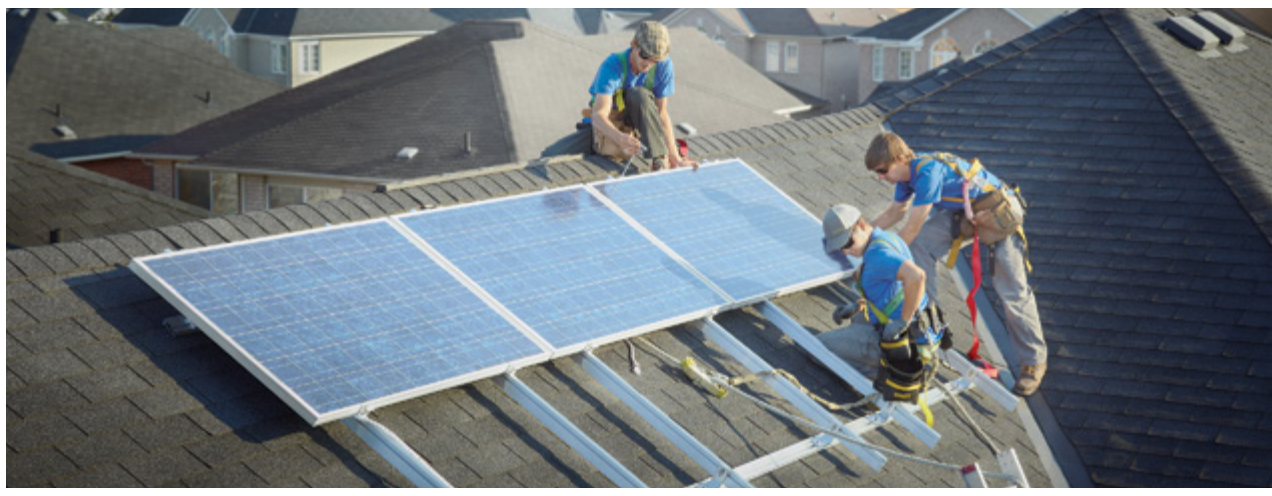
INVESTING IN ONTARIO

PEPPERMEDIA

Building Ontario's electricity system for the future



Over the last decade or so, Ontario's energy landscape has undergone a broad-based transformation. Since 2003, Ontario has invested more than $35 billion in over 16,000 megawatts (MW) of new and refurbished clean generation, including nuclear, natural gas and renewables, representing about 40 percent of Ontario's current supply. During this time, approximately $15 billion has been invested to enhance and renew more than 15,000 kilometres of power lines, including both transmission and distribution lines. These investments have resulted in a system that is both reliable and cleaner, with significantly lower emissions. The Independent Electricity System Operator (IESO) works at the heart of the power system, ensuring that there is enough power to meet the province's energy needs in real time, while also planning and securing energy for the future.

The elimination of coal-fired generation, the development of new natural-gas fired generation and the integration of new renewable resources such as wind, solar and bioenergy are the most important developments that have contributed to making Ontario's electricity system cleaner. Greenhouse gas emissions in Ontario's electricity sector have declined by more than 80 percent from 10 years ago. As of June this year, Ontario had an installed capacity of nearly 4,500 MW of wind generation, as well as close to 2,200 MW of solar generation. And the role of renewable energy sources will continue to grow. By 2025, renewable resources such as wind, solar, bioenergy and hydro facilities are expected to make up nearly 50 percent of Ontario's installed generating capacity.

Conservation and energy efficiency have also been important contributors to the reliability of Ontario's electricity system. Both help to reduce peak demand and minimize costs associated with meeting those peaks. The results of Ontario's conservation efforts have become increasingly visible and material. Through conservation programs and changes to codes and standards, Ontario has saved 12.7 billion kilowatt-hours of electricity in the past 10 years, which is equivalent to about half the annual electricity demand in the City of Toronto.

