- THE RESILIENCE ISSUE -

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THE GRID

2019

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Canadian Electricity Association | Association canadienne de l'électricité

EDITOR'S NOTE

Resilience has become a buzzword in the Canadian electricity sector. With a changing climate, a shifting workforce, an evolving political landscape, and the movement towards electrification, building resiliency is integral for electricity companies across Canada.

We focused much of our messaging in 2019 around these ideas and began calling this year's edition of our annual magazine: The Resilience Issue. The CEA team knew a magazine focused on resiliency efforts would not be complete without stories from Canadian electricity utilities. We are pleased to include 9 stories from our members on how they are focused on the future and adapting to the changing climate. We hope you enjoy this year's edition of The Grid.

Julia Muggeridge
Director of Communications, CEA

Canadian Electricity Association -
The voice for safe, secure, and sustainable electricity
Working together, utilities and companies that provide products and services to the sector, to ensure Canadian electricity is some of the cleanest in the world.
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- By Francis Bradley -

Chief Operating Officer, CEA

On working at CEA

I have been at CEA for almost 33 years now. I've had the opportunity to work in every single role within the organization. I first joined CEA as a junior in communications. I worked my way through the communications department, worked a little in Government Relations and then moved into taking on the responsibility for councils and committees. I have also been acting Treasurer, acting Secretary to the Board of Directors and I came full circle when I assumed the role of Chief Operating Officer (COO), close to four years ago. Last year, I was also given the responsibility for our Public Affairs Group – which brought me back to my early days in communications.

On resilience in the electricity sector

I started hearing the use of the term "resilience" with respect to electricity, oddly enough around Y2K, when I became involved in emergency preparedness and emergency management.

It's a term that had been used by emergency preparedness professionals for quite some time. Today, we talk a lot about resilience with respect to climate resilience and changing weather patterns.

I'll often use unusual quotes for things. One of the quotes that I use a lot in the security space is from Mike Tyson, "Everybody has a plan and then you get punched in the face." It's something that I've always used when preparing cybersecurity exercises. When you step back and take an all-hazards perspective, you recognize that we will be impacted one way or the other. We can do everything possible to harden our systems, to prepare for emergencies, but the reality is that a "once in 500-year storm" is going to happen and it will impact us. The issue isn't, "can we harden our systems?" We will to the degree in which we can. But we need to build them so that they are resilient, so that they can bounce back and recover. I think that's very timely for our theme this year.

We are on the cusp of massive change in this industry. There's no holding it back. How can we adapt as effectively as possible? Resilience recognizes that change is going to happen and how we can adapt to that change in a manner that is, in the case of our members, less harmful to our customers. In the case of what CEA does, we look at how we can develop programs and services for the members to be prepared and be able to respond to these massive changes that are already starting to take place in the industry.

On building a resilient workforce

Around a decade ago, CEA launched what became the Human Resources Sector Council. We were concerned about the wave of retirements that were going to take place. We've managed to pass through that wave of retirement. Now we need to think about what the workforce of the future is going to be. It will be, in some ways, a lot like the current workforce and in other ways, very different from the current workforce. There will continue to be the requirement for very technical skill sets. We're still going to be relying on the backbone of the grid. We're going to need people that can work in a very challenging work environment.

This is a really interesting business. We've harnessed lightning and we deliver it safely to people's homes across the country. That takes a lot of really special skills from a variety of trades and careers. At the same time, new technologies are going to mean that we're also going to have an increasing need for technologists and people in the I.T. and artificial intelligence space. Industrial control systems are going to become increasingly important. We've seen this shift happen gradually over time. Twenty years ago, every company had a significant number of people working for them in the distribution business that went out to read meters. Now we have advanced metering infrastructure. There's going to be more changes over time. And while we look to the future in terms of what that workforce is going to be, we need to understand what future requirements are going to be.

One of the initiatives that we've been promoting is what we're calling National Lineworker Appreciation Day. This is something that has been done in other jurisdictions. It's an opportunity to dedicate one day every year to celebrate the sometimes-heroic actions of Canadian lineworkers.

We're looking to create this National Lineworker Appreciation Day here in Canada. We're talking to officials in the Government of Canada to see if we can get something officially announced and officially confirmed, and this continues to be a priority for us.

The first thing I think of when I hear that there's a storm coming is the people that will be out there when the lines come down, when the poles come down. I was in Montreal in 1998 during the ice storm and boy did we get to see some impressive work there. When I see people hanging out of helicopters trying to work on transmission lines and on distribution lines, the least we can do is give them one day a year to recognize the vital work that they do for us.

On building resilient infrastructure

A few years ago, we commissioned work to give a sense of the scope and scale of infrastructure investment requirements in the electricity sector from 2010 to 2030. That number is 350 billion dollars. This means, "let's simply replace what's aging and move forward." But we know that the world that we're moving into is going to require a different type of investment. We're going to need to put investments in for electrification of transportation and climate change adaptation. Recent work by the Conference Board of Canada shows that the work to undertake these investments from now to 2050 is 1.7 trillion dollars. It will require massive investments because we need to make sure that we are ready for greater electrification of the economy.

On working in the electricity sector during changing times

We are on the cusp of massive change, regardless of whose predictions you're listening to in terms of what the future will look like. Everybody agrees on some fundamental things, and among those common points, there is the increasing importance that electricity will play in the future.

From a personal standpoint, I think it is endlessly fascinating to be so close to and to be able to watch the changes that are taking place in the sector. It gives us a unique perspective at the association. We're in that space between the members, the government and the policy makers. We're also in the space between and amongst the members to help them do the work that they need to do.

I get to work with people that are doing amazing things that have never been done before, never thought of before. I have gotten to meet some of the smartest people around when it comes to I.T. and artificial intelligence and security. I've had the opportunity to represent Canada at all kinds of really important international forums. I get to work with a professional and fun group of people here at the association. So, I find it both professionally rewarding and personally enjoyable.

POWERING THE CALM WITHIN A STORM

HYDRO ONE'S NEW STORM PREDICTION TOOL IS YIELDING BIG RESULTS FOR COMMUNITIES

- By Chad Heard -

Manager, External Communications, Hydro One

Nothing quite tests the resiliency of hydro employees like a ravaging storm that leaves a trail of devastation and destruction in its wake. Downed power lines and broken poles strewn dangerously across roads while homes, businesses and community buildings are darkened, almost invisible on the horizon. This is just the physical devastation; hydro teams are also on the scene when lives and businesses grind to a sudden halt and communities confront the emotional aftershock of the damages they have been hit with.

A palpable sense of urgency flows through companies like Hydro One, Ontario's largest electrical transmission and distribution utility, as crews respond to what may seem like an unending stream of power outage reports in a bid to bring normalcy back to customers.

It is in this human response where order is found amid the storm's chaos, fuelled by a confidence accumulated over years of storm restoration experience. The work just needs to get done safely and quickly.

