

1 **PRODUCTION FORECAST AND METHODOLOGY - NUCLEAR**

2 3 **1.0 PURPOSE**

4 This evidence provides the production forecast for the OPG nuclear facilities and Darlington
5 New Nuclear Program (“DNNP”) facilities, and a description of the methodology used to derive
6 the forecast. The nuclear generation forecast and methodology are substantively the same as
7 in OPG’s prior applications. Any changes are noted as applicable.

8
9 Altogether, the Application is seeking approval of a total nuclear production forecast of 128.6
10 terawatt-hours (“TWh”) for the IR term. This includes:

- 11 • 126.2 TWh for OPG Nuclear Facilities (consisting of a plan of 18.7 TWh in 2027, 26.7 TWh
12 for 2028, 25.1 TWh for 2029, 26.8 TWh for 2030, and 28.9 TWh for 2031), and
- 13 • 2.4 TWh for DNNP Facilities for 2030-2031 (consisting of a plan of 0.5 TWh in 2030 and
14 1.9 TWh in 2031).

15 16 **2.0 NUCLEAR PRODUCTION METHODOLOGY AND PLANNING PROCESS**

17 **2.1 Methodology**

18 Nuclear production planning and forecast methodology for this application remains
19 substantively unchanged from EB-2020-0290 and broadly applies in the same manner for OPG
20 nuclear facilities and DNNP facilities.

21
22 OPG nuclear facilities and DNNP facilities are designed as baseload generators. The annual
23 nuclear production forecast for each is equal to the sum of the nuclear generating units’
24 capacity multiplied by the number of hours in a year, less the number of hours for any planned
25 outages, planned derates, forced production losses (i.e., unplanned outages and unplanned
26 derates, as defined in Attachment 1 of this exhibit) and corrections for sources of generation
27 losses (i.e., lake temperature, grid losses, and consumption (station service), as defined in
28 Attachment 1).

1 The nuclear facilities and DNNP facilities production planning process is focused on
2 establishing annual planned outage schedules and calculating variances to planned
3 generation due to forced production losses. Outage durations are determined based on the
4 scope of work defined for each outage while considering recent benchmarking efforts and
5 industry best practices, with a commitment to continuously improve. The objective is to
6 establish a realistic and accurate annual nuclear production forecast based on the generation
7 and planned outage scope, and forced production losses with the following deliverables:

- 8 • A planned outage schedule for all stations that includes unit outage start dates, end dates,
9 and durations based on the major elements and preventative maintenance comprising the
10 scope of work that will be executed during each outage.
- 11 • Operational reliability targets such as Unit Capability Factor (“UCF”), Unit Capability Rate
12 and the level of forced production losses based on forecast Forced Loss Rate (“FLR”).
- 13 • Generation forecasts (in TWh) for individual nuclear units and an aggregated forecast for
14 each station.

15
16 The generation and outage plan is an input to OPG’s overall corporate business plan. As
17 discussed in Ex. F2-4-1, outage resource requirements and cost estimates for the outage
18 OM&A cost budget are also tied to the nuclear generation and outage plan.

20 **2.2 Schedule**

21 Planned outage schedules identify the number of days required for inspections and
22 maintenance activities to ensure continued safe, reliable and long-term operation. The planned
23 outage schedule is prepared, for OPG nuclear facilities, in accordance with OPG’s aging and
24 life cycle management programs and in for both OPG nuclear facilities and DNNP facilities,
25 compliance with OPG’s nuclear operating licenses issued by the CNSC, with consideration for
26 Ontario’s electricity grid system demand (i.e., IESO constraints). The planned outage schedule
27 also incorporates “lessons learned” from past OPG outages and operating experience outside
28 of OPG.

29
30 Planned outages are complex, involving many OPG divisions and groups working together.
31 Outages require focus, expertise, high levels of coordination, training and includes a level of

1 detail that exceeds that of many major construction projects (due to nuclear regulatory
2 complexity and constraints in work execution). They require careful preparation and the safe
3 execution of a well-developed plan that accounts for nuclear, radiological, and industrial safety,
4 as well as the efficient achievement of production goals and cost controls. OPG's nuclear
5 facilities typically involve more than twenty thousand work activities (i.e., tasks), involving many
6 different types of resource personnel and hours of labour, sequenced in an optimal order to
7 ensure safe, and effective execution while ensuring the fuel core is cool, controlled and
8 contained at all times. In comparison, DNNP facilities' outage activities and durations are
9 largely based on refueling requirements.

10
11 Planned outages consist of a combination of "routine" inspection, maintenance and "non-
12 routine" activities specific to a particular outage. Examples of routine inspections are fuel
13 channel, feeder, steam generator legal requirements and fitness for service to operate to the
14 next planned outage and preventative maintenance. Non-routine activities include corrective
15 and deficient maintenance, and replacements or modifications of the equipment or plant
16 configuration that can only be done when the unit is shut down.

17
18 Planned outages must be submitted to and be "time-stamped" by the IESO. In most cases,
19 OPG submits its nuclear outage schedule early in order to secure an early time-stamp date;
20 this date determines the outage's advanced approval priority in the IESO's outage queue. In
21 addition to this advance approval process, all outages must receive final approval from the
22 IESO before they can begin. The IESO can deny approval of a planned outage start at any
23 time up to the beginning of the outage. OPG works with the IESO to proactively address
24 concerns regarding grid demand and planned nuclear outages.

25
26 Consistent with prior applications and now utilized also for the DNNP facilities, planned outage
27 durations include a station-level allowance under the control of the site for uncertainty related
28 to discovery work that is based on industry OPEX. Planned outage durations also include
29 nuclear fleet-level allowance days under the control of the Chief Nuclear Officer to address
30 risks to the completion of planned outages due to complexity in fleet level constraints (e.g.,

1 availability of Advance Inspection and Maintenance resources that service multiple
2 organizations and outages).

3 4 **3.0 OPG NUCLEAR FACILITIES**

5 The period between the 2027-2031 IR term encompasses significant changes to the OPG
6 nuclear line of business. Refurbishment of all Darlington units is expected to be complete in
7 2026, with all four units in-service throughout the entire IR term (see Ex. D2-2-1). These
8 generation gains are offset by Pickering, with Units 1 and 4 having ended their commercial
9 operation in 2024, and Units 5-8 being planned to shutdown on September 30, 2026 prior to
10 transitioning into refurbishments (see Ex. D2-3-1). This will temporarily reduce nuclear
11 production as there will be no generation from Pickering until the first Pickering refurbished
12 unit, Unit 5, is planned to return to service in May 2031.

13
14 In addition to the major projects, as described in Ex. D2-1-2, this IR term also includes several
15 significant, emergent equipment replacements and rehabilitations required to address
16 reliability risks to Darlington's post-refurbishment operations, and which with impacts to the
17 generation forecast. This includes the Darlington Steam Generator ("SG") Primary Moisture
18 Separators ("PMS") Replacement projects. OPG has taken the opportunity to complete this
19 emergent work where possible in the 2022-2026 IR term. This includes replacing the PMS in
20 two SGs in Unit 3 and the PMS in all four SGs in Unit 1 during refurbishment windows to
21 minimize post-refurbishment outage impacts. Replacements of the PMS in all four SGs on Unit
22 4 have been installed while the unit is under refurbishment. The PMS replacements on the
23 remaining two SGs in Unit 3 are planned to be undertaken in a 2026 Darlington outage. As a
24 result of this optimization effort, only one outage is needed during the 2027-2031 IR term to
25 replace the PMS for all four SGs in Unit 2. See Ex. D2-1-3, Section 3.1.3 for further discussion
26 on this project.

27
28 Concurrently, during the same Unit 2 Darlington PMS replacement outage in 2027, OPG will
29 execute the Darlington Unit 2 Turbine Control and Auxiliary Systems Upgrade project that was
30 deferred from 2025 to support grid reliability and manage resource constraints during
31 concurrent nuclear outages. OPG has reviewed the challenges with regard to parallel

1 execution of these significant work programs and built a strategy around key evolutions through
2 existing work planning processes, allowing OPG to take one major outage instead of two. See
3 Ex. D2-1-3, Section 3.1.3 for further discussion on this project.

4
5 OPG is also planning for Turbine Rotor Replacements for all four Darlington units starting in
6 2029, with three units' replacements being completed during the IR term in their respective
7 planned outages. Once completed, this is forecasted to result in a planned uprate of 21 MW
8 per unit, which is reflected in the nuclear production plan following each replacement. See Ex.
9 D2-1-3, Section 3.1.3 for further discussion on this project.

10
11 Other major work planned includes Darlington Generator Stator Rewinds which were initially
12 determined to be at low risk of requiring a rewind on Units 1 and 2 based on inspections
13 performed prior to refurbishment. However, during a Unit 1 regular planned outage prior to
14 refurbishment and in the refurbishment outage for Unit 2, scheduled inspections determined
15 that there was increased degradation associated with generator stator winding conditions. As
16 part of refurbishment, OPG conducted full/partial replacements of the stator winding wedges
17 as a remedial action. While these less involved interventions were successful in enabling their
18 return-to-service and mitigating near-term degradation, further assessments since have
19 indicated signs of insulation degradation that cannot be managed by continued adjustments.
20 As a result, OPG has determined that the Generator Stators in Unit 1 and Unit 2 will require
21 an in-situ rewind in their respective planned outages in 2028 and 2030 respectively.

22
23 Another major non-routine work being planned at Darlington is Steam Generator ("SG")
24 chemical clean on all four units. Based on build-up of boiler deposits in the SGs, a chemical
25 clean is required continue to operate the SGs safely and reliably, maintaining the design and
26 licensing bases. This commitment forms part of OPG's SG Life Cycle Management Plan as
27 submitted to the regulator. Execution of SG chemical clean is planned in their respective
28 planned outages for Unit 3 in 2026, Unit 2 in 2027, Unit 1 in 2028, and Unit 4 in 2029.

