



2017 Sustainability Report

ONTARIO**POWER**
GENERATION

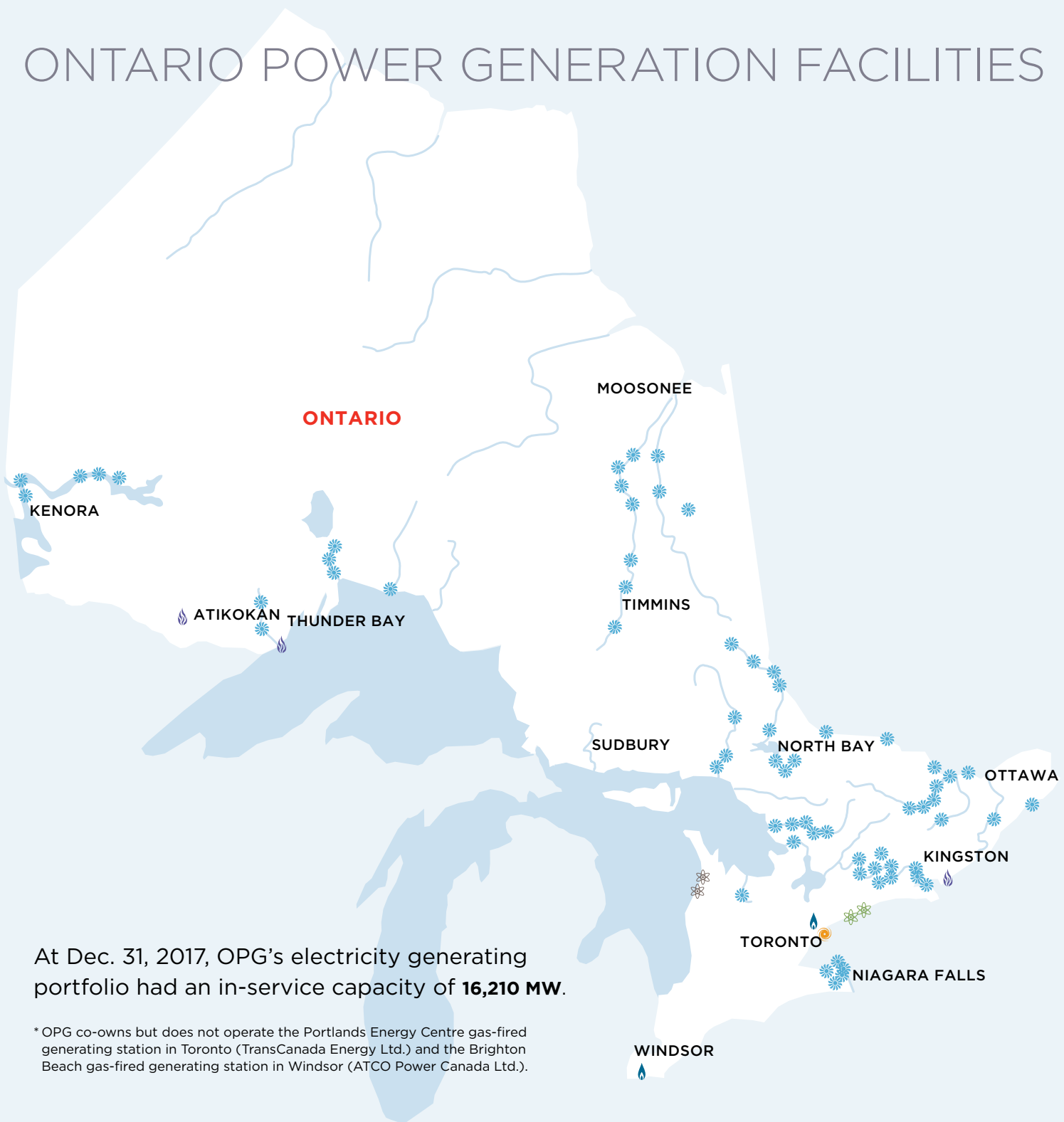


Front Cover: Calabogie Generating Station
celebrated 100 years of service in 2017.
Inside Cover: Elliott Chute Generating Station

CONTENTS

- OVERVIEW 3
 - About OPG3
 - Executive Message4
 - About this Report6
 - Our Approach to Sustainability8
- ENVIRONMENT 13
 - Environmental Compliance13
 - Biodiversity and Wildlife Habitat15
 - Climate Change17
 - Nuclear Emissions19
 - Nuclear Waste21
 - Water Management22
- SOCIAL 23
 - Stakeholder Engagement23
 - Indigenous Relations26
 - Health and Safety28
 - People and Culture30
 - Corporate Citizenship31
- ECONOMIC 34
 - Financial Strength35
 - Cost of Electricity35
 - Reliability of Assets36
 - Renewal and Development of Assets37
 - Long-Term Energy Plan41
 - Supply Chain42
 - Local Economic Impact43

ONTARIO POWER GENERATION FACILITIES



2

Nuclear
Stations

2

Leased
Nuclear
Stations

3

Thermal
Stations

2

Co-Owned
Gas-Fired
Stations*

66

Hydroelectric
Stations

1

Wind
Power
Turbine



OVERVIEW

ABOUT OPG

Our Business

Ontario Power Generation (OPG) is an electricity generation company whose principal business is the generation and sale of electricity in Ontario. OPG was established under the *Business Corporations Act* (Ontario) and is wholly owned by the Province of Ontario. OPG's registered head office is located at 700 University Avenue, Toronto, Ontario, M5G 1X6, Canada.

As at Dec. 31, 2017, OPG's electricity generation portfolio had an in-service capacity of 16,210 megawatts (MW). OPG owns and operates two nuclear generating stations, 66 hydroelectric generating stations, three thermal generating stations, and one wind power turbine. In addition, OPG and TransCanada Energy Ltd. co-own the Portlands Energy Centre gas-fired combined cycle generating station (GS), and OPG and ATCO Power Canada Ltd. co-own the Brighton Beach gas-fired combined cycle GS. OPG's 50 per cent share of the in-service capacity and generation volume of the co-owned facilities is included in the generation portfolio statistics set out in this report. OPG does not operate Portlands Energy Centre or Brighton Beach.

OPG also owns two other nuclear generating stations, Bruce A GS and Bruce B GS, which are leased on a long-term basis to Bruce Power Limited Partnership to operate. The leased stations are not included in the generation portfolio statistics set out in this report.

OPG operates under an electricity generation licence issued by the Ontario Energy Board (OEB) and offers its generation into the real-time energy market, or spot market, to be dispatched by the Independent Electricity System Operator (IESO). In 2017, OPG's electricity generation accounted for over 50 per cent of the total energy generated on Ontario's electricity grid, as reported by the IESO. The majority of OPG's generation is from its nuclear and hydroelectric stations.



Capacity and Generation

Download a summary of OPG's generating capacity and electricity production data.

[Download file.](#)

EXECUTIVE MESSAGE

As one of the largest near-zero-carbon generators in North America, OPG produces about half of Ontario's electricity at a cost that is 40 per cent less than other generators. In 2017, we continued to demonstrate our commitment to clean, low-cost power and sustainable operations by advancing the Darlington Refurbishment project, completing a new hydroelectric station in northern Ontario, and finishing a major clean energy project in Niagara.

Clean, low-cost power made in Ontario



JEFF LYASH
President and CEO

Over the past 10 years, OPG has virtually eliminated carbon and smog-causing emissions from its power generation by shutting down its coal plants, investing in and preserving our nuclear generation assets, expanding our hydroelectric fleet, and establishing a good mix of renewable and gas generation.

Our transition to a diverse and clean generation portfolio has helped decarbonize Ontario's electricity system and moderates the price of power.

Key to securing 30 more years of clean power and significant economic benefits across the province is our \$12.8 billion project to refurbish Darlington Nuclear. More than 200 companies from across Ontario are helping us deliver Canada's largest

clean energy project, which remains on schedule and on budget. In 2017, the first unit was separated from the rest of the station and dismantling of the reactor core began.

In northeastern Ontario, we partnered with the Taykwa Tagamou Nation to build the Peter Sutherland Sr. GS, which officially went into service in spring 2017. The new hydropower station is now producing 28 megawatts of renewable electricity for the grid, enough to power about 25,000 homes. More than 200 people, including close to 50 local Indigenous people, helped bring this project in on time and on budget. Such mutually beneficial partnerships contribute to Indigenous community development and provide a long-term revenue stream.

At Niagara Falls, another clean energy project was completed ahead of schedule and under budget. Refurbishment of the 300-hectare reservoir at the Sir Adam Beck Pump GS, an important source of flexible carbon-free electricity, adds 50 more years to the reservoir's life.



Left: Jeff Lyash speaks with employees about the Darlington Refurbishment project.
Right: OPG continues to make investments in the performance of Pickering Nuclear GS.



OPG continued investing in the performance of Pickering Nuclear in preparation for its continued operation to 2024. Providing approximately 14 per cent of the province's electricity with virtually no carbon emissions, the station will play a key role in delivering clean, reliable, low-cost baseload electricity during the Darlington and initial Bruce Power refurbishments. Continuing Pickering's operation to 2024 will save Ontario electricity customers up to \$600 million, contribute more than 7,500 jobs and add \$1.54 billion a year in GDP to the province's economy, all while avoiding an estimated 17 million tonnes of carbon emissions.

Electrification

OPG understands that energy fuels our society but clean energy fuels the future. We're preparing to use our clean power to help decarbonize the transportation sector through electrification, which we believe will benefit customers and Ontario's economy. Since 2008, we have been advocating for electric vehicles (EVs) through Plug'n Drive, a not-for-profit group started by OPG. In 2017, OPG sponsored Plug'n Drive's new EV Discovery Centre in Toronto. OPG is also taking steps to save money by electrifying our fleet of SUVs and cars, and we've installed a number of chargers across our sites to help spur adoption of EVs. We are also investigating other ways to expand transportation electrification and create growth opportunities for OPG.

Power with purpose

At OPG, we believe in generating power with a purpose. This includes investing in regional environmental and biodiversity programs to create and care for wetlands, woodlands, greenspaces and nature trails across the province. From planting close to 7 million trees and shrubs since 2000, to helping to restore the Atlantic salmon population in Lake Ontario, to supporting organizations like Toronto Wildlife Centre, Bruce Trail Conservancy, and Ontario Nature in bringing nature to Ontario families, OPG is committed to a clean and environmentally sustainable Ontario.

At the heart of all we do is our diverse and talented group of dedicated employees, whose efforts keep our generating units operating 24 hours a day, 365 days a year. Their efforts are the reason OPG will continue to deliver strong, reliable performance in all of our operations and projects going forward. We are proud of all we have accomplished in 2017 and thank our employees for their tireless service and contributions.

Thank you for your interest in OPG and we welcome your feedback.

JEFF LYASH
President and CEO



OPG provides clean and low-cost power in a sustainable manner.

ABOUT THIS REPORT

Scope

This report communicates the value OPG places on sustainability, the company’s approach to managing its impacts, and its recent performance results. The report presents information about sites operated by OPG unless otherwise noted. The reporting period is from Jan. 1 to Dec. 31, 2017. This is OPG’s 19th annual sustainability report.

In conjunction with this report, OPG provides information about its sustainability programs and performance in its annual report, annual information form, management’s discussion and analysis reports, consolidated financial statements, news articles, and station performance reports, which are all available on www.opg.com.

Reporting What is Most Relevant

This report covers the topics that reflect the company’s most significant environmental, social and economic impacts, and the interests of OPG’s stakeholders and partners. In early 2018, OPG conducted an assessment to re-examine and redefine its list of priority sustainability topics. The views of internal and external stakeholders were assessed and the following 18 priority sustainability topics were identified.

TOPIC	DESCRIPTION
Biodiversity and wildlife habitat	Management of biodiversity and natural areas reduces impacts from operations and helps maintain ecosystem health.
Climate change	Includes climate change mitigation and adaptation. Maximizing the use of OPG’s clean generation capacity is a business opportunity for the company.
Corporate citizenship	Strengthens the well-being of host communities and OPG’s social licence to operate.
Cost of electricity	OPG’s power is priced lower than other generators in Ontario which helps moderate customer bills.
Environmental compliance	Strong environmental management practices protect the environment and build customer trust.
Financial strength	OPG has a duty to deliver an appropriate level of return on the Shareholder’s investment and to meet its financial obligations.
Health and safety	Includes workplace health and safety, nuclear emergency preparedness, and public water safety near hydroelectric operations.

