Tab 4

Index

May 12, 2017

MANITOBA HYDRO

2017/18 & 2018/19 GENERAL RATE APPLICATION

FINANCIAL TARGETS & UNCERTAINTY ANALYSIS

INDEX

Appendices

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2017/18 & 2018/19 GENERAL RATE APPLICATION

FINANCIAL TARGETS & UNCERTAINTY ANALYSIS

4.0 OVERVIEW

Tab 4 provides an overview of Manitoba Hydro's financial ratios and financial targets, its examination of the impact of various financial planning assumptions by way of an uncertainty analysis and a discussion on credit rating agency perspectives and reports.

4.1 FINANCIAL RATIOS AND FINANCIAL TARGETS

The financial and operational risks associated with the management of an integrated electricity and natural gas distribution utility are significant. The most significant risks facing Manitoba Hydro are catastrophic infrastructure failure, extreme drought, loss of export market access and rising interest rates. Interest rate risk has become increasingly critical as Manitoba Hydro's electric segment debt is forecast to grow from 7 times domestic revenue in 2012/13 to 15 times domestic revenue by 2021/22 at approved rates. Manitoba Hydro manages these risks through the growth and the maintenance of an adequate level of financial reserves in the form of retained earnings. An adequate level of financial reserves is also required to maintain access to low-cost financing for both the Corporation and its owner, the Province of Manitoba.

Improving the financial strength of the Corporation is essential to making the investments in infrastructure needed to continue providing safe and reliable service to customers; financially withstanding the risks and uncertainties that are inherent in Manitoba Hydro's operations; and to providing customers insurance against possible future rate instability.

Manitoba Hydro has three primary financial targets which are used to assess the financial strength of the Corporation. These targets have been revised since the last GRA, having been recently reviewed both internally as well as by an external consultant in 2015:

MEASURE	TARGET
Equity Ratio	Maintain a minimum ratio of 25%
Interest Coverage	Maintain a minimum ratio of greater than 1.80
Capital Coverage*	Maintain a ratio of greater than 1.20

(*excluding major new generation and transmission projects)

The first is to maintain a minimum equity ratio of 25%, a measure of the portion of assets that are financed by internally generated funds rather than debt. The second is an earnings before interest, taxes, depreciation and amortization interest coverage ratio with a minimum target of greater than 1.80, which measures the ability to meet interest payment obligations with cash flow. The third is to maintain a capital coverage ratio of greater than 1.20, which is a measure of the ability of cash flow from operations to fund sustaining capital expenditures. It should be noted that as the Corporation continues through a phase of unprecedented investment, the omittance of the capitalized interest on major capital expenditures is recognized to overstate the capital coverage ratio.

The consolidated results for the last ten years are provided below in **Figures 4.1**, **4.2**, and **4.3**.

