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Risk Analysis –
Ministry of Energy GA Smoothing Proposal

February 24, 2017
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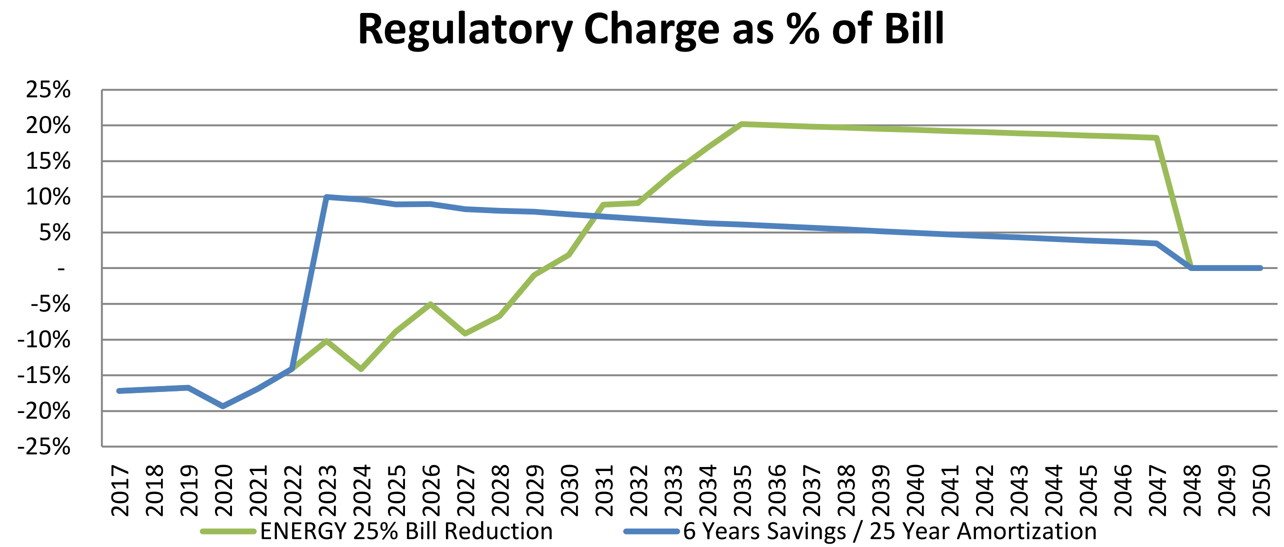
Context

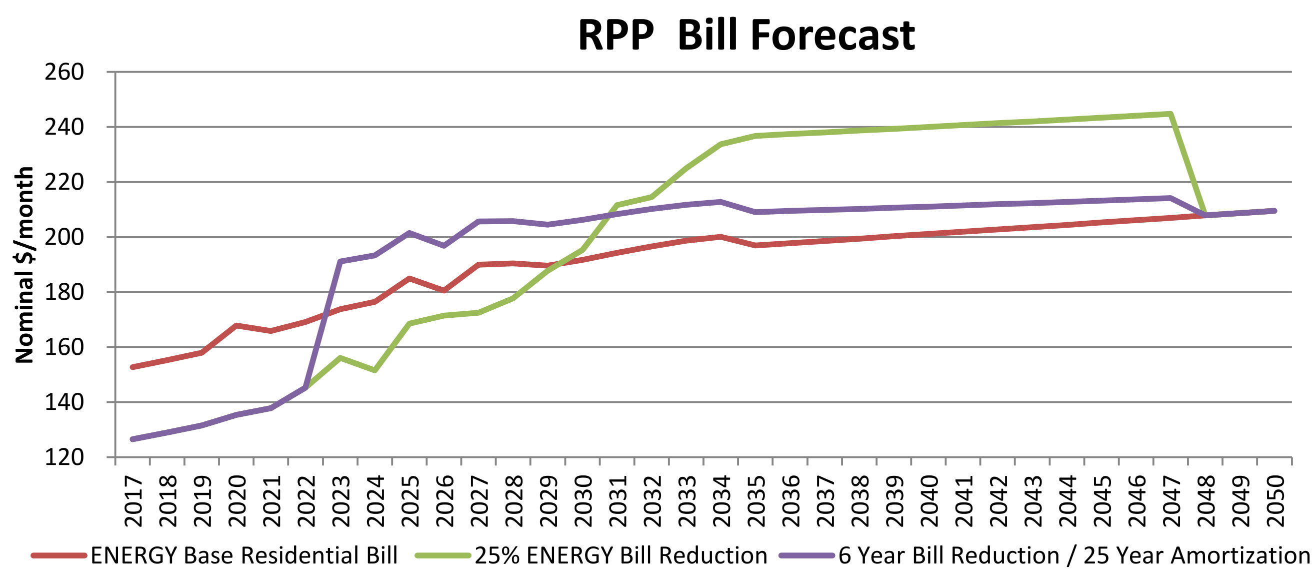
- The Ministry of Energy has proposed a variety of scenarios for reducing electricity bills.