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For planners, forecasters and operators, conservation has evolved into a strategic, multi-dimensional framework, with an emphasis on technology-driven solutions that deliver enduring, verifiable results. For homeowners, energy efficiency can both help to manage household electricity bills and improve home comfort. In commercial and industrial settings, where bigger projects deliver bigger energy savings, energy conservation can boost the competitiveness of Ontario's businesses by optimizing operational processes and systems, improving working conditions, and increasing employee productivity and retention.

Ontario's nuclear fleet will also continue to provide a vital role in the province's energy mix, providing reliable baseload power at a reasonable rate and a measure of certainty in a time of rapid change. In 2015, nuclear power accounted for 60 percent of the electricity generated in the province and is expected to continue to provide the majority of the supply over the longer term. Investment in Ontario's nuclear fleet has been ongoing and will continue. In 2012, Bruce units 1 and 2 were returned to commercial operation for the first time since 1997 and 1995 respectively. Starting this year, the scheduled refurbishments of units at both Darlington and Bruce will ensure that nuclear energy continues to provide a vital role in providing clean power to Ontario for decades to come. These refurbishments represent an investment of $26 billion over the next 16 years.

Ten years of transformation is not an end game, however. If anything, the pace of change is quickening. Ontario is at a pivotal point in revisiting the way we think about electricity and the value it provides. Within this context, to ensure the continued reliability and flexibility of the system, the IESO works closely with government, Indigenous communities, stakeholders, customers and local communities to identify viable options that support reliability and adapt the power system to meet these changing conditions.

Things like energy efficiency, demand management and load displacement are proving to be cost-effective resources that are being leveraged in a variety of ways to benefit individuals, industries and the province as a whole. And, building on Ontario's smart meter infrastructure, data-driven apps and solutions are already delivering new insights into consumption patterns and supporting better decision-making about how and when to use electricity. We are also in the early stages of adopting smart homes, with more and more devices being connected to and communicating with one another. Smart grids, with powerful monitoring and automation tools, are increasing the capability for energy companies and consumers to effectively respond to the changing daily environment.

The IESO is also exploring how energy storage can be integrated into the day-to-day operation of Ontario's electricity system. Energy storage has the potential to transform how the IESO plans and operates the power system by providing a range of real-time grid balancing services and injecting or withdrawing energy on demand. It can help optimize the performance of renewable resources by smoothing out natural fluctuations in solar and wind production and provide support when demand for electricity rises or falls quickly.

Micro-grids are being developed in Ontario for their ability to increase local resilience and support added reliability, especially during destructive and damaging storms. They also offer increased ability to connect and manage variable local renewable generation resources, such as solar or wind, with energy storage. For remote First Nation communities, where it is not economically feasible to connect to the grid, renewable generation that is integrated into community micro-grids can avoid diesel generation.

In this context, the IESO recently published the Ontario Planning Outlook (OPO), which gives both a 10-year review (2005-2015) and a 20-year outlook (2016-2035) for Ontario's electricity system. The report concludes that Ontario is well-positioned to meet provincial needs into the next decade, while continuing to adapt to the changes occurring across the sector. The OPO will also provide the planning context for policy makers, industry stakeholders and the public, serving as an early input into the government's Long-Term Energy Plan engagement process, starting this fall.

Ontario has come a long way since the summer of 2005 when the province was reliant on supply from other jurisdictions to meet high provincial demands for electricity. Investment to date has provided the province with a reliable supply of low-emission electricity from a broad variety of sources. As the IESO continues to plan the system for the future, it will involve discussion and input from all stakeholders. Getting the right resource mix and ensuring continued reliability is an ongoing process that requires the consideration of a range of options, which may include generation, conservation, energy storage, transmission and/or distribution, emerging communication and control technologies, or some combination of these alternatives. In all cases, a balance will be sought to meet customer needs, system needs and sector needs.

Submitted by the Independent Electricity System Operator

BOILERMAKERS UNION: A KEY PART OF REFURBISHING ONTARIO NUCLEAR PLANTS

Ontario's Boilermakers are taking a leading role in some of the toughest jobs in building the infrastructure of tomorrow in our province. Nowhere is that more evident than in the nuclear industry, where members of the Boilermakers union are key in refurbishing and building the facilities at Bruce Power near Port Elgin and the Darlington generating station east of Toronto.