TOPIC	DESCRIPTION
Indigenous relations	OPG is committed to working with Indigenous communities, proximate to its present and future operations, to foster positive and mutually beneficial relationships.
Local economic impact	Includes employment opportunities, spending on goods and services, and payments to the Province of Ontario.
Long-term energy plan	OPG supports Ontario’s long-term energy plan to create a system that is clean, reliable and cost-effective.
Nuclear emissions	OPG’s nuclear emissions are kept as low as reasonably achievable to ensure operations do not adversely impact human health and the environment.
Nuclear waste	OPG is responsible for the safe, long-term management of radioactive wastes generated by its nuclear operations.
People and culture	An engaged, diverse and inclusive workforce at OPG drives performance and a culture to succeed.
Reliability of assets	Impacts the financial sustainability of the company and enables consistent delivery of power to customers.
Renewal and development of assets	Tied to the ongoing viability of the company and impacts the local economy.
Stakeholder engagement	Understanding the needs and expectations of interested parties builds trust and respect.
Supply chain	OPG’s ability to operate depends on timely access to equipment, materials and service suppliers.
Water management	Managing water levels and flows at OPG’s dams and hydroelectric stations protects watersheds and maximizes power production.

Data Assurance and Quality

The following reviews are conducted to ensure OPG’s sustainability reporting is accurate and credible.

- Operational and performance data is validated by both line management and independent reviewers, and prescribed data is subject to assessments and audits as part of OPG’s assurance program.
- Sustainability data and practices are verified by an independent auditor every four years as part of the Canadian Electricity Association’s Sustainable Electricity Program.
- OPG’s sustainability report is evaluated by an external sustainability consultant against criteria for best practices in sustainability reporting. OPG’s 2016 report was scored as having above average achievement.

- The Global Reporting Initiative (GRI) Sustainability Reporting Standards were used as guidance to define report content and quality.

Comments and questions about this report are encouraged and may be provided to OPG’s Vice President, Environment, at webmaster@opg.com.

GRI Content Index
Download a summary of the GRI disclosures included in this report.
[Download file.](#)

OUR APPROACH TO SUSTAINABILITY

Key Drivers

OPG believes that operating in a sustainable manner is directly connected to business success. Sustainable development is a prerequisite for maintaining a social licence to operate, and it requires that impacts be identified and managed. Additionally, ensuring the best possible use of resources drives efficiency and innovation, which ultimately improves the company's return on investment. For these reasons, OPG has integrated sustainability requirements into its business model, risk management framework, policy requirements, and performance targets.

On a broader scale, our world is facing urgent social, economic and environmental challenges. A framework to address these challenges is set out in the 2030 Agenda for Sustainable Development which was adopted by Canada and other United Nations member states in 2015. The Agenda includes an ambitious set of 17 Sustainable Development Goals (SDGs) that will require collaborative efforts by governments, non-governmental organizations, businesses, and citizens alike to achieve. Many of OPG's business priorities and practices support the advancement of the SDGs, in particular, the goal of Affordable and Clean Energy (Goal 7).

Business Model

OPG's sustainability strategy is guided by its business model which describes how the company operates. The business model includes a mission statement, ethical values, expected behaviours, and strategic imperatives to ensure the company is focused on the right work and programs to meet its long-term goals. The following diagram shows how the business model creates value for customers and our Shareholder, the Province.

OPG also has a risk management framework to identify, evaluate and mitigate risks that could significantly impact the achievement of its strategic imperatives. Detailed information about OPG's risk framework and key risks can be found in the company's *2017 year-end Management's Discussion and Analysis*.



LEARN MORE

Sustainable Development Goals

Read more about the 17 United Nations Sustainable Development Goals at www.un.org/sustainabledevelopment

Strategic Imperatives



OPERATIONAL EXCELLENCE

Operational excellence at OPG is accomplished by the safe and environmentally responsible generation of reliable and cost-effective electricity from the company's generating assets through a highly trained and engaged workforce.



PROJECT EXCELLENCE

OPG's vision for project excellence is to be an industry leader in project management capability and performance. As part of the commitment to project excellence, OPG continues to enhance and streamline its approach to project planning and execution, with the goal of delivering all projects safely, on time, on budget, and with high quality.



FINANCIAL STRENGTH

As a commercial enterprise, OPG's financial priority is to achieve a consistent level of strong financial performance that delivers an appropriate level of return on the Shareholder's investment.



SOCIAL LICENCE

OPG holds itself accountable to the public and its employees, and continues to focus on maintaining public trust. OPG is committed to maintaining high standards of public safety and corporate citizenship, including environmental stewardship, transparency, community engagement, and Indigenous relations.

MISSION

Power With Purpose: Providing low-cost power in a safe, clean, reliable and sustainable manner for the benefit of our customers and Shareholder.

VALUES

Safety
Integrity
Excellence
People and Citizenship

BEHAVIOURS

Say It, Do It • Integrate and Collaborate
Think Top and Bottom Line • Simplify It
Tell It As It Is • Generate the Future
Drive Performance, Build Potential
Build Relationships • Lead Change

Governance

Board of Directors

OPG's Board of Directors explicitly assumes responsibility for the stewardship of OPG and its business. The Board is made up of individuals with expertise in managing large businesses, managing and operating nuclear stations, managing capital intensive companies, and overseeing regulatory, government and public relations. The following committees of the Board focus on areas critical to the company:

- Audit and Risk Committee
- Compensation, Leadership and Governance Committee
- Darlington Refurbishment Committee
- Generation Oversight Committee

OPG's Board policies establish the parameters for the management of the company. OPG has policy statements pertaining to the environment, nuclear safety, safe operations, employee health and safety, Indigenous relations, code of business conduct, risk management, cyber security, and disclosure.

Chief Executive Officer

The Chief Executive Officer is accountable to the Board for ensuring a culture of integrity and ethical conduct; increasing shareholder value; defining and executing a corporate strategy, including a sustainable business model that will service the long-term power generation needs of the province; and providing a standard of leadership that will achieve operational excellence with respect to matters of safety, stakeholder relationships, financial performance, asset reliability, and health, environmental and regulatory compliance.



Carlo Crozzoli
Senior Vice President,
Corporate Business
Development and
Strategy



Chris Ginther
Chief Administrative
Officer



Sean Granville
Chief Nuclear Officer



Ken Hartwick
Chief Financial Officer
and Senior Vice
President, Finance



Glenn Jager
President, Nuclear



Barb Keenan
Senior Vice President,
People and Culture and
Chief Ethics Officer



Catriona King
Vice President,
Corporate Secretary



Mike Martelli
President, Renewable
Generation



Dietmar Reiner
Senior Vice President,
Nuclear Projects



Jennifer Rowe
Senior Vice President,
Corporate Affairs

Executive Team

Sustainability performance is a shared responsibility at OPG. Within OPG’s executive team, members have responsibilities for setting standards, and key performance indicators where appropriate, related to the environment, health and safety, ethics, stakeholder engagement, and financial stewardship. Annual priorities and targets are included in a corporate scorecard which is used to assess the company’s overall performance.

Individual operating units and functions are also required to establish annual performance objectives and to report monthly on key performance results. Performance targets are reinforced with management employees through an annual incentive plan that links compensation to performance.



LEARN MORE

OPG Governance

Additional information about OPG’s Board of Directors, Committees of the Board, Board policies, and the Executive Team is available at

www.opg.com/about

Goals and Results

The following table is an overview of OPG’s key sustainability goals and opportunities, and performance results from 2017. More information about how OPG’s sustainability priorities were managed in 2017 can be found in the relevant sections of this report.

Sustainability
Performance Data

Download a summary of the sustainability performance data presented in this report.

[Download file.](#)

Ongoing In Progress Achieved

FOCUS AREA	GOALS AND OPPORTUNITIES	2017 RESULTS
ENVIRONMENT	No significant events that impact the company’s reputation.	There were no significant environmental events in 2017. Achieved excellent performance against annual targets for environmental infractions and spills.
	Exceed compliance obligations where it makes business sense.	Advanced biodiversity conservation through a variety of programs and partnerships.
	Make strategic investments to facilitate a low-carbon future.	Continued to invest in nuclear capabilities, enhance the role of renewables, and implement a transportation electrification strategy.
	Ensure nuclear operations have no adverse impacts on human health or the environment.	Conducted environmental monitoring in the vicinity of nuclear stations to confirm the public and the environment are protected.
		Nuclear emissions and public radiation doses in 2017 were small fractions of the legal limits.
	Reduce the effect of low and intermediate level radioactive waste (LILRW) on the environment.	Volume of LILRW produced was better than the annual target. Progress continued toward a decision regarding the proposed deep geologic repository for LILRW.
SOCIAL	Work with Indigenous communities to foster positive and mutually beneficial relationships.	Continued to support procurement, employment and educational opportunities with Indigenous community partners.
	Build a diverse, healthy, engaged workforce, and the culture to succeed.	Continued to create a culture that aligns all employees and allows the company to achieve its business strategy.
		Implemented programs to promote diversity and inclusion. Offered programs and activities to recognize employee achievements and encourage engagement.

FOCUS AREA	GOALS AND OPPORTUNITIES	2017 RESULTS
SOCIAL <i>continued</i>	Achieve ultimate goal of zero injuries.	Annual target for workplace safety was not met, however, OPG's safety performance was among the best of comparator Canadian electrical utilities. 
	Ensure that safe operation is the overriding priority in all activities performed.	The Canadian Nuclear Safety Commission (CNSC) gave OPG's nuclear stations the highest possible safety rating. 
		Promoted public water safety around dams and hydroelectric stations. 
ECONOMIC	Increase net income and return on equity.	Net income attributable to the Shareholder was \$860 million. 
	Maintain OPG's generation price advantage for the benefit of customers.	Remained Ontario's lowest-cost generator. Pursued efficiency improvements in the company's cost structure and operational model. 
	Support successful outcomes for OPG's rate regulated operations.	The Ontario Energy Board issued its decision on OPG's 2017-2021 rate application after an extensive regulatory review process. 
	Optimize operational performance and outage plans across the generating fleet.	Focused on improving equipment reliability, optimizing outages, enhancing maintenance programs, increasing output, and extending operating life. 



OPG's sites are home to an abundance of wildlife, including the midland painted turtle

ENVIRONMENT

OPG has an ISO 14001-registered Environmental Management System (EMS) to manage its environmental responsibilities. The EMS provides OPG with a framework to meet its compliance obligations, establish environmental objectives, and maintain operational control through programs that manage the significant environmental aspects of its operations.

Topics in this section:

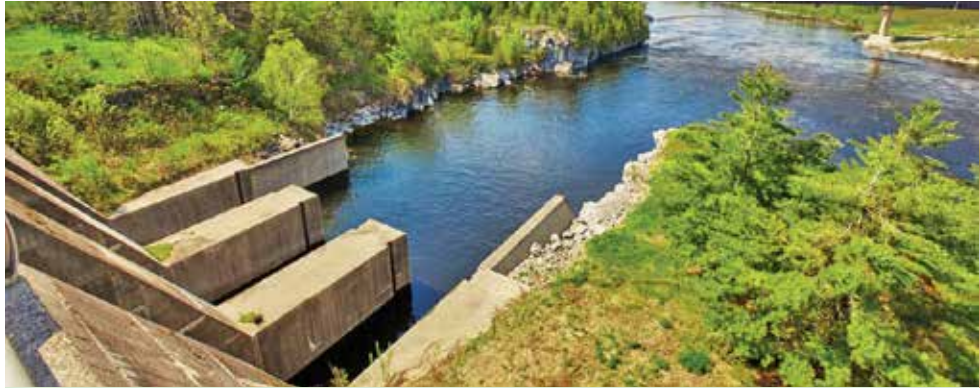
- Environmental compliance
- Biodiversity and wildlife habitat
- Climate change
- Nuclear emissions
- Nuclear waste
- Water management

ENVIRONMENTAL COMPLIANCE

Regulatory Infractions

OPG must comply with a large number of environmental requirements contained in statutes, regulations, bylaws, licences, permits, and approvals. OPG considers regulatory compliance to be a minimum, non-negotiable standard and strives to continually improve performance.

OPG classifies its non-compliances with environmental regulatory requirements based on the potential for regulatory action (i.e., charges, orders, and penalties), and the level of impact to the environment or human health. All infractions are reported by OPG to the appropriate federal, provincial and/or municipal authorities as required, and corrective actions are taken to prevent recurrence.



