



Office of the Treasury Board

Ontario Fair Hydro Plan

Analysis of Financial Models and Risks

April 2017

Purpose



- In March 2017, the government approved and announced the Ontario Fair Hydro Plan (OFHP), which committed to lowering electricity bills by 25% for the typical residential customer and holding rate increases to the rate of inflation for four years.
 - In addition to residential customers, small businesses and farms would also benefit from the initiative (approximately 90% of all customers).
- On April 12, 2017, Treasury Board Secretariat received two models:
 - The model the Ministry of Energy developed and used to support the March submission; and
 - The financial model that was developed by the Ontario Power Generation (OPG) that provides details regarding the financing of the proposed structure.
- The models received are based on high level aggregates and do not allow for running different scenarios that would allow TBS to determine the financial impact of potential changes in variables. In discussions with the Ministry of Energy and OPG, it has been agreed that these scenarios must be developed – both to help creation of a risk-based outlook for the province, as well as to respond to questions that will inevitably arise from the credit rating agencies.
 - Given the current focus on the legislative pieces, the scenarios will be done in the coming weeks.
- Hence this deck focusses on risks without providing \$ impacts, and is intended to support ongoing discussions by highlighting factors as the legislation and regulations are drafted, and the initiative is implemented.

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Ontario Fair Hydro Plan: How does it work?

- Overview of the model
- The Model: Phases
- The Model: Key assumptions

2

What are the risks and implications?

- Risks/sensitivities
- Next Steps: Scenario Testing

3

Key Considerations and Risk Mitigation Strategies

- Options through Phases
- Monitoring & Early Warning Indicators

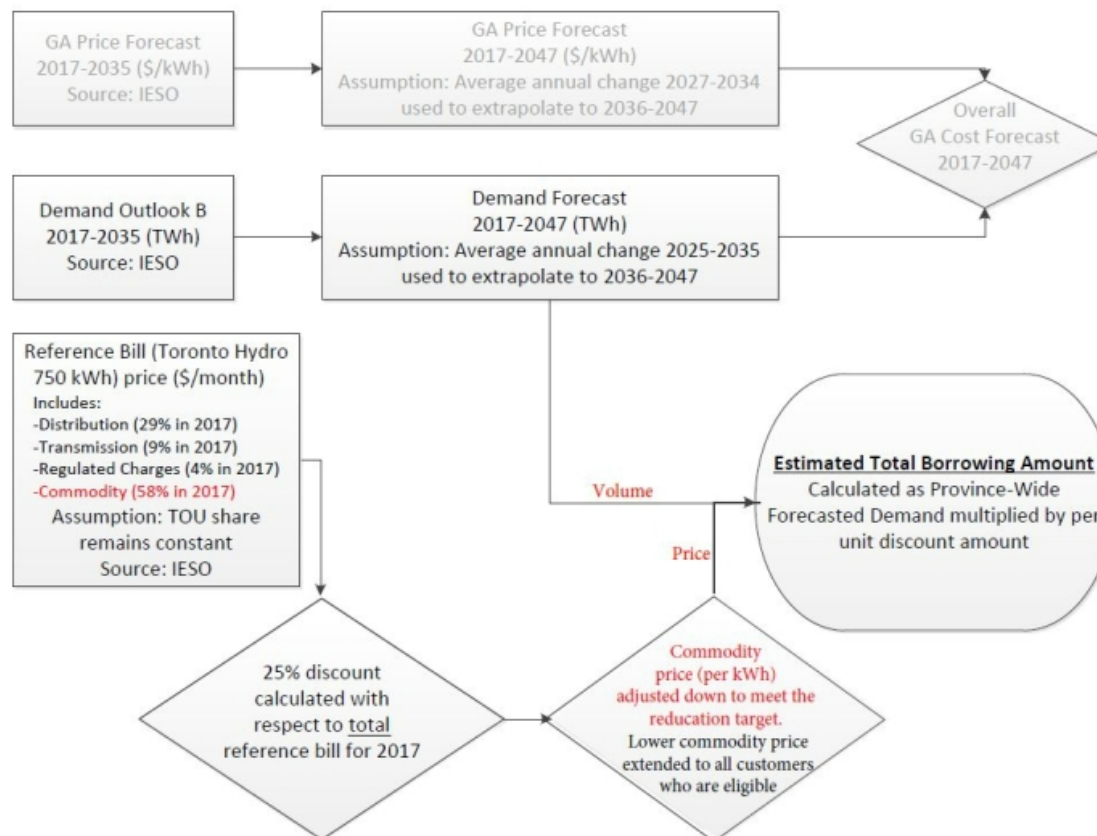
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Ontario Fair Hydro Plan