To give an idea of the scale of these projects, the Bruce Nuclear plant is the largest nuclear facility in the world on one footprint. The refurbishment of the Darlington facility is a $10-billion project that will take place over the next 10 years.

Boilermakers play a huge role in projects like these. They rebuild the reactor chambers and are responsible for the huge ancillary installations like storage vessels, cooling systems and the various conduits for carrying water to cool the reactors and steam to power the electric turbines.

This can mean jobs like positioning giant storage tanks to tolerances of thousandths of an inch, or using special techniques to weld parts for systems that deliver super-hot steam, in all kinds of weather and working conditions.

Boilermakers are trained for this work in a four-year apprenticeship program that is the most stringent and comprehensive in the world. And their learning doesn't stop when they graduate as journey-persons. The union's state-of-the-art training centre in Burlington, supplemented by facilities in Sarnia, Sudbury and Thunder Bay, provides specialized training in subjects such rigging and hoisting huge components like storage tanks, working at heights, in confined spaces and with respirator equipment, operating high-capacity cranes, working with flammable liquids and others.

Specialized training

The Boilermakers who work on our nuclear facilities need every bit of their knowledge, training and years of experience. But before they work on a nuclear plant, they take even more specialized training.

Ontario Power Generation (OPG) has built a $30-million mock-up of a reactor vault, on which every person working on the reactor must be trained. The mock-up recreates conditions in the field as much as possible, with training in the use of a breathing apparatus and protective clothing, as well as working in areas where radiation is a concern. Similar mock-ups have been built for other areas of the facilities.

It's not enough that Boilermakers take the training course. They must also pass a series of tests five times before they can work on the reactor chambers and other critical components.

Safety is the number one core value for the Boilermakers, the contractors who employ them and the OPG. As the project proceeds, it's a principle that demands absolute adherence and respect. Many things can affect safety, like changes in scheduling and people. Safety can get eroded if everyone is not conscious of it.

"We don't have a choice: we have to get this right," OPG Project Director Ken Hobbs told a recent industry conference. "We need to have all our project partners involved in this, committed to the same values we have. Any break in the chain will have a negative impact."

Thousands of jobs

How important is this work to the Ontario economy? The Darlington refurbishment alone will employ at least a thousand skilled tradespeople every day for the next 10 years. At times, the workforce will double to 2,000. That adds up to more than a billion dollars in wages that will reinforce local economies throughout Ontario.

Once the Darlington project is finished in 2020, it will be the turn of Bruce Nuclear. In all, the projects will mean thousands of skilled jobs over the next 15 to 20 years.

For the Boilermakers union, it means working in partnership with OPG, Bruce Power, their contractors and other unions.

"It's all about teamwork," says John Petronski, business manager of Boilermakers Local 128, which represents key people working on the refurbishment. "Nobody can do this alone."

The union has a tradition of teamwork that it brings to the table in this round of refurbishment.