Figure 4.1 Equity Ratio Actuals

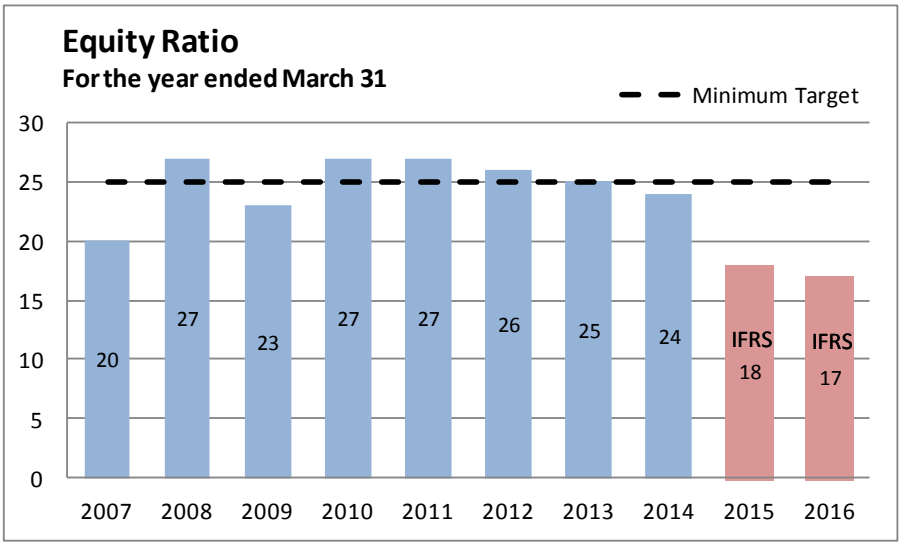


Figure 4.2 Interest Coverage Ratio Actuals

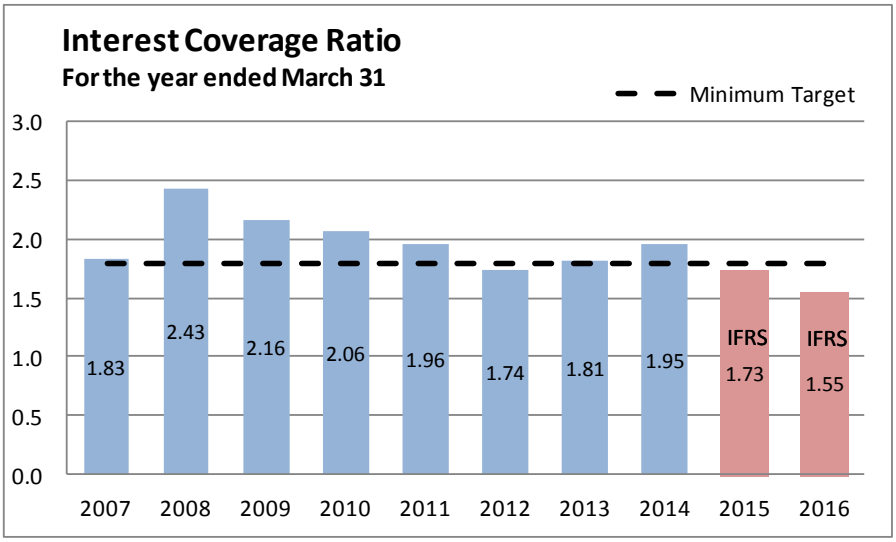
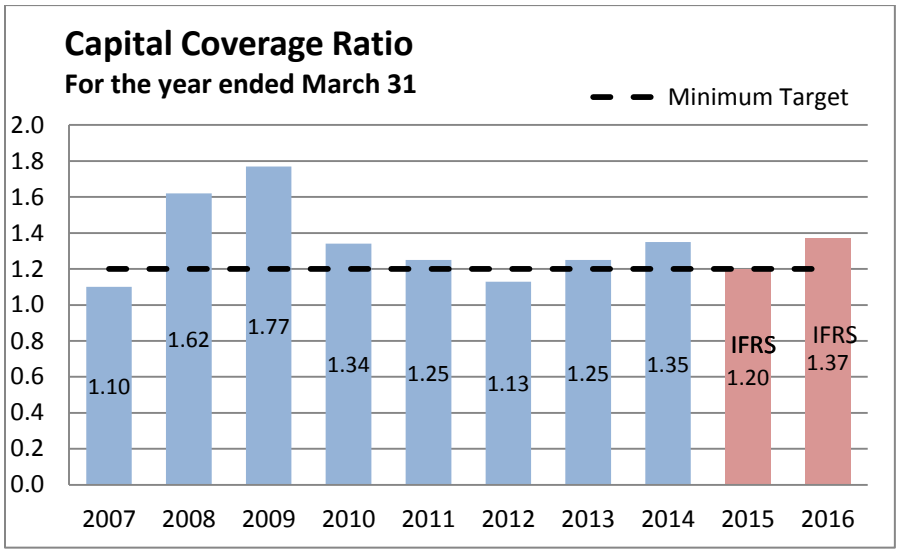


Figure 4.3 Capital Coverage Ratio Actuals



4.2 KPMG'S 2015 FINANCIAL TARGET REVIEW

Manitoba Hydro's financial targets were originally set in 1995 after an internal study and an external consultant review. Since that time, these targets have been internally reviewed by the Corporation and periodically enhanced. Recognizing that the current investments in Major New Generation and Transmission (MNG&T) and existing infrastructure would place considerable pressure on Manitoba Hydro's key financial

ratios, it was important that Manitoba Hydro's financial targets be once again reviewed by an external consultant.