LEARN MORE

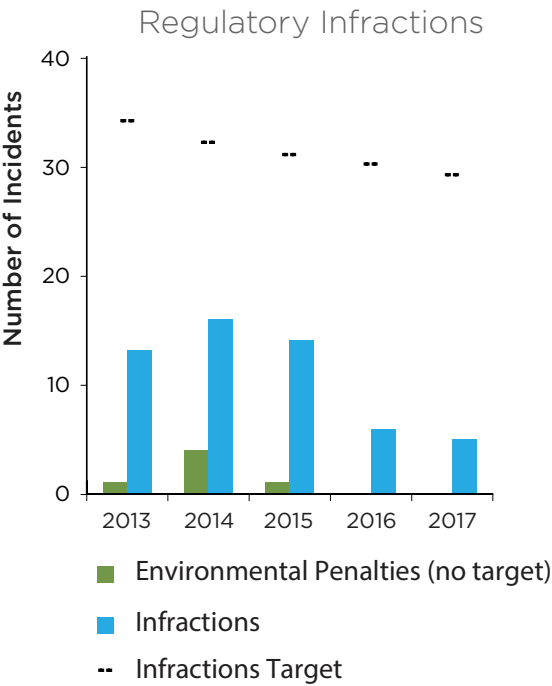
Proud to be one of Canada's Best 50 Corporate Citizens

In 2017, OPG was named – for the fifth year in a row – as one of the Best 50 Corporate Citizens in Canada by Corporate Knights. This distinction reflects OPG's commitment to resource, employee and financial management.

[Read more.](#)



In 2017, OPG met its target of zero significant environmental infractions and there were five moderate infractions, which was OPG's best performance ever. The most frequent type of infraction over the past five years has been non-compliances with effluent monitoring requirements administered by the Ontario Ministry of the Environment and Climate Change. OPG did not receive any environmental penalties from a regulatory authority in 2017.

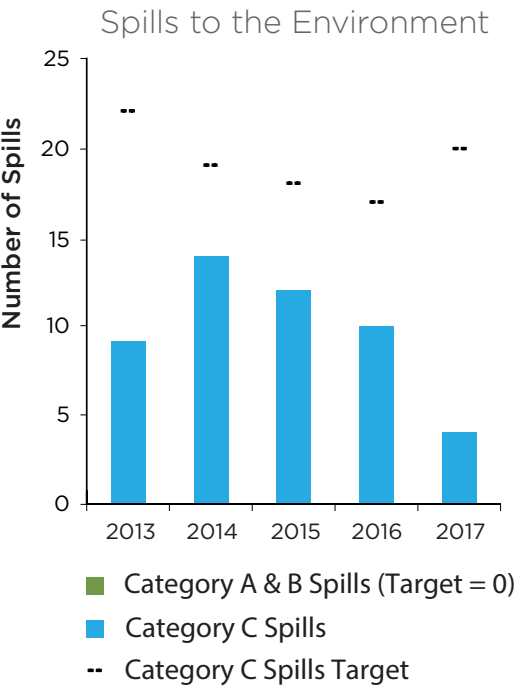


Spill Management

OPG has extensive spill management programs to prevent spills of pollutants to the environment and to minimize their potential consequences. Spills are prevented through risk assessments, material management practices, leak detection and repair, and the use of spill containment tools and structures. When a spill does occur, emergency response processes minimize any adverse impacts on the environment and reporting procedures ensure regulatory authorities are notified as required.

OPG classifies its spills that are reportable to a regulatory authority based on the actual or potential impacts to plants, animals, human health and safety, conduct of business, and use of property. Category A spills are considered very

serious; Category B spills are considered serious; and Category C spills are all other spills that are less serious than Category A and B spills. In 2017, OPG had no Category A or B spills and Category C spill performance was better than target with only four spills. This was the lowest number of spills in the company's history. In the past five years, oil leaks from equipment have been OPG's most common type of spill.



Darlington Nuclear GS



Left: Creek restoration at the Wesleyville site.



Right: Juvenile lake sturgeon.

BIODIVERSITY AND WILDLIFE HABITAT

OPG Site Programs

OPG strives to maintain, or enhance where it makes business sense, significant natural areas and species of concern on and near its sites. Where disruption to the environment is required, OPG plans and conducts work carefully to maximize benefits and responsibly manage or offset residual impacts.

OPG maintains site biodiversity plans that specify conservation objectives and actions to protect natural areas. Program highlights from 2017 included the following.

- **Biodiversity Monitoring:** Chats Falls GS completed the first year of a two-year bat study to determine the presence of bat species and identify potential bat habitat. With Bird Studies Canada, a Motus Wildlife Tracking System to track and identify migrating birds, bats and insects was installed at the Nanticoke site. Wildlife Preservation Canada surveyed the Darlington Nuclear GS site for pollinators.
- **Naturalization and Restoration:** To celebrate its 40th birthday, Lennox GS planted 12,000 trees to bring its overall site total to 40,000 trees. At the Wesleyville site, a large collapsed culvert was removed on Wesleyville Creek to restore the natural channel connection for brook trout and other fish species. Pickering Nuclear GS supported shoreline restoration through the planting of over 500 plants along the Frenchman's Bay barrier beach.

- **Third-Party Recognition:** OPG's biodiversity program was recognized by the Canadian Electricity Association with the 2017 Sustainable Electricity award for Commitment to Continuous Performance Improvement. Lennox GS and OPG's hydroelectric operations in eastern Ontario received a Gold Level Conservation Certification from the Wildlife Habitat Council.

As part of its ongoing operations, OPG employs a number of measures to protect fish and fish habitat that may be impacted by its activities. The typical threats to fish are impingement and entrainment, migration barriers, and station thermal emissions. A variety of compensatory measures may be used, including: water flow alterations, trap and transport programs, a fish ladder, stocking programs, a fish diversion system, station effluent temperature limits, and habitat creation. OPG also supports research initiatives related to fish and the aquatic environment. In 2017:

- Higher than normal spring water levels allowed fish to access and spawn in spillways at some hydroelectric stations along the Ottawa River. When water levels subsided, OPG maintained flows to the spillways to protect fish, eggs and larvae and to assist their movement downstream.
- OPG continued implementation of its 11 mitigation plans for lake sturgeon and American eel at hydroelectric stations where these species may be impacted.

- OPG partnered with the Ontario Ministry of Natural Resources and Forestry and Trent University on a research project to evaluate the success of relocating lake sturgeon.
- The Shebandowan Lake Control Dam replacement project was completed ahead of schedule, which allowed early closure of the temporary bypass channel and restoration of flows to the main channel. Fish began to use new spawning habitat that was created as part of the project.

Biodiversity Partners

OPG's regional biodiversity program strategically funds and promotes efforts to protect and restore biodiversity across Ontario. Qualified partners are funded for projects to address key biodiversity issues along defined themes such as reforestation, wetlands, grasslands, and lakes and rivers.

OPG also supports initiatives that contribute to biodiversity education, awareness, scientific

- Post-construction operating and monitoring obligations were initiated for the new Peter Sutherland Sr. hydroelectric station. Studies will be conducted over the next several years to monitor the effectiveness of measures taken to protect fish.
- The fish diversion system installed at the Pickering Nuclear GS water intake continued to significantly reduce fish impingement.

knowledge and ecological stewardship. Partners include the Bruce Trail Conservancy, Earth Rangers, LEAF, Ontario Nature, Rouge Park, Toronto Wildlife Centre, and Friends of the Earth Canada. In 2017, OPG continued as the lead sponsor for the Lake Ontario Atlantic Salmon Restoration Program, also known as Bring Back the Salmon, to help restore a self-sustaining Atlantic salmon population to Lake Ontario and its tributaries.

Reforestation

OPG's tree and shrub planting efforts promote diverse, healthy and resilient forests which contribute to climate change mitigation. In 2017, OPG's regional biodiversity program partners planted more than 223,000 native trees and shrubs on over 300 acres of land. Since 2000, OPG and its partners have planted more than 6.7



million native trees and shrubs, offsetting over three million tonnes of carbon dioxide during their lifetime.

Wetlands

Wetlands provide habitat and ecosystem services such as flood control, water filtration, recreation and climate change mitigation. In 2017, OPG's regional partners created or restored over 40 acres of wetland habitat.



Grasslands

Grasslands provide critical habitat, are vital for pollinators, and deep-rooted prairies rival forests in the sequestration of carbon. Through OPG's regional partnerships, over 65 acres of native grasslands were created or restored in 2017, which brings the total to 130 acres since 2014.



Lakes and Rivers

Ontario's lakes and rivers have been impacted by agricultural, residential and industrial development. In 2017, OPG's support of ecological restoration projects by Ontario NativeScape was a key contribution to the St. Clair/Sydenham River Nutrient Reduction Initiative. South Nation Conservation



Authority restored natural meandering stream channels in the Larose Forest, and the Nature Conservancy of Canada installed "wing-deflectors" to restore meanders on Willow Creek.

CLIMATE CHANGE

Low-Carbon Future

OPG strives to be a leader in climate change mitigation by implementing operational and growth strategies that support reductions in greenhouse gas (GHG) emissions. OPG's transition to a low-carbon generation portfolio began in 2003 with an ambitious smog reduction and climate change initiative to eliminate coal-fired electricity generation in the province. The phase-out of coal at OPG's generating stations was completed in 2014. OPG is now Ontario's largest low-cost clean energy provider, producing electricity that is 99 per cent free of GHG emissions.

To build on this success, OPG continues to evaluate and implement plans to increase the generation capacity of its hydroelectric fleet where economical, invest in other low-carbon technologies, including nuclear innovation and energy storage, and take a leadership role in the electrification of Ontario's transportation sector.

The transportation sector accounts for approximately 30 per cent of GHG emissions in Ontario, and OPG is well-positioned to provide the power needed to support the transition from fossil-fuelled to electric vehicles. The electrification of transportation in Ontario offers a key opportunity to reduce carbon emissions and maximize the use of existing clean generation capacity to meet the added electricity demand.

OPG's transportation electrification strategy:

- Leverages OPG's clean electricity to support the electrification of transportation.
- Encourages off-peak charging to maximize the use of existing clean generation investments, leading ultimately to lower electricity costs for our customers.

OPG's clean electricity is key to Ontario's low-carbon future.



- Raises awareness of electric vehicles and enables mechanisms to facilitate electric vehicle adoption.
- Creates new commercial growth opportunities for OPG.

In 2017, OPG participated in initiatives to advance the adoption of electric and hydrogen vehicles. OPG also continued its long-standing sponsorship of Plug'n Drive, a non-profit organization committed to increasing public awareness and understanding of electric vehicles. Within OPG, the company began to transition its vehicle fleet to electric, and vehicle chargers were installed at a number of workplaces. Along with reducing carbon emissions, transitioning fleet vehicles to electric will reduce fuel and maintenance costs.

OPG will continue to evolve its transportation electrification strategy in 2018 as well as its understanding of how electrification will impact Ontario's electricity system, further reduce GHG emissions, and allow for lower power rates for our customers. OPG will evaluate pilot projects around vehicle-grid integration and the development of virtual power plants, and assess the potential for hydrogen production via electrolysis.



LEARN MORE

Investing in Innovation

OPG's transportation electrification strategy is focused on maximizing use of Ontario's, and particularly OPG's, clean electricity advantage to power the transportation sector.

[Watch a video.](#)

Climate Change Adaptation

OPG has identified climate change and extreme weather as a strategic risk for the company. Longer term changes in precipitation patterns and amounts, water temperatures, and ambient air temperatures may impact the availability and quality of water resources and normal operations of generating station components. Impacts due to changing climate could potentially affect power production at hydroelectric stations, and cooling water efficiency at nuclear and thermal stations. Unusual or unpredictable weather also has the potential to damage electricity generation and transmission infrastructure.

To date, OPG has not identified significant impacts attributed to climate change or extreme weather; however, it is recognized that efforts are required to: assess potential short-term and long-term changes and their associated risks; refine adaptation requirements; and monitor developments in climate science, adaptation activities, policy and standards, and regulatory requirements.

As part of OPG’s climate change adaptation plan, efforts have been made to increase awareness of the climate change risk, and identify and prioritize impacts to OPG’s operations. OPG is also focused on increasing resilience against climate vulnerabilities.

OPG continues to participate in climate change adaptation initiatives at the municipal, provincial, and federal level, and with its industry peers. OPG is also an affiliate member of the Ouranos consortium on climate change which allows the company to participate in climate change science research and access expertise related to climate science.

Climate change may impact the availability and quality of water resources.