Creative

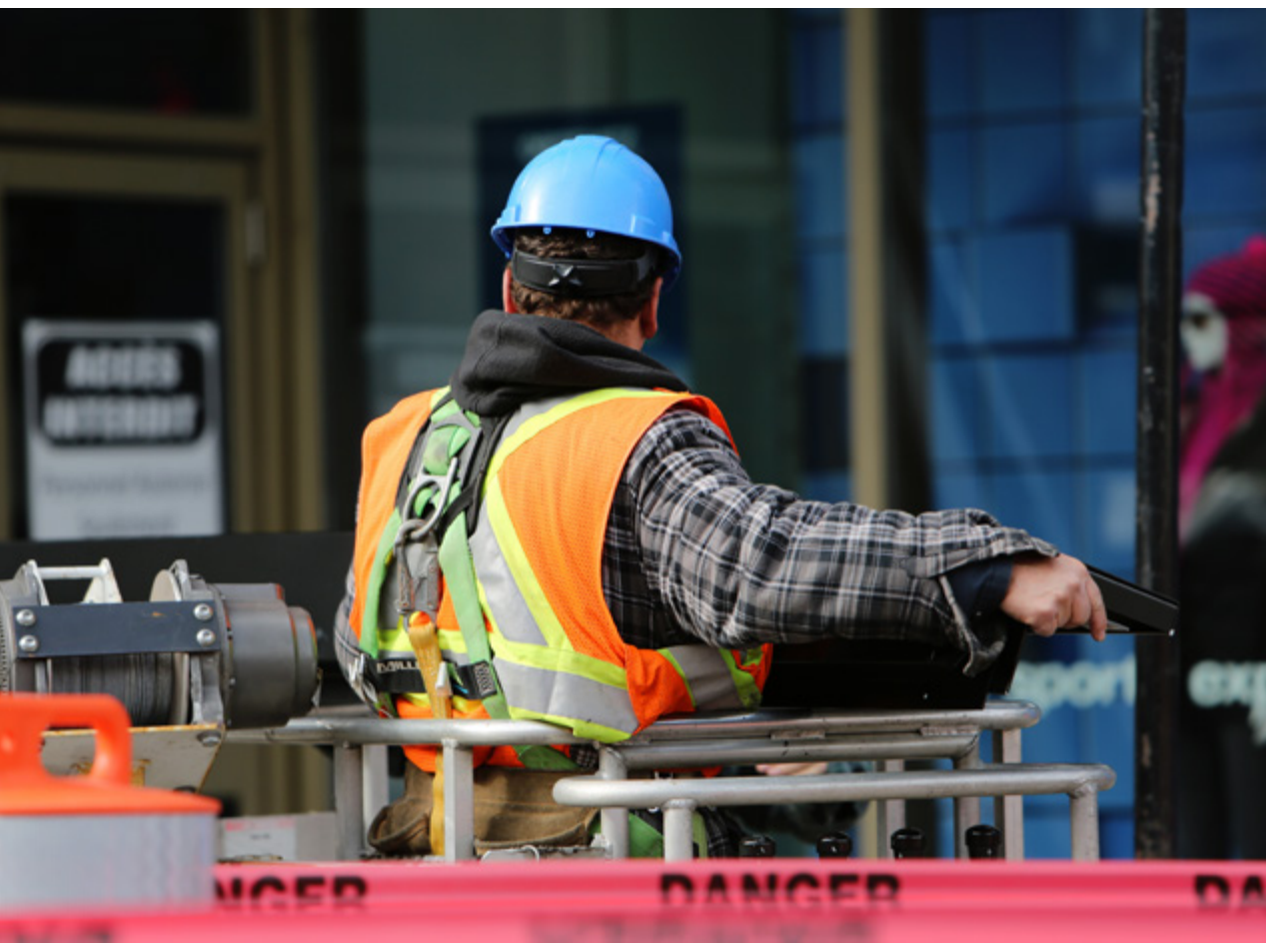
"The union has gone forward with some unique and creative ways to align with the other trades," says Hobbs. "The Boilermakers are in the forefront of other initiatives too. That reassures the OPG."

"We take pride in our work," says Petronski. "Our aim in every project is to build it safely and built it well. We believe we're working not only for ourselves and our employers, but for everyone in Ontario. That's why we have to — and we will — get it done right."

Article provided by Union Communications

International Brotherhood of Boilermakers

AIMING FOR 'GOOD JOBS FOR ALL' IN AN EVOLVING, MORE PRECARIOUS LABOUR MARKET



Casual work at minimum wage, working two or more jobs to reach full-time hours, or not knowing how many shifts they will get from week to week – these working conditions are the norm for a growing numbers of Canadians, and part of the trend towards more "precarious" work in the 21st-century labour market.

Labour organizations and other stakeholders are intensifying their efforts to reverse this trend and advance the cause of "good jobs for all" – to help more Canadians enjoy reliable employment with fair compensation and protection of their rights.

In previous decades, the standard employment relationship was a full-time, secure job – often in a large company with a unionized workforce. Today, temporary, casual and part-time employment is increasingly common, in many cases, for people who want but cannot secure full-time work.