29
30 Major generation highlights of the 2027-2031 Plan (126.2 TWh):

- 1 • Reduction of 25.7 TWh compared to 2022-2026 OEB-approved Plan (151.9 TWh) primarily
2 due to Pickering shutdown for Units 1 and 4 and Units 5-8 transition to refurbishment, offset
3 by the return to service of all four Darlington units following their refurbishment.
- 4 • Darlington units post-refurbishment reflect improved performance:
- 5 ○ Overall Darlington outage schedule efficiency efforts, including leveraging Canadian
6 Nuclear Safety Commission (“CNSC”) approved 36-months outage intervals and
7 piloting planned outage duration improvements following refurbishment.
- 8 ○ The 2027-2031 Plan reflects outage optimization efforts OPG undertook during the
9 2022-2026 IR term upon early return to service of Darlington Units, including extending
10 a planned outage to support PMS replacements in 2026. These efforts have reduced
11 the outages needed in the 2027-2031 Plan to execute the major equipment
12 replacements and rehabilitations work described above.
- 13 ○ Unit 4 post-refurbishment forecast FLR improvements at 6% and 4% for the first and
14 second years respectively (versus 12% and 6% used in the EB-2020-0290 forecast).
15 OPG has implemented initiatives to improve plant equipment reliability, fuel handling
16 and lessons learned from prior unit refurbishments. An example is the Foreign Object
17 Search and Retrieval program that has been included in Unit 4 refurbishment scope to
18 minimize risk upon returning to service. This was a lesson learned from a Unit 3 outage,
19 where foreign material in boilers resulted in a Boiler Tube Leak forced outage. These
20 initiatives are addressed in Ex. F2-1-1.
- 21 ○ Expectations of better outage execution performance as a result of outage
22 improvement initiatives. Such initiatives are based on industry best practices to improve
23 the outage planning process, outage tooling, scope of work assessments, and training.
24 As an example, OPG is developing a Rapid Delivery Machine at Darlington, which will
25 improve radiological safety for employees in all instances, as well as reduce durations
26 of fuel channel inspection and vault maintenance campaigns by up to 10 days per
27 outage whenever vault work is critical path. These improvements are incorporated into
28 the generation forecast upon expected completion of the project.
- 29 ○ Three out of four Darlington units will have Turbine Rotor Replacements completed
30 during the IR term, resulting in a net production increase of 0.6 TWh as a result of unit
31 net electrical output rating increasing by 21 MW, which is built into production forecast.

- 1 ○ Reduced equipment-related outages from 30 days to 15 days due to retirement of
- 2 certain risks following the completion of Darlington Refurbishment Program (“DRP”).
- 3 ● Darlington Vacuum Building Outage (regulatory requirement) is scheduled in 2027,
- 4 strategically overlapping with the Unit 2 outage to replace PMS and execute the Turbine
- 5 Control and Auxiliary Systems Upgrade, reducing the overall planned outage days.

6

7 The actual nuclear production for 2020-2024 and the forecast for 2025-2031 are presented in

8 Ex. E2-1-1, Table 1. The monthly nuclear production forecast for 2027-2031 is presented in

9 Ex. E2-1-1, Table 2.

10

11 **Historical Results**

12 In EB-2020-0290, OPG was planning to end commercial operations at Pickering during the

13 2022-2026 period. In September 2022, the Province of Ontario announced the extension of

14 Pickering Units 5-8 operations from December 2025 to September 2026 (“extension period”).

15 This will lead to approximately 11.4 TWh increase in generation for 2026. As discussed in Ex.

16 H1-1-1, through the Pickering B Variance Account established under O. Reg. 53/05, OPG will

17 record and return net revenues generated during the extension period that are earned from

18 the output of the Pickering Units 5-8 to the ratepayers, subject to the OEB’s review in a future

19 application.

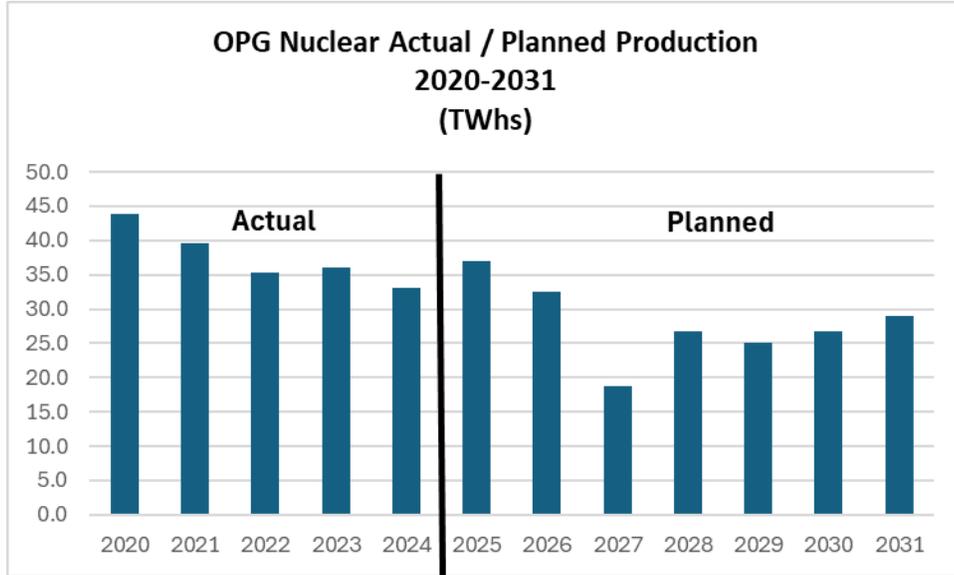
20

21 Overall, actual and planned nuclear production over the 2020-2031 period declines, with 2027

22 being the lowest, before rising towards the end of the IR term as shown in Chart 1.

1

Chart 1



2
3

4 The overall decline in nuclear production over the 2020-2029 period primarily reflects the
 5 impact of the DRP (up to 2026) and no Pickering generation starting October 1, 2026, with
 6 Units 1 and 4 having permanently shut down in 2024 and Units 5-8 planned to transition to
 7 refurbishment. Generation increase in 2030 is the result of one planned outage scheduled at
 8 Darlington (versus 2 planned outages in 2029) while 2031 is primarily attributable to Pickering
 9 Unit 5 returning to service post-refurbishment in May 2031.

10

11 The Planned Outage (“PO”) days details over the years 2022-2024 are provided in Chart 2
 12 below and are discussed under Ex. E2-1-2, Section 5.0.

13

14

15

Chart 2 – Planned Outage Durations^{1,2}

	2022	2023	2024
Pickering Planned Outage Days (OEB-approved)	487.2	371.1	270.2
Pickering Planned Outage Days (Actuals)	393.8	355.6	283.0
Variance	93.4	15.5	-12.8
Darlington Planned Outage Days (OEB-approved)	73.0	112.2	55.0

Darlington Planned Outage Days (Actuals)	45.1	0.0 *	99.0
Variance	27.9	112.2	-44.0

¹ Includes Unbudgeted Planned Outages days. Excludes Planned Outage days for the Darlington Refurbishment Program.

² Does not reflect the EB-2020-0290 settlement adjustment for production forecast.

* Darlington PO deferred from 2023 to 2024

Darlington had fewer PO days compared to plan in 2022-2024 primarily due to not requiring a Unit 3 Post Refurbishment outage in 2023, combined with generation gains from lower number of unbudgeted planned outage days required. However, these generation gains were offset by a higher number of FLR days over those years (see Section 3.4, Chart 4), which are not factored into Chart 2. Pickering outage days show a declining trend as a result of Unit 1 and Unit 4 end of commercial operations. Pickering's 2022 PO days reflected a VBO and four POs. The variance is primarily attributable to one PO completed ahead of schedule and one PO that started later and was completed in early 2023 to mitigate execution overlap challenges of parallel execution of VBO.

Both stations have experienced equipment issues over the historical period, which led to the following unbudgeted planned outages (e.g., Equipment Aging Outage days):

Pickering Unbudgeted:

- Unit 7 unbudgeted PO was taken to address grayloc leak repairs (2022) – 5.9 days.
- Unit 5 unbudgeted PO to repair vault air conditioning units in order to prevent Forced Outage in summer months due to vault temperature limits (2023) – 13.5 days.
- Unit 8 unbudgeted PO to resolve oil ingress into the generator brush gear enclosure (2023) – 15.1 days.
- Unit 1 planned derate with an impact of 6.6 equivalent days lost to perform necessary inspection & maintenance on Fuel Handling equipment to ensure reliability (2023).
- Unit 5 unbudgeted PO to repair vault air conditioning units leaks (2024) – 21.9 days
- Unbudgeted POs (5 events) due to grid constraints or external factors with total impact of 20.6 days.