NUCLEAR EMISSIONS

Radiation Protection

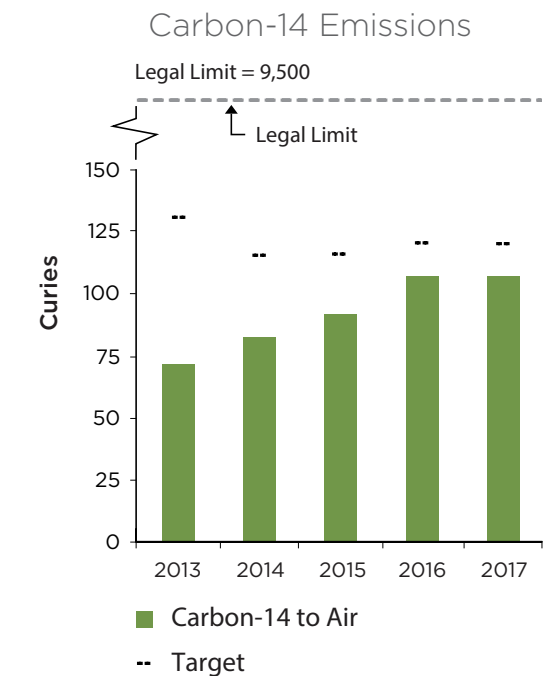
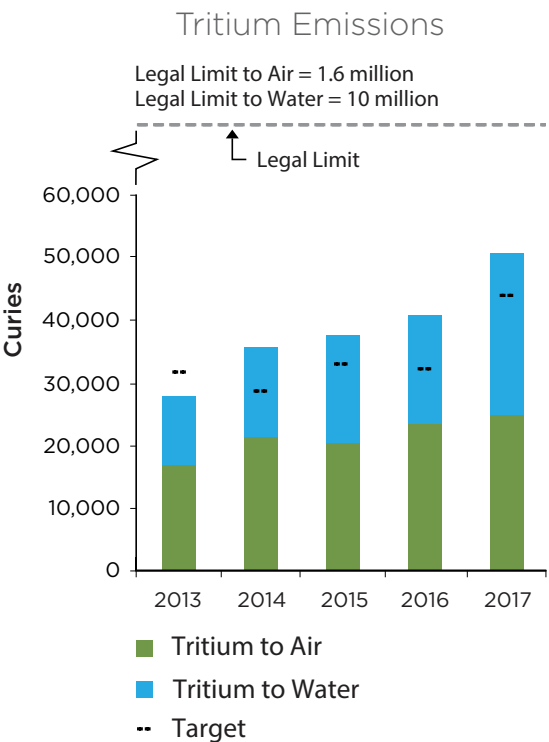
Small amounts of radioactivity are released to the environment as a result of nuclear reactor operation. OPG has a radiation protection program to ensure its releases to air and water remain as low as reasonably achievable. Station emissions are minimized and controlled through maintenance programs, operating procedures, and the use of equipment such as vapour recovery dryers, water purification systems, and air filters.

Stringent internal station targets for emissions are set based on past performance and external benchmarking to promote continual improvement. In 2017, the annual targets for tritium emissions were not achieved due to equipment performance issues; however, tritium emissions remained less than one per cent of legal limits. Improvement initiatives include dedicated teams to monitor and minimize emissions, and tritium reduction program development and innovations. Performance for carbon-14 emissions was better than target in 2017.

To ensure OPG’s nuclear operations do not adversely impact human health and the environment, Darlington Nuclear GS and Pickering Nuclear GS have environmental monitoring programs (EMPs) in the vicinity of the stations.

These programs are designed to assess impacts to the local population and the environment, demonstrate compliance with regulatory limits, validate the effectiveness of containment and effluent controls, and verify predictions made by environmental risk assessments. In 2017, results from the EMPs demonstrated the impact of operations on the local population and environment continues to be very low.

The Canadian Nuclear Safety Commission (CNSC) also maintains an independent environmental monitoring program to verify that the public and environment around CNSC-regulated nuclear facilities are not adversely affected by releases to the environment. CNSC sampling results have confirmed the public and environment around OPG’s nuclear generating stations are protected and there are no expected health impacts.



Radiation Dose to the Public

Public radiation exposure from OPG’s nuclear generating stations is estimated on an annual basis by assessing impacts to “critical groups” of people who live or work near the stations. Dose calculations consider the eating, drinking and living habits of these groups. This information is obtained through surveys and analysis of environmental samples taken from a variety of sources including air, water, milk, soil, sediments, vegetation, animal feed, eggs, poultry and fish. The group and age class with the highest dose is reported as the annual public dose for a given site. Dose is expressed in microsieverts (µSv) which is an international unit of radiation dose measurement.

In 2017, the public doses calculated for Darlington Nuclear GS and Pickering Nuclear GS were 0.7 and 1.8 µSv respectively. These doses are less than 0.2 per cent of the legal limit of 1,000 µSv per year, and approximately 0.1 per cent of the estimated average background radiation dose around Darlington Nuclear GS and Pickering Nuclear GS of 1,400 µSv per year.



LEARN MORE

Results of Environmental Monitoring

OPG’s annual environmental monitoring program reports, which include an assessment of radiation dose to the public, and quarterly environmental emissions data reports are available online.

[Browse reports.](#)

Darlington Nuclear GS turbine hall.



NUCLEAR WASTE

Low and Intermediate Level Radioactive Waste

Low and intermediate level radioactive waste (LILRW) is a by-product of nuclear generating stations. Low level waste consists of materials such as protective clothing, floor sweepings, mops and rags. Intermediate level waste includes materials such as resins, filters and used reactor components. LILRW from OPG-owned nuclear stations is safely stored at OPG’s waste management facility located at the Bruce nuclear site in the Municipality of Kincardine.

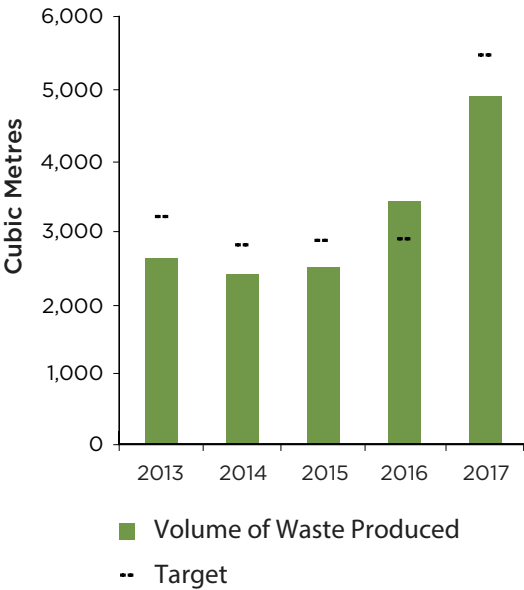
Minimizing the generation of waste not only reduces OPG’s environmental footprint, it also lowers costs associated with waste processing and storage. Strategies for reducing waste include sorting, decontaminating and/or reusing radioactive items, and only taking what is necessary into radioactive work areas. Additionally, low level waste is incinerated or compacted where possible to reduce volume. In 2017, OPG met its internal target for the production of LILRW. The target was adjusted upward for 2017 to account for work activities associated with the Darlington Refurbishment project.

OPG has proposed to build and operate a deep geologic repository (DGR) as a permanent solution to safely isolate and store about 200,000 cubic metres of LILRW at the secure Bruce nuclear site. High level used nuclear fuel would not be stored or managed in the DGR.

In 2015, a federal Joint Review Panel concluded that, given mitigation, there is unlikely to be significant environmental impact from the proposed project. Since 2015, OPG has

responded to additional information requests about the DGR from the federal Minister of Environment and Climate Change and the Canadian Environmental Assessment Agency. In August 2017, the Minister requested that OPG update its analysis of potential cumulative effects of the project on the Saugeen Ojibway Nation’s (SON) physical and cultural heritage. OPG continues its engagement with the SON towards securing their support for the project and to formulate a response to the request.

Low and Intermediate Level Radioactive Waste



LEARN MORE

Permanent Solution for High Level Waste

The NWMO is undertaking a multi-year site selection process for the eventual permanent disposal of used nuclear fuel in a deep geological repository.

[Read more.](#)

High Level Radioactive Waste

High level radioactive waste is used nuclear fuel that no longer contains enough fissionable uranium to heat water efficiently. Used fuel bundles are removed from the reactor and stored in water-filled pools at the station for at least ten years while their heat and radioactivity decline. Afterwards, they are transferred to dry storage containers made of concrete and steel. OPG is currently storing used nuclear fuel at the Pickering, Darlington and Bruce nuclear generating station sites. The Nuclear Waste Management Organization (NWMO) is responsible for the design and implementation of Canada’s plan for the long-term management of used nuclear fuel.

Dedicated Nuclear Funds

Pursuant to the Ontario Nuclear Funds Agreement between OPG and the Province of Ontario, OPG established a Used Fuel Segregated Fund and a Decommissioning Segregated Fund to fund future costs associated with the management of low and intermediate level radioactive waste, used nuclear fuel, and the eventual decommissioning of its nuclear stations and waste management facilities, including the stations leased to Bruce Power. OPG maintains these funds in third-party custodial and trust accounts that are segregated from the rest of OPG's assets.



Used nuclear fuel bay at Pickering Nuclear GS.

WATER MANAGEMENT

In 2017, OPG operated 66 hydroelectric plants and 241 dams on 24 river systems. Many of these structures are used to control or adjust water levels and flows in accordance with requirements that range from voluntary watershed management commitments to international treaties.

Regulating levels and flows helps maintain water levels for recreational, commercial or other water-based activities; prevents shoreline erosion and damage to infrastructure; reduces impacts to fish; and prevents damage to aquatic and terrestrial habitats. It can also play a significant role in flood mitigation and prevention in many watersheds. OPG uses hydrological and meteorological data to manage water levels, flows, and water storage. OPG strives to schedule water use to optimize electricity production and minimize controllable water spills due to surplus baseload generation conditions.

OPG works with municipalities and organizations, including the Ontario Ministry of Natural Resources and Forestry, the Ottawa River Regulation Planning Board, the Lake of the Woods Control Board, and the International Lake Ontario-St. Lawrence Board of the International Joint Commission on water management provisions for water levels and flows across the province.

In 2017, extreme rainfall was recorded across southern and eastern Ontario, resulting in record flows and high levels. This created abnormal conditions starting in the spring which continued throughout the year. The high flows introduced new water management and environmental challenges. During this time, OPG collected valuable data which will be used to further improve OPG's management of extreme weather events.



Mountain Chute GS



Celebrating Canada's 150th birthday

SOCIAL

OPG holds itself accountable to its core values of Safety, Integrity, Excellence, and People and Citizenship as outlined in its [*Code of Business Conduct*](#). OPG believes maintaining high standards for stakeholder engagement, health and safety, emergency preparedness, workplace culture, and community investment is essential to being a good employer and corporate citizen.

Topics in this section:

- Stakeholder engagement
- Indigenous relations
- Health and safety
- People and culture
- Corporate citizenship

STAKEHOLDER ENGAGEMENT

Building Trust and Relationships

OPG's licence to operate depends on meeting the environmental, social and economic expectations of stakeholders and local Indigenous communities. Accordingly, OPG has an engagement framework

for openly sharing and receiving information. This framework allows OPG to build trust, adapt to evolving stakeholder expectations and regulatory requirements, and make better business decisions.

GROUP	METHODS OF ENGAGEMENT AND FEEDBACK SYSTEMS	ENGAGEMENT EXAMPLES 2017
INDIGENOUS PARTNERS AND COMMUNITIES 	Community relations and outreach, capacity-building support including employment and business opportunities, Corporate Citizenship Program	- Engaged with the Mohawks of Akwesasne on potential energy storage facility at Cornwall. - Hosted information sessions on relicensing Pickering Nuclear GS. - Finalized plans for the Indigenous Opportunities in Nuclear program. - Trained OPG staff on Indigenous relations. - Sponsored 84 Indigenous community initiatives.
LOCAL COMMUNITIES 	Website, social media, visitor centres, community advisory councils, open houses, facility tours, direct mail, TV (select communities), print, radio and online advertising, hearings, consultations, participation in community events, Corporate Citizenship Program, community research	- Distributed 150,000 emergency awareness kits to homes and businesses within 10 kilometres of the Pickering and Darlington nuclear stations. Continued the distribution of potassium iodide (KI) pills. - Hosted open houses at the Darlington and Pickering nuclear stations and on select river systems. - Held a “Virtual Town Hall” on operations in northeastern Ontario. - Hosted meetings with Darlington and Pickering community advisory councils. - Issued quarterly nuclear performance reports. - Provided community investment support. - Conducted provincial tracking research. - Issued quarterly electronic project updates and performance newsletters to stakeholders.
MEDIA 	News releases, Twitter, 24/7 media desk coverage, media tours of stations, outreach to media stakeholders	- Issued 42 news releases on a range of topics including water safety, plant operations, financial results, environmental and community initiatives, Indigenous outreach, Darlington Refurbishment, and other projects. - Hosted more than 27 media events and tours.
SUPPLIERS AND CONTRACTORS 	Internet web page on opg.com, supplier pre-qualification process, labour requirements, face-to-face meetings	- Held numerous supplier events with local officials across Ontario in support of Darlington Refurbishment. - On-site service providers register with ISNetworld. - Promoted improvement in supplier performance and quality of parts and services.
INDUSTRY GROUPS 	Working groups, organizations, meetings, conferences	Sponsor and member of a variety of organizations such as the Canadian Nuclear Association, CANDU Owners Group, Canadian Electricity Association, Ontario Waterpower Association, Ontario Biodiversity Council, and Canadian Council of Aboriginal Business.