"The rise in precarious work stems from a number of institutional changes in the labour market, including the shift to service-jobs away from goods-producing jobs and a decline in the share of workers who are members of a union," says Sheila Block, senior economist with the Canadian Centre for Policy Alternatives, which has conducted research into the changing nature of work.

Block points to labour law in Ontario, which hasn't kept pace with the growing fragmentation of the labour force.

"We have legislation written when we had 10-thousand employees at a steel plant in Hamilton who looked for protection of a union. Today, the people who need that protection are working for a coffee-shop chain with colleagues spread across hundreds of different locations," says Block. "The question is how do we modernize laws to allow those people to exercise their right to choose to join a union?"

Our goal is to make work better and fairer for both unionized and non-unionized workers; we want all boats to rise

While proponents of change see unionization rights as part of the equation, they are calling for various enhancements to broaden access to good jobs.

"Our goal is to make work better and fairer for both unionized and non-unionized workers; we want all boats to rise," says Katha Fortier, Ontario regional director with Unifor, Canada's largest private-sector union. "That's why unions have advocated for strengthening the Canada Pension Plan, for example, which brings advantages to all workers."

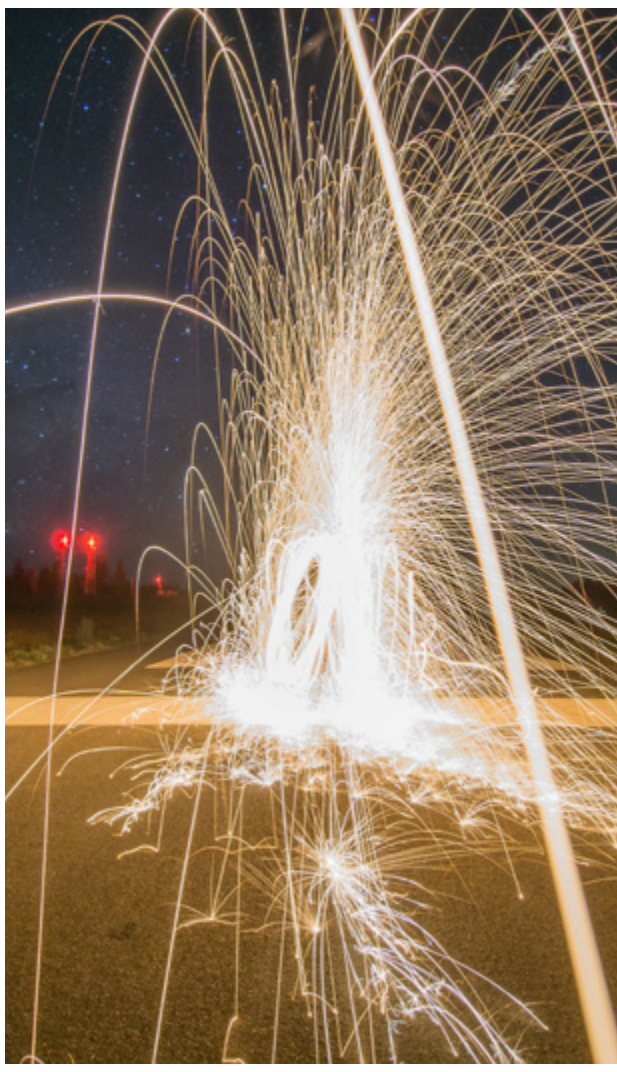
"A good job is one where you have adequate health and safety – that is paramount. You also have enough income and a schedule that is predictable enough to let you participate both in your family and community," says Block.

Fortier agrees that the issue of predictable, reliable shift schedules is very important. In 2015, Unifor negotiated better scheduling procedures and other improvements for members working at Metro grocery stores in the Toronto area.

"Along with wage increases, we negotiated advance notice of scheduling and minimum hours of work, so that people can better plan their lives," Fortier explains. "Those gains were fairly unique among collective agreements in the retail sector."

Increasingly, the issues stemming from the new reality of work are also capturing the attention of policy-makers. The Ontario government is consulting stakeholders through its "Changing Workplaces Review," and will recommend changes to the Employment Standards Act and the Labour Relations Act to enhance worker rights and protections in the province.