For more than a century, the problem-solving approach to weather-related outages has remained largely the same: a storm rolls through, it wreaks havoc and then crews are dispatched to repair the grid. Storms are notoriously unpredictable in their scale, scope and wrath, meaning a reactive strategy with crews on standby was the only option.

Recently, that all changed in Ontario.

Hydro One combined advances in artificial intelligence with mountains of historical weather data and years of the company's own outage restoration records; the result was a tool that can predict a brewing storm's impact on the electrical system. Wielding that tool yields a probability-driven scenario capability, providing estimates for the potential number of outages and where they are more likely to strike.

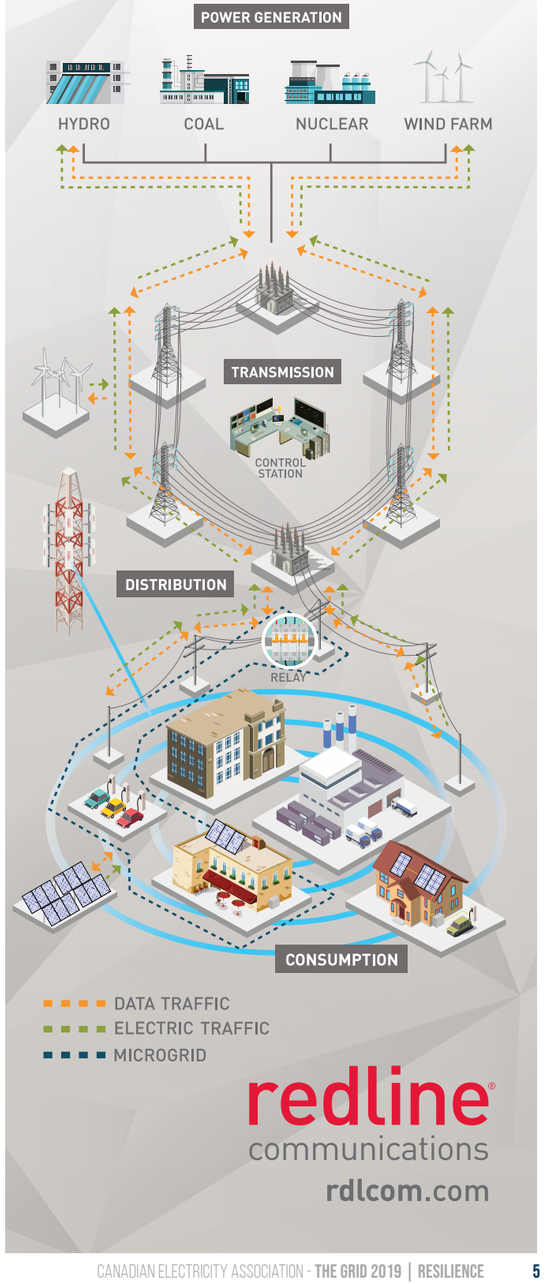
The prediction provides vital information to enable the company's emergency restoration leaders to make informed decisions in advance of the first flash of lightning, drop of freezing rain or gust of wind. In addition to gauging the size of the response that might be necessary, crews are positioned in areas most likely to be impacted, while others are put on standby to be ready if needed.

This more proactive approach helps ensure the right people, equipment and expertise is already in communities when the lights go out.

Deployed initially as a pilot in late 2017, a storm the following April serves as an example of how this new approach delivered results. With nearly a half-million customers losing power, the company was able to fully restore service to roughly 80% of its customers within 48 hours and all customers within four days, an improvement by a third over a similar sized storm in 2013. Hydro One's storm response garnered an Emergency Recovery Award from the Edison Electric Institute.

With Hydro One being more efficient with early preparations that result in faster power restoration times, customers can get back to going about their day. More than that, it helps enable field teams to be more effective in what they do best: getting the lights back on.

DISTRIBUTED GENERATION IN TODAY'S GRID INFRASTRUCTURE



THE CEA ELECTION REPORT: 2019

- By Michael Powell -

Director of Government Relations, CEA

As many of you already know, the Canadian federal elections are taking place this year. On October 21st, barring something exceptionally unforeseen, Canadians will head to the polls and decide whether they want four more years of Justin Trudeau as Prime Minister or whether they prefer to change direction and opt for a government led by Andrew Scheer or Jagmeet Singh.

It is impossible to get away from the politics of campaigns. As winter turns to spring, polls had narrowed enough so that, while the Liberals were in the lead, the gap with the Conservatives was within the margin of error. A series of scandals, regional economic concerns, and the impact of a populist resurgence present headwinds for the government.

October is a long time away; a lot may still happen. In either case, this presents a real opportunity for the electricity sector. Party commitments during the campaign will inform government of the public's priorities for the next four years. Emphasizing the opportunities in a coming electrical revolution will set the tone for years to come.

We, as an industry, will inevitably be part of the conversation. Questions about the environment will dominate the campaign. The Liberals' climate plan, particularly the carbon tax and decarbonization efforts, have become a major partisan flashpoint. The Federal Conservatives as well as several Provincial Governments opposing them, have been connected to more complicated economic issues facing the oil sector and personal pocket book issues.

CEA is working to shape this discussion. In this context, CEA is emphasizing the role that electricity will play in our future as Canada transitions to a lower carbon economy, regardless of who wins the elections in the fall. The electricity sector represents much of Canada's climate progress to date. Already, more than 80% of electricity produced in Canada is non-emitting and sectoral GHG emissions are on pace to less than 60% of their 2005 levels by 2020. This will continue as consumer demand, technological change and other forces encourage greater electrification.

We are working with elected officials from all parties to highlight ways in which the government can facilitate this process. The Conference Board of Canada estimates that our sector will need to invest $1.7 trillion by 2050. A clear, national strategy for electrification will help ensure that investments meet the needs of tomorrow. Addressing regulatory frictions, including cumulative impact and differing priorities between national and provincial regulators, will make projects easier to build. Individual Canadians will benefit from such programs to adopt new technologies like electric vehicles. This will be beneficial to our sector and will help voters control personal expenses.

Elections matter in general, but the 2019 federal election will be particularly important. The Canadian Electricity Association is committed to ensuring that all parties are informed about the opportunities that our sector offers, the needs that it faces, and how this benefits the Canadians we both serve.

Michael Powell is Director of Government Relations for CEA. He can be reached at powell@electricity.ca

TRANSFORMING

OUR ENERGY SYSTEM AND CREATING A LOWER-CARBON FUTURE

- By Daniel Jurijew -

Vice President, Government & External Relations, Capital Power

It is no secret that the electricity industry is currently undergoing a massive transformation. We are experiencing not only the largest fuel switch in history, but also the evolution of the power grid into one that is increasingly decentralized, low-carbon, networked and flexible. A build-out of renewable generation and development and implementation of net-zero emissions technologies is required to continue providing for the world's ever-increasing need for power without additional cost to the environment. To help create our sustainable future, developing our resiliency is key.

