

GLOBAL ADJUSTMENT (GA) FINANCING OPTIONS MODELLING: INTEREST COST ANALYSIS

The Ministry of Energy (Energy) has provided modelling of three GA options for potential price mitigation initiatives in the submission dated February 22, 2017.

All three options require financing a portion of the Global Adjustment (GA). Under the three options, GA related details includes as follows:

Option 1: GA Smoothing for RPP-Eligible Only (Borrow est. \$2.5 – 3.5 billion per year initially upfront, Residential Bills Lowered about 25% to 2021)

Option 2: GA Smoothing for RPP-Eligible Only (Borrow est. \$1.7 – 2.6 billion per year initially upfront, Residential Bills Lowered about 20% to 2021)

Option 3: GA Smoothing for RPP-Eligible Only (Borrow est. \$1.4 – 1.6 billion per year initially, Residential Bills Lowered about 18% to 2021)

Note that Energy's updated estimates are based on the electricity load eligible for the Regulated Price Plan (RPP).

Included in the analysis below is some sensitivity analysis on different interest rates. Compared to the 5% base case interest rate, with cumulative interest costs of about \$35.5 Bn, for a 25 basis points (bps) increase (0.25%), the cumulative interest cost could increase by about \$4.7 Bn. And for a 50 bps increase, by about \$7 Bn (or about 20%).

- This assumes that the period of recovery is reduced (with a lower interest rate) or increased (with a higher interest rate) compared to Energy's base case.
- In the case of a lower interest rate scenario, the negative bill impact as a result of the GA being above the True Cost of the GA will end early as the associated debt would be paid off in less than 30 years, and vice versa.
- Alternative modelling assumptions, such as maintaining a fixed amortisation period, would result in different estimates of total interest expense and peak amounts of debt.

At a 3.5% cost of financing (about the current long-term Provincial borrowing cost), the cumulative interest cost would be about \$18.4 Bn, or about \$17.1 Bn below the 5% base case (or about \$10.1 Bn lower than at a 4.5% rate).

Sensitivity to changes in interest rates is particularly high as it reflects the increase in interest rates and compounding, as in the first part of the GA smoothing period, interest costs are deferred and capitalised, resulting in significant cumulative interest expense over each period's debt balances. For example, under the base case option 1, the cumulative annual debt balance is about \$690 Bn, rising to about \$780 Bn if interest rates are 5.5%.

Energy Base Case / Status Quo Modelling: Approx. 5% interest rate, for a 30-year term.

\$ millions	Total Principal Debt	Total Accumulated Interest Costs	Peak Total Debt
Option 1	\$24,977	\$35,542	\$38,501 occurs in Year 2032
Option 2	\$14,760	\$19,733	\$21,477 occurs in Year 2029
Option 3	\$12,862	\$19,498	\$20,326 occurs in Year 2033

Assumes an interest rate of 5% (compounded monthly).

Sensitivities

Base Case plus 0.50%: Approx. 5.50% for a 30-year term.

\$ millions	Total Principal Debt	Total Accumulated Interest Costs	Peak Total Debt
Option 1	\$24,977	\$45,516	\$40,838 occurs in Year 2032
Option 2	\$14,760	\$25,541	\$22,443 occurs in Year 2029
Option 3	\$12,862	\$24,810	\$21,721 occurs in Year 2033

Assumes an interest rate of 5.50% (compounded monthly).

Note: Accumulated Interest Costs for a 30-year term. With a higher interest rate, the amortization period extends beyond the 30-year forecasted period resulting in a remaining balance at the end of the 30-year period. At the end of a 30-year term, a balance of approximately \$8.4 billion (Option 1) and \$5 billion (Option 2) still remains. Therefore, accumulated total interest costs under all options will be significantly higher over a projected longer period to pay down the deferred costs.

For Option 3, Energy assumes conservation costs in any given year are financed over a 15 year period indefinitely which is why there is non-zero accumulated debt beyond the 30-year amortization period, resulting in an approximate balance of \$5.6 billion. With this sensitivity, this balance increases to approximately \$10 billion.

Base Case less 0.50%: Approx. 4.50% for a 30-year term.

\$ millions	Total Principal Debt	Total Accumulated Interest Costs	Peak Total Debt
Option 1	\$24,977	\$28,522	\$36,344 occurs in Year 2031
Option 2	\$14,760	\$15,707	\$20,555 occurs in Year 2029
Option 3	\$12,862	\$15,119	\$19,162 occurs in Year 2032

Assumes an interest rate of 4.50% (compounded monthly).