As stated in an interim report, the key focus of the review is "vulnerable workers in precarious jobs and the need for legislative amendments to address some of the issues facing these workers".



MAKING HEALTH & SAFETY A CULTURAL INVESTMENT IN ONTARIO

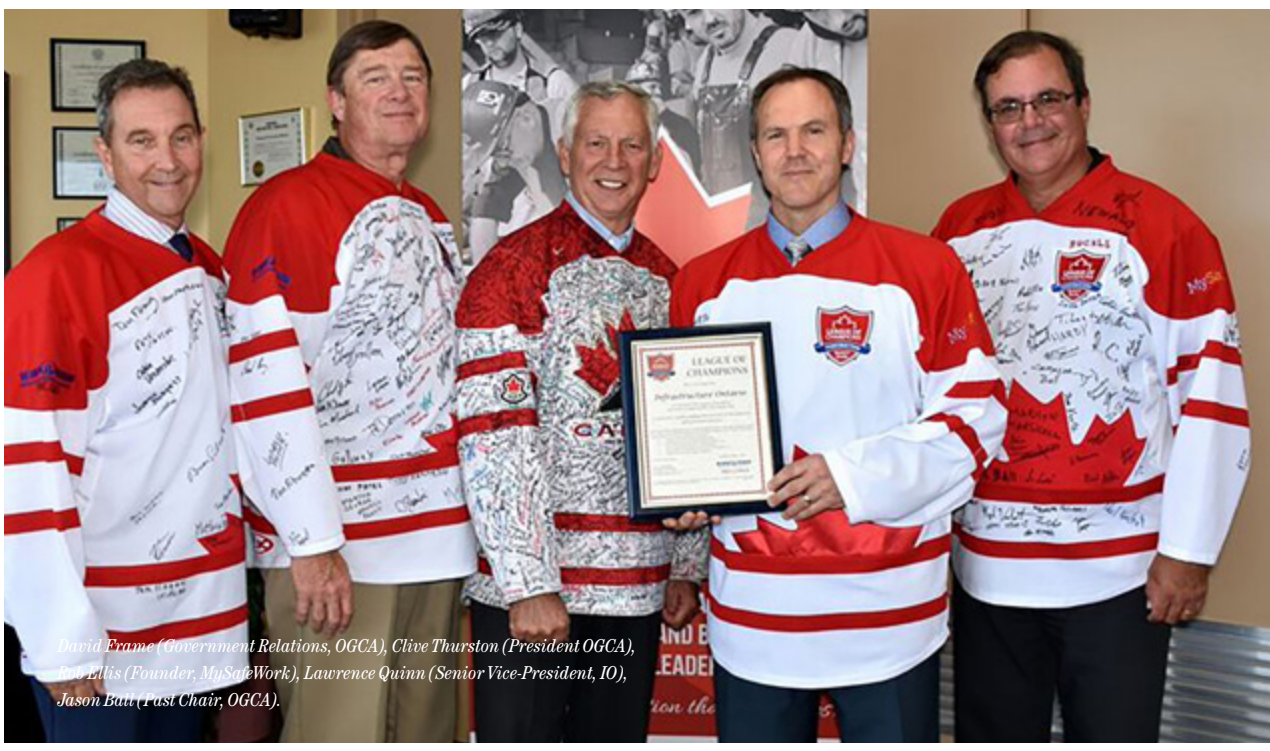
When the topic of health and safety in construction comes up, most people picture a hard hat and steel-toed boots.

Last week, Infrastructure Ontario's Senior Vice President Lawrence Quinn donned a hockey jersey to the applause of leaders in workplace safety called the League of Champions.

The League is an organization that strives to be "a catalyst for safety improvement in individual companies and the industry as a whole."

By donning the League's coveted jersey, Quinn made IO the first public agency to literally wear its commitment to safety on its sleeve.

"We value the well-being of our employees as well as our clients, industry partners and the general public," said Quinn. "IO is committed to making health and safety a priority on all of its job sites across Ontario, including our own."


