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Pickering nuke plant extension to cost \$307M, may prove ‘uneconomical’: OPG

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The plan to keep the province's oldest nuclear power plant humming until 2024 is being budgeted to cost more than \$300 million, yet Ontario Power Generation is hedging in case sticker shock strikes, according to recent financial filings.



Energy Minister Bob Chiarelli and OPG President Jeff Lyash at the Darlington nuclear power plant in January, 2016. The Pickering extension plan was announced the same day. (Geoff Zochodne/QP Briefing)

The Liberal government [said in January](#) it had approved OPG's pursuit of another four years of operation for the Pickering station, from 2020 to 2024. The provincially-owned power company is performing "component condition assessments" to determine what work must be done - or if the plan is even practical.

“There is a risk that the station’s extended operation to 2024 may be determined to be uneconomical to pursue,” stated OPG's [first-quarter financial results](#), which were released last Friday.

Nuclear projects in the province also have a history of running over-budget, including work done at the Pickering plant. The price of restarting two mothballed reactors at the station earlier this century [was \\$2.6 billion](#), after it was initially estimated that it would cost \$1.3 billion to put four of the units back in service.

Environmental advocates have pointed out the Pickering facility, just east of Toronto, is no spring chicken. The province's [most recent long-term energy plan](#) expected the station to operate until 2020, and even allowed for an earlier shutdown; OPG says the 2020 date was built around conservative estimates, and that there's an opportunity for a longer life.

A recent inspection also found issues with two of the 12 steam generators in the plant's Unit 4. The reactor had been taken offline in January for scheduled maintenance, and was anticipated to return to service on Friday, although it had not as of that afternoon.

Meanwhile, the work required to grant Pickering a stay of decommissioning is expected to cost \$307 million, OPG says. That does not include the daily costs of running the facility.

"We have estimated additional funding of \$307 million from 2016-2020 over and above normal operating costs, to enable extended operations to 2024," said OPG spokesman **Neal Kelly** in an email.

The Pickering plant provides about 13 per cent of Ontario's electricity while producing little to no greenhouse gas emissions – indeed, extending its life could contribute to the Liberal government meeting its climate change goals. And while Environment and Climate Change Minister **Glen Murray** [has been pilloried by the Progressive Conservatives](#) for seemingly questioning whether nuclear would be needed later this century, Premier **Kathleen Wynne** has reiterated that the power source is part of the government's long-term energy plan.

A spokesperson for Energy Minister **Bob Chiarelli** said the government has "no reason to believe that it will be uneconomical to move forward with continued operations at Pickering."

"In January, we approved OPG's plan to seek regulatory approvals for ongoing operation of Pickering up to 2024," said **Dan Moulton** in an email. "OPG is in the process of completing confirmatory work and engage with the Canadian Nuclear Safety Commission and the Ontario Energy Board to seek approvals. OPG will seek final government approval to proceed after these activities have been completed."

However, there are concerns about the staying power of the aging Pickering plant. Four of its reactors began producing electricity in the early 1970s, and two of its eight units have been shut down since 1997.

In the foreword to a March, 2016, report arguing for the immediate decommissioning of the plant, [the Ontario Clean Air Alliance said](#) Pickering “is operating beyond its original ‘design lifetime’ which came to a close in 2015.

“In other words, systems are being pushed past the operational period for which they were originally designed despite the materials problems caused by the intensely inhospitable environment inside the reactor cores that have taken their toll over years of operation,” added the group.

But OPG has faith in its plan: “OPG is still confident that extending Pickering operations to 2024 is safe, technically feasible and will be economic,” said Kelly.

Greenpeace senior energy analyst **Shawn-Patrick Stensil** told *QP Briefing* that the “only way Pickering can continue operating is if the Wynne government and the federal nuclear regulator [Canadian Nuclear Safety Commission] allow OPG to forgo needed safety upgrades and inspections.”

“Keeping Pickering running is not only dangerous but a huge waste of money,” Stensil added. “The government rubber-stamped running these reactors without full cost estimates from OPG and knowing full well the station is the cause of ongoing surplus generation.”

OPG and the province – the company’s sole shareholder – are backing a plan to run all six of Pickering’s operating reactors until 2022, when two units would shut down and four would continue pumping out power to 2024. Doing so, they say, would save electricity customers up to \$600 million, prevent eight million tonnes in greenhouse gas emissions, and save 4,500 jobs in Durham Region.

Under Wynne's watch, the province has also committed to a \$12.8-billion refurbishment of OPG’s Darlington nuclear plant – which begins later this year – and a \$13-billion rebuild by Bruce Power at the facility it leases from OPG (with the latter project's upfront costs to be borne by Bruce Power, recouped through the electricity rates it receives). Keeping Pickering running longer would bridge the gap in base-load electricity during those overhauls, OPG says.

A case for keeping Pickering open past 2020 started to come into focus last year, including [arguments made by the Power Workers’ Union](#) (whose members work at

the facility)), stating that a life-extension for the plant was a lower-cost option that could plug the hole in base electricity supply.