- Overview of the model
- The Model: Phases
- The Model: Key assumptions

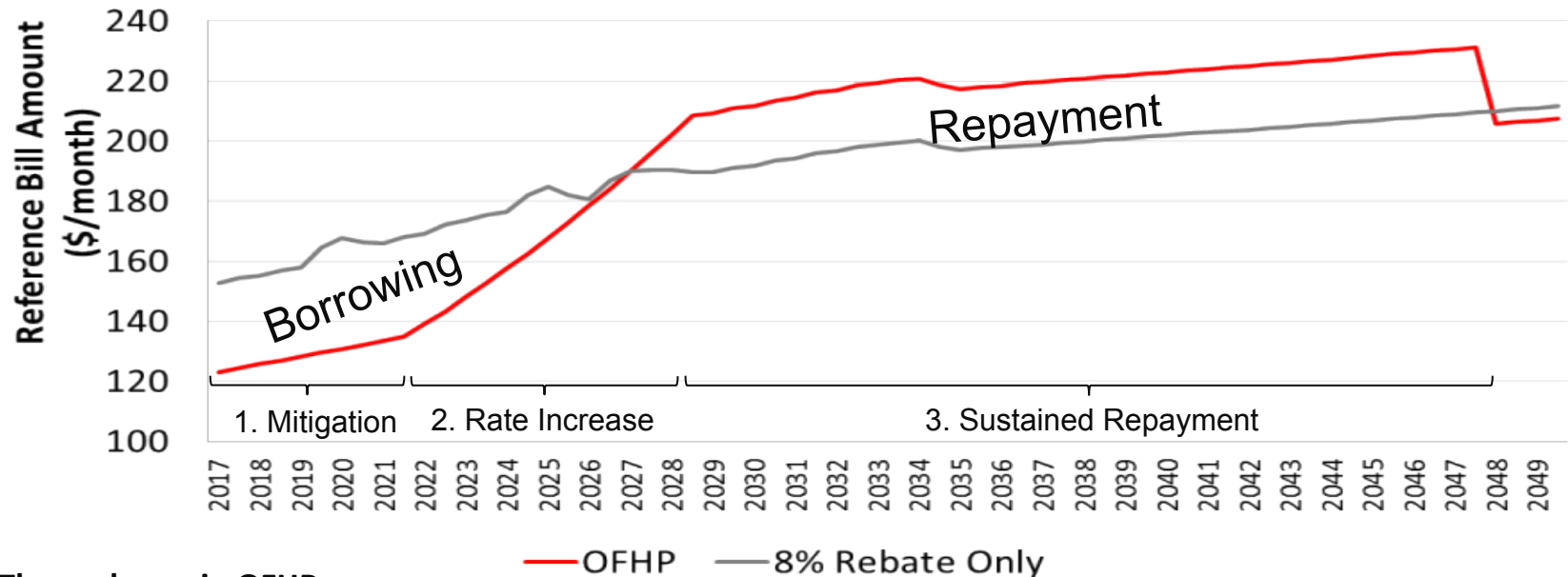
Ontario Fair Hydro Plan: Construct

- Through refinancing of the Global Adjustment (GA), which provides immediate rate relief by spreading the cost of electricity investments over a longer period of time, the OFHP reduces electricity bills by 25% for the typical residential customer in 2017, and holds rate increases to 2% (the expected rate of inflation).



Ontario Fair Hydro Plan: Phases

- OFHP can be thought of as having three phases:



Three phases in OFHP:

Phase 1: Mitigation

- 2017 bill set 25% lower than original projection (that did not include 8% HST rebate)
- Increase in bill capped to 2% per year until 2021

Phase 2: Rate Increase

- Bill **increases 6.3% each year** to avoid exceeding borrowing limit of \$28B
- Planned increases end in 2028 when sustained repayment starts

Phase 3: Sustained Repayment

- Bill remains **10.4% higher** than projected with 8% rebate until 2047
- Difference represents financing repayment
- Total interest paid: **\$26.2B**

Ontario Fair Hydro Plan: Key Assumptions



- The model is a high level and aggregate model, which is build on other independent forecasts (e.g. IESO demand forecast). There are a large number of assumptions built into the model explicitly and implicitly (as a large number of assumptions are embedded into the other forecasts that are used as inputs into this model).
- These variables can be bucketed into three groups (variables in red have significant impact):