1 **Darlington Unbudgeted:**

- 2 • Unit 3 unbudgeted PO to address boiler tube leak (2024) – 7.1 days.
3 • Unit 2 had unbudgeted PO to address planned MW oscillation repairs during U2 Turbine
4 Trip on Loss of Excitation window (2024) – 5.5 days.
5

6 **3.1 Production Forecast Assumptions**

7 The 2027-2031 production forecast considers recent historical results including the PO
8 execution performance improvements realized since 2021 and incorporates the following key
9 components:

- 10 • **Darlington units in operation post Darlington Refurbishment Program:** With the
11 planned completion of DRP in 2026, the production forecast assumes that all Darlington
12 units will be in operation through the entire IR term.
- 13 • **Pickering Shutdown of Units 1 and 4:** Pickering Units 1 and 4 ended commercial
14 operation on October 1, 2024 and December 31, 2024 respectively. The production
15 forecast therefore includes no generation from these units.
- 16 • **Pickering Units 5-8 Refurbishment:** The production forecast assumes that Pickering
17 Units 5-8 will be taken offline at the end of September 2026 prior to transitioning into
18 refurbishment in January 2027. The production forecast assumes that Unit 5 will return to
19 service in May 2031 consistent with the Pickering Refurbishment Program’s release quality
20 estimate (see Ex. D2-3-1).
- 21 • **Pickering Post-Refurbishment Outages:** For Pickering Unit 5 returning to service in May
22 2031, one post-refurbishment outage has been scheduled to address equipment issues
23 that are expected to emerge. As discussed in EB-2016-0152 and EB-2020-0290 with
24 respect to the DRP, the need for these post-refurbishment outages is based on OPEX from
25 other nuclear facilities that underwent major refurbishment. The need for these at outages
26 at Pickering is underscored by the age of the units pre-refurbishment and the scope and
27 execution complexity of the Pickering Refurbishment Program. The first post-refurbishment
28 outage (55 days) is scheduled within six months following Unit 5 return to service, and is
29 scheduled to be completed within 2031.
- 30 • **Pickering Planned Uprate:** The production forecast assumes that post-refurbishment,
31 Unit 5 will return with a higher Maximum Continuous Rating (“MCR”) capacity of 572 MW

1 compared with the current MCR of 540 MW as a result of improved turbine generator
2 technology and thermal efficiency following refurbishment.

- 3 • **Planned Outage Cycles:** Maintaining a 36-month outage cycle for Darlington. Most of the
4 PO durations during the IR term are longer than regular POs in order to complete major
5 equipment replacements and rehabilitations to mitigate equipment reliability risks as
6 discussed above. Other than the Unit 5 post-refurbishment outage, there will be no planned
7 outages for Pickering during the rate term.
- 8 • **Equipment Risk Outages:** As discussed in Section 2.1 and Section 3.2.1, OPG has
9 continued to observe equipment aging issues at both Pickering and Darlington that require
10 equipment risk outages or unbudgeted planned outages to repair as it is not feasible or
11 economical to proactively mitigate all possible modes of failure. In addition to this, OPG is
12 also planning to undertake a significant amount of complex and significant modifications to
13 replace and rehabilitate major equipment as discussed above, which may require
14 equipment risk outages to address post-installation equipment issues. For these reasons,
15 OPG has planned for equipment risk outages at Darlington to address equipment issues
16 related to, (1) issues currently being tracked (Section 3.2.1 below), and (2) outages that
17 may be required to address post-installation issues.
- 18 • **Darlington Vacuum Building Outage (“VBO”) in 2027:** As per OPG’s Power Reactor
19 Operating Licence, the Darlington VBO has been scheduled for spring of 2027. This
20 includes replacement of key Emergency Coolant Injection valves that can only be replaced
21 during a VBO. OPG has leveraged lessons learned from the last Darlington VBO in 2015,
22 the Pickering VBO in 2022 and industry best practices to refine outage scope and
23 complexity.
- 24 • **Darlington FLR:** Darlington’s unit post-refurbishment FLR targets are reduced to 6% and
25 4% for the first and second year respectively for Unit 1 and Unit 4, reflecting operating
26 experience and lessons learned from Units 2 and 3. FLR was previously 12% and 6% in
27 the first two years post-refurbishment. All Darlington units are expected to transition to post-
28 refurbishment normal operations by 2028. The resultant station FLR varies between 2.9%
29 to 2.0% per year (2.2% average) over the IR term, as discussed further in Section 3.3.
- 30 • **Pickering Post-Refurbishment:** Consistent with industry OPEX, higher FLR is expected
31 immediately after Units return from refurbishment. The FLR target for Unit 5 is 12% in the

1 first year; which applies to the approximately 7.5 months following the Unit's return to
2 service in May 2031. The FLR target for this first Pickering unit to undergo refurbishment
3 has been set higher than the FLR target for Darlington Unit 4, which is the 4th unit returning
4 to service.

5 6 **3.2 Planned Outages**

7 **3.2.1 Schedule**

8 The four Darlington Units are on a three year (36-month) planned outage cycle, which means
9 that either one or two regular single unit planned outages occur each year for routine inspection
10 and maintenance over the IR term. With Unit 4 expected to return to service in 2026, Darlington
11 units are effectively reinstated to three-year (36-month) PO cycle interval over the entire IR
12 term.

13
14 As noted above in Section 3.2 relating to equipment risk outages, while each station has an
15 extensive preventive maintenance program that is realized through online or planned outage
16 repairs, it is not feasible or economical to proactively mitigate all possible modes of failure.
17 Unless there are safety concerns or regulatory limits requiring immediate action, OPG will take
18 an equipment risk outage at an appropriate time to repair components that fail. As discussed
19 in Section 2.1, OPG has undertaken unbudgeted planned outages and experienced forced
20 outages due to the equipment issues at the Darlington and Pickering facilities. Such instances
21 highlight the various equipment-related risks that OPG monitors under its Risk Management
22 Program. In addition, as a result of the major equipment replacements and rehabilitation work
23 during the IR term, there are risks associated with the performance of new equipment
24 installations. Accordingly, OPG's outage plan for the IR term includes a 15-day equipment risk
25 outage each year to address potential issues at Darlington. These outages are expected to be
26 taken in response to specific active risks that OPG is currently tracking under the Risk
27 Management Program or to address any issues associated with major equipment being placed
28 in-service, namely:

- 29 • Darlington boiler tube leak
- 30 • Darlington low pressure service water system degradation
- 31 • Darlington fuel handling reliability issues

- 1 • Darlington MW oscillation repairs (experienced in 2024, as discussed above)
- 2 • Emergent post-installation equipment issues for major, complex and non-routine work,
- 3 including SG PMS replacements, SG rewinds, Turbine Rotor Replacements, Turbine
- 4 Control and Auxiliary Upgrade and non-routine steam generator cleanings.

5
6 The completion of the DRP has retired some aging-related risks. This has enabled a reduction
7 in the expected equipment-risk related planned outages from 30-days duration during the
8 2022-2026 rate term to 15 days in this IR term as OPG continues to monitor active equipment
9 issues at Darlington that were not addressed during refurbishment.

10 11 3.2.2 Vacuum Building Outage

12 The VBO is planned at a twelve-year frequency as approved by CNSC in Darlington's Power
13 Reactor Operating Licence. The last VBO at Darlington was in 2015. As a result, OPG is
14 required to conduct a VBO in 2027 which will result in all four-units being taken offline for
15 nuclear safety purposes. OPG has scheduled the VBO during the extended Unit 2 outage in
16 2027, resulting in only incrementally taking three units offline.

17
18 In planning for the VBO, OPG has reviewed lessons learned and benchmarked other utilities.
19 In addition, OPG is utilizing innovative technology and drones to perform some of the vacuum
20 building inspection work and planning to initiate projects that would provide opportunities in
21 future VBO's.¹ OPG's generation forecast reflects a planned duration of 45.9 days to execute
22 the VBO. Any further scoping opportunities would require CNSC approval.² OPG will update
23 its application should there be any material change related to the VBO duration.

24
25 There is no VBO scheduled for Pickering during the IR term.

¹ See Project #84552 Darlington VBO Power Operated Valves Replacement Project in Ex. D2-1-3, Section 3.1.1.

² Subsequent to the establishment of the generation plan underpinning the 2025-2031 business plan, OPG has received CNSC approval for a one-day reduction to the VBO outage duration per unit (3 days total).

3.3 Forced Loss Rate

Forced production losses (i.e., unplanned outages and derates) are a source of variance to planned generation. OPG forecasts FLR targets that reflect the risk of forced production losses at Darlington and Pickering. The FLR targets are based on the plants' historical performance, any known improvements or component condition issues, initiatives to improve equipment reliability, and with consideration of post-refurbishment risks.

Pickering's FLR performance is set out in Chart 3 below:

Chart 3 – Pickering Forced Loss Rate

	2020	2021	2022	2023	2024	Avg.	10-Year Avg.
FLR- Actual (%)	2.7	6.2	1.8	2.8	2.6	3.2	4.17
OEB-Approved (%)¹	5.0	5.0	3.5	3.5	3.5	4.1	4.89

¹EB-2020-0290, Ex. E2-1-2, Table 1

Pickering's FLR performance has averaged 3.2% over the 2020-2024 period compared to an OEB-approved target of 4.1%. The Pickering FLR target remains at 3.5% until September 30, 2026, considering some equipment challenges that may emerge in the final years of operation prior to Units being taken offline for refurbishment. Considering operating experience from other nuclear fleets and industry, Pickering's Unit 5 FLR is set at 12% for the first-year post-refurbishment.

Darlington's FLR performance is set out in Chart 4 below:

Chart 4 – Darlington Forced Loss Rate

	2020	2021	2022	2023	2024	Avg.	10-Year Avg.
FLR-Actual (%)	1.5	3.5	7.5	1.4	12.1	5.2	3.85
OEB-Approved (%)¹	4.2	3.0	2.1	1.2	6.0	3.3	2.07

¹EB-2020-0290, Ex. E2-1-2, Table 1

1 Darlington's FLR performance has averaged 5.2% over the 2020-2024 period compared to an
2 OEB-approved target of 3.3%. The high FLR in 2022 and 2024 was primarily attributable to a
3 forced outages on Unit 2 (Turbine Stop Valve) and Unit 3 (Boiler Tube Leak) respectively.

4
5 With operating experience from Units 2 and 3 and leveraging lessons learned that have since
6 been applied to subsequent units, Units 1 and 4 FLR targets were reduced to 6% and 4% for
7 first and second year respectively post-refurbishment.