There are no guarantees OPG will receive regulatory approval from the Canadian Nuclear Safety Commission to operate the Pickering facility past 2018, when the current licence expires. The same goes for the Ontario Energy Board, which sets electricity rates and establishes what costs are eligible to be recovered. OPG said in its first-quarter filing that it is aiming to file a five-year rate application with the OEB this quarter.

In answering questions about electricity rates, the energy minister said last week that the government is “assuming” the Pickering life-extension plan will be approved, “but we can’t 100 per cent assume that at this point.”

Chiarelli told *QP Briefing in March* that OPG will ask the government for a "final" approval for the Pickering extension after all the regulatory hurdles have been cleared. "There's a fairly high confidence level, but we don't certainly take it for granted," said the energy minister.

6. Both PWU and CME noted the recent announcement by the Minister of Energy supporting a plan to extend the life of Pickering units. PWU suggested it would be helpful to know how this announcement affects the EOL dates assumed in OPG's application and OPG's preliminary assessment of revenue requirement impact. This suggestion should not be accepted by the Board and disclosure should not be required in this respect.
7. The station EOL changes giving rise to OPG's application are unrelated to the Minister's announcement. The changes giving rise to station EOL changes in this application arise from changes effective December 31, 2015 as a result of confirmation in 2015 of high confidence that all four Pickering units 5-8 are expected to operate until at least the end of 2020. The Minister's announcement occurred subsequent to December 31, 2015 and is related to a different circumstance and project that is yet to yield a high confidence result. The impact of the Minister's announcement will be considered in the context of OPG's next payment amounts application.

This was part of a February, 2016, submission by OPG to the OEB.

OPG stated in a February, 2016, filing to the OEB that the Pickering life-extension plan is “a project that is yet to yield a high confidence result.” The company said in its most recent financial statements that it is still doing assessments to figure out what work needs to be done to keep the plant running to 2024. Initially, Pickering was slated to operate until 2020, but OPG says it must also do more technical work to back that up.

Furthermore, an April, 2016, status report from the Canadian Nuclear Safety Commission (CNSC) says an inspection conducted during a planned maintenance

outage of the plant's Unit 4 reactor “showed significant steam generator tube thinning in a number of tubes since the last outage inspections in Steam Generators 11 and 12, winter 2014 and fall 2011 respectively.”

1.4 Pickering
Operational Status
Unit 1 is at Full Power.
Unit 2 is in a Safe Storage State.
Unit 3 is in a Safe Storage State.
Unit 4 is in a Planned Maintenance Outage.
Unit 5 is at Full Power.
Unit 6 is at Full Power.
Unit 7 is at Full Power.
Unit 8 is in a Planned Maintenance Outage.
Licensing
Power reactor operating licence expires on August 31, 2018.
Comments
Unit 4 Planned Maintenance Outage commenced January 7, 2016. The return to service date is currently scheduled for April, 2016.
Unit 8 Planned Maintenance Outage commenced March 1, 2016. The return to service date is currently scheduled for June 2, 2016.
Event Notifications and Updates
During the Unit 4 Planned Maintenance Outage, the periodic inspection of the steam generators showed significant steam generator tube thinning in a number of tubes since the last outage inspections in Steam Generators 11 and 12, winter 2014 and fall 2011 respectively. There are a total of 12 steam generators in Unit 4. The extent of condition carried out by OPG did not show the same tube thinning in the rest of the steam generators. OPG conducted a root cause assessment to determine the thinning mechanism and is working on a return to service plan. The return to service date will depend on the resolution of this issue. CNSC staff must review and approve the disposition of the steam generator tubes prior to the unit returning to service. Presently, Unit 4 is not expected to return to service before mid-April.

A page from an April CNSC report on the status of nuclear reactors in Canada.

“The extent of condition carried out by OPG did not show the same tube thinning in the rest of the steam generators,” added the report. “OPG conducted a root cause assessment to determine the thinning mechanism and is working on a return to service plan.”

At an April 7 public meeting, CNSC president **Michael Binder** asked if the tube thinning would affect the Pickering life-extension plan. An OPG official responded that “we clearly have to address this issue,” but that it doesn’t affect the unit’s operation. The issue, the CNSC was told, was “chemistry related.” The OPG official said they were taking action.

THE PRESIDENT: Just a final question on that one. I understand that you are asking for an extension of life for Pickering to 2024. So this thinning will not put this idea in danger?

MR. KOUTSCH: Mark Koutsch for the record.

We clearly have to address this issue.

Right now it doesn't affect the operation of the unit, but if we -- we have to mitigate to keep as many boiler tubes in service as possible and that's what we're working towards.

Pickering’s 500-megawatt Unit 4 had been out of service since Jan. 7, for the aforementioned planned maintenance. Kelly told *QP Briefing* earlier in May that the unit had been refurbished in the early 2000's, making it one of the plant's newer units, but that all outages are unique.

Kelly said OPG had decided to widen the scope of its work during the maintenance outage because of the lower demand for electricity at this point in the year.

The CNSC said it wouldn't come back online before mid-April, and OPG was expecting it to be up and running for Friday, although it was not in service as of that afternoon.