Exogenous Variables

- Interest Rates
- USD/CAD Exchange Rate
- Debt ceiling of \$28B (borrowing limit 10% of bill)
- Natural Gas Prices

Policy Parameters

- Use of Toronto Hydro Customer @ 750 kWh as the reference bill
- 25% bill reduction in 2017
- Bill increase capped at CPI annually until 2021
- Rate increase accelerate starting in 2022 in order to never exceed the \$28B cap
- Payments set to fully repay by 2047
- Implementation approach

Other Model Inputs

- IESO Demand Forecast (Outlook B)*
- IESO Global Adjustment Forecast*
- * includes a large number of variables ranging from: generation costs, federal CO2 price, regulatory charges, energy conservation, technological disruption, exchange rates, load forecasting and seasonal adjustments, etc.)

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What are the risks and implications?

- Risks/sensitivities
- Next Steps: Scenario Testing

Assumptions and Risks: Eurig Compliance



- As outlined on slide 6, the base model has three phases:
 - Phase 1: Bill lowered by 25%, **increases kept to CPI growth (2%) from 2018-2022;**
 - Phase 2: Bill **increases 6.3% each year** from 2022 to 2028; and
 - Phase 3: While year-over-year increases slow down, **bills remain 10.4% higher** than what it would have been without the GA smoothing/OFHP.
- Analysis is currently underway to better understand intergenerational costs and benefits and the impact of GA smoothing on recovery charges that would be allowed under the current Eurig compliance rules.
- Depending on the legal determination, if the annual increases in bills or the commodity prices will be subject to caps, additional borrowing/provincial funding may be required.
- The next couple of slides explore various assumptions built into the model, and what any variation in these assumptions may mean. As such it is important to keep in mind that impacts referenced below will be incremental to the increases allowed under the current model and each would continue to be subject to similar Eurig limits.

Assumptions and Risks: Demand



- Demand is a key assumption built into the model. Both the Ministry of Energy and the OPG's models use IESO Demand Forecast (Outlook B – “Flat Demand Outlook”), which explores a level of long-term demand that roughly matches the level of demand that exists today.
 - Both MOE and OPG have confirmed that they believe this is the most appropriate outlook to use from the four that have been developed by IESO for the Ontario Planning Outlook.
 - TBS does NOT have access to the IESO model to run sensitivity analysis.
- While TBS does NOT have access to the IESO model to run sensitivity analysis, we have analyzed how prior IESO forecasts performed against actual electricity demand. Variance analysis suggests that, IESOs forecasts have been reasonably accurate in predicting short term (18-2 yrs), but tended to overestimate medium to long term demand vis-à-vis actuals. 2-4% overestimation was noted in 2005 of the near-term forecast (2006-2008); long-term forecasts are expected to be even less accurate due to increased uncertainties.
- If the current outlook has a similar bias (overestimation of demand) built in, there would be pressures built into the medium to long term outlook.
 - If actual demand is below projections, the fixed costs in the system (generation contracts, transmission and distribution) as well as the repayment requirements will have to be recovered over a smaller amount of consumption, which would necessitate additional borrowing (assuming the \$28B ceiling has not been reached), higher recovery rates, and if higher recovery rates (beyond the 10.3% built into the base outlook can't be exceeded for Eurig or other “absorbability” reasons) are not an option, then provincial financing.
- It is also important to note that the IESO forecast is the aggregate demand for all consumers across the province, whereas the program will cover approximately 90% of the users. If there are marked differences between the projected electricity demand for various classes, there may be an added margin for variance.

Assumptions and Risks: Interest Rates



- OPG has developed a detailed financial model where the borrowing is carried out in tranches, interest is paid for Yrs 1-10, with interest + principal payments starting in Yr 11.
- The model and current projects assume an interest rate of 5% per year.
 - It is important to note that the model is very sensitive to the interest rate.
 - The assumption of 5% is in line with the outlook reflected in the 2017 Budget and the current consensus of private sector economists for the 2017-2020 period.
 - **If interest rates rise steadily from 5% to 7% (historical average) between 2020 and 2024**
 - Phase 2: Bill **increases 7.3% each year** (compared to 6.3% without interest rate increase)
 - Phase 3: Bill remains **12.5% higher** (compared to 10.4% without interest rate increase) and the total interest paid increases to \$37.5B (compared to the \$26.2B that would be paid @ 5%)
- Consideration should be given to building permissive language in the proposed legislation and regulations to allow for timely course correction mechanisms. For instance, if interest rates are going up (or other variables are changing that is increasing pressure on the model), consideration could be given to allowing higher bill increases sooner (possibly moving up when Phase 2 starts, or allowing for transitional adjustments between 2% increases under Phase 1 and 2).
 - Section 7xx in the current draft legislation enables course corrections during the first phase (i.e. until April 30, 2022) through regulations made by the Lieutenant Governor in Council
 - Section 10xx in the current draft legislation enables course corrections after April 30, 2022 through determinations made by the Financial Services Manager (i.e. OPG)