GROUP	METHODS OF ENGAGEMENT AND FEEDBACK SYSTEMS	ENGAGEMENT EXAMPLES 2017
GOVERNMENT AND GOVERNMENT AGENCIES 	Meetings, hearings, consultations, correspondence	- Engagement with local, provincial and federal members of government, and groups like the Mayor’s Nuclear Technology Caucus and Great Lakes Caucus. - Facilitated tours and briefings on OPG’s operations across the province with representatives from all parties. - Supported OPG’s 2016 application to the Ontario Energy Board for new regulated prices, which included participation in the public hearing process. - Meetings with Independent Officers of the Legislative Assembly, such as the Environmental Commissioner of Ontario, Office of the Auditor General, and Ontario’s Financial Accountability Office.
NON-GOVERNMENT ORGANIZATIONS 	Meetings, hearings, consultations, open houses	- Supporter and member of organizations such as Ontario Community Newspaper Association and Lake Ontario Waterkeepers. - Partner and supporter of environmental and biodiversity initiatives.
EMPLOYEES 	Intranet, newsletters, regular face-to-face meetings, email, videos, posters, ad hoc surveys, information sessions	- PowerNet intranet site. - PowerNews company newsletter. - Senior management emails, blogs and video messages. - Regular safety and department meetings. - Yammer social network.
ELECTRICITY RATEPAYERS, GENERAL PUBLIC 	Public hearings, earned and paid media including TV water safety public service announcements, extensive digital and social media presence, open houses, visitor centres, print publications	- Frequent updates on opg.com. - Relaunched <i>The Power of Water</i> safety campaign. - Campaign to raise awareness of the benefits of Darlington Refurbishment. - Advertised in major and community newspapers and industry magazines. - Issued various publications including sustainability report, financial reports, performance reports and PowerNews. - Frequent postings to social media, i.e., Twitter, Facebook, Instagram, and LinkedIn. - Distributed new stories and content weekly. - Used video to show behind the scenes at stations.



LEARN MORE

Darlington Refurbishment Open House

An open house event was held in November 2017 to give the public an opportunity to learn more about the Darlington Refurbishment project and the nuclear power industry. [Watch a video recap.](#)



Renowned Akwesasne artist John B. Thomas's 21-foot long mural depicting the daily life of the Mohawk people living on the river in the late 1700s at OPG's St. Lawrence Power Development Visitor Centre in Cornwall.

INDIGENOUS RELATIONS

Outreach Activities

OPG is committed to building and growing mutually beneficial working relationships with Indigenous communities near its current and future operations. These relationships are built on a foundation of respect for the culture, and the customs and rights of Indigenous peoples.

OPG meets regularly with Indigenous community representatives and members to share information, discuss development initiatives and review planned project activities. In 2017, outreach activities included:

- Engagement with First Nations in southwestern Ontario regarding the demolition of the retired Lambton and Nanticoke generating stations, as well as applications for potential energy storage facilities in Sarnia and Wallaceburg.
- Engagement with the Mohawks of Akwesasne regarding an application for a potential energy storage facility at Cornwall. Discussions were held regarding the return of four islands to the community – a commitment made in the Final Settlement Agreement.
- Information sharing sessions with representatives of the Williams Treaties First Nations, the Mohawks of the Bay of Quinte, and Métis Nation of Ontario Region 8 about Pickering Nuclear GS relicensing and environmental reporting.
- Ongoing discussions with Saugeen Ojibway Nation, the Métis Nation of Ontario, and the Historic Saugeen Métis on nuclear waste operations and the proposed deep geologic repository for low and intermediate level radioactive waste at the Bruce nuclear site.
- Finalizing plans for the Indigenous Opportunities in Nuclear program which will use the Darlington

Refurbishment project as a catalyst to increase the number of Indigenous people represented in the nuclear industry through apprenticeships. The Darlington Refurbishment team is working with vendors and unions in conjunction with Kagita Mikam Aboriginal Employment and Training, as well as the Aboriginal Apprenticeship Board of Ontario.

- Indigenous Relations training sessions for OPG staff were held across the company. Positive feedback has resulted in the continuation of the program in 2018.
- Provided capacity funding for a micro-hatchery at the Mattagami First Nation's Mary Jane Naveau Memorial School which gave elementary school students the opportunity to observe thousands of walleye eggs hatch into fry.

Building relationships with Indigenous communities also means investing in their young people. OPG's Native Circle is pleased to award the John Wesley Beaver Memorial Award each year to a female and male Indigenous post-secondary student. The 2017 recipients were Bryer Twiss, originally from Portage La Prairie, Manitoba, but now a resident of Ontario, and Cameron Hartman from Thunder Bay.

The Native Circle also organizes OPG's annual National Aboriginal Day celebrations to support cultural awareness. In 2017, celebrations were held at the Darlington Energy Complex with cultural programming provided by members of the Williams Treaties First Nations, and at the Kipling Office Complex where the Native Canadian Centre acted as the host drum.



LEARN MORE

Sue Prince, Indigenous Relations Advisor

Sue is a member of Mattagami First Nation who has been acting as a liaison between Indigenous communities and OPG since 2012.

[Read more.](#)



Left and top right: National Aboriginal Day celebrations. Bottom right: OPG was proud to present the 2017 John Wesley Beaver Award to Bryer Twiss and Cameron Hartman.

Economic Partnerships

Through partnerships with Indigenous communities and firms, OPG has developed a number of projects to produce clean, renewable electricity while providing education, training, employment and contract opportunities to surrounding Indigenous communities. Most recently, construction of the Peter Sutherland Sr. hydroelectric station was completed in spring 2017 in partnership with Taykwa Tagamou Nation, and OPG is developing the Nanticoke Solar Facility with partner Six Nations of the Grand River Development Corporation..

OPG continues to enhance its business relationships with Indigenous communities through its commitment to the Canadian Council for Aboriginal Business's Progressive Aboriginal Relations (PAR) program. OPG will make a submission for Gold level certification in 2018. OPG is also a major sponsor of the Waubetek Business Awards, and recently launched an initiative to improve relations with Indigenous communities by proactively identifying supply and joint venture opportunities for Indigenous businesses.

HEALTH AND SAFETY

Employee Safety

OPG has a long-standing commitment to employee and contractor safety with an ultimate goal of zero injuries. Its commitment to safety excellence extends beyond a conventional framework of standards and procedures to include transformational cultural initiatives, mechanisms for continual improvement, and a team-oriented approach. An example is OPG's "iCare Enough to Act" safety campaign that profiles individual employees talking about what safety means to them. While OPG maintains a robust health and safety management system, it is employees' actions that will propel the company to the next level of safety performance.

Workplace safety performance is measured using two primary indicators, All Injury Rate (AIR) and Accident Severity Rate (ASR). AIR measures the number of injuries involving employees that result in lost time or that require medical treatment. OPG's 2017 AIR was 0.48 injuries per 200,000 hours worked, which was the third best annual performance in the history of the company. ASR measures the number of days lost due to injuries. The ASR for the year was 3.57.

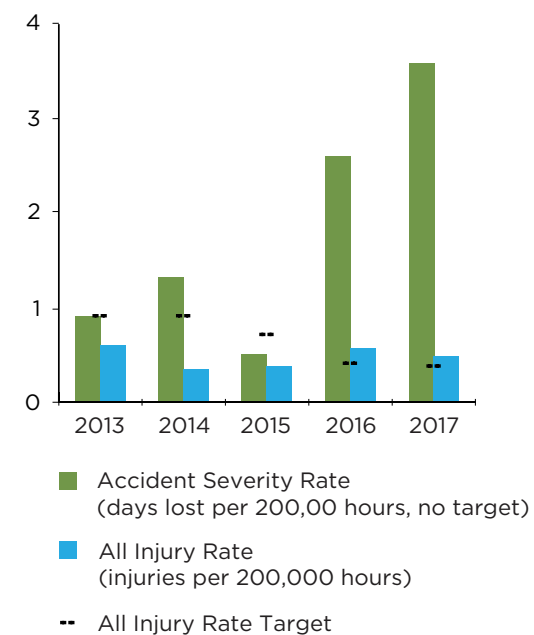
"A workplace should be safe. It should be an environment where we all feel valued, respected and secure. At OPG, employee safety has been and will always remain our number one priority. Our goal is to have a workplace that's safe in every sense of the word, and our responsibility to our employees doesn't stop at the end of the work day."

- JEFF LYASH, OPG PRESIDENT AND CEO

OPG will continue its injury reduction plan in 2018 by determining causal factors and focusing on improvement mechanisms. It will also place greater emphasis on measuring leading indicators as opposed to lagging indicators. The intent is to focus on behaviours and align with the "iCare" culture.



Workplace Safety



Employee Health

OPG's greatest asset is its people. Its Total Health strategy is intended to protect employees by fostering a health culture that helps them and their families pursue their optimal health outcome. OPG feels that "Total Health" builds a more resilient and engaged workforce, reduces the costs associated with ill health, and makes OPG a more attractive place to work.

In 2017, OPG continued its partnership with Ontario Shores, one of four Ontario Psychiatric Hospitals, to deliver mental health first aid training that is accredited by the Mental Health Commission

Public Water Safety

OPG staff work closely with partners in site communities to promote public safety around dams and hydroelectric stations. OPG properties and facilities are clearly marked with warning signs, and barriers are in place to prevent access. During 2017, OPG continued its water safety campaign with a series of public service announcements illustrating the danger of water near hydroelectric dams and generating stations. The message remains "Stay Clear, Stay Safe."

of Canada. The goal is to educate staff and help them identify signs of mental health problems in co-workers, friends, family, and even themselves. This training also provides tools to support an individual, and direct them to appropriate help and treatment. Launched in 2016, OPG is committed to training 2,000 employees by the end of 2018.



Emergency Preparedness

OPG's emergency management program is designed to ensure the company can manage an emergency in a timely and effective manner. A comprehensive emergency preparedness plan is in place to protect employees and the public, the environment, property and assets, and operational continuity. In 2017:

- OPG's Security and Emergency Services staff continued to provide 24/7 emergency response coverage at the Darlington and Pickering nuclear stations.
- OPG - along with regional, provincial and municipal emergency preparedness groups - distributed 150,000 emergency preparedness kits to residents and businesses within 10 kilometres of the Pickering and Darlington nuclear stations.
- The Pickering and Darlington nuclear station fire teams switched to a radio system that enhances interoperability with nearby fire services.

- OPG participated in the Province of Ontario's public consultation process to revise the Provincial Nuclear Emergency Response Plan (PNERP). The updated PNERP master plan is the framework for enhanced emergency preparedness in the unlikely event of a nuclear emergency in Ontario.





Left: Emergency preparedness exercises ensure that participants are able to work together to help safeguard the health and safety of the public in the event of an emergency. Right: Nuclear security officer.



OPG also hosted the following emergency exercises as part of its commitment to continuous improvement:

- Exercise Unified Control (ExUC) simulated a response to a severe accident at Pickering Nuclear GS. The two-day exercise involved the participation of OPG's emergency response organization and more than 30 partner organizations at the municipal, regional, provincial and federal levels.

- GridEx IV, a North American electricity industry exercise, successfully demonstrated OPG's preparedness to respond to simulated cyber and physical incidents which would affect the reliability of the North American Bulk Electric System.
- An infectious disease exercise tested OPG's readiness to respond to an incident that could have an impact on employee attendance and continuity of operations.

PEOPLE AND CULTURE

Employee Engagement

OPG aspires to be a company where people work together with a sense of ownership and involvement; where employees at all levels have opportunities to expand their skills and understanding, in an environment where information flows freely.

Employee programs and activities are in place to create a sense of pride in being an OPG employee and to foster teamwork across the organization. Programs include the Power of You employee recognition awards, the annual charity campaign, and numerous events that celebrate OPG's cultural diversity and promote an inclusive workplace.

OPG also has an active and robust talent and succession planning process. In support of building leadership talent, OPG offers an "Accelerate" development program, which provides high-potential employees with the opportunity to learn, grow and progress their career.

Employees are kept up to date on business and operational activities by leveraging several communication tools such as the company's intranet site, newsletters, face-to-face rollouts, and videos from executives to provide ongoing performance information, and highlight accomplishments by teams and individuals.

In 2017, OPG continued to progress its culture transformation. Work during the early part of the year was focused on defining the culture shifts needed to enable OPG to achieve its goals and strategic priorities, as well as educating employees on these shifts. The remainder of the year was focused on execution. Good progress was made in streamlining business processes and driving outcomes and results. This work will continue into 2018.

