technical skills that they can apply to other rescue scenarios throughout the community.



Campbell River Fire Department crews tie-off to the structural members above the catwalk handrail as they increase their familiarity with their Fall Protection gear and High Angle Rescue techniques. *Photo courtesy of Capital Power Corporation*.

STAKEHOLDER AND COMMUNITY ENGAGEMENT

AltaLink sponsors initiative to repatriate Blackfoot regalia

For more than 110 years, the regalia of Chief Crowfoot of the Blackfoot Nation, including his deerskin jacket, leggings, ceremonial knife, and bow and arrow, has been on display in the Royal Albert Memorial Museum in Exeter, England. In 2014, AltaLink donated \$25,000 to an initiative led by Siksika First Nation to bring these historic and culturally significant treasures back home to Alberta, where they will eventually be displayed at Blackfoot Crossing Historical Park.

ATCO Power works to promote watershed management through collaboration and transparency

ATCO Power's approach to multi-stakeholder engagement is based on long-term collaboration and transparency. It has participated in the Stakeholder Advisory Group of the Battle River Watershed Alliance since its inception, set up as an inclusive, collaborative and consensus-based community partnership to strike a balance between a healthy aquatic ecosystem, a vibrant economy, and sustainable communities. Based upon the recommendations of this group, an approved Water Management Plan for the Battle River Basin was released in 2014 by the Alberta government.

NB Power seeks unprecedented public input on future of Mactaquac Dam

New Brunswick Power Corporation (NB Power) is ensuring the community has a say in the future of the Mactaquac Dam. At a public meeting in November 2014, NB Power presented three options for the dam, which was followed by a lively discussion with area residents on the environmental and social implications of each. The final decision will be strongly informed by that input along with feedback gathered from a broader engagement program rolled out later this year.

Giving customers a voice in Nova Scotia Power's long-term plan

A long-term integrated resource plan was developed by Nova Scotia Power in 2014 to enable the company to meet future energy needs in a cost-effective and reliable manner. More than 20 community engagement sessions were held across the province to gather the input of customers on four key topics: cost, innovation, energy sources, and reliability. Comments were also solicited through the **TomorrowsPower.ca** customer-focused website.

SaskPower raises the bar for on-reserve recycling initiatives

SaskPower has partnered with Black Lake First Nation to create Northern Saskatchewan's first-ever appliance recycling program. This year, the program collected and transported 26 tonnes of appliances and hazardous materials (e.g., halocarbons, petrochemicals) to Regina to be recycled. Every effort was made to maximize the benefits to the community, with local labour and suppliers engaged whenever possible. The success of the Black Lake Hazardous Waste Removal Project has since sparked interest from other remote Aboriginal communities.



Construction of Muskrat Falls Project's Vac Transmission line. *Photo courtesy of Nalcor Energy.*



Great turn out at a Nova Scotia Power's community engagement sessions. Photo courtesy of Nova Scotia Power.



ECONOMIC PERFORMANCE

Delivering value by powering Canada's economy

Canada's economy depends on a strong electricity sector. CEA members are delivering real economic value to Canadian communities through a variety of means, including generating the energy that powers businesses and making significant charitable contributions. They also continue to invest in energy conservation programs and new infrastructure, ensuring the supply of power remains dependable and cost-effective in the years to come.

6.034

BILLION

in distribution

BILLION

in transmission

In 2014, CEA members invested approximately 13 billion in infrastructure to meet the needs of current and future generations.

\$4.104

BILLION

in generation

0000



000

7.517

MILLION in 2014 charitable

donations

"In Brookfield Renewable Energy Group we found a partner who supports our vision of environmental and social responsibility."

Debra Hanuse Chief of the 'Namgis First Nation

BROOKFIELD RENEWABLE ENERGY GROUP

Diversifying the local economy with an innovative partnership

Northeastern Vancouver Island is known for its traditional resource industries such as forestry, mining, and fishing. When those started to decline, Brookfield Renewable Energy Group saw an opportunity to deliver real value to the local economy through the construction of a 45 MW hydroelectric facility on the Kokish River.

The Kokish facility is located on the traditional lands of the 'Namgis First Nation. Brookfield worked with the 'Namgis to form Kwagis Power LP, a joint partnership that allowed both parties to be equally involved in all aspects of the project, from planning and permitting to construction and operations. Now that the facility is fully commissioned, a portion of the revenue generated by its operations will be directed into a 'Namgis Community Benefit Fund.