In November 2014, KPMG was retained to provide recommendations with respect to appropriate financial targets which align with the mandate of Manitoba Hydro and the interests of its stakeholders considering its operating and business outlook and associated risks. KPMG's observations and recommendations can be found in its report to Manitoba Hydro which is dated May 2015 provided in Appendix 4.1 of this filing.

The financial target review considered: the objectives of maintaining rate stability for customers while at the same time maintaining safe and reliable service; the period of significant capital investment and infrastructure renewal that Manitoba Hydro is entering into; and the maintenance of Manitoba Hydro's self-supporting status for credit rating purposes.

The scope of work did not extend to reviewing broader policy questions associated with overall structure, governance framework, and business strategy and plans.

Key factors and observations that influenced KPMG's recommendations as set out in the Executive Summary of their report are as follows:

- Relative to other Crown utilities with a significant base of hydro-electric generation, Manitoba Hydro faces a number of heightened risks including a larger capital investment program, greater hydrology risks, significant reliance on export revenues, and relatively higher assets and debt on a per capita basis compared to other jurisdictions. These risks suggest that Manitoba Hydro should have financial targets that provide a significant amount of equity cushion.
- Manitoba Hydro's target equity ratio is at the low end of those maintained or forecast by other power utilities and a number of those utilities plan to strengthen their financial ratios in the longer term.
- Loss of self-supporting status would have very detrimental effects on the Province and the utility. Uncertainty with respect to when self-supporting status would be lost suggests that financial targets should err on the side of caution.

- Additional rate increases in the early years of the forecast horizon can result in a significant improvement in Manitoba Hydro's financial metrics in later years reducing the impact of interest compounding on the additional debt that is required when rate increases are lower.
- Manitoba Hydro has limited ability to restrain a drop in financial ratios during adverse conditions such as drought which highlights the risk of having an equity ratio that approaches 10%.
- Manitoba Hydro's capital investment program is characterized by periodic "bumps" or "hills" of large magnitude which magnify the challenges associated with Manitoba Hydro's limited levers with which to adjust its equity cushion.
- Manitoba Hydro will need to depart from its equity target during major build programs: this reflects the utility's limited financing tools and reliance on retained earnings as its dominant source of equity. Accordingly, the equity position should rise above 25% in advance of major build programs to mitigate the deviations from target that are observed.
- In the long-term, with respect to deviations from any target, it would be desirable to limit decreases in the equity ratio to 5-10 percentage points.
- Government guarantees enable government-owned utilities such as Manitoba Hydro to have lower equity ratios in their capital structure and to have lower financial metrics than averages observed for investor-owned utilities.

KPMG's overall finding was that the current financial targets used by Manitoba Hydro were appropriate. The following is a summary of KPMG's key findings and recommendations to Manitoba Hydro:

Debt/Equity: The current debt to equity ratio of 75:25 was a reasonable long-term target but 70:30 would provide additional financial strength and address unique financial challenges and risks. KPMG recommended that the debt to equity ratio in the long term should fall within the range of 75:25 to 70:30. KPMG also suggested that it would be desirable to maintain a minimum equity ratio near 15% during major capital expansions.

Interest Coverage: If Manitoba Hydro continues with the current EBIT (earnings before interest and taxes) interest coverage ratio, a minimum target of 1.20 is reasonable. KPMG recommended Manitoba Hydro adopt an EBITDA (earnings before interest, taxes, depreciation and amortization) interest coverage ratio with a target of 1.80 or greater.

