

**ONTARIO POWER GENERATION INC.**  
**ANNUAL INFORMATION FORM**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

March 12, 2020



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# 1 PRESENTATION OF INFORMATION

References in this Annual Information Form (AIF) to the “Company”, the “Corporation” or “OPG” are made to Ontario Power Generation Inc. Unless otherwise noted, the information contained in this AIF is as at or for the year ended December 31, 2019. Amounts are expressed in Canadian dollars unless otherwise indicated. The Glossary found at the end of this AIF contains certain terms defined throughout this AIF and abbreviations and acronyms that may not be otherwise defined in this document. This AIF is dated March 12, 2020.

Certain portions of the Company’s annual Management’s Discussion and Analysis dated March 12, 2020 (MD&A) and audited consolidated financial statements as at and for the year ended December 31, 2019 are incorporated by reference into this AIF as stated below. The MD&A and annual consolidated financial statements are available on SEDAR at [www.sedar.com](http://www.sedar.com) and on the Company’s website at [www.opg.com](http://www.opg.com). ***The above information is not, unless otherwise specifically stated, incorporated by reference into this AIF.***

Financial information is presented in accordance with United States generally accepted accounting principles (US GAAP). The Company also uses certain non-GAAP financial performance measures which are intended to provide additional information to investors and do not have any standardized meaning under US GAAP, and therefore may not be comparable to other issuers, and should not be considered in isolation or as a substitute for measures of performance under US GAAP. For a detailed description of each of the non-GAAP measures and a detailed reconciliation to the most directly comparable measure under US GAAP, refer to the section, *Key Operating Performance Indicators and Non-GAAP Financial Measures* section of the MD&A.

## 2 CAUTION REGARDING FORWARD-LOOKING INFORMATION

This AIF contains forward-looking statements that reflect OPG's current views regarding certain future events and circumstances. Any statement contained in this document that is not current or historical is a forward-looking statement. OPG generally uses words such as "anticipate", "believe", "foresee", "forecast", "estimate", "expect", "schedule", "intend", "plan", "project", "seek", "target", "goal", "strategy", "may", "will", "should", "could" and other similar words and expressions to indicate forward-looking statements. The absence of any such word or expression does not indicate that a statement is not forward-looking.

All forward-looking statements involve inherent assumptions, risks and uncertainties. All forward-looking statements could be inaccurate to a material degree. In particular, forward-looking statements may contain assumptions such as those relating to OPG's generating station (GS) performance, availability and operating lives, fuel costs, surplus baseload generation (SBG), cost of fixed asset removal and nuclear waste management and associated funding requirements, performance and earnings of investment funds, refurbishment of existing facilities, development and construction of new facilities, acquisition transactions, performance of acquired businesses, defined benefit pension and other post-employment benefit (OPEB) obligations and funds, income taxes, proposed new legislation, the ongoing evolution of electricity industries and markets in Ontario and the United States (US), the continued application and renewal of energy supply agreements and other contracts for non-regulated facilities, foreign currency exchange rates, environmental and other regulatory requirements, operating licence applications to the Canadian Nuclear Safety Commission (CNSC) and the Federal Energy Regulatory Commission (FERC), health, safety and environmental developments, changes in the Company's workforce, renewal of union collective agreements, business continuity events, the weather, financing requirements and liquidity, funding sources, applications to the Ontario Energy Board (OEB) for regulated prices, the impact of regulatory decisions by the OEB, forecasts of earnings, cash flow, Return on Equity Excluding Accumulated Other Comprehensive Income (ROE Excluding AOCI), Total Generating Cost (TGC), operations, maintenance and administration (OM&A) expenses and project and other expenditures, retention of critical talent, and supplier and third party performance. Accordingly, undue reliance should not be placed on any forward-looking statement. The forward-looking statements included in this AIF are made only as of the date of this AIF. Except as required by applicable securities laws, OPG does not undertake to publicly update these forward-looking statements to reflect new information, future events or otherwise.

OPG faces various risks that could have a material adverse effect on its business, strategy, generating stations, reputation, financial condition, operating results, generation development and other projects. There may be further risks and uncertainties that are not presently known, or that are not currently believed to be material, that may in the future adversely affect the Company's performance or financial condition. OPG may be exposed to a significant event that it is not fully insured or indemnified against. For details on risks faced by OPG, refer to the section, *Risk Management* in the MD&A.

## 3 CORPORATE STRUCTURE

### 3.1 INCORPORATION AND HEAD OFFICE

OPG was formed in April 1999 through the restructuring of Ontario Hydro's integrated electricity business. OPG was established under the *Business Corporations Act* (Ontario) (OBCA) and is wholly owned by the Province of Ontario (Province or Shareholder). OPG's various articles of incorporation, amalgamation and amendment are publicly filed with the Ministry of Government Services. OPG and the Province are parties to a Memorandum of Agreement (MOA) that sets out OPG's role and responsibilities. Further details on the MOA are discussed in the section, *Interest of Management and Others in Material Transactions* under the heading, *Relationship with the Province and the OEFC*.

OPG's registered head office is located at 700 University Avenue, Toronto, Ontario, M5G 1X6, Canada.

## 4 DESCRIPTION OF THE BUSINESS

### 4.1 OVERVIEW

OPG is an Ontario-based electricity generation company whose principal business is the generation and sale of electricity. As of December 31, 2019, OPG and its wholly-owned subsidiaries owned and operated two nuclear generating stations, 66 hydroelectric generating stations, three thermal generating stations and one solar facility in Ontario, Canada. Through its wholly-owned subsidiaries in the US, the Company also wholly or jointly owned and operated 85 hydroelectric generating stations and held minority shareholdings in 13 hydroelectric and two solar facilities in the US. In addition, OPG and TC Energy Corporation (TC Energy) co-own the 550 megawatt (MW) Portlands Energy Centre (PEC) combined cycle natural gas-fired GS, located in Ontario. OPG also owns two nuclear generating stations in Ontario, the Bruce A GS and the Bruce B GS (together, the Bruce nuclear generating stations), which are leased on a long-term basis to Bruce Power L.P. (Bruce Power). As at December 31, 2019, OPG did not operate PEC, the Bruce nuclear generating stations, and the minority-held facilities in the United States.

OPG's proportionate share of the in-service generating capacity and electricity generation volume from the co-owned and minority-held facilities is included in the Company's generation portfolio statistics set out in this AIF and the MD&A. The Bruce nuclear generating stations are not included in the Company's electricity generation and other operating statistics set out in this AIF and the MD&A.

Including its share of the co-owned and minority-held facilities, as at December 31, 2019, OPG's total in-service generating capacity was 17,017 MW, of which 16,390 MW is located in Ontario and the remainder in the US. OPG's in-service generating capacity in Ontario represents approximately 45 percent of installed generation capacity in Ontario's electricity system as reported by the Independent Electricity System Operator (IESO). OPG's in-service generating capacity as at December 31, 2019 excludes Unit 2 of the Darlington nuclear GS (Darlington GS). The unit, which has a generating capacity of 878 MW, was taken offline in mid-October 2016 and is currently undergoing refurbishment as part of the four-unit Darlington Refurbishment project. For the year ended December 31, 2019, OPG's electricity generation in Ontario accounted for approximately 50 percent of the total energy generated on Ontario's electricity system, as reported by the IESO.

OPG operates in Ontario under an electricity generation licence issued by the OEB, which is valid until October 30, 2023. OPG expects the licence to be renewed in the future.

OPG's core business operations consist of nuclear generation, renewable generation, thermal generation and nuclear waste management. OPG reports operating results in four business segments to provide information that is aligned with how management assesses business performance and, ultimately, how management decisions are made. OPG's four business segments as at December 31, 2019 are as follows:

- Regulated – Nuclear Generation;
- Regulated – Nuclear Waste Management;
- Regulated – Hydroelectric; and
- Contracted and Other Generation.

Set out below is a brief description of each of the business segments. Further information and the operating results for each of the segments is included in the sections, *Business Segments* and *Discussion of Operating Results by Business Segment* in the MD&A.

The *Ontario Energy Board Act, 1998* and *Ontario Regulation 53/05* provide that OPG receives regulated prices for electricity generated from the Darlington and Pickering nuclear generating stations and the 54 hydroelectric facilities in Ontario prescribed for rate regulation (collectively, prescribed facilities or regulated facilities). OPG's regulated prices for these facilities are determined by the OEB. The operating results of these facilities are reported under the Regulated – Nuclear Generation, Regulated – Nuclear Waste Management and Regulated – Hydroelectric segments. The OEB is an independent, quasi-judicial tribunal that regulates market participants in Ontario's natural gas and electricity industries, and reports to the Legislature of the Province through the Ontario Ministry of Energy, Northern Development and Mines. OPG is Ontario's only electricity generator subject to rate regulation by the OEB.

Electricity generated from OPG's non-regulated assets is reflected within the Contracted and Other Generation business segment. All of such assets in Ontario are subject to Energy Supply Agreements (ESAs) with the IESO or other long-term contracts. The majority of the ESAs are structured to provide for recovery of operating costs and capital investment in the underlying facilities and a formula-based return on invested capital, subject to the facilities continuing to meet their contractual obligations. The IESO is a non-profit corporate entity governed by an independent board of directors appointed by the Province and is responsible for operating the electricity market and directing the operation of the bulk electrical system in Ontario.

Electricity generated from the Company's US assets are also reported in the Contracted and Other Generation business segment. Generating facilities in the US earn revenue through a combination of energy and capacity contracts and the supply of energy and capacity into wholesale spot electricity markets. While revenue from generating facilities supplying energy and capacity into US wholesale spot electricity markets represents a small portion of OPG's overall revenue, the Company may enter into hedging arrangements from time to time to further mitigate the commodity price risks.

OPG is subject to a number of legislative and regulatory requirements in the jurisdictions in which it operates, including those of administrative tribunals, electricity system operators and other regulatory bodies, and certain international treaties. Collectively, these sources dictate many of the constraints within which OPG is permitted to operate its facilities and manage its business.

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## 4.2 CORPORATE STRATEGY

OPG's mission is to provide low cost power in a safe, clean, reliable and sustainable manner for the benefit of the customers and Shareholder. OPG's strategic objectives describe the Company's long-term goals. OPG's strategic objectives are as follows:

- People Powering the Future;
- Value Through Innovation and Efficiency;
- Putting Customers and Communities First; and
- Energy Industry Leader.

OPG's business imperatives describe the areas in which OPG needs to continue to demonstrate excellence to enable achievement of its strategic objectives. OPG's business imperatives are as follows:

- Operational Excellence;
- Project Excellence;
- Financial Strength; and
- Social Licence.

For additional information regarding corporate strategic objectives and business imperatives, refer to the section, *The Company* under the heading, *Corporate Strategy* in the MD&A.

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#### 4.3 ELECTRICITY INDUSTRY AND ELECTRICITY MARKETS

The electricity industry is principally comprised of four components:

- Generation – the production of electricity;
- Transmission – the transfer of electricity across high-voltage power lines from generating facilities to local areas;
- Distribution – the delivery of electricity within local areas to homes and businesses using relatively low-voltage power lines; and
- Energy marketing and other services – the purchase of large amounts of electricity or equivalent financial products and the subsequent re-selling in smaller quantities to third parties in either the wholesale or retail markets.

Electricity has traditionally been generated in large, multi-unit, centralized facilities. These facilities are usually classified by:

- (i) the type of fuel used;
- (ii) capacity, typically expressed in MW; and
- (iii) dispatch mode (being whether or not the electricity generated by a particular facility is dispatched to meet peak, intermediate or baseload demand).

The energy produced by a facility is generally expressed as its output over the time the facility operates, typically in terms of megawatt-hours (MWh). New supply from smaller scale, largely intermittent, renewable sources such as wind, solar and bio-energy is being integrated into the power system, connected either directly to the transmission system or embedded in distribution networks. Distributed generation involves production of electricity closer to end users and away from large scale production facilities that require more transmission. Electricity systems typically require new capital expenditures and processes in order to accommodate intermittent generators.

Electricity is an essential commodity that cannot be stored without converting to other forms, a process that is more difficult in large volumes. Therefore, electricity supply must instantaneously match demand to maintain the stability and reliability of the electrical power system. This is accomplished by coordinating the supply of and demand for electricity, a responsibility typically assigned to regulated regional system operators or local balancing authorities. To ensure the balancing of electricity supply with demand, some generators are needed to produce a constant supply of energy to meet fixed energy needs (baseload generation), while others are needed to adjust energy output to match changes in demand (peaking and intermediate generation).

Electricity systems have evolved on a regional basis and are connected to neighbouring regional power grids. Electricity markets in neighbouring regions whose transmission systems are connected to each other, either directly or through other contiguous connected markets, are referred to as interconnected markets. Such connections enhance system reliability and permit the purchase and sale of electricity between electricity markets. Interconnection transmission capabilities between interconnected markets are subject to physical and weather dependent limitations. These limitations include planned or forced outages to transmission lines and other equipment that reduce transmission capacity, as well as wind and temperature conditions that affect the transfer capability of all transmission lines on the electrical system.

## Ontario's Electricity Industry

OPG's predecessor, Ontario Hydro, served as a vertically integrated electric utility in Ontario. Following the adoption of a restructuring plan for Ontario's electricity industry pursuant to the *Energy Competition Act, 1998*, five principal successors to Ontario Hydro's integrated electricity business began operating as separate entities on April 1, 1999:

- OPG, which purchased and assumed the electricity generation, wholesale energy and ancillary services businesses of Ontario Hydro;
- Hydro One, which purchased and assumed the transmission, distribution and retail energy services businesses of Ontario Hydro;
- the Independent Electricity Market Operator (later renamed the IESO), which was formed to act as both the independent electricity system operator and the market operator. The IESO is responsible for the dispatch of generation to meet demand, the control of the Ontario transmission grid and the operation of energy and ancillary markets;
- the Electrical Safety Authority, which was established to carry out electrical equipment and electrical wiring safety and inspection functions; and
- the Ontario Electricity Financial Corporation (OEFC), which is the legal continuation of the former Ontario Hydro and is responsible for managing the debt and certain other obligations not transferred to other successor companies of Ontario Hydro.

OPG purchased and assumed all of the interest of Ontario Hydro in and to all officers, employees, assets, liabilities, rights and obligations of Ontario Hydro directly or indirectly relating in any manner to the applicable activities carried on by Ontario Hydro as of April 1, 1999, pursuant to the transfer orders made by Order-in-Council under the *Electricity Act, 1998*. The transfer orders provide that if they fail for any reason to fully and effectively in law transfer any such asset, right, liability or obligation or that if such transfer would constitute a breach of the terms of the asset, right, liability or obligation or of any applicable law, such assets, rights, liabilities or obligations are not transferred, but are held by the OEFC for the benefit of OPG.

Ontario's competitive electricity market was opened by the IESO in 2002. The market is used to manage the purchase and sale of wholesale electricity in the province.

Since the opening of the competitive market, Ontario's power supply mix has experienced significant change. A significant amount of new generating capacity has been added, while coal-fired generation, which at its peak accounted for approximately 6,500 MW of capacity, has been eliminated. New natural gas powered capacity of over 5,000 MW as of the end of 2019 has largely replaced the peaking capacity previously provided by coal-fired generation, while the return to service of Units 1 and 2 at the Bruce A GS in 2012 added approximately 1,500 MW of baseload nuclear generation. New wind and solar generating capacity of approximately 8,000 MW has also been added as of the end of 2019.

While electricity supply in Ontario has increased, the province's electricity demand as reported by the IESO has fallen by approximately 10 percent compared to pre-2008 recession levels, largely due to changes in economic conditions and conservation measures and also partially due to the addition of small scale solar generation embedded in the distribution system. Embedded generation reduces the demand supplied by grid-connected generation. Shorter-term fluctuations in electricity demand are impacted by variations in seasonal weather conditions. Ontario's electricity demand as reported by the IESO was 135.1 terawatt hours (TWh) in 2019, which excludes electricity exports out of the province.



## Ontario's Electricity Market

Ontario's real-time energy supply needs are met through the wholesale electricity market administered by the IESO, with the market price, the Hourly Ontario Energy Price, set by offers or bids into the market. OPG offers its generation into this real-time energy market, or spot market, to be dispatched by the IESO. The IESO receives hourly offers from electricity generators and importers to provide energy, along with bids to withdraw energy from a few flexible loads and exporters and then schedules the lowest-cost offers needed to meet demand every five minutes.

Virtually all non-OPG generators in Ontario have energy supply contracts with the IESO that provide for payments that are different from the market price of electricity. The prices for all of OPG's nuclear and most of its hydroelectric stations in Ontario are set by the OEB. The difference between the market price and the prices paid for regulated and contracted generation, as well the cost of conservation and demand management programs, are charged to Ontario electricity consumers through the Global Adjustment portion of the total price of electricity.

SBG occurs when electricity production from the baseload generating facilities is greater than the market demand for electricity. Baseload generation supply surplus in Ontario is managed by the IESO, mainly through generation reductions at hydroelectric and certain nuclear stations and other grid-connected renewable resources. The prevalence of SBG conditions is impacted by weather conditions which affect electricity demand, availability of wind and solar generation quantities and through the impact on water flows, the availability of hydroelectric power. For additional information on SBG conditions, refer to the section, *Highlights* under the heading, *Electricity Generation* in the MD&A.

The OEB has authorized an additional pricing mechanism for OPG's regulated hydroelectric generation that provides a financial incentive to OPG to shift hydroelectric generation from lower market price periods to higher market price periods. This is intended to benefit customers through the displacement of generation from the relatively higher cost sources. The time-shifting is made possible by the ability to store water in reservoirs located at a number of OPG's hydroelectric facilities, including the Sir Adam Beck Pump GS.

The IESO also administers the operating reserve market and is responsible for procurement of other ancillary services. The objective of the operating reserve market is to ensure that additional supplies of energy are available to maintain power system reliability following an unforeseen event. Other ancillary services include regulation service, voltage control and reactive support, black start capacity and other services required to maintain the reliability of the Ontario electricity system. OPG participates in the operating reserve market and provides other ancillary services to the IESO.

The IESO is transitioning into the detailed design stages of its Market Renewal Program, which is expected to result in a redesign of Ontario's electricity markets and which may impact OPG depending on the market features that are implemented. The IESO's stated goal for the Market Renewal program is to improve how electricity is priced, scheduled and procured in order to meet electricity system and participant needs reliably, transparently, efficiently and at lowest cost. OPG is actively participating in the Market Renewal Program and continues to collaborate with the IESO.

OPG and other electricity market participants in Ontario are required to comply with Market Rules issued by the IESO. As an owner and operator of generating stations, OPG is also subject to reliability standards as set out by the IESO, the North American Electric Reliability Corporation (NERC), and the Northeast Power Coordinating Council (NPCC). Such standards are binding on OPG pursuant to the OEB-issued electricity generating licence and the IESO Market Rules. The IESO monitors compliance with and enforces the Market Rules and coordinates with system operators and reliability agencies in other jurisdictions to ensure energy adequacy and security across the interconnected bulk electricity system in North America.

Ontario's market is interconnected with New York, Michigan, Minnesota, Manitoba and Québec. Market intermediaries wishing to import or export electricity between Ontario and the interconnected markets are required to schedule these transactions through the Ontario spot market. As part of its trading activities, OPG transacts with counterparties in Ontario and interconnected markets in using predominantly short-term physical and financial instruments, including over-the-counter energy-related derivatives, of typically one year or less in duration.

## US Electricity Markets

The structure of the US electricity industry varies by region, ranging from traditional models with vertically integrated utilities subject to rate regulation to market-based models aimed at promoting competitive power generation. Market-based models were adopted by a number of states through a restructuring of their respective vertically integrated utilities beginning in the 1990s, facilitated by legislative and regulatory changes.

Power generators in the restructured markets typically can sell electricity directly under bilateral contracts to retail customers or load serving entities or into wholesale markets administered by an independent regional system operator. There are seven regional system operators in the US covering the majority of national electricity consumption.

OPG's generating facilities in the US operate in both traditional and restructured markets. Restructured markets in which OPG's facilities operate are the Independent System Operator New England, Midcontinent Independent System Operator, New York Independent System Operator, PJM Interconnection LLC, and California Independent System Operator. OPG's facilities operating in traditional markets are in regions overseen by the SERC Reliability Corporation (SERC). OPG's generating facilities in the US sell electricity through a combination of bilateral contracts with load serving entities and energy and capacity offers into the wholesale spot markets.

In addition to administering the wholesale electricity markets and dispatching electricity to balance supply and demand, the regional system operators are responsible for ensuring reliable electricity system operation and resource adequacy. This includes ensuring the supply of ancillary services necessary for ongoing power system reliability, making system planning decisions and developing appropriate financial mechanisms to support availability of sufficient capacity to meet customers' needs. The Company's generating facilities in the US participate in the ancillary services and capacity markets in the jurisdictions in which they operate.

In order to participate in the wholesale spot energy, capacity or ancillary services markets, non-exempt electricity sellers are required to obtain market-based rate authorization from the FERC, the federal agency responsible for the regulation of sale and transmission of wholesale electricity, natural gas and oil in interstate commerce. The FERC's regulation includes oversight of the regional system operators and the NERC. The NERC is certified by the FERC as the national energy reliability organization for the development and enforcement of reliability standards for the supply of electricity. The NERC oversees eight regional reliability organizations, including the NPCC and SERC, which have delegated authorities and responsibilities to enforce the NERC and regional reliability standards.

The *Public Utility Regulatory Policies Act of 1978* (PURPA) confers on qualifying generation projects (qualifying facilities) the right to sell power to an electric utility at the cost the utility would avoid by purchasing power from the qualifying generation project rather than generating it themselves or purchasing it from another source. Qualifying facilities also have the right to interconnect with an electric utility and receive relief from certain federal and state-level regulatory requirements. Qualifying projects include certain cogeneration facilities and certain small power production facilities, including those whose primary fuel source is renewable. Qualifying facilities that meet certain criteria are exempt from the requirement to obtain FERC market-based rate authorization. All of OPG's generating facilities in the US are either qualifying facilities and/or have obtained other necessary approvals and authorization (including market-based rate authorization) from FERC to operate and sell energy into the market. A number of bilateral contracts for these facilities are constituted by virtue of the facilities being qualifying facilities under the PURPA. The qualifying facility program is implemented at the state level and overseen by the FERC.

As part of policies aimed at increasing renewable energy development, a number of states have adopted renewable portfolio standards, which require electricity suppliers to supply a certain minimum share of their customer's electricity use from designated renewable sources, including certain types of hydroelectric facilities. Electricity utilities that are subject to these mandates must obtain renewable energy credits or certificates (RECs), which are uniquely created for each reported MWh of eligible electricity generation injected into the grid. Electric utilities can meet their obligations under the renewable portfolio standards by purchasing RECs through compliance markets administered by regional system operators. In addition, RECs are traded in voluntary markets, which are driven by consumer preferences and are largely administered through third parties. Most of OPG's generating facilities in the US qualify as designated renewable sources and offer their RECs into the respective markets.

OPG Energy Trading (OPGET), a wholly-owned subsidiary of OPG, engages in US-based wholesale energy trading activities in the northeast US, including over-the-counter energy-related derivatives. OPGET retains FERC market-based rate authorization. OPG's US-based subsidiaries with hydroelectric operations engage in over-the-counter energy-related derivative markets as part of hedging activities.

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#### 4.4 REGULATED PRICING

The majority of OPG's electricity generation is from the Regulated – Nuclear Generation and Regulated – Hydroelectric business segments. The OEB sets volumetric prices for electricity generated from these nuclear and regulated hydroelectric facilities in Ontario. The regulated prices are generally designed to permit the Company to recover, over a forecasted generation volume, an allowed level of operating costs and capital investment and to earn a formulaic rate of return on a deemed equity portion of the capital invested in the regulated assets, known as rate base. Rate base for OPG represents the average net level of investment in regulated fixed and intangible assets in service and an allowance for working capital. *Ontario Regulation 53/05* under the *Ontario Energy Board Act, 1998* sets out certain requirements the OEB must follow in setting regulated prices for OPG's prescribed facilities. The outcomes of OPG's applications for regulated prices to the OEB determine a large portion of the Company's revenues and can have a significant impact on the Company's financial performance.

OPG's regulated prices comprise base regulated prices, rate riders to recover or repay approved deferral and variance account (regulatory account) balances and, as applicable, rate riders to recover an interim period revenue shortfall or excess. An interim period revenue shortfall or excess arises in instances when a subsequent OEB decision results in a difference between final regulated prices retroactively effective for an interim period and the regulated prices in effect during that period on an interim basis. A table outlining the OEB-authorized regulated prices for electricity generated from the regulated facilities in Ontario for the period from January 1, 2018 to December 31, 2021 in effect as of the date of this AIF can be found in the section, *Revenue Mechanism for Regulated and Non-Regulated Generation* under the heading, *Regulated Generation* in the MD&A. A table outlining the OEB-approved rate base levels, deemed equity percentage and formulaic rates of return on equity can be found in the section, *Core Business and Outlook* under the heading, *Financial Strength* in the MD&A.

The base regulated prices in effect since June 1, 2017 were established by the payment amounts order issued by the OEB in March 2018, using an incentive ratemaking methodology for the hydroelectric facilities and a custom incentive regulation framework for the nuclear facilities. The payment amounts order reflected the findings in the OEB's decision on OPG's 2017-2021 application for new regulated prices issued in December 2017.

For the hydroelectric facilities, the base regulated prices in effect since June 1, 2017 are determined by annually escalating the base regulated prices in effect prior to June 1, 2017, with some adjustments, using an approved formula equal to an industry-specific weighted inflation factor based on indices published annually by the OEB, less a stretch factor adjustment. The base regulated prices in effect prior to June 1, 2017 were established based on an approved revenue requirement for the 2014-2015 period that reflected the OEB-allowed level of operating costs and a return of and on rate base for the regulated hydroelectric facilities.

For the nuclear facilities, the base regulated prices for the June 1, 2017 to December 31, 2021 period have been set using a rate smoothing approach that may defer a portion of each year's approved nuclear revenue requirement for future collection in the Rate Smoothing Deferral Account, with the objective of making changes in OPG's overall production-weighted regulated price more stable year over year, consistent with the requirements of *Ontario Regulation 53/05*. The approved nuclear revenue requirement for each of the years 2017 to 2021 is based on the OEB-allowed level of operating costs and a return of and on rate base. In accordance with *Ontario Regulation 53/05*, the nuclear revenue requirement is adjusted by the amount of OPG's revenues, net of costs, from leasing the Bruce nuclear generating stations to Bruce Power, such that OPG's revenues reduce the nuclear revenue requirement and OPG's costs increase it.

Amounts deferred in the Rate Smoothing Deferral Account are recorded as revenue in the Regulated – Nuclear Generation segment in the period to which the underlying approved revenue requirement relates. The regulation requires the OEB to authorize recovery of the deferred amounts, together with interest at a long-term debt rate reflecting OPG's cost of long-term borrowing approved by the OEB, over a period not to exceed ten years following the end of the Darlington Refurbishment project.

Deferral and variance accounts are typically established by the OEB to capture, for subsequent review and approval, differences between actual costs and revenues and the corresponding forecast amounts approved by the OEB in setting base regulated prices, or to record the impact of items not reflected in the approved base regulated prices. Such accounts generally help to mitigate risks and uncertainties to the regulated entity and its customers. Certain of the regulatory accounts are established as required by *Ontario Regulation 53/05*. The rate riders to recover or repay approved balances in deferral and variance accounts in effect over the January 1, 2018 to December 31, 2021 period were established by a combination of the OEB's March 2018 payment amounts order and, beginning in 2019, the OEB's decision and order issued in February 2019 on OPG's August 2018 deferral and variance account clearance application. Revenue received from the recovery of regulatory account balances is largely offset by amortization expense of regulatory assets and regulatory liabilities recorded for these balances on the consolidated balance sheets. Descriptions of OPG's deferral and variance accounts can be found in Note 9 of OPG's 2019 audited consolidated financial statements.

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#### 4.5 WATER RIGHTS

OPG's management of available water resources directly affects the generation output, efficiency and ultimately return on investment for the Company's hydroelectric assets. The watersheds on which OPG's hydroelectric generating facilities are located are shared by many users and are subject to various legislative, contractual and regulatory requirements. Accordingly, OPG must balance the economic, environmental, social and legal requirements associated with the watersheds when utilizing water to optimize electricity generation.

##### International Rivers

The six OPG hydroelectric generating stations subject to OEB rate regulation since 2008 are directly or indirectly supplied by two major international waterbodies, Lake Erie, via the Niagara River and Welland Canal, and the St. Lawrence River, and are subject to treaties with the US relating to water use. These stations represent approximately 44 percent of OPG's total in-service hydroelectric capacity in Ontario.

Through a series of agreements between the Government of Canada and the Province, and certain federal and provincial laws, OPG has been granted the right to exercise Canada's rights with respect to the construction, maintenance and operation of generating facilities under the *Boundary Waters Treaty of 1909* and the *Niagara Diversion Treaty of 1950* between Canada and the US. Both of these treaties continue in perpetuity but are terminable by either party with 12 months prior written notice. Given the significance of these treaties, OPG does not expect either party to exercise their respective termination rights in the foreseeable future.

The *Boundary Waters Treaty of 1909* established the International Joint Commission with the mandate of regulating shared water uses and preventing and resolving disputes between the US and Canada. In December 2016, the International Joint Commission issued an order implementing a new plan to manage water levels and flows in Lake Ontario and the St. Lawrence River, effective January 7, 2017. The new plan, which replaced the existing plan in use since 1963, is intended to allow for more natural water levels, while minimizing impacts to other users, including hydroelectric power production. No significant changes to OPG's energy production have been experienced as a result of the new plan.

The *Niagara Parks Act* (Ontario) gives the Niagara Parks Commission the authority to grant certain rights for the use of the waters of the Niagara River for purposes of power generation. By agreement with OPG, the Niagara Parks Commission has agreed not to grant any rights to third parties until after 2056.

Under an agreement between OPG and the St. Lawrence Seaway Management Corporation, a Canadian federal agency, the units of the DeCew Falls generating stations in Ontario use water that is transported along the Welland Canal from Lake Erie. The agreement has been renewed through June 30, 2038.

The Province has granted OPG the right to use water from the International Rapids section of the St. Lawrence River for power generation at the R.H. Saunders GS, subject to an agreement between the Government of Canada and the Province. The Government of Canada has the right, upon notice and after unsuccessful arbitration, to take over the operation of and title to the R.H. Saunders GS in the unlikely event of a breach of the agreement by the Province.

#### Canadian Interprovincial Rivers

Four of OPG's hydroelectric stations are located on the Ottawa River, which forms part of the Ontario-Québec border. These stations represent approximately 13 percent of OPG's total Ontario in-service hydroelectric capacity. Three of these stations are subject to 999-year leases with each of the Provinces of Ontario and Québec. The fourth station is subject to a water power lease with the Province of Ontario, which is renewable to 2031, subject to certain conditions. OPG's use of water from the Ottawa River basin is subject to guidelines established by the Ottawa River Regulation Planning Board, comprised of government and industry representatives.

#### Ontario Interior Rivers

Fifty-six of OPG's hydroelectric stations, representing approximately 43 percent of OPG's total Ontario in-service hydroelectric capacity, are located on 20 other Ontario river systems. OPG holds waterpower leases, Crown leases and licences with the Province on the river systems that supply 37 of these stations. These leases and licences have expiry dates, including renewal periods, ranging between 2023 and 2075. Certain of these leases provide that the leased property and any fixed improvements, including generating stations and dams, will revert to the Province on the expiry of the lease. OPG intends to secure new leases and licences for these stations and initiated the process with the Ontario Ministry of Natural Resources and Forestry (MNRF) to replace the tenure that expires in 2023. OPG's use of Ontario's interior watersheds is constrained by restrictions contained in certain of the waterpower leases and licences.

Eight of the 56 stations are located on the Trent and Rideau Waterways and are operated pursuant to licences from the Government of Canada. OPG is currently in the process of renewing the licences with Parks Canada, which were set to expire in February 2020. OPG has received an overholding letter from Parks Canada for an extension of the licences until April 2020 to complete the renewal process. The renewal process is nearly complete and OPG expects that it is well positioned to secure the renewal. Ten of the 56 stations are not subject to leases or licences. A land use permit issued for the Peter Sutherland Sr. GS remains in effect while a waterpower lease for the site is prepared by the MNRF.

The current provincial regulatory framework requires the development of Operational Plans for new storage dams and generating stations in Ontario, except for those on international rivers, interprovincial rivers or rivers under federal jurisdiction. These plans include any limitations on water flows and elevations and historically have been a component of formal Water Management Plans (WMPs). WMPs were established under the *Lakes and Rivers Improvement Act* (Ontario) (LRIA) and *Water Management Planning Guidelines for Waterpower* (2002), on a watershed basis, in consultation with the MNRF, federal fisheries authorities, stakeholders, such as recreational and commercial users, local communities, environmental groups, and partners, such as Indigenous groups. In October 2016, the MNRF published a Technical Bulletin, *Maintaining Water Management Plans* (2016), eliminating the need for WMPs where they are not already in place, removing the expiry date from existing WMPs and outlining the requirements for Operational Plans for new waterpower works going forward. Existing WMPs continue to be in effect. WMPs and Operational Plans may be amended as certain conditions change or new data becomes available. OPG operates in compliance with WMPs and Operational Plans.

The operations of certain OPG stations in northwestern Ontario can impact users in Manitoba and are subject to directions provided by the Lake of the Woods Control Board, which is comprised of Ontario, Manitoba and federal government representatives.

### Ontario Dams

OPG's Safe Operations Policy stipulates that OPG dams will meet all applicable dam safety legislation and take into consideration best practices as recommended in guidelines published by the Canadian Dam Association as well as other appropriate national and international risk management practices. In Canada, dams fall under provincial jurisdiction, with the exception of dams situated in interprovincial and international boundary waters and canals, and those owned by the Government of Canada. The majority of OPG's dams located in Ontario fall within the jurisdiction of the Province, with 20 dams falling within the jurisdiction of the Province of Québec and 13 dams associated with the Trent-Severn and Rideau Waterways falling under federal jurisdiction. The International Joint Commission has an oversight role for dams and associated works on international boundary waters, including the St. Lawrence River and the Niagara River.