As a power generator within this transformation, Capital Power sees immense opportunity.

In addition to continuing to improve the emissions performance of our thermal fleet through technical and process innovation, we are making investments to advance the demonstration and deployment of technologies that will be a key part of the solution to climate change - both within our industry and beyond.

We view carbon capture, utilization and storage (CCUS) as integral parts of the long-term solution for achieving climate policy objectives in North America and globally. CCUS could potentially enable zero or near-zero emission natural gas generation and reduce emissions from the various industrial processes that will continue to rely on natural gas.

One recent CCUS investment we have made is in C2CNT, a NRG COSIA Carbon XPRIZE finalist. C2CNT's technology captures carbon dioxide (CO_2) from thermal generation emissions and transforms it into carbon nanotubes which are conductive, stronger than steel, and have multiple applications across many different industries. These nanotubes have the potential to be a game-changer in how the energy industry uses and eventually eliminates CO_2 from its operations.

We have also recently joined Energy Futures Lab 2.0 as a funding partner. Our participation as a member of this diverse leadership group allows us to be at the forefront of the collaborative effort it will take to build the sustainable energy system the future requires of us, and achieve responsible, future-ready power.

As we look to ultimately convert our coal units to natural gas, our Genesee Performance Standard is expected to reduce the carbon emissions of our Genesee facility by 10% by 2021, and by a further 40% after full conversion to natural gas. CCUS will ensure a long-term role for natural gas as a near zero-emitting source of dispatchable power generation to support a resilient and cost-effective power system that achieves Canada's 2050 decarbonization goal.

Our investment and support for responsible, clean power generation will help make us a resilient contributor to our energy future.

YES, IT IS 2019:

MAKING SUSTAINABILITY A CORE PART OF DOING BUSINESS

- By Channa Perera -

Vice President, Policy Development and Director of Generation, CEA

The concept of sustainable development, commonly referred to as sustainability, has a long and rich history. It goes back to 1983 when the United Nations General Assembly established the Brundtland Commission to help identify effective strategies for addressing a myriad of growing environmental concerns around the world. The work of this United Nations Commission, which culminated in the report "Our Common Future", remains one of the authoritative perspectives on sustainable development, which the Commission defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." While this initial definition has always been open for interpretation, it is fundamentally about the efficient use of natural resources, ecological protection and inter-generational equity.

While the definitional discourse around sustainability has evolved over time to focus on progressive business strategies and activities to address environmental, social, and economic impacts, the mainstreaming of this concept has been far from perfect. Many industries, including electricity, have had difficulty in fully understanding and integrating sustainability into their operations and decision-making processes.

However, after decades of fine-tuning, industries are starting to turn the corner. After all, it is 2019, and several generations – from Baby Boomers to Generation X and Millennials – have had a chance to shape the sustainability agenda and our common future.

The Canadian electricity industry, for one, can be proud of its role in shaping this sustainable future. Through the leadership of the Canadian Electricity Association and its members, the industry launched the Environmental Commitment & Responsibility (ECR) Program over two decades ago, in 1997. The program mandated each CEA member company to conform to the internationally recognized ISO 14001 Environmental Management System, becoming the first energy sector association in Canada to make conformance with a standard mandatory requirement of membership.

In 2009, the sector further enhanced this commitment through the transformation of the ECR Program to a sustainable development initiative by launching the Sustainable Electricity Program™. Now in its tenth year, the program aims to: integrate sustainability into company decision-making; foster continuous performance improvement; and, advance the public acceptance and support for utility operations through meaningful engagement, collaboration, transparency and accountability.

The Sustainable Electricity Program promotes sustainability integration under the following five pillars:

1. Low Carbon Future
2. Infrastructure Renewal and Modernization
3. Building Relationships
4. Risk Management
5. Business Excellence

CEA members are already making significant strides. Air emissions are at an all-time low; engagement levels with employees, local communities, stakeholders, and Indigenous Peoples have significantly improved; and investments to renew and modernize infrastructure are also on the rise.

Today, over 80% of the electricity generation mix in Canada is Greenhouse Gas (GHG)-free, making it one of the cleanest in the world. While investments in performance improvement can be perceived as an added cost of doing business, decades of research show that pursuing sustainable business practices leads to reduced risk exposure; better return on investment; enhanced community engagement and support for industry operations; engaged employee base; and increased customer satisfaction.

As we look ahead to the future, the relevance of sustainability is expected to grow as countries deal with multiple stressors on the environment, the society and the economy.

The world, through the United Nations, has again set an ambitious 2030 global sustainability agenda through the establishment of 17 sustainable development goals ranging from gender equality to advancement of clean energy and innovation. Working towards the achievement of these goals will be important to ensure a healthy environment, a just society, and a prosperous economy for generations to follow.

I am confident the Canadian electricity industry is, and will continue to be, part of the solution!

Channa Perera is Vice President of Policy Development and Director of Generation for CEA. He can be reached at perera@electricity.ca

BIODIVERSITY IN THE ELECTRICITY SECTOR

- By Megan Falle -

Senior Advisor, Legislative and Regulatory Affairs (Environment), CEA

Biodiversity consists of all the life forms surrounding us – ranging from plants, insects, animals, microorganisms and the enormous diversity of genes within these species. Our existence depends on these delicate ecosystems for our clean air, water and other natural resources.

Unfortunately, our world's biodiversity is under threat. A recent report produced by the World Wildlife Fund has stated that humanity has wiped out over 60% of mammals, birds, fish and reptiles since 1970. Experts are warning that the annihilation of these important wildlife species is as much of an emergency as climate change.

The threats contributing to these statistics include activities done on behalf of the electricity sector. Power generation, from both non-renewable and renewable sources can have a wide range of biodiversity impacts. Linear features, such as corridors for power lines, can fragment habitats. Hydropower generation can have a significant impact on aquatic habitats. Fossil fuels can impact biodiversity through air and water pollution.

Nevertheless, conservation efforts can help mitigate these effects. Utilities wide ranging and varied impacts on biodiversity also mean that there are numerous ways in which they can make positive contributions towards biodiversity protection.

Encouragingly, CEA members are already making great strides. For example, AltaLink waited until the winter season to build a 131km transmission line to protect the sensitive vegetation in the area by building access roads completely out of snow and ice.

Ontario Power Generation has planted over 6 million trees and shrubs in strategic locations across Ontario to expand forested areas. Members can continue to partake in initiatives such as local biodiversity partnerships and working to raise awareness of the importance of preserving biodiversity to their employees and customer base.

The Government of Canada is also taking steps to raise awareness on this important topic. Canada is currently working towards a meeting of the United Nation's Convention on Biological Diversity, taking place in 2020. This meeting will act as a progress check on participating countries' advances towards their 2020 goals and where new commitments for the protection of the environment will be made.