Capital Coverage: The capital coverage ratio is a unique and important financial target to Manitoba Hydro. KPMG found that the current target of 1.20 or greater is reasonable.

4.3 MANITOBA HYDRO'S 2015 FINANCIAL TARGET REVIEW

In 2015, following the completion of the KPMG review, Manitoba Hydro developed its financial target recommendations for the then members of Manitoba Hydro-Electric Board (MHEB) taking into consideration the findings and recommendations of KPMG and an expanded uncertainty analysis undertaken by the Corporation. Manitoba Hydro's 2015 Financial Target Review is provided in Appendix 4.2 of this filing.

The previous MHEB endorsed the following conclusions in December 2015:

- That the current debt/equity ratio target of 75:25 be retained as its long-term financial target.
- That it would be impractical to adopt a 70:30 target at this time due to further incremental revenue increases that would be required from domestic customers necessary to do so, and that it does not believe that maintenance of the 75:25 debt/equity ratio target places customers at undue risk of rate instability.
- That the adoption of a minimum debt/equity ratio of 85:15 was not prudent at this time.
- That an EBITDA interest coverage ratio with a minimum target of 1.80 be adopted to replace the current 1.20 EBIT interest coverage target.
- That the current capital coverage ratio with a minimum target of 1.20 (excepting MNG&T) be retained as it is an effective measure of the ability of the Corporation to generate sufficient cash to sustain its operations.

4.4 MHEB'S 2016 REVIEW SINCE THE KPMG FINANCIAL TARGET REVIEW

Since the last (GRA) and the 2016/17 Supplemental Filing, a new Board of Directors (MHEB) has been appointed along with a new President & CEO and a new Chief Finance & Strategy Officer. Together, the MHEB and senior management team have charted a new course for Manitoba Hydro inclusive of a strategic imperative to restore financial sustainability. While overall minimum financial targets have not changed, Manitoba Hydro is of the view that previous financial plans were inadequate in that the time frame under which the Corporation reached financial health was unacceptable, leaving the Corporation at too high of a risk for too long. A path back to 25% equity of longer than ten years is, in the view of Manitoba Hydro, too risky.

4.5 UNCERTAINTY ANALYSIS METHODOLOGY & RESULTS

As part of the integrated planning process, Manitoba Hydro quantifies the financial impacts of changes to key planning assumptions in the Integrated Financial Forecast (IFF) report through sensitivity analysis. A sensitivity or scenario analysis is intended to provide insight into directional changes and relative level of risk.

The cumulative impacts to the MH16 electric operations retained earnings and the minimum equity ratio observed over the 10-year forecast period are shown in **Figure 4.4** for each of the key changes in assumption.

Figure 4.4 – Key Variable Sensitivity Impacts to MH16 Retained Earnings

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	Lowest Equity Ratio in 10 yr Risk Scenario
Low Domestic Load Growth	(6)	(16)	(31)	(48)	(69)	(94)	(121)	(149)	(179)	14% (2019)
High Domestic Load Growth	17	46	107	175	250	331	418	508	600	15% (2019)
+ 1% Interest	(23)	(64)	(121)	(207)	(338)	(480)	(621)	(766)	(930)	14% (2019)
- 1% Interest	22	62	117	200	327	457	586	717	854	15% (2018)
C$/US$ Down 0.10 (C$ Strengthening)	13	16	20	16	(16)	(68)	(123)	(169)	(220)	15% (2019)
C$/US$ Up 0.10 (C$ Weakening)	(13)	(15)	(18)	(13)	17	63	111	150	194	14% (2018)
Low Export Price	(31)	(70)	(106)	(147)	(236)	(338)	(446)	(600)	(777)	14% (2019)
High Export Price	31	75	138	218	332	448	562	705	848	15% (2018)
5 Year Drought (starting in 2018/19)	(299)	(761)	(930)	(1 151)	(1 367)					12% (2020)
+ 1% Rate Increase in 2017/18	28	48	70	95	121	145	171	198	228	15% (2019)
- 1% Rate Increase in 2017/18	(27)	(46)	(68)	(92)	(119)	(150)	(182)	(215)	(253)	14% (2019)
$1B in Capital Overruns	(11)	(33)	(54)	(104)	(178)	(254)	(331)	(410)	(498)	14% (2019)
Capital Down $100 million/year	12	30	57	93	139	193	254	323	404	15% (2019)
Capital Up $100 million/year	(9)	(26)	(52)	(87)	(131)	(185)	(246)	(316)	(404)	14% (2019)