The Province regulates dams under the LRIA administered by the MNRF. The legislation requires MNRF approval for activities such as the construction, alteration, improvement or repair of dams. In 2011, the MNRF published a revised set of Technical Guidelines for dams, following a period of public consultation. The Technical Guidelines represent the current government standards for dam safety. In general, OPG practices in the area of dam safety and public safety around dams exceed the minimum requirements outlined in the Technical Guidelines.

The LRIA regulations and the Technical Guidelines allow the MNRF to enter into an agreement with a dam owner related to the application of the Technical Guidelines. In 2019, OPG entered into such an agreement with the MNRF which includes provisions allowing OPG to pilot more modern methods of analysis than those currently prescribed in provincial standards. These more up to date methods are expected to result in improved levels of public safety while lowering the overall costs associated with dam upgrades.

The Quebec Ministry of Sustainable Development, Environment, and Fight Against Climate Change is responsible for the *Quebec Dam Safety Act (2002) and Regulations*. This legislation covers OPG's dams on the Ottawa River and, in addition to routine requirements for dam surveillance and emergency management, prescribes specific reporting requirements to the Ministry related to periodic dam safety reviews. OPG's last formal submission was made in December 2016, with the dam safety review reports accepted by the Ministry as meeting all of the requirements. The next submission is required in 2026.

Parks Canada published their guidance document related to dam safety, Directive for Dam Safety Program of Parks Canada Dams and Water Retaining Structures, in 2009. The document covers OPG's dams located on federal waterways administered by Parks Canada, and closely aligns with the Canadian Dam Association guidelines.

Currently, there is no federal or provincial regulation with respect to public safety around dams that addresses dam public safety issues relating to changes in operating water levels, discharges from the hydroelectric or dam facilities and other waterways-based hazards posed by such facilities. The *Canadian Navigable Waters Act* (Canada) requires OPG to obtain approvals for the installation of all in-water works, such as safety booms and buoys associated with the Company's waterways public safety program.

#### United States Rivers and Dams

Any hydroelectric power plant that was constructed on or after August 26, 1935 and is located on navigable waters or federal lands, uses surplus waters from a federal dam, or affects interstate commerce in the US operates under the FERC's jurisdiction. The FERC authorizes hydropower projects either by issuing a licence or, in the case of some smaller projects, by determining that the project is exempt from licensing but authorized to operate. Licences typically are issued for terms ranging from 30 to 50 years. At the end of each term, the licensee must apply for a new licence term. The relicensing process typically requires approximately five to six years to complete. All but one of OPG's 85 hydroelectric generating facilities in the US fall under FERC's jurisdiction. The FERC has issued licences to 68 of these facilities and has exempted 16 others from licensing. Twenty out of the 68 licensed facilities are currently in various stages of the relicensing process, with one more facility expected to initiate a relicensing process in 2020.

A hydropower licence sets out terms and conditions including environmental measures to protect, mitigate effects on, or enhance environmental resources and recreational facilities, engineering measures to ensure safe construction and operation of the project, and other requirements. The licensing process provides for the participation of government agencies, stakeholders and members of the public. Mandatory terms and conditions prescribed by certain state and federal agencies form part of the licence and are also applicable to exempt facilities.

The FERC oversees dam and public safety associated with hydropower facilities within its jurisdiction. The FERC's requirements for ensuring dam safety include site specific requirements for dam surveillance and inspection, requirements for periodic independent third party engineering evaluations of the safety of individual facilities, requirements for development of emergency action plans, and reporting requirements to the FERC. The FERC also has guidelines in place to assist owners in managing public safety around dams that include both physical controls in the form of fencing, safety booms, operational controls, and materials to educate the public and raise awareness of the hazards associated with the operation of the hydroelectric facilities. All but one of OPG's 85 hydroelectric facilities in the US are subject to the FERC's dam safety regulations, with one facility subject to regulation and oversight by the state of Wisconsin.

Additional details on OPG's dam safety and waterways public safety programs are found in the section, *Environmental, Social, Governance and Sustainability* under the heading, *Workplace Safety and Public Safety*.

## 4.6 BUSINESS OPERATIONS

### 4.6.1 Nuclear

#### Overview of Nuclear Generating Facilities

OPG owns and operates two nuclear generating stations, the results of which are reported in the Regulated – Nuclear Generation business segment. The following are the two nuclear generating stations OPG owned and operated as at December 31, 2019:

Generating Station	Location	Operating Units	In-Service Capacity (MW)
Darlington <sup>1</sup>	Clarington, Ontario	3	2,634
Pickering <sup>2</sup>	Pickering, Ontario	6	3,094

<sup>1</sup> The Darlington GS comprises three operating units and one unit, Unit 2, undergoing refurbishment since mid-October 2016. All four Darlington units have been in service since the early-1990s. As at December 31, 2019, the total in-service generating capacity of the three operating units was 2,634 MW. Unit 2 has a generating capacity of 878 MW.

<sup>2</sup> The Pickering GS comprises six operating units and two units in a permanent safe shutdown state. Four of the eight Pickering GS units originally went into service in the 1970s. A decision was made by Ontario Hydro in the late 1990s to place these four units in voluntary lay-up. In 2003 and 2005, respectively, two of the four laid-up units were returned to commercial operation, with the two remaining units placed in a permanent safe shutdown state. The other four operating units have been in service since the mid-1980s.

Both the Darlington GS and the Pickering GS have been designed to operate at full power as baseload generating facilities. The generating performance of OPG's nuclear generating stations is expressed using the Unit Capability Factor (UCF). UCF is the amount of energy a generating unit is capable of producing as a percentage of its maximum output assuming no external constraints such as transmission limitations. The nuclear UCF excludes unit(s) during the period in which they are undergoing refurbishment. UCF results for the Darlington GS and the Pickering nuclear GS (Pickering GS) are discussed in the section, *Discussion of Operating Results by Business Segment* under the heading, *Regulated – Nuclear Generation Segment* in the MD&A. There are currently no regulatory accounts related to the impact of generation performance of OPG's nuclear stations on revenue from the base regulated prices.

OPG maintains a site preparation licence granted by the CNSC in 2012 in relation to the potential construction of new nuclear units at the Darlington site. The licence expires in 2022. OPG has informed the CNSC of the Company's intent to renew the licence and, in December 2019, received the CNSC's concurrence with its site preparation licence renewal plan. OPG intends to submit a licence renewal application in mid-2020. No decision on potential technology partners for new nuclear reactor development at the Darlington site has been made and no project has been commenced.

For additional information on OPG's nuclear operations, refer to the section, *Core Business and Outlook* under the heading, *Operational Excellence – Electricity Generation Production and Reliability* in the MD&A.

#### Nuclear Generation Technology

Nuclear generation harnesses the energy released during controlled nuclear fission reactions to produce steam that is used to drive turbines to generate electricity. Nuclear generation has two main advantages. It is a relatively low marginal-cost generation technology, and it produces virtually no greenhouse gas (GHG), sulphur dioxide nitrogen oxide or mercury emissions. The latter advantage has become more significant as governments implement climate change action plans and stricter air emission standards.

In contrast to other types of generating facilities, notwithstanding the lower fuel costs, nuclear generating stations incur nuclear waste management and decommissioning costs and greater operating and maintenance expenses. In addition, the construction of nuclear generating stations entails greater initial capital costs than other generation technologies. The higher initial costs reflect the complexity of the technical processes fundamental to nuclear electricity generation, and the additional design and safety precautions taken to protect the public from potential risks associated with nuclear operations.



All of OPG's nuclear generating stations use Canada Deuterium Uranium (CANDU) technology reactors. CANDU is a pressurized-heavy-water, natural-uranium power reactor, originally designed in the 1960s by a consortium of Canadian government agencies and private industry. CANDU reactors are unique in their use of natural-uranium fuel and deuterium oxide, or heavy water, as both a moderator to slow down the fission process and a coolant within the reactor. The refuelling system is also unique in that CANDU reactors can be refuelled at full power. This is due to the subdivision of the reactor core into hundreds of separate fuel channels, each holding a single string of natural uranium fuel bundles, allowing for greater fuel efficiency. In contrast, US reactors, which use enriched uranium fuel, must be shut down during refuelling. All nuclear power reactors in Canada use CANDU technology. CANDU reactors are currently operating in Ontario, New Brunswick, Argentina, Romania, South Korea, Pakistan and China.

#### Nuclear Fuel Procurement

OPG's nuclear fuel supply chain involves the purchase of uranium concentrate, services for the conversion of uranium concentrate into uranium dioxide and services for the manufacture of nuclear fuel bundles containing uranium dioxide pellets. OPG currently establishes contractual arrangements with each of these distinct components separately and, as appropriate, maintains ownership of the uranium throughout the supply chain. OPG maintains a portfolio of multi-year supply contracts for uranium concentrate with domestic and foreign suppliers as well as uranium commodity traders. Occasionally, short-term spot market purchases are made to support a portion of OPG's uranium concentrate needs. OPG's nuclear fuel bundles are supplied by a Canadian-based manufacturer.

#### Nuclear Regulation

The *Nuclear Safety and Control Act* (NSCA) establishes the mandate and authority of the CNSC to make regulations governing all aspects of the development and application of nuclear energy in Canada. The NSCA grants the CNSC the power to act as a court of record, the right to make regulations, the power to require financial guarantees for nuclear waste management and nuclear facilities decommissioning as a condition of granting a licence, order-making powers and the power to impose monetary penalties for licence infractions. The NSCA also grants the CNSC the power to require periodic re-certification of nuclear operators and to set requirements for various nuclear facility security measures. It also provides for regulatory authority over environmental matters, including a requirement that licence applicants make adequate provision for the protection of the environment. The NSCA grants the CNSC licensing authority for all nuclear activities in Canada, including but not limited to the issuance of new licences to operators, the renewal of existing licences, protection of the environment arising from nuclear activities and making regulations related to nuclear activities.

A fundamental principle in nuclear regulation is that the licensee bears the responsibility for safe operation, with the CNSC setting safety objectives in areas such as radiation protection and physical security for nuclear generating stations and the transport of radioactive materials. The CNSC verifies compliance with the licence and performs audits and inspections of the licensee's performance against these objectives. The CNSC issues guidance documents to assist licensees in complying with regulatory requirements. Requirements specified in these guidance documents have been incorporated into the design and operating documents for OPG's nuclear generating stations.

Since the operation and regulation of nuclear energy has transboundary impacts, Canada has become a signatory to various international conventions relating to nuclear energy and emergency responses and is bound by conventions that it has ratified. In addition, the CNSC has a bilateral information exchange and co-operation agreement with the US Nuclear Regulatory Commission, which provides, among other things, for the prompt, reciprocal notification of reactor safety problems that could affect both US and Canadian nuclear generating facilities.

The CNSC publishes an annual report on the regulatory oversight and safety performance for nuclear power generating sites. The report assesses how well licensees are meeting regulatory requirements and program expectations in areas such as human performance, radiation and environmental protection, and emergency management and fire protection at Canada's nuclear power plants and adjacent waste management facilities. The most recent report is the 2017 annual report issued by the CNSC in September 2018. The report assigned both the Darlington GS and the Pickering GS the highest possible safety rating of "Fully Satisfactory", and the Darlington, Pickering, and Western waste management facilities the safety rating of "Satisfactory". The Darlington GS achieved this rating for the ninth consecutive year, while the Pickering GS achieved this rating for the third consecutive year. The report assessed the safety performance of the waste management facilities for the first time. Beginning with the 2018 annual report, which is expected to be issued in 2020, the CNSC will no longer assign overall safety ratings for each nuclear facility, instead providing ratings for each defined Safety and Control Area.

In 2017, the CNSC approved regulatory document *REGDOC 2.2.4 – Fitness for Duty – Managing Alcohol and Drug Use* for use at Canadian nuclear power plants. This document sets out requirements for managing fitness for duty of workers in relation to alcohol and drug use at high-security sites, including for-cause alcohol and drug testing for workers in positions identified as safety-sensitive or safety-critical, and random alcohol and drug testing for workers holding safety-critical positions. In September 2019, CNSC staff advised that they generally agree with the licensees' request to amend the regulatory document to include oral fluid testing, specifically for cannabinoids. A public consultation period on the change to the regulatory document is expected to begin toward the end of the first quarter of 2020 and OPG anticipates that all aspects of the regulatory document requirements will be implemented within six months of the completion of this process, with the exception of random testing of workers holding safety critical positions, which will be implemented within one year of the finalization of the regulatory document.

All of OPG's nuclear power reactor operating licences and waste facility licences are current and up to date. The current operating licence for the Darlington GS was granted by the CNSC in December 2015 and expires on November 30, 2025. The current operating licence for the Pickering GS was granted by the CNSC in August 2018 and expires on August 31, 2028. The Pickering GS licence allows for commercial operation of the station to December 31, 2024. Further details on the operating licence for the Pickering GS are discussed in the section, *General Development of the Business* under the heading, *Nuclear Business Developments – Extension of Pickering Commercial Operations*.

In May 2017, following an application by OPG and a set of public hearings, the CNSC announced that the licence for the Western Waste Management Facility (WWMF) located at the Bruce nuclear generating stations' site was renewed for a ten-year period and will be valid until May 31, 2027. In February 2018, following an application by OPG and a set of public hearings, the CNSC announced that the licence for the Pickering Waste Management Facility was renewed for a ten-year period and will be valid until August 31, 2028. The current licence for the Darlington Waste Management Facility is valid until April 30, 2023.

Details on Canada's nuclear liability regime and related insurance coverage can be found under the heading, *Insurance*.

#### Nuclear Generating Station Life

Service life predictions for OPG-operated nuclear generating stations are developed by assessing the impacts of a number of operating, technical and regulatory considerations on both unit and station economics. A decision by OPG to remove a unit from service would be primarily an economic decision that becomes more likely as the number of components requiring replacement and the frequency and duration of inspections required to ensure a unit's fitness for service increases. The key life-limiting components at OPG's nuclear stations include fuel channels, feeder tubes, steam generators and other reactor components. End-of-service life predictions are reviewed as new information on possible degradation mechanisms becomes available and as future generation expectations are revised.

## Nuclear Facility Planning

OPG uses a structured approach to identify and prioritize projects to optimize returns from nuclear station reinvestment within the constraints imposed by technical and financial requirements, while ensuring that safety, environmental and other regulatory programs are of the highest priority. Input from predictive maintenance programs, life cycle management plans and system health monitoring is used to determine the activities necessary to sustain and improve nuclear unit performance.

A structured framework modeled on the best practices identified by the Electric Power Research Institute, the Institute for Nuclear Power Operations and the World Association of Nuclear Operators (WANO) is used to optimize the maintenance of the nuclear generating stations and assess the health of the facilities. The structured framework includes predictive maintenance programs, which combine technologies and human expertise to analyze equipment performance, maintenance and design data in order to make timely decisions about the scope and timing of inspections and maintenance for major or critical equipment. The predictive maintenance program for each station is prioritized on the basis of the importance of the equipment for reactor safety. Life cycle management plans are maintained for critical station components and are updated annually to incorporate operating experience and new information. The life cycle plans define the inspection and maintenance programs required to ensure that these components perform in accordance with their design basis. In addition, system engineers conduct performance monitoring of station systems according to system performance monitoring plans that are based on a comparison of performance indicators against established targets to improve system performance. System performance is assessed by collecting, trending and analyzing station data. This information is reported in system health reports which are updated annually, at a minimum.

OPG's practices impacting the performance of the nuclear stations are audited regularly by WANO, with identified areas for improvement acted upon with priority. In December 2017, OPG hosted a WANO peer evaluation for the Pickering GS, which focused on the safe and reliable operation of the station while evaluating the plant material condition and functional and cross-functional areas of the station. The results of the evaluation showed that the Pickering GS sustained its strong rating while demonstrating significant improvement since the last review.

In the fourth quarter of 2018, OPG hosted a WANO peer evaluation for the Darlington GS, which focused on the station's plans for nuclear safety and plant reliability, day-to-day operations and overall behaviours. The results of the evaluation maintained Darlington's excellent standing for the fourth consecutive review period as one of the top performing nuclear plants in the world.

In the fourth quarter of 2019, OPG hosted a WANO peer follow-up evaluation for the Pickering GS that focused on the safe and reliable operation of the station while evaluating the plant material condition and functional and cross-functional areas of the station. The review concluded that the Pickering GS achieved an exemplary performance rating, recognizing the station as one of the top performing nuclear plants in the world and resulting in its best ever WANO peer review.

In 2016, OPG hosted a team of experts from the International Atomic Energy Agency (IAEA) at the Pickering GS to conduct a standard Operational Safety Review Team mission. The team conducted an in-depth review of performance and adherence to international safety standards and released the final report in 2017 which confirmed that the Pickering GS demonstrates a strong commitment to safety. In September 2018, the IAEA's Operational Safety Review Team conducted a follow-up operational safety review of the Pickering GS and released the final report in December 2018 which commented on OPG's strong commitment in implementing the recommendations and suggestions from the 2016 review, and noted that several recommendations and suggestions were fully implemented and significant progress had been made on several others.

Nuclear planned outages are necessary to execute inspection and maintenance work related to asset management and regulatory requirements for systems and equipment where access is not possible under normal operating conditions. Planned outages also give OPG an opportunity to perform system and equipment upgrades, project work, configuration changes and other improvements and modifications. The nuclear generation plan, by reference to the station's life cycle management plans, establishes the number, frequency and duration of the outages for each year required to ensure the continued safe and reliable long-term operation of the plant and its compliance with CNSC regulatory requirements.

The outage cycle determines the number of planned outages at each nuclear generating station in a particular year. The Darlington GS is on a 36-month outage cycle, where each of the four units undergoes an outage every three years, resulting in one or two outages per year for the station. The Pickering GS is on a 30-month outage cycle. In addition, the CNSC currently requires all units at each station to be shut down every 12 years to allow for inspection and maintenance on the station vacuum building, containment systems and other safety systems.

#### Nuclear Ancillary Operations

OPG's nuclear generating units contain approximately 7,400 tonnes of deuterium oxide, or heavy water, not including heavy water contained at the leased Bruce nuclear generating stations. The heavy water is required to operate CANDU reactors. Ontario Hydro ceased the operation of its heavy water plants in 1997 and the plants were subsequently decommissioned. There are currently no heavy water plants in Canada. OPG believes that its existing inventory of heavy water will be sufficient to replenish supplies as a result of normal operating losses at its nuclear generating stations, including the refurbishment of the Darlington GS. OPG also believes that sufficient quantities of heavy water are available for possible changes in operating conditions or for potential new nuclear generating facilities.

Tritium is a radioactive substance produced as a by-product of operating CANDU reactors, through the use of heavy water in the reactor moderator and heat transport systems. OPG operates a specialized facility at its Darlington site, the Darlington Tritium Removal Facility (TRF), which removes tritium from the tritiated heavy water (detritiation) used at the nuclear generating stations, in order to control the occupational dose exposure to employees and limit the amount of tritium released to the environment. The extracted tritium is chemically immobilized, placed in special containers, and safely stored in a vault. The Darlington TRF is also expected to be used to detritiate heavy water during the eventual decommissioning of OPG's nuclear generating stations. Some tritium is sold to government-approved organizations for authorized commercial and health industry uses. OPG also provides detritiation services to Bruce Power.

Cobalt-60 isotopes produced by OPG at certain units of its nuclear generating stations is mainly for use in the health industry to sterilize surgical and medical supplies. Cobalt-60 is currently produced in Units 6, 7 and 8 at the Pickering GS. Cobalt-60 can be produced in reactors which, like the CANDU reactors, use adjuster rods to regulate power. The production process involves replacing the stainless steel rod by a rod containing cobalt-59, which is isotopically converted into cobalt-60 after lengthy exposure to the atomic reaction in the reactor core. During planned maintenance outages, the rods are removed, cut, and packaged for sale as cobalt-60, and new rods are inserted in the reactor to continue the production cycle.

### Bruce Power Refurbishment and Bruce Lease Agreement

OPG leases the four-unit Bruce A (Units 1 to 4) and the four-unit Bruce B (Units 5 to 8) nuclear generating stations and associated lands and facilities to Bruce Power on a long-term basis. The stations are located in the Municipality of Kincardine, Ontario on the shore of Lake Huron. Units 1 and 2 at the Bruce A GS were refurbished by Bruce Power under a refurbishment agreement with the IESO and returned to service in 2012. Under an updated refurbishment agreement between the IESO and Bruce Power announced in December 2015, Bruce Power is proceeding with the refurbishment of the six un-refurbished units of the Bruce nuclear generating stations. The output from the Bruce nuclear generating stations is not subject to rate regulation by the OEB.

While Bruce Power is responsible for operating all of the leased units, OPG is primarily responsible for the management of the used nuclear fuel and other nuclear waste associated with the Bruce nuclear generating facilities, as well as the decommissioning of the facilities at the Bruce nuclear generating stations' site. Under the lease agreement between Bruce Power and OPG (Bruce Lease) and related agreements, OPG receives rent payments, and fees for nuclear waste management, heavy water detritiation services and certain other services.

In order to facilitate Bruce Power's refurbishment plans, the Bruce Lease and related agreements were amended in December 2015 to extend Bruce Power's future options to renew the lease up to the end of 2064. To better align with OPG's costs, beginning in 2016, the agreements were also amended to revise the approach for calculating rent payments and fees for nuclear waste management other than used fuel and, beginning in 2017, to modify the fee structure for OPG's heavy water detritiation services. Amendments were also made to enable certain adjustments to future rent payments and other fees for potential future changes in OPG's decommissioning and nuclear waste management cost estimates related to the Bruce nuclear generating facilities and to remove a conditional rent rebate provision. Certain of the above amendments were executed by OPG pursuant to a Shareholder Declaration and Shareholder Resolutions.

The refurbishment of the first of the six un-refurbished Bruce nuclear generating units, Unit 6, commenced in January 2020. Any nuclear waste resulting from this refurbishment that is determined to be non-routine per the existing waste management contract between Bruce Power and OPG requires an additional agreement to compensate OPG for managing this waste. In June 2018, OPG and Bruce Power executed a supplemental agreement to enable OPG to recover costs associated with the receipt, storage and disposal of non-routine steam generator and re-tube waste relating to Bruce Power's Unit 6 refurbishment.

Pursuant to a Memorandum of Understanding (MOU) dated November 12, 2015, OPG and Bruce Power have committed to ongoing collaboration to improve their respective nuclear refurbishment programs. Focus areas for collaboration include asset management and inspection programs, procurement, tooling, waste management and labour arrangements.

#### 4.6.2 Renewable Generation

OPG's renewable generation fleet comprises 54 regulated and 12 non-regulated hydroelectric generating stations and one solar facility located in Ontario and, through the Company's wholly-owned US subsidiaries, 85 wholly or jointly owned and operated hydroelectric generating stations located throughout the United States.

##### Overview of Hydroelectric Generating Facilities

Hydroelectric generating stations use the energy of falling water to drive hydraulic turbines that generate electricity. OPG's hydroelectric stations provide one of the Company's competitive advantages – a reliable, relatively low-cost source of renewable energy free of air emissions. Electricity generation from OPG's hydroelectric facilities depends primarily upon the availability of water, which is affected largely by natural factors such as precipitation and evaporation. It is also impacted by the prevalence of SBG conditions. OPG's hydroelectric stations operate as baseload, intermediate or peaking stations, depending on their physical characteristics and hydrological conditions. The financial impact of SBG conditions and variability in water flows on the rate regulated hydroelectric generating stations in Ontario is mitigated by OEB-authorized regulatory variance accounts.

OPG currently owns and operates 66 hydroelectric generating stations and 241 associated dams located on 24 river systems across Ontario. The operating results of 54 of these stations that are rate regulated by the OEB are reported in the Regulated – Hydroelectric segment. The operating results of the remaining 12 non-regulated hydroelectric stations in Ontario are subject to ESAs with the IESO or other long-term contracts and are reported in the Contracted and Other Generation business segment.

As at December 31, 2019, OPG's regulated hydroelectric facilities in Ontario had a total in-service generating capacity of 6,420 MW and the non-regulated hydroelectric facilities in Ontario had a total in-service generating capacity of 1,058 MW. OPG's hydroelectric stations in Ontario range in age from the Peter Sutherland Sr. GS which commenced commercial operations in 2017 to the DeCew Falls I GS, which is over 120 years old. Certain hydroelectric stations have shared operations, including the R.H. Saunders and Chats Falls generating stations, which operate under joint operating agreements with the New York Power Authority and Hydro-Québec, respectively.

Hydroelectric ESAs with 50-year terms are in place for the following hydroelectric facilities in Ontario:

Generating Facility	Expiry Date
Lac Seul and Ear Falls generating stations	February 2059
Healey Falls GS	April 2060
Sandy Falls, Wawaitin, Lower Sturgeon and Hound Chute generating stations	December 2060
Little Long, Harmon, Smoky Falls and Kipling generating stations <sup>1</sup>	January 2064
Peter Sutherland Sr. GS	March 2067

<sup>1</sup> These facilities are also known as the Lower Mattagami generating stations.

The generating performance of OPG's hydroelectric generating stations in Ontario is expressed using plant availability. Availability is represented by the percentage of time the generating unit is capable of providing service, whether or not it is actually generating electricity, compared to the total time for the respective period, weighted by unit capacity. Hydroelectric plant availability results for the Regulated – Hydroelectric business segment and the Contracted and Other Generation business segment are discussed in the section, *Discussion of Operating Results by Business Segment* under the headings, *Regulated – Hydroelectric Segment* and *Contracted and Other Generation Segment*, respectively, in the MD&A.

OPG operates and maintains Ontario-based hydroelectric facilities in regional operations groups. In 2017, the number of regional groups was reduced from five to four, by integrating the Central Operations work centers into three of the other existing groups. These operations groups are also responsible for the operation and maintenance of OPG's solar and thermal generating facilities.

The following are the four regional operations groups that currently operate and maintain OPG's 66 Ontario-based hydroelectric facilities as of December 31, 2019:

Region	River System	Generating Stations		In-Service Capacity (MW)
Eastern	Madawaska River	• Arnprior • Barrett Chute • Calabogie	• Mountain Chute • Stewartville	2,626
	Mississippi River	• High Falls		
	Ottawa River	• Chats Falls • Chenaux	• Des Joachims • Otto Holden	
	Rideau River	• Merrickville		
	St. Lawrence River	• R.H. Saunders		
	Trent River	• Auburn • Frankford • Hagues Reach • Healey Falls * • Lakefield • Meyersburg	• Ranney Falls • Seymour • Sidney • Sills Island	
Northeast	Abitibi River	• Abitibi Canyon	• Otter Rapids	1,846
	Matabitchuan River	• Matabitchuan		
	Mattagami River	• Harmon * • Kipling * • Little Long * • Lower Sturgeon *	• Sandy Falls * • Smoky Falls * • Wawaitin *	
	Montreal River	• Chute • Hound Chute *	• Lower Notch	
	New Post Creek	• Peter Sutherland Sr. *		
	South River	• Bingham Chute • Elliot Chute	• Nipissing	
	Sturgeon River	• Crystal Falls		
	Wanapitei River	• Coniston • McVittie	• Stinson	
Northwest	Aguasabon River	• Aguasabon		687
	English River	• Caribou Falls • Ear Falls *	• Lac Seul * • Manitou Falls	
	Kamanistikwia River	• Kakabeka Falls	• Silver Falls	
	Nipigon River	• Alexander • Cameron Falls	• Pine Portage	
	Winnipeg River	• Whitedog Falls		
South Central (previously Niagara)	Beaver River	• Eugenia		2,319
	Muskoka River	• Big Eddy • Hanna Chute • Ragged Rapids	• South Falls • Trethewey Falls	
	Niagara River	• Sir Adam Beck I • Sir Adam Beck II	• Sir Adam Beck Pump	
	Severn River	• Big Chute		
	Welland River	• DeCew I	• DeCew II	

\* Subject to an Energy Supply Agreement with the IESO

OPG also wholly or jointly owns and operates 85 hydroelectric generating stations and 88 dams located on 47 river systems throughout the United States. The results of these stations are reported in the Contracted and Other Generation business segment. These facilities had a total in-service generating capacity of 617 MW, excluding minority-held facilities, as at December 31, 2019. The US hydroelectric stations' energy and capacity contracts have expiry dates ranging from 2021 to 2039.

OPG operates and maintains its 85 US-based hydroelectric generating stations across 18 states in the following six operational divisions as of December 31, 2019:

Operational Division	States	Number of Generating Stations	In-Service Capacity (MW)
Southeast	• North Carolina • Virginia	6	234
Northeast	• Maine • New Hampshire	18	92
East	• Massachusetts • Vermont • New York	15	81
West Pennsylvania	• Pennsylvania	4	75
Midwest	• California • Minnesota • Colorado • Oregon • Illinois • Wisconsin • Michigan • Washington	30	71
Mid-Atlantic	• New Jersey • Pennsylvania • New York • Virginia • West Virginia	12	64

For additional information on OPG's hydroelectric operations, refer to the section, *Core Business and Outlook* under the heading, *Operational Excellence – Electricity Generation Production and Reliability* in the MD&A.

#### Hydroelectric Facility Planning

Major components of hydroelectric facilities typically include: generating equipment such as turbines, generators and transformers; civil works such as powerhouses, dams, headworks, spillways and water conveyance canals and tunnels; and facilities required to operate and maintain the stations such as control rooms and work centres. Although there is a link between the age of a facility and the capital investment required to maintain it, age does not generally establish an upper limit on the expected useful life of a hydroelectric station. Regular maintenance and the replacement of specific components typically allow stations to operate for very long periods.

OPG currently operates five staffed control rooms across Ontario that provide remote control and monitoring for all of OPG's Ontario-based hydroelectric generating facilities. These control rooms are designed to minimize the number of staffed control rooms, reduce control system failures and increase the amount of information available for production planning. Over 2017 and 2018, OPG amalgamated several control rooms, reducing the total number of control rooms to the current five.

OPG uses a structured portfolio approach to identify and prioritize projects for its hydroelectric asset investment programs. Engineering reviews and station condition assessments are performed as appropriate to determine short-term and long-term expenditure requirements to sustain or improve station performance and longevity. These may be followed by the preparation of a facility life cycle plan on an as-needed basis for marginal assets or assets potentially requiring significant expenditures relative to the value of the facility. This approach is designed to identify necessary capital, operating and maintenance expenditures for specific facilities and to direct resources towards those facilities that can best maintain or enhance their value.



OPG's maintenance programs include a preventive maintenance program to identify, schedule and execute maintenance activities at the hydroelectric facilities. The preventative maintenance program is based on the concept of streamlined reliability-centred maintenance, whereby the type and frequency of maintenance applied to an individual component is determined based on the nature and consequences of failure, balancing cost and risk.

The cornerstone of OPG's project prioritization and maintenance approaches for the hydroelectric assets is that safety, environmental and other regulatory programs are of the highest priority.

#### Water Management

OPG's water management strategy for its hydroelectric facilities is to safely utilize available water for generation of electricity in conformance with applicable legal, environmental, operational and regulatory requirements. OPG uses hydrological and meteorological data to manage water levels, water flows and water storage, and strives to schedule water use for optimum utilization and to minimize controllable water spills due to SBG conditions.

In recent years, OPG's hydroelectric operations experienced challenging conditions due to high water levels and flows in Ontario. The Company has worked closely with stakeholders, including industry partners and various levels of government, to safely and effectively manage conditions within its control. In 2019, the Province appointed a Special Advisor to assess current roles and responsibilities of governments, agencies and organizations involved in flood management and review the actions taken in 2019 in connection with higher water levels and flows experienced at OPG's hydroelectric operations as a result of spring freshet. The Special Advisor concluded that there were no indicators of human error or negligent operation of water control structures as the cause of the flooding, and that the government and its partners were effective at reducing and mitigating flood risks. OPG continues to explore ways to manage water systems and invest in infrastructure, where feasible, to help mitigate the impact of severe weather events on affected communities and businesses.

#### Gross Revenue Charge and Water Rental Payments

Hydroelectric generating stations in Ontario are subject to taxes and charges as prescribed by *Ontario Regulation 124/02* under the *Electricity Act, 1998*. These taxes and charges, referred to as Gross Revenue Charge (GRC), are based on station gross revenue, which, for this purpose, is determined as the product of annual station energy generation and the prescribed revenue rate of \$40/MWh (Gross Revenue). All OPG hydroelectric generating stations in Ontario are subject to GRC Property Tax, which is determined by applying graduated tax rates, ranging from 2.5 percent to 26.5 percent through four tiers of production, to a station's annual Gross Revenue. GRC Property Tax payments are made to the OEFC. Hydroelectric generating stations that are subject to water power lease agreements with the MNRF are additionally subject to GRC Water Rental payments. The GRC Water Rental charge is determined as 9.5 percent of a station's annual Gross Revenue. GRC Water Rental payments are made to the Ontario Ministry of Finance.

Annual land rental fees are paid to the MNRF as prescribed by Crown leases and licences of occupation which authorize OPG's tenure (including flooding rights), typically at storage dam sites.

The eight OPG hydroelectric generating stations located on the Trent River and Rideau Canal are subject to rental charges prescribed by licences with Parks Canada. These licences authorize OPG to occupy the lands, maintain and operate the powerhouses and dams and utilize water that is surplus to navigation needs for the generation of electricity.

Water conveyance charges are paid to the St. Lawrence Seaway Management Corporation as prescribed by a lease agreement providing for the withdrawal of water surplus to navigation needs from the Welland Canal for utilization at the DeCew Falls generating stations. The water conveyance charges apply to the transport of water from Lake Erie through the Welland Canal to OPG's intakes in Allanburg, Ontario.

Water rental payments are made to the Government of Québec, as prescribed by an agreement dated January 2, 1943. This agreement pertains to the sharing of the water powers of the Ottawa River and was ratified by the Governments of Ontario and Québec. Water rental charges payable to the Province of Québec and the GRC payments are each based on one-half of the energy produced at the three regulated OPG hydroelectric generating stations located on the Ottawa River. The current rate amending agreement has expired and a new agreement is currently being negotiated between the Governments of Ontario and Québec. No significant changes to the agreement are expected as a result of the rate negotiation. Under the agreement, OPG also provides compensation to Hydro Québec for the generating value at OPG's stations on the Ottawa River attributed to the water diverted into the Ottawa River through the Dozois Reservoir in Québec. OPG shares in the operation and maintenance costs of the dam enabling the Dozois diversion.

The GRC and water rental payments for the regulated hydroelectric stations are recoverable through OEB-approved regulated prices applicable to these stations.