"We believe in the power of partnerships built on shared values. In Brookfield, we found a partner who supports our vision of environmental and social responsibility," says Debra Hanuse, Chief of the 'Namgis First Nation. "This partnership and the resulting Kokish River project allows us to share in the benefits derived from our ancestral lands."

The project provided substantial economic benefits through job creation and spending on local goods and services. Approximately 250 people were employed during the two-year construction period (including 12 'Namgis members), with local subcontractors hired to work on-site. Of the total capital cost of approximately \$200 million, about \$30 million was spent locally on heavy industry, food, and accommodations.

Completed in April 2014, the Kokish facility now generates enough clean, renewable energy to power 13,000 households each year. Through a 40-year electricity purchase agreement with BC Hydro and Power Authority, it will provide sustainable, long-term economic activity for the region for years to come. Brookfield and the 'Namgis are truly proud of the Kokish River facility. The project not only demonstrated the seamless integration of sustainability concerns but also serves as a great model of how the public sector, private sector, and First Nation communities can work together to improve Canada's energy infrastructure.



Brookfield Renewable Energy Group and the 'Namgis First Nation at the ribbon-cutting ceremony for the opening of the Kokish River hydroelectric facility. *Photo courtesy of Brookfield Renewable Energy Group.*

PRINCIPLE 7: ECONOMIC VALUE AND COMMUNITY INVESTMENTS

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

The electricity sector is a major contributor to the economic growth of Canadian communities. From facilitating uninterrupted operation of commercial and public sector services to everyday consumer electronics, CEA member utilities provide an essential service to the communities in which they operate. They also add value to their communities in other ways, from sourcing practices that promote and support local businesses to investor and

Figure 10 Annual Charitable Donations

government dividends, all of which inject money back into the local economy.

In 2014, CEA members contributed \$27.517 million in charitable donations (**Figure 10**) and supported numerous organizations and initiatives including national charities such as the United Way and the Heart and Stroke Foundation, local food banks, community facilities, and health and safety campaigns.





Workers pause on the Lower Mattagami Hydroelectric Project – Kipling Generating Station. *Photo courtesy of Ontario Power Generation Inc.*

PRINCIPLE 8: ELECTRICITY DEMAND, EFFICIENCY, AND CONSERVATION

Produce, deliver, and use electricity in an efficient manner while promoting energy conservation programs.

CEA Corporate Utility Members are committed to creating a culture of energy efficiency and conservation in the communities in which they operate. Some of the initiatives conducted over the past year include appliance removal and exchange programs, coaching and auditing services to help small businesses better manage their energy consumption, and rebates and incentives to encourage homeowners and businesses to install energy efficient technologies. By reducing the amount of energy consumed, initiatives like these are crucial to moderating the investment required for new infrastructure, reducing customer electricity bills, and benefiting the environment. The ongoing

implementation of smart meters and smart grid technologies will further accelerate the development of innovative new energy conservation programs, including time-of-use pricing and hour-by-hour consumption monitoring.

In 2014, CEA Corporate Utility Members with energy conservation programs reported 1,087 GWh of energy savings, a reduction of 35.6 per cent form 2013. While external conservation efforts decreased, CEA members realized an additional 78 GWh in efficiency savings from their own generation stations and equipment, an increase of 8.6 per cent over 2013.



Bighorn sheep visit the reclamation area at the Arrow Lakes Generating Station. Columbia Power Corporation has completed extensive rehabilitation work at the reclamation site to make the area attractive to birds and wildlife. *Photo courtesy of Columbia Power Corporation.*

PRINCIPLE 9: INFRASTRUCTURE RENEWAL AND MODERNIZATION

Invest in the renewal and modernization of generation, transmission, and distribution systems to meet current and future energy needs in a safe, reliable, and cost-effective manner.

Many of Canada's electricity assets are reaching the end of their lifecycle, which can range from 30 years for a utility pole to as much as a century for a hydroelectric power plant. Much of the system built a generation ago now needs to be replaced or refurbished. To ensure a reliable, cost-effective supply of electricity, utilities must maintain their existing assets while also investing in and developing new infrastructure. As Figure 11 shows, since 2010, CEA members have invested \$58.912 billion in generation, transmission, and distribution equipment; in 2014, they invested \$13.127 billion in new and refurbished infrastructure. While this is a decrease of approximately \$1 billion compared to 2013, it is a reflection of the cyclical nature of new investments and construction.