Figure 4.4 reveals that a five-year drought beginning in 2018/19, interest rates one percent higher or lower than forecast, and low and high export prices have the largest potential impact on Manitoba Hydro's retained earnings.

While the sensitivity analysis provides good insight into the financial impacts of changes to key assumptions in isolation, further analysis is undertaken in the form of Manitoba Hydro's uncertainty analysis. The uncertainty analysis is a sophisticated analytical tool which evaluates the impacts of the variation of multiple planning variables in order to determine a range of possible financial outcomes for the utility. The uncertainty analysis presented below combines multiple risk factors which reveals a more extensive picture of the risks facing the Corporation.

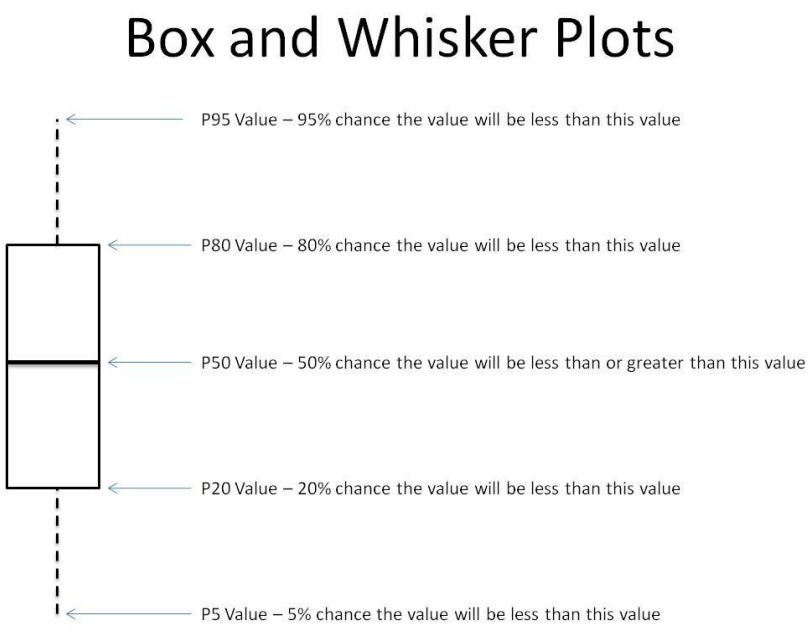
Since its introduction at the 2013 Needs For and Alternatives To (NFAT) process, Manitoba Hydro has expanded the capabilities of the uncertainty analysis to incorporate and model the effects of water supply variability. Along with the other two significant risk factors, namely interest rates and export prices, the uncertainty analysis combines these three risk factors, some of which have offsetting impacts, to generate a number of discrete financial projections.

It is assumed that the three risk factors are mutually independent, variation in one parameter is independent of the variation in another. For each combination of risk

factors (i.e. each scenario), a set of pro forma financial statements (projected income statement, projected balance sheet and projected statement of cash flows) is generated. The uncertainty analysis focuses on four financial metrics from the pro forma financial statements: the equity ratio, net income/loss, net debt balance and retained earnings, and displays the range of possible financial outcomes.

The results of the uncertainty analysis have been graphically depicted in a box plot. The box plot is a convenient way of showing groups of numerical data through their 20^{th} and 80^{th} percentiles. In other words, the box represents 60% of possible outcomes in a fiscal year. Box plots also have lines (whiskers) extending vertically from the boxes indicating variability from the 80^{th} up to the 95^{th} percentile and from the 20^{th} down to the 5^{th} percentile. Box plots display variation in samples of a statistical population without making any assumptions about the underlying statistical distribution. The following diagram in **Figure 4.5** explains how to interpret the box plot figures.