For the applicable US hydroelectric stations, OPG pays annual charges for headwater benefits as determined by the FERC. Headwater benefits represent the additional electric generation that occurs at a downstream hydroelectric generating facility resulting from regulation of river flow by upstream facilities, usually by increasing or decreasing the release of water from upstream reservoirs.

Further details on water rights can be found under the heading, *Water Rights*.

#### Overview of Nanticoke Solar Facility

Solar generating facilities collect and convert the sun's emitted light into electricity. OPG owned and operated one solar facility, in Ontario, as at December 31, 2019:

Generating Facility	Location	In-Service Capacity (MW)
Nanticoke	Nanticoke, Ontario	44

The Nanticoke solar facility, placed in service in 2019, operates under a Large Renewable Procurement I (LRP I) contract with the IESO through Nanticoke Solar LP (NSLP) and is located at the former coal-fired Nanticoke GS site and adjacent lands. The LRP 1 contract for the facility expires in March 2039. Six Nations of Grand River Development Corporation, through its subsidiary, and the Mississaugas of the Credit First Nation, through a wholly owned corporation, own 15 percent and 5 percent interests, respectively, in NSLP. The facility is operated and maintained under OPG's South Central Operations operational group. The results of the Nanticoke solar facility are reported in the Contracted and Other Generation business segment.

For additional information on the Nanticoke solar facility, refer to the section, *General Development of the Business* under the heading, *Renewable Generation Business Developments – Nanticoke Solar Facility*.

### 4.6.3 Thermal

#### Overview of Thermal Generating Facilities

Thermal generating stations use heat energy to drive steam turbines that generate electricity. OPG's wholly-owned operating thermal facilities are comprised of the following as at December 31, 2019:

Generating Station	Location	Fuel Type	In-Service Capacity (MW)
Atikokan <sup>1</sup>	Atikokan, Ontario	Biomass	205
Brighton Beach <sup>2</sup>	Windsor, Ontario	Natural Gas	560
Lennox <sup>3</sup>	Greater Napanee, Ontario	Oil or Natural Gas	2,100

<sup>1</sup> The Atikokan GS is subject to a ten-year ESA with the IESO expiring in July 2024.

<sup>2</sup> The Brighton Beach GS operates under a 20-year energy conversion agreement expiring in July 2024.

<sup>3</sup> The Lennox GS is subject to an ESA with the IESO for the period from January 2013 to September 2022.

These stations, which operate as peaking facilities under their respective ESAs or other long-term contracts, provide Ontario's electricity system with the flexibility to meet changing daily system demand and capacity requirements and have enabled the system to accommodate the expansion of Ontario's renewable generation portfolio. The continued operation of these stations provides Ontario with over 2,800 MW of peaking generation capacity.

The Atikokan GS is the largest generating station in North America fuelled by 100 percent biomass, while the Lennox GS is Canada's largest oil/gas-fuelled power plant. The Lennox GS is operated and maintained under the Eastern Operations operating group and the Atikokan GS is part of Northwest Operations. The Brighton Beach combined-cycle natural gas-fired GS is operated by a wholly-owned subsidiary of OPG.

The results of the Lennox, Atikokan and Brighton Beach generating stations are reported in the Contracted and Other Generation business segment.

Former thermal stations that are no longer available to generate electricity are excluded from the Contracted and Other Generation business segment once they are removed from service. This includes the Lambton GS and Nanticoke GS sites, which ceased coal-fired generation in 2013, and the Thunder Bay GS, which ceased operations in 2018. Refer to the section, *General Developments of the Business* under the heading, *Thermal Business Developments* for further details.

The generation performance of OPG's wholly-owned thermal generating stations located in Ontario is measured using the Thermal Equivalent Forced Outage Rate (EFOR). EFOR is measured by the ratio of time a generating unit is forced out of service by unplanned events, including any forced deratings, compared to the amount of time the generating unit was available to operate. EFOR results for the thermal stations are discussed in the section, *Discussion of Operating Results by Business Segment* under the heading, *Contracted and Other Generation Segment* in the MD&A.

#### Thermal Fuel Procurement

Due to the relatively low capacity factor of the Lennox GS, natural gas is purchased on the spot market, other than a small volume of fixed term natural gas required for non-generation operational services. Oil for the Lennox GS is contracted for and purchased on an as needed basis. Fuel switching at the station is based on market and fuel economics. Annual procurement of biomass fuel quantities for Atikokan GS is pre-determined by the corresponding ESA. Agreements are in place with suppliers for the purchase of all biomass fuel pellets needed to provide fuel for the Atikokan GS for the remaining duration of its ESA. Pursuant to the Brighton Beach GS energy conversion agreement, Shell Energy North America (Canada) Inc. owns and trades the electricity produced by the facility in return for the supply of gas and the fees payable under the agreement.

### Thermal Facility Planning

OPG's facility planning approach is designed to identify necessary capital and operating and maintenance expenditures for each thermal facility. This planning approach aims to sustain facility availability for the remaining service life through station reinvestment within constraints imposed by technical, financial, safety and system requirements, as well as regulatory and contractual limits. Periodic engineering reviews of major systems are conducted to identify performance issues, provide reinvestment recommendations where appropriate and ensure that regulatory, safety and operating standards continue to meet expectations. OPG undertakes projects at thermal stations that are expected to achieve an appropriate return within the service life of the stations.

### Decommissioning of Former Thermal Generating Stations

OPG has recognized and carries on its balance sheet a liability to cover future expenditures to decommission and dismantle each of its wholly-owned thermal generating stations at the end of their estimated service lives. This provision is not funded and is estimated on the basis of station closure. The estimates for these liabilities are based on a review of required decommissioning, clean-up and restoration activities, underlying economic assumptions and anticipated timing of these activities in line with current accounting end-of-life assumptions for the operating sites. For the former Nanticoke, Lambton and Thunder Bay generating stations, the liability reflects the estimated cost of executing current decommissioning plans. OPG has a comprehensive program to ensure the safe, secure and environmentally responsible decommissioning of these stations.

### Portlands Energy Centre Partnership

OPG has a 49.95 percent partnership interest in Portlands Energy Centre L.P., a limited partnership formed with TC Energy (49.95 percent) and the general partner of the partnership, Portlands Energy Centre Inc. (0.1 percent). The shareholders of Portlands Energy Centre Inc. are OPG (50 percent) and TC Energy (50 percent). PEC is a 550 MW combined cycle generation natural gas turbine electricity generating facility located in the port area of downtown Toronto, Ontario. The station was declared in-service in a combined cycle mode in 2009. PEC operates under a 20-year Accelerated Clean Energy Supply contract with the IESO expiring in 2029 and trades electricity in the Ontario electricity market. As discussed further in the section, *General Development of the Business* under the heading, *Acquisition Developments – Agreement to Acquire Portfolio of Natural Gas-Fired Assets in Ontario*, OPG has entered into an agreement to purchase TC Energy's 50 percent interest in PEC. The Contracted and Other Generation business segment includes OPG's share of equity income from its current 50 percent ownership interest in the station.

#### 4.6.4 Nuclear Waste Management

##### Overview

OPG is responsible for the ongoing management of irradiated wastes generated by its nuclear operations. In addition, OPG has the obligation for decommissioning its nuclear generating stations and nuclear waste facilities after the end of their useful lives and for managing irradiated wastes that arise in connection with the decommissioning. The handling and disposal of nuclear waste in Canada is subject to federal legislation.

The wastes generated by OPG's nuclear operations include the following:

- Used nuclear fuel bundles;
- Intermediate-level waste – material that has come in close contact with the reactors, but is less radioactive than used fuel, such as ion exchange resins and reactor equipment and components; and
- Low-level waste – material used in connection with station operation that is not highly radioactive, such as tools and protective clothing.

The results of the Company's nuclear waste management operations are reported in the Regulated – Nuclear Waste Management segment and consist of the following activities:

- management of used nuclear fuel and low and intermediate level irradiated waste (L&ILW);
- decommissioning of OPG's nuclear generating stations including the stations on lease to Bruce Power and other nuclear facilities;
- management of the Nuclear Segregated Funds established under the Ontario Nuclear Funds Agreement (ONFA) to fund OPG's obligation for nuclear facilities decommissioning and the long-term management of nuclear waste; and
- other related activities including the inspection and maintenance of the waste storage facilities.

Accretion expense, which is the increase in the carrying amount of the present value liabilities for nuclear fixed asset removal and nuclear waste management liabilities reported on the balance sheet, due to the passage of time, and the earnings from the Nuclear Segregated Funds are reported under this segment. The Regulated – Nuclear Waste Management segment is considered rate regulated because OPG's costs associated with nuclear waste management and nuclear facilities decommissioning liabilities are included by the OEB in the determination of regulated prices for production from the Darlington and Pickering nuclear generating stations.

##### Federal Government Policy

In accordance with the requirements of the *Nuclear Fuel Waste Act* (Canada) (NFWA), in 2002, OPG and the other owners of nuclear fuel waste in Canada established a separately incorporated Nuclear Waste Management Organization (NWMO), with a mandate to manage and coordinate the full range of activities relating to the long-term management of nuclear fuel waste in Canada. This includes the design and implementation of Canada's plan for the long-term management of used nuclear fuel. In 2007, the federal government approved NWMO's submitted option, the Adaptive Phased Management (APM) plan, as the long-term solution for nuclear fuel waste. The APM plan contemplates the eventual long-term permanent disposal of radioactive nuclear fuel waste in a deep geologic repository (DGR) after a collaborative process of communication and engagement with Canadians aimed at selecting a suitable geological site with an informed and willing host community. The NWMO is currently undertaking a site selection process for the used fuel DGR and has indicated that it expects to complete the process by about 2023.

The NFWA requires the nuclear fuel waste owners in Canada to establish and make payments into trust funds for the purpose of funding the implementation of the long-term management plan for used fuel. Accordingly, OPG has established the Ontario NFWA Trust (the NFWA Trust), which forms part of the Nuclear Segregated Funds under the ONFA. Additional details can be found under the heading, *Funding Mechanisms*.

## Current Practices and Assumptions

### *Station Decommissioning*

OPG's planning assumption for the decommissioning of its nuclear generating stations is a deferred dismantlement strategy. Under this strategy, each station will be de-watered and de-fuelled immediately after it has ceased operations and prepared for safe storage and monitoring. Thereafter, OPG intends to monitor the station for approximately 30 years while in safe storage, after which time the station will be dismantled and the site restored over a period of approximately ten years. This strategy has been communicated to the CNSC through regular updates of OPG's preliminary decommissioning plans and liability estimates for the nuclear generating stations. OPG's nuclear operating licences have been issued based on, amongst other considerations, CNSC's understanding of this strategy. The current operating licence for the Pickering GS, which is valid until August 31, 2028, supports a plan to place the station in a safe storage state by 2028 following the end of commercial operation.

### *Used Nuclear Fuel*

Used nuclear fuel bundles from OPG's reactors and leased reactors at the Bruce nuclear generating site are temporarily stored at each nuclear generating station in water-filled pools, known as wet bays, for a cooling-off period of at least ten years, during which time their radioactivity is substantially reduced. Each nuclear generating station has sufficient capacity to store used nuclear fuel bundles in the wet bays for approximately 15 to 20 years of operation.

After the used nuclear fuel bundles have been stored for the cooling-off period, they are transferred from the wet bays to above-ground dry storage containers at the corresponding nuclear station site. Currently, there is used nuclear fuel bundles in dry storage at the Darlington, Pickering and Bruce nuclear generating sites.

OPG's planning assumption for the long-term management of used nuclear fuel bundles is consistent with the NWMO's APM concept of disposal in a DGR. The NWMO has indicated that it expects an in-service date of 2043 at the earliest for the used fuel DGR.

### *Low and Intermediate Level Waste*

The majority of OPG's L&ILW is stored at WWMF located on the Bruce nuclear generating site. This facility, which continues to be owned and operated by OPG following the lease of the Bruce generating stations, operates under a separate licence issued by the CNSC. A smaller volume of ILW is stored at each of the waste management facilities at the Darlington and Pickering sites.

OPG's planning assumption for the long-term management of L&ILW has been the placement of this nuclear waste in a separate L&ILW DGR facility to be constructed on the lands adjacent to the WWMF in Kincardine, Ontario and operated by OPG. In light of the January 31, 2020 vote by members of the Saugeen Ojibway Nation (SON) not to support OPG's proposed L&ILW DGR at this site, the Company has begun a process to evaluate potential alternative solutions for the safe long-term management of the L&ILW and to assess the potential impact on its nuclear fixed asset removal and nuclear waste management liabilities. Due to significant uncertainties associated with potential alternative solutions and the estimation of their cost at the present time, including factors beyond the Company's control, no adjustment to these liabilities recorded on the balance sheet as at December 31, 2019 was recognized as a result of the SON community vote. OPG will continue to evaluate the underlying assumptions and cost estimates based on available information. Further details can be found under the section, *Nuclear Business Developments* under the heading, *Deep Geologic Repository for Low and Intermediate Level Waste*.

## Funding Mechanisms

On April 1, 1999, Ontario Hydro's obligation for nuclear facilities decommissioning and nuclear waste management was transferred to OPG. The responsibility for funding the obligations for nuclear facilities decommissioning and the long-term nuclear waste management between the Province and OPG is described in the ONFA. The key provisions of the ONFA are:

- (i) for OPG to establish two segregated funds, the Used Fuel Segregated Fund to fund the future costs of long-term used nuclear fuel management and certain costs of used nuclear fuel storage incurred after the stations are shut down, and the Decommissioning Segregated Fund to fund the future costs of nuclear decommissioning and long-term L&ILW management, and certain costs of used nuclear fuel storage incurred after the stations are shut down;
- (ii) for the OEFC to be responsible for funding approximately \$2.4 billion present value as at April 1, 1999 that had been an accumulated liability of Ontario Hydro, which the OEFC has since then fully funded through an initial contribution to the Decommissioning Segregated Fund;
- (iii) for the Province to limit OPG's financial exposure in relation to the cost of used nuclear fuel management for the first 2.23 million bundles of used fuel; and
- (iv) for the Province to provide financial guarantees to the CNSC for OPG's nuclear decommissioning and nuclear waste management obligations, as required by the CNSC.

The Used Fuel Segregated Fund and the Decommissioning Segregated Fund are administered by a third party custodian and held in accounts segregated from OPG's other assets. OPG has granted a security interest in both funds to the Province. As a result, these funds are not available to satisfy the claims of OPG's creditors.

OPG's funding liabilities and required contributions to the Used Fuel Segregated Fund and the Decommissioning Segregated Fund are determined based on reference plans and associated life cycle cost estimates periodically approved by the Province under the ONFA. These reference plans are prepared by OPG with the assistance of external consultants and based on external practices and international benchmarks. Under the ONFA reference plans, the total present value of OPG's future nuclear facilities decommissioning and nuclear waste management costs is determined based on baseline cost estimates and a set of underpinning planning assumptions, including remaining useful lives of the nuclear stations, proposed methods and timing of nuclear waste disposal and economic indicators. Given the long-term duration of these life cycle programs, the multiple assumptions involved and the evolving technology to handle nuclear waste, there is a significant degree of inherent uncertainty and judgement surrounding the measurement of the underlying costs, which may increase or decrease materially over time.

The limits to OPG's financial exposure under the ONFA with respect to the life cycle cost of long-term management of the first 2.23 million bundles of used nuclear fuel are as follows (all amounts are expressed in January 1, 1999 present value dollars):

- (i) OPG will bear all costs up to \$4.6 billion;
- (ii) OPG and the Province will share, on an equal basis, costs incurred between \$4.6 billion and \$6.6 billion;
- (iii) OPG will be responsible for 10 percent of the costs incurred between \$6.6 and \$10 billion, and the Province will be responsible for the remaining 90 percent;
- (iv) the Province will be wholly responsible for any costs above \$10 billion.

OPG's funding liability for these used fuel costs under the ONFA is capped at \$5.9 billion in January 1, 1999 present value dollars, which is equivalent to approximately \$17.4 billion in December 31, 2019 present value dollars. OPG is responsible for all incremental costs relating to the management of used nuclear fuel bundles in excess of the 2.23 million threshold. As at December 31, 2019, approximately 2.76 million bundles of used fuel had been produced. The 2.23 million fuel bundles threshold represents the estimated total life cycle bundles based on the initial estimated useful lives of the nuclear stations assumed in the ONFA.

Under the ONFA, the Province guarantees OPG's annual return earned in the Used Fuel Segregated Fund at 3.25 percent plus the rate of change in the Ontario Consumer Price Index, as defined in the ONFA, for funding related to the first 2.23 million used nuclear fuel bundles. Upon approval of a new or amended ONFA reference plan, the Province is obligated to make an additional contribution to the Used Fuel Segregated Fund in relation to the first 2.23 million bundles if the fund assets earned a rate of return that is less than the guaranteed rate of return. If the return on the fund assets exceeds the Province's guaranteed rate of return, the Province is entitled to withdraw any portion of the excess related to the first 2.23 million bundles, upon approval of a new or amended ONFA reference plan. OPG is responsible for cost increases and investment returns for the portion of the fund attributable to the used nuclear fuel bundles in excess of the 2.23 million threshold. OPG also is responsible for cost increases and investment returns for the Decommissioning Segregated Fund.

Investments in the Nuclear Segregated Funds include a diversified portfolio of equity and fixed income securities, pooled funds, infrastructure, real estate and other investments. As the Nuclear Segregated Funds are invested to fund long-term liability requirements, the portfolio asset mix is structured to achieve the required return over a long-term horizon. While the funds are managed to achieve, in the long term, the target return rate based on the discount rate specified in the ONFA, the rates of return earned in a given period may be subject to various external factors including financial market conditions and changes in the Ontario Consumer Price Index, both of which can be volatile and cause short-term fluctuations in the Company's financial results. OPG jointly oversees the investment management of the Nuclear Segregated Funds with the Province.

In accordance with *Ontario Regulation 53/05*, the OEB is required to ensure that OPG recovers the revenue requirement impact of its nuclear waste management and nuclear decommissioning liabilities arising from the current approved ONFA reference plan. This includes costs related to the portion of OPG's liabilities associated with the Bruce nuclear generating stations. The OEB has authorized regulatory accounts to record the impact associated with changes in OPG's nuclear waste management and nuclear decommissioning liabilities relative to amounts reflected in regulated prices. Under the OEB-approved cost recovery methodologies, OPG's net income is exposed to the rate of return risk for the portion of the Nuclear Segregated Funds related to the Darlington and Pickering nuclear generating stations.

#### *Contributions to the Nuclear Segregated Funds*

OPG's contribution requirements under the ONFA are recalculated each time there is an approved new or amended reference plan and under certain other events. Reference plans are required to be prepared at least every five years, or more frequently if there is an underlying change in the assumptions of the reference plan that both OPG and the Province agree are significant enough to trigger a recalculation of the contribution levels during the five-year period.

Prior to 2017, OPG made contributions to the Used Fuel Segregated Fund every quarter, including a one-time special payment in earlier years, as required by the ONFA. These contributions reflected ONFA requirements to fund the majority of the underlying used nuclear fuel liability by the end of the initial estimated useful lives of the nuclear stations assumed in the ONFA, resulting in significantly higher contributions to the Used Fuel Segregated Fund in the earlier years of OPG's existence. To date, OPG has not been required to make contributions to the Decommissioning Segregated Fund, which was fully funded at its inception through the initial contribution made by the OEFC and, taking into account fund asset performance and changes in underlying funding obligations over time, at the time of every subsequent approved ONFA reference plan.



Based on the 2017 ONFA Reference Plan approved by the Province effective January 1, 2017, OPG is currently not required to make overall contributions to the Nuclear Segregated Funds. Contributions may be required in the future should the Nuclear Segregated Funds be in an underfunded position at the time of the next ONFA reference plan update, which is currently scheduled to be completed at the end of 2021. Such may be the case as a result of future variability in fund asset performance due to volatility inherent in financial markets and economic conditions. Future contribution levels also are dependent on changes in baseline cost estimates and underpinning planning assumptions used to establish the funding obligations in subsequent ONFA reference plans, as well as any changes in the tax treatment of fund earnings. OPG's required contributions could increase, for example, if cost estimates increased, if the operating lives of the nuclear stations were revised, if fund assets earned less than the target rate of return, or if the income earned in the funds became subject to income tax.

OPG is required to make annual contributions to the NFWA Trust based on a funding formula approved by the federal Minister of Natural Resources for OPG and the other nuclear fuel waste owners in Canada. Any OPG contributions to the Used Fuel Segregated Fund as well as any portion of the Used Fuel Segregated Fund currently not in the NFWA Trust can be applied to satisfy the trust's annual contribution requirements. The funds in the NFWA Trust will be used for the purposes of long-term management of used nuclear fuel waste, in accordance with the NFWA. OPG and the Province are beneficiaries of the NFWA Trust.

If there is a surplus in the Decommissioning Segregated Fund such that the funding liabilities, as defined by the most recently approved ONFA Reference Plan, are at least 120 percent funded, OPG may direct, at the time a new or amended reference plan is approved, up to 50 percent of the surplus over 120 percent to the Used Fuel Segregated Fund, with the OEFC entitled to a distribution of an equal amount.

If there is a surplus in the Used Fuel Segregated Fund such that the funding liabilities, as defined by the most recently approved ONFA Reference Plan, are at least 110 percent funded, after taking into account the guaranteed return on the funding related to the first 2.23 million used fuel bundles, the Province has the right, at any time, to access the excess amount greater than 110 percent. Neither OPG nor the Province have a right to direct any amounts from the Used Fuel Segregated Fund to the Decommissioning Segregated Fund.

Upon termination of the ONFA, the Province has the sole right to any excess funds in the Decommissioning Segregated Fund and the Used Fuel Segregated Fund.

OPG has the responsibility for the management and disposal of the used nuclear fuel and L&ILW generated by the Bruce nuclear generating stations and for the eventual decommissioning of these stations. These obligations on the part of OPG are recovered from Bruce Power through annual rent payments and volumetric fees under the Bruce Lease and related agreements. Pursuant to the lease agreement, Bruce Power must return the two Bruce nuclear generating stations to OPG together, in a de-fuelled and de-watered state. As such, these de-watering and de-fuelling costs will not be funded by OPG. Further details on these agreements can be found under the heading, *Business Operations – Nuclear*.

## Provincial Guarantee

In accordance with the NSCA, the CNSC requires OPG to have sufficient funds available to discharge its existing nuclear waste management and nuclear decommissioning obligations. The CNSC process requires the CNSC financial guarantee requirement to be updated once every five years and for OPG to provide an annual report to the CNSC on the assumptions, asset values and resulting financial guarantee requirements. The CNSC financial guarantee requirement calculation takes into account nuclear waste expected to be generated to the end of each year.

The most recent five-year update of the CNSC financial guarantee requirement spans the 2018-2022 period and was accepted by the CNSC in November 2017. Based on the most recent annual report, OPG expects that the CNSC financial guarantee requirement for the 2020-2022 period will continue to be satisfied by the forecast fair market value of the Nuclear Segregated Funds without the requirement of a Provincial Guarantee. As provided for by the terms of the ONFA, the Province is committed to provide a Provincial Guarantee to the CNSC as required, on behalf of OPG, should there be a shortfall between the CNSC financial guarantee requirement and the fair market value of the Nuclear Segregated Funds during the 2020-2022 period, as it has done in the past. OPG pays the Province an annual guarantee fee equal to 0.5 percent of the outstanding amount, if any, of the Provincial Guarantee.

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## 4.7 ENVIRONMENTAL, SOCIAL, GOVERNANCE AND SUSTAINABILITY

### 4.7.1 Environment

#### Overview

OPG recognizes that operating in a sustainable, safe and inclusive manner is directly connected to business success and is expected by the Company's Shareholder and stakeholders. As Ontario's largest low-cost clean energy provider, the Company strives to be a leader in sustainability and climate change mitigation through the implementation of operational and growth strategies that minimize the Company's environmental footprint, foster biodiversity, support reductions in GHG emissions and increase resilience to climate change impacts. OPG is committed to meeting, and as necessary, exceeding the Company's environmental obligations and commitments. Details regarding OPG's Environmental Policy can be found in the section *Environmental, Social, Governance and Sustainability* under the heading *Environmental and Sustainability* in the MD&A.

OPG's Environmental Policy is implemented through OPG's province-wide environmental management system (EMS). Within the EMS, OPG sets environmental objectives and maintains planning, operational control and monitoring programs to manage its negative and positive impacts on the environment. The policy is reviewed annually to ensure that it remains appropriate to the purpose and context of the Company's operations. Environmental performance targets are set as part of the annual business planning process and are based on past performance and external benchmarking to promote continuous improvement. The most significant environmental aspects of OPG's operations include: spills, chemical and thermal emissions to water, water flow and level changes, radiological emissions, L&ILW, displacement of fossil fuels, enhancement and disruption of wildlife habitat, and fish impingement and entrainment.

Details of OPG's environmental performance and initiatives to fulfill the Company's Environmental Policy can be found on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website is incorporated by reference herein.***

#### Environmental Compliance

OPG must comply with a large number of environmental requirements contained in statutes, regulations, by-laws, licences, permits and approvals. Failure to comply with applicable environmental laws may result in enforcement actions, remediation actions or restrictions to operations. OPG reports any incidents of non-compliance to the appropriate government or regulatory authorities as required, with corrective action plans developed and implemented accordingly. Changes in compliance obligations can result in new requirements and increased costs.

### Protection of Fish

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.

### Biodiversity and Habitat Stewardship

The generation of electricity can have an impact on biodiversity, either directly through habitat loss and fragmentation or indirectly through emissions to the environment. OPG is committed to managing its sites in a manner that strives to maintain significant natural areas and associated species of concern. OPG also works with its community partners to support regional ecosystems and biodiversity through science-based habitat stewardship. OPG's regional biodiversity program strategically funds and promotes efforts to protect and restore biodiversity in areas of Ontario where genetic, species or ecosystem diversity has been most impacted, and substantive threats remain.

### Awards and Recognitions

In November 2017, OPG's biodiversity program was recognized by the Canadian Electricity Association (CEA) with the 2017 Sustainable Electricity award for Commitment to Continuous Performance Improvement.

In November 2018, OPG received the Wetlands Project Award from the Wildlife Habitat Council in recognition of the Company's efforts to promote habitat conservation and management at the Chats Falls wetland.

In March 2019, OPG received the Conservation Partner of the Year Award from the Ontario Federation of Anglers and Hunters in recognition of OPG's support of the Lake Ontario Atlantic Salmon Restoration Program.

In September 2019, the Darlington GS was presented with the 2019 Sustainability Award by the Oshawa Chamber of Commerce for its commitment to environmental stewardship and sustainability initiatives. Also in 2019, OPG's biodiversity program received national recognition when OPG was named as a finalist for the Canadian Museum of Nature's Nature Inspiration Awards.

In June 2019, OPG was named, for the seventh year in a row, as one of the Best 50 Corporate Citizens in Canada by Corporate Knights. The annual corporate rankings are based on performance data covering resource, employee and financial management, with an emphasis on transparency, in order to recognize companies leading in sustainability.

### Climate Change Mitigation and Air Quality

OPG's operational and growth strategies support reductions in GHG emissions and improved air quality. 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, making OPG Ontario's largest clean energy provider.

OPG monitors and reports GHG emissions from its facilities in accordance with the regulatory requirements set out by Environment and Climate Change Canada and the Ontario Ministry of the Environment, Conservation and Parks (MECP). Effective July 3, 2018, the Government of Ontario revoked the *Cap and Trade Program Regulation* which had been in effect since July 1, 2016. The cap and trade program was a market mechanism introduced by the previous Government of Ontario to put a price on carbon in the province. The revocation of the cap and trade program did not have a material financial impact on the Company.

Under the federal Greenhouse Gas Pollution Pricing Act (GGPPA), an Output-Based Pricing System (OBPS) for industrial facilities took effect on January 1, 2019 and a fuel charge came into effect on April 1, 2019 in Ontario. On July 10, 2019, OBPS regulations were published, including fuel-specific performance standards for electricity generation that apply retroactively beginning January 1, 2019. OPG has implemented processes to comply with the federal requirements and recover associated carbon costs to the extent possible.

On July 4, 2019, the Government of Ontario published Greenhouse Gas Emissions Performance Standards (EPS) to provide Ontario with an alternative to the OBPS portion of the federal GGPPA. Only the registration provisions of the EPS currently apply. Other key provisions will not apply while Ontario is subject to the federal OBPS requirements. Neither the federal pricing system nor the provincial EPS are expected to have a material financial impact on the Company.

OPG monitors actions being undertaken by various levels of government with respect to GHG emission levels and support for a low-carbon economy. In support of efforts to mitigate climate change, the Company continues to evaluate and implement plans to increase the generation capacity of its hydroelectric fleet where economical, and invest in other low-carbon technologies including nuclear innovation, energy storage and transport electrification. OPG is also proactively taking steps to ensure resiliency of its assets and minimize risks related to climate change and severe weather events. For further details refer to the section, *Environmental, Social, Governance and Sustainability* in the MD&A.

#### Radiological Emissions

Small amounts of radioactivity are released to the environment as a result of nuclear reactor operation. OPG maintains an effluent monitoring and control program to ensure radiological emissions are kept well below the release limits specified in the station operating licences. OPG also has environmental monitoring programs in the vicinity of the nuclear stations to ensure operations have no adverse impacts on human health and the environment. These programs are designed to assess impacts, demonstrate compliance with regulatory limits, validate the effectiveness of containment and effluent controls and verify predictions made by environmental risk assessments. Results from the monitoring programs confirm OPG's radiological emissions are a small fraction of the regulatory release limits.

In 2018, the CNSC released sampling results from its 2017 independent environmental monitoring program, which confirmed that the public and environment around the Darlington GS and the Pickering GS are protected and that there are no expected health impacts.

Further details are discussed under the heading, *Workplace Safety and Public Safety – Nuclear Radiation Safety*.

#### **4.7.2 Workplace Safety and Public Safety**

Workplace safety and public safety are fundamental core values at OPG. OPG is committed to operating all of its facilities in a safe, secure and reliable manner that reduces risks to an acceptable level. Safety is an overriding priority in all activities performed at OPG's generating and other facilities and all employees and contractors are expected to conduct themselves in a manner that ensures workplace safety and public safety in line with the Company's safety culture, the Employee Health and Safety Policy and the Safe Operations Policy.

#### Workplace Health and Safety

In the area of workplace safety, OPG is committed to achieving excellent performance through continuous improvement and a strong safety culture, with the ultimate goal of zero injuries. OPG utilizes integrated health and safety management systems and a set of operational risk control procedures to ensure continued monitoring of health and safety performance and to support continuous learning and improvement in this area. Over the past several years, OPG has stood in the top quartile of its comparator Canadian electrical utilities in various safety performance metrics. In November 2019, OPG received the CEA President's Award of Excellence for Employee Safety, recognizing OPG's top safety performance within the comparator group in the previous year.

In May 2018, the Employee Assistance Society of North America awarded OPG the annual Corporate Award of Excellence. These awards are given to organizations that showcase the excellence, innovation and impact of employee assistance programs in the workplace with a view to enhance employee well-being and support a healthy and productive working environment. OPG was recognized for its commitment to an organizational culture that values safety and good mental health as critical components of the organization's success.

Additional details of OPG's workplace health and safety programs and performance are discussed in the section, *Environmental, Social, Governance and Sustainability* under the heading, *Workplace Safety and Public Safety* in the MD&A.

#### Nuclear Radiation Safety

OPG manages a radiation protection program designed to minimize detrimental health effects to employees and members of the public. OPG follows developments in the field of radiation protection as documented by the International Commission on Radiological Protection (ICRP), the United Nations Scientific Committee on the Effects of Atomic Radiation and the US National Council on Radiation Protection and Measurements. Widely recognized as the main source of expert advice regarding protection from the harmful effects of ionizing radiation, the ICRP periodically issues recommendations concerning principles of radiation protection. These recommendations are usually adopted by most countries without significant modification and are incorporated into the applicable laws. The Canadian Radiation Protection Regulations are based on the recommendations of the ICRP, and OPG's nuclear facilities conform to these regulations. The CNSC is the federal agency that regulates radiation protection in Canada.

Radiation exposures to station personnel and the public are limited by station design and adherence to approved operating procedures. Over the years, OPG has been a leader in applying the principles of keeping radiation doses as low as reasonably achievable. OPG's internal operating limits for occupational exposure are set well below the regulatory limits to ensure that the regulatory limits are not exceeded. OPG's operating targets for radiological emissions are set at even more restrictive levels and typically represent small fractions of the regulatory limits. For further details of OPG's annual dose exposure to the public, refer to the section, *Environmental, Social, Governance and Sustainability* under the heading, *Workplace Safety and Public Safety* in the MD&A.

As a condition of receiving operating licences for its nuclear facilities, OPG has developed comprehensive emergency plans that detail the Company's planned response to reactor accidents, as well as accidents involving the transportation of radioactive materials. These plans dictate how OPG will work with municipal, regional, provincial and federal agencies to safeguard station personnel and members of the public in the unlikely event of a radiation emergency at one of OPG's facilities. Station staff are required to regularly participate in emergency exercises to maintain and continuously improve response capability for such events.

Pursuant to the *Emergency Management and Civil Protection Act*, a provincial agency, Office of the Fire Marshal and Emergency Management (OFMEM), is required to periodically update the Provincial Nuclear Emergency Response Plan (PNERP) for cabinet approval. Based on the approved PNERP Master Plan, the OFMEM prepares Implementing plans for each major nuclear site in the province, including the Darlington and Pickering nuclear generating stations, in order to provide detailed guidance and direction. In 2016, the CNSC advised the OFMEM to consider more severe accidents in the update to the PNERP. In December 2017, the Province approved the updated PNERP Master Plan. The changes included a new 20-kilometre Contingency Planning Zone around the Darlington and Pickering nuclear generating stations, which will improve protective actions for the public. The Province published the Implementing Plan based on the updated PNERP Master Plan for the Pickering GS in 2018 and Darlington GS in 2019. OPG has updated its nuclear emergency preparedness plans to conform with the updated PNERP Master Plan and the Implementing Plans for both the Darlington and Pickering nuclear generating stations.

On January 12, 2020, the Provincial Emergency Operations Centre (PEOC), operated by the Province, issued an emergency alert, stating there was an incident at the Pickering GS. This alert was sent in error during a routine test conducted by PEOC. OPG was not involved in this test and there was no incident at the Pickering GS or any OPG facilities that would have prompted public notification. On February 27, 2020, the Province released the results of an investigation which concluded that the cause of the alert was human error, confirming that the alert was not connected to OPG or the Pickering GS in any way.