It is important for the Canadian Electricity Association and its members to become more involved in our country's efforts wherever and whenever possible. For this reason, CEA has recently formulated a 'Biodiversity Network' whereby members can share best practices and learn about other stakeholder's biodiversity initiatives.

By supporting biodiversity, utility companies will minimize their environmental risk as well as the risk of adverse publicity. They will also gain recognition from national governments, regulators, customers and communities as responsible operators working towards sustainable developments.

Moving forward, combatting this large and crucial issue will need to be a collaborative effort; CEA welcomes any members interested in learning more about our increased efforts to contact Megan Falle (falle@electricity.ca) for further information.

BUILDING RESILIENCY INTO THE GRID

- By Natali McGladrey -
Marketing & Communications Advisor, ATCO Electricity Global Business Unit

In late March, the Fort McMurray West 500-kV Transmission Project was energized ahead of schedule, on-budget, and with an impeccable safety record. Alberta PowerLine, a partnership between ATCO and Quanta Services Inc., was selected in 2014 by the Alberta Electric Systems Operator through a competitive global process to develop, design, build, finance, own, operate and maintain the 508km project that runs from Wabamun, Alberta, just west of Edmonton, to Fort McMurray.

The project, valued at $1.6 billion, was financed through the largest public-private-partnership (P3) bond in Canadian history. It is also the longest 500 kV AC transmission line in Canada and was ranked among the top 50 in ReNew Canada's top 100 infrastructure projects in Canada for 2019.

We, at ATCO, are proud of our ability to compete against global competitors and win this important infrastructure project, enabling continued growth in northern Alberta. Our success in delivering the project lies with our strategy of building and sustaining relationships with our partners and the many communities that we have the privilege to serve.

Throughout the planning phase of the project, we prioritized meaningful community engagement. We held more than 3,000 face-to-face meetings, engaging with people in an open, transparent and honest manner and incorporating the feedback into our route and construction plans. Alberta PowerLine also undertook extensive consultation with Indigenous communities and engaged them as active participants in the project through significant contracts totaling more than $85 million, which provided opportunities for employment, skills training and local economic development.

During construction, our people faced challenges head-on. One such challenge was the prevalence of muskeg on 75% of the route, which required freezing temperatures and intensive right-of-way

management to allow access to the project worksites. This terrain also required construction be condensed into two winter seasons. We were committed to protect the Woodland Caribou, which is a threatened species important to Alberta's biodiversity and plays a central role in the cultures and histories of Indigenous communities near the project. Our comprehensive Caribou Protection Program is setting a new standard for construction in Alberta. Thanks to the use of innovative engineering designs and, in particular, a 'guyed V' transmission line structure, we decreased construction time, reduced material and construction costs, and improved quality management and construction efficiencies.

Recently, ATCO has been meeting with Indigenous communities about an equity ownership model, which will enable Indigenous communities to become direct owners and participants in Alberta's energy sector.

Our commitment is to conduct our business in a manner that reflects our values: integrity, transparency, entrepreneurship, perseverance, accountability, collaboration and caring.

At each step of this project, we have worked hard to embody these values, while successfully completing this project early and on-budget. We are looking forward to the next 35 years of operating and maintaining this critical transmission infrastructure as an integral part of Alberta's Interconnected Electrical System.

THE URGENT NEED FOR RELIABLE POWER

THE WATAYNIKANEYAP PROJECT - A UNIQUE FIRST NATIONS OWNERSHIP MODEL

- By Karen M. McCarthy -
Vice President, Communications and Corporate Affairs, Fortis Inc.

Playing an important role in the development and capacity building of First Nations communities is not one that energy utilities would have necessarily envisioned in the past. However, once you consider the unique connection between a safe and reliable energy supply and the socio-economic conditions of First Nations communities in our country, the relationship becomes more obvious.

The Potential to Connect Remote First Nations to the Grid

First Nations communities in Northern Ontario identified the need to build a transmission line to improve the way of life in their communities. Improving the reliability of electricity, an essential service, and creating a viable First Nations business opportunity was critical.

First Nations leaders decided they wanted a majority stake in the project, capacity-building for their communities and the ability to own the project over time so future generations could continue to prosper. To move forward, they knew that they also needed a utility partner. Fortis embraced this opportunity.

The 1800km transmission line would connect a large number of First Nations communities to the main Ontario electricity grid for the first time. The project would certainly be one of the largest construction projects undertaken by Fortis' Ontario utility.

Wataynikaneyap Power, the First Nations and Fortis partnership, saw itself as an enabler of the socio-economic transformation of the First Nations communities which would eventually connect to the Ontario grid.

Wataynikaneyap Power also knew there was a way to deliver clean, reliable electricity and achieve a return on investment utilizing the First Nations expertise in community and land, while combining Fortis' expertise in transmission development.

Knowledge Transfer – A Shared Vision

As project planning got underway, little did Fortis know how much its own people would learn. Yes, the company has plenty of experience working alongside Indigenous people in Canada, but this project was unique. The vision that its First Nations partners would own the project outright in 25 years is fundamental to the project. Getting there would take discipline and good planning, both from Fortis and its First Nations partner communities – all 24 of them.

Working to bring together 24 communities with the vision of connecting to the main electricity grid had been at the forefront for a decade. Thanks to the leadership and persistence of Margaret Kenequanash and others, the way was paved with First Nations Chiefs to support the shared benefits of the project for the region. "It is hard to comprehend at times the magnitude of this project and what change it will bring," explained Kenequanash , CEO of Wataynikaneyap Power, the utility overseeing the project. "The vastness of the project led to much discussion among Chiefs and many years of engagement with the communities."

Two of the communities became official partners in the project at the beginning of 2019. As part of that arrangement, Fortis sold a minority position to Algonquin Power.

Connecting remote First Nations communities to the grid was initiated by the First Nations and is also a priority of the Governments of Ontario and Canada. The significant funding arrangements put in place by the federal and provincial governments for the project are critical to its success. Wataynikaneyap Power thanks both governments for their involvement.

Much has been accomplished already with the project, with a new transmission line to Pikangikum completed in December 2018. For the first time in 10 years, families were able to turn on Christmas lights. Before that, the lack of capacity of the diesel generating system played havoc with the community's need for more power. It simply was not available.

"Handing out Christmas lights to people brought a smile to everyone's face, including mine, and it reminded me of the importance of living up to our commitments to bring a line that lights up into the communities on time," Kenequanash said.

Challenging Circumstances in First Nations Communities

Many issues permeate the communities to be connected to the provincial grid over the next few years. According to Frank McKay, Chair of the Board of Wataynikaneyap Power, with existing diesel generation systems at capacity, there is no room for growth. "New homes, businesses, schools and other infrastructure cannot be connected, which results in over-crowding and inadequate support in the community. Residents suffer from intermittent power, or no power at all, when the generators fail," said McKay.

To make matters worse, the challenges of transportation in the North often disrupt fuel delivery, potentially interrupting the power supply and depriving people of the very thing they need to keep their communities going.