- This analysis focuses on the Ministry's proposal to borrow funds to smooth the Global Adjustment overtime. OPG assumes the base case is the Ministry scenario with an initial 25% reduction in bills, increasing by 2% thereafter.
  - Note, the following analysis only includes GA smoothing. Other initiatives that the Ministry is proposing to get to the total 25% bill reduction are not included in the analysis.
  - This analysis has been updated to include rate reductions for all Regulated Price Plan (RPP)-eligible customers (previous analysis only included RPP customers).
- The following sensitivity analyses maintain the Ministry's proposed near-term savings using debt to cover any increased costs. The debt is then recovered over the period from 2030 to 2047 as in the Ministry's original proposal.

ENERGY 25% Reduction Base Case

- The Ministry of Energy's base case is a 25% reduction in RPP bills, increasing at 2% thereafter.
- For similar regulatory debts in the US, the regulatory recovery charge has been limited at 10% of bills in order to secure debt.
- The ENERGY base case leads to a charge of almost 20% of bills and would not be financeable using debt markets.
- Reducing bills by 25%, and keeping them low for 6 years would be a more manageable level of debt to finance publicly.

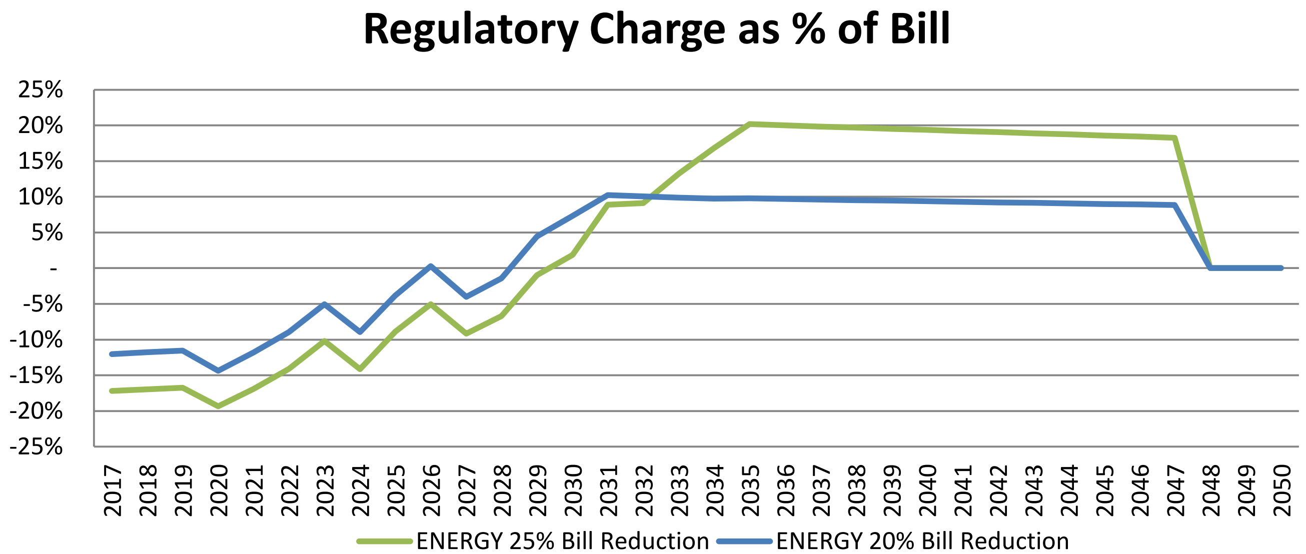


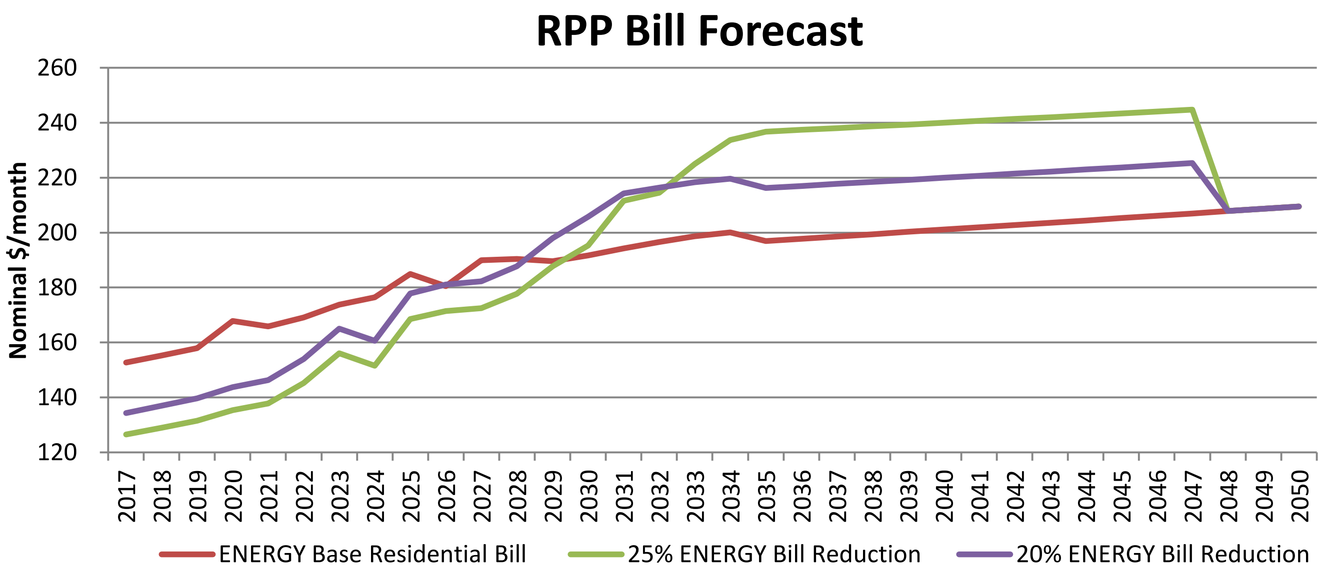


ENERGY 20% Reduction Case

- Alternatively, a 20% reduction in residential bills, increasing at 2% thereafter would also make the debt more likely to be finance in the public market.

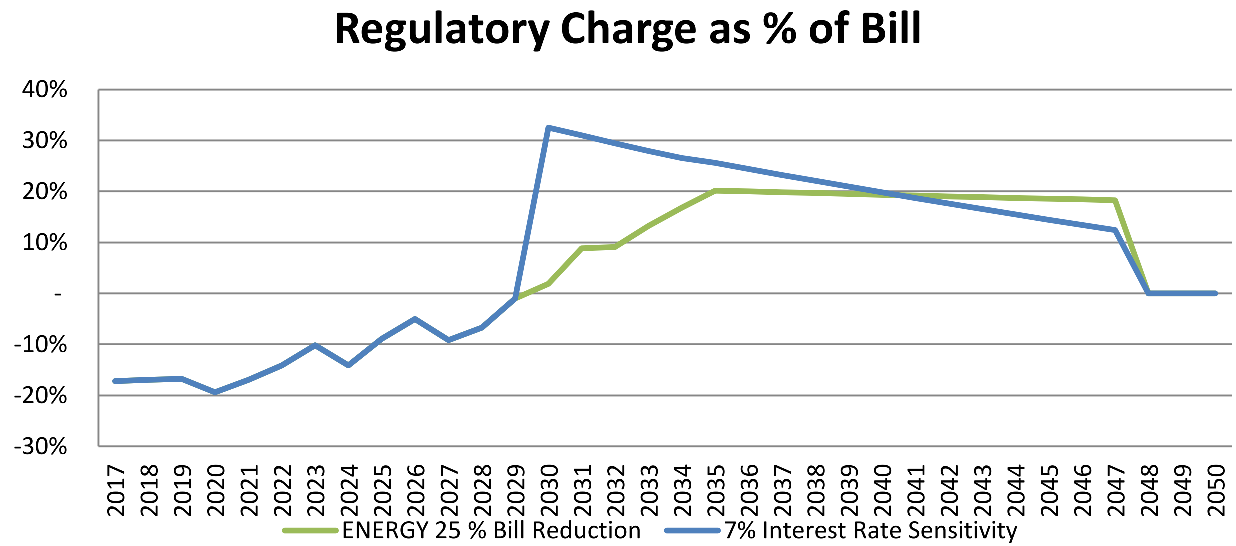
- The regulatory charge would peak at 10.3% of bills.