#### Dam Safety and Waterways Public Safety

OPG manages dam safety and other risks associated with the production of hydroelectric power through OPG's Dam Safety Program in line with the Safe Operations Policy. The Safe Operations Policy directs OPG to ensure that dams are designed, constructed, operated and maintained in a manner that meets all applicable dam safety legislation and regulatory requirements, and takes into consideration industry best practices. OPG is one of the first dam owners in Canada to have developed and implemented a dam safety program and is considered an industry leader in many aspects of the program.

In the US, dam safety for hydropower dams is regulated by the FERC, which has published detailed guidelines supporting the regulations on dam safety. The FERC's regulatory regime includes a system of oversight that includes annual inspections by the regulator and a number of routine submissions as well as periodic dam safety reviews. Consistent with the FERC regulations, OPG's subsidiaries in the US have in place Owners Dam Safety Programs (ODSPs) to govern dam and public safety processes and operations. The ODSPs document the commitment to dam and public safety, define roles and responsibilities and set out how various aspects of the program are managed. The ODSPs are subject to independent audit to ensure the managed system remains effective in addressing potential risks posed by the facilities.

In addition to effectively managing the safety of dams against catastrophic failure, OPG has developed a number of technical standards and procedures concerning public safety around dams, and materials to educate the public and increase awareness of the safety risks associated with the operation of the hydroelectric facilities. This includes the implementation of control measures in the form of signage, safety booms, buoys, fencing and audible alerts at the appropriate facilities. These measures are actively managed to maintain their effectiveness. OPG's water safety public education program in Ontario includes educational advertisements on various media platforms and engagement of agencies and stakeholders, such as the MNR, Ontario Provincial Police, Life Saving Society, Ontario Waterpower Association and others.

Since 2007, OPG has engaged an independent advisory panel consisting of internationally recognized experts to conduct an annual review of the Company's dam safety program. The Chair of the independent panel establishes areas of in-depth review and reports the observations to OPG's Board of Directors (Board). The panel has consistently found that the risks associated with the Ontario dams owned and operated by OPG are being managed in alignment with industry best practices and guidelines. OPG remains committed to high standards of public safety on waterways around hydroelectric generating stations and dams, and continues to make investments in waterway and dam safety upgrades.

Additional details on the regulatory regime related to dams and waterways can be found under the heading, *Water Rights*.

### 4.7.3 Human Resources

#### Workforce Resourcing Strategies

A well trained and engaged workforce is fundamental to the achievement of OPG's business imperatives. The Company is focused on building a diverse, committed, healthy and agile workforce that thrives in a dynamic and changing industry, while fostering a strong culture of collaboration, accountability and innovation. OPG continues to communicate and implement the values and behaviours expected from its employees in order to maintain a strong focus on safety, performance excellence, continuous improvement and corporate citizenship. Further details on OPG's workforce resourcing strategies are found in the section, *Environmental, Social, Governance and Sustainability* under the heading, *Human Resources* in the MD&A.

#### Employees

OPG's average number of regular employees and average number of seasonal, casual construction and non-regular employees (Other Employees) during the year ended December 31, 2019 were as follows:

Business Segment	Regular Employees	Other Employees	Total Employees
Regulated – Nuclear Generation <sup>1</sup>	6,776	1,853	8,629
Regulated – Hydroelectric	1,189	60	1,249
Contracted and Other Generation <sup>2</sup>	644	91	735
Other	106	17	123
<b>Total</b>	<b>8,715</b>	<b>2,021</b>	<b>10,736</b>

<sup>1</sup> Includes employees associated with the Regulated – Nuclear Waste Management segment.

<sup>2</sup> Includes average number of regular and other employees employed by acquired businesses from the respective dates of acquisition.

Most of OPG's workforce supports the company's Ontario-based operations. Approximately 87 percent of OPG's employees in Ontario are represented by the Power Workers' Union (PWU) and the Society of United Professionals (Society). The PWU represents most workers below the level of first line manager – from clerical staff to technicians and trades staff and station operators. The Society represents supervisors, professional engineers, scientists and other professionals. The current collective agreement between the PWU and OPG expires on March 31, 2021. The current collective agreement between the PWU and OPG's wholly-owned subsidiary operating the Brighton Beach GS expires on November 15, 2020. The current collective agreement between the Society and OPG expires on December 31, 2021.

Bargaining rights with the craft unions that perform construction work at OPG's generating facilities in Ontario are established either through the Electrical Power Systems Construction Association (EPSCA) or directly with OPG and its wholly-owned subsidiaries. Most of these collective agreements currently have multi-year terms that expire in 2025. The remaining collective agreements expire in 2020 and are currently in the process of being negotiated for renewal. The EPSCA is a voluntary association of owners and contractors who perform work in Ontario's electrical power systems sector.

The Government of Ontario's Bill 124, *Protecting a Sustainable Public Sector for Future Generations Act, 2019* came into effect on November 7, 2019. The legislation limits compensation increases for unionized and non-unionized employees in the province's public sector by establishing three-year moderation periods. Salary increases are limited to 1 percent for each 12-month period of the applicable moderation period. Any incremental increases to existing and new compensation entitlements, including salary increases, are also limited to a total of 1 percent on average for all employees, for each 12-month period of the moderation period. The legislation applies to OPG.

#### 4.7.4 Indigenous Relations

The Company believes in building long-term, mutually beneficial working relationships with Indigenous communities, businesses and organizations across Ontario and continues to support procurement, employment and educational opportunities with Indigenous communities. OPG seeks to establish these relationships based on a foundation of respect, transparency and mutual responsibility. OPG is also committed to continuing to undertake proactive engagement and consultation with Indigenous communities on its new projects and, where appropriate, to pursue generation-related development partnerships on the basis of long-term commercial arrangements and other joint projects.

OPG owns and operates electricity generation assets within the traditional territories of Indigenous Peoples, and has a formal Indigenous Relations Policy that governs its relationships with Indigenous communities. OPG is designated a Silver level standing under the Canadian Council for Aboriginal Business' Progressive Aboriginal Relations program (PAR). The certification recognizes OPG as a national best-practices organization with a demonstrated commitment in the area of Indigenous relations. OPG is committed to the goal of achieving a Gold PAR certification. Further details on OPG's Indigenous Relations Policy, engagement and initiatives are found in the section, *Environmental, Social, Governance and Sustainability* under the heading, *Indigenous Relations* in the MD&A.

The Aboriginal and Treaty rights of Indigenous communities are recognized and affirmed in the *Constitution Act, 1982*. OPG may be subject to claims by Indigenous communities or other Indigenous groups and individuals. These claims may stem from project and generation development activities related to the operations of OPG and historic operations of OPG's predecessor companies, which may have impacted the Aboriginal and/or Treaty rights, or the absence of legal permits, rights-of-way or easements. Legal precedents created by court rulings may impact negotiations and resolution of past grievances. To date, OPG has resolved past grievance claims that resulted in Full Settlement Agreements with 21 First Nation communities.

##### Partnerships

OPG currently has four commercial partnerships with Indigenous communities related to new generation developments. OPG's first such partnership became operational in 2009 as part of the Obishikokaang Waasiganikewigamig/Lac Seul hydroelectric GS project, with the Lac Seul First Nation becoming a 25 percent equity holder in the project. This first of its kind partnerships was subsequently used by OPG as a model for developing other renewable energy projects in partnership with Indigenous communities.

The signing of the "Amisk-oo-Skow" Agreement with the Moose Cree First Nation in 2010 marked OPG's second generation-development partnership with an Indigenous community. Through a wholly-owned corporation, Moose Cree First Nation owns a 25 percent interest in the Lower Mattagami River hydroelectric generation project.

In 2015, OPG and Coral Rapids Power Corporation (CRP), a corporation wholly owned by the Taykwa Tagamou Nation, partnered to develop the Peter Sutherland Sr. hydroelectric GS, through PSS Generating Station LP (PSS).

OPG and a subsidiary of the Six Nations of Grand River Development Corporation partnered to develop the Nanticoke solar facility, through NSLP in 2016. The Six Nations of Grand River Development Corporation, through its subsidiary, and the Mississaugas of the Credit First Nation, through a wholly owned corporation, own 15 percent and 5 percent interests, respectively, in NSLP.

Additionally, in August 2019, OPG completed the commissioning of a renewable micro grid in partnership with the Kiashke Zaaging Anishinaabek (KZA), also known as the Gull Bay First Nation, to help the community reduce its diesel use. Ownership of the micro grid will be transferred to KZA upon the completion of a system monitoring period.



In March 2020, OPG, EPCOR Utilities Inc. and PCL Construction signed a MOU with Minawshyn Development Corporation (MDC), a wholly owned corporation of the Matawa First Nations member communities, and Enterprise Canada Inc. to identify and assess potential projects to develop community-based infrastructure with the Matawa First Nations member communities in northern Ontario. The MOU will allow OPG to play a lead role in development by working with MDC on exploring infrastructure solutions that will benefit their communities.

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#### 4.8 INSURANCE

The principal types of discretionary insurance carried by OPG include directors' and officers' liability, excess commercial general liability, all risks property, boiler and machinery breakdown, including statutory boiler and pressure vessel inspections and business interruption. In addition to providing coverage for OPG's non-nuclear generating facilities, this insurance applies to the conventional operations at OPG's nuclear generating stations. OPG also maintains nuclear property insurance, including nuclear boiler and machinery breakdown, for damage to the nuclear portions of its generating stations and for perils propagating from the nuclear to the conventional side of its assets. This coverage complements the conventional property insurance program.

OPG also purchases or requires contractors to purchase discretionary insurance for construction projects. For the Darlington Refurbishment project, the owner-controlled insurance program consists of wrap-up liability, course of construction and marine transit insurance.

OPG purchases certain insurance coverage as required by statute, namely owned and leased motor vehicle liability, aviation liability (for drone operations) and nuclear liability insurance. The federal *Nuclear Liability and Compensation Act* (NLCA) that came into effect on January 1, 2017, and its predecessor legislation, the *Nuclear Liability Act*, impose absolute liability on a licensed operator of a nuclear generating station for any damage to property of, or injury to, the public arising from a nuclear incident, other than damage resulting from sabotage or acts of war. As such, the legislation protects all other persons from liability, including suppliers of nuclear fuel and components used in nuclear reactors.

The NLCA requires all operators of nuclear generating stations in Canada to maintain specified amounts of nuclear liability insurance purchased from a federal government approved insurer or other equivalent forms of financial security approved by the federal government. Under the NLCA, OPG is required to maintain \$1 billion per incident of nuclear liability insurance for each of its nuclear installations as defined by the NLCA, for which there is no deductible amount. The Darlington GS site and the Pickering GS site are considered to be two separate nuclear installations under the NLCA. OPG is also required to maintain \$13 million per incident of nuclear liability insurance for the WWMF. OPG is not responsible for purchasing nuclear liability insurance for the Bruce nuclear generating stations as Bruce Power is required to purchase such insurance. OPG continues to maintain nuclear liability insurance or other forms of financial security that have been approved by the federal government equal to the required liability limits.

Under Part I of the NLCA, an operator is liable for all damages resulting from a nuclear incident. If, in the opinion of the Governor in Council, OPG's liability could exceed the specified insured amount in respect of a nuclear incident, or it would be in the public interest to do so, the Governor in Council shall proclaim Part II of the NLCA as applicable in respect of a nuclear incident. Under Part II of the NLCA, OPG's liability would be effectively limited to the amount of required abovementioned insurance, and the Governor in Council may authorize additional funds to be paid by the federal government as may be specified in an order.

## 5 GENERAL DEVELOPMENT OF THE BUSINESS

The following is a summary of key developments in OPG's business since January 2017.

### 5.1 ACQUISITION DEVELOPMENTS

Date	Description of Development
<b>Eagle Creek Renewable Energy</b>	
2018	On November 27, 2018, the Company acquired 100 percent of the equity in Eagle Creek Renewable Energy, LLC (Eagle Creek), a hydropower platform with interests in 76 hydroelectric generating stations and two solar facilities throughout the US at acquisition date, for a total cash purchase price of approximately US\$298 million (C\$386 million), which is net of assumed debt. At acquisition date, Eagle Creek's portfolio had an in-service generating capacity of approximately 226 MW and operated primarily in New England, Midwest and New York power market areas. The acquisition represented the expansion of OPG's renewable generation portfolio to new geographies, with additional clean energy generation aligning to OPG's business imperatives.
<b>Brighton Beach Generating Station</b>	
2019	On August 30, 2019, OPG acquired the remaining 50 percent interest in the combined-cycle natural gas-fired Brighton Beach GS from ATCO Power Canada Ltd., an affiliate of Canadian Utilities Limited, for \$200 million, inclusive of assumed debt. The Brighton Beach GS, located in Windsor, Ontario, provides approximately 560 MW of in-service generating capacity and operates under an energy conversion agreement expiring in 2024. The Brighton Beach GS is operated by a wholly-owned subsidiary of OPG.
<b>Cube Hydro</b>	
2019	On October 7, 2019, OPG acquired 100 percent of the equity in Cube Hydro Partners, LLC and affiliate Helix Partners, LLC (collectively, Cube Hydro) at a purchase price of US\$1.12 billion, inclusive of assumed debt and subject to customary working capital adjustments. Total consideration paid, net of assumed debt, was approximately US\$845 million (C\$1.12 billion), subject to the finalization of customary working capital and other adjustments. Cube Hydro is a hydropower platform with 385 MW of in-service generating capacity across 19 hydroelectric facilities located throughout the northeastern and southeastern US, and provides additional scale to US hydroelectric operations acquired as part of Eagle Creek in 2018. Cube Hydro's operations are being merged with Eagle Creek. The combined organization will operate as a wholly-owned subsidiary of OPG under the Eagle Creek Renewable Energy name.
<b>Agreement to Acquire Portfolio of Natural Gas-Fired Assets in Ontario</b>	
2019	<p>In July 2019, OPG, under a new subsidiary, entered into a purchase and sale agreement with affiliates of TC Energy to acquire a portfolio of combined-cycle natural gas-fired plants in Ontario for \$2.87 billion, subject to customary working capital and other adjustments. The portfolio includes the 900 MW Napanee GS, the 683 MW Halton Hills GS, and the remaining 50 percent interest in the 550 MW PEC. The acquisition is subject to a number of closing conditions, including the receipt of various regulatory approvals and the commencement of commercial operations at the Napanee GS. A pre-merger notification and a request for an Advance Ruling Certificate have been filed with the Commissioner of Competition, and the review is currently in process. Closing is expected to occur approximately at the end of the first quarter of 2020.</p> <p>All of the assets being acquired from TC Energy operate under ESAs with the IESO, with expiry dates ranging from 2029 to 2040. The natural gas electricity generation from these assets is an important component of maintaining the reliability of Ontario's electricity system, complementing the growth of variable sources of electricity generation in the province, such as wind and solar.</p>

## 5.2 GENERAL DEVELOPMENTS

Date	Description of Development
<b>Ontario Fair Hydro Plan</b>	
2017	<p>In 2017, the previous Government of Ontario passed legislation to establish Ontario's Fair Hydro Plan (Fair Hydro Plan) with the objective of deferring and refinancing a portion of the Global Adjustment costs charged to electricity consumers over a longer period of time. The <i>Ontario Fair Hydro Plan Act, 2017</i> (Fair Hydro Act) received Royal Assent and the associated general regulation came into force in June 2017.</p> <p>Pursuant to the Fair Hydro Act, effective May 1, 2017, the IESO began to defer the collection of a portion of the Global Adjustment costs. The Fair Hydro Act allowed the IESO to transfer a portion of the deferred balance to a financing entity that would fund the deferral in exchange for an irrevocable right to recover the balance and associated financing and other costs from specified consumers in the future (Investment Interest). The legislation appointed OPG as the Financial Services Manager under the Fair Hydro Act and conveyed upon it statutory obligations, including the creation of one or more financing entities that may acquire Investment Interests from the IESO.</p> <p>The Fair Hydro Trust (the Trust) was established as the financing entity contemplated by the Fair Hydro Act in December 2017. The majority unitholder and beneficiary of the Trust is a wholly-owned subsidiary of OPG. Immediately after the Trust's establishment, OPG entered into a management agreement with the Trust which provided OPG with the powers and duties of managing the Trust, including determining whether to acquire Investment Interest from the IESO. The Trust's financial position and results were consolidated into OPG's financial results up to May 9, 2019.</p> <p>In order for the Trust to finance the Investment Interest acquired from the IESO, it incurred senior debt from capital markets and subordinated debt from OPG. The Trust's investment attracted financing amounts and other related fees.</p> <p>In December 2017, the Trust purchased its first tranche of Investment Interest from the IESO for approximately \$1.18 billion.</p>
2018	<p>During 2018, the Trust's additional purchases of Investment Interest from the IESO totalled \$609 million.</p> <p>In September 2018, the Province announced its intention to make future proposed legislative changes to the Fair Hydro Act to cancel the Global Adjustment refinancing component of the Fair Hydro Plan.</p>
2019	<p>The <i>Fixing the Hydro Mess Act, 2019</i> received Royal Assent on May 9, 2019 and came into force in November 2019. The new legislation amended various statutes related to energy in Ontario, including the Fair Hydro Act. Under the new legislation, the Province is responsible for paying existing funding obligations administered by the Trust, while OPG is responsible for paying the operating costs of the Trust. As there will be no new Global Adjustment refinancing, and the Province is responsible for the existing funding obligations, including principal payments administered by the Trust, the Trust is prohibited from issuing any new funding obligations. On this basis, OPG deconsolidated the Trust from its consolidated financial results effective May 9, 2019, de-recognizing the financing receivables, long-term debt and other balances of the Trust. Subsequent to the deconsolidation, the Company's substantial retained interest in the Trust is recorded as a loan receivable on the consolidated balance sheets and represents the subordinated notes issued by the Trust to OPG.</p>

Date	Description of Development
<b>Ontario's Long-Term Energy Plan</b>	
2017	<p>In October 2017, the previous Government of Ontario issued Ontario's 2017 Long-Term Energy Plan (LTEP) that outlined plans for the future development of Ontario's electricity system and replaced the previous LTEP issued in 2013.</p> <p>As it relates to the supply of electricity, the 2017 LTEP recognized the refurbishment of Ontario's nuclear generating stations as the most cost-effective option for producing emission-free baseload generation to meet Ontario's needs and reaffirmed support for the refurbishment of the four units at the Darlington GS and the six units at the Bruce nuclear generating stations, subject to the principles established in the 2013 LTEP. The 2017 LTEP also recognized the value to customers of continuing to operate the Pickering GS until 2024, as planned. With respect to hydroelectric electricity generation, the 2017 LTEP highlighted the opportunity to continue to invest in optimizing existing hydroelectric facilities, noting that pumped hydroelectric storage could play an important role in the reliability of the electricity system.</p> <p>Additionally, the 2017 LTEP discussed the potential impact of a number of innovative technologies on the future of the electricity system. Among others, these included the increased electrification of the transportation sector, the emergence of energy storage and the opportunity for Ontario to foster nuclear innovation technologies. The 2017 LTEP also recognized the importance of Indigenous peoples' continuing role in shaping Ontario's energy planning, projects and policies.</p>
<b>Renewal of Collective Agreements</b>	
2018	The three-year governing collective agreement between the PWU and OPG expired on March 31, 2018. The parties reached a tentative renewal agreement in June 2018, which was not initially ratified by the PWU membership. In December 2018, the Government of Ontario directed the renewal collective agreement to be concluded through a mediation/arbitration process.
2019	<p>The mediation/arbitration process for the renewal of the collective agreement between the PWU and OPG concluded on April 3, 2019 with the issuance of the arbitrator's decision. The arbitrator ordered the parties to implement the previously reached but not ratified tentative renewal agreement. The renewed collective agreement expires on March 31, 2021.</p> <p>In anticipation of the expiry of the one-year governing collective agreement between the Society and OPG on December 31, 2019, negotiations to renew the collective agreement took place in the second quarter of 2019. After the parties were unable to reach an agreement during negotiations, they proceeded to interest mediation/arbitration in November 2019. On November 5, 2019, the appointed arbitrator issued an arbitration award for a two-year collective agreement between the parties, covering the period from January 1, 2020 to December 31, 2021.</p>
<b>Payment of Dividend to Shareholder</b>	
2017	In April 2017, OPG completed the sale of its head office premises and associated parking facility located at 700 University Avenue and 40 Murray Street in Toronto, Ontario, a non-core asset of the business. The sale was undertaken pursuant to a Shareholder Declaration and a Shareholder Resolution received by OPG.
2018	In March 2018, pursuant to the Shareholder Declaration and the Shareholder Resolution, and as prescribed in the <i>Trillium Trust Act, 2014</i> (Trillium Trust Act), OPG transferred the proceeds from the April 2017 disposition of the head office properties, net of prescribed deductions under the Trillium Trust Act, into the Province's Consolidated Revenue Fund in the form of a special dividend of \$283 million authorized by the Board in March 2018.

Date	Description of Development
<b>Sale of Lakeview Site</b>	
2018	In March 2018, OPG completed the sale of its former Lakeview GS site located in Mississauga, Ontario, a non-core asset of the business. The sale was undertaken pursuant to a Shareholder Declaration and a Shareholder Resolution received by OPG. In accordance with the Shareholder Resolution, approximately 67 acres of the site is to be used by the City of Mississauga for parkland, institutional and cultural purposes.
<b>Clarington Campus Plan</b>	
2019	In June, 2019, the Company announced plans to establish a new corporate campus in Clarington, Ontario. The new campus will be a high-tech energy hub that will bring together all non-station based employees in Toronto, Niagara and Durham regions to promote innovation and collaboration across the organization. The campus is planned to include the existing Darlington Energy Complex and a new building, and will reduce OPG's existing real estate footprint and associated costs. It is expected to be constructed by 2024.
<b>Efficiency Improvement and Cost Reduction Initiatives</b>	
2017 - 2019	OPG is committed to pursuing productivity improvements and efficiencies in operating costs across the organization, while ensuring no adverse impact on the safety, reliability and environmental sustainability of the Company's operations. In 2017, OPG launched a strategy to accelerate the pace of digital transformation across the enterprise. The strategy continued into 2018 and 2019 and is focused on making investments to modernize information technology infrastructure, enhance mobility and connectivity, embed robotic process automation and artificial intelligence technologies, and improve data management and data analytics capability. The goal of the strategy is to increase field and office productivity, improve equipment reliability and station performance, reduce operating costs and enable the Company's focus on growth opportunities and energy sector innovation. Further details on OPG's efficiency improvement and cost reduction strategies are found in the section, <i>Core Business and Outlook</i> under the heading, <i>Operational Excellence</i> in the MD&A.

### 5.3 RATE APPLICATION DEVELOPMENTS

Date	Description of Development
<b>OEB Decisions on OPG's Regulated Prices</b>	
2017	<p>On December 28, 2017, the OEB issued its decision on OPG's May 2016 five-year application for new regulated prices for nuclear and regulated hydroelectric generation. The following main outcomes were rendered in the OEB's decision:</p> <ul style="list-style-type: none"> <li>• The new regulated prices have an effective date of June 1, 2017.</li> <li>• New regulated prices for the hydroelectric facilities for each of the years 2017 to 2021 are determined by annually escalating the base regulated prices in effect prior to June 1, 2017, with some adjustments, using a formula equal to an industry-specific weighted inflation factor based on indices published annually by the OEB for use in incentive regulation formulas, less a stretch factor adjustment of 0.3 percent.</li> <li>• For the nuclear facilities, a revenue requirement was determined for each of the years 2017 to 2021 based on the OEB-allowed level of OPG's forecast operating costs and a return of and on rate base, as reduced by a stretch factor amount equal to 0.6 percent of the majority of operations, maintenance and administration costs and non-Darlington Refurbishment in-service capital additions approved for recovery. The return on nuclear rate base was determined using the OEB's formulaic prescribed return on equity rate of approximately 8.8 percent and an OPG-specific deemed capital structure of 45 percent equity and 55 percent debt. The approved nuclear revenue requirements over the 2017-2021 period totalled \$15.9 billion over the full five years, which represented a decrease of approximately \$0.6 billion compared to OPG's proposed nuclear revenue requirement levels, excluding amounts that otherwise would have been recorded in OEB-authorized regulatory accounts for repayment to, or recovery from, customers in the future. The stretch factor applies starting in 2018 and compounds in each year to 2021.</li> <li>• A total of \$5.5 billion in Darlington Refurbishment in-service capital additions was reflected in nuclear rate base by 2021, which excluded the Heavy Water Storage and Drum Handling Facility. The Heavy Water Storage and Drum Handling Facility is expected to be reviewed by the OEB as part of OPG's next application for nuclear base regulated prices.</li> <li>• The decision approved recovery of OPG's requested forecast costs of approximately \$292 million over the 2017-2021 period for activities to enable the commercial operation of the Pickering GS beyond 2020 and operating cost and generation impacts associated with planned continued operation of the station in 2021.</li> <li>• The nuclear electricity production forecast for the 2017-2021 period was approved as submitted by OPG.</li> <li>• The decision maintained the previously approved cost recovery methodologies for the Company's nuclear waste management and nuclear decommissioning liabilities for the prescribed nuclear facilities and for the Bruce nuclear generating stations, while directing OPG to file a future study examining such methodologies. The approved nuclear revenue requirements incorporated the impacts of the updated estimates of these liabilities as at December 31, 2016 as reflected in the 2017 ONFA Reference Plan and OPG's consolidated financial statements.</li> <li>• As proposed by OPG, the recovery of pension and OPEB costs in the nuclear revenue requirement was set on the basis of OPG's forecast cash payments for pension and OPEB plans, with differences between pension and OPEB accrual costs and cash payments continuing to be recorded in the Pension &amp; OPEB Cash Versus Accrual Differential Deferral Account.</li> <li>• All deferral and variance account balances proposed by OPG for recovery were accepted, resulting in the approval to recover \$305 million recorded in these accounts as at December 31, 2015, without adjustments. All applicable existing deferral and variance accounts were continued, with new accounts established to record costs related to implementing the CNSC's fitness for duty requirements and to record differences between forecast and actual amount of Scientific Research &amp; Experimental Development investment tax credits attributable to the nuclear facilities.</li> </ul>

Date	Description of Development
	<p>In September 2017, the OEB issued a report outlining the guiding principles and policy for recovery mechanisms of pension and OPEB costs of rate regulated utilities in the Ontario electricity and natural gas sectors. The report established the accrual basis of accounting as the method of determining pension and OPEB amounts for rate-setting purposes, unless the OEB finds that this method does not result in just and reasonable rates in the circumstances of a particular utility. The report also provided for the establishment of a generic variance account to record asymmetric carrying charges in favour of customers on the differences between the accrual costs recovered and the cash payments made by a utility in respect of pension and OPEB plans. Carrying charges on this differential are to be assessed prospectively, at a prescribed interest rate set quarterly by the OEB based on the quarterly return of a mid-term corporate bond index yield.</p>
2018	<p>On March 29, 2018, the OEB issued the final payment amounts order establishing the new regulated prices, including interim period shortfall riders, with an implementation date of March 1, 2018, and associated amounts of approved nuclear revenue requirement to be deferred for future collection in the Rate Smoothing Deferral Account over the 2017 to 2021 period. Pursuant to the order, \$102 million of approved nuclear revenue requirement was deferred in the Rate Smoothing Deferral Account in 2019 and \$391 million is to be deferred in 2020. The OEB determined that no portion of the nuclear revenue requirement was to be deferred for 2017, 2018 and 2021.</p> <p>In January 2018, OPG filed a motion asking the OEB to review and vary the December 2017 decision in relation to the approval of an effective date of June 1, 2017 for the new regulated prices rather than the January 1, 2017 effective date requested in OPG's application. On August 30, 2018, the OEB released its decision that denied OPG's motion.</p> <p>In August 2018, OPG filed an application with the OEB requesting disposition of the Pension &amp; OPEB Cash Versus Accrual Differential Deferral Account balance as at December 31, 2017, balances accumulated between January 1, 2016 and December 31, 2017 in other regulatory accounts, and associated income tax impacts.</p> <p>In December 2018, the OEB approved the annual formulaic adjustment to increase the base regulated price for the regulated hydroelectric facilities to \$42.15/MWh effective January 1, 2019, as proposed by OPG.</p>
2019	<p>On February 21, 2019, the OEB issued a decision and order that approved the full settlement agreement reached by OPG and interveners on OPG's requested disposition of regulatory accounts, which resulted in the approval to recover a total of \$1.3 billion comprising balances recorded in these accounts and associated income tax impacts, without adjustments. The decision and order authorized OPG to collect \$535 million of the approved balances through incremental rate riders on nuclear and regulated hydroelectric electricity generation over the January 1, 2019 to December 31, 2021 period. The remaining approved balances will be collected after 2021. The \$1.3 billion in approved balances included \$433 million that was previously approved but not yet authorized for collection by the OEB.</p> <p>In making its February 2019 decision and order, the OEB approved that the accrual method is the appropriate regulatory accounting and cost recovery basis for the December 31, 2017 pension and OPEB-related balances in the Pension &amp; OPEB Cash Versus Accrual Differential Deferral Account. Amounts recovered from the Pension &amp; OPEB Cash Versus Accrual Differential Deferral Account are subject to carrying charges in favour of customers, in line with the OEB's September 2017 report on the guiding principles and policy for recovery mechanisms of pension and OPEB costs of rate regulated utilities in the Ontario electricity and natural gas sectors.</p> <p>In December 2019, the OEB approved the annual formulaic adjustment to increase the base regulated price for the regulated hydroelectric facilities to \$43.15/MWh effective January 1, 2020, as proposed by OPG.</p>



## 5.4 NUCLEAR BUSINESS DEVELOPMENTS

Date	Description of Development
<b>Darlington Refurbishment</b>	
<p>The Darlington GS generating units are approaching their originally designed end-of-life. Refurbishment of the four generating units is expected to extend the operating life of the station by at least 30 years. The budget for the four-unit refurbishment is \$12.8 billion, which includes the costs of the pre-requisite projects in support of the execution phase of the refurbishment. The first refurbished unit, Unit 2, is expected to be returned to service in the second quarter of 2020. The second unit to undergo refurbishment, Unit 3, is expected to commence execution of refurbishment activities in the second quarter of 2020. The last unit is scheduled to be completed in 2026. The overall project is tracking on schedule and to the \$12.8 billion budget.</p> <p>The Darlington Refurbishment project is a multi-phase program comprising of five major sub-projects that are executed across four major segments for each unit. Descriptions of each major sub-project and segment can be found in the section, <i>Core Business and Outlook</i> under the heading, <i>Project Excellence – Darlington Refurbishment</i> in the MD&amp;A.</p> <p>Additionally, OPG has substantially completed all of the pre-requisite projects including construction of facilities, infrastructure upgrades and installation of safety enhancements. These pre-requisite projects are integral to the Darlington Refurbishment project and the continued operation of the Darlington GS. The final pre-requisite project, the Heavy Water Storage and Drum Handling Facility, has been substantially completed and is tracking to be fully available for service by the required date to support refurbishment activities on Unit 3.</p> <p>OPG also has completed all of the work required as of the end of 2019 to support the requirements set out in the Integrated Implementation Plan (IIP) for the station previously accepted by CNSC staff. The IIP contains actions previously identified as part of a series of assessments undertaken by OPG in line with applicable CNSC regulatory requirements related to life extensions of nuclear plants.</p> <p>The revenue requirement impact of differences in the amount or timing between approved forecast rate base additions and the actual rate base additions related to OPG's investments to increase the output of, refurbish or add generating capacity to one or more of its nuclear or hydroelectric regulated facilities, including the Darlington Refurbishment project, are recorded for future review and disposition in a variance account authorized by the OEB pursuant to <i>Ontario Regulation 53/05</i>.</p>	
2017	<p>The remainder of the first major segment of the Unit 2 refurbishment, Shut Down, was completed in April 2017. The second major segment, Disassembly, commenced and progressed during 2017.</p> <p>Planning continued for the Unit 3 refurbishment. OPG continued to enter into commitments to procure major components for the Units 3 refurbishment that require long lead times.</p> <p>In November 2017, the Financial Accountability Office of Ontario issued a report, "An Assessment of the Financial Risks of the Nuclear Refurbishment Plan" which concluded that refurbishment of the four units at the Darlington GS and the six units at the Bruce nuclear generating stations provides the most cost effective, low emission generation source available to meet Ontario's baseload electricity requirements.</p> <p>OPG completed the Re-tube Waste Processing Building in November 2017, a major pre-requisite project.</p>
2018	<p>The Disassembly segment of the Unit 2 refurbishment was completed in May 2018. In June 2018, OPG inspected and cleaned the reactor vessel in preparation for the third major segment, Reassembly, which commenced in July 2018.</p> <p>In March 2018, the Board approved the funding to complete planning and pre-requisite activities for the refurbishment of Unit 3. These planning and pre-requisite activities continued to progress in accordance with the overall project schedule. Receipt of materials for the Re-tube and Feeder Replacement of Unit 3 began, and OPG continued to enter into commitments to procure major components that require long lead times. Construction on the Full Scope Maintenance Simulator for the turbine generator also began.</p>