"Power is a necessity, not a luxury," said Barry Perry, President and CEO, Fortis. "We need to be in a position in this country where all people have access to reliable power and where we can support the economic development of communities with increased power supply when it is needed," he said.

Perry said that not only is the diesel fuel being used for current power generators expensive and difficult to transport, but its use also has environmental and health risks. The move away from the current diesel system could avoid an estimated 6.6 million tonnes of CO_2 equivalent greenhouse gas emissions over 40 years.

Delivering Hope is a Dual Proposition

Wataynikaneyap Power has engaged the communities in Northwestern Ontario to ensure everyone is aware of the various stages of the project. The utility recently received Ontario Energy Board leave-to-construct approval and is currently waiting on environmental assessment approval which would allow the remainder of the project to proceed, seeing communities north of Red Lake and Pickle Lake connected.

Core to the project is training and education for participants living in the First Nations communities. Aided by federal government funding and more, the communities now have hope for employment on the project. Now, people can look forward to being part of a large project which will make their communities better, knowing that, as workers, they have played a significant role in its construction.

Participants from the second round of the project's Line Crew Ground Support training program celebrated their graduation in November 2018 with their families. Two more intakes of this training program are scheduled to begin in April and August of 2019 with applications being accepted on an ongoing basis. The Fortis Inc. subsidiary, FortisOntario, acts as the project manager for the project.

Mike Jardine is its Chief Operating Officer. He took the position after many years as a senior member of the leadership team at Fortis utility Newfoundland Power. "Together, we are enablers," said Jardine. "By all measures, we are building a very long transmission line through a remote part of Northern Ontario - which is no small feat. However, what we are really doing is working with our First Nations partners to help transform remote communities so they may see more development of sufficient, modern housing and community facilities, while at the same time enabling capacity-building for people and communities."

Jardine credits his engineering and operations experience in Newfoundland and Labrador's harsh environment as the right background to prepare him to oversee the 1800km line development and construction in Ontario where terrain can be difficult to navigate. Community load restrictions due to the limitations of on-site diesel generators in affected communities will be eliminated once the project is complete, while plans are in place to develop backup generation for these communities.

Facilitating Opportunity

According to the Ontario Waterpower Association, 275 MW of developable waterpower has been identified in proximity to the remote First Nations communities. These hydro opportunities, as well as other wind and solar renewable energy projects, are not feasible without a grid connection. Other economic development, business and employment opportunities, are also constrained due to a lack of accessible power.

"The Wataynikaneyap Power Project will help to redefine how business must be conducted with First Nations by focusing on the provision of sustainable ownership positions for First Nations," said Kenequanash. "This provides the foundation for the communities to participate meaningfully in the economic prosperity of Canada."

"The tie that binds all of the work we do in our partnership is our shared vision. Together, we are going to create a strong, viable business for First Nations communities for generations to come," said Perry. "The power of Fortis and the expertise of our utilities is fully behind this project. It's our job to transfer our knowledge so our First Nations partners can eventually fully operate and maintain the utility."

The "Line that Brings Light" (translation for Wataynikaneyap) surely will enable greater prosperity and a new way for the future.

IMPROVING DAM SAFETY

ON THE LOWER MATTAGAMI RIVER

- By Paul Choi -

Senior Communications Advisor, Ontario Power Generation

In northeast Ontario, planning is underway to improve dam safety along the Lower Mattagami River. OPG, along with partner Moose Cree First Nation, owns and operates four hydro facilities on the river, located about 70 kilometres northeast of Kapuskasing. The Lower Mattagami River complex includes the Little Long Generating Station (GS), Smoky Falls GS, Harmon GS, and Kipling GS. The eight-gate Adam Creek spillway structure located on the Little Long Reservoir allows OPG to safely pass water around these stations.

The Little Long Dam Safety Project proposes to increase the discharge capacity at this spillway structure to comply with updated requirements established by the Province of Ontario. The company is looking to add four new sluice gates, which control water levels and flow rates in rivers, at the Adam Creek spillway. OPG will also make reliability improvements to the existing Little Long, Smoky Falls and Adam Creek sluice gates.

"This work will ensure flood water is able to bypass the stations in a controlled manner, in the event of a rare large flood," said Susan Rapin, Plant Technical Support Manager at OPG. "This will allow OPG to continue to operate these facilities on the Lower Mattagami River safely, while protecting people, property and the environment."

OPG is actively engaging with Indigenous communities and stakeholder groups to provide information and updates on the project, said Rapin. "We want to ensure that community members are well-informed throughout both the planning and execution of the project."

In 2015, OPG completed the $2.6-billion Lower Mattagami Project in partnership with Moose Cree First Nation. The project added a third generating unit to the Little Long, Harmon, and Kipling stations, and completely redeveloped Smoky Falls GS. Moose Cree First Nation has a 25 per cent equity share in the new generating units.

STANDING UP TO MOTHER NATURE:

HOW TORONTO HYDRO IS BECOMING MORE RESILIENT TO EXTREME WEATHER

- By Christina Basil -

Media Relations Specialist, Toronto Hydro

In 2018, Toronto Hydro's grid was battered by five powerful storms that left an accumulated total of 175,000 customers in the dark. During one event, sustained winds were clocked at 90 km/h with gusts of 119 km/h.

But the utility was able to bounce back from each storm quickly and efficiently, due to careful planning and preparations that have been years in the making.

Grid resiliency is an important focus at Toronto Hydro, and it has opted to take a multifaceted approach to large-scale emergencies. A dedicated emergency management team has been created, whose role is to evaluate and implement best practices and solutions for all types of crises, including storms. And the adoption of the Incident Management System, a framework to help improve the coordination of emergency response protocols, has helped Toronto Hydro execute and communicate its restoration process more efficiently.

All of these changes are key to planning for the future as extreme weather events are expected to increase due to climate change.

By incorporating climate projections for temperature, rainfall and freezing rain into construction and maintenance plans, Toronto Hydro is looking for ways that new equipment can withstand the stronger elements. It's investing in flood mitigation systems in stations and using submersible equipment such as stainless steel transformers to protect against flooding.

To help combat high winds and freezing rain, the utility is raising the height of its overhead poles to clear tree branches and installing breakaway service wires to help limit the damage sustained to overhead equipment. While these investments won't prevent outages from large trees toppling onto overhead lines, they will help crews and system controllers restore power more quickly.

Preventative maintenance is also part of Toronto Hydro's strategy. Proactively pumping out vaults that are prone to flooding and trimming trees to prevent contact with overhead lines all contribute to fewer outages.

Ultimately, this is good news for customers. As extreme weather becomes more frequent, customer expectations of utilities and their ability to weather climate change is expected to grow too. By taking steps now to improve the resiliency of the grid, Toronto Hydro is preparing for emergencies of the future.