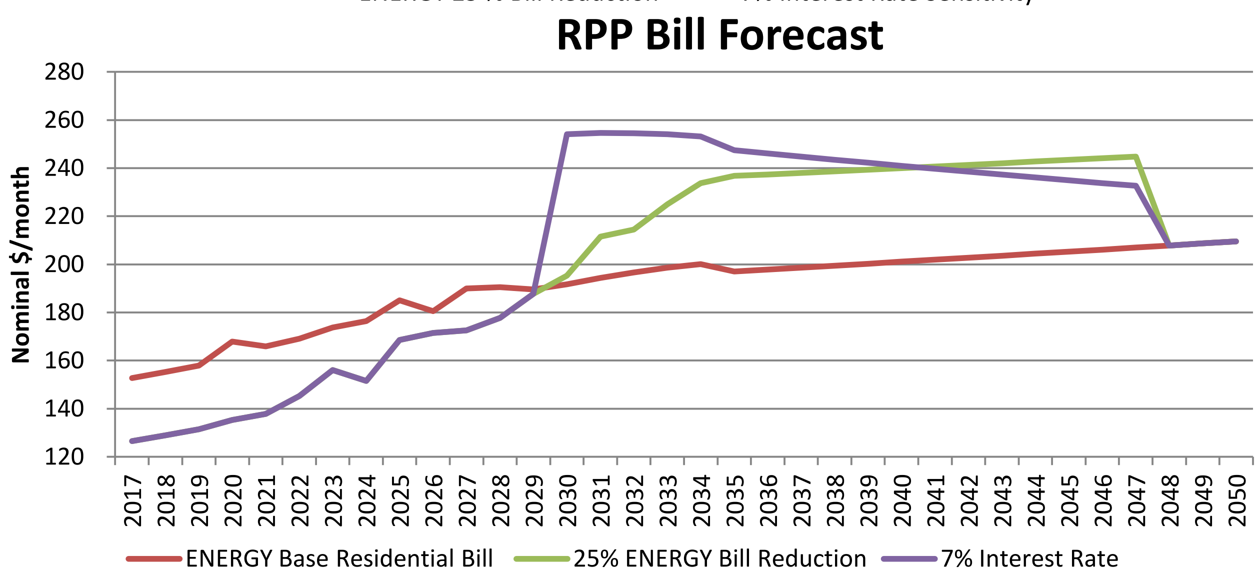




Interest Rate Increase

- An increase of the interest rate from 5% to 7% for the debt used to fund the bill reductions would have a significant impact on future bills.
- Smoothing the repayment could reduce the initial spike in prices, but would still lead to much higher prices in the long-term.





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OPG System Cost Sensitivities

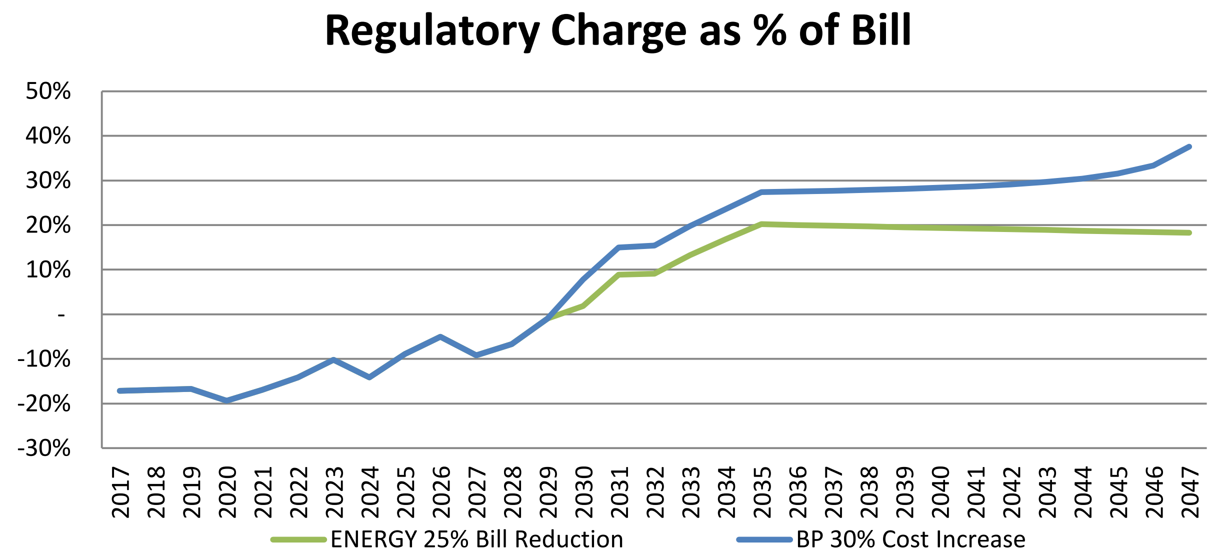
- The following sensitivities were modeled to examine the impact that unexpected system costs would have on the regulatory charge.

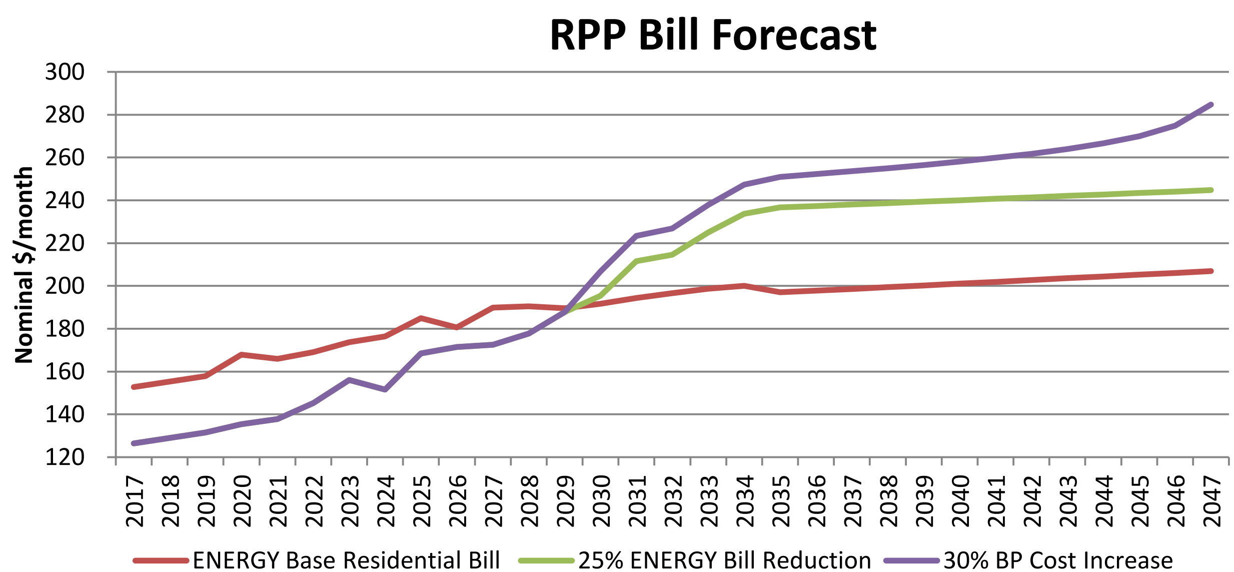
- In order to maintain the Ministry’s proposed bill reductions, the additional system costs are deferred using financing up to 2030 after which they are amortized to 2047.