Date	Description of Development
2019 - 2020	<p>The Reassembly segment of the Unit 2 refurbishment continued in 2019. In the second quarter of 2019, the project successfully completed the Fuel Channel installation series, the Upper and Middle Feeders installation series, and re-filled the unit's moderator with heavy water, which is used for the creation of nuclear energy. Challenges were experienced in achieving the planned installation rates for the Lower Feeder installation series, extending the completion of the series into October 2019. The Reassembly segment was completed in the fourth quarter of 2019 with the completion of the Lower Body Tubing installation series.</p> <p>The fourth major segment of the Unit 2 refurbishment, Power Up, commenced in November 2019, with loading of new fuel into the reactor, which was completed by the end of November 2019. The Primary Heat Transport System was filled with heavy water in January 2020. The project is currently working to restore the reactor vault, which includes removing the bulkheads to reconnect Unit 2 back to the operating units. Vault Restoration is on track for completion toward the end of the first quarter of 2020. Achievement of this milestone will represent the completion of construction work, full reconnection of Unit 2 to the station, and transition of the unit to start-up activities.</p> <p>Planning and pre-requisite activities for the refurbishment of Unit 3 continue to progress in accordance with the overall project schedule, incorporating experience learned to date from the Unit 2 refurbishment.</p>
<b>Extension of Pickering Commercial Operations</b>	
<p>One of OPG's objectives is to maximize the safe and reliable operating life of the Pickering GS generating units. In connection with this objective, OPG continues to plan and execute the planned work required to enable continued safe and reliable operation of the station to 2024. This includes undertaking the required technical and inspection work to ensure continued fitness-for-service of the station's fuel channels and other major station components. OPG is also working with the Province on a further optimization of the shutdown sequence of the Pickering GS units.</p> <p>In addition to providing Ontario with a reliable, cost effective source of baseload electricity during a period of nuclear unit refurbishments at the Darlington and Bruce nuclear generation stations, continued operation of the Pickering GS helps to reduce carbon emissions and extends employment for over 3,000 positions at OPG.</p>	
2017	<p>In the fourth quarter of 2017, OPG confirmed that technical assessments completed to date provided sufficient confidence in the programs and provisions in place to assure fitness-for-service of the Pickering GS fuel channel components in line with the planned extended commercial operation period to December 31, 2024. OPG continued to execute the work required for the planned extended commercial operation of the station, including plant modifications and other work as identified through the Periodic Safety Review (PSR), station reliability initiatives and equipment component inspections. The PSR, a comprehensive assessment of the station's design and operation undertaken in support of the station's licence renewal process, confirmed that there is a high level of safety throughout the continued operation of the station to 2024.</p>
2018	<p>In August 2018, following an application process including a set of public hearings, OPG received a ten-year operating licence renewal for the Pickering GS from the CNSC, valid until August 31, 2028. The licence allows for commercial operation of the Pickering GS to December 31, 2024 and supports the plan to subsequently place the station in a safe storage state by 2028. The CNSC directed that OPG present a comprehensive update on its licensed activities at the Pickering GS at the mid-point of the ten-year licence period and no later than 2023.</p>

Date	Description of Development
2019	<p>OPG continued to execute the planned work required to extend the safe and reliable operation of the Pickering GS to 2024, including as required under the PSR and associated IIP commitments previously accepted by CNSC staff. All PSR and IIP commitments as of the end of 2019 were completed on or ahead of plan.</p> <p>OPG completed preliminary assessments which demonstrated that further optimization of the end of operations dates for the Pickering GS generating units is safe, technically feasible and would result in incremental economic and other benefits to the province and to OPG. In consideration of these benefits, OPG is working with the Province on a plan to further optimize the shutdown sequence of the Pickering GS units. Operating any of the units past December 31, 2024 would be subject to CNSC regulatory approval, through a public hearing process. Additional technical analysis and inspections will need to be performed to confirm fitness-for-service of fuel channels and other major station components in support of further optimization of the stations' shutdown sequence.</p>
<b>Deep Geologic Repository for Low and Intermediate Level Waste</b>	
<p>Developing an L&amp;ILW DGR on lands adjacent to the WWMF in Kincardine, Ontario was OPG's preferred solution for the safe long-term management of the L&amp;ILW. OPG had reached agreement with local municipalities for the development of the L&amp;ILW DGR at this site. The environmental effects of the proposed L&amp;ILW DGR were examined by the CNSC and Canadian Environmental Assessment Agency appointed Joint Review Panel (JRP) to meet the requirements of the Canadian Environmental Assessment Act as well as the project specific Environmental Impact Statement Guidelines. In a report submitted in 2015, the JRP concluded that, given mitigation, there is unlikely to be significant environmental impact from the project and recommended that the federal Minister of Environment approve the Environmental Assessment.</p>	
2017	<p>In August 2017, the federal Minister of Environment and Climate Change requested OPG to update its analysis of potential cumulative effects of the project on the SON's physical and cultural heritage, including a description of the potential effects of the project on the Nation's spiritual and cultural connection to the land, taking into account the results of the SON Community Process.</p>
2018 - 2019	<p>During 2018 and 2019, OPG continued to engage with the SON towards securing support for the L&amp;ILW DGR project at the site and to formulate a response to the federal Minister's information request. A series of province-wide SON community engagement sessions was conducted in 2019 with a goal to reach a resolution regarding support via a community-wide voting process.</p>
2020	<p>On January 31, 2020, SON members voted not to support OPG's proposed DGR project for L&amp;ILW on lands adjacent to the WWMF in Kincardine, Ontario. OPG respects the decision of the SON community and will uphold its earlier commitment not to proceed with the project at the site without SON support. OPG will explore alternative solutions for safe long-term management of L&amp;ILW and will engage with key stakeholders on any new site selection process. Any new process will include engagement with Indigenous communities as well as interested municipalities. Due to significant uncertainties associated with potential alternative solutions and the estimation of their cost at the present time, including factors beyond the Company's control, no adjustment to the Company's ARO as at December 31, 2019 been recognized as a result of the SON community vote.</p>

## 5.5 RENEWABLE GENERATION BUSINESS DEVELOPMENTS

Date	Description of Development
<b>Sir Adam Beck Pump Generating Station Reservoir Refurbishment</b>	
Where economical and practical, OPG pursues opportunities to refurbish, expand, redevelop and extend the operating life of its long-lived hydroelectric fleet. In 2016, OPG began refurbishment construction on a project to refurbish the 300-hectare storage reservoir at the Sir Adam Beck Pump GS. The Sir Adam Beck Pump GS facility allows OPG to pump and store water diverted from the Sir Adam Beck generating complex during periods of low electricity demand to be used to generate up to 600 MW of electricity during subsequent periods of high electricity demand.	
2017	In February 2017, OPG completed refurbishment construction on the project, ahead of the originally planned schedule date of April 2017 and below the budget of \$58 million. The reservoir refurbishment work included the installation of a partial new reservoir liner and construction of a grout curtain in the bedrock foundation of the reservoir dyke. The refurbishment is expected to add approximately 50 more years to the reservoir's life.
<b>Peter Sutherland Sr. Hydroelectric Generating Station</b>	
In 2015, OPG commenced a project to construct the Peter Sutherland Sr. GS, a new 28 MW hydroelectric station on the New Post Creek near its outlet to the Abitibi River, with a budget of \$300 million. The station was constructed through PSS, a partnership between OPG and CRP, a wholly-owned subsidiary of the Taykwa Tagamou Nation.	
2017	In March 2017, final testing and commissioning of the turbine and generator units were successfully completed and both units were declared substantially complete. On March 31, 2017, the project received a permit from the Ontario Ministry of the Environment and Climate Change, now known as the MECP, to take water for operations to allow the station to operate commercially. This in-service date was ahead of the originally planned schedule of the first half of 2018. The project's schedule had been accelerated to take advantage of favourable weather conditions.  OPG began to receive contracted revenue for the project following the IESO's confirmation of the station's commercial operations as of March 31, 2017, under a 50-year hydroelectric ESA. In April 2017, CRP exercised its right under the partnership agreement to increase its interest in PSS to 33 percent.
<b>Nanticoke Solar Facility</b>	
In 2016, NSLP, then a partnership between OPG, SunEdison Canadian Construction LP (SECCLP) and a subsidiary of Six Nations of the Grand River Development Corporation, was selected through the IESO's LRP I program to develop a 44 MW solar facility at OPG's Nanticoke GS site and adjacent lands in Haldimand County, Ontario. The LRP I program was a competitive bidding process for procuring large renewable energy projects in Ontario. NSLP and the IESO executed a 20-year LRP I contract, which formalized the terms and conditions for the development and operation of the new solar facility.	
2017	During 2017, OPG purchased SECCLP's interests in NSLP.
2018	Construction on the project commenced during the second quarter of 2018 and continued throughout the year.
2019	In March 2019, the Nanticoke solar facility was placed in service and confirmation of commencement of commercial operations was received from the IESO, with an effective date of March 1, 2019. The facility represents the first solar facility operated by the Company.

Date	Description of Development
<b>Ranney Falls Hydroelectric Generating Station</b>	
2017	In 2017, OPG began construction work on a 10 MW single-unit powerhouse on the existing Ranney Falls GS site. The new unit will replace an existing unit that reached its end of life in 2014, doubling the station's in-service generating capacity to 20 MW.
2018	During 2018, primary concrete placement for the new powerhouse, spillway and forebay wall was completed, with construction continuing with the balance of plant activities. In addition, gate installation was completed and gate hydraulic systems installation was in progress.
2019 - 2020	Turbine and generator unit fabrication was completed, and installation commenced in the first quarter of 2019. OPG has now completed construction and continues commissioning on the new unit. Due to equipment component issues identified during commissioning, the new in-service date for the project is expected to be in the first half of 2020. The project continues to track on budget of \$77 million.
<b>Sir Adam Beck I Hydroelectric Generating Station Units G1 and G2 Replacement</b>	
OPG has initiated a project to replace two older generating units at the Sir Adam Beck I GS that used outdated line frequency technology of 25 hertz (Hz) prior to being decommissioned in 2009. The conversion of these units to standard generator technology of 60 Hz is expected to add approximately 125 MW of incremental generating capacity, providing many more decades of cost effective, clean power from one of the flagship stations in the Company's hydroelectric fleet.	
2018	Definition phase work on the project commenced in November 2018.
2019	During 2019, OPG removed the decommissioned units and associated equipment from the site and continued front-end engineering design activities, and is in the process of finalizing the detailed cost and schedule commitments for the project. The installation of the new G2 unit is scheduled to begin in the second half of 2020 following the completion of engineering activities. The project's expected in-service date is 2022, with a total estimated cost in the range of \$120 million to \$150 million.
<b>Little Long Dam Safety Project</b>	
2019	In January 2019, OPG initiated a plan to improve dam safety along the Lower Mattagami River in Ontario, primarily through the Little Long Dam Safety project. The project will increase the discharge capacity and make other reliability and operational improvements at the Little Long Main Dam, helping the Company to comply with updated dam safety requirements established by the Province. The project entered the execution phase in the fourth quarter of 2019 with the procurement of critical materials, advanced detailed engineering construction design and permitting activities. The project's expected in-service date is in 2023, with a budget of \$650 million. The Little Long Dam supports OPG's hydroelectric generating stations on the Lower Mattagami River.

## 5.6 THERMAL BUSINESS DEVELOPMENTS

Date	Description of Development
<b>Decommissioning of Nanticoke and Lambton Generating Stations</b>	
<p>OPG ceased coal-fired generation at the Lambton and Nanticoke generating stations in 2013. Over 2015 and 2016, OPG announced that it would decommission the stations as it could not commercially support continued preservation of these sites in light of the outlook for long-term electricity demand in the province that did not support the need for their future conversion. OPG is in the process of executing decommissioning plans for the two stations, which will ensure that they are closed safely, securely, and in an environmentally responsible manner. The decommissioning plan for the Nanticoke GS accommodated the construction and operation of the Nanticoke solar facility. The costs of the decommissioning activities are charged against the associated asset retirement obligation carried on the balance sheet.</p>	
2017	During 2017, OPG substantially completed the demolition of the Nanticoke GS coal yard equipment and structures, and mobilized the demolition contractor for the powerhouse and associated structures.
2018	<p>The demolition of the Nanticoke GS stacks took place safely in February 2018. Demolition activities continued for the station's powerhouse and associated structures.</p> <p>As part of the process to decommission the Lambton GS, a contract for the removal of the powerhouse and associated structures was issued in July 2018. The demolition contractor was mobilized to site and the removal of saleable equipment, asbestos abatement and demolition activities continued.</p>
2019	Demolition, site clean-up activities and removal of saleable equipment and materials at both Lambton GS and Nanticoke GS sites continued in 2019, including the implosion of the Nanticoke GS powerhouse. Demolition and site clean-up activities at the Nanticoke GS are expected to be completed in 2020.
<b>Thunder Bay Generating Station</b>	
2018	In July 2018, OPG reached an agreement with the IESO to terminate the ESA for the advanced biomass-fuelled generating unit at the Thunder Bay GS, effective June 30, 2018. The termination of the ESA and subsequent closure of the station was determined to be the most cost effective alternative for electricity consumers and allowed OPG to avoid additional repair costs that would have been necessary to continue to operate the station for the remainder of the ESA term to January 2020. The termination agreement with the IESO provided for payments to OPG for the remainder of 2018 to allow for the orderly cessation of activities as part of the station's closure, including disposition of fuel inventories and fuel contracts. In October 2018, OPG received notice from the IESO approving de-registration of the station. The main output transformers were physically disconnected from the grid in November 2018.
2019 - 2020	Following closure, the station has been undergoing a decommissioning process, with all systems drained and de-energized during 2019. An external water treatment system has been commissioned to treat site run-off, primarily from the ash landfill. While decommissioning work on the station continues, the Company is also assessing alternate solutions for the site, including a potential sale of the property.

## 5.7 NEW BUSINESS DEVELOPMENTS

Date	Description of Development
<b>New Nuclear Development</b>	
As part of its strategy to expand the business, OPG continues to explore nuclear small modular reactor (SMR) technology as a source of safe, carbon-free, reliable and cost effective energy.	
2018	In November 2018, Natural Resources Canada published “A Call to Action: A Canadian Roadmap for Small Modular Reactors”, a report prepared by a group of Canadian provincial governments, territorial governments and power utilities, including OPG, that was convened by Natural Resources Canada to gather feedback on the direction for possible development and deployment of nuclear SMRs in Canada. The report found that Canada is well-positioned to lead the world in SMR development given its long history in nuclear power.
2019	<p>Global First Power (GFP), Ultra Safe Nuclear Corporation™ (USNC) and OPG have partnered on a small modular reactor project in Canada proposed by GFP using Micro Modular Reactors technology (MMR™). The companies propose to construct and operate a 15 MW thermal (approximately 5 MW electrical) MMR plant at Chalk River Laboratories, owned by Atomic Energy of Canada Limited and operated by Canadian Nuclear Laboratories (CNL), in response to CNL’s request for expressions of interest to construct a demonstration SMR at a CNL site. In July 2019, the Canadian federal government issued the notice of commencement of an environmental assessment for the proposed project. In parallel, GFP will provide CNL with the required information as CNL continues its proponent selection process, and provide the CNSC with information to support the licence application process.</p> <p>In December 2019, the Provinces of Ontario, Saskatchewan and New Brunswick entered into a MOU to advance the development of nuclear SMRs. The MOU recognizes SMRs as the next generation of innovative, versatile and scalable nuclear reactors that promise to further enhance the safety, economic, and environmental benefits of nuclear energy. As part of the MOU, the Provinces agreed to collaborate on developing a business case and strategic plan for the deployment of SMRs including market opportunities across Canada and globally.</p>
<b>Collaboration for Production of Medical Isotopes</b>	
2018	In June 2018, OPG’s wholly-owned subsidiary, Laurentis Energy Partners (formerly Canadian Nuclear Partners), and BWX Technologies, Inc. (BWXT) announced a collaboration that will make the Darlington GS the first commercial nuclear power station worldwide to produce large quantities of molybdenum-99 (Mo-99). Mo-99 is a parent isotope of technetium-99 (Tc-99m), which is used for skeletal, brain and organ imaging. The CANDU reactors at the Darlington GS allow for the insertion and removal of medical isotope targets while continuing to produce electricity, allowing for a continuous domestic supply of this critical medical isotope. Laurentis Energy Partners will supply BWXT with Mo-99, which will be processed into Tc-99m generators for medical use. The plan to produce Mo-99 at the Darlington GS is subject to CNSC review and approval, which is in progress.
2019	In 2019, OPG and Nordion (Canada) Inc. entered into an agreement to expand OPG’s production of cobalt-60 to the Darlington GS, mainly for use in the health industry to sterilize surgical and medical supplies. The plan to produce cobalt-60 at the Darlington GS is subject to CNSC review and approval. Cobalt-60 is currently produced by OPG at certain units of the Pickering GS, which is approaching end of life.

Date	Description of Development
<b>Transport Electrification</b>	
OPG is pursuing initiatives to increase the use of electric vehicles within its operations and more broadly, and is assessing vehicle grid integration and hydrogen applications for the transportation sector. OPG is working with commercial fleets to provide fleet electrification solutions, helping them optimize electricity consumption and minimize costs, and is also developing strategies for efficient and cost-effective integration of electric vehicles into the electricity grid.	
2017	As part of its commitment to help de-carbonize Ontario's transportation sector, OPG is a founding sponsor of Plug'n Drive, a non-profit organization working to accelerate the adoption of electric vehicles and maximize their environmental and economic benefits. In May 2017, Plug'n Drive announced the opening of the world's first experimental learning facility dedicated to electric vehicle education and awareness, with OPG sponsoring the Centre's training facility.
2018	In December 2018, OPG became the first Canadian company to join the EV100 initiative by affirming its commitment to transition over 500 of its vehicles to electric by 2030, where technically and economically feasible. OPG joins a growing number of leading global businesses who have all committed to large-scale electrification of their fleets by 2030.
2019	In 2019, OPG and a subsidiary of Hydro One Limited (Hydro One) formed a partnership to own and operate electric vehicle fast charging stations across Ontario, under the Ivy Charging Network brand. The Ivy Charging Network is expected to be the largest fast-charging network in Ontario with 73 sites and 160 chargers by the end of 2021. In addition to enabling the electrification of the transportation sector, this initiative is expected to provide a new source of revenue for OPG.  Also in 2019, OPG constructed a vehicle-to-grid pilot with electric vehicles and bidirectional chargers hosted at two commercial buildings in Toronto, Ontario. This pilot implementation with Peak Power Inc., a global energy technology services provider, will explore feasibility of demand management using an aggregate resource.

## 6 RISK FACTORS

Details on risks faced by OPG are found in the section, *Risk Management* in the MD&A.

## 7 DIVIDENDS

The declaration and payment of dividends remains at the sole discretion of the Board and is dependent on the results of OPG's operations, the Company's financial condition and cash requirements, securities legislation requirements and other factors considered relevant by the Board in exercising its discretion and judgment on an ongoing basis. OPG did not declare or pay any dividends in 2017 or 2019. OPG declared and paid a special dividend of \$283 million in the first quarter of 2018 representing the proceeds from the sale of OPG's head office premises and associated parking facility, net of prescribed deductions under the Trillium Trust Act. Refer to the section, *General Development of the Business* under the heading, *General Developments – Payment of Dividend to Shareholder* for further details.

There are no restrictions in the articles of the Company that could prevent the Company from paying dividends. However, the declaration and payment of dividends are subject to financial tests set forth in the OBCA.



## 8 DESCRIPTION OF CAPITAL STRUCTURE

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### 8.1 GENERAL DESCRIPTION

The authorized share capital of OPG consists of an unlimited number of common shares, the voting shares of the Company, and an unlimited number of non-voting Class A shares. As at December 31, 2019, OPG had 256,300,010 common shares and 18,343,815 Class A shares issued and outstanding, all of which are owned directly by the Province, at a stated value of \$5,126 million and \$787 million, respectively. OPG is authorized to issue an unlimited number of common shares and Class A shares without nominal or par value. Holders of common shares are entitled to one vote per share at meetings of the shareholders of the Company. Any issue of new shares is subject to the consent of OPG's shareholder, the Province.

The Company's Articles of Amalgamation were amended effective December 1, 2017 to allow for the creation and issuance of non-voting Class A shares to the Province in exchange for its equity injections. The Class A and common shares rank equally as to dividends on a share for share basis, and all dividends declared by OPG shall be declared in equal amounts per share on all outstanding shares without preference or distinction. Upon the liquidation, dissolution or wind-up of OPG, whether voluntary or involuntary, the holders of Class A shares and common shares are entitled to share equally, on a share for share basis, in all distributions of property and assets without preferences or distinction. Any issuance of new shares is subject to the consent of the Province. OPG is entitled to redeem outstanding Class A shares as may be approved by the Board.

As all of the Company's voting securities are held by the Province, the Company is controlled by the Province.

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### 8.2 MARKET FOR SECURITIES

The Company does not have any securities listed on any exchange or similar market for securities.

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### 8.3 MEDIUM TERM NOTE PROGRAM

In October 2017, OPG issued \$500 million of Series 1 Notes due in 2027, with a coupon interest rate of 3.32 percent. In June 2018, OPG issued \$450 million of Series 2 Notes due in 2048, as a green bond offering, with a coupon interest rate of 3.84 percent. The net proceeds from this green bond offering were used to finance or re-finance eligible hydroelectric investments under OPG's Green Bond Framework. In January 2019, OPG issued \$500 million of Series 3 Notes due in 2049, as a green bond offering, with a coupon interest rate of 4.25 percent. The net proceeds from the issuance were used to finance or re-finance eligible projects as defined under OPG's Green Bond Framework, namely the November 2018 acquisition of Eagle Creek. OPG's Green Bond Framework encompasses projects that offer tangible environmental benefits.

In September 2019, OPG issued \$500 million of Series 4 Notes due in 2029, with a coupon interest rate of 2.98 percent, and \$300 million of Series 5 Notes due in 2050, with a coupon interest rate of 3.65 percent.



## 8.4 CREDIT RATINGS

OPG has credit ratings from DBRS Limited (DBRS), S&P Global Ratings (S&P) and Moody's Investors Service (Moody's), which provide credit ratings for commercial entities. A credit rating generally provides investors with an independent measure of credit quality of an issue of securities. Maintaining an investment grade credit rating supports OPG's ability to access cost effective financing. Credit rating categories for long-term debt instruments range from highest credit quality (generally 'AAA') to default in payment (generally 'D').

There can be no assurance that a credit rating will remain in effect for any given period of time or that a credit rating will not be lowered, withdrawn or revised by a rating agency if, in their judgment, circumstances so warrant. The rating of any securities is not a recommendation to buy, sell or hold such securities, and such ratings do not comment as to market price or suitability for a particular investor.

During the past three years, OPG has made payments to DBRS, S&P and Moody's for their credit rating services and for other services. OPG reasonably expects such payments will continue in the future for the services acquired.

This section describes OPG's credit ratings, as of the date of this AIF:

	DBRS	S&P	Moody's
Senior unsecured debt (Trend/Outlook)	A (low) (Stable)	BBB+ (Negative)	A3 (Stable)
Commercial paper program – Canada	R-1 (low)	A-1 (low)	NR <sup>1</sup>
Commercial paper program – US	NR <sup>1</sup>	A-2	P-2

<sup>1</sup> NR indicates no rating assigned.

Credit Rating Agency	Rating Descriptions
DBRS	<p>Long-term debt instruments that are rated in the 'A' category by DBRS are considered to be of good credit quality. The capacity for the payment of financial obligations by the obligor of such instruments is considered to be substantial, but of lesser credit quality than higher-rated entities. Entities in the 'A' category may be vulnerable to future events, but qualifying negative factors are considered manageable. The addition of a 'high' or 'low' modifier indicates relative standing within the rating category.</p> <p>DBRS's commercial paper credit rating scale ranges from 'R-1(high)' to 'D', which represents the highest to lowest quality of such securities rated. The rating of 'R-1(low)' is the third highest and is considered to be of good credit quality.</p>
S&P	<p>A 'BBB' rating category by S&amp;P for long-term debt instruments means that the obligor has adequate capacity to meet its financial commitments, but is considered more subject to adverse economic conditions than higher-rated entities. The addition of a plus '+' or minus '-' designation after a rating indicates the relative standing within a particular rating category.</p> <p>S&amp;P's Canadian commercial paper rating scale ranges from 'A-1 (high)' to 'D', which represents the highest to lowest quality of such securities rated. The rating of 'A-1 (low)' is the third highest and is considered to be satisfactory.</p>
Moody's	<p>Long-term debt instruments rated 'A' by Moody's are considered upper-medium-grade and are subject to low credit risk. Moody's appends numerical modifier 1, 2 and 3 to each generic rating category. The modifier '1' indicates that the obligation ranks in the higher end of the generic rating category; the modifier '3' indicates a ranking in the lower end of that generic rating category.</p> <p>Moody's commercial paper credit rating scale includes P-1, P-2, P-3 and NP, with P-1 representing the highest and NP representing the lowest quality of such securities rated. The rating of P-2 is the second highest and an issuer rated P-2 is considered to have a strong ability to repay short-term obligations.</p>

## 9 DIRECTORS AND OFFICERS

### 9.1 DIRECTORS

The following tables set forth the name, age, municipality of residence, position with the Company and principal occupation of each of the Directors of the Company as of the date of this AIF.



**Wendy Kei**

Age: 52

Toronto, Ontario, Canada

Wendy Kei was appointed Board Chair for Ontario Power Generation effective June 27, 2019. She was initially appointed to the OPG Board in March 2017.

Ms. Kei currently serves on the boards of directors of Guyana Goldfields, Inc. (TSX: GUY) and Royal Nickel Corporation (RNC Minerals)(TSX: RNX) where she is Chair of the Audit Committee. She also is a member of the Department of Audit Committee for Transport Canada. Ms. Kei is an accomplished Finance Executive with over 25 years of business experience in a variety of industries. For the majority of her career, she has been working within the mining industry and brings a strong focus on corporate governance, finance, risk management and significant expertise in executing complex mergers and acquisitions.

Ms. Kei is a Chartered Professional Accountant (CPA-CA) and previously served as Chief Financial Officer of Dominion Diamond Corporation (formerly Harry Winston Diamond Corporation and Aber Diamond Corporation).

Ms. Kei is a member of the Chartered Professional Accountants of Ontario, holds the ICD.D designation from the Institute of Corporate Directors and holds a Bachelor of Mathematics degree from the University of Waterloo. Ms. Kei was selected as a Diversity 50 2016 Candidate by the Canadian Board Diversity Council.

**2019 Board/Committee Membership:**

Board (Director since March 2017, Board Chair from June 2019)

Audit and Risk Committee (until June 2019)

Compensation, Leadership and Governance Committee (Chair from April 2019)

Generation Oversight Committee (until May 2019)

**2019 Attendance:**

6 of 6 100%

2 of 2 100%

3 of 3 100%

2 of 2 100%

The Board Chair attends all Committee meetings.

6 of 6 100%

**Principal Occupation:** Corporate Director

**Board Memberships for other Reporting Issuers:** Guyana Goldfields Inc. (TSX), RNC Minerals (TSX)

**Independence from OPG:** Independent

**Interlocking Directorships on Boards of other Reporting Issuers:** None

**Ken Hartwick**

Age: 57

Milton, Ontario, Canada

Ken Hartwick is Ontario Power Generation's President and CEO. Mr. Hartwick joined OPG in March 2016 as OPG's Chief Financial Officer and Senior Vice President - Finance, where he led all operations under Finance, Business Development, Strategy, and Risk. As CFO and SVP - Finance, Mr. Hartwick also led the launch of Canada's first utility green bond as well as OPG's expansion to the U.S. through the acquisition of Eagle Creek Renewable Energy LLC.

Mr. Hartwick joined OPG from Wellspring Financial Corporation, where he was CFO and Treasurer. He was also interim President and CEO at Atlantic Power Corporation, a generating company that does business in Canada and the U.S. For ten years prior, Mr. Hartwick was the President and CEO of Just Energy Corporation, a Canadian-based energy retailer. In addition, he held the position of Chief Financial Officer at Hydro One between 2001 and 2004. He also held senior positions at Cap Gemini and was a partner at the accounting firm Ernst & Young.

Mr. Hartwick is a Chartered Professional Accountant with an Honours Bachelor of Business Administration degree. He serves on a number of boards of directors.

Originally from Norwood, Ontario (near Peterborough), Mr. Hartwick now lives in Milton with his wife. He has three grown children.

**2019 Board/Committee Membership:**

Board (Director since June 2019)

The President and CEO attends all Committee meetings, excluding independent Director in camera meetings/sessions.

**2019 Attendance:**

4 of 4 100%

12 of 12 100%

**Principal Occupation:** President & Chief Executive Officer, Ontario Power Generation Inc.

**Board Memberships for other Reporting Issuers:** MYR Group, Inc. (NASDAQ), Spark Energy (NASDAQ)

**Independence from OPG:** Not Independent

**Interlocking Directorships on Boards of other Reporting Issuers:** None



**Jean Paul (JP) Gladu**  
Age: 46  
Toronto, Ontario, Canada

JP Gladu is currently the President and CEO of the Canadian Council for Aboriginal Business based in Toronto. Anishinaabe from Thunder Bay, Mr. Gladu is a member of Bingwi Neyaashi Anishinaabek located on the eastern shores of Lake Nipigon. Mr. Gladu has over two decades of experience in the natural resource sector including work with Aboriginal communities and organizations, environmental non-government organizations, industry and governments from across Canada, including involvement in business development for the Bingwi Neyaashi Anishinaabek Nation from 2009 to 2012. He has produced a number of publications related to Aboriginal issues including: forest certification, Native values collection, biofuel opportunities, First Nation community land use plans, criteria and indicators for sustainable forestry, and cedar product development.

Mr. Gladu holds a Forest Technician Diploma from the Sault College of Applied Arts and Technology, a Bachelor of Science degree in forestry from Northern Arizona University, and an Executive Masters of Business Administration from Queens University in Kingston.

Mr. Gladu currently serves on the Canadian Electricity Association's Public Advisory Panel and board of directors of Noront Resources Ltd. and as Chancellor of the Board of Governors of St. Paul's University College at the University of Waterloo. He has also held previous board positions with Colleges and Institutes Canada (previously the Association of Canadian Community Colleges), Northern Policy Institute, Canadian Foundation for Economic Education boards of directors, Centre for Research and Innovation in the Bio-Economy, Papasay Management Corporation, and Canadian Bioenergy Association. He also held advisory positions with the Canadian Association of Petroleum Producers Renewable Clean Energy Committee and the Ontario Provincial Forest Policy Committee.

**2019 Board/Committee Membership:**

Board (Director since November 2015)  
Audit and Risk Committee (since May 2019)  
Compensation, Leadership and Governance Committee  
Generation Oversight Committee

**2019 Attendance:**

6 of 6	100%
3 of 3	100%
5 of 5	100%
5 of 5	100%

**Principal Occupation:** President and CEO, Canadian Council for Aboriginal Business

**Board Memberships for other Reporting Issuers:** Noront Resources Ltd. (TSX)

**Independence from OPG:** Independent

**Interlocking Directorships on Boards of other Reporting Issuers:** None

**John Herron**

Age: 66

Punta Gorda, Florida, USA

John Herron retired in 2013 from Entergy where he was the President, CEO and Chief Nuclear Officer of Entergy Nuclear, with responsibility for Entergy's nuclear plants located in New York, Massachusetts, Vermont, Michigan, Louisiana, Mississippi and Arkansas as well as the company's management service to the Cooper Nuclear Station for the state of Nebraska.

He previously served as Entergy's Senior Vice President for nuclear operations handling the operational side of fleet management. Mr. Herron joined Entergy in February 2001 as Vice President, Operations at the Waterford 3 Nuclear Station in Killona, Louisiana. He then moved to New York as the senior Vice President of the Indian Point Energy Center in February 2002.

Mr. Herron began his career in nuclear operations in 1979 at Vermont Yankee Nuclear Power Corporation. Positions there included technical services superintendent, operations manager, technical programs manager, shift supervisor and supervisory control room operator. In 1994, he moved to Brownville, Nebraska to become plant manager at Nebraska Public Power District's Cooper Nuclear Station.

Mr. Herron then joined the Tennessee Valley Authority as plant manager at Sequoyah Nuclear Plant in Soddy-Daisy, Tennessee, from October 1996 through July 1999. From July 1999 to February 2001, Mr. Herron served as Site Vice President at TVA's Browns Ferry Nuclear Plant.

Prior to his career in utilities, Mr. Herron served in the U.S. Navy from 1972 to 1978. He was attached to the USS Tullibee and the S1C NPTU Windsor, where he was an instructor at the Nuclear Submarine Prototype School.

Mr. Herron holds a bachelor's degree in Business Management from Franklin Pierce College in Rindge, New Hampshire. He also attended the Advanced Management Program at the Harvard Business School in May 2005.

Mr. Herron currently serves on the board of directors for Duke Energy. He also served on the board of directors for the Institute of Nuclear Power Operations and on the Nuclear Strategic Issues Advisory Committee of the Nuclear Energy Institute. In the aftermath of Japan's 2011 earthquake, he was named to the World Association of Nuclear Operators Post-Fukushima Commission and the US nuclear industry's Fukushima Response Steering Committee.

**2019 Board/Committee Membership:**

Board (Director since November 2013)  
Darlington Refurbishment Committee  
Generation Oversight Committee (Chair)

**2019 Attendance:**

6 of 6	100%
4 of 4	100%
5 of 5	100%

**Principal Occupation:** Corporate Director**Board Memberships for other Reporting Issuers:** Duke Energy (*NYSE*)**Independence from OPG:** Independent**Interlocking Directorships on Boards of other Reporting Issuers:** None

**Ani Hotoyan-Joly**

Age: 58

Markham, Ontario, Canada

Ani Hotoyan-Joly is a member of the board of directors of Women's College Hospital in Toronto. She is a member of the Executive Committee and Chair of the Governance and Nominations Committee. She is also a member of the board of directors of Friends of Canadian Broadcasting and Chair of the Audit Committee. Most recently, Ms. Hotoyan-Joly was a member of the Board of Echelon Financial Holdings Inc. and the Chair of the Governance Committee and a member of the Audit & Risk Committee. She was also a member of the board of directors of Insurance Company of Prince Edward Island and Chair of the Audit and Risk Committee. Currently, she is a member of the Executive Board of Armenian Relief Society of Canada and was the past Chair of A.R.S. Armenian Private School's Board of Trustees.

Ms. Hotoyan-Joly is a successful finance executive with over 32 years of business experience in financial services including insurance and reinsurance industries.

Most recently, Ms. Hotoyan-Joly was the Chief Financial Officer and Corporate Secretary of Coventree Inc. Prior to that she was the VP Finance and Chief Financial Officer at Swiss Reinsurance Company Canada (P&C) and prior to that she held senior positions at Zurich Canada.

Ms. Hotoyan-Joly is a Chartered Professional Accountant Fellow and Chartered Accountant Fellow and holds a Bachelor of Commerce degree from the University of Toronto and the ICD.D designation from the Institute of Corporate Directors. She was selected as a 2016 Diversity 50 Candidate by the Canadian Board Diversity Council.