Assumptions and Risks: System Costs



- The current framework is focused on providing relief on the overall electricity bill, by providing a sufficient reduction in the commodity price of electricity.
- For the Reference Bill that is being used as the analysis, 42% of the bill is currently covering electricity system costs (generation contracts, Transmission, Distribution, existing regulatory charges, etc.) and only 58% of the bill pertains to the commodity cost of electricity.
- In order to main the proposed bill reductions in total bills, it will be important to account for and actively manage the potential increases in the system costs.
 - If the system costs (generation, transmission, distribution, etc.) for the Toronto Hydro reference customer goes up, it would require a greater reduction in commodity prices (and hence significantly greater borrowing) to meet the commitment of 25% reduction and the subsequent 2% cap.
 - OPG's noted that additional system costs are deferred using financing up to 2030 after which they are amortized to 2047. TBS will be following up with the Ministry of Energy and OPG to get a better understanding of what may be built as assumptions into the base case with respect to this risk.

Other Risks That May Impact the Fiscal Plan



- The proposed structured will be reviewed by credit rating agencies to allow OPG to borrow in the open market. Depending on the perceived risks and credit assessment, there may be an impact on:
 - The interest at which OPG can borrow the funds;
 - The amount of equity/funding the province may have to inject into the Trust at the outset;
 - The nature and timing of guarantees that may be required.
- If the Trust can't raise the full funding requirements in the market as various tranches come due, additional cash injections would be required. Similarly, if the borrowing cap of \$28B is reached sooner than forecast, the province may have to provide the incremental funding needed to float the program to 2047.
- Beyond 2022, when steep increases are required (from 6.3% per year under the base case (compound increase of 55%) to over 8% if there are changes in interest rates, demand, and/or other variables, such as natural gas), there will likely be additional pressure on the government to offset a part of the scheduled increases.

3

Key Considerations and Risk Mitigation Strategies

- Options through Phases
- Monitoring & Early Warning Indicators

Risk Response Actions by Phase



Available actions to respond to an emerging risk depends on the phase in which it is identified. Consideration should be given to building permissive language in the proposed legislation and regulations to allow for timely course correction mechanisms.

Actions to respond to Risk	Phase in which risk is identified		
	Phase 1 - Mitigation	Phase 2: Rate Increase	Phase 3: Sustained Repayment
Allowing greater rate increases during the remainder of the rate mitigation phase (change to policy direction)	✓		
Higher year-over-year increases throughout the rate increase phase	✓	✓	
Higher payment amounts throughout sustained payment phase	✓	✓	✓
Use public funds to ease pressure	✓	✓	✓

Risks – Fair Adjustment Phase – 2017-2022



- From 2017 to 2022, the Ontario Energy Board determines electricity rates
 - Lieutenant Governor in Council may make regulations prescribing the methodology to be applied by the OEB to determine electricity rates
- The table below summarizes impacts, potential actions, and indicators should any identified risk cause deviation from the MOE/IESO forecasted financing plans

Risk	Impact	Potential Action	Indicator
Electricity rates increases deviate from 2% annually	• Increases <2% will require more borrowing and result in reaching the \$28B debt limit sooner (increasing the total repayment) • Increases >2% increases consumer bills, especially as the difference accumulates over time	• Section 6.1xx and 6.2xx could make reference to 2% and/or CPI to better align with the model forecasts	• Bi-annual electricity rates
Interest rates are > 5%	• Would result in reaching the \$28B debt limit sooner than planned, increasing the total repayment amount • Increases consumer bills beyond the current forecast	• Section 6.1xx and 6.2xx could require that the methodology to determine rates be reviewed/updated should interest rates significantly increase over 5%	• Bi-annual interest rate
Electricity Demand Forecast is overestimated (approx. 2-4% historically)	• Would result in reaching the \$28B debt limit sooner than planned, increasing the total repayment amount • Increases consumer bills beyond the current forecast	• Section 6.1xx and 6.2xx could require that the methodology to determine rates be reviewed/updated should demand be significantly lower than projected	• Actual electricity consumption