Diversity and Equity

OPG demonstrates its commitment to diversity and inclusion by incorporating these priorities in its strategic goal to build a diverse, healthy, engaged workforce, and the culture to succeed.

Electricity Human Resources Canada has recognized these efforts through a number of industry awards, mostly notably the Workplace Diversity and Inclusion Champion Award. While honoured to be recognized in this field, there is more work to do. Achievement of OPG's diversity goals will be accomplished through enterprise-wide dedication and a variety of initiatives including:

- Training and workshops for employees on the fundamentals of diversity and inclusion;
- Formation of the Indigenous Relations Recruitment and Retention Working Group; and

- The creation of special programs in recruitment, development and advancement to ensure our employee population reflects the communities we serve.

To promote diversity in OPG's leadership, the Board of Directors has set a target for diverse representation on the Board of 50 per cent, including a target of 40 per cent women on the Board by 2019. Diversity is defined as: women, Aboriginal peoples, people with disabilities, and visible minorities. At the end of 2017, overall diversity of the Board was at 50 per cent and representation of women on the Board was 29 per cent. At the executive level, OPG tracks and monitors diversity succession planning metrics and strives to have a diverse candidates list for senior management positions.



OPG strives to create a workforce that reflects diverse populations of the communities in which it operates.

CORPORATE CITIZENSHIP

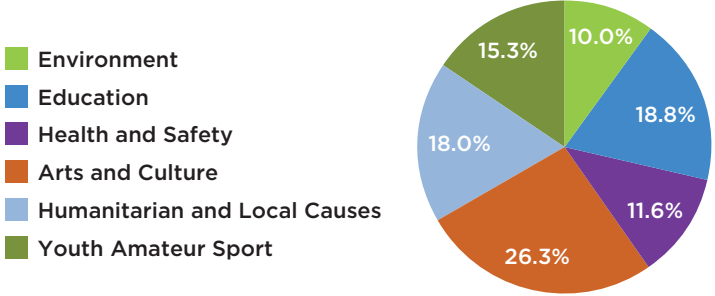
OPG has generating stations in communities across Ontario from Kenora to Cornwall. As a publicly owned generator with a history of service that goes back for more than 100 years, OPG strives to be an engaged community member, helping to contribute to host community well-being.

The Corporate Citizenship Program (CCP) is one way OPG demonstrates its commitment to corporate social responsibility by providing community investment (charitable, non-profit) support to grassroots initiatives in the host communities in which OPG operates. OPG believes this is essential to being a good corporate citizen and neighbour.

In 2017, OPG provided CCP Community Investment (CI) support to over 800 initiatives in the program focus areas of: education (including 250 student awards); environment; and community (youth amateur sport, arts and culture, health and safety, humanitarian and local causes) including support of Indigenous initiatives. With average annual program CI totalling \$2.4 million, and 75 per cent of OPG's annual contributions between \$100 and \$2,500, OPG ensures support benefits a broad spectrum of community needs and leverages good value.

Featured below are a few examples of the valuable work done in 2017 by OPG's community partners. It is their commitment and hard work that is contributing to community well-being and sustainability.

2017 Corporate Citizenship Program
Community Investment by Focus Area



Corporate Citizenship Partnership Profiles

ENVIRONMENT

Canadian Peregrine Foundation

At the Pickering Nuclear GS, two returning peregrine falcons moved up to some quieter real estate in 2017. The same two parent birds have called Pickering Nuclear home since 2013, returning to the site every March to nest and raise their chicks. The female falcon laid four eggs in a gravel-filled nesting box placed on a ledge close to the station's Unit 8 building rooftop. OPG works with the Canadian Peregrine Foundation (CPF) and the Ontario Ministry of Natural Resources and Forestry to tag the peregrine fledglings before they fly off around July. It is all in an effort to keep track of the migratory bird, which is a species of special concern and is in recovery with numbers steadily increasing from the 1960s when the species was classified

as extirpated in Ontario. Since 2000, OPG has proudly supported CPF's research, recovery and environmental education programs. This includes the "Project School Visit" program for primary students which promotes an understanding of birds of prey, and the importance of environmental stewardship and wildlife habitat. To date, with OPG's support, CPF have delivered over 900 school visits across OPG host communities benefiting tens of thousands of students.

To learn more, [read a news story](#) about the peregrines at Pickering Nuclear or visit www.peregrine-foundation.ca



Left: Resident Pickering Nuclear peregrine falcon.

Right: Canadian Peregrine Foundation's Project School Visit program is helping to foster future environmental stewards.



EDUCATION
Scientists in School

Since 1989, Scientists in School (SiS), Canada's leading non-profit science education charity has reached more than 8 million elementary students through its half-day classroom workshops that inspire young minds and build literacy in STEM (Science, Technology, Engineering and Math). Students become junior scientists participating in hands-on activities with visiting science and engineering professionals. Over 56 curriculum-aligned STEM workshop topics are offered like "Electricity - Get Charged" and "What in the World is Matter?" OPG has been a proud partner of SiS since 1993. Each year, with OPG's support, SiS engages over 135,000 students and delivers over 5,000 classroom workshops across OPG's host communities, helping to foster young people's interest at an early age in STEM in order to inspire our future energy sector and STEM leaders.



Students study the basics of electricity during a Scientists in School classroom workshop.

To learn more, [read a news story](#) about how Scientists in School inspires young minds or visit www.scientistsinschool.ca

ARTS AND CULTURE
First Nations Peace Monument

At DeCew House Heritage Park in Thorold, the First Nations Peace Monument stands as a symbol of recognition of the important role First Nations played, and continue to play, in Canada's history. Spearheaded by the Friends of Laura Secord community group, the monument was unveiled in October 2017. The monument, with its circular structure consisting of two curved walls, was designed by world-renowned Blackfoot architect Douglas Cardinal. The monument is located near the site where Laura Secord, with the help of Mohawk warriors, warned colonial British forces of an impending American invasion during the War of

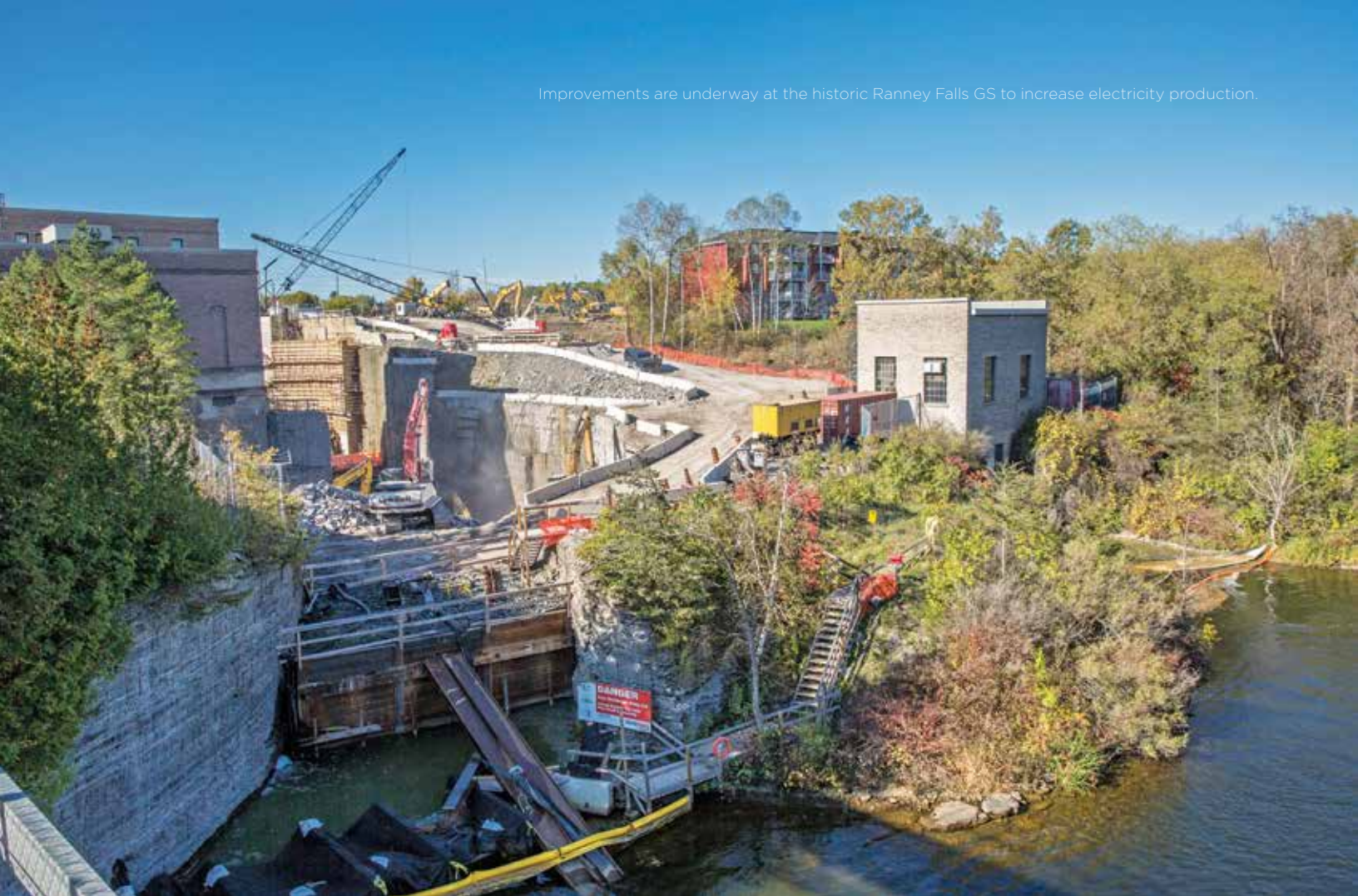
1812. Following Secord's warning, a contingent of warriors from Kahnawake, the Grand River and other First Nations, bravely secured victory at the Battle of Beaver Dams, arguably changing the course of the war that defined Canada. The monument was made possible by the hard work and generosity of countless individuals and organizations which include OPG's Niagara Operations.

To learn more, [read a news story](#) about the First Nations Peace Monument or plan a visit at www.friendsoflaurasecord.com



Douglas Cardinal, world-renowned Blackfoot architect and designer of the First Nations Peace Monument, DeCew House Heritage Park, Thorold.

Improvements are underway at the historic Ranney Falls GS to increase electricity production.



ECONOMIC

OPG focuses on providing maximum value to the people of Ontario by generating reliable electricity at a price that moderates overall rates for electricity customers. OPG also provides economic value to Ontarians through employment, the purchase of goods and services, and contributions to government revenues.

Topics in this section:

- Financial strength
- Cost of electricity
- Reliability of assets
- Renewal and development of assets
- Long-term energy plan
- Supply chain
- Local economic impact

FINANCIAL STRENGTH

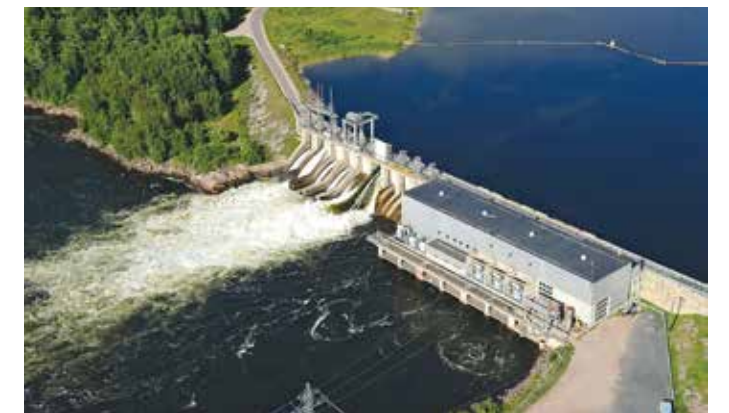
Financial Performance

As a commercial enterprise, OPG's financial priority is to achieve a consistent level of strong financial performance that delivers an appropriate return on the Shareholder's investment and positions the company for future expansion. Inherent in this priority are four objectives:

- Increase revenue, reduce costs and achieve appropriate return.
- Ensure availability of cost-effective funding for operational needs, generation development projects and other business opportunities, and long-term obligations.
- Pursue opportunities to expand the existing core business and capitalize on new growth paths.
- Manage risks.

OPG's net income attributable to the Shareholder was \$860 million for 2017, compared to \$436 million in 2016. The increase was the result of a gain on sale of OPG's head office premises and associated parking facility, the impact of the Ontario Energy Board's (OEB) decision on OPG's application for new regulated prices issued in December 2017, and higher earnings on the Nuclear Segregated Funds.

OPG manages an array of risks to mitigate potentially unfavourable impact on the company's financial performance. This includes risks related to rate regulation, financial markets and long-term obligations. OPG is also exposed to risks such as weak electricity demand, displacement of generation by competitors, and financial risk associated with energy trading. Detailed information about the company's financial risks is available in OPG's [2017 Annual Report](#).