- Additional system costs which occur after 2030 are also amortized to 2047.

Increase in Generator Costs

- An increase in the cost of generation could have a significant impact on bills.
- For example, a 30% increase in the cost of generation from the Bruce Nuclear Generating Station would cause the regulatory charge to make up 40% of bills in the future.





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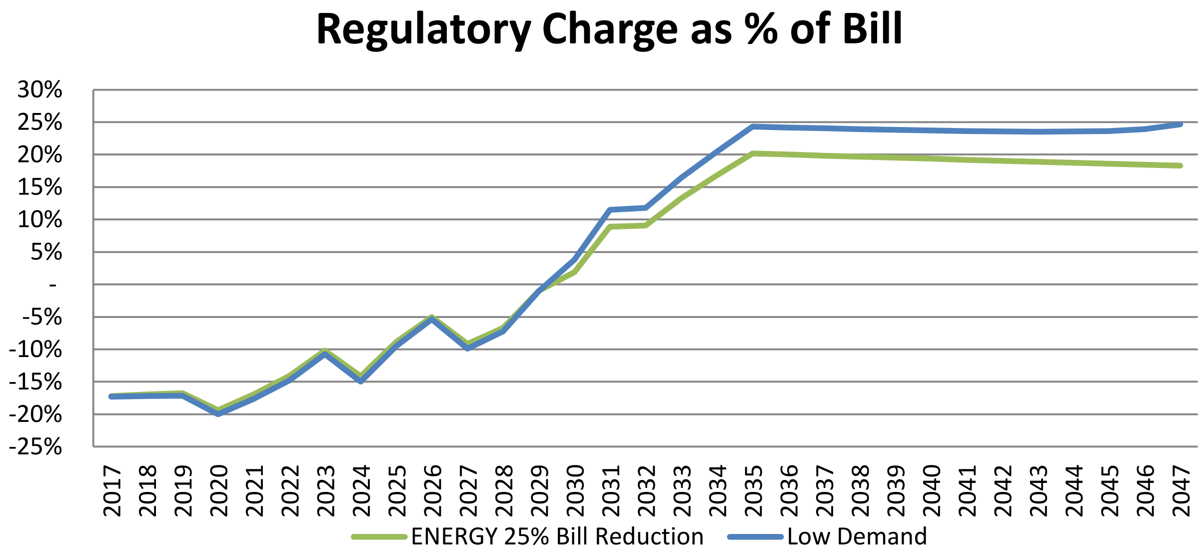
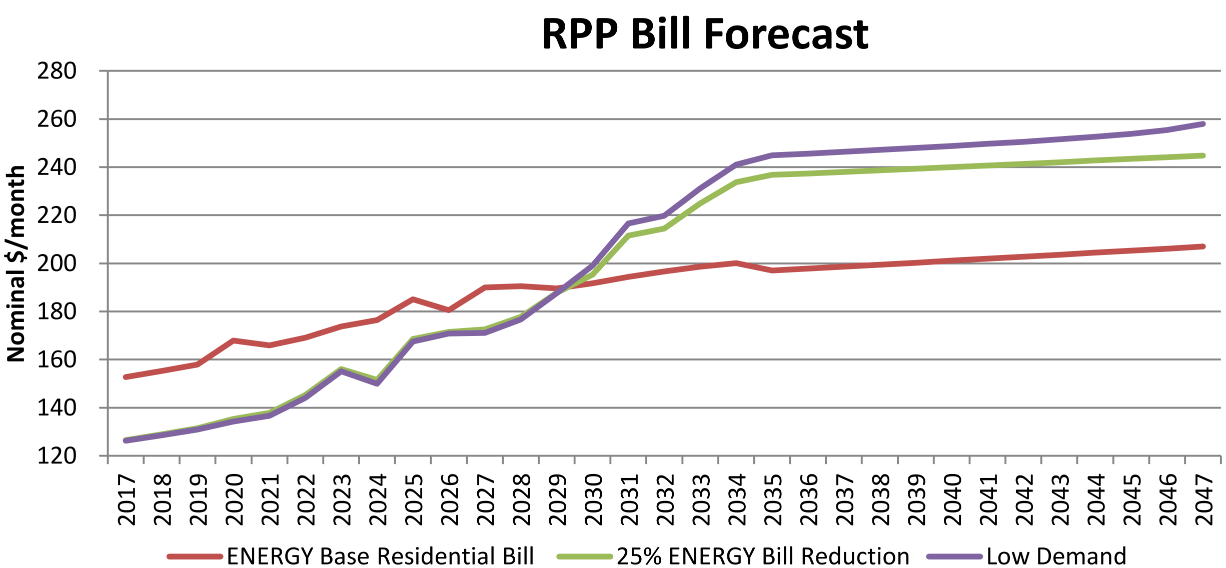
Lower than Expected Demand (IESO Outlook A)