Figure 4.5 Box and Whisker Plot Interpretation



Instead of relying on an expected case (MH16) and a few sensitivities for a view of the future, the uncertainty analysis incorporates hundreds of plausible views of the future to assist the decision making process. Instead of focusing on a single forecast value (such as one equity ratio in 2027), this analysis provides the decision maker with the likelihood that the equity ratio in 2027 will be less than or greater than a particular value, based on a large sample set of financial projections.

The next section describes the three key risk factors included in the uncertainty analysis.

Water Supply Variability

The uncertainty of volume of water supply available for hydro generation is one of the key risks that Manitoba Hydro faces. The IFF is produced from a forecast of interchange revenues and generation costs based on the average of all historic stream flows. A review of the chronology of the 102 historic stream flow record reveals the stream flow variability from year to year, as well as trends over various periods of time. Much of this water flow variability is dampened when only average revenues are assumed in the IFF. **Figure 4.6** shows the annual energy in terawatt-hours (TWh) from inflows over the period from 1912 to 2013.

Figure 4.6 Annual Energy from Inflows (TWh)

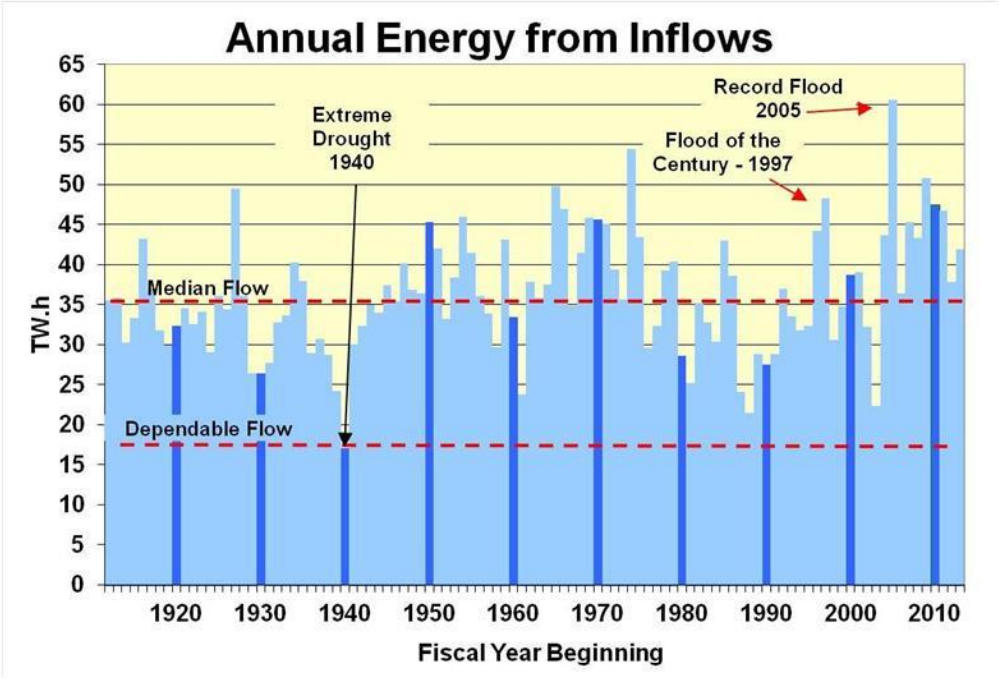


Figure 4.7 shows the year over year change of the annual energy (in TWh) over the same 1912 – 2013 time period and demonstrates that the change in energy from one year to the next can be extreme.