The new rates set by the OEB ensure OPG can continue to deliver clean, safe and reliable energy.

COST OF ELECTRICITY

Ontario's Low-Cost Generator

OPG provides about half the power produced in Ontario, at a price that is approximately 40 per cent less than the average of other generators. This lower cost helps moderate the price customers pay.

The OEB sets the prices for electricity generated from OPG's regulated nuclear and hydroelectric facilities. Approximately 90 per cent of OPG's revenue comes via regulated rates. OPG is the only electricity generator in the province that undergoes a public review of its rates by the OEB. The average sales price for OPG's regulated nuclear generation segment during 2017 was 7.1 cents per kilowatt hour (¢/kWh), compared to 6.9 ¢/kWh during 2016. The average sales price in 2017 for the regulated hydroelectric segment was 4.2 ¢/kWh, compared to 4.4 ¢/kWh during 2016.

Electricity generated from most of OPG's unregulated assets is subject to Energy Supply Agreements (ESAs) with the Independent Electricity System Operator (IESO). Regulated rates and ESAs provide stable and predictable revenue streams, compared to potential fluctuations in revenue caused by increases or decreases in energy market prices.

LEARN MORE

OPG Payment Amounts

Information about the OEB's December 2017 decision on OPG's application for new regulated prices can be found at

www.oeb.ca

RELIABILITY OF ASSETS

Ensuring Reliability

OPG strives to operate and maintain its facilities to optimize the reliability of its generating assets. OPG manages reliability risks through equipment maintenance, inspection and testing programs, and by conducting engineering reviews and station condition assessments to identify and prioritize short-term and long-term requirements to sustain or improve performance.

OPG reports Nuclear Unit Capability Factor (UCF) as the reliability measure for its nuclear stations, Hydroelectric Availability as the reliability measure for its hydroelectric generating units, and Thermal Equivalent Forced Outage Rate (EFOR) as the reliability measure for its thermal stations.

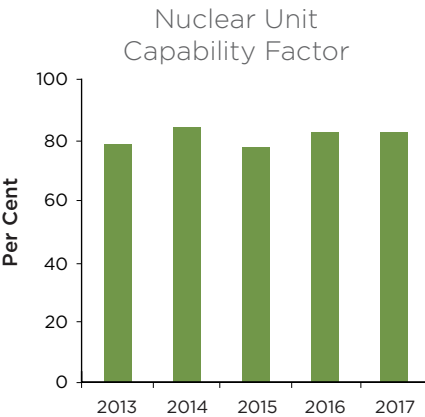


The Canadian Nuclear Safety Commission awarded the Darlington and Pickering nuclear stations its highest safety rating of "fully satisfactory."

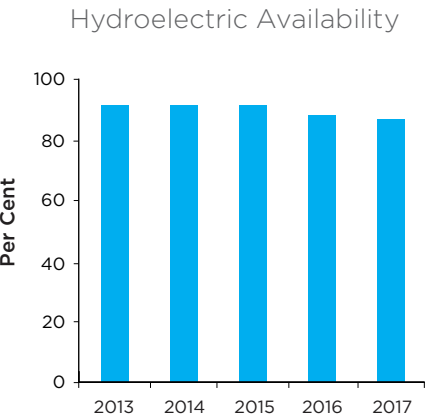
The UCF at Darlington Nuclear GS decreased in 2017 compared to 2016, primarily due to a higher number of planned outage days in 2017, largely driven by constraints related to the transition of the station's operating units toward refurbishment. The UCF excludes Unit 2 while it is undergoing refurbishment. At Pickering Nuclear GS, the UCF increased in 2017 compared to 2016, primarily due to outage cycle optimization, favourable unit conditions and execution of planned outage work resulting in a lower number of unplanned and planned outage days at the station compared to 2016.

The availability of OPG's hydroelectric generating stations decreased during 2017 compared to 2016. The decrease was primarily due to a higher number of unplanned outage days at the Northwest and Niagara regions' hydroelectric stations and planned outage days at the Lower Mattagami River generating stations, partially offset by higher availability from the Sir Adam Beck Pump GS due to a higher number of planned outage days in 2016 reflecting the refurbishment of the station's reservoir.

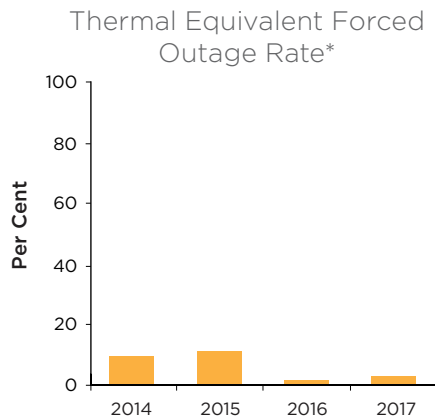
The higher Thermal EFOR in 2017, compared to 2016, was primarily due to a higher number of unplanned outage days at a Lennox GS unit as a result of a transmission outage and a generator-related outage in 2017.



Unit Capability Factor represents energy generated, adjusted for external constraints such as transmission or demand limitations, as a percentage of potential maximum generation over a specified period. (Good = ↑)



Availability represents the amount of time generating units are capable of providing service as a percentage of the total time for a respective period. (Good = ↑)



Equivalent Forced Outage Rate represents the amount of time that generating units are forced out of service as a percentage of the amount of time available to operate. (Good = ↓)

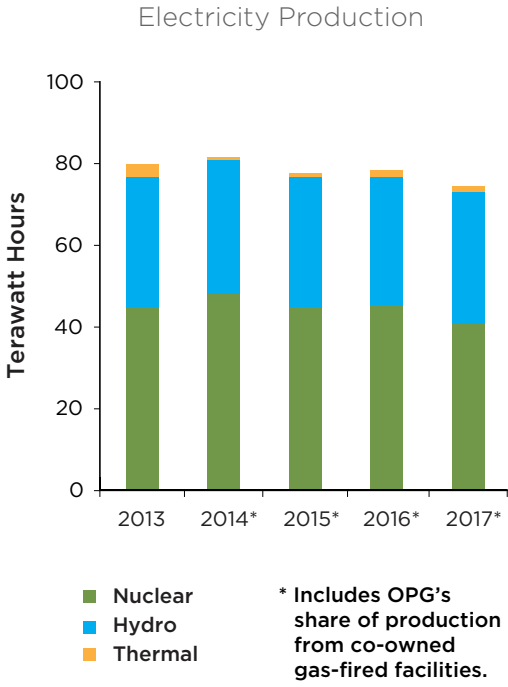
* Key indicator as of 2014.

Electricity Production

Total electricity generated decreased in 2017 to 74.1 terawatt hours (TWh) from 78.2 TWh in 2016. The decrease was expected and primarily due to Unit 2 at Darlington Nuclear GS being removed from service in October 2016 for refurbishment. This decrease in electricity generation was partially offset by an increase in generation from Pickering Nuclear GS, as well as higher electricity generation from the regulated hydroelectric segment.



Barrett Chute GS.



RENEWAL AND DEVELOPMENT OF ASSETS

OPG produces electricity from a diversified portfolio of generating assets. In 2017, OPG continued to invest in infrastructure renewal and modernization and to pursue projects to increase generation capacity.

Nuclear

Darlington Refurbishment Project

Refurbishment of Darlington Nuclear GS will ensure the continuation of the station's role as a key supplier of clean, safe and affordable power for another 30 years. The scope of the project includes infrastructure upgrades at the Darlington site and the replacement, repair and maintenance of station components. The total project budget is \$12.8 billion, including capitalized interest and escalation, and the project is scheduled to be completed by 2026.

In 2017, the Darlington Refurbishment project continued on schedule and on budget. Defuelling and islanding of the first unit to be refurbished, Unit 2, was completed in the first half of 2017. The disassembly and removal of reactor components commenced in the third quarter of 2017 and was completed in May 2018, signifying the completion of the second major segment of the project.



In addition to the activities on Unit 2, OPG is progressing with planning activities on the refurbishment of Unit 3 and ensuring that lessons learned from the Unit 2 refurbishment are being incorporated. In February 2018, the Government of Ontario confirmed its commitment to proceed with the refurbishment of Unit 3.



OPG and its partners are working to complete the Darlington Refurbishment safely, on time and on budget.

Pickering Nuclear Continued Operations

Pickering Nuclear GS has been safely producing electricity for more than 40 years, and OPG’s objective is to maximize the safe and reliable operating life of the station. Under OPG’s plan, all six operating units at the station would operate to 2022, at which point two units would be shut down and the remaining four units would continue to operate to 2024.

OPG has conducted assessments to demonstrate that extending operations at Pickering Nuclear GS is safe, technically feasible and has economic benefits for Ontario. Having Pickering available will provide Ontario with a source of baseload electricity during nuclear unit refurbishments at the Darlington Nuclear GS and Bruce Power stations, reducing the need for gas-fired capacity and energy imports. Running Pickering Nuclear GS until 2024 will save electricity customers up

to \$600 million, benefit Ontario by contributing over \$12 billion to the economy, and avoid an estimated 17 million tonnes of carbon dioxide emissions.

Extending Pickering’s operating life requires approval from the Canadian Nuclear Safety Commission (CNSC). OPG filed the Pickering licence renewal application in August 2017 for the CNSC’s approval in 2018. Following a two-part public hearing, the CNSC announced its decision to renew Pickering’s licence for a 10-year period. The licence allows for commercial operations until the end of 2024, to be followed by post-shutdown activities and a stabilization stage until 2028. OPG will continue to work closely with its community partners to ensure the station is operated reliably, and to the highest standards of safety, security and environmental stewardship.



The continued operation of the Pickering station will support over 7,500 jobs each year.

Hydroelectric

Peter Sutherland Sr. GS

In 2017, OPG and its partner Coral Rapids Power, a wholly-owned company of the Taykwa Tagamou First Nation, completed construction of Peter Sutherland Sr. GS, a two-unit hydroelectric station that has 28 MW of generating capacity. The station was placed in service at the end of March 2017, ahead of the originally planned schedule and below the approved budget of \$300 million. The station provides clean, renewable and reliable hydroelectric power for up to 25,000 homes. Coral Rapids Power has a 33 per cent interest in Peter Sutherland Sr. GS.

LEARN MORE

Peter Sutherland Sr. GS

After almost two years of construction and eight years of planning, OPG’s newest station is now powering northeastern Ontario. [Read more.](#)



Sir Adam Beck Pump GS Reservoir Refurbishment



Sir Adam Beck Pump GS.

The Sir Adam Beck Pump GS plays an important role in generating flexible power for Ontario. The station uses electricity in off-peak periods to pump water into its 750-acre reservoir, which can then be released to generate electricity when demand is high. The reservoir refurbishment project, which began in April 2016, was completed in February 2017 ahead of the originally planned in-service date and below the approved budget of \$58 million. The refurbishment is expected to add another 50 years of life to the reservoir.

Ranney Falls GS

In 2017, OPG began construction work on a 10 MW single-unit powerhouse on the Ranney Falls GS site. The new unit will replace an existing unit that reached its end of life in 2014. As of the end of 2017, excavation was completed, construction continued in the expanded forebay, powerhouse and spillway area, and concrete placement of the new powerhouse and the spillway integrated structure was in progress. The project’s expected in-service date is in the fourth quarter of 2019, with a budget of \$77 million. The project is tracking on schedule and on budget.