From year to year, investment trends fluctuate as some projects are completed and others begin preliminary planning and assessment. For example, in December 2014, the BC Government approved BC Hydro and Power Authority's proposed \$8.8 billion Site C Clean Energy Project on the Peace River that will provide 1,100 MW of capacity and produce about 5,100 GWh of electricity each year when completed in 2024.

As CEA Corporate Utility Members invest in new infrastructure, they are considering a range of conventional and non-conventional technologies including large hydro projects similar to Site C, small-scale run-of-river hydro, nuclear, gas, coal with carbon capture and storage, and renewable technologies, such as wind, solar and biomass. In 2014, installed wind capacity for instance in Canada accounted for about 9,700 MW, with Ontario leading in terms of that existing capacity, followed by Quebec and Alberta.¹¹ CEA members also either generated or purchased nearly 12,310 GWh of electricity from wind and other renewable sources, including solar, biomass, tidal and biofuel. Although technologies such as wind are becoming cost-competitive, there are still barriers to market integration, including public support, intermittency, and transmission inter-connections.

Figure 11 Investments in New and Refurbished Infrastructure





PRINCIPLE 10: BUSINESS MODEL PRESSURES

Engage and work collaboratively with utility regulators, policy makers, stakeholders, technology providers, and supply chain partners to meet evolving customer expectations and business requirements.

Canadian Utility Appreciation Day

During a keynote speech in Toronto, New Jersey Governor Chris Christie signed a proclamation declaring December 5, 2014, as Canadian Utility Appreciation Day. Three CEA members (Hydro One Inc., Hydro Ottawa, and Toronto Hydro Corporation) were among the electric and natural gas utilities recognized for the assistance and expertise they provided during the emergency response and recovery efforts following Hurricane Sandy in October 2012. CEA was also recognized by Governor Christie for the participation of former President and Chief Executive Officer, Jim R. Burpee in daily teleconferences with key U.S. utility leaders and government officials during the power-restoration period.

System Reliability

More than ever, Canadians depend on electricity to power their daily lives. As severe weather events become more common, utilities are under increasing pressure to prevent and respond to power outages. In 2014, both the frequency and duration of service interruptions improved (both including and excluding significant weather events) compared to the previous year (Figures 12 and 13). Specifically, the frequency of outages (excluding significant events) declined by 8.0 per cent while the duration of the outages (excluding significant events) declined by 13.6 per cent. Tree contacts contributed to the majority of these power outages.

Supply Chain Management

To meet their business requirements in a more cost-effective way, CEA members are constantly working to identify supply chain efficiencies and reduce their purchasing costs. Manitoba Hydro, for example, launched the first implementation phase of its multi-year Supply **Chain Performance Enhancement** Program, which focuses on ways to reduce costs and increase operational capacity through strategic sourcing, inventory management optimization, and reducing the total cost ownership of its fleet. Other CEA members. such as TransCanada, are improving their procurement policies, processes, systems, and tools to make it easier for local labour and suppliers to contribute to infrastructure renewal development projects.

Figure 12 System Average Interruption Duration Index (SAIDI)







CEA Canadian Composite
 CEA Canadian Composite
 (Excluding Significant Events)



ATCO Electric designs the next-generation substation

ATCO Electric has established an in-house think tank called Project Innovate to develop more cost-effective, sustainable energy infrastructure. One of its first successes is the 'Next Generation Substation' design, which reduces construction costs for a 144-25 kV substation by 46 per cent and the time to build one by three months. The new design also decreases substation size, reducing environmental footprint by as much as 55 per cent while also cutting material, labour, and equipment costs during construction and commissioning.



In 2014, ATCO Electric's Transmission Division designed a Next Generation Substation. *Photos courtesy of ATCO Electric*.

BC Hydro powers the Northern economy with new transmission line

BC Hydro and Power Authority's 344-km Northwest Transmission Line came into service in July 2014, pushing the transmission grid further north through some of the province's most remote terrain. The line will deliver affordable, reliable power to new mining and clean energy developments, which will greatly stimulate the region's economy. In December, the line was extended a further 90 km to the community of Iskut, which will help its residents reduce their reliance on local diesel generation.