8
9 Notwithstanding the recent FLR performance at Darlington, and the need to execute major
10 replacement and rehabilitation projects in support of post-refurbishment operations during the
11 IR term, Darlington continues to target an improved FLR performance, set at 2.0% FLR over
12 the 2028-2031 period once Units 1 and 4 enter their third year of post-refurbishment
13 operations.

14 15 **4.0 DNNP FACILITIES**

16 The first of four DNNP facilities' units is planned to be commercially available and generating
17 starting in October 2030. The 2027-2031 DNNP facilities' production forecast incorporates the
18 following key components and assumptions:

- 19 • **DNNP Facilities Unit 1:** The production forecast includes 2.4 TWh generation from the
20 first unit, which is planned to enter commercial operation in October 2030. Unit 1 is the only
21 DNNP facilities unit operating during the IR term, generating for close to 15 months during
22 the IR term. A mechanism has been established under O. Reg. 53/05 to account for any
23 production variances as a result of differences between the actual in-service date and the
24 OEB-approved forecast in-service date. See Ex. H1-1-1 for more information.
- 25 • **DNNP Facilities – Unit Rating:** Based on current design information, OPG is planning its
26 generation forecast to include a MCR and net electrical rating of 327 MW and 315 MW
27 respectively (includes 12 MW consumption).
- 28 • **DNNP Facilities – FLR:** Based on industry experience and considering the first of a kind
29 nature of the project, the generation plan for the first SMR reflects lower availability with
30 FLR of 12% for first year of operation, before reducing to 6% in the second year.

- 1 • **DNNP Facilities – PO Days:** With only one unit planned to be in operation during this IR
2 period, the production forecast includes one 15-day outage to address equipment issues
3 that are expected to emerge within the first six months of operation. In addition, there is a
4 50-day planned outage after its first year of commercial operations in the fall of 2031. The
5 first outage currently includes initial re-fueling, prescribed inspection and maintenance, as
6 well as potential additional regulatory inspections over first of a kind operations and first
7 time start-up related activities. This outage is based on the available OPEX from industry
8 peers (Tennessee Valley Authority and Boiling Water Reactor Owner’s Group data)
9 including OPG’s nuclear fleet and extensive input from the original equipment
10 manufacturer. After the initial PO, the SMR units are expected to be on a two year (24-
11 month) PO cycle.

1 **LIST OF ATTACHMENTS**

2

3 Attachment 1: Glossary of Outage and Generation Performance Terms

1 **ATTACHMENT 1**

2
3 **GLOSSARY OF OUTAGE AND GENERATION PERFORMANCE TERMS**

4
5 The following evidence is substantially unchanged from that filed in EB-2013-0321.

6
7 **Consumption Losses:** The electrical service energy consumed by a station and used to
8 supply the electrical load for ancillary equipment and related on-site processes.

9
10 **Derate:** A derate is where a unit is delivering a portion but not all of its full electrical power.
11 Derates include:

- 12 • **Planned Derate:** A planned reduction in available power generation, scheduled with the
13 IESO at least 28 days in advance.
14 • **Forced Derate:** An unplanned reduction in available power generation, which can include
15 deratings due to equipment, safety, or environmental reasons.

16
17 **Forced Extensions to Planned Outages:** An extension to a planned outage which is not
18 scheduled with the IESO at least 28 days in advance, and is unavoidable because the unit is
19 not capable of safe operation at the scheduled outage completion time (e.g., an unexpected
20 condition discovered during the scheduled outage which drives critical path).

21
22 **Forced Loss Rate:** Forced Loss Rate is a World Association of Nuclear Operators (“WANO”)
23 indicator of performance reliability. Forced Loss Rate is a measure of the percentage of energy
24 generation that a plant is not supplying to the electrical grid during non-planned outage periods,
25 because of forced production losses, i.e., forced outages or unplanned derates. This indicator
26 excludes forced production losses due to high lake water temperatures and forced extensions
27 to planned outages.

28
29 **Forced Outage:** An unplanned electricity system component failure (e.g., immediate, delayed,
30 postponed, startup failure) or other condition that requires the unit be removed completely from
31 service immediately and, per WANO industry performance reporting guidelines, for which OPG
32 did not provide at least 28 days advance notice to the IESO for the start of the outage.

1 **Forced Production Losses:** Lost production due to forced outages and forced derates.

2

3 **Generation Losses:** The total generation losses that are outside the control of plant
4 management, equal to the sum of “Consumption Losses” + “Grid Losses” + “Lake Temperature
5 Losses”.

6

7 **Grid Losses:** Generation losses due to a reduction in electrical power generation because the
8 grid is unable to accept the available power (due to a problem outside of the station boundary)
9 or because of demand limitations.

10

11 **Lake Temperature Losses:** High lake water temperature losses due to reduced condenser
12 efficiency resulting in lower generation output.

13

14 **Life Cycle Management:** Life cycle management is the integration of safety management,
15 ageing management and business management decisions, together with economic
16 considerations over the life of a nuclear power plant in order to:

- 17 • Maintain an acceptable level of performance including safety.
18 • Optimize the operation, maintenance and service life of structures, systems, and
19 components.
20 • Maximize returns on investment over the operational life of the nuclear power plant.
21 • Take account of strategies for life cycle funding (including decommissioning), fuel
22 management, and waste management.

23

24 **Maximum Continuous Rating:** The design, or demonstrated higher, maximum power of a
25 unit operating continuously (in MWs).

26

27 **Planned Outage:** An outage which has been scheduled with the IESO at least 28 days in
28 advance of the start date. It is subject to final approval by the IESO, the starting time of which
29 could be postponed up to the scheduled hour of shutdown. The schedule must include the
30 planned completion date. The planned outage duration cannot be revised (increased or
31 decreased) after the planned outage has commenced.

1 **Unbudgeted Planned Outage:** An emergent outage that was not included in the approved
2 integrated nuclear outage and generation plan that underpins the business plan, but for which
3 OPG had sufficient time to notify the IESO at least 28 days prior to the start date. Although not
4 included in the approved plan, the notice provided allows the outage to be categorized as
5 “planned” for performance reporting purposes as per WANO industry guidelines.

6

7 **Unit Capability Factor:** A standard WANO indicator of performance reliability. Unit capability
8 factor is the percentage of maximum energy generation that a unit is capable of supplying to
9 the electrical grid, limited only by factors within the control of plant management. Unit capability
10 factor is derived as the ratio of generation available from a unit over a specified time period
11 divided by the maximum generation that the unit is able to produce under ambient conditions
12 and at maximum reactor power during the same period. The available generation is reduced
13 by planned and unplanned production losses deemed under station management’s control.
14 However, the derivation of available generation is not affected by losses due to events not
15 under station management’s control including environmental conditions (e.g., loss of
16 transmission, lake water temperature derates, labour disputes, and potential low demand
17 periods). While these events do impact production, they do not penalize unit capability factor
18 as the units are considered available to produce at these times.

19

20 **Unit Capability Rate:** A standard indicator of performance reliability. Ratio of the available
21 energy generation over a given time period to the reference energy generation over the same
22 time period but not counting planned energy losses in the denominator. Unit Capability Rate,
23 like UCF, is expressed as a percentage.

Numbers may not add due to rounding.

Filed: 2025-12-12
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 Exhibit E2
 Tab 1
 Schedule 1
 Table 1

Table 1
Production Trend - Combined Nuclear (TWh)

Line No.	Prescribed Facility	2020 Actual	2021 Actual	2022 Actual	2023 Actual	2024 Actual	2025 Budget	2026 Budget	2027 Plan	2028 Plan	2029 Plan	2030 Plan	2031 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
	OPG Nuclear Facilities												
1	Darlington NGS	23.4	18.5	13.9	14.6	11.7	21.1	21.1	18.7	26.7	25.1	26.8	27.1
2	Pickering NGS	20.5	21.1	21.4	21.5	21.3	15.8	11.4	0.0	0.0	0.0	0.0	1.9
3	Total OPG Nuclear Facilities	43.9	39.6	35.3	36.1	33.0	36.9	32.5	18.7	26.7	25.1	26.8	28.9
4	DNNP Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.9
5	Total	43.9	39.6	35.3	36.1	33.0	36.9	32.5	18.7	26.7	25.1	27.3	30.9

Numbers may not add due to rounding.