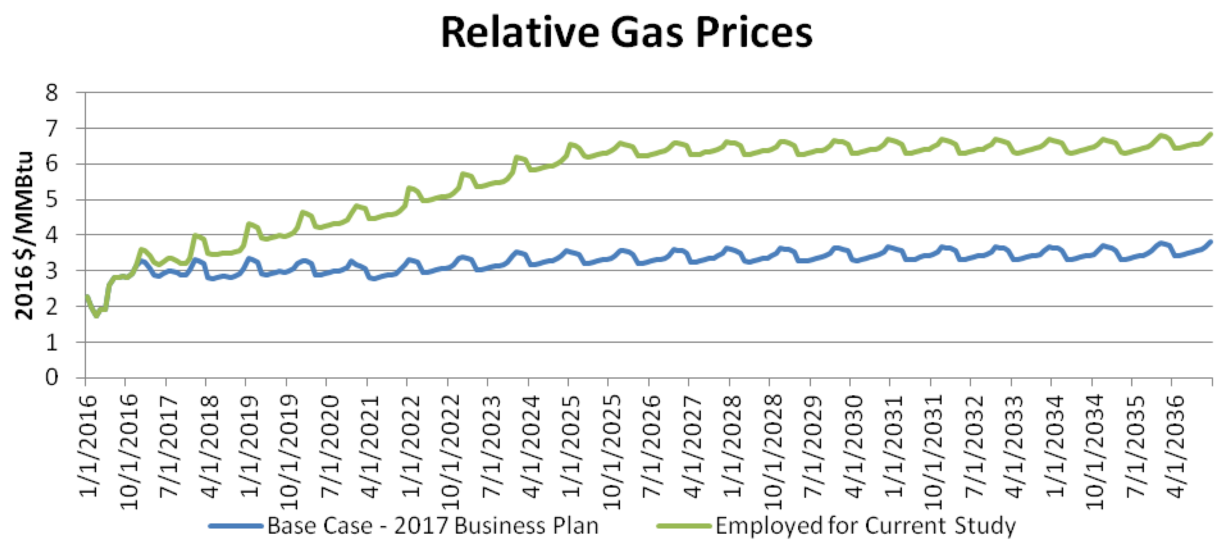
- Lower than expected demand would be problematic for the proposed initiative.
- The majority of electricity system costs are fixed (generation contracts, Tx & Dx, etc.).
- If demand falls below expectations these fixed costs must be recovered over a smaller amount of consumption, increasing the unit cost of electricity ($/MWh).
- In order to maintain bills at the targeted level, additional borrowing may be necessary.
- Compounding the issue, should demand continue to fall further below expectations each year, the regulatory charge is recovered over a lower and lower amount of generation, increasing the unit cost.
- <u>NOTE:</u> The analysis on the right only considers the impact of low demand on the cost of generation. Including other major fixed costs such as conservation and transmission & distribution would magnify the results further.