Ontario Power Generation completes Northern Ontario's biggest hydro project in 50 years

Ontario Power Generation Inc. (OPG) in partnership with the Moose Cree First Nation completed the Lower Mattagami River Hydroelectric Project in January 2015. The largest hydro infrastructure investment in Northern Ontario in the past halfcentury, this \$2.6 billion project added 438 MW of renewable hydro capacity across four generating stations. Over the course of the project, \$1 billion in contracts were awarded to Ontario businesses, including more than \$350 million spent in the North. The project also provided over 400 person years of employment for First Nations and Métis people and 25 First Nation businesses provided services.

New biogas facility adds generation to Saskatoon Light & Power's mix

Saskatoon Light & Power, a municipal distribution utility, has built its first new generation facility in more than 100 years. Completed in March 2014, the Landfill Gas Collection System captures methane-rich gas from Saskatoon's landfill and uses it to fuel two generators that produce 13 GWh each year, which is enough energy to power 1,300 homes. The facility will also become a new revenue source for the City once its initial investment is repaid.



Saskatoon Light & Power's landfill gas collection facility. *Photo courtesy of Saskatoon Light & Power.*



Decreasing construction times and costs at AltaLink

By using screwpiles rather than traditional concrete caissons in the construction of its power line towers, AltaLink is realizing substantial project cost and time savings. Literally screwing the foundation into the ground means less soil needs to be displaced, which minimizes tower footprint, uses fewer raw materials, and requires smaller crews and less heavy equipment. It also provides greater certainty in project delivery: three tower bases can be prepared each day compared to one per month when using caissons.

Improving technician collaboration through the FortisAlberta Control Centre

The new FortisAlberta Inc. Control Centre, completed in May 2014, allows power line technicians across the province to work collaboratively with system operators to enhance the quality of service provided to customers. In addition to constructing a state-of-the-art facility, this mega-project involved the implementation of outage management, data acquisition, and other technologies, all of which will be built upon in the years to come to meet evolving service demands.

Hydro Ottawa cuts municipal energy consumption with LED streetlights

In 2014, Hydro Ottawa demonstrated its commitment to energy efficiency by completing an ambitious project to convert 740 high-pressure sodium streetlights to light-emitting diode (LED) streetlights along one of the City of Ottawa's major traffic arteries. The new lighting system includes adaptive controls that allow streetlights to be dimmed to exact levels when necessary, which will help the City decrease its energy consumption by 650,000 kWh per year while also significantly reducing maintenance costs.

Newfoundland and Labrador Hydro promotes energy efficiency in isolated communities

Newfoundland and Labrador Hydro (NL Hydro), a Nalcor Energy Company, uses the Isolated Systems Community Energy Efficiency Program to promote energy efficiency to residential and commercial customers in communities served by diesel generation. In 2014 alone, it installed over 23,000 free energy saving products for 1,081 customers, helping them realize 1,357 MWh in annual energy savings. The company also provides free facility audits, technical support, and financial assistance to help businesses identify and implement efficiency retrofits and other capital upgrades. By the end of 2014 the program has been offered in 42 remote communities, installed 47,312 energy efficient products in 269 businesses and 3,582 homes and saved 4.04 GWh of electricity.



Newfoundland and Labrador Hydro employee, Lori O'Brien is a community representative who helps educate people on energy use and energy efficient products. *Photo courtesy* of *Newfoundland and Labrador Hydro, a Nalcor Company.*



View of the Lower Mattagami Hydroelectric Project – Kipling Generating Station. *Photo courtesy of Ontario Power Generation Inc.*

STAKEHOLDER AND COMMUNITY ENGAGEMENT

ENMAX brightening the lives of vulnerable Albertans

In 2014, ENMAX Corporation launched the Lighting Up Alberta campaign to raise funds for Habitat for Humanity and Homeless Foundations of Edmonton and Calgary. In addition to the campaign, ENMAX donated \$45,000 to the Calgary Homeless Foundation to light up 22 of their buildings with energy efficient lighting, and \$100,000 to Habitat for Humanity to install energy efficient lighting, programmable thermostats and other energy management tools at their Neufeld Landing Development in Edmonton.