Filed: 2025-12-12
 EB-2025-0297
 Exhibit E2
 Tab 1
 Schedule 1
 Table 2

Table 2
 Monthly Production - Combined Nuclear (TWh)
 IR Term

Line No.	Prescribed Facility	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
	2027 Plan:													
	OPG Nuclear Facilities													
1	Darlington NGS	2.0	1.7	1.9	0.6	0.2	1.7	1.8	1.8	1.7	1.9	1.8	1.6	18.7
2	Pickering NGS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	OPG Nuclear Facilities Subtotal	2.0	1.7	1.9	0.6	0.2	1.7	1.8	1.8	1.7	1.9	1.8	1.6	18.7
4	DNNP Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Total	2.0	1.7	1.9	0.6	0.2	1.7	1.8	1.8	1.7	1.9	1.8	1.6	18.7
	2028 Plan:													
	OPG Nuclear Facilities													
6	Darlington NGS	2.0	1.8	1.9	1.8	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.2	26.7
7	Pickering NGS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	OPG Nuclear Facilities Subtotal	2.0	1.8	1.9	1.8	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.2	26.7
9	DNNP Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Total	2.0	1.8	1.9	1.8	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.2	26.7
	2029 Plan:													
	OPG Nuclear Facilities													
11	Darlington NGS	2.2	1.7	1.9	2.5	2.5	2.4	2.4	2.3	1.8	1.9	1.8	1.6	25.1
12	Pickering NGS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	OPG Nuclear Facilities Subtotal	2.2	1.7	1.9	2.5	2.5	2.4	2.4	2.3	1.8	1.9	1.8	1.6	25.1
14	DNNP Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	Total	2.2	1.7	1.9	2.5	2.5	2.4	2.4	2.3	1.8	1.9	1.8	1.6	25.1
	2030 Plan:													
	OPG Nuclear Facilities													
16	Darlington NGS	2.6	2.3	2.6	2.5	2.6	2.4	2.5	2.3	1.8	1.9	1.8	1.7	26.8
17	Pickering NGS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	OPG Nuclear Facilities Subtotal	2.6	2.3	2.6	2.5	2.6	2.4	2.5	2.3	1.8	1.9	1.8	1.7	26.8
19	DNNP Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.5
20	Total	2.6	2.3	2.6	2.5	2.6	2.4	2.5	2.3	1.8	2.0	2.0	1.9	27.3
	2031 Plan:													
	OPG Nuclear Facilities													
21	Darlington NGS	2.6	2.2	1.9	1.9	1.9	1.8	2.5	2.5	2.4	2.6	2.5	2.3	27.1
22	Pickering NGS	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.3	(0.0)	0.1	1.9
23	OPG Nuclear Facilities Subtotal	2.6	2.2	1.9	1.9	2.1	2.2	2.8	2.8	2.7	2.9	2.5	2.3	28.9
24	DNNP Facilities	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	(0.0)	0.2	1.9
25	Total	2.8	2.4	2.1	2.0	2.3	2.4	3.0	3.0	2.9	3.0	2.5	2.5	30.9

1 **COMPARISON OF PRODUCTION FORECASTS – NUCLEAR**

2 3 **1.0 PURPOSE**

4 This evidence presents period-over-period comparisons of actual and forecast nuclear
5 production for 2020-2031, in support of the approval of OPG’s nuclear facilities’ production
6 forecast for the IR term. In addition, this evidence separately sets out the production forecast
7 for the Darlington New Nuclear Program (“DNNP”) facilities, the first unit of which will enter
8 commercial operation during the IR term.

9 10 **2.0 OPG NUCLEAR FACILITIES**

11 **2.1 Overview**

12 Variances between actual and forecast production in the 2022-2026 term are primarily the
13 result of the successful execution of the Darlington Refurbishment Program (“DRP”), including
14 the implementation of lessons learned and unit over unit efficiencies, and the Province of
15 Ontario’s decision to extend Pickering Units 5-8 operations from 2025 to 2026.¹ Other reasons
16 for variances are attributed to changes in the following: station planned outage (“PO”) days,²
17 forced outages (“FO”), planned or forced derates and unbudgeted POs. Variances may also
18 arise due to station consumption, grid losses and impacts on thermal performance resulting
19 from high lake water temperature.

20
21 Period-over-period variances are presented in Ex. E2-1-2, Tables 1a and 1b, and are explained
22 below.

23 24 **2.2 Period-Over-Period Changes – IR Term**

25 As discussed in Ex. E2-1-1, Section 3.0, Pickering will be fully offline as of September 30,
26 2026. While Units 1 and 4 have ended commercial operation, Units 5-8 will transition to

¹ Under *Ontario Regulation 53/05*, OPG will return to ratepayers net revenues generated between January 1, 2026, to September 30, 2026, resulting from the extended operations of Pickering Units 5-8. See Ex. H1-1-1, Section 5.28, for information regarding the Pickering B Variance Account.

² PO days excludes a) outage days for Darlington units out of service during refurbishment, and b) outage equivalent planned derate days.

1 refurbishment, with Unit 5 returning to service towards the end of the IR term in May 2031.
2 Until such point, there is no Pickering station generation during the IR term.

3
4 Also as discussed in Ex. E2-1-1, the DRP will conclude in 2026, with all four Darlington units
5 operating throughout the IR term for the first time since 2016. Darlington's generation is
6 impacted during this IR term by a four-unit vacuum building outage in 2027, and major
7 equipment replacements and rehabilitations works requiring extended outages during the IR
8 term as discussed below.

9 10 **2027 Plan versus 2026 OEB-Approved**

11 The 2027 Plan nuclear production of 18.7 terawatt-hours ("TWh") is 3.2 TWh lower than the
12 2026 OEB-approved plan production of 21.9 TWh. Since both the 2027 Plan and 2026 OEB-
13 approved do not include any Pickering generation, the lower 2027 Plan production relative to
14 2026 OEB-approved is attributed to Darlington:

- 15 • Higher production in 2027 Plan compared with 2026 OEB-approved due to the completion
16 of the DRP in 2026. The 2026 OEB-approved plan assumed that the last Darlington Unit 4
17 refurbishment would be complete in October 2026 (288 days).
- 18 • Lower production in 2027 Plan due to higher PO days (316.5 days) required primarily to
19 execute major equipment replacements and rehabilitation associated with the Primary
20 Moisture Separator ("PMS") Replacement on all four Steam Generators in Darlington Unit
21 2 in 2027, as well as the Unit 2 Turbine Control and Auxiliary Systems Upgrade ("TG
22 Controls") project being executed in parallel. Both projects are described in Ex. D2-1-3,
23 Section 3.1.3.
- 24 • Lower production in 2027 Plan due to planned Vacuum Building Outage ("VBO"; 45.9 days
25 per unit (137.7 days total)) which necessitates shutdown of Units 1, 3, and 4. OPG has
26 strategically overlapped the VBO with the above Unit 2 planned outage to optimize the
27 outages.
- 28 • Higher production in 2027 Plan due to 19.5 fewer FLR equivalent days in 2027 Plan when
29 compared with 2026 OEB-approved.
- 30 • Higher production in 2027 Plan compared with 2026 OEB-approved due to Unit 3 bulkhead
31 derates not required upon refurbishment completion (savings of 15.1 equivalent days).

1 **2028 Plan versus 2027 Plan**

2 The 2028 Plan nuclear production of 26.7 TWh is 8.0 TWh higher than the 2027 Plan
3 production of 18.7 TWh. The higher production of 2028 relative to 2027 is primarily due to
4 371.2 fewer PO days at Darlington as summarized below:

- 5 • Higher production in 2028 Plan compared with 2027 Plan as VBO (137.7 days impact) is
6 completed in 2027.
- 7 • Higher production in 2028 Plan compared with 2027 Plan due to 233.6 fewer PO days;
8 126.4 days for one PO in 2028 compared to 360.0 days for the Unit 2 PMSR and TG
9 Controls PO in 2027.

10

11 **2029 Plan versus 2028 Plan**

12 The 2029 Plan nuclear production of 25.1 TWh is 1.6 TWh lower than the 2028 Plan production
13 of 26.7 TWh. The lower production in 2029 relative to 2028 is due to Darlington having 72.7
14 more PO days than in 2028 as summarized below:

- 15 • Three POs in 2029 totaling 214.1 days as compared to two POs totaling 141.5 days in
16 2028.

17

18 **2030 Plan versus 2029 Plan**

19 The 2030 Plan nuclear production of 26.8 TWh is 1.8 TWh higher than the 2029 Plan
20 production of 25.1 TWh. The higher production in 2030 relative to 2029 is primarily due to
21 higher production at Darlington as summarized below:

- 22 • Higher production in 2030 Plan compared with 2029 Plan due to 74.9 fewer PO days at
23 Darlington (one PO in 2030 whereas 2029 has two POs).

24

25 **2031 Plan versus 2030 Plan**

26 The 2031 Plan nuclear production of 28.9 TWh is 2.1 TWh higher than the 2030 Plan
27 production of 26.8 TWh. The higher production in 2031 relative to 2030 is primarily due to the
28 return of Pickering Unit 5 from refurbishment and impacts of unit uprates at Darlington as
29 summarized below:

- 30 • Higher production from Pickering Unit 5 return to service post-refurbishment in May 2031
31 (+1.9 TWh).

1 **2.3 Period-Over-Period Changes – Bridge Years**

2 **2026 Budget versus 2026 OEB-Approved**

3 The 2026 planned nuclear production of 32.5 TWh is 10.5 TWh higher than the 2026 OEB-
4 approved production of 21.9 TWh. The higher 2026 planned production is primarily due to a
5 combination of the following:

- 6 • Lower production at Darlington relative to OEB-approved due to Unit 3 planned outage
7 shifted from 2027 to 2026 and extended outage duration to conduct emergent work
8 associated with the SG PMSR (-4.8 TWh).
9 • Higher production at Darlington due to planned early return to service of Unit 4 resulting in
10 183.0 fewer refurbishment days (+3.9 TWh).
11 • Higher production at Pickering due to Pickering Units 5-8 extended operation from January
12 1, 2026 to September 30, 2026 (+11.4 TWh).

13
14 **2026 Budget versus 2025 Budget**

15 The 2026 planned nuclear production of 32.5 TWh is 4.4 TWh lower than the 2025 planned
16 nuclear production of 36.9 TWh. The lower 2026 planned production is primarily due to:

- 17 • Lower production at Pickering due to the planned shutdown of Units 5-8 on September 30,
18 2026 compared with entire year of production in 2025 (-4.4 TWh).