David Frame (Government Relations, OGCA), Clive Thurston (President OGCA), Pat Ellis (Founder, MySafeWork), Lawrence Quinn (Senior Vice-President, IO), Jason Ball (Past Chair, OGCA).

Certificate of Recognition

To raise the bar on safety, IO is in the process of enhancing the performance requirements on all of its larger construction projects. The Certificate of Recognition (COR) occupational health and safety accreditation program is a key component that IO currently uses to cover Major Projects that use the Alternative Financing and Procurement (AFP) model and are generally over $100 million. Over time, traditionally delivered real estate projects with a construction value over $10 million are heading in the same direction. These are the projects IO refers to as Direct Delivery.

"ProjectCos on our AFP projects continue to be asked to submit safety records up front as part of the evaluation process," according to Quinn, noting that it includes Workplace Injury Summary Reports and CAD7, which outlines the record of a company's safety record and management of safety insurance claims. "What has changed is that we now ask for COR as a fundamental prequalification requirement," said Quinn. "We also evaluate the safety records and this influences the frequency of independent safety inspections during construction".

Effective September 1, 2016, COR is a mandatory requirement for general contractors / constructors participating in the Request for Qualifications (RFQ) process for AFP projects.

"IO wants to work with industry partners who are leaders in the field of health and safety," said Quinn. "These initiatives move us in the right direction for AFP projects and we're expanding that effort into traditional delivery as well."

For Direct Delivery projects, COR requirements are being phased in to ensure there's adequate time for firms bidding on these projects to begin and complete the application process. As of Spring 2017, companies will be required to have applied for COR certification to be eligible to bid on Direct Delivery projects. Effective Spring 2018, companies will need to be COR-certified to submit RFP's for these projects.

The safety focus also carries over into demolition projects, with IO adopting the Professional Engineers of Ontario guidelines.

Partnership with Industry

IO takes great pride in building and maintaining strong relationships with a number of industry associations. Both IO and the Ontario General Contractors Association (OGCA) understand that while there will always be challenges to overcome, a professional partnership is the best way forward.

"I'm delighted that IO has enthusiastically joined the League of Champions to support the creation of a safety culture throughout the construction industry," noted OGCA president Clive Thurston. "The province is the largest buyer of construction in Ontario, so having IO adopt COR and join the League is significant."

"IO's leadership will have an immediate and lasting impact on health and safety," said Thurston.

Healthy Government Buildings

For the thousands of facilities in the government's real estate portfolio, IO is also taking steps to ensure strong safety standards are in place to protect the ministry tenants who deliver programs and services Ontario residents count on. IO uses service providers for property and land management as well as project management on upgrade and renovation work that falls below the $10 million threshold. Diligence and collaboration are the key to properly overseeing their efforts, through the use of tools like annual audits, recurring review meetings and quarterly reporting on health and safety.

Safety First for IO Employees

For IO, the focus on safe and healthy work environments begins with in its own workspace.

"We have a framework in place to guide internal efforts around compliance and awareness on health and safety," said Quinn. "Our approach involves continuous improvement, information sharing and training, and we're currently looking at all of our policies to ensure we're current with industry standards."

IO also protects its staff on visits to construction sites. A recent policy change requires IO employees to submit a project site visit form to their manager beforehand. The form outlines health and safety implications relevant to the visit. For one thing, personal protective equipment is mandatory. On AFP sites, safety training is provided by ProjectCo and no one enters the site without authorization Additionally, in the fall of 2016, IO will be running regular training for its staff related to hazard analysis on construction sites. This will prepare them for what to look out for when touring active sites.

"Leadership starts from within," said Quinn.

Ontario's Commitment To Nuclear Is Good News For Jobs and Greenhouse Gas Reductions

By Don MacKinnon
President
Power Workers' Union

The Ontario government's support for extending the operation of the Pickering Nuclear Generating Station by four years to 2025 and the refurbishment of the Darlington and Bruce Nuclear Stations is good news for the province's environment and economy. These investments are clear evidence of the province's continuing commitment to achieving: real greenhouse gas (GHG) emission reductions; securing a long-term, Ontario-based electricity supply; mitigating rising electricity costs; and, supporting and creating jobs.