SMART AUDIO

- By Julie Lupinacci -

Chief Customer Officer, Hydro Ottawa

There is no stopping the growth and popularity of voice assistants such as Amazon's Alexa and Google Assistant. As sales continue to soar, so do the expectations of consumers. No longer satisfied by simply checking the weather or listening to music, the technological advancements in this area mean that consumers are now using voice assistants to transform their homes and create a smart hub to help automate their lives. Having voice access to an ever-expanding selection of products and services means that, when it comes to customer service, consumers expect access whenever and however they desire.

This growth and evolution in customer service have in large part been dictated by customers. More than ever, customers are choosing for themselves how they want to interact with and be served by companies. It was not business leaders that were looking to make customer service available 24 hours a day, 7 days a week, this evolution in customer service was driven by consumers. These demands have resulted in more options and more innovation from those looking to stay relevant. Savvy companies have been watching these technological advancements and identifying opportunities to leverage technology.
Hydro Ottawa did just that, becoming the first utility in Canada to offer a voice assistant skill to consumers.

Today, Hydro Ottawa customers who have downloaded and enabled the smart speaker skill can use Alexa or Google Assistant to find out how much electricity they have consumed and what they can do to reduce their usage in the future. Customers looking for information on when their upcoming bill is due and what the amount they owe is, need only to consult Alexa. Those uncertain about current time-of-use just have to check-in with Google. This new skill also provides timely information on outages in the city. It does not limit customers to accessing information only through their smart speaker.

Customers can access this information anywhere they can access Alexa or Google Assistant, on their phone, tablet and in their car with more options becoming available. Most importantly, in the event of an emergency, this expanded access means customers have one more way of accessing important information.

Although this new venture into voice assistants is relatively new for Hydro Ottawa, the company knows that this first roll out has laid the groundwork for further innovation, allowing the team to build more features into the smart speaker skills. This will allow Hydro Ottawa to provide customers with a more intuitive and smart home experience. By focusing on consumer needs, Hydro Ottawa is giving customers more ways to interact with their electricity accounts through the channel of their choice.

Allowing customers to access information when, where and how they want is just one opportunity Hydro Ottawa continues to focus on customer value and look for innovative ways to exceed customer expectations.

"Okay Google, open Hydro Ottawa."

To learn more about the skill and how to download & enable, ***visit: hydroottawa.com/smart-speakers***

THE NEXT FRONTIER
FOR ENERGY EFFICIENCY

- By Ann Kelly -

Director of Customer, Energy Efficiency and Human Resource Committee, CEA

The electricity sector is unique in a variety of ways. For instance, the marketing approach that is used by many electric utilities uniquely stands out over the most prominent and technology-enabled, big box, online retailers and technology providers. Electric utilities provide their customers with programs, incentives, information and opportunities to help them use less of the product they sell. Although this marketing approach would likely be mocked on Dragon's Den, electric utilities choose to promote energy efficiency because it is beneficial to their customers, to the environment and to their businesses.

Offering energy efficiency information and programs provides an opportunity for utilities to engage and enhance the relationships with their customers.

Economic benefits accrue locally, regionally, provincially and federally from Energy Efficiency and Conservation programs. Some of the direct, indirect and induced benef include customer savings, economic growth, jobs and improved competitiveness for industry and businesses. From a grid perspective, Energy Efficiency measures can ease capacity constraints and smooth the pace of asset renewal investment.

Moreover, as we begin to deal with changing weather patterns and the increasing occurrence of environmental events - such as forest fires, tornados and floods - we need to recognize that, not only is Energy Efficiency a cost-effective option to reduce Greenhouse Gas and other air emissions, it also plays a role in bolstering the resilience of the electricity grid, buildings and critical infrastructure. During winter weather events, a home with an energy efficient envelope will stay warm longer than one that is less efficient.

Over the last decade, residential customer household energy use has shifted from large appliances – which, over time, have been made more efficient - to a proliferation of smaller appliances and electronic devices. Those do not individually consume large amounts of household electricity but will do so collectively. Electric utilities will continue deliver programs and initiatives to their customers based on consumption data and local conditions of energy demand to help them use less of the product their utility sells because it is better for the customers, the utility, the environment and the economy.

Ann Kelly is Director of Customer, Energy Efficiency, and Human Resource Committee for CEA. She can be reached at kelly@electricity.ca

MULTI-UTILITY BENEFITS
WILL DRIVE INNOVATION AND CUSTOMER SERVICE FOR THE MODERN GRID

- By Jim Keech -

President and CEO, Kingston Hydro and Utilities Kingston

Today, Kingston Hydro is a reliable and consistent hydro company that is focused on creating value for its customers and shareholders. Our core business is to deliver power at a competitive rate.

We do this through the economy of scope and customer service benefits of the multi-utility model. Unique in Ontario, Utilities Kingston provides water, wastewater, natural gas, electricity and broadband networking services–all under one roof.

However, to remain relevant tomorrow, Kingston Hydro, like most local distribution companies in Ontario, must evolve for the future. Industry trends - such as distributed energy resources, the Internet of Things, customer expectations for increased online services and the cost of energy - mean that utilities must advance experimentation in customer engagement, electrical vehicle integration, data analytics, energy storage, grid automation, microgrids, and more.

As Kingston Hydro completes its strategic plan for 2019-2024, followed closely by the Utilities Kingston strategic planning process, we will examine how to drive innovation and find efficiencies. As a modern energy company, how can we best support community goals and stay ahead of changing customer needs?

We believe the answer for Kingston Hydro lies in one of the biggest innovations in the utilities sector: Kingston's multi-utility model. While it allows us to run a very efficient, customer-focused operation, our utility also has a proven track record of innovation to benefit customers and the community.

For example, our cross-functional team helped make the City of Kingston the first municipality in Canada to monitor and publicly report sewer overflows in real-time. We accomplished this through the collaboration of our Supervisory Control and Data Acquisition (SCADA), engineering and operations groups.

Other successes include optimizing biogas generation at wastewater plants as a source of carbon neutral fuel and the evaluation of a unique system to store energy when electricity prices are low and feed it back to the grid at higher demand times.

By participating in Kingston's multi-utility model for community benefit, Kingston Hydro will advance innovation in new technology and customer service. We will be guided by the Kingston Hydro strategic plan for 2019-2024 to ensure a strong future for our customers and community.

ELECTRIFICATION:

SCOPING NEW CHALLENGES AND OPPORTUNITIES FOR THE SECTOR

- By Stephen Koch -

Director of Emerging Issues, CEA

Over the last 30 years, the Canadian electricity industry experienced severe spikes in peak power requirements. Governments and utilities implemented energy efficiency programs to respond to customers use of electricity. Incenting customers to use electricity in off-peak hours and making energy conscious technology purchases, was the focus to reduce the peak power demand. As we enter a new decade, this sector will again be faced with electricity demand as industries move towards electrification and a low carbon economy.