19
20 **2025 Budget versus 2025 OEB-Approved**

21 The 2025 planned nuclear production forecast of 36.9 TWh is 5.8 TWh higher than the 2025
22 OEB-approved production of 31.1 TWh. The higher 2025 planned production is primarily due
23 to:

- 24 • Higher production at Darlington due to:
25 ○ 107 fewer refurbishment days with Unit 1 having returned to service on November 27,
26 2024 versus OEB-approved assumption of April 18, 2025 (+2.2 TWh).
27 ○ 182.0 fewer PO days due to shifting the Unit 2 Turbine Controls scope from 2025 to
28 2027 (see Ex. E2-1-1, Section 3.0 for further discussion) (+3.8 TWh).
29 ○ 61 fewer post-refurbishment PO days attributed to Unit 3 (removal of 31-day post-
30 refurbishment PO) and Unit 1 (reduced post-refurbishment PO from 55 days to 25 days)
31 (+1.3 TWh). As a result of Unit 3's early return to service from refurbishment, a Unit 3

1 planned outage was shifted from 2027 into 2026, which eliminated the need for the Unit
2 3 post-refurbishment PO. Unit 1's reduced forecast for its post-refurbishment outage
3 reflects operating experience from successful operation of Darlington Units 2, 3, and 1
4 post-refurbishments to-date.

- 5
- 6 • Lower planned production at Pickering primarily due to 80.0 additional planned PO days
7 required to address Unit 6 equipment inspection and maintenance issues associated with
8 life extension to September 31, 2026, partially offset by 5.0 fewer Equipment Aging Outage
9 days (-0.8 TWh).
 - 10 • Production Settlement adjustment (-0.9 TWh)

11

12 **2025 Budget versus 2024 Actual**

13 The 2025 planned nuclear production of 36.9 TWh is 3.9 TWh higher than the 2024 production
14 of 33.0 TWh. The higher 2025 planned production is primarily due to:

- 15 • Higher planned production at Darlington (+9.4 TWh) due to:
 - 16 ○ 333 fewer refurbishment days (365 days in 2025 for Unit 4 compared to 698 days in
17 2024 for Units 1 and 4 combined);
 - 18 ○ 74 fewer PO days (25 days in 2025 planned production compared to 99 days in 2024);
19 and
 - 20 ○ 41.2 fewer FLR equivalent days (38.6 days in 2025 planned production compared to
21 79.8 days in 2024).
- 22 • Lower planned production at Pickering (-5.5 TWh) primarily due to Units 1 and 4 end of
23 commercial operations in 2024, with only Units 5-8 operating through 2025, partially offset
24 by 172.7 fewer PO days in 2025 (110.3 PO days in the 2025 planned production compared
25 to 283 PO days in 2024).

26

27 **2.4 Period-Over-Period Changes – Historical Years**

28 **2024 Actual versus 2024 OEB-Approved**

29 The 2024 actual nuclear production of 33.0 TWh is 1.1 TWh lower than the 2024 OEB-
30 approved production of 34.1 TWh. The lower 2024 production is primarily due to a combination
31 of the following:

- 1 • Lower production at Darlington due to 31.4 additional PO days in 2024 (86.4 days actual
2 compared to 55 days in OEB-approved) reflecting a Unit 2 PO that was shifted from 2023
3 to 2024 to support grid reliability and manage resource constraints during concurrent
4 nuclear outages (-0.7 TWh).
- 5 • Lower production at Darlington due to higher actual FLR of 12.1% compared to 6.0% OEB-
6 approved (-0.9 TWh), primarily due to the following forced outages
- 7 o 26.3 days to repair boiler tube leak in Unit 3;
8 o 4.4 days to address circulating cooling water pump issues on Unit 3;
9 o 32.7 days to address loss of excitation related issues on Unit 2; and
10 o 11.1 days to repair boiler feed water suction pipe leaks on Unit 1.
- 11 • Higher production at Darlington due to 35 fewer refurbishment days with Unit 1 available
12 for commercial operations on November 27, 2024 (698 days actual for Units 1 and 4
13 combined compared to 733 days in OEB-approved). This was driven by improvements in
14 refurbishment schedules based on implementing prior unit lessons learned (+0.7 TWh),
- 15 • Higher production at Darlington as no derates were required during installation of the
16 Bulkhead to isolate Unit 4 for refurbishment from the operating units as well as during the
17 removal of the Bulkhead while bringing Unit 1 from refurbishment (+0.8 TWh).
- 18 • Production Settlement adjustment (-0.7 TWh).

19

20 **2024 Actual versus 2023 Actual**

21 The 2024 nuclear production of 33.0 TWh is 3.1 TWh lower than the 2023 production of 36.1
22 TWh. The lower 2024 production is primarily due to lower production at Darlington (-3.0 TWh):

- 23 • 99 higher PO days (99 days in 2024 and no PO days in 2023);
24 • 69.3 higher FLR equivalent days (79.8 days in 2024 compared to 10.5 days in 2023); and
25 • 32 fewer refurbishment days (698 days in 2024 for Unit 1 and 4 combined compared to
26 730 days in 2023 for Units 1, 3, and 4 combined).

27

28 **2023 Actual versus 2023 OEB-Approved**

29 The 2023 actual nuclear production of 36.1 TWh is 4.9 TWh higher than the 2023 OEB-
30 approved production of 31.2 TWh. The higher 2023 production is primarily due to higher
31 production at Darlington:

- 1 • Higher production at Darlington due to 108 fewer days required for refurbishment of
2 Darlington units. Darlington Unit 3 was returned to service 166 days earlier than the OEB-
3 approved plan as a result of the incorporation of significant operating experience and
4 lessons learned from Unit 2 (+3.5 TWh). This was partially offset by the refurbishment of
5 Darlington Unit 4 being advanced by 58 days to start immediately after Unit 3's return to
6 service (-1.2 TWh).
- 7 • Higher production at Darlington due to fewer PO equivalent days, including a regular
8 planned outage (82.2 days) that was shifted from 2023 to 2024 to support grid reliability
9 and manage resource constraints during concurrent nuclear outages (+1.8 TWh).

10 11 **2023 Actual versus 2022 Actual**

12 The 2023 nuclear production of 36.1 TWh is 0.8 TWh higher than the 2022 production of 35.3
13 TWh. The higher 2023 production is primarily due to higher production at Darlington:

- 14 • Higher production at Darlington due to 45 fewer PO days in 2023 compared to 2022 (+0.9
15 TWh).
- 16 • Higher production at Darlington due to better FLR in 2023 compared to 2022 (+0.8 TWh).
- 17 • Lower production at Darlington due to 45 more refurbishment days at Darlington in 2023.
18 There were 730.0 refurbishment days in 2023 with Unit 1 under refurbishment throughout
19 the year (365 days) and Unit 4 refurbishment starting after Unit 3 returned to service. In
20 comparison, there were 685.0 refurbishment days in 2022 as Unit 1 refurbishment began
21 in February 2022 while Unit 3 refurbishment was already in progress (-0.9) TWh.

22 23 **2022 Actual versus 2022 OEB-Approved**

24 The nuclear production of 35.3 TWh in 2022 was 1.7 TWh higher than the 2022 OEB-approved
25 production of 33.6 TWh. The higher 2022 production is primarily due to a combination of the
26 following:

- 27 • Higher production at Darlington due primarily to:
 - 28 ○ 27.9 fewer PO days in 2022 compared to OEB-approved (+0.6 TWh);
 - 29 ○ Savings of 22.3 days as no derates were required during the installation of the
30 Bulkhead to isolate Unit 1 for refurbishment from the operating units. This was the result

1 of implementation of Enriched Boric Acid project,³ coupled with refurbishment schedule
2 optimization based on lessons learned changes in operating unit fueling strategy (+0.5
3 TWh).

- 4 • Lower production at Darlington due to 40.6 more FLR equivalent days. Darlington's actual
5 FLR was 7.5% versus 2022 OEB-approved of 2.1% (-0.8 TWh).
- 6 • Higher production at Pickering primarily due to 93.4 fewer PO days where regular PO were
7 completed ahead of schedule with more efficient outage execution. One PO started later
8 and was completed in early 2023 to mitigate execution overlap challenges of parallel
9 execution of VBO (+1.2 TWh).

10 11 **2022 Actual versus 2021 Actual**

12 The 2022 nuclear production of 35.3 TWh is 4.3 TWh lower than the 2021 production of 39.6
13 TWh. The lower 2022 production is primarily due to a combination of the following:

- 14 • Lower production at Darlington due to 320.0 more refurbishment days in 2022. There were
15 365.0 refurbishment days in 2021 for Unit 3 compared with 685.0 refurbishment days in
16 2022 for Unit 3 during the entire year and Unit 1 refurbishment beginning in February (-6.7
17 TWh).
- 18 • Higher production at Darlington primarily due to 110.4 fewer PO days required in 2022
19 compared with 2021 (+2.3 TWh).

20 21 **2021 Actual versus 2021 OEB-Approved**

22 The 2021 nuclear production of 39.6 TWh was 4.2 TWh higher than the 2021 OEB-approved
23 production of 35.4 TWh. The higher 2021 production is primarily due to a combination of the
24 following:

- 25 • Higher production at Darlington due to 200.0 fewer refurbishment days. The OEB-approved
26 production forecast reflected a six-month period when two units would be refurbished in
27 parallel. Following revisions to the DRP schedule, this overlap began February 15, 2022
28 when Unit 1 began its refurbishment as opposed to June 15, 2021 (+4.2 TWh).

³ The implementation of the Enriched Boric Acid project improves fueling reliability, allowing OPG to do longer maintenance windows on the fueling machine while a unit is operating.

- 1 • Lower production at Darlington due to 104.3 higher PO days. The OEB-approved
2 production forecast reflected a post-refurbishment outage and a primary heat transport
3 pump motor replacement mini outage, and no regular POs. In comparison, the 2021 Actual
4 had two regular POs with 155.5 days. As a result of the revised DRP schedule, OPG had
5 to move a Darlington Unit 1 outage from 2020 to 2021 and also add a PO in 2021 to support
6 Unit 4 operation until its start of refurbishment (-2.2 TWh).
- 7 • Higher production at Pickering due to 227.3 fewer PO days. The Pickering VBO was moved
8 to 2022 following Canadian Nuclear Safety Commission approval, accounting for 120.0
9 fewer PO days required at Pickering (+1.5 TWh).
- 10 • Higher production at Pickering due to the number of POs at Pickering being reduced from
11 three to two due to the transition from a 24-month to a 30-month outage cycle (+1.3 TWh).