Figure 4.7 Energy from Inflows – Year over Year Change

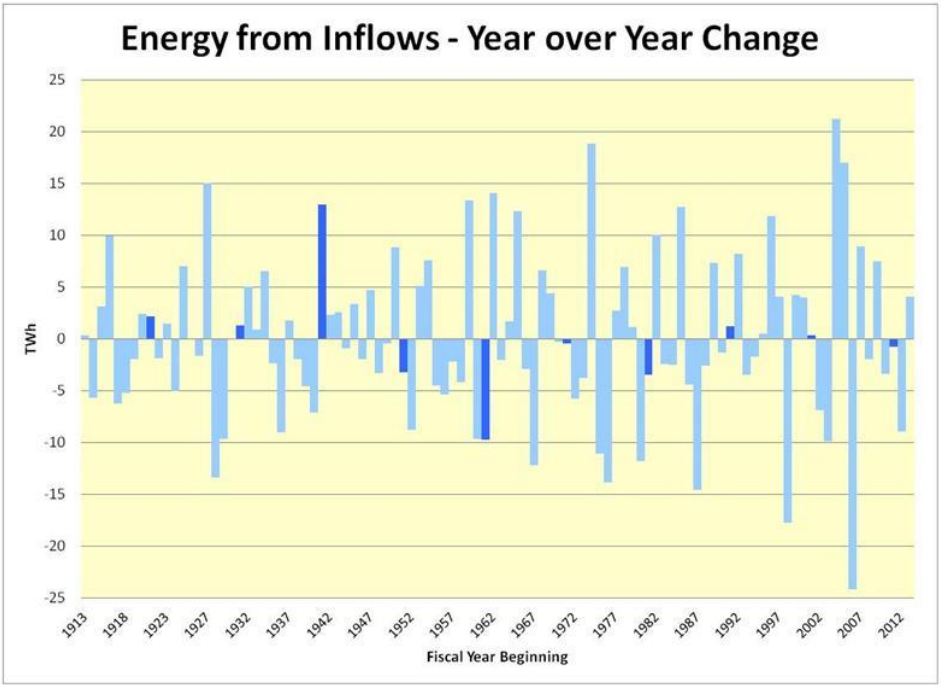
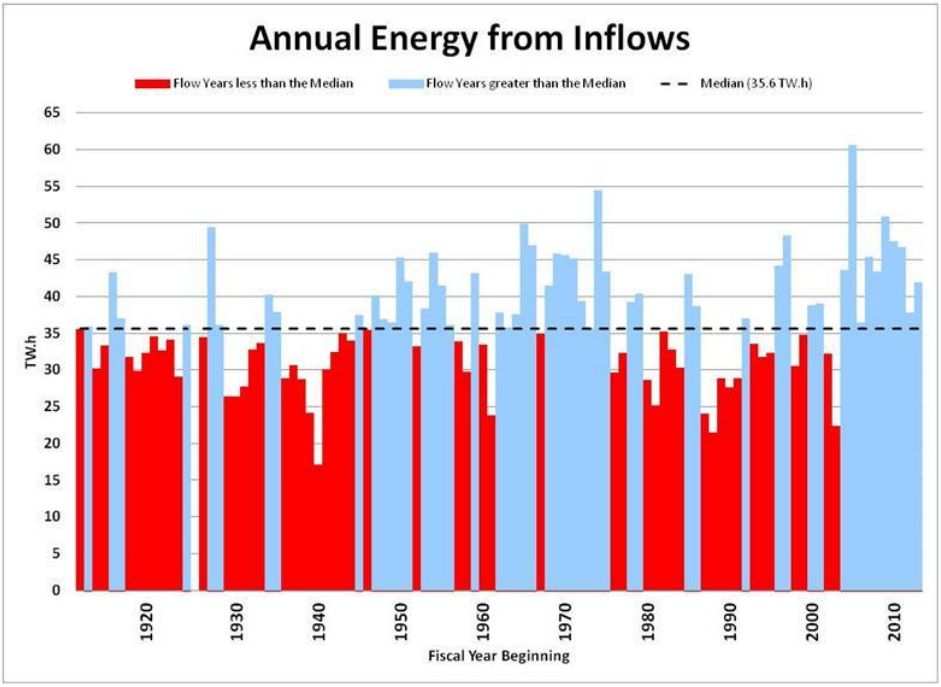