Note: With a lower interest rate, the amortization period would be reduced. Instead of a 30-year period, the amortization period will be approximately 28.5 years (Option 1) and 28 years (Option 2).

Base Case plus 0.25%: Approx. 5.25% for a 30-year term.

\$ millions	Total Principal Debt	Total Accumulated Interest Costs	Peak Total Debt
Option 1	\$24,977	\$40,288	\$39,652 occurs in Year 2032
Option 2	\$14,760	\$22,491	\$21,955 occurs in Year 2029
Option 3	\$12,862	\$22,028	\$21,012 occurs in Year 2033

Assumes an interest rate of 5.25% (compounded monthly).

Note: Accumulated Interest Costs for a 30-year term. At the end of a 30-year term, a balance of approximately \$4 billion (Option 1) and \$2.4 billion (Option 2) still remains. Therefore, accumulated total interest costs under all options will be higher.

For Option 3, Energy assumes conservation costs in any given year are financed over a 15 year period indefinitely which is why there is non-zero accumulated debt beyond the 30-year amortization period, resulting in an approximate balance of \$5.6 billion. With this sensitivity, this balance increases to approximately \$7.6 billion.

Base Case less 0.25%: Approx. 4.75% for a 30-year term.

\$ millions	Total Principal Debt	Total Accumulated Interest Costs	Peak Total Debt
Option 1	\$24,977	\$31,810	\$37,382 occurs in Year 2032
Option 2	\$14,760	\$17,586	\$21,011 occurs in Year 2029
Option 3	\$12,862	\$17,202	\$19,729 occurs in Year 2032

Assumes an interest rate of 4.75% (compounded monthly).

Note: With a lower interest rate, the amortization period would be reduced. Instead of a 30-year period, the amortization period will be approximately 29.5 years (Option 1) and 29 years (Option 2).

Other Interest Rate Scenarios

Borrowing Rate: Approx. 4.20% for a 30-year term.

<i>\$ millions</i>	Total Principal Debt	Total Accumulated Interest Costs	Peak Total Debt
Option 1	\$24,977	\$25,034	\$35,371 occurs in Year 2030
Option 2	\$14,760	\$13,739	\$20,021 occurs in Year 2029
Option 3	\$12,862	\$12,914	\$18,504 occurs in Year 2032

Assumes an interest rate of 4.20% (compounded monthly).

Note: With a lower interest rate, the amortization period would be reduced. Instead of a 30-year period, the amortization period will be approximately 28 years (Option 1) and 27.5 years (Option 2).

Borrowing Rate: Approx. 3.50% for a 30-year term.

<i>\$ millions</i>	Total Principal Debt	Total Accumulated Interest Costs	Peak Total Debt
Option 1	\$24,977	\$18,364	\$33,265 occurs in Year 2030
Option 2	\$14,760	\$10,024	\$18,956 occurs in Year 2028
Option 3	\$12,862	\$9,435	\$17,163 occurs in Year 2031

Assumes an interest rate of 3.50% (compounded monthly).

Note: With a lower interest rate, the amortization period would be reduced. Instead of a 30-year period, the amortization period will be approximately 26 years (Option 1) and 25 years (Option 2).

STAFF COMMENTS

- It should also be noted that all GA Options require that debt is increased each year. This means that there is a significant interest rate risk should rates rise in the years to come.
 - Rates have been relatively low in recent years and could rise with the market.
 - Even if market rates remain constant, as Ontario assumes more debt, there is a risk that Ontario's (or its agency's) cost of borrowing will increase should there be negative changes in its credit rating. With lower credit ratings, interest rates will also increase.
 - Ontario is currently Aa2 (Stable) by Moody's as of April 2016. This rating was Aa2 (Negative) in since July 2014.¹
- The requirement of debt and thereafter, the repayment of debt is based on the GA schedule provided by Ministry of Energy. Therefore, any interest rate sensitivities result in either shortening (due to lower interest rate) or extending (due to higher interest rate) the amortization period.
 - Under all Options, when interest rates are increased, the amortization period is extended in that it exceeds the forecast of GA provided by Energy, resulting in significant debt balances at the end of the 30 year horizon. This means that the above mentioned Total Accumulated Interest Costs are under-estimated as no forecast is available to determine the higher end of the range.

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February 27, 2017

¹ https://www.moody's.com/research/Moodys-assigns-negative-outlook-to-Ontarios-ratings-affirms-Aa2-ratings--PR_303116