12 13 **2021 Actual versus 2020 Actual**

14 The 2021 nuclear production of 39.6 TWh is 4.3 TWh lower than the 2020 production of 43.9
15 TWh. The lower 2021 production is primarily due to a combination of the following:

- 16 • Lower production at Darlington primarily due to:
 - 17 ○ 122.5 higher PO days for 2021 (155.5 PO days) compared to 2020 (33 PO days) (-2.6
18 TWh).
 - 19 ○ 90 higher Darlington refurbishment days for 2021. Unit 3 was undergoing refurbishment
20 for the entire 2021 compared with 275 refurbishment days in 2020 as Unit 2 completed
21 refurbishment on June 4, 2020 and Unit 3 commenced refurbishment on September 3,
22 2020 (-1.9 TWh).
- 23 • Higher production at Pickering due to 114.6 fewer PO days for 2021 (335.5 PO days)
24 compared with 2020 (450 PO days) (+1.4 TWh). This was partly offset by lower production
25 at Pickering due to higher actual FLR for 2021 at 6.2% compared with 2020 FLR of 2.7%
26 (-0.9 TWh).

27 28 **2020 Actual versus 2020 OEB-Approved**

29 The 2020 nuclear production of 43.9 TWh is 6.6 TWh higher than the 2020 OEB-approved
30 production of 37.4 TWh. The higher 2020 production is primarily due to higher production at
31 Darlington:

- 1 • Higher production at Darlington due to 91.1 fewer refurbishment days. In the 2020 OEB-
2 approved production forecast, there was no gap between Unit 2 and Unit 3 refurbishments.
3 Following revisions to the DRP schedule in response to the COVID-19 pandemic, there
4 was a two-month gap between the return to service of Unit 2 and the start of the
5 refurbishment of Unit 3 (+1.9 TWh).
- 6 • Higher production at Darlington due to the primary heat transport pump motor replacement
7 mini outage included in EB-2016-0152 was cancelled as the work was completed in a prior
8 year (+0.8 TWh).
- 9 • Higher production at Darlington from 150.2 fewer PO days due to a combination of the
10 following:
 - 11 ○ The later return to service date for Unit 2 necessitated revisions to the outage schedule,
12 which resulted in the rescheduling of the first Unit 2 post-refurbishment outage from
13 2020 to 2021 (+1.3 TWh); and
 - 14 ○ The shifting of the Unit 1 PO from September 2020 to February 2021 (+1.9 TWh);
 - 15 ○ Partly offset by a regulatory requirement to perform a single fuel channel replacement
16 outage in advance of the Unit 3 refurbishment (-0.7 TWh).

18 **3.0 DNNP FACILITIES**

19 **3.1 Overview**

20 The first of four DNNP facilities' units is planned to be commercially available and generating
21 starting in October 2030. Prior to this, there is no planned generation for the DNNP facilities.
22 As such, there are no period-over-period comparison available for the historical or bridge
23 years.

25 **3.2 Period-Over-Period Changes – IR Term**

26 **2027 Plan versus 2026 OEB-Approved**

27 There is no planned production from the DNNP facilities during this timeframe.

29 **2028 Plan versus 2027 Plan**

30 There is no planned production from the DNNP facilities during this timeframe.

1 **2029 Plan versus 2028 Plan**

2 There is no planned production from the DNNP facilities during this timeframe.

3

4 **2030 Plan versus 2029 Plan**

5 The 2030 DNNP facilities production forecast includes 0.5 TWh as DNNP facilities Unit 1 is
6 planned to enter commercial operations in October 2030. There is no planned production
7 during 2029 for the DNNP facilities.

8

9 **2031 Plan versus 2030 Plan**

10 The 2031 DNNP facilities production of 1.9 TWh is 1.4 TWh higher than 2030 Plan production
11 of 0.5 TWh.

- 12 • There is higher production forecasted in 2031 with DNNP facilities' Unit 1 operating for a
13 full year. This production increase is partly offset by the first PO at the DNNP facilities'
14 Unit 1 as well as the warranty outage, both scheduled in 2031.

Table 1a
 Comparison of Production Forecast - Combined Nuclear

Line No.	Business Unit	2020		2020		2021		2021		2022		2022	
		OEB Approved ²	(c)-(a) Change	Actual	(g)-(c) Change	OEB Approved ²	(g)-(e) Change	Actual	(k)-(g) Change	OEB Approved ³	(k)-(i) Change	Actual	(k)
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	
Darlington NGS													
1	TWh	17.7	5.7	23.4	(4.9)	16.6	1.9	18.5	(4.6)	13.4	0.5	13.9	
2	Unit Capability Factor (%)	79.4	13.7	93.1	(10.4)	90.9	(8.3)	82.7	4.3	85.8	1.2	87.0	
3	PO Days ^{1,2}	183.2	(150.2)	33.0	122.5	51.2	104.3	155.5	(110.4)	73.0	(27.9)	45.1	
4	Refurb PO Days	366.0	(91.1)	274.9	90.1	565.0	(200.0)	365.0	320.0	685.0	0.0	685.0	
5	FEPO Days	0.0	1.3	1.3	(1.3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	FLR (%)	4.2	(2.6)	1.5	2.0	3.0	0.5	3.5	4.0	2.1	5.4	7.5	
7	FLR Days Equivalent	38.1	(20.4)	17.7	15.3	25.0	8.1	33.0	22.0	14.4	40.6	55.0	
Pickering NGS													
8	TWh	19.6	0.9	20.5	0.6	18.8	2.3	21.1	0.3	19.8	1.6	21.4	
9	Unit Capability Factor (%)	73.4	2.8	76.3	2.7	70.6	8.3	78.9	1.1	74.1	5.9	80.0	
10	PO Days ²	498.9	(48.9)	450.0	(114.6)	562.8	(227.3)	335.5	58.3	487.2	(93.4)	393.8	
11	Refurb PO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	FEPO Days	0.0	13.0	13.0	(13.0)	0.0	0.0	0.0	1.1	0.0	1.1	1.1	
13	FLR (%)	5.0	(2.3)	2.7	3.6	5.0	1.2	6.2	(4.4)	3.5	(1.7)	1.8	
14	FLR Days Equivalent	84.9	(39.2)	45.6	69.1	81.4	33.4	114.7	(82.4)	58.9	(26.5)	32.3	
OPG Nuclear Facilities Totals													
15	Unit Capability Factor (%)	76.2	8.3	84.5	(3.8)	79.0	1.6	80.7	2.0	78.5	4.2	82.7	
16	PO Days ^{1,2}	682.1	(199.1)	483.0	7.9	614.0	(123.1)	491.0	(52.1)	560.2	(121.3)	438.9	
17	FEPO Days	0.0	14.3	14.3	(14.3)	0.0	0.0	0.0	1.1	0.0	1.1	1.1	
18	FLR (%)	4.6	(2.5)	2.1	2.9	4.0	0.9	5.0	(0.8)	2.9	1.3	4.2	
19	FLR Days Equivalent	122.9	(59.6)	63.3	84.4	106.3	41.4	147.7	(60.4)	73.2	14.1	87.3	
20	TWh before Adjustments	37.4	6.6	43.9	(4.3)	35.4	4.2	39.6	(4.3)	33.2	2.1	35.3	
21	OEB/Settlement Adjustments ⁴	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	(0.4)	0.0	
22	TWh including Adjustments	37.4	6.6	43.9	(4.3)	35.4	4.2	39.6	(4.3)	33.6	1.7	35.3	
DNNP Facilities													
23	TWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	Unit Capability Factor (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25	PO Days ²	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27	FLR (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28	FLR Days Equivalent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29	Total TWh Including Adjustments	37.4	6.6	43.9	(4.3)	35.4	4.2	39.6	(4.3)	33.6	1.7	35.3	