Electrification is more than just the growth of electric vehicles, it is about increasing electricity as a primary source of low carbon energy. This shift is largely driven by consumer and political demand to reduce greenhouse gas emissions in a sector already 80% greenhouse gas free. While the transportation sector including passenger vehicles, mass transit and heavy-duty trucking is positioned to lead this move towards electrification, buildings and industrial applications will be just as impactful.

The Electric Power Research Institute noted that electrification could increase the North American demand by 24% to 52% by 2050. This challenge will stretch current infrastructure to its maximum capacity. As the industry continues to migrate from carbon-based generation, the limitations of renewable energy will become obvious. Energy storage, distributed energy resources and grid modernization will be critical in bringing new generation to the customer.

The electricity sector is taking measures to meet these new demands while utilizing existing assets and investments to manage potential stranded assets. Through a committee of senior CEA members, the industry has developed potential future scenarios and identified signposts that may anticipate potential changes to the sector. Those drivers of change include customer needs and demands, disruptive technology, new competitive dynamics, multiple government policy and outdated regulation.

Two-way grid communication and customer data on usage, are important to ensuring future supply is available when the customer requires it, no matter what future scenario is implemented. A Navigant research report shows utilities are projected to spend nearly $100 billion on networking/ communications equipment and services over the next decade. Non-traditional competitors will also play a role in data collection with the widespread adoption of smart appliances and home control apps.

Utilities focused on disruptive data-tracking innovations will be better equipped to anticipate customer demand. Organizations solely focused on the supply of power could be a relegated to a vulnerable commodity-based company.

Again, we find the Canadian Electricity industry in challenging times with the movement towards electrification. Once again, the industry will embrace the challenge and implement a safe, reliable and cost-effective solution to the power system of the future.

Stephen Koch is Director of Emerging Issues for CEA. He can be reached at koch@electricity.ca

MY MILLENNIAL ENERGY FUTURE

WHY ELECTRICITY COMPANIES SHOULD LOOK MORE LIKE ENERGY MANAGEMENT COMPANIES

- By Justin Crewson -

Director of Transmission and Distribution, CEA

The Merriam-Webster dictionary defines a millennial as any "person born in the 1980s or 1990s". The Urban Dictionary describes millennials as "no house… no money… just avocado". Avocado toast notwithstanding, it seems that I qualify as a millennial. Therefore, I thought I would take this opportunity to contemplate my millennial energy future. Or rather, true to millennial form, ponder how electricity companies can provide my millennial energy future for me.

Like many children of the 1980s and 1990s, I spent the better part of the past 15 years getting overeducated in liberal arts, escaping underemployment, and finally, establishing myself professionally. Given these achievements I have recently begun to contemplate home ownership. And somewhere distant yet still within my millennial utilitarian calculus is a philanthropic desire to achieve the millennial green trifecta: Rooftop Solar, Battery Storage and an Electric Vehicle.

However, when I get down to the numbers, my millennial energy future seems bleak. A 10kW self-installed roof-mounted PV will cost $21,500. A Nissan Leaf electric vehicle, $37,000. And three Tesla Powerwall batteries that will enable me to charge my EV (even during blackouts) and power my 2,000 square foot home for 60% of the typical day, $29,600. Of course, none of these estimates includes the capital outlay required for the lifecycle maintenance of these investments. Nor do they include the cost for the "smart home" eco-system that will truly enable energy savings and be ubiquitous by the time I finally save enough for a mortgage down payment.
Ironically, the costlier of the three items above, the Nissan Leaf, seems most within reach to me. Why? Simple and easy to find leasing/financing options, and one-stop maintenance services. All of this makes the most of my most important assets - time and my credit rating.

Upon reflection, it seems to me that for my millennial energy future to come to fruition my local electricity company will need to look more like a provider of a full suite of energy management and financing services that will help me reduce my carbon footprint while also resulting in overall energy savings. If this means having an energy management/services line item added to my monthly energy bill, I am all for it as long as I don't need to bring a lot of upfront capital and I can offset much of this cost through overall energy savings.

Indeed, a number of CEA member companies have developed smart appliance amortization, and various Distributed Energy Resource aggregation and net-metering initiatives.
But I believe it is incumbent upon political officials, energy regulators and electricity companies to sit-down, and in a focused way, start charting out how electricity companies can begin to look more like energy management companies.

If well-managed by a local energy management company, my millennial energy future will not only enable my personal objectives, but it can also result in system-wide savings over business as usual scenarios. Local energy management companies can help to ensure that the essential components of the emerging smart grid are safely and strategically managed by a reputable and competent authority, which will leave me with more time to eat avocado toast and shop on Amazon. Afterall, these are the true priorities of any creation of the 1980s and 1990s.

Justin Crewson is Director of Transmission and Distribution for CEA.
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EXTENDING A HELPING HAND

NATIONAL LINEWORKER APPRECIATION DAY

- By Joelle Lancaster -

Advisor, Issues Management, CEA

For over a century, lineworkers have been working hard to build and maintain the powerlines that provide Canadians access to reliable, affordable and clean energy. Climate change has caused an increase in severe weather events which, in turn, has elevated the importance of lineworkers in ensuring a steady supply of power to Canadians. During extreme weather events - such as snowstorms, freezing rain and tornados - lineworkers are on the job and are exposed to dangerous elements as they work in high-risk conditions to repair transformers, clear debris from transmission lines, and work with other live electrical equipment to turn the lights back on for Canadians. These dangerous conditions led the *Globe and Mail* to rank lineworkers as having one of the 10th riskiest jobs in Canada.

This job does not end at the limits of a lineworker's service territory. Mutual assistance agreements are, in other words, engagements between various utilities where their respective lineworkers assist each other in times of severe weather in order to restore power to customers of utilities all across the North America. In September 2018, when tornados touched down in Ottawa and left much of the city in the dark, 18 lineworkers from Alectra Utilities traveled from Southern Ontario to assist their fellow utilities in the restoration process. This was the fourth time in the preceding 18 months that Alectra Utilities employees have been committed to provide such assistance.

As the climate changes, extreme weather events have increased over time and consequently, so has the call for assistance from fellow utilities. In 2018, Canadian utilities sent more than 550 personnel across provincial borders to assist with storm restoration.

The movement of skilled workers extends beyond provincial borders and across North America.

Always willing and able to travel great distances to rebuild critical infrastructure, mutual assistance activities have brought personnel from Ottawa to Long Island (Hurricane Jose in 2017), from Ontario to California (2018 wildfires), and all the way from PEI and Alberta to Turks & Caicos (Hurricane Irma in 2017). Not all utilities utilize the same equipment and procedures; crews face working conditions mirroring those encountered at home, including handling high-voltage equipment, solving new challenges and learning new skills such as how to safely climb an electrical pole in the absence of bucket trucks. Despite the long hours, the poor weather conditions, and the monumental task of working on unfamiliar electrical systems, lineworkers are unwavering in their commitment to help restore and maintain the power systems underlying the communities they work in.