Figure 4.8 contains the same data points as **Figure 4.6**; however, in **Figure 4.8** the years that were below the historic median of 35.6 TWh are denoted in red and the years above the historic median are denoted in blue. This colour coding highlights trends or patterns of extended periods where the annual energy remained above or below the historic median level. For example, the period in the 1920s to 1940s had predominantly lower than median energy. The following period in the 1950s to 1970s had predominantly higher than median energy. The 1980s to early 2000s was a period of lower than median energy. Now, mid 2000s to present day, energy from inflows has been well above median and for the longest sustained period in recorded history.

If historical water flow cycles are repeated, it is reasonable to expect, at a minimum, a period of lower than median energy during the forecast period. For this reason, it is important to understand the potential variability of financial results from average.

Figure 4.8 Annual Energy from Inflows – Below and Above Median



To incorporate both the annual flow variability and the cycles, 102 'flow cases' were constructed each beginning with a different historical 'flow year' (i.e. 1912 to 2013), followed by a repeat of the chronological flow history. The 102 'flow cases' are run through the Corporation's production costing model to produce time series forecasts of flow related revenues and costs which are then incorporated into the financial forecast model to produce 102 financial projections.

Export Prices

The 2016 Electricity Export Price Forecast contains three price forecasts:

Reference	the consultant's best estimate of the future, adjusted in January 2017 to further reduce the forecast to reflect the current trend in projected on-peak and off-peak prices and capacity values
Low	contains 2016/17 on-peak and off-peak prices and capacity values held constant in real terms throughout the forecast period
High	the consensus reference export price forecast from the 2015 Electricity Export Price Forecast was selected to represent the high price sensitivity for MH16

Figure 4.9 shows the nominal dollar average unit export price for each of the three export price forecasts. The average export price is the average of all firm and opportunity export sales net of transmission charges. The reduction in average export price in 2025/26 is a function of the expiry of a portion of Manitoba Hydro's firm dependable contracts.

Figure 4.9 Average Export Price

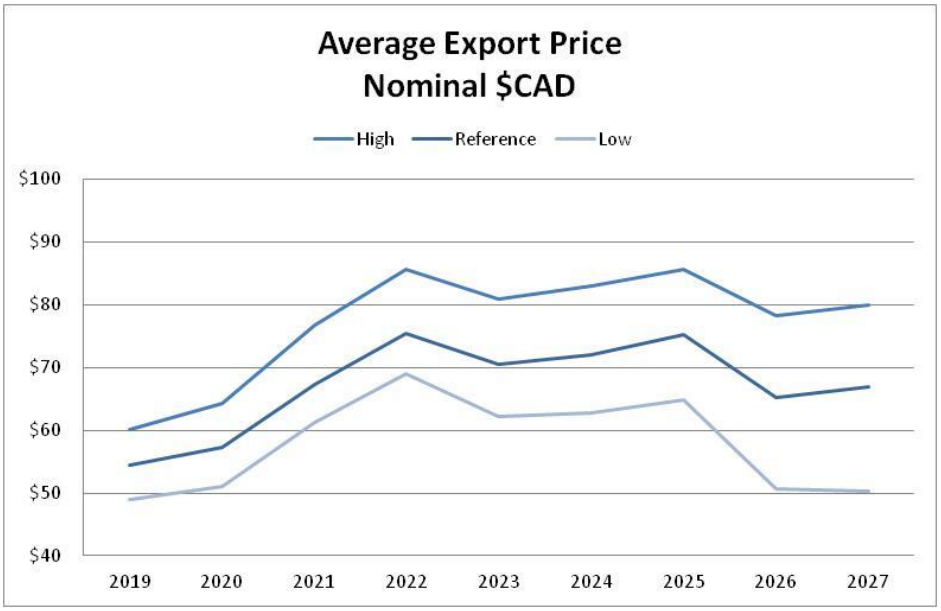