Line No.	Business Unit	2022		2023		2023		2024		2024		2025	
		Actual	(e)-(a) Change	OEB Approved ²	(e)-(c) Change	Actual	(i)-(e) Change	OEB Approved ²	(i)-(g) Change	Actual	(k)-(i) Change	Budget	(k)
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	
Darlington NGS													
30	TWh	13.9	0.7	9.6	5.0	14.6	(3.0)	12.0	(0.3)	11.7	9.4	21.1	
31	Unit Capability Factor (%)	87.0	10.0	78.1	18.9	97.0	(22.4)	81.8	(7.2)	74.6	19.6	94.2	
32	PO Days ^{1,2}	45.1	(45.1)	112.2	(112.2)	0.0	99.0	55.0	44.0	99.0	(74.0)	25.0	
33	Refurb PO Days	685.0	45.0	838.0	(108.0)	730.0	(32.0)	733.0	(35.0)	698.0	(333.0)	365.0	
34	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
35	FLR (%)	7.5	(6.1)	1.2	0.2	1.4	10.6	6.0	6.1	12.1	(8.5)	3.8	
36	FLR Days Equivalent	55.0	(44.5)	5.9	4.6	10.5	69.3	38.0	41.8	79.8	(41.2)	38.6	
Pickering NGS													
37	TWh	21.4	0.1	21.2	0.3	21.5	(0.2)	21.4	(0.1)	21.3	(5.5)	15.8	
38	Unit Capability Factor (%)	80.0	0.6	79.4	1.3	80.7	2.6	83.3	(0.0)	83.3	5.8	89.1	
39	PO Days ²	393.8	(38.2)	371.1	(15.5)	355.6	(72.6)	270.2	12.8	283.0	(172.7)	110.3	
40	Refurb PO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
41	FEPO Days	1.1	0.9	0.0	2.0	2.0	(2.0)	0.0	0.0	0.0	0.0	0.0	
42	FLR (%)	1.8	1.0	3.5	(0.7)	2.8	(0.2)	3.5	(0.9)	2.6	0.9	3.5	
43	FLR Days Equivalent	32.3	18.1	63.1	(12.6)	50.5	(4.4)	66.8	(20.7)	46.1	1.1	47.2	
OPG Nuclear Facilities Totals													
44	Unit Capability Factor (%)	82.7	4.0	79.0	7.7	86.7	(6.8)	82.8	(2.9)	79.9	12.1	92.0	
45	PO Days ^{1,2}	438.9	(83.3)	483.3	(127.7)	355.6	26.4	325.2	56.8	382.0	(246.7)	135.3	
46	FEPO Days	1.1	0.9	0.0	2.0	2.0	(2.0)	0.0	0.0	0.0	0.0	0.0	
47	FLR (%)	4.2	(1.9)	2.8	(0.6)	2.2	4.0	4.4	1.8	6.3	(2.7)	3.8	
48	FLR Days Equivalent	87.3	(26.4)	69.0	(8.0)	61.0	64.9	104.8	21.1	125.9	(40.1)	85.8	
49	TWh before Adjustments	35.3	0.8	30.8	5.3	36.1	(3.1)	33.4	(0.4)	33.0	3.9	36.9	
50	OEB/Settlement Adjustments ⁴	0.0	0.0	0.4	(0.4)	0.0	0.0	0.7	(0.7)	0.0	0.0	0.0	
51	TWh including Adjustments	35.3	0.8	31.2	4.9	36.1	(3.1)	34.1	(1.1)	33.0	3.9	36.9	
DNNP Facilities													
52	TWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
53	Unit Capability Factor (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
54	PO Days ²	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
55	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
56	FLR (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
57	FLR Days Equivalent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
58	Total TWh Including Adjustments	35.3	0.8	31.2	4.9	36.1	(3.1)	34.1	(1.1)	33.0	3.9	36.9	

Notes:

- PO days excludes planned outage days for units out of service during refurbishment.
- PO days excludes planned outage equivalent days for planned derating of units or staggered unit shutdown.
- OEB Approved amounts are per EB-2016-0152, Ex. E2-1-2, Table 1, and approved in the Decision and Order, pp. 11-13.
- Production Settlement Adjustment Amounts per OPG Settlement Proposal, Filed 20210716, Table 17 - 2022-2026 Settled Production Forecast (TWh), p. 25.

Table 1b
 Comparison of Production Forecast - Combined Nuclear

Line No.	Business Unit	2025		2025		2026		2026		2027		2028	
		OEB Approved ⁴	(c)-(a) Change	Budget	(g)-(c) Change	OEB Approved ⁴	(g)-(e) Change	Budget	(i)-(g) Change	Plan	(k)-(i) Change	Plan	(k)
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	
Darlington NGS													
1	TWh	13.5	7.5	21.1	(0.0)	21.5	(0.4)	21.1	(2.4)	18.7	8.0	26.7	
2	Unit Capability Factor (%)	68.2	26.0	94.2	(18.2)	89.4	(13.4)	76.0	(13.1)	62.9	25.7	88.6	
3	PO Days ^{1,2}	268.0	(243.0)	25.0	261.7	59.1	227.6	286.7	226.0	512.7	(371.2)	141.5	
4	Refurb PO Days	472.0	(107.0)	365.0	(260.0)	288.0	(183.0)	105.0	(105.0)	0.0	0.0	0.0	
5	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	FLR (%)	6.4	(2.8)	3.6	(0.1)	4.3	(0.7)	3.5	(0.6)	2.9	(0.7)	2.2	
7	FLR Days Equivalent	46.2	(7.6)	38.6	(0.9)	46.8	(9.1)	37.7	(10.4)	27.3	1.5	28.9	
Pickering NGS													
8	TWh	16.6	(0.8)	15.8	(4.4)	0.0	11.4	11.4	(11.4)	0.0	0.0	0.0	
9	Unit Capability Factor (%)	93.2	(4.1)	89.1	(2.1)	0.0	87.1	87.1	(87.1)	0.0	0.0	0.0	
10	PO Days ^{3,3}	35.0	75.3	110.3	0.5	0.0	110.8	110.8	(110.8)	0.0	0.0	0.0	
11	Refurb PO Days	0.0	0.0	0.0	368.0	0.0	368.0	368.0	1,092.0	1,460.0	4.0	1,464.0	
12	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	FLR (%)	3.5	0.0	3.5	(0.0)	0.0	3.5	3.5	(3.5)	0.0	0.0	0.0	
14	FLR Days Equivalent	49.4	(2.1)	47.2	(12.9)	0.0	34.3	34.3	(34.3)	0.0	0.0	0.0	
OPG Nuclear Facilities Totals													
15	Unit Capability Factor (%)	79.7	12.3	92.0	(12.5)	89.4	(9.9)	79.5	(16.6)	62.9	25.7	88.6	
16	PO Days ^{1,2}	303.0	(167.7)	135.3	262.2	59.1	338.4	397.5	115.2	512.7	(371.2)	141.5	
17	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	FLR (%)	5.0	(1.4)	3.6	(0.0)	4.3	(0.8)	3.5	(0.6)	2.9	(0.7)	2.2	
19	FLR Days Equivalent	95.6	(9.8)	85.8	(13.8)	46.8	25.2	72.0	(44.7)	27.3	1.5	28.9	
20	TWh before Adjustments	30.2	6.7	36.9	(4.4)	21.5	10.9	32.5	(13.8)	18.7	8.0	26.7	
21	OEB/Settlement Adjustments ⁴	0.9	(0.9)	0.0	0.0	0.4	(0.4)	0.0	0.0	0.0	0.0	0.0	
22	TWh including Adjustments	31.1	5.8	36.9	(4.4)	21.9	10.5	32.5	(13.8)	18.7	8.0	26.7	
DNNP Facilities													
23	TWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	Unit Capability Factor (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25	PO Days ²	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27	FLR (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28	FLR Days Equivalent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29	Total TWh Including Adjustments	31.1	5.8	36.9	(4.4)	21.9	10.5	32.5	(13.8)	18.7	8.0	26.7	

Line No.	Business Unit	2028		2029		2030		2031	
		Plan	(c)-(a) Change	Plan	(e)-(c) Change	Plan	(g)-(e) Change	Plan	(g)
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	
Darlington NGS									
30	TWh	26.7	(1.6)	25.1	1.8	26.8	0.3	27.1	
31	Unit Capability Factor (%)	88.6	(5.1)	83.5	5.1	88.6	0.1	88.7	
32	PO Days ^{1,2}	141.5	72.7	214.1	(74.9)	139.2	0.0	139.2	
33	Refurb PO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
34	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
35	FLR (%)	2.2	(0.2)	2.0	(0.0)	2.0	0.0	2.0	
36	FLR Days Equivalent	28.9	(4.0)	24.9	1.5	26.4	0.0	26.4	
Pickering NGS									
37	TWh	0.0	0.0	0.0	0.0	0.0	1.9	1.9	
38	Unit Capability Factor (%)	0.0	0.0	0.0	0.0	0.0	67.0	67.0	
39	PO Days ^{3,3}	0.0	0.0	0.0	0.0	0.0	55.0	55.0	
40	Refurb PO Days	1,464.0	(4.0)	1,460.0	0.0	1,460.0	(230.0)	1,230.0	
41	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
42	FLR (%)	0.0	0.0	0.0	0.0	0.0	12.0	12.0	
43	FLR Days Equivalent	0.0	0.0	0.0	0.0	0.0	21.0	21.0	
OPG Nuclear Facilities Totals									
44	Unit Capability Factor (%)	88.6	(5.1)	83.5	5.1	88.6	(2.8)	85.8	
45	PO Days ^{1,2}	141.5	72.7	214.1	(74.9)	139.2	55.0	194.2	
46	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
47	FLR (%)	2.2	(0.2)	2.0	0.2	2.2	1.2	3.4	
48	FLR Days Equivalent	28.9	(4.0)	24.9	1.5	26.4	21.0	47.4	
49	TWh	26.7	(1.6)	25.1	1.8	26.8	2.1	28.9	
DNNP Facilities									
50	TWh	0.0	0.0	0.0	0.5	0.5	1.4	1.9	
51	Unit Capability Factor (%)	0.0	0.0	0.0	88.0	88.0	(15.3)	72.7	
52	PO Days ²	0.0	0.0	0.0	0.0	0.0	64.9	64.9	
53	FEPO Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
54	FLR (%)	0.0	0.0	0.0	12.0	12.0	(6.0)	6.0	
55	FLR Days Equivalent	0.0	0.0	0.0	9.1	9.1	25.2	34.3	
56	Total TWh Including Adjustments	26.7	(1.6)	25.1	2.3	27.3	3.6	30.9	

Notes:

- 1 PO days excludes planned outage days for units out of service during refurbishment.
- 2 PO days excludes planned outage equivalent days for planned derating of units or staggered unit shutdown.
- 3 PO days includes staggered shutdown days
- 4 OEB Approved amounts are per EB-2016-0152, Ex. E2-1-2, Table 1, and approved in the Decision and Order, pp. 11-13.
- 5 Production Settlement Adjustment Amounts per OPG Settlement Proposal, Filed 20210716, Table 17 - 2022-2026 Settled Production Forecast (TWh), p. 25.