The hard work and hardships undertaken by lineworkers in service of customers across the continent and beyond is one of the many reasons that the Canadian Electricity Association is calling on the government to designate a National Lineworker Appreciation Day on July 10th of every year. This will be a day in which electric utilities across the country reflect on the dangers of the job and the courageous men and women that encounter these dangers every day, at home, across Canada and North America.

Joelle Lancaster is Advisor, Issues Management for CEA.
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LEADERSHIP LESSONS LEARNED FROM OUR MENTORS

CEA SENIOR FELLOW RELEASES NEW MENTORING BOOK

Canadian Electricity Association Senior Fellow David McKendry released his new book Leadership Lessons Learned from Our Mentors at the annual CS Week Conference in Phoenix Arizona April 8th – 12th, 2019.

Applicable to any personal or business setting, Leadership Lessons Learned from Our Mentors is an easy-read compilation of universal values showing how to get things done through your most important asset: people.

The anthology of lessons features 40 chapters from successful utility customer service executives, directors and managers, who together share a combined 2,000 years of experience and 470 time-honoured leadership lessons to be shared with readers.

These include honest, evocative and personal stories about their mentors whose words and actions have helped shape their respective success.

Written in first person, Leadership Lessons Learned From our Mentors shares battle-tested secrets to success from respected utility thought leaders across North America.

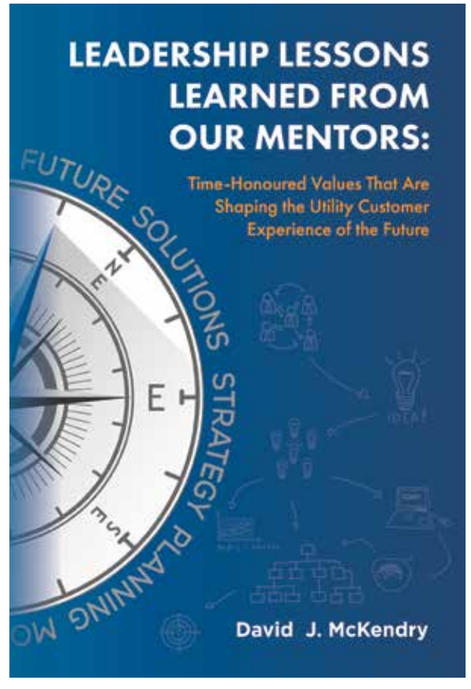
CEA Member contributors include: Francis Bradley – Chief Operating Officer of the Canadian Electricity Association, Eileen Campbell – Vice President Customer Service at Alectra, Jill Doucett – Director Customer Relations at NB Power, Julie Lupinacci Chief Customer Officer at Hydro Ottawa, Vinay Sharma Chief Executive Officer at London Hydro, and Chris Tyrrell - Executive Vice-President Utility Transformation and Chief Customer Care and Conservation Officer at Toronto Hydro (Retired).

These accomplished individuals along with the other featured professionals continue to shape the utility customer experience for essential "life blood" services such as electricity, gas and water to millions of residential and business consumers.

David McKendry is Senior Fellow at the Canadian Electricity Association. He provides guidance on Electricity Distribution, Customer Service, Emerging Technologies and Issues and is a coach and mentor. Prior to joining CEA in 2018, McKendry served for several years as the Director of Customer Service for Hydro Ottawa. His emphasis on leadership excellence coupled with an obsession to achieve effective, repeatable and positive customer experiences are cornerstones of his success. He shares his personal stories in his new book.

Leadership Lessons Learned from Our Mentors is published by CS Week. CS Week is one of the largest utility customer service conferences in North America where over 2,000 delegates representing over 275 utilities gather annually to share thought leadership and best practices.

David McKendry is Senior Fellow at CEA. He can be reached at mckendry@electricity.ca. Email info@electricity.ca for further information and speaking engagement availability.



COMBATTING CYBER THREATS THROUGH COLLABORATION

- By Peter Gregg -

President and CEO, Independent Electricity System Operator (IESO)

It is no secret that the frequency of cyber attacks targeting critical infrastructure, financial, private and public institutions has been on the rise in recent years, with some disrupting major services and making headlines across the globe. According to a recent survey by the Canadian Internet Registry Authority, 40% of Canadian companies experienced a cyber attack in the last 12 months alone.

Within the electricity sector, the increasing prevalence and sophistication of cyber threats, which know no borders or jurisdiction, has become part of the new operating reality, adding multiple layers of complexity to the already complex work of ensuring a reliable and resilient power system. Being a reliability coordinator now goes beyond just the flow of electrons.

Having best-in-class cybersecurity at all levels of the electricity system has never been more critical to ensuring the reliable operation of the power grid.

It begins with recognizing that the way cybersecurity has been approached in recent years is already becoming outdated. The increasing technological advancement and interconnected nature of the electricity system means it is no longer sensible to have utilities and power plants operating in silos, with each managing their own cybersecurity efforts in isolation. No matter how strong your cyber defense is, there is no doubt it can be stronger through partnerships and greater collaboration.

We recently became the first system operator in North America to have accountability for providing cyber security-related services to the broader electricity sector under a new mandate from our regulator, the Ontario Energy Board. This includes working with transmitters and local distribution companies to facilitate the sharing of centralized cybersecurity information. The change recognizes our leadership in helping protect Ontario's power grid from cyber threats and leverages the comprehensive cybersecurity governance framework that we already have in place for our own operations.

To increase our capabilities and help us fulfill this new mandate, we recently launched a new security operations centre. The centre provides actionable information in a near real-time capacity, 24/7, which will help to ensure that any threats targeting data, assets and infrastructure are dealt with before widespread damage and disruption can occur across Ontario's system.

We have also established a relationship with the Canadian Centre for Cyber Security, which is part of the Communications Security Establishment (CSE) to leverage their cyber expertise and support our efforts to defend our electricity infrastructure. This will give us global insights into trends, patterns and prior warnings. The most exciting part of our partnership, though, is an initiative known as Project Lighthouse.

Lighthouse is a multi-phase project designed to provide situational awareness of cyber threats impacting electricity companies within Ontario and enable more timely action and response to those cybersecurity threats.

Lighthouse delivers capabilities to analyse internet-based data from generation, transmission, and distribution companies to both predict and identify cybersecurity attacks. This is truly ground-breaking work and something that will provide a value-added benefit to the overall security of Ontario's electricity system. It also speaks to the value of collaboration – now, local utilities and generators are supported by the IESO at a provincial level and the CSE at a federal and international level.

As our sector continues to move towards an increasingly automated, interconnected and decentralized model, no organization can guarantee their systems are 100 per cent secure from cyber threats. That is why it is imperative that we continue to work together to expand our connections as an industry, to continue to develop innovative solutions to our cybersecurity capabilities and to ensure that electricity grids across Canada continue to operate safely and reliably for the benefit of Canadians.

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