Building stronger, safer communities with the Hydro One PowerPlay program

Hydro One Inc. is dedicated to enabling healthy, active, and safe lifestyles for children and youth. Through its PowerPlay program, it supports the development of recreational facilities and equipment in the communities in which it operates. In 2014, Hydro One funded 48 community projects across Ontario, distributing \$625,000 to help build 18 playgrounds, four skateboard parks, heating and lighting for six community facilities, and many other projects.

Maritime Electric reduces peak load during the holidays

Through its Holiday Light Exchange Program, Maritime Electric Company, Limited, offered \$5 in cash to customers who turned in an old (but still working) set of incandescent holiday light strings. More than 4,300 sets of lights were exchanged in 2014; by decreasing the number of inefficient bulbs in use, the program saved more than 76,000 kWh and helped reduce overall peak load during this past holiday season.



Children pose for a picture of one of the playground projects supported through Hydro One Inc.'s PowerPlay program. Photo courtesy of Hydro One Inc.

Northwest Territories Power Corporation gives customers the tools to make smarter energy choices

To help its customers save money on their bills, the Northwest Territories Power Corporation launched a new education campaign called PowerWise. On the PowerWise website, customers can find energy saving tips for household appliances as well as an energy calculator to determine their total energy usage per room. The website is part of a larger campaign that also includes posters and press releases to encourage people to manage their power usage in smarter ways.

SaskPower promotes community electricity literacy and support for infrastructure investment through an innovative Power to Grow outreach campaign

SaskPower is working to ensure that the electricity system that creates and delivers power to communities is ready to support growth and change in Saskatchewan—today and into the future. The Power to Grow public outreach tour travels to communities throughout Saskatchewan. It features a futuristic inflatable tent that provides a 360-degree experience, an electric vehicle fully wrapped in graphics that illustrates Saskatchewan's power sources, interactive displays that show the aging system and how difficult it is to generate power, and an 'ideal home' which illustrates the growing demand for power and energy saving tips.

A focus on using local suppliers at TransCanada

In 2014, TransCanada started developing a new Supplier Diversity and Local Participation Program to help the communities adjacent to or affected by its business realize greater economic benefits. In addition to providing an integrated approach for creating opportunities for qualified local suppliers to participate on TransCanada projects, this initiative will also support targeted community investments in education and training programs to help develop the skills, knowledge, and capacity of local businesses and contractors.



SaskPower employees poised to answer customer questions at a Power to Grow event. *Photo courtesy of SaskPower.*



TransCanada developed a Supplier Diversity and Local Participation Program to help its communities realize greater economic benefits. *Photo courtesy of TransCanada.*



KEY ACHIEVEMENTS

Sustainable Electricity Company[™] designation

Two more companies received the **Sustainable Electricity Company designation** over the past year: Toronto Hydro Corporation became the third utility to do so in June 2014, followed by Hydro One Inc. in January 2015. This designation is given to utilities that meet the additional criteria developed by CEA to demonstrate their commitment to sustainability.



"Our commitment to sustainability is really a commitment to our community, employees, and stakeholders. As an overarching driver, sustainability plays a key role in our success."

Anthony Haines, President and Chief Executive Officer,

Toronto Hydro Corporation



"This designation recognizes the outstanding job our employees do in delivering electricity in a socially responsible and sustainable manner, and in meeting the high expectations of the people of Ontario."

Carmine Marcello,

President and Chief Executive Officer, Hydro One Inc.

2015 Sustainable Electricity Award winners

Environmental Commitment Award –

ONTARIO POWER GENERATION INC.

In recognition of the Biomass Conversion Initiative

Social Responsibility Award -

BROOKFIELD RENEWABLE ENERGY GROUP

In recognition of the Kokish Hydroelectric Facility Partnership with the 'Namgis First Nations

Certificate of Recognition for Sustainability Leadership –

TRANSCANADA

In recognition of social and economic initiatives related to the training of Energy Operations employees, and the promotion of local procurement and supplier diversity



Left to right: Scott Martin, Senior Vice President, Business and Administrative Services at Ontario Power Generation Inc.; Nicole Wershler, Manager of Strategy and Planning for Energy Operations at TransCanada; and Felipe Pinel, Chief Executive Officer, North America at Brookfield Renewable Energy Group.