**2019 Board/Committee Membership:**

Board (Director since March 2017)  
Audit and Risk Committee (Chair from April 2019)  
Compensation, Leadership and Governance Committee

**2019 Attendance:**

6 of 6	100%
4 of 4	100%
5 of 5	100%

**Principal Occupation:** Corporate Director**Board Memberships for other Reporting Issuers:** None**Independence from OPG:** Independent**Interlocking Directorships on Boards of other Reporting Issuers:** None

**Selma Lussenburg**

Age: 64

Toronto, Ontario, Canada

From 2013 to 2018, Selma Lussenburg was the VP Governance, Corporate Safety and Security, General Counsel and Corporate Secretary at the Greater Toronto Airports Authority (Toronto Pearson International Airport). Ms. Lussenburg has served as General Counsel and Corporate Secretary for two other large and complex businesses in highly regulated industries: the Ontario Municipal Retirement System (OMERS) (investment and pension administration) and AT&T Enterprises Canada (telecommunications) and prior thereto she practiced corporate commercial and trade law at major law firms in Canada and Australia.

In her role as General Counsel and Corporate Secretary and while in private practice, Ms. Lussenburg gained extensive experience in mergers/acquisitions/divestitures, corporate commercial agreements, international investment and trade, and procurement as well as deep governance experience, leading teams and implementing strategies to achieve long-term business success.

At Toronto Pearson, Ms. Lussenburg was the senior executive responsible for corporate safety and security and the senior executive diversity and inclusion champion. While at AT&T, she served as Chief Privacy Officer.

Ms. Lussenburg currently serves as a director of MAG Silver Corporation (TSX/NYSE: MAG), a director of the Muskoka District Airport, the Chair of the Ontario Government's Internal Audit Justice Sectoral Advisory Committee, and a member of the Executive Committee of the Canada-US Law Institute, and is a Canadian representative on the NAFTA 2022 Committee on the resolution of private commercial disputes.

Ms. Lussenburg has previously served as the Chair of the IATA/ACI World Smart Security Committee (focused on enhancing passenger security and security screening efficiency and effectiveness), Chair of the Aeropole Board of Governors, Chair of Ontario Capital Growth Corporation, and, as a member of the board of directors of Oxford Properties. She holds a Chartered Director (C.Dir) designation from the Directors College.

**2019 Board/Committee Membership:**

Board (Director since November 2019)  
Audit and Risk Committee (since November 2019)  
Darlington Refurbishment Committee (since November 2019)  
Generation Oversight Committee (since November 2019)

**2019 Attendance:**

1 of 1	100%
1 of 1	100%
1 of 1	100%
1 of 1	100%

**Principal Occupation:** Corporate Director

**Board Memberships for other Reporting Issuers:** MAG Silver Corporation (TSX/NYSE)

**Independence from OPG:** Independent

**Interlocking Directorships on Boards of other Reporting Issuers:** None

**Scott McDonald**

Age: 64

Toronto, Ontario, Canada

Scott McDonald is an experienced corporate director and former senior executive. He currently serves as a Director on the board of directors of the Michael Garron Hospital (formerly Toronto East General Hospital) and has served as a director and HR Committee Chair on the boards of directors of Purolator and SCL.

Mr. McDonald had a successful career as a senior business executive with large, complex Canadian and North American companies in both the private and public sectors. With extensive C-suite experience in Human Resources, his background also includes experience in general management, operations, sales, and distribution across several industries – forest products, consumer packaged goods, food, logistics, and distribution. His career provided him with the opportunity to have worked in both official languages, and also to work and live in Toronto, Sudbury, Montreal, and Ottawa.

Mr. McDonald is a member of the Human Resources Professionals Association, holds the ICD.D designation from the Institute of Corporate Directors and has a Bachelor's degree from the University of Toronto. He is also a graduate of executive programs at McGill University, MIT, and the Rotman School at U of T.

**2019 Board/Committee Membership:**

Board (Director since January 2020)

Audit and Risk Committee (since January 2020)

Compensation, Leadership and Governance Committee (since January 2020)

Generation Oversight Committee (since January 2020)

**2019 Attendance:**

N/A N/A

N/A N/A

N/A N/A

N/A N/A

**Principal Occupation:** Corporate Director**Board Memberships for other Reporting Issuers:** None**Independence from OPG:** Independent**Interlocking Directorships on Boards of other Reporting Issuers:** None



**Yezdi Pavri**

Age: 70

North York, Ontario, Canada

Yezdi Pavri retired as Vice Chairman of Deloitte Canada in June 2012 after a career of more than 30 years. Prior to being named Vice Chairman, Mr. Pavri was a member of the firm's national Management Committee for over ten years and was the Managing Partner of the Toronto practice since June 2004. He founded Deloitte's national Enterprise Risk Services practice in 1990 and led it for 15 years. He was a founding member of the global firm's India Steering Committee and co-chaired the firm's first Diversity and Inclusion Committee.

Mr. Pavri holds a Bachelor's degree in Aeronautical Engineering from the Indian Institute of Technology in Bombay and a Master's degree in Thermal Power Engineering from Imperial College in London. He is a Fellow of the Chartered Professional Accountants of Ontario.

Mr. Pavri currently serves on the board of ICICI Bank of Canada, and has previously served on the Boards of Enterra Holdings Limited (the global parent of Golder Associates), MD Financial Services, and Hydro One. Mr. Pavri is also a past Chairman of the Board of Trustees of United Way of Greater Toronto.

**2019 Board/Committee Membership:**

Board (Director since September 2015)

Audit and Risk Committee

Compensation, Leadership and Governance Committee

Darlington Refurbishment Committee (since May 2019)

**2019 Attendance:**

6 of 6 100%

4 of 4 100%

5 of 5 100%

3 of 3 100%

**Principal Occupation:** Corporate Director**Board Memberships for other Reporting Issuers:** None**Independence from OPG:** Independent**Interlocking Directorships on Boards of other Reporting Issuers:** None

**Jim Reinsch**

Age: 76

Frederick, Maryland, USA

Jim Reinsch recently retired from the Bechtel Group where he was Senior Vice President and Partner, and past President of Bechtel Nuclear. In this role, he was responsible for the global profit/loss, customer relations, operations, project management, marketing and business development of Bechtel's three nuclear business segments: nuclear operating plant services, steam generator replacement, and operations of Bechtel's global nuclear activities. During his 40 years with Bechtel, he also presided over Bechtel Canada, and managed large regions in the United States and Asia. He served as the President of the American Nuclear Society organization, and was a member of the Nuclear Energy Institute as well as a member of their Executive Committee.

Mr. Reinsch is a member of several international nuclear energy organizations, including the World Association of Nuclear Operators and the World Nuclear Association. Mr. Reinsch holds a Bachelor of Science degree from the University of Maryland.

Mr. Reinsch is a past Board member of Frederick Memorial Hospital, Hood College Board of Trustees, Duke Energy, and the Smithsonian National Portrait Gallery. Additionally, he serves on the Emirate Nuclear Energy Corporation's Committee on Nuclear Power which reports to the board of directors.

**2019 Board/Committee Membership:**

Board (Director since August 2015)  
Darlington Refurbishment Committee (Chair)  
Generation Oversight Committee

**2019 Attendance:**

6 of 6	100%
4 of 4	100%
5 of 5	100%

**Principal Occupation:** Corporate Director**Board Memberships for other Reporting Issuers:** None**Independence from OPG:** Independent**Interlocking Directorships on Boards of other Reporting Issuers:** None

**James Sheppard**

Age: 71

League City, Texas, USA

James Sheppard was appointed to the OPG Board in March 2017 and currently serves as an Independent Consultant. Mr. Sheppard was as Interim Senior Vice President for Southern California Edison Company and served as its Interim Chief Nuclear Officer from September 2010 to December 9, 2010. From 1993 to 2009, Mr. Sheppard held several senior positions associated with the South Texas Project nuclear power plant, including Chairman, President and Chief Executive Officer of STP Nuclear Operating Company, which operated the facility for its three owners. He served as Executive Officer of South Texas Project Electric Generating Station. He served as an executive at STP for ten years, holding positions of Vice President and Assistant to the President and Chief Executive Officer; Vice President of Engineering and Technical Services; Vice President of Business Systems; Assistant to the executive vice president; and General Manager of Licensing. He has been an Independent Director at Xcel Energy Inc. since March 2011.

Mr. Sheppard holds a Bachelor of Science degree in aerospace engineering from the U.S. Naval Academy and a Master's degree in business administration from Duke University.

**2019 Board/Committee Membership:**

Board (Director since March 2017)  
Compensation, Leadership and Governance Committee (since May 2019)  
Darlington Refurbishment Committee  
Generation Oversight Committee

**2019 Attendance:**

6 of 6	100%
3 of 3	100%
4 of 4	100%
5 of 5	100%

**Principal Occupation:** Corporate Director

**Board Memberships for other Reporting Issuers:** Xcel Energy Inc. (NYSE)

**Independence from OPG:** Independent

**Interlocking Directorships on Boards of other Reporting Issuers:** None

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## Past Occupation

All of the Company's directors have held the positions listed above or other executive positions within the same or associated firms or organizations during the past five years or longer, except for the directors listed below.

Director	Past Occupation
Selma Lussenburg	VP Governance, Corporate Safety & Security, General Counsel & Corporate Secretary at Greater Toronto Airports Authority (GTAA) from 2013 to 2018.
Scott McDonald	Chief Human Resources Officer at Canada Post Corporation from 2013 to 2018.

## Composition of the Committees of the Board of Directors

The Company has four committees of the Board: the Audit and Risk Committee, the Compensation, Leadership and Governance Committee, the Darlington Refurbishment Committee and the Generation Oversight Committee. As President and Chief Executive Officer (CEO) of OPG, Mr. Hartwick is not a member of any Board committees but attends all committee meetings. The Board Chair is typically not a member of any committees but attends all committee meetings. Until a replacement Chair of the Compensation, Leadership and Governance Committee is selected, Ms. Kei has remained as the Chair of that committee.

The voting members of the committees, as of the date of this AIF (unless otherwise indicated), are identified below. The table below lists the committees of the Board and their members as of the date of this AIF.

Director <sup>1</sup>	Audit and Risk Committee <sup>2,5,6</sup>	Compensation, Leadership and Governance Committee <sup>2,3,4</sup>	Darlington Refurbishment Committee <sup>3,4,6</sup>	Generation Oversight Committee <sup>4,5</sup>
JP Gladu	✓	✓		✓
John Herron			✓	Chair
Ani Hotoyan-Joly	Chair	✓		
Wendy Kei		Chair		
Selma Lussenburg	✓		✓	✓
Scott McDonald	✓	✓		✓
Yezdi Pavri	✓	✓	✓	
Jim Reinsch			Chair	✓
James Sheppard		✓	✓	✓

<sup>1</sup> Bernard Lord served as a Director from November 2013 to June 2019 and was the Board Chair.

<sup>2</sup> George Lewis served as a Director from February 2005 to March 2019 and was the Audit and Risk Committee Chair and a member of the Compensation, Leadership and Governance Committee.

<sup>3</sup> Peggy Mulligan served as a Director from December 2005 to March 2019 and was the Compensation, Leadership and Governance Committee Chair and a member of the Darlington Refurbishment Committee.

<sup>4</sup> Bill Coley served as a Director from January 2013 to March 2019 and was a member of the Compensation, Leadership and Governance Committee, Generation Oversight Committee and Darlington Refurbishment Committee.

<sup>5</sup> Lisa Demarco served as a Director from April 2014 to March 2019 and was a member of the Audit and Risk Committee and the Generation Oversight Committee.

<sup>6</sup> Jeff Coles served as a Director from October 2018 to July 2019 and was a member of the Audit and Risk Committee and Darlington Refurbishment Committee.

## 9.2 OFFICERS

The following table sets forth the name, municipality of residence, position with the Company and the date of commencement for each of the officers of the Company as of the date of this AIF:

Name	Municipality of Residence	Current Position Held	Officer Since
Wendy Kei	Toronto, Ontario	Board Chair	June 2019
Ken Hartwick	Milton, Ontario	President and Chief Executive Officer	March 2016
Shelley Babin	Toronto, Ontario	Senior Vice President, Law & General Counsel, and Chief Ethics Officer	July 2019
Nicolle Butcher	Toronto, Ontario	Senior Vice President, Corporate Business Development & Strategy	July 2019
Alec Cheng	Markham, Ontario	Vice President, Treasurer	December 2018
Heather Ferguson	Toronto, Ontario	Senior Vice President, Corporate Affairs	July 2019
Chris Ginther	Newmarket, Ontario	Chief Administrative Officer	July 2012
Sean Granville	Whitby, Ontario	Chief Nuclear Officer	July 2019
David Kaposi	Toronto, Ontario	Vice President, Chief Investment Officer	November 2013
Mike Martelli	Toronto, Ontario	President, Renewable Generation	July 2013
Carlton Mathias	Toronto, Ontario	Vice President, Corporate Governance and Corporate Secretary	August 2018
John Mauti	Toronto, Ontario	Chief Financial Officer and Senior Vice President, Finance	April 2019
Dominique Minière	Toronto, Ontario	President, Nuclear	March 2019
Dietmar Reiner	Clarington, Ontario	Chief Project Officer & Senior Vice President, Enterprise Projects	June 2014

On February 13, 2019, OPG announced the departure of Jeff Lyash from OPG as President and CEO, effective March 31, 2019, to take on another role. The Company also announced that the Board appointed Mr. Hartwick, then Chief Financial Officer and Senior Vice President, Finance, to the position of President and CEO, effective April 1, 2019.

### Past Occupation

All of the executive officers of the Company have held the positions listed above or other positions within the Company during the past five years or longer, except for the officers listed below.

Name	Past Occupation
Ken Hartwick	Interim President and CEO at Atlantic Power Corporation from September 2014 to January 2015, Chief Financial Officer at Wellspring Financial Corporation from February 2015 to March 2016.
Shelley Babin	Associate at Fasken Martineau DuMoulin LLP from 2014 to May 2015.
Sean Granville	Seconded from OPG to NB Power as Chief Nuclear Officer from February 2013 to December 2015.
Dominique Minière	Chief Operating Officer at Electricité de France from January 2015 to March 2019.

### Cease Trade Orders, Bankruptcies, Penalties or Sanctions

To the knowledge of OPG, no director or executive officer is, at the date of the AIF, or was within ten years before the date of the AIF, a director, chief executive officer or chief financial officer of any company, that (a) was subject to an order that was issued while the director or executive officer was acting in the capacity as director, chief executive officer or chief financial officer, or (b) was subject to an order that was issued after the director or executive officer ceased to be a director, chief executive officer or chief financial officer and which resulted from an event that occurred while that person was acting in the capacity as director, chief executive officer or chief financial officer, except for:

- Ani Hotoyan-Joly was the Chief Financial Officer and Corporate Secretary of Coventree Inc. (Coventree) on November 8, 2011, when the Ontario Securities Commission issued an order that trading in any securities by Coventree cease and any exemptions contained in Ontario securities law do not apply to Coventree until such time as Coventree completes its winding up. The order was made on the basis that Coventree had contravened Ontario securities law by failing to issue and file certain news releases and material change reports in 2007. The events in question occurred before Ms. Hotoyan-Joly became the Chief Financial Officer and Corporate Secretary of Coventree in May 2009. Coventree completed a court-supervised winding up process on June 29, 2018.

To the knowledge of OPG, no director or executive officer of OPG, or a shareholder holding a sufficient number of securities of OPG to affect materially the control of OPG (a) is, as at the date of the AIF, or has been within the ten years before the date of the AIF, a director or executive officer of any company (including OPG) that, while that person was acting in that capacity, or within a year of that person ceasing to act in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold its assets; or (b) has, within the ten years before the date of the AIF, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or become subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager, or trustee appointed to hold the assets of the director, executive officer or shareholder, except for:

- Ani Hotoyan-Joly was the Chief Financial Officer and Corporate Secretary of Coventree from May 2009 to June 2018. On February 15, 2012, Coventree announced that the winding up of the company would commence and that Duff & Phelps Canada Restructuring Inc. (now known as KSV Advisory Inc.) was appointed as the liquidator of the company for the purpose of winding up its affairs. Coventree completed a court-supervised winding up process on June 29, 2018.

### Conflicts of Interest

Directors and officers of OPG are required to disclose any existing or potential conflicts in accordance with OPG policies governing directors and officers and in accordance with the OBCA. The Board of Directors Conflict of Interest Policy and the Company's Code of Business Conduct cover potential conflicts of interest for Directors and all OPG employees, respectively.

### Indebtedness of Directors and Executive Officers

As of the date of this AIF, no director or executive officer of the Company or any of its subsidiaries had any outstanding indebtedness to the Company or any of its subsidiaries except routine indebtedness or had any indebtedness that was the subject of a guarantee, support agreement, letter of credit or other similar arrangement or understanding provided by the Company or any of its subsidiaries.

## 10 CORPORATE GOVERNANCE

National Instrument 58-101 *Disclosure of Corporate Governance Practices* (NI 58-101), was implemented by Canadian securities regulatory authorities to provide greater transparency for the marketplace regarding issuers' corporate governance practices. OPG's corporate governance practices align with NI 58-101 and National Policy 58-201 *Corporate Governance Guidelines*. In addition, OPG continuously reviews its governance practices against the principles discussed in the 2013 Report on Building High Performance Boards, being the most current such report issued by the Canadian Coalition for Good Governance, and has concluded that OPG compares favourably to those principles that apply to OPG.

### Board of Directors

OPG's Board of Directors is comprised of individuals with the following capabilities:

- managing large businesses;
- managing and operating nuclear stations;
- understanding of the Canadian nuclear environment;
- engineering and/or project management, including large infrastructure project management;
- managing capital intensive companies;
- knowledge and expertise in mergers and acquisitions;
- overseeing regulatory, government and public relations;
- human resources management;
- financial, investment, legal and corporate governance expertise;
- knowledge of information technology/cybersecurity;
- knowledge of Indigenous communities; and
- stakeholder management.

The Board exercises its independent supervision over management as follows: all of the members of the Board are independent of the Company except for the Company President and CEO; meetings of the Board are held at least five times a year; a formal Charter for the Board and for each Board committee have been adopted and the charters are reviewed annually; and a portion of each Board and Board committee meeting is reserved for independent Directors to meet without management present. Further information of the Board's role and responsibilities are included in OPG's Charter of the Board of Directors which can be found on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website is incorporated by reference herein.***

### *Position Descriptions*

The Board and each Board committee is chaired by an independent Director and each have a written job description. The detailed written job descriptions of the Board Chair and each Board committee Chair can be found on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website is incorporated by reference herein.***

OPG has a written position description for the CEO. This position 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. In addition, the Board delineates the President and CEO role and responsibilities through the By-laws, the Board Charter, the Board policies and the corporate and CEO annual goals and objectives. The Board sets and monitors performance against annual corporate and CEO targets and objectives.

### *Director Independence*

On an annual basis, the Compensation, Leadership and Governance Committee of the Board reviews the disclosures made by Directors in the annual Director Questionnaire and reviews each disclosed affiliation's relationship with OPG in order to determine whether the Director is (or remains) independent. The Compensation, Leadership and Governance Committee reports on its review to the Board.

Based on the meaning of Independence in Section 1.4 of National Instrument 52-110 *Audit Committees* (NI 52-110) and a review of the applicable factual circumstances against this standard, the Compensation, Leadership and Governance Committee has determined that all Directors listed are independent, except for Ken Hartwick, who is considered to have a material relationship with OPG by virtue of his position as President and CEO of OPG.

The Board has a Board of Directors Conflict of Interest Policy and Procedure that governs the disclosure and mitigation of Director conflicts or potential conflicts of interest and has adopted an annual process of written disclosure by Directors in order to:

- (i) identify potential conflicts of interest for the purposes of complying with the Board of Directors Conflict of Interest Policy and the OBCA;
- (ii) validate the Directors' independence and financial literacy for the purposes of complying with securities regulations related to boards of directors and audit committees; and
- (iii) satisfy other disclosures and regulatory filings.

To further minimize potential conflicts of interest, the Board has a policy on interlocking directorships. This policy states that no more than two OPG Directors may sit on a board of directors of another reporting issuer at the same time. Directors must confirm that they are in compliance with OPG's policy on interlocking directorships when disclosing to the Board Chair appointments to other boards of directors.

A copy of the Board of Directors Conflict of Interest Policy can be found on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website is incorporated by reference herein.***

### *Strategic Planning*

OPG's Board holds an annual strategy session and devotes a significant portion of each regular Board meeting to discussion of corporate strategic matters. Management is responsible for developing the strategy and presenting it to the Board for discussion.

In 2019, the Board received reports on key strategic issues, risks, competitive developments and corporate opportunities related to the Company. Management ensures that the key strategic elements are incorporated into OPG's annual budget and business plan, which are reviewed and approved by the Board. The Board also periodically receives briefings from external advisors on broad energy industry developments and/or special strategic matters.

### *Overseeing the Management of Risks*

The Board oversees OPG's approach of identifying, reporting and mitigating the risks that could significantly impact the Company's capacity to achieve its long-term strategic objectives, as well as specific business plan objectives. To fulfill its risk oversight responsibilities, the Board established an Enterprise Risk Management (ERM) Program with oversight by an Audit and Risk Committee, comprised of independent Directors. The ERM program employs a framework that management uses to manage the Company's risk profile, as well as the Company's internal audit program. The ERM program assists the Board in understanding how risks may affect the Company and how they are being addressed by management. The Audit and Risk Committee receives quarterly reports from OPG's Chief Risk and Audit Executive (CRAE) on enterprise-wide risks and internal audit findings, and meets with the CRAE *in camera*.



Through the Compensation, Leadership and Governance Committee, the Board also monitors the risks associated with the Executive Compensation Program, to preclude the Company's decision-makers from taking excessive risk in order to achieve incentives under the compensation plans. The CRAE and Senior Vice President, Human Resources jointly review the executive compensation framework on an annual basis to identify any potential for unintended risk-taking. The Senior Vice President, Human Resources provides an annual report to the Compensation, Leadership and Governance Committee on the results of their review.

#### *Orientation and Continuing Education*

The Compensation, Leadership and Governance Committee is responsible for reviewing and recommending appropriate orientation programs for new Directors. New directors are provided relevant documentation relating to OPG's governance practices and policies and to its business. New Directors attend plant tours of OPG generating facilities, where they also receive comprehensive introductory briefings from OPG senior executives on OPG's operations and business activities.

The Board supports and sponsors the continuing education of OPG Directors, both in the business of OPG and in their duties as Directors. This includes plant tours of OPG's major facilities, site visits to projects with OPG's Indigenous business partners and special presentations by internal and external experts on topical business-related issues or on specific aspects of OPG's operations. Directors are also provided with articles and publications on current topics of interest. Board members have full access to all Board and Board committee materials and records. OPG has developed a Director Governance Handbook which provides Directors with information necessary to fulfill their roles, including director duties and obligations under the OBCA, and relevant corporate policies and procedures. OPG also co-sponsors Director attendance at the Institute of Corporate Directors' Director Education Program, or equivalent, and sponsors attendance at the Goizueta Director program for members of Board committees responsible for oversight of nuclear operations.

#### *Ethical Business Conduct*

The Board has adopted a policy for ethical business behaviour and a Code of Business Conduct. The mandate of the Audit and Risk Committee requires that it receive regular reports throughout the year on the Code of Business Conduct in order to satisfy itself that appropriate code of conduct and compliance programs are in place and are being enforced and that remedial action is being taken. The Audit and Risk Committee receives quarterly reports from management on the Code of Business Conduct (including reports on any substantiated cases of fraud) and the disposition of cases including disciplinary action, as well as an annual report on the Code of Business Conduct and a report on the annual review of the Board policy. The Audit and Risk Committee has procedures for the receipt, retention and treatment of complaints received pertaining to accounting, internal controls or auditing matters and for the confidential anonymous submission by employees concerning such matters.

OPG's Code of Business Conduct is applicable to all OPG employees and equally applicable to agents, representatives, consultants, contractors, and business partners acting on OPG's behalf. The OPG Board of Directors mandate explicitly acknowledges the Board's role in creating a culture of integrity throughout the organization. The Board has statutory obligations regarding conflict of interest as well as a separate procedure for disclosure. The Board is required to follow both provincial legislative requirements and guidance regarding specific types of conflict and disclosure in their role as directors in the OPG Board of Directors Conflict and Interest Policy and Procedure. A copy of the Code of Business Conduct can be found on SEDAR at [www.sedar.com](http://www.sedar.com) and is also available on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website is incorporated by reference herein.***

### *Nomination of Directors*

The Compensation, Leadership and Governance Committee is responsible for conducting an annual review of the OPG Board's principles and systems of governance and oversight of annual Board, Board committee and Director evaluations. The Compensation, Leadership and Governance Committee maintains a robust Succession Plan for the orderly rotation of directors to ensure that the Board has the skills, experience and diversity required. The Succession Plan includes the following components:

- (i) core requirements for a high performing board;
- (ii) skill sets required by the OPG Board as a whole;
- (iii) skills profile for the current Board;
- (iv) tenure map of the current Board;
- (v) Board diversity target and implementation;
- (vi) "evergreen list" of potential Board candidates; and
- (vii) Board succession priorities.

The Compensation, Leadership and Governance Committee recommends candidates to the Shareholder. Nominations of Directors by the Shareholder may also be considered by the committee.

When considering a potential candidate, the Compensation, Leadership and Governance Committee considers the qualities, experience and skills that the Board, as a whole, should have in light of the business opportunities and risks facing OPG. The attributes the Compensation, Leadership and Governance Committee considers in a candidate include integrity, business judgment and experience, diversity, professional expertise, independence from management, financial literacy and communication skills, as well as sufficient time available to fulfill his or her obligations as a Board member. Further, the Board ensures that a diverse candidate is interviewed for every vacancy on the Board. The Board's diversity targets are set out below under the heading, *Diversity in Leadership*.

From time to time, the Compensation, Leadership and Governance Committee may engage outside advisors to assist in identifying potential candidates.

### *Performance Assessments*

The Compensation, Leadership and Governance Committee is responsible for the annual process for evaluating the performance of the Board, its committees and individual Directors. The Board and committee evaluations are based upon the completion of confidential questionnaires regarding assessment of performance and compliance with the Board and Committee Charters. The individual Director evaluations are based on self-assessment questionnaires, which are submitted in confidence to the Board Chair and the Chair of the Compensation, Leadership and Governance Committee. The Compensation, Leadership and Governance Committee reports the results of the evaluations to the Board and the results are discussed amongst the Board. The Compensation, Leadership and Governance Committee makes recommendations to the Board for enhancing the Board's governance and effectiveness.

### *Director Tenure/Board Renewal*

The OPG Board Charter sets out the Board's policy on tenure being that directors may serve on the Board for up to ten years from the date that they were first appointed to the Board, with the possibility of an extension to a director's tenure for one further term in exceptional circumstances. When considering Board renewal, the Compensation, Leadership and Governance Committee regularly reviews the Board skills profile and Board Diversity and Inclusion Policy. From time to time, the committee makes recommendations to add skills to the Board that reflect OPG's business opportunities and risks.

## Compensation

### *Executive Compensation Framework*

The Compensation, Leadership and Governance Committee is comprised of independent members who oversee the compensation of executives from the Enterprise Leadership Team to CEO. Additional details regarding the committees' responsibilities can be found below under the heading, *Committees of the Board of Directors*.

In September 2016, the previous Government of Ontario introduced *Regulation 304/16: Executive Compensation Framework*. The regulation set out how all employers, including OPG, designated under the *Broader Public Sector Executive Compensation Act, 2014* must establish and post compensation programs for executives. The regulation required all designated employers to have a written Executive Compensation Program that describes the compensation they may provide to executives. The program was required to include the compensation philosophy, salary and performance-related pay caps, comparative analysis details and a description of other elements of compensation. OPG met the requirements of *Ontario Regulation 304/16* and, effective January 1, 2017, implemented its Executive Compensation Program. OPG's Executive Compensation Program applies to employees at the Vice President level and higher. A copy of OPG's Executive Compensation Program is available on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website is incorporated by reference herein.***

On August 13, 2018, the Government of Ontario introduced the *Compensation Framework Regulation 406/18* under the *Broader Public Sector Executive Compensation Act, 2014*. This regulation replaces the *Executive Compensation Framework* regulation, imposes a freeze on base salary for designated executives, which covers OPG employees at the Vice President level and higher, and restricts for-performance payments to the pay-for-performance envelope disbursed in the 2017 pay year. The Government of Ontario is in the process of reviewing Executive Compensation programs throughout the broader public sector and until a review is completed, there remains uncertainty on the executive compensation parameters that will be applicable going forward. The review is expected to be completed by mid-2020.

### *CEO Compensation*

Among its other responsibilities, the Compensation, Leadership and Governance Committee oversees, on behalf of the Board, the setting of the CEO's annual goals and objectives and the annual review of CEO performance and makes recommendations to the Board with respect to CEO compensation. The Committee may seek input from an independent advisor with regard to monitoring and benchmarking compensation trends.

The CEO's base pay and incentives compensation are compliant with the *Compensation Framework Regulation 406/18*.

For details regarding compensation paid to Directors and executive officers during the financial year ended December 31, 2019, refer to OPG's Statement of Executive Compensation, which is attached to this AIF as Appendix C.

### *Director Compensation*

As at March 12, 2020, OPG's Director compensation framework provides each Director who is not an employee of OPG with an annual retainer of \$25,000. Directors also receive a \$3,000 retainer for each Board committee of which they are a member. There are four standing committees of the Board and Directors serve on at least three committees, unless they are a Chair of a committee. Directors receive an additional retainer for serving as committee chairs. The retainer for the chair of the Audit and Risk Committee is \$8,000. The chairs of the other three committees receive retainers of \$5,000.

In addition to the above, Directors are compensated for each regular and/or special meeting that they attend and receive a fee of \$2,000 or \$1,000 for a long or short meeting, respectively. The Board Chair may also determine that no fee is warranted.

In order to retain national and international expertise, non-resident Directors are compensated in US dollars and Directors who travel over certain distances receive a travel time fee to cover travel related to Board and Board committee meetings they attend.

Since 2004, the Chair of the Board, in their role as non-executive Chair, receives an all-inclusive annual fee of \$150,000 and is reimbursed for out-of-pocket expenses including travel and other expenses.

### Committees of the Board of Directors

The following are the current standing Board committees as of the date of this AIF:

#### *Audit and Risk Committee*

This committee is responsible for the integrity, quality and transparency of OPG's financial information, the adequacy of the financial reporting process, the systems of internal controls and related principles, policies and procedures established by management. The Committee is responsible for the oversight of the Company's regulatory filings, financial statements, MD&A and press releases prior to their disclosures to the public, including approval of quarterly financial statements and recommending approval of the annual financial statements and various other annual disclosures to the Board. The committee is also responsible for recommending the appointment and compensation of the external auditor to the Board and for oversight of the external auditor.

The committee also provides oversight of OPG's corporate financing strategies including:

- policies related to financial exposure management;
- processes for identifying major financial risks;
- performance of the OPG Pension Fund, the Used Fuel Segregated Fund and the Decommissioning Segregated Fund;
- review and approval of the audited financial statements of the OPG Pension Fund, the Used Fuel Segregated Fund and the Decommissioning Segregated Fund; and
- review and approval of the statements of investment policies and procedures for the OPG Pension Fund and the Decommissioning Segregated Fund.

The Audit and Risk Committee also oversees an independent internal audit function and management's ERM program, which includes the review of management's assessment of significant risks to achieving OPG's business plan objectives. The committee is also responsible for ensuring that an effective Code of Business Conduct is in place at OPG and monitors compliance with this code.

For further details regarding the Audit and Risk Committee, see *Appendix A - Audit and Risk Committee Information*.

### *Compensation, Leadership and Governance Committee*

This committee provides oversight of OPG's human resources and compensation policies and practices, including CEO objectives and compensation, disclosure on compensation and human resources matters, leadership talent review, succession planning and collective bargaining negotiations. The committee also provides oversight of the design of OPG's benefit and pension plans.

The Compensation, Leadership and Governance Committee oversees the Board's governance program and practices to ensure that they are consistent with high standards of corporate governance, including annually reviewing and assessing the Board's system of corporate governance with a view to maintaining these high standards. The committee also is responsible for overseeing OPG's reputation management plan, and for identifying and recommending to the Board candidates for nomination to the Shareholder in consideration of the Board's Succession Plan and Board Diversity and Inclusion Policy. Finally, the committee oversees OPG's processes for Board, Board committee and Director assessments, as well as Director compensation and new Director orientation.

### *Darlington Refurbishment Committee*

The Darlington Refurbishment Committee is responsible for oversight of the execution of the Darlington Refurbishment project, including retaining external independent oversight advisors. The committee was also responsible for making a recommendation to the Board with respect to a final budget and schedule for the Darlington Refurbishment project, which was subsequently approved by the Board in November 2015. The committee monitors and reports on the progress of the refurbishment program against the approved budget and schedule. The committee is responsible for making recommendations to the Board with respect to the refurbishment of subsequent Darlington units and other recommendations for approvals related to the refurbishment program as may be required from time to time.

### *Generation Oversight Committee*

This committee is responsible for the oversight of safe, secure and efficient operations of OPG's generating facilities. Additionally, the committee is responsible for the development, risk management, financing and execution of the Company's major generation projects, including those related to nuclear waste management but not the Darlington Refurbishment project. This committee also is responsible for providing oversight for matters relating to business development and business acquisitions. The committee is also responsible for the oversight of OPG's environmental and dam safety management systems and OPG's Indigenous relations. The committee reviews reports of internal and external advisors/assessors in respect of OPG's generation operations and management's response to the findings from such assessments. The committee provides oversight to ensure that OPG's generating facilities are in compliance with nuclear safety, industrial and occupational health and safety and environmental laws and regulations.

### Diversity in Leadership

OPG embraces diversity in its broadest sense – a mix of talents, perspectives, backgrounds and experiences that increase our collective capability. OPG believes strongly in developing a culture of inclusion in which everyone is treated fairly and respectfully and each member is valued as an integral part of the team. OPG embraces, respects, accepts and values differences among all employees and directors.

Diversity is an integral part of OPG's business practice and the constituency of the Board. The Board considers diversity essential in attracting qualified directors and maintaining a highly effective board of directors. OPG has a written Board of Directors Diversity and Inclusion Policy which ensures that the Compensation, Leadership and Governance Committee interviews a diverse candidate for every Board vacancy.