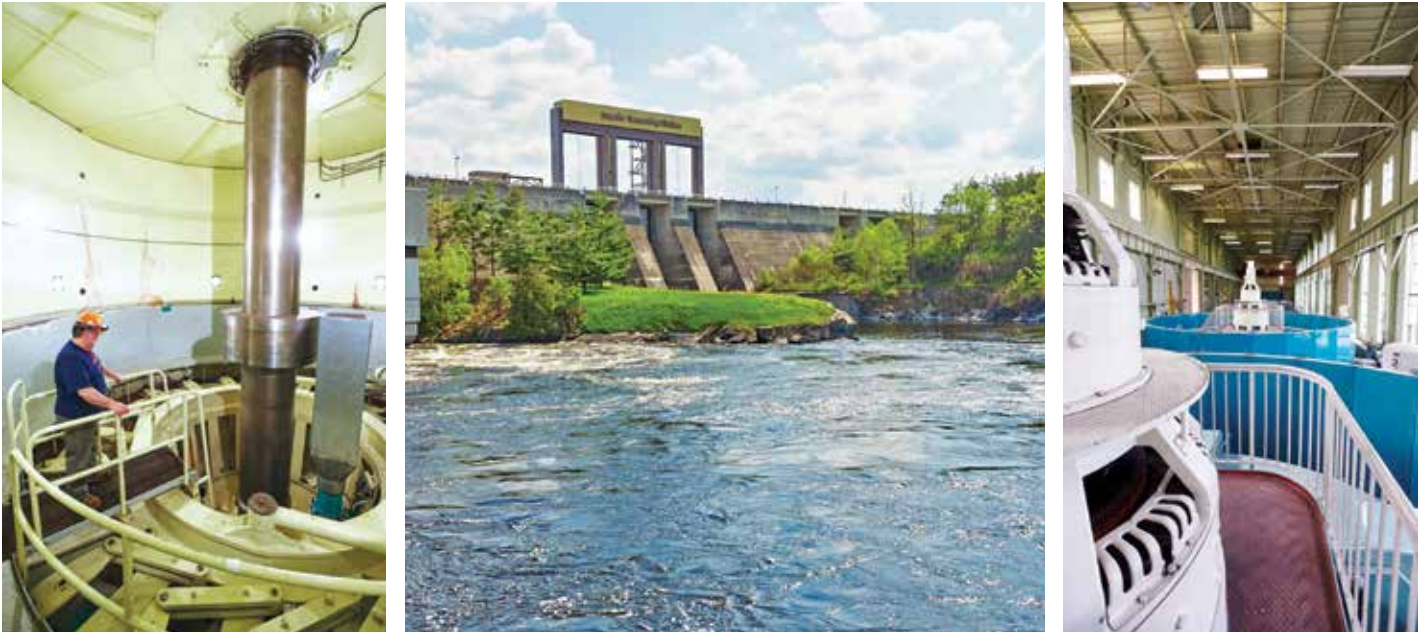
“We’re proud of our role as stewards of heritage assets. Ranney Falls is the next in a long line of OPG hydroelectric stations to be refurbished and upgraded. Electricity customers will benefit from this investment for generations.”

- MIKE MARTELLI, OPG PRESIDENT,
RENEWABLE GENERATION

Overhauls and Improvements

OPG’s hydroelectric stations are the oldest and most established components of OPG’s energy portfolio and have formed the basis of Ontario’s power supply for more than a century. As part of its commitment to operational excellence, OPG continues to overhaul and upgrade its existing hydroelectric generating fleet. During 2017, OPG worked on projects at Sir Adam Beck Pump GS,

Sir Adam Beck 1 GS, Harmon GS, DeCew Falls GS, Little Long GS, and Lower Notch GS. OPG also completed the replacement of the Shebandowan Lake Control Dam at the Kakabeka Falls GS and commenced definition phase work for the Water Conveyance System project to rehabilitate the Sir Adam Beck 1 GS canal and associated structures.



OPG’s hydroelectric assets have long service lives and, with either maintenance efforts or rebuilding, will continue to supply electricity for the foreseeable future.

Nanticoke Solar Facility

The project encompasses the construction of a 44 MW solar facility at OPG’s Nanticoke site and adjacent lands under a contract with the Independent Electricity System Operator, through Nanticoke Solar LP, a partnership between OPG and a subsidiary of the Six Nations of the Grand River Development Corporation. Significant contracts for equipment and engineering construction services have been executed and site preparation has commenced. The facility is expected to be completed in the first quarter of 2019, with a budget of \$107 million.

Green Bonds

In early 2018, OPG developed a Green Bond Framework under which it will issue multiple green bonds and use the proceeds to finance and/or refinance eligible projects that focus on renewable energy generation and energy efficiency and management. OPG’s green bond proceeds will be held in a segregated account and money will be released as eligible projects require funding. OPG’s inaugural green bond issuance focuses solely on hydro projects. More information about OPG’s green bonds is available on www.opg.com.

LONG-TERM ENERGY PLAN

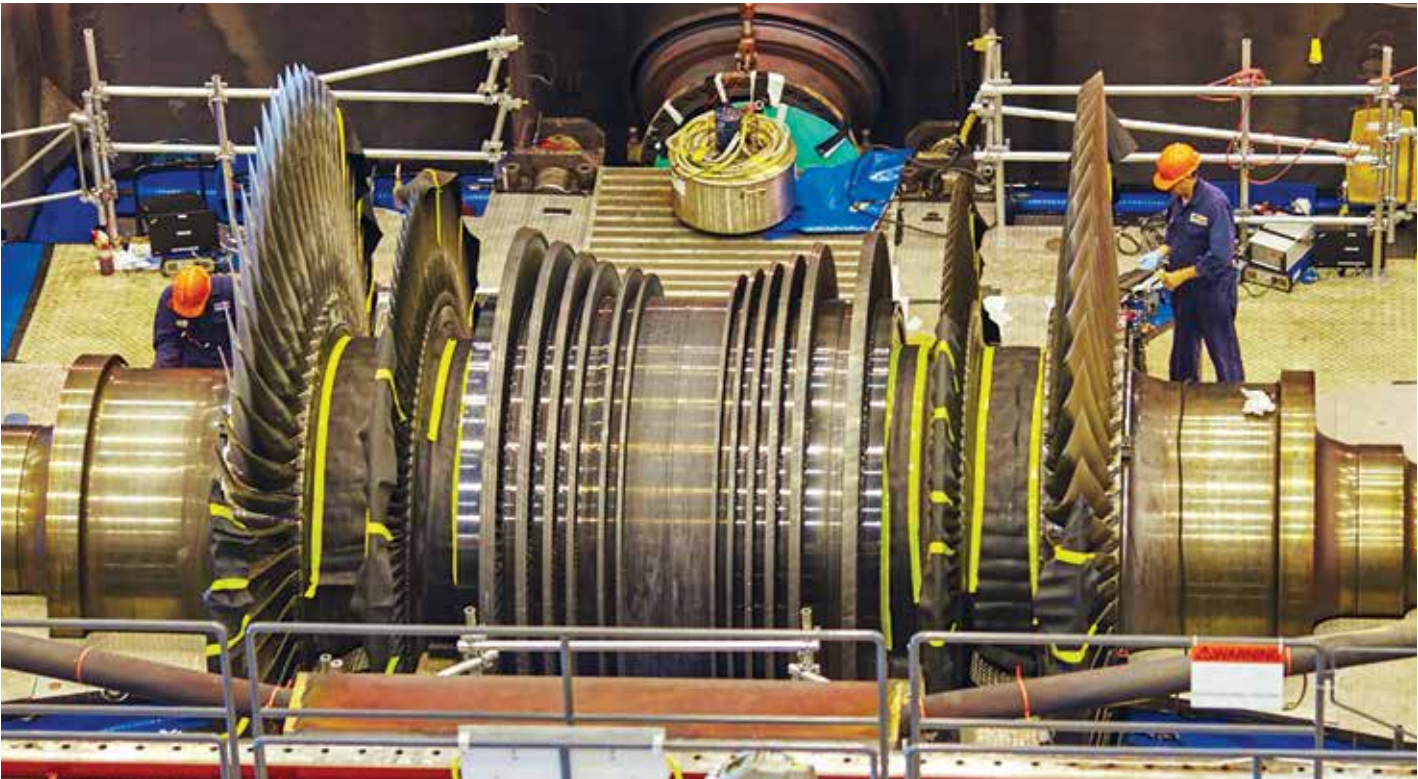
Clean, Reliable, Affordable

As Ontario’s largest clean energy provider, OPG is well-positioned to support Ontario’s energy needs and plans for the future development of its electricity system.

Ontario’s long-term energy plan includes a continued role for nuclear power. The Province recognizes the refurbishment of Ontario’s nuclear generating stations as the most cost-effective option for producing low-carbon baseload generation and supports the refurbishment of

the four units at Darlington Nuclear GS. The Province also recognizes the value to customers of continuing to operate Pickering Nuclear GS until 2024.

With respect to hydroelectric generation, OPG will continue to invest in optimizing existing hydroelectric facilities. Pumped hydroelectric storage could also play an important role in the reliability of the electricity system.



Turbine work at Darlington Nuclear GS.

Innovation and Growth

A number of innovative technologies have the potential to impact the future of the electricity system. Among others, these include the increased electrification of the transportation sector, the emergence of energy storage, and the opportunity for Ontario to foster nuclear innovation technologies. OPG continues to assess how best to capitalize on potential business opportunities in these and other areas.

Indigenous peoples have a key role in shaping Ontario’s energy planning, projects and policies. Over the past several years, OPG has partnered with Indigenous communities on a number of generation-related developments and other joint projects and will continue to pursue additional opportunities. In addition to the development of the Nanticoke solar facility in partnership with the Six Nations of the Grand River, OPG is working with the Kiashke Zaaging Anishinaabek (KZA), also known as the Gull Bay First Nation, to construct a new renewable micro grid.

SUPPLY CHAIN

OPG's supply chain organization supports the company through the cost-effective acquisition and timely availability of materials and services. OPG's supply chain processes are consistent with approved financial management and control standards, and all applicable legal requirements. Suppliers and contractors who wish to do business with OPG must be pre-qualified based on a demonstration of their ability to manage quality, health and safety, and environmental aspects, in addition to satisfying technical and commercial requirements. Contracts are awarded following OPG's established procurement activity procedures. OPG's suppliers are expected to ensure full

compliance with *OPG's Supplier Code of Conduct* and *Code of Business Conduct* in their business dealings with OPG. Certain suppliers may also be subject to OPG audits or assessments, which are commensurate with their approved scope of work and specified quality requirements. OPG has approximately 2,000 active suppliers. OPG is also proud to be a strong supporter of local businesses. Recent assessments found that 92 per cent of OPG's spending was executed through suppliers within Canada with 89 per cent of them within Ontario. OPG also has strong working relationships with its Indigenous suppliers, providing jobs and training to the local communities.



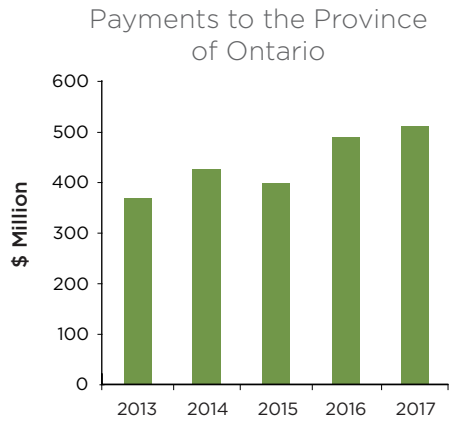
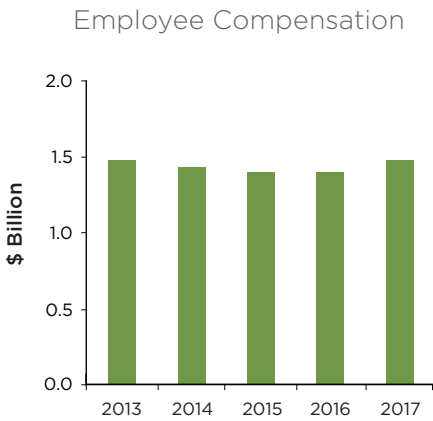
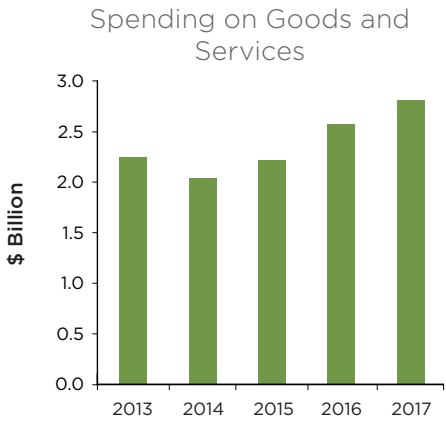
LEARN MORE

Schomberg Company Steps Up
B.C. Instruments is one of more than 60 Ontario-based companies engaged in the Darlington Refurbishment project.
[Read more.](#)

LOCAL ECONOMIC IMPACT

Electricity generation is a capital-intensive business. It requires continued investment in plants and technologies to maintain and improve operating performance, to increase generation capacity of existing stations, and to invest in the development of new generating stations, emerging technologies and other business growth opportunities. When making these investments, OPG provides support to the economy through the purchase of goods and services. During 2017, OPG purchased \$2.8 billion in goods and services.

In 2017, compensation to employees totalled approximately \$1.5 billion. Employees live in Ontario and purchase their goods and services locally, thereby transferring wealth back into the economy. Payments made by OPG to its Shareholder, the Province, also benefit the economy and the people of Ontario. Payments to the Province include payments in lieu of taxes, gross revenue charges, and current income tax payments. These payments totalled \$511 million in 2017.



LEARN MORE

Economic Impact of Pickering Nuclear GS
Research was undertaken by the Ontario Chamber of Commerce (OCC) in partnership with the Canadian Centre for Economic Analysis (CANCEA) to evaluate the economic contribution that Pickering Nuclear GS could make to Ontario to 2024.
[Read more.](#)



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