2015 Sustainable Electricity Award Winners



July 16, 2015



26 Forest Road B3A 2M3 Tel.: 902 435 7562 Fax: 902 484 7639 Email: dandk@duerdenandkeane.com www.duerdenandkeane.com

Re: Sustainable Electricity Independent Verification Assurance Statement

As part of the Sustainable Electricity program, all CEA Corporate Utility Members are verified once every four-to-five years on sustainability performance and reporting by an independent verifier in accordance with the CEA independent verification protocols. This assurance letter is to attest that Duerden & Keane Environmental Inc. (D&K) successfully completed on-site independent verification of the following companies in 2014 and 2015 calendar years:

 Brookfield Renewable Energy Group, Hydro Ottawa, Maritime Electric Company, Limited, Nalcor Energy, New Brunswick Power Corporation, Newfoundland Power Inc., Nova Scotia Power Inc., Oakville Enterprises Corporation, Ontario Power Generation Inc., and Saint John Energy.

SCOPE OF THE VERIFICATION:

The degree of adherence to the CEA Sustainable
 Development—Corporate Responsibility Policy

For Duerden & Keane Environmental Inc.,

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

- Consistency and accuracy of information provided to CEA on key performance indicators
- Conformance with CEA's requirement for an ISO 14001:2004
 consistent Environmental Management System (EMS)

VERIFIER CONCLUSIONS:

- A good understanding and commitment to the principles of the Sustainable Electricity program by senior company executives and staff
- High level of consistency between information provided to CEA and information published in other reports
- Some minor discrepancies in annual performance reporting and need for corrective action
- Significant conformity with CEA's EMS requirement

Bue Leane

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

GLOSSARY OF KEY TERMS

All Injury Frequency (AIF) Rate is based on the total number of Fatalities and Lost-Time Injuries, plus the total number of Medical Treatment Injuries which occurred in the calendar year. All Injury Frequency Rate = [(No. of Fatalities + No. of Lost-Time Injuries + No. of Medical Treatment Injuries) x 200,000] / Exposure Hours.

Biodiversity includes the diversity of ecosystems, of the species within those ecosystems, and the genetic diversity that exists within species. It is a holistic concept referring to the entire ecosphere, including all of its ecosystems and the evolutionary processes that allow it to function and evolve.

Capital expenditure refers to the cost of construction for new generation, transmission, and distribution facilities (units, plants, lines, substations, etc.); the cost of refurbished generation, transmission, and distribution facilities (e.g. betterments and replacements of existing generating units); and expenditures for the purchase or acquisition of pre-existing facilities. Carbon dioxide equivalent (CO₂eq) is

a universal measure of global warming potential for GHGs. Carbon dioxide is used as a reference gas against which the other GHGs are measured since it has the smallest global warming potential. The global warming impact of all GHGs is measured in terms of equivalency to the impact of CO₂ via global warming potentials.

Climate Change Adaptation refers to an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Lost-Time Injury Frequency Rate

is based on the total number of Lost-Time Injuries or illnesses, which occurred in the calendar year. Lost-Time Injury Frequency Rate = (Number of Lost-Time Injuries x 200,000) / Exposure Hours. Lost-Time Injury Severity Rate is

calculated using the following formula: Lost Time Injury Severity Rate = (Number of Lost Days x 200,000) / Exposure Hours.

Non-compliance fine refers to a monetary penalty for a major or a minor infraction of existing federal/ provincial/municipal laws and regulations.

Priority spills refers to petroleum spill that is over 500 litres, contains over one gram of polychlorinated biphenyls (PCBs), and any volume of petroleumbased or PCB-contaminated substance that enters a water body.

SF₆ (Sulphur hexafluoride) is a colourless, odourless, non-toxic non-flammable gas with very low reaction chemistry. It is used by the electricity industry as a gaseous insulator for high-voltage circuit breakers, switchgear, and other electrical equipment, often replacing harmful PCBs.

System Average Interruption Duration Index (SAIDI) is defined as the system average interruption duration for customers served per year. SAIDI = Total Customer-Hours of Interruptions / Total Customers Served.

System Average Interruption Frequency Index (SAIFI) is defined as the average number of interruptions per customer served per year. SAIFI = Total Customer-Interruptions / Total Customers Served.

Workplace diversity refers to the variety of differences between people in an organization, including race, gender, ethnic group, age, tenure, organizational function, education, and background.

FOR SUSTAINABLE ELECTRICITY[™] PROGRAM INQUIRIES



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