### *Board of Directors*

In January 2019, OPG became a member of the 30% Club Canada, a widely recognized organization, whose mission includes the aspirational goal of having 30 percent of board seats and senior management positions within the Canadian business community to be held by women by 2022. In August 2019, the Board set a new target for diverse representation on the Board of 50 percent of the independent directors, including a target of 30 percent women on the Board by 2022. As of the date of this AIF, overall diversity of the Board is greater than 50 percent and representation of women on the Board is 33 percent (three of nine independent directors).

### *Senior Management*

Although a diversity target and policy has not been established for senior management, OPG continues to track and monitor diversity succession planning metrics and strives to have a diverse candidates list for senior management positions. As at December 31, 2019, women filled 29 percent of Corporate Officer roles and 27 percent of senior management (senior managers and above) positions. In total, there were four women in Corporate Officer roles and 164 women in senior management positions. OPG tracks and monitors diversity succession planning metrics and strives to have a diverse candidates list for senior management positions.

### Further Information on OPG Governance

OPG provides additional information on the Company's governance on its website ([www.opg.com](http://www.opg.com)) including:

- Memorandum of Agreement with the Shareholder
- Shareholder Directives
- Board and Committee Charters
- Board and Committee Chair Position Descriptions
- Board of Directors Conflict of Interest Policy
- Board Diversity and Inclusion Policy
- Indigenous Relations Policy
- Code of Business Conduct
- Disclosure Policy
- Environmental Policy
- Employee Health and Safety Policy
- Nuclear Safety Policy
- Safe Operations Policy
- Cyber Security Policy
- Executive Compensation Program
- Enterprise Risk Management Policy
- Delegation and Exercise of Authority Policy

***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website nor any of the contents of the aforementioned additional information on OPG's governance are incorporated by reference herein.***

## 11 INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS

### 11.1 RELATIONSHIP WITH THE PROVINCE AND THE OEFC

#### Relationship with the Shareholder

As a corporation created under and governed by the OBCA, OPG's management is supervised by its Board of Directors, which is obligated by law to act in the best interests of the Company. The Company's sole Shareholder, the Province, owns all of the Company's issued and outstanding common shares and thereby has the power to determine the composition of the Company's Board of Directors.

As one of several wholly-owned government business enterprises of the Province, OPG has transactions in the normal course of business with various government ministries and organizations in Ontario that fall under the purview of the Province.

#### Memorandum of Agreement

On August 17, 2005, OPG entered into the MOA with the Shareholder regarding OPG's role and responsibility as a power producer in Ontario. In July 2015, the MOA was revised. The MOA serves as the basis of agreement between OPG and the Shareholder regarding OPG's mandate, governance, performance, reporting and communications and establishes the accountabilities between OPG and the Province. OPG's business imperatives are based on the Company's mandate as set out in the MOA. The MOA was reaffirmed for continuance by the Ontario Minister of Energy, Northern Development and Mines and the OPG Board Chair in the fourth quarter of 2019. The MOA remains in effect for not more than five years from the date of execution.

A copy of the MOA can be found on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website nor any of the contents of the MOA are incorporated by reference herein.***

#### Shareholder Directives

The Shareholder may at times direct OPG to undertake special initiatives. A Shareholder directive is issued when the Shareholder finds it necessary to assume decision-making power and authority over certain aspects of the business operations of the Corporation. Under a Shareholder directive, the Shareholder assumes all the rights, powers, duties and liabilities of the Directors to manage or supervise the management of the business and the Directors are relieved of their duties and liabilities. Shareholder directives are communicated as written pursuant to section 108 of the OBCA. Copies of each Shareholder directive can be found on the Company's website at [www.opg.com](http://www.opg.com). ***Unless otherwise specifically stated, none of the information contained on, or connected to the Company's website nor any of the contents of the Shareholder directives are incorporated by reference herein.***

#### Ontario Nuclear Funds Agreement

The ONFA between OPG and the Province sets out the responsibility for funding the obligations for the decommissioning of OPG's nuclear facilities and the long-term management of OPG's used nuclear fuel and other nuclear waste. Pursuant to the ONFA, the Company has established a Used Fuel Segregated Fund and a Decommissioning Segregated Fund to fund the future costs of these activities. Additional details can be found in the section, *Description of the Business* under the heading, *Nuclear Waste Management – Funding Mechanisms*.

### OPG Debt Held by the OEFC

A portion of OPG's long-term debt has been financed by the OEFC. As at December 31, 2019, the OEFC held \$3,135 million of OPG's long-term debt with maturities ranging from one month to 28 years. For additional details, see Note 11 of the Company's audited consolidated financial statements as at and for the year ended December 31, 2019.

### Fair Hydro Trust Loan Receivable to OPG

The Company's interest in the Fair Hydro Trust includes subordinated debt issued by the Trust as part of its financing for the acquisition of Investment Interest from the IESO in 2017 and 2018. OPG recognizes this interest as a loan receivable on the consolidated balance sheet following the deconsolidation of the Trust effective May 9, 2019, as a result of the *Fixing the Hydro Mess Act, 2019* receiving Royal Assent. Under this legislation, the Province is responsible for paying existing funding obligations administered by the Trust. The Trust is prohibited from issuing any new funding obligations. Additional details on the Fair Hydro Trust can be found in the section, *General Development of the Business* under the heading, *General Developments – Ontario Fair Hydro Plan*.

### Payments-In-Lieu of Corporate Income Taxes and Property Taxes

OPG is exempt from income taxes on its operations under the *Income Tax Act* (Canada). However, under the *Electricity Act, 1998*, OPG is required to make payments in lieu of corporate income taxes to the OEFC. These payments are calculated in accordance with the *Income Tax Act* (Canada) and the *Taxation Act, 2007* (Ontario), as modified by the *Electricity Act, 1998* and related regulations. This results in OPG paying taxes similar to those imposed under the federal and Ontario tax acts.

OPG is subject to income tax audits by the Ontario Ministry of Finance. As of the date of this AIF, income tax audits up to and including the 2015 taxation year have been completed. OPG remains subject to income tax examination by the Ontario Ministry of Finance for years after 2015.

The *Electricity Act, 1998* also provides that OPG and certain of its subsidiaries are required to make payments in lieu of property tax to the OEFC on their non-hydroelectric generating station buildings and structures. These payments generally equal the difference between property taxes that would be otherwise payable if these assets were privately owned, and the amount payable to municipalities in respect of these assets as determined under the *Assessment Act, 1990* (Ontario). As with other hydroelectric generators in Ontario, OPG's hydroelectric generation operations are not subject to payments in lieu of property taxes because they are subject to the GRC regime. Additional details on the GRC regime can be found in the section, *Description of the Business* under the heading, *Business Operations – Renewable Generation*.

## 12 LEGAL PROCEEDINGS AND REGULATORY ACTIONS

### 12.1 LEGAL PROCEEDINGS

OPG is potentially the subject of various legal proceedings and claims that arise in the ordinary course of business. The outcome of these proceedings and claims is uncertain. Based on information available as of the date of this AIF, management believes that none of the proceedings and claims, individually and in the aggregate, are expected to have a material impact on OPG.



### British Energy Claim

On August 9, 2006, a Notice of Action and Statement of Claim filed with the Ontario Superior Court of Justice in the amount of \$500 million was served against OPG and Bruce Power by British Energy Limited and British Energy International Holdings Limited (together British Energy). The action is for contribution and indemnity of any amounts British Energy was liable for in an arbitration against it by some of the owners of Bruce Power regarding an alleged breach of British Energy's representations and warranties to the claimants when they purchased British Energy's interest in Bruce Power (the Arbitration). Both the action and the Arbitration relate to corrosion to a steam generator unit discovered after OPG leased the Bruce nuclear generating stations to Bruce Power.

In 2012, the arbitrator found that British Energy was liable to the claimants for some of the damages they claimed. The final settlement amount was valued by British Energy at \$71 million. In September 2014, British Energy amended its Statement of Claim (Amended Claim) to reduce the claim amount to \$100 million to reflect that the purchasers of British Energy's interest in Bruce Power did not receive the full damages they originally claimed in the Arbitration. British Energy also added an allegation to its Amended Claim that OPG breached a covenant to maintain the steam generator between the time of the initial agreement to lease and the effective date of the lease in accordance with "Good Utility Practices".

In November 2016, British Energy obtained consent from the Ontario Superior Court of Justice to a timetable for the remaining steps in the litigation, pursuant to which the matter was to be set down for trial by December 31, 2018. OPG delivered a statement of defence in accordance with an extension of the original June 30, 2017 delivery deadline set up in the timetable. British Energy served a reply and served its Affidavit of Documents in November 2018. The parties exchanged documentary productions in September 2019. A pre-trial is scheduled for May 31, 2021 and a trial is scheduled to commence on November 8, 2021.

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## 12.2 REGULATORY ACTIONS

OPG is not aware of any penalties or sanctions imposed by a court relating to securities legislation or by a securities regulatory authority or other regulatory body against the Company, nor has the Company entered into any settlement agreements before a court relating to securities legislation or with a securities regulatory authority. Penalties or sanctions imposed by a court or regulatory body other than a securities regulatory authority and where not related to securities legislation are disclosed when considered important to a reasonable investor in making an investment decision.

## 13 MATERIAL CONTRACTS

Except for contracts entered into in the ordinary course of business (unless otherwise required by applicable securities requirements to be disclosed), there were no material contracts entered into by the Company or its subsidiaries during the most recently completed financial year, or before the most recently completed financial year that are still in effect.

## 14 INTERESTS OF EXPERTS

The external auditor of the Company is Ernst & Young LLP, Chartered Professional Accountants, located at 100 Adelaide Street West, P.O. Box 1, Toronto, Ontario M5H 0B3. Ernst & Young LLP has been the Company's auditor since OPG was formed in 1999, and is independent in accordance with the Rules of Professional Conduct of the Chartered Professional Accountants of Ontario.

## 15 GLOSSARY

Term	Definition
Adaptive Phased Management or APM	Canada's plan for the long-term management for nuclear fuel waste, whereby nuclear fuel waste would be permanently placed in a deep geologic repository at a suitable geological site.
ancillary service	a service necessary to maintain the reliability of the electricity grid.
availability	when used in reference to a generating unit, a measure of mechanical reliability represented by the percentage of time a generating unit is capable of providing service, whether or not it is actually in-service, relative to the total time for the period.
baseload generating facilities	electricity generating facilities that produce a constant supply of energy.
bilateral contract	an agreement covering the generation of electricity and/or electricity services, including capacity and ancillary services, entered into between an electricity generator and an end-user, or between an electricity generator or end-user and a market intermediary such as a local electric utility.
biomass	plant material from agricultural and forest sources that can be used to produce energy, including beneficiated biomass, which includes torrefied, carbonized and steam exploded biomass.
black start capability	generator's ability to help restore the province's power system without relying on an external supply of electricity.
CANDU	an acronym for CANada Deuterium Uranium, a family of nuclear fission reactors developed in Canada which use pressurized heavy water coolant (deuterium oxide) as a moderating agent and natural uranium (uranium dioxide) as fuel.
capacity factor	the ratio (usually specified as a percentage) of the amount of energy that a generating asset actually generated over a period of time divided by the amount of energy that the generating asset would have produced over the same period of time if it had operated continuously at full capacity.
CNSC	an acronym for Canadian Nuclear Safety Commission, a federal body that regulates the use of nuclear energy and materials in Canada.
decommissioning	actions taken in the interest of health, safety, security and protection of the environment to retire a facility permanently from service and render it to a predetermined end-state condition.
deep geologic repository	network of underground tunnels and placement rooms for used nuclear fuel and low-level and intermediate-level nuclear waste containers. It is designed to safely contain and isolate Canada's used nuclear fuel and low-level and intermediate-level nuclear waste over the long term.
detritiation	the removal of tritium from heavy water.
deuterium oxide	see heavy water.
distributed generation	production of electricity closer to end users and away from large scale production facilities that require more transmission.
equivalent forced outage rate	the hours of unit failure given as a percentage of the total hours of the availability of that unit.
Energy Supply Agreement	a bilateral contract between the IESO and an electricity generator covering the generation of electricity and/or electricity services in Ontario, including capacity and ancillary services.

Term	Definition
FERC	an acronym for Federal Energy Regulatory Commission, the federal agency responsible for the regulation of sale and transmission of wholesale electricity, natural gas and oil in interstate commerce in the United States.
Global Adjustment	includes the difference between Ontario's electricity market clearing price used to dispatch generation and the prices paid to contracted and regulated generators in the province, and the cost of conservation and demand management programs.
government business enterprises	Government organizations that are separate legal entities with the power to contract in their own name, have the financial and operating authority to carry on a business, are principally focused on the selling of goods and services to individuals and non-government organizations, and are able to maintain their operations and meet their obligations through revenues generated outside the government reporting entity.
gross revenue charge	taxes and charges levied on hydroelectric generating stations in Ontario as prescribed by <i>Ontario Regulation 124/02</i> under the <i>Electricity Act, 1998</i> .
heavy water (deuterium oxide)	water containing significantly more than the natural proportion of heavy hydrogen (deuterium) atoms to ordinary hydrogen atoms, used as a moderator in CANDU reactors.
IESO	an acronym for Independent Electricity System Operator, a non-profit entity responsible for operating the electricity market and directing the operation of the bulk electrical system in Ontario.
in-service generating capacity	the portion of installed capacity (the highest level of output which a generating unit is designed to maintain indefinitely without damage to the unit) that has not been removed from service.
interconnection	a transmission line which carries power across the service area boundary of geographically adjacent jurisdictions.
intermediate facilities	electricity generating facilities that are needed for intermediate load requirements to meet demand during peak hours of the day, adjusting output as consumer demand moves up and down.
intervener	individuals or groups who have the OEB's permission to actively participate in a public hearing about a utility's application.
kWh	a kilowatt hour, the commercial unit of electric energy (the amount of electricity consumed by ten 100 watt light bulbs burning for one hour).
Load	the quantity of electricity consumption measured as either the energy consumed over a given period of time or the rate of energy consumption at a given time by a particular customer or group of customers.
memorandum of understanding	an agreement between two or more parties outlining the terms and details of an understanding, including each parties' requirements and responsibilities.
microsievert	a measure of radiation dose to an individual.
MW	a megawatt, equal to 1,000,000 watts or 1,000 kilowatts.
MWh	a megawatt-hour, equal to 1,000 kWh.
OEB	an acronym for the Ontario Energy Board, an independent, quasi-judicial tribunal that regulates market participants in Ontario's natural gas and electricity industries.

Term	Definition
OEFC	an acronym for the Ontario Electricity Financial Corporation, the legal continuation of the former Ontario Hydro. The OEFC is responsible for managing the debt and certain other obligations not transferred to other successor companies of Ontario Hydro.
ONFA	an acronym for the Ontario Nuclear Funds Agreement between OPG and the Province that sets out the responsibility for funding the liabilities for the decommissioning of OPG's nuclear stations and the long-term management of OPG's used nuclear fuel and other nuclear waste.
Ontario NFWA Trust	a trust established by OPG pursuant to the <i>Nuclear Fuel Waste Act</i> (Canada) for the purpose of funding the implementation of Canada's long-term nuclear fuel waste management plan.
operating reserve	the capacity that can be called upon on short notice by the IESO to replace scheduled energy supply that is unavailable as a result of an unexpected outage or to augment scheduled energy as a result of unexpected demand or other contingencies.
peaking facilities	electricity generating facilities that generally run only when there is a high demand for electricity.
prescribed facilities	OPG's electricity generating stations the output of which receives regulated prices determined by the OEB. OPG's prescribed facilities are the Darlington and Pickering nuclear generating stations and 54 hydroelectric generating stations located across a number of major river systems in the province.
rate rider	an amount which is added to or subtracted from the base regulated rate to recover or refund a specific amount of money for a temporary period.
reactive support	the control and maintenance of prescribed voltages on the IESO-controlled grid.
refurbishment	the work needed to extend the life of a reactor unit by replacing the major life-limiting components (such as pressure tubes, steam generators, etc.).
regulation service	regulation service acts to balance total electricity system generation with total electricity system load demand (plus transmission losses) on a minute-by-minute or second-by-second basis, and acts to help correct variations in power system frequency. This service corrects for short-term changes in electricity use that might affect the stability of the power system.
Shareholder	the sole shareholder of OPG, the Province of Ontario.
surplus baseload generation	a condition that occurs when electricity generation from baseload generating facilities is greater than the electricity market demand.
tritium	a radioactive substance that is created within CANDU reactors as a result of heavy water in the reactor moderator and heat transport systems.
TWh	a terawatt hour, equal to 1,000,000 MWh.
unit	an electrical generator, together with its driving turbine and auxiliary equipment.
unit capability factor	amount of energy a generating unit is capable of producing as a percentage of its maximum output assuming no external constraints such as transmission limitations.
watt	a scientific unit of electric power representing the rate of work of one joule per second.

## **APPENDIX A**

### **ONTARIO POWER GENERATION INC. AUDIT AND RISK COMMITTEE INFORMATION**

## AUDIT AND RISK COMMITTEE INFORMATION

NI 52-110 has been implemented by Canadian securities regulatory authorities to encourage reporting issuers to establish and maintain strong, effective and independent audit committees, to enhance the quality of financial disclosure and to foster increased investor confidence in Canada's capital markets. The Audit and Risk Committee's Charter is attached to this AIF as Appendix B.

### Composition of the Audit and Risk Committee

All members of the Audit and Risk Committee are independent within the meaning of NI 52-110 and are financially literate. Each member has an understanding of internal controls and procedures for financial reporting. As part of OPG's Continuing Education Program for Directors, Audit and Risk Committee members are provided with access to both internal and external educational resources, including seminars and courses, in order to maintain or enhance their financial literacy.

As at March 12, 2020, members of the Audit and Risk Committee were:

Director	Relevant Education and Experience
Ani Hotoyan-Joly (Chair)	Ms. Hotoyan-Joly holds a Bachelor of Commerce Degree from the University of Toronto and is a Fellow of the Chartered Professional Accountants and Chartered Accountants. She also holds the Institute of Corporate Director (ICD.D) Designation. Ms. Hotoyan-Joly currently serves on the board of directors of Friends of Canadian Broadcasting and is the Chair of the Audit Committee. Ms. Hotoyan-Joly has previously served as a member of the Audit and Risk Committee for Echelon Financial Holdings Inc. and as Chair of the Audit and Risk Committee for Insurance Company of Prince Edward Island. Ms. Hotoyan-Joly has also served as Chief Financial Officer and Corporate Secretary of Coventree Inc. and as VP Finance and Chief Financial Officer at Swiss Reinsurance Company Canada.
JP Gladu	Mr. Gladu holds an Executive Master of Business Administration from Queens University. He also serves on the board of directors and Audit Committee for Noront Resources Ltd. Mr. Gladu is currently the President and Chief Executive Officer at the Canadian Council for Aboriginal Business.
Selma Lussenburg	Ms. Lussenburg holds a Bachelor of Law (LLB) from the University of Ottawa and a Master of Law from the Australian National University. She also holds a Chartered Director (C.Dir) Designation from the Directors College and completion of the Director's College Financial Literacy module. Ms. Lussenburg has previously served as Chair and Audit Committee member of Ontario Capital Growth Corporation. Ms. Lussenburg has also served as General Counsel at the Greater Toronto Airports Authority (GTAA) where she was a member on the GTAA's Disclosure Committee.
Scott McDonald	Mr. McDonald holds the Institute of Corporate Director (ICD.D) Designation. Mr. McDonald currently serves on the board of directors of the Michael Garron Hospital. He has previously served on the boards of directors and as HR Committee Chair for Purolator and SCI. Mr. McDonald has extensive experience in senior business executive positions with large, complex Canadian and North American companies in both the private and public sectors.
Yezdi Pavri	Mr. Pavri holds a Master's degree in Thermal Power Engineering from Imperial College in London and is a Fellow of the Chartered Professional Accountants and Chartered Accountants. Mr. Pavri currently serves on the board of directors for ICICI Bank of Canada. He has previously served on the boards of Enterra Holdings Limited, MD Financial Services and Hydro One. Mr. Pavri served as a Partner with Deloitte LLP from 1986 to retirement in 2012. He was the founding architect of Deloitte's Enterprise Risk Services (ERS) practice.

### Pre-Approval Policies and Procedures

The Audit and Risk Committee Charter contains provisions governing the Company's relationship with the external auditors, including but not limited to annual performance reviews and a comprehensive review of the external auditors at least once every five years and pre-approval of all services to be provided by the external auditors. The most recent comprehensive review of the external audit firm was completed in 2019, for the period from 2014 to 2018. The Board reappointed Ernst & Young LLP as the Company's auditor for the 2020 fiscal year in November 2019.

### External Auditor Service Fees

The following fees were accrued by OPG in connection with services rendered by Ernst & Young LLP:

<i>(thousands of dollars)</i>	<b>2019</b>	<b>2018</b>
Audit Fees <sup>1</sup>	<b>2,577</b>	2,442
Audit-Related Fees <sup>2</sup>	<b>597</b>	587
All Other Fees <sup>3</sup>	<b>6</b>	6
Tax Fees <sup>4</sup>	<b>-</b>	2

<sup>1</sup> "Audit Fees" refer to fees for audit services.

<sup>2</sup> "Audit-Related Fees" refer to fees for assurance and related services that reasonably relate to the performance of the audit or review of the Company's financial statements and are not reported under "Audit Fees".

<sup>3</sup> "All Other Fees" refer to fees for services not included in the categories of "Audit Fees", "Audit-Related Fees" and "Tax Fees".

<sup>4</sup> "Tax Fees" refer to fees for tax compliance and tax advisory services.

## **APPENDIX B**

### **ONTARIO POWER GENERATION INC. AUDIT AND RISK COMMITTEE CHARTER**



**Ontario Power Generation Inc.**  
**Audit and Risk Committee of the Board**

**CHARTER**

**Purpose**

The function and purpose of the Audit and Risk Committee is to assist the Board of Directors in their responsibility for oversight of matters relating to:

1. the integrity of OPG's financial statements and reporting, including with respect to OPG's role as Financial Services Manager of the Fair Hydro Trust;
2. the integrity and adequacy of internal controls and standards of Codes of Conduct and ethics;
3. the performance of OPG's internal audit function;
4. the performance and independence of OPG's external auditors;
5. business and financial planning;
6. the performance of OPG's pension, nuclear decommissioning, and used fuel investment funds
7. OPG's Enterprise Risk Management;
8. assessment of committee performance and board policies; and
9. OPG's cyber security program.

Management is responsible for the preparation, presentation and integrity of OPG's interim and annual financial statements and related disclosure documents. Management is responsible for maintaining appropriate accounting and financial reporting principles and policies and systems of internal and disclosure controls and procedures to comply with accounting standards and applicable laws and regulations which provide reasonable assurance that the assets of the Company are safeguarded and transactions are authorized, executed, recorded and properly reported.

Management is also responsible for the identification, assessment, monitoring, and management of the risks to achieving OPG's strategic and business plan objectives and the development and implementation of policies and procedures to respond to such risks.

The Committee's role is to provide oversight that ensures the Company's assets are protected and safeguarded within reasonable business limits and report such to the Board.

**Committee Responsibilities and Duties**

The Committee shall perform the duties set out in this Charter and shall perform such other duties as may be necessary or appropriate under applicable law or securities rules, or as may be delegated to the Committee by the Board from time to time.

**1. Integrity of OPG's Financial Statements and Reporting**

The Committee reviews and makes recommendations to the Board with respect to:

- a) appointment or replacement of the Chief Financial Officer;
- b) OPG's annual financial statements and external audit report, including financial statements, Management Discussion and Analysis (MD&A), related footnotes and any documentation required by the Securities Act to be prepared and filed by OPG or that OPG otherwise files with securities regulators; and
- c) OPG's Annual Information Form, if required, prior to filing with securities regulators.

The Committee reviews and approves:

- a) OPG's quarterly financial statements and interim financial information and disclosures in the MD&A and earnings press release, prior to filing.

In carrying out its responsibilities for oversight of the integrity of OPG's financial statements and reporting, the Committee will include in its review:

- a) adequacy of procedures in place for the review of OPG's public disclosure of financial information extracted or derived from OPG's financial statements;
- b) the adequacy of OPG's role as Financial Services Manager of the Fair Hydro Trust, including in relation to the Management Oversight Committee (MOC) Charter and the continuing sufficiency of the MOC Charter as reviewed by the Committee from time to time;
- c) significant accounting principles and reporting issues and impact on the financial statements, including complex or unusual transactions, highly judgmental areas, major issues regarding or changes to OPG's selection/application of accounting principles, financial presentations, the effect of regulatory and accounting initiatives, as well as off-balance sheet arrangements on OPG's financial statements;
- d) analysis prepared by Management and/or the external auditor detailing financial reporting issues and judgments made in connection with the preparation of financial information, including analysis of the effects of alternative generally accepted accounting principles methods; and
- e) whether any other matters related to conduct have come to the Committee's attention that causes it to believe that the financial statements contain an untrue statement of material fact or omit to state a necessary material fact.

## **2. Integrity and Adequacy of Internal Controls and Standards of Codes of Conduct and Ethics**

In carrying out its responsibilities for the integrity and adequacy of internal controls, including compliance with legal and regulatory requirements and standards of codes of conduct and ethics, the Committee reviews:

- a) legal, tax, or regulatory matters that may have a material impact on OPG's operations and the financial statements, including, but not limited to, violations of securities law or breaches of fiduciary duty;
- b) the scope of review of internal control over financial reporting, significant findings, recommendations and Management's responses for implementation of actions to correct weaknesses in internal controls;
- c) disclosures made by the Chief Executive Officer and Chief Financial Officer during the certification process regarding significant deficiencies in the design or operation of internal controls or any fraud that involves Management or other employees who have a significant role in OPG's internal controls;
- d) procedures for the receipt, recording and treatment of complaints received by OPG regarding accounting, internal accounting controls, or auditing matters, and procedures for the confidential and anonymous submission by OPG employees of concerns regarding accounting or auditing matters;
- e) expenses of the Board Chair, Board of Directors, President/CEO and the President/CEO's direct reports on an annual basis, and of any other senior officers and employees the Committee considers appropriate; and
- f) reports from the Chief Ethics Officer on independent reviews and investigations of fraud allegations, matters that may involve fraud and/or Codes of Conduct violations and compliance.

## **3. Performance of OPG's Internal Audit Function**

The Committee reviews and makes recommendations to the Board with respect to:

- a) appointment or replacement of the Chief Risk and Audit Executive.

The Committee reviews and approves:

- a) the annual internal audit plan and all major changes to the plan, including the organizational structure, budget and the adequacy of resources; and
- b) the charter of the internal audit function triennially.

In carrying out its responsibilities for the performance of OPG's internal audit function, the Committee reviews:

- a) results of Internal Audit reports including significant findings, the adequacy of control processes, Management's response and the timetable for implementation of Management actions to correct weaknesses, and any difficulties encountered in the course of their work (such as restrictions on the scope of their work or access to information);
- b) Internal Audit's confirmation of organizational independence and disclosure of any conflict of interest; and
- c) Internal Audit performance relative to the annual internal audit plan.

#### **4. Performance and Independence of External Auditor**

The Committee reviews and makes recommendations to the Board with respect to:

- a) the external auditor to be annually appointed on behalf of the Shareholder and related compensation, including results of a cyclical performance review, and a comprehensive review of the external audit firm at least once every five years.

The Committee reviews and approves:

- a) pre-approval of additional audit services and fees to be provided by the external auditors if such services are required further to the annual compensation approved by the Board. The Committee may delegate such pre-approval authority to the Committee Chair up to a limit of \$250,000. Any decisions of the Committee Chair to whom pre-approval authority is delegated must be presented to the full Audit and Risk Committee at its next scheduled meeting.

In carrying out its responsibilities for the performance and independence of OPG's external audit function, the Committee reviews:

- a) the work and report of the external auditor engaged for the purpose of preparing or issuing an auditor's report or performing other audit, review or attest services for OPG, including the resolution of disagreements between Management and the external auditor regarding financial reporting;
- b) the independence and qualifications of the external auditor;
- c) the annual report by the external auditor describing the auditing firm's internal quality control procedures, any material issues raised by the most recent internal quality-control review or peer review of the auditing firm or by any inquiry or investigation by governmental or professional authorities within the preceding five years respecting one or more independent audits carried out by the external auditor and any steps taken to deal with any such issues and all relationships between the external auditors and OPG;
- d) scope and approach of the annual audit plan with the external auditors;
- e) quality and acceptability of OPG's accounting principles including all critical accounting policies and practices used, any alternative treatments that have been discussed with Management as well as any other material communications with Management;
- f) external auditor's process for identifying and responding to key audit and internal control risks;
- g) rotation of the lead audit partner and other audit partners every seven years, and consider regular rotation of the audit firm;
- h) all related-party transactions; and
- i) OPG's hiring policies regarding partners, employees and former partners and employees of the present and former external auditor of OPG.

## **5. Business and Financial Planning**

The Committee reviews and makes recommendations to the Board on:

- a) OPG's business plan, including overall financing plan in support of the Company's capital expenditures and medium – long term forecast;
- b) OPG's rate applications to the Ontario Energy Board, including proposed payment amounts and any agreement arising from a Settlement Conference with intervenors; and
- c) corporate financing vehicles, credit facilities, including any plans to access capital debt markets and other related financing activities. The Board may delegate to an officer of the Company authority to enter into such financing activities in such a manner as the Board shall determine at the time of such delegation. Any decisions of the officer to whom authority is delegated must be presented to the full Audit and Risk Committee at its next scheduled meeting.

## **6. Pension, Nuclear Decommissioning and Used Fuel Investment Funds**

The Committee reviews and makes recommendations to the Board on:

- a) the appointment or replacement of the Chief Investment Officer;
- b) the appointment of the auditor for the OPG Pension Fund and the Used Fuel Segregated Fund and Decommissioning Segregated Fund;
- c) the broad objectives, governance frameworks and risk posture for the OPG Pension Fund and the Used Fuel Segregated Fund and Decommissioning Segregated Fund and annual status report on these Funds; and
- d) the tri-ennial valuation of the Pension Fund and annual valuation of the Supplementary Employee Retirement Pension Plans. *(The Committee provides advice to the Compensation, Leadership and Governance Committee on the affordability of proposed pension benefit changes.)*

The Committee reviews and approves:

- a) the appointment of the members of OPG's Pension Committee. In addition, the Committee may, at any time, remove or replace any member of the Pension Committee or fill a vacancy on the Pension Committee. The Pension Committee Chair may temporarily appoint a senior management employee to fill a vacancy on the Pension Committee until the next regularly scheduled Audit and Risk Committee meeting;
- b) the annual audited financial statements for the OPG Pension Fund, the Used Fuel Segregated Fund and the Decommissioning Segregated Fund;
- c) the investment policies and procedures, including the design of modifications, for the OPG Pension Fund, as required by the *Pension Benefits Act* (Ontario) and its regulations, and for the Decommissioning Segregated Funds, as required by the Ontario Nuclear Funds Agreement; and
- d) the appointment of the Pension Plan actuary.

In carrying out its responsibilities for the oversight of financial planning and investment funds, the Committee reviews:

- a) reports on a quarterly, annual or by exception basis, on compliance with and appropriateness of the asset mix policy; total fund and asset class returns relative to benchmarks; material compliance with breaches of policies or procedures; and work conducted by the plan actuary; and
- b) periodic reports on the calculation of OPG's nuclear waste liability.

## **7. OPG's Enterprise Risk Management**

The Committee reviews and makes recommendations to the Board on:

- a) the appointment or replacement of the Chief Risk and Audit Executive; and
- b) the Company's enterprise risk policy, framework, overall risk appetite and targets.

In carrying out its responsibilities for oversight of OPG's Enterprise Risk Management the Committee reviews:

- a) the processes employed by Management for identifying and assessing the Company's principal risks;
- b) periodic reports on Management's assessment of the principal risks to achieving the Company's strategic and business plan objectives, and the strategies for monitoring, managing and responding to those risks;
- c) periodic reports on significant emerging and evolving risks and relevant external events that could potentially impact OPG's risk profile;
- d) compliance metrics related to OPG's commercial operations trading, treasury, and fuels management;
- e) regular reports on OPG's cyber security position and programs; and
- f) periodic reports on OPG's Insurance Program.

## **8. Assessment of Committee Performance and Board Policies**

In carrying out its responsibilities for assessment of Committee performance and Board policies, the Committee shall:

- a) review and assess Committee performance, including a review of the adequacy of and its compliance with this Charter, in accordance with the evaluation process approved by the Board and taking into account all legislative and regulatory requirements applicable to the Committee as well as any best practice guidelines recommended by regulators with whom OPG has a reporting relationship;
- b) provide oversight of the implementation of the following Board policies, and review these policies at least annually (or as otherwise noted below) to ensure their continuing adequacy:
  - i. Delegation and Exercise of Authority Policy;
  - ii. Disclosure Policy;
  - iii. Code of Business Conduct and Supplier Code of Conduct, including anti-bribery and corruption;
  - iv. Enterprise Risk Management Policy (*reviewed every three years*); and
  - v. Cyber Security Policy; and
- c) provide oversight of the development of any new policies deemed necessary by the Committee.

## **9. Oversight of OPG's Cyber Security Program**

In carrying out its responsibilities for oversight of OPG's cyber security program, the Committee shall:

- a) review reports provided by Management on the overall status of OPG's cyber security program at least annually;
- b) designate members of Management, with appropriate expertise, that are accountable for implementing and managing an appropriate cyber security program that includes compliance with applicable regulatory standards, maintaining policies and procedures devoted to the management of cyber security risk and developing an incident response plan;
- c) confirm that sufficient resources are devoted to the management of cyber security risks;

- d) engage Management in discussions to identify OPG's most critical data assets, where they reside, how they can be accessed, and how often the systems are tested to ensure the data is adequately protected;
- e) discuss with Management whether specific cyber security insurance is required; and
- f) encourage a culture where all employees understand cyber security as an enterprise-wide risk management issue and receive training on how to manage risk.

## **Organization**

### **Members**

The Audit and Risk Committee shall consist of three or more Directors as determined by the Board of Directors. All members of the Committee shall be independent as defined by the Ontario Securities Commission, and not "affiliated" with OPG.

The Board shall appoint the members of the Committee and the Chair of the Committee annually. The Board may appoint a member to fill a vacancy which occurs in the Committee between annual elections of Directors. Any member of the Committee may be removed or replaced at any time by the Board.

If a member of the Committee becomes "affiliated" with OPG, the member may continue as a member of the Committee with the approval of the Board Chair, in consultation with the Corporate Secretary.