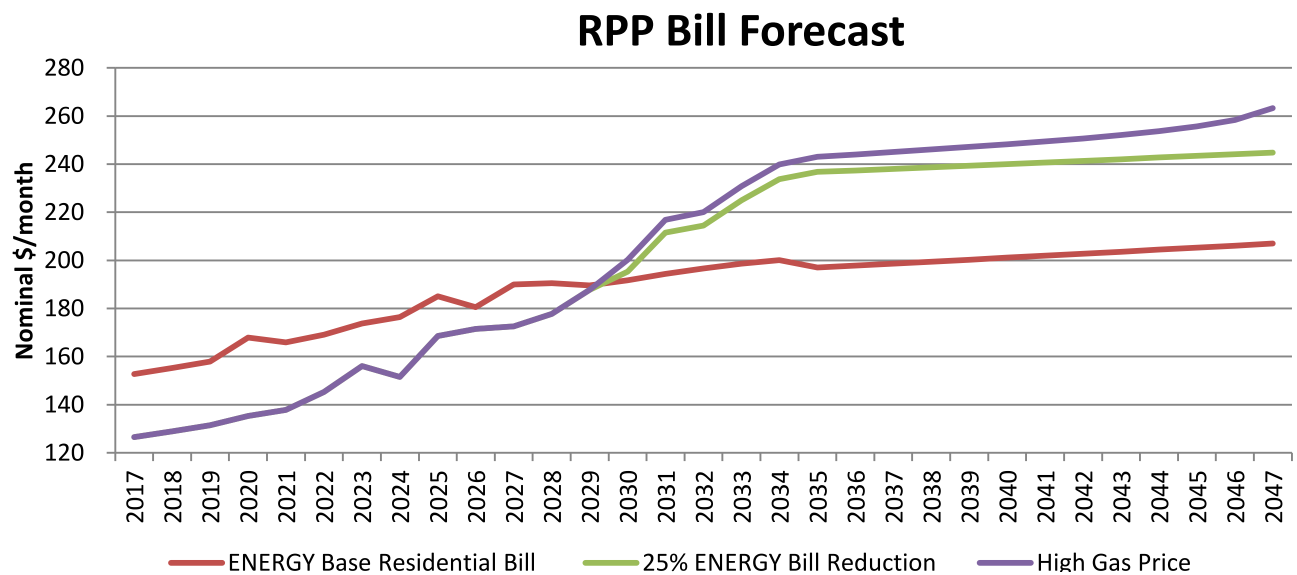




High Gas Price Sensitivity

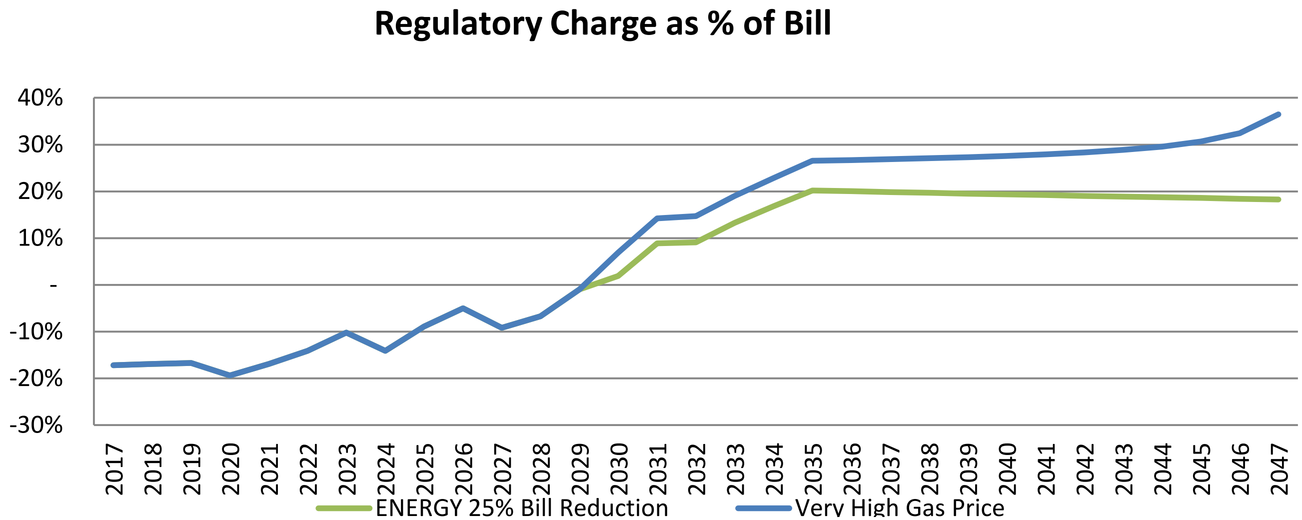
- An increase in natural gas prices would have a large impact on electricity bills during the period when the regulatory charge is recovered.