Ontario Power Generation's (OPG) Pickering Station generates 3,100 megawatts of safe, low-cost, low-carbon electricity for Ontario. A recent analysis by Strategic Policy Economics (Strapolec) confirms that each year the station's output helps avoid millions of tonnes of GHG emissions while annually contributing hundreds of millions of dollars to the economies of Durham Region and Ontario. As well, extending the station's operations by just four years reduces electricity system costs by over $600 million, saves $4 billion from avoided energy imports and provides over $1.2 billion in additional revenues to the provincial government. That's good news for the environment, Ontario's economy, consumers and taxpayers.

In fact, over the past seven years, Ontario's nuclear stations have safely and affordably provided more than half of the province's electricity. Each year, the province's three nuclear stations have helped avoid tens of thousands of tonnes of smog producing pollutants and about 60 million tonnes of GHG emissions. That's equivalent to taking about 12 million vehicles off the road! Moreover, Ontario's Independent Electricity System Operator indicates that the all–in cost of the electricity produced is less than the average cost of electricity in Ontario today.

OPG's Darlington Station and Bruce Nuclear Station are among the top performing nuclear facilities in the world. The mid-life refurbishment of the nuclear units at these two facilities secures another 30 years of affordable, reliable, 24/7, GHG emission-free electricity for our homes and businesses. As noted in Ontario's 2013 Long-Term Energy Plan, these refurbished stations will produce electricity more affordably than any other new source of generation, including electricity imports from Quebec.

Generating electricity in Ontario keeps economic wealth and jobs here instead of exporting these benefits to other jurisdictions. Nuclear energy is not just Ontario's electricity workhorse, but also a major contributor to the province's economy. Ontario is the heart of Canada's $6 billion plus, 60,000 job nuclear industry. This includes 180 supply chain companies located in communities across the province and support for high-tech innovation-focused R&D at Ontario's universities and colleges.

Currently, Ontario's three nuclear stations are among the province's biggest employers. OPG's Pickering and Darlington stations are the largest industrial employers in Durham Region and the Bruce Nuclear Station employs more people than GM's Oshawa Plant. Most importantly, these are high-skilled, well-paying jobs.

Analyses show that extending the operation of the Pickering Station and the mid-life refurbishments of the Darlington and Bruce stations will generate billions in GDP, thousands of good jobs and more high-value, innovation focused R&D. The Pickering extension will support 40,000 person years of employment alone. Renewing the Darlington and Bruce stations will add hundreds of thousands of person years of employment including ongoing station operations and maintenance, construction trades, manufacturing of materials and supplies, and engineering.

According to the Conference Board of Canada, the economic activity from refurbishing the Darlington Station will generate, on average, more than 11,000 jobs per year between 2014 and 2023. Ontario workers and businesses are expected to receive 96 percent of the economic benefits.

For more than a century, Ontario has focused on developing a secure electricity supply as the foundation of its economy. Nuclear energy has, and will continue to be a major provider of reliable, low-carbon, low-cost electricity for decades to come.

This is good news for the environment and another generation of Ontarians who will benefit from the high-skilled, middle-class jobs.

A Great Decision For Our Province

Extending the operation of the Pickering Nuclear Station to 2025 and refurbishing the Darlington and Bruce Nuclear Stations will deliver tremendous environmental and economic benefits for Ontario.

- Avoids 10s of millions of tonnes of greenhouse gas emissions every year
- Delivers long-term, low-carbon energy security
- Keeps billions of dollars here in Ontario
- Contributes to affordable electricity prices
- Sustains and creates hundreds of thousands of person years of high-skilled, good-paying jobs
- Supports Ontario's role as an innovation leader

Ontario's nuclear technology advantage is clearly our province's best option for tackling climate change while generating economic prosperity and good jobs.

For more information please go to: www.pwu.ca

FROM THE MEN AND WOMEN WHO HELP KEEP THE LIGHTS ON.

POWER WORKERS' UNION