As a "venture issuer", OPG is exempt from the statutory requirements of National Instrument 52-110 requiring members of Audit Committees be independent and financially literate. However, OPG considers such independence and financial literacy to be "best practice" and therefore each of the members of the Audit and Risk Committee shall satisfy the applicable independence and financial literacy requirements of the laws and regulations governing Audit Committees.

The Board of Directors shall confirm that each member of the Audit and Risk Committee is financially literate; as such qualification is interpreted by the Board of Directors in its business judgment, and in compliance with National Instrument 52-110 and its Companion Policy.

### **Meetings**

The Committee shall meet as frequently as it determines but not less than quarterly. During quarterly meetings, the Committee will hold separate in camera sessions with the external auditors, the Chief Risk and Audit Executive and Management to discuss any matters that the Committee believes should be discussed and to provide a forum for any relevant issues to be raised.

Notice of the time and place of each meeting of the Committee must be given to each member of the Committee not less than 48 hours before the time of the meeting.

A quorum of the Committee shall be a majority of its members, but not less than two. The powers of the Committee may be exercised at a meeting at which a quorum of the Committee is present in person or by telephone or other electronic means, or by a resolution signed by all members entitled to vote on that resolution at a meeting of the Committee. Each member is entitled to one vote in Committee proceedings.

The Chair shall preside at all meetings of the Committee at which he or she is present (or if not able to be present designate another member of the Committee to chair the meeting) and shall develop the agenda for each Committee meeting. The agenda for each meeting of the Committee shall be delivered to each member of the Committee at least 48 hours prior to any meeting of the Committee, together with such other materials as the Chair determines necessary.

Minutes shall be kept of all meetings of the Committee and shall be maintained by OPG's Corporate Secretary. The procedure at meetings is to be determined by the Committee unless otherwise determined by the by-laws of OPG, by a resolution of the Board or by this Charter.

The Committee may meet in camera (without management present) at any time during the meeting consistent with the Board guideline on the conduct of in camera sessions and the keeping of minutes from in camera sessions.

The Committee may invite any Director, officer or employee of OPG or OPG's counsel or any other person to attend meetings of the Committee to assist in the discussion and examination of the matters under consideration by the Committee.

### Reports

The Committee will report its activities and actions to the Board of Directors with recommendations, as the Committee deems appropriate.

The Committee will provide for inclusion in OPG's financial information or regulatory filings any report from the Audit and Risk Committee required by applicable laws and regulations and stating among other things whether the Committee has:

- (i) reviewed and discussed the audited financial statements with Management;
- (ii) discussed pertinent matters with the internal and external auditors;
- (iii) received disclosures from the external auditors regarding the auditors' independence and discussed with the auditors their independence; and
- (iv) recommended to the Board of Directors that the audited financial statements be included in OPG's Annual Report.

### Authority

The Audit and Risk Committee shall have the authority to:

- a) conduct or authorize investigations into any matters within the Committee's scope of responsibilities;
- b) set and pay the compensation for any advisors employed by the Committee; and
- c) communicate directly with the internal and external auditors.

While the Audit and Risk Committee has the responsibilities and powers set forth in this Charter, it is not the duty of the Audit and Risk Committee to plan or conduct audits or risk assessments, or to determine that OPG's financial statements and disclosures are complete and accurate and are in accordance with generally accepted accounting principles and applicable rules and regulations. These are the responsibility of Management and, as appropriate, the external auditor.

### Delegation of Authority

The Committee may not delegate its oversight responsibilities. The Committee may delegate to a sub-committee, the Chief Executive Officer or any employee of OPG the authority to exercise any right, power or responsibility that the Committee may have on such terms and conditions and within such limits as the Committee deems appropriate provided that the sub-committee, Chief Executive Officer or employee subsequently advises the Committee of any right, power or responsibility so exercised.

### Access to Management and Outside Advisors

The Audit and Risk Committee shall have unrestricted access to members of Management and relevant information.

The Audit and Risk Committee has the authority to retain legal counsel, accountants or other advisors to assist it in the conduct of any investigation, as it determines necessary to carry out its duties.

*Effective: May 13, 2016*

*Revised: March 7, 2019*

*Last Reviewed: March 7, 2019*

## **APPENDIX C**

### **ONTARIO POWER GENERATION INC. STATEMENT OF EXECUTIVE COMPENSATION**



**Form 51-102F6**  
**Statement of Executive Compensation**  
**(with respect to financial year ended on December 31, 2019)**  
**Ontario Power Generation Inc.**

**Compensation Discussion and Analysis**

***Executive Summary***

This Compensation Discussion and Analysis describes the material elements of the compensation paid to the named executive officers (“NEOs”) of Ontario Power Generation Inc. (OPG) with respect to the financial year ended December 31, 2019. In 2019, the position of Chief Executive Officer transitioned from Jeffrey Lyash to Kenneth Hartwick with Mr. Hartwick assuming the position effective April 1. The position of Chief Financial Officer transitioned from Kenneth Hartwick to John Mauti on an interim basis effective April 1, and permanent basis effective July 4. When referring to the NEOs in this Compensation Discussion and Analysis, the following individuals are being referred to as a group:

Position	Name	OPG Title
Chief Executive Officer (April 1 – Dec. 31)	Kenneth Hartwick	President & Chief Executive Officer
Chief Executive Officer (Jan.1 – March 29)	Jeffrey Lyash	President & Chief Executive Officer
Chief Financial Officer	John Mauti	Chief Financial Officer and Senior Vice President Finance
Next three most highly compensated executive officers	Sean Granville	Chief Nuclear Officer
	Dominique Miniere	President, Nuclear
	Michael Martelli	President, Renewable Generation

OPG’s compensation program for the NEOs includes both fixed and variable (i.e. pay for performance) components. The Program design targets total compensation at the 50th percentile of the labour market within which OPG competes for talent (the “comparator group”). This statement provides an overview of OPG’s philosophy and approach related to executive officer compensation, followed by an analysis of the resulting compensation earned by each NEO during 2019 under “Summary Compensation Table”.

OPG’s compensation program for executive officers is also governed by legislation enacted by the Province of Ontario, OPG’s sole shareholder. This legislation establishes compensation restraints and controls that affect compensation for NEOs and other non-unionized employees.

## ***Compensation Governance***

The OPG Board of Directors (Board) follows compensation best practices and government requirements. There is a five-member Compensation Leadership and Governance Committee (CLGC). The role and scope of the work by the CLGC is set out in the CLGC Charter. As of December 31, 2019, the members of the CLGC were Wendy Kei (Chair), JP Gladu, Ani Hotoyan-Joly, Joe Sheppard and Yezdi Pavri, all of whom are independent directors. Each of the members has direct or indirect experience that is relevant to their responsibilities in executive compensation. The members include individuals who were senior executives from large organizations. The skills and experience of the members include salary administration and oversight, executive compensation experience, and responsibility for compensation matters.

Additional information on CLGC membership and the annual performance evaluation for Board members can be found in OPG's 2019 Annual Information Form and Analysis in the "Corporate Governance" section.

The CLGC meets a minimum of four times a year. Each meeting is presided by a Chair of the Committee, and minutes of the meetings are kept. Time is allotted at each meeting for the members to meet in camera without management present. The CLGC reports on the proceedings of each meeting to the Board of Directors at the next Board meeting. Committee decisions are either reported to the Board if the decision was within the authority delegated to the Committee under its Charter, or, for matters beyond the Committee's authority it puts forth a recommendation to the full Board for approval.

The CLGC is responsible for overseeing all significant compensation matters including:

- Reviewing compensation structures, decisions and payouts (base salary, pay for performance incentive, etc.), and ensuring a strong link between pay and performance.
- Reviewing annually and approving the changes, as appropriate, to OPG compensation, including compensation principles and objectives for total compensation, desired competitive positioning and comparator groups.
- Ensuring that compensation programs and performance measures in the Corporate Balanced Scorecard appropriately reflect the corporation's approach to risk management.
- Ensuring that executive compensation levels and performance targets are consistent with the Board's compensation philosophy and aligned with and designed to achieve OPG's strategic and operating objectives.
- Overseeing senior executive pay, as it relates to corporate governance and legislation, including total compensation, individual contract provisions in senior executive employment offers, severance agreements.
- Overseeing succession planning for the CEO and senior executives.

## ***Compensation Related Fees***

The CLGC engage Hugessen Consulting to provide independent support to the Committee in reviewing compensation matters. Decisions made by the CLGC, however, are the responsibility of the CLGC and may reflect factors and considerations other than the information and recommendations provided by Hugessen Consulting.

Hugessen Consulting has been engaged by the CLGC since 2013 to provide research and advice on compensation and benefits design and benchmarking, executive compensation including pay for

performance incentive plans, and pension plans and policies. The aggregate fees for Hugessen Consulting for services provided to the CLGC in 2018 and 2019 were \$31,469, and \$20,730, respectively. This work continues into 2020.

In addition, OPG management engaged a number of consulting firms, including Willis Towers Watson, Hay Group and Aon-Hewitt to provide a variety of pension, benchmarking, compensation and competitive market reviews and recommendations for all levels of employees.

### ***Compensation Risk Assessment***

OPG conducts an annual review of its executive compensation framework to ensure an appropriate level of risk and reward is maintained while minimizing opportunities for excessive risk taking. The CEO recommends the goals and objectives in the stakeholder return program (SRP) and medium-term incentive plan (MTIP) to the CLGC; the CLGC then recommends to the Board for approval. The CLGC ensures that a rigorous process is followed including stress testing and input from the Committee's independent advisor.

### ***Objectives of Executive Compensation***

OPG's compensation philosophy guides the development of all compensation elements and is a key consideration in the development of OPG's Executive Compensation Program (the "program"). The philosophy is intended to ensure that OPG is able to attract, retain and motivate key talent in a manner that complies with the Regulation, is competitive and affordable, and aligns with OPG's business strategy. OPG's compensation philosophy is comprised of five key principles:

- Drive organization results with a performance orientation that aligns with OPG's business strategy and risk tolerance, while taking into consideration affordability, market competitiveness as well as the context and environment in which OPG operates.
- Demonstrate fiscal conservatism through sustainability, sound financial management and defensibility while supporting the attraction and retention of top talent.
- Have a strong performance orientation linked to OPG's value creation and results while allowing individual compensation to be meaningfully differentiated based on performance, where appropriate.
- Recognize OPG's role as a significant Ontario employer; encourage employee development, a culture of trust and respect and a seamless integration with talent and succession management objectives.
- Be simple to understand and administer, sustainable and scalable; communicated in a way that is integrated with messages about non-monetary recognition such that the perceived value of all programs meet or exceed program costs.

### ***Comparator Group***

OPG seeks to offer a competitive total compensation package. In order to ensure that the NEOs are competitively compensated, OPG periodically reviews and benchmarks total compensation against the 50th percentile compensation of the appropriate comparator groups. Comparator groups are established based on a mix of private and public sector organizations that are similar in size, scope and complexity,

reflecting organizations from which OPG competes for talent. External market comparisons ensure positions are benchmarked relative to industry-specific requirements.

OPG benchmarks its executive positions based on the following selection criteria:

- The scope of responsibilities of the organization's executives
- The type of operations the organization engages in
- The industries within which the organization competes for executives
- The size of the organization
- The location of the organization

### ***Components of OPG's Executive Compensation Program***

The components of the executive compensation program in which the NEOs participated during 2019 are described in the section that follows. Additional details about how decisions are made with respect to base salary and pay for performance incentives are provided in "Elements of Cash Compensation". Information on elements of a pay for performance program introduced in January 2017 is also included.

Compensation Element	Type	Comments
Base Salary	Fixed	The base salary provides a competitive level of fixed compensation that reflects the market value of the position and recognizes the skills and experience the NEO brings to OPG.
Short Term Incentives (pay for performance)	Variable	All NEOs participate in a short-term pay for performance incentive plan intended to deliver a portion of total compensation on a pay for performance basis. The NEOs can earn short-term cash pay for performance amounts if key OPG financial and operational objectives and individual performance measures are achieved.
Medium Term Incentives (pay for performance)	Variable	All NEOs participate in a medium term pay for performance incentive plan intended to deliver a portion of total compensation on a pay for performance basis. The NEOs can earn medium term cash pay for performance amounts if key OPG financial and operational objectives are achieved over a three year period.
Pension	Fixed	The pension plans in place are designed to provide retirement income to the NEOs based on their income and length of service to OPG.
Benefits	Fixed	The NEOs participate in health, dental and group life insurance benefit programs available to other management employees.

### ***Elements of Cash Compensation***

In September 2016, the Government of Ontario introduced Regulation 304/16: Executive Compensation Framework. The regulation sets out how all employers, including OPG, designated under the *Broader Public Sector Executive Compensation Act, 2014* ("BPSECA") must establish and post compensation programs for executives. The regulation required all designated employers to have a written Executive Compensation Program that describes the compensation they may provide to executives. The program included the compensation philosophy, salary and performance-related pay caps, comparative analysis

details and a description of other elements of compensation. OPG met the requirements of Ontario Regulation 304/16 and, effective January 1, 2017, implemented its Executive Compensation Program. OPG's Executive Compensation Program applies to employees at the Vice President level and higher.

On August 13, 2018, the Ontario government introduced the Compensation Framework Regulation 406/18 under BPSECA. This regulation replaces the earlier Executive Compensation Framework regulation. It imposes a freeze on base salary for designated executives, which covers employees at the Vice President level and higher. Section 4 of Regulation 406/18 provides that any new performance-related pay envelope should not exceed the total envelope disbursed in the 2017 pay year. The Ontario government is in the process of reviewing Executive Compensation programs throughout the broader public sector.

### Base Salary

The CLGC establishes salary ranges for all non-unionized (Management Group) employees including NEOs. The OPG salary structure is very detailed and rigorously maintained with base salaries defined by job responsibilities and salary ranges defined for each job level. When reviewing executive salaries and pay for performance incentives, the CLGC consults its external compensation advisors to obtain information on the executive compensation market including external benchmarks.

### Short-Term Incentive (pay for performance)

OPG's short term pay for performance incentive program, the stakeholder return program (SRP), is intended to motivate and reward employees to achieve results that will benefit the people of Ontario, our largest stakeholder. This program provides compensation on a pay for performance basis if key financial and operational objectives of the Corporation and individual objectives are met. At the beginning of each year the CEO and leadership team develop a proposed Corporate Balanced Scorecard and individual objectives are set in alignment with corporate objectives. The Corporate Balanced Scorecard is reviewed by the CLGC and approved by the Board. The final SRP pay out reflects the overall corporate score achieved by the enterprise and individual performance ratings. The CLGC and the Board have the discretion to adjust the final score and payout amounts under the plan.

The CEO's pay for performance incentive amount is approved by the Board of Directors; 70% is based on the achievement of corporate scorecard results and 30% on achievement of strategic initiatives.

For the remaining NEOs, the amount of their annual pay for performance incentive under the program is determined by individual performance (based on CEO's assessment of their individual results and performance), corporate score, funding limits and legislative limitations. The target level of pay for performance incentive award varies according to position and level.

Performance measures for the 2019 Corporate Balanced Scorecard were organized into the following four groupings and corresponding KPIs:

- 1. Social Licence (10%)**
  - a. Safety: Total Recordable Injury Frequency
  - b. Safety: Timely Completion of Safety Corrective Actions
- 2. Financial Strength (40%)**

- a. Earnings Before Taxes
- b. Operating OM&A Expenses
- c. Strategic Growth Investments
- 3. Operational Excellence (20%)**
  - a. Production
- 4. Project Excellence (30%)**
  - a. Darlington Refurbishment - Project Cost and Milestone Dates (Unit 2)
  - b. Renewable Generation Major Development Projects In-Service
  - c. Total In-Service Capital

The scorecard key performance indicators (KPI) are measured on the basis of threshold, target and stretch targets, with score ranging from 0 to 1.5 (target being equal to 1.0). The overall year-end 2019 corporate score is 0.987.

#### Medium-Term Incentive (pay for performance)

OPG's medium-term incentive pay for performance program (MTIP) is a component of OPG's Board approved Executive Compensation Program (ECP) effective January 1, 2017.

It is specifically designed to recognize the role Executives play in delivering strategic multi-year objectives by providing cash pay for performance linked to achievement of OPG's business targets on a 3-year cycle. As a cornerstone of the ECP, MTIP helps ensure OPG has a market-competitive and sustainable compensation plan to attract and retain top talent at executive levels. MTIP augments the SRP's focus on annual corporate and individual performance with a focus on longer term, individual contribution to collective performance.

Each NEO's MTIP pay for performance is based on OPG's performance against goals over a three-year performance period. The 2017 to 2019 MTIP performance measures align with the longer term strategic objectives of the organization and focus on financial and operational criteria, for example, Return on Equity (ROE), Total Generating Cost (TGC), and key project milestones. The Board approves the targets and measures for each cycle. The individual's pay for performance opportunity is calculated based on the NEO's target, established at the beginning of the 3-year cycle and as adjusted for changes in positions throughout the cycle, multiplied by OPG's performance, against up to three key corporate performance measures, and adjusted by the Board's informed judgement.

At the end of the 3-year MTIP performance cycle, the Board reviews the corporate performance score based on the numerical data and the recommendation of the CEO. The Board has discretion on the final score and payout.

The pay for performance cash awards are paid following assessment of performance at the end of each year for SRP and at the end of the 3-year performance cycle for MTIP. The 2017 to 2019 performance cycle for MTIP closed at the end of 2019 and incorporates assessment of 2017 and 2018. The table below shows the NEOs' SRP and MTIP pay for performance target opportunities as a percentage of base salary for 2019, including the 2017 to 2019 MTIP cycle:

Name	SRP Pay for Performance Target Opportunity (% of base salary)	MTIP Pay for Performance Target Opportunity (% of base salary)
K. Hartwick	60% <sup>1</sup>	70%
J. Lyash <sup>2</sup>	-	-
J. Mauti <sup>3</sup>	45%	20%
S. Granville	45%	60%
D. Miniere <sup>4</sup>	45%	-
M. Martelli	45%	55%

<sup>1</sup> K. Hartwick was CFO from January 1-March 31, 2019, during which time his SRP target was 45%. 2019 SRP was prorated for his time in each role.

<sup>2</sup> J. Lyash's resignation rendered him ineligible for 2019 SRP (short term incentive) and Mr. Lyash did not participate in MTIP.

<sup>3</sup> J. Mauti was VP Chief Controller & Accounting Officer from January 1 to July 3, 2019 with an SRP target of 30% for this time period. Mr. Mauti's 2019 SRP was prorated for his time in each role.

<sup>4</sup> D. Miniere was appointed to his position effective March 4, 2019. Mr. Miniere's 2019 SRP is prorated for his time in this role. Mr. Miniere was not eligible for MTIP for the 2017 to 2019 period.

The actual pay for performance amount paid can vary from those shown above, depending on whether performance met threshold levels or achieved exceptional performance. If corporate performance is below threshold, no pay for performance incentives are paid. These target amounts were derived based on benchmark analysis for each of the positions.

### ***Material Terms of Employment Agreements and Arrangements with Named Executive Officers***

The following is a summary of the material terms of the employment agreements for the NEOs. For further information regarding the NEO's pension benefits and other post-employment compensation, see "Pension Benefits" and "Termination and Change in Control Payments".

#### ***Mr. Hartwick***

Mr. Hartwick joined OPG as CFO and SVP Finance on March 14, 2016. Mr. Hartwick was appointed President & Chief Executive Officer on April 1, 2019. Mr. Hartwick participates in the SRP, MTIP and OPG registered and supplemental pension plans.

#### ***Mr. Lyash***

OPG entered into a five-year employment agreement with Mr. Lyash, commencing August 4, 2015, as President & Chief Executive Officer. Mr. Lyash resigned from OPG effective March 29, 2019.

#### ***Mr. Mauti***

Mr. Mauti was appointed CFO and SVP Finance on July 4, 2019 (acting in this role from April 1, 2019 until permanent appointment). Prior to his current position, Mr. Mauti was VP Chief Controller & Accounting Officer from January 1, 2015. Mr. Mauti participates in the SRP, MTIP and OPG registered and supplemental pension plans.

#### ***Mr. Granville***

Mr. Granville was appointed Chief Nuclear Officer on May 1, 2018. Mr. Granville participates in the SRP,

MTIP and OPG registered and supplemental pension plans.

**Mr. Miniere**

Mr. Miniere was appointed as President Nuclear on March 4, 2019. Mr. Miniere participates in the SRP, MTIP and OPG registered and supplemental pension plans.

**Mr. Martelli**

Mr. Martelli was appointed as President Renewable Generation on July 3, 2013. Mr. Martelli participates in the SRP, MTIP and OPG registered and supplemental pension plans.

**Summary Compensation Table**

The following table summarizes the compensation paid by OPG to the Chief Executive Officer, Chief Financial Officer and to each of the other NEOs, for the three years ended December 31, 2019.

The information provided in the Summary Compensation Table below differs from that published under the *Public Sector Salary Disclosure Act, 1996* (Ontario) for the year ended December 31, 2019. The differences are due to the timing of payment of pay for performance incentive amounts. Salary disclosure under the *Public Sector Salary Disclosure Act, 1996* (Ontario) represents amounts reported on T4 forms for each year. Information in the Summary Compensation Table is based on the year the pay for performance incentive was earned. Under OPG's pay for performance program, incentives are generally earned in one year and paid in the following year.

**Summary Compensation**

Name and Title	Year	Salary (\$)	Non-Equity Incentive Compensation (Pay for Performance \$) <sup>1</sup>		Pension Value (\$) <sup>2</sup>	All Other Compensation (\$) <sup>3</sup>	Total Compensation (\$)
			Annual Incentive Plan (SRP)	Long-Term Incentive Plan (MTIP) <sup>6</sup>			
K. Hartwick <sup>4</sup>	2019	\$614,063	\$372,964	\$171,553	\$866,000	\$6,863	\$2,031,443
President & Chief Executive Officer	2018	\$404,250	\$233,985	\$81,716	\$184,000	\$24,939	\$928,890
	2017	\$385,000	\$257,938	-	\$172,000	\$24,618	\$839,556
J. Lyash	2019	\$193,750	-	-	\$142,000	\$1,941	\$337,691
President & Chief Executive Officer	2018	\$775,000	\$837,233	-	\$414,000	\$31,089	\$2,057,322
	2017	\$775,000	\$947,825	-	\$421,000	\$30,864	\$2,174,689
J. Mauti	2019	\$297,788	\$119,884	\$42,102	\$560,000	\$788	\$1,020,562
CFO and SVP Finance	2018	\$247,798	\$114,743	\$37,804	\$170,000	\$20,708	\$591,503
	2017	\$235,998	\$122,866	-	\$165,000	\$20,673	\$544,527
S. Granville <sup>5</sup>	2019	\$415,000	\$276,483	\$180,898	\$667,000	\$2,390	\$1,541,771
Chief Nuclear Officer	2018	\$407,173	\$188,716	\$165,555	\$969,000	\$188,167	\$1,918,611
	2017	\$338,000	\$180,999	-	\$151,000	\$84,531	\$727,680
D. Miniere President Nuclear	2019	\$563,968	\$250,963	-	\$310,000	\$2,942	\$1,127,873
M. Martelli	2019	\$394,784	\$219,719	\$186,232	(\$12,000)	\$3,413	\$792,148
President, Renewable Generation	2018	\$394,784	\$182,805	\$170,437	\$195,000	\$65,117	\$1,008,143
	2017	\$379,600	\$223,603	-	\$169,000	\$61,446	\$833,649

**Notes:** The Ontario government is in the process of reviewing Executive Compensation programs throughout the broader public sector and until a review is completed, there remains uncertainty on the new parameters set forth.

<sup>1</sup> Non-equity incentive compensation includes earned pay for performance amounts for SRP and applicable MTIP cycles for 2018 and 2019.

<sup>2</sup> 2018 Pension Value based on service cost, net of employee contributions, and includes difference in actual pensionable earnings versus



expected pensionable earnings.

<sup>3</sup> All Other Compensation includes Taxable Benefits paid. All other allowances ceased on December 31, 2018.

<sup>4</sup> Mr. Hartwick was appointed March 14, 2016 and received a \$100,000 transitional bonus as per the terms of his employment contract (captured in 2016 All Other Compensation).

<sup>5</sup> Mr. Granville was promoted to Chief Nuclear Officer on May 1, 2018. He received retention bonuses of \$151,000 in 2018 and \$49,000 in 2017.

<sup>6</sup> MTIP amounts for the 2016-2018 cycle were paid in 2019; these amounts were earned in 2018.

## Pension Benefits

The table below shows the following information for each NEO participating in OPG's defined benefit pension arrangements:

- Years of credited service as at December 31, 2019;
- Estimated annual benefit accrued, or earned, for service up to December 31, 2019 and up to the age of 65; and
- A reconciliation of the accrued obligation from December 31, 2018 to December 31, 2019.

Name	Number of years credited service at December 31, 2019(#)	Annual benefits payable (\$)		Opening present value of defined benefit obligation (\$)	Compensatory change <sup>1</sup> (\$)	Non-compensatory change <sup>2</sup> (\$)	Closing present value of defined benefit obligation (\$)
		At December 31, 2019	At Age 65				
K. Hartwick	3.8	\$50,000	\$160,000	\$710,000	\$866,000	\$244,000	\$1,820,000
J. Lyash	3.7	\$100,000	\$100,000	\$2,260,000	\$142,000	(\$2,402,000)	-
J. Mauti	28.3	\$150,000	\$200,000	\$3,210,000	\$560,000	\$430,000	\$4,200,000
S. Granville	37.4	\$290,000	\$330,000	\$6,520,000	\$83,000	\$667,000	\$7,270,000
D. Miniere	0.8	\$10,000	\$70,000	-	\$310,000	-	\$310,000
M. Martelli	34.6	\$270,000	\$320,000	\$6,120,000	(\$12,000)	\$512,000	\$6,620,000

### Notes:

<sup>1</sup> Compensatory changes are changes to the pension liabilities due to the impact of an additional year of service (i.e. service cost, always a positive change) that is attributable to OPG (i.e. net of member contributions), as well as the impact of any difference in actual pensionable earnings versus expected pensionable earnings on the employee's total pension benefit for all service to date.

<sup>2</sup> Non-compensatory elements include changes to the Plan liabilities due to interest on the beginning of year liability, changes in plan assumptions (e.g. the discount rate), member contributions during the year, and the impact of any other non-pay related changes if different from assumed. Changes in assumptions as of December 31, 2019 include decrease in discount rate (from 3.83% to 3.12%, which results in increase in liability); decrease in inflation assumption from 2.0% to 1.75% and corresponding decrease to salary increase assumption; and change in mortality table.

OPG provides pension benefits to its employees through two pension arrangements: The Ontario Power Generation Inc. Pension Plan (the "Registered Plan") and the Ontario Power Generation Inc. Supplementary Pension Plan (the "Supplementary Plan"). Details of these plans are provided in the table below:

	Registered Plan	Supplementary Plan
<b>Type of Plan</b>	Contributory defined benefit pension plan registered under the <i>Income Tax Act</i> (Canada) and the <i>Pension Benefits Act</i> (Ontario).  Pensions earned for service after 1992 are subject to limits under the <i>Income Tax Act</i> (Canada).	Provides benefits to those employees whose entire benefit could not be provided through the Registered Plan as a result of the limits under the <i>Income Tax Act</i> (Canada). Members of the Supplementary Plan earn benefits under one of three schedules: Supplementary Payment Schedule (“SPS”), Executive Supplementary Payment Schedule (“ESPS”) and the Designated Supplementary Payment Schedule (“DSPS”).
<b>Annual Pension Benefit</b>	2.0% of final average earnings less 0.5% of final average earnings up to the average of the Year’s Maximum Pensionable Earnings	Same as Registered Plan
<b>Bridge Benefit</b>	Temporary bridging pension is provided to age 65	Same as Registered Plan
<b>Indexing</b>	Fully indexed to CPI, to a maximum increase of 8% per annum.	SPS and DSPS - Same as Registered Plan ESPS - Benefits are indexed at 50% of CPI (to a maximum of 4% per annum)
<b>What’s included in Pensionable Earnings?</b>	Base salary plus pay for performance incentive amounts (limited to 5% of base pay)	SPS - Same as Registered Plan ESPS - Base salary plus pay for performance incentive amounts (limited to target level, excludes MTIP) DSPS – Base salary plus Authorized Bonus and Key Duty Allowance (limited to 14% and 10% of base pay respectively). Note: None of the NEOs are enrolled in the DSPS
<b>When eligible for an Unreduced Pension?</b>	Age plus continuous service equals 84 (if hired before July 1, 2014*)  Age plus continuous service equals 90 (if hired post-June 30, 2014)  Effective January 1, 2025 age plus continuous service equals 90	SPS and DSPS - Same as Registered Plan ESPS - Age equals 60  * If hired prior to July 1, 2014, pension earned up to January 1, 2025 unreduced at Rule 84 date. Pension earned on and after January 1, 2025 will be unreduced at Rule 90 date.

As at December 31, 2019, the NEOs participated in the following pension arrangements:

<b>Executive</b>	<b>Employment Agreement</b>
K. Hartwick	Mr. Hartwick participates in the Registered Plan and the ESPS provision of the Supplementary Plan.
J. Lyash	Mr. Lyash resigned from OPG effective March 29, 2019.
J. Mauti	Mr. Mauti participates in the Registered Plan and the SPS provision of the Supplementary Plan.
S. Granville	Mr. Granville participates in the Registered Plan and the SPS provision of the Supplementary Plan.
D. Miniere	Mr. Miniere participates in the Registered Plan and the SPS provision of the Supplementary Plan.
M. Martelli	Mr. Martelli participates in the Registered Plan and the SPS provision of the Supplementary Plan.

### ***Termination and Change in Control Payments***

Based on the terms and conditions of the employment agreements of each of the NEOs, the following summarizes entitlements upon certain termination scenarios, and the potential or actual payments which each NEO would be eligible for in the event of termination without cause as at December 31, 2019.

<b>Executive Name &amp; Job Title</b>	<b>Employment Agreement</b>	<b>Total Payment (\$)</b>
<b>K. Hartwick</b> CEO & President	Provides that upon termination without cause, severance shall be equivalent to 18 months base salary payable on a continuance basis. Benefits other than short term and long term disability benefits cease at the end of the applicable statutory notice period.	\$1,026,000
<b>J. Lyash</b> CEO & President	The employment contract was terminated on March 29, 2019.	None
<b>J. Mauti</b> CFO & SVP Finance	Provides that upon termination without cause, severance shall be equivalent to 18 months base salary payable on a continuance basis. Benefits other than short term and long term disability benefits cease at the end of the applicable statutory notice period.	\$525,000

<b>S. Granville</b> Chief Nuclear Officer	The employment contract does not contain any specific termination clauses.	None
<b>D. Miniere</b> President, Nuclear	Provides that upon termination without cause, severance shall be equivalent to 12 months base salary payable on a continuance basis. Benefits other than short term and long term disability benefits cease at the end of the applicable statutory notice period.	\$680,000
<b>M. Martelli</b> President, Renewable Generation	The employment contract does not contain any specific termination clauses.	None

### **Director Compensation**

The table below captures the fees and other compensation provided to OPG's Board of Directors in 2019. Amounts are shown in Canadian dollars unless otherwise specified.

<b>Name</b>	<b>OPG Board Fees (\$)</b>	<b>Notes<sup>1</sup></b>
Bernard Lord <sup>2</sup>	\$73,750	Board Chair
Wendy Kei <sup>3</sup>	\$111,192	Board Chair
Bill Coley <sup>4</sup>	\$23,500	Non-resident director
Elisabeth (Lisa) DeMarco <sup>4</sup>	\$15,750	
JP Gladu	\$75,250	
John Herron	\$86,000	Non-resident director
Ani Hotoyan-Joly	\$71,000	
George Lewis <sup>4</sup>	\$17,750	
Peggy Mulligan <sup>4</sup>	\$21,000	
Yezdi Pavri	\$79,250	
Jim Reinsch	\$91,000	Non-resident director
James Sheppard	\$99,250	Non-resident director
Jeff Coles <sup>5</sup>	\$37,250	
Selma Lussenburg <sup>6</sup>	\$22,300	

**Notes:** The above table has been modified from prescribed format. OPG does not provide Directors with share-based awards, option-based awards, non-equity incentive plan compensation or a pension. The total fees are contingent upon the number of committees the Director sits on, if they are a Chair of a Committee, and the number of meetings they attend. OPG director compensation was well below the 50<sup>th</sup> percentile of the compensation levels of comparator companies in 2018. From time-to-time the Board and Compensation, Leadership and Governance Committee may engage a third-party to review Director compensation.

<sup>1</sup> US dollars shown for US non-resident directors who are compensated in US dollars in order to retain national and international expertise.

<sup>2</sup> Bernard Lord resigned as Board Chair effective June 26, 2019.

<sup>3</sup> Wendy Kei was appointed Board Chair effective June 27, 2019. Ms. Kei was appointed Chair of the CLGC effective April 1, 2019.

<sup>4</sup> Directors who resigned from the Board effective March 31, 2019: Bill Coley, Elisabeth (Lisa) DeMarco, George Lewis, Peggy Mulligan.

<sup>5</sup> Jeff Coles resigned from the Board effective July 18, 2019.

<sup>6</sup> Selma Lussenburg was appointed to the Board effective November 5, 2019.

Each director who was not an employee of OPG received:

- a) \$25,000 annual Board retainer
- b) \$3,000 annual retainer for each Committee membership

- c) Committee chairs received an annual retainer of \$5,000, except for the Chair of the Audit and Risk Committee received an annual retainer of \$8,000
- d) \$2,000 for a long meeting attended, or \$1,000 for a short meeting attended, as determined by the Board Chair. The Board Chair may also determine no meeting fee is warranted.
- e) Travel time allowance, based on the distance travelled to a meeting, of \$1,000 for travel of 160-645 kilometres,
- f) \$1,500 for travel of 645-2,415 kilometres, or \$2,500 for travel greater than 2,415 kilometres.

Information on committee membership and the annual performance evaluation for Board members can be found in OPG's year-end 2019 Annual Information Form under the "Corporate Governance" section.

The Chair of the Board, in her role as non-executive Chair, receives an all-inclusive annual fee of \$150,000. This amount is determined by resolution of OPG's shareholder and has remained unchanged since 2004. Mr. Hartwick did not receive additional compensation for serving as a director of OPG.