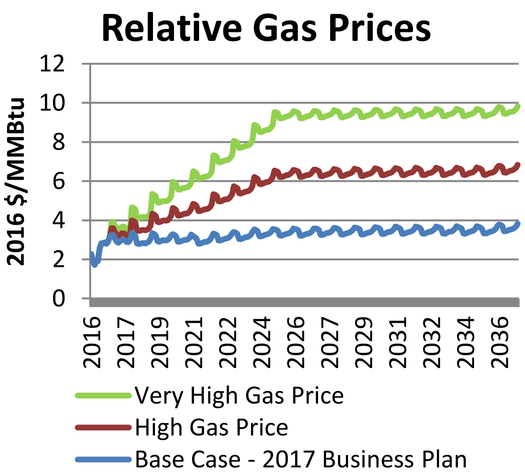


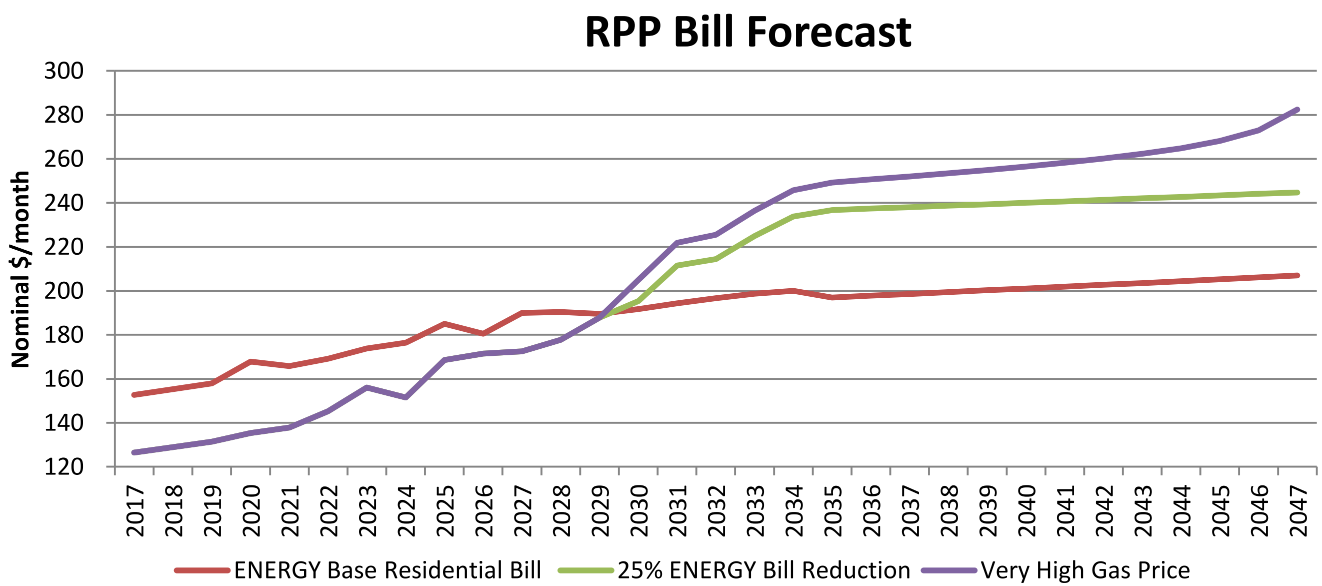


Very High Gas Price Sensitivity

- Increasing gas prices even further causes the regulatory charge to make up nearly 40% of bills.







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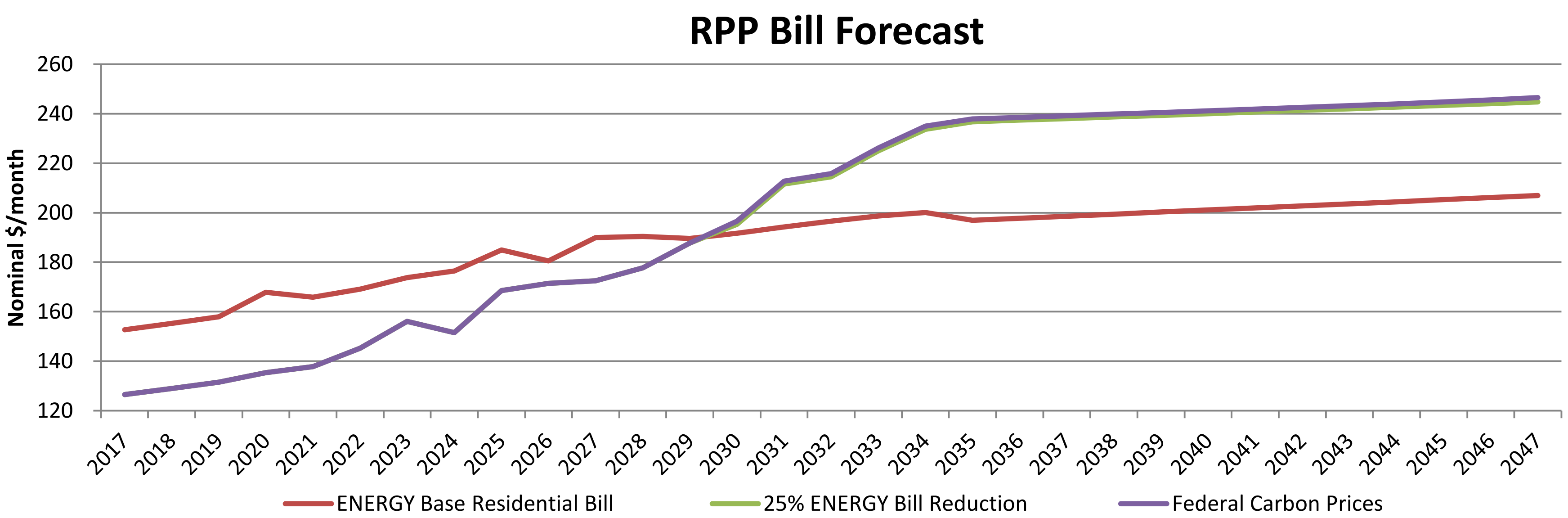
Carbon Price Sensitivity

- Moving to the proposed Federal carbon prices from forecast Ontario cap-and-trade carbon prices would have a minimal impact on bills.



Exchange Rate Sensitivity

- A decrease in the Canadian dollar relative to the USD would have a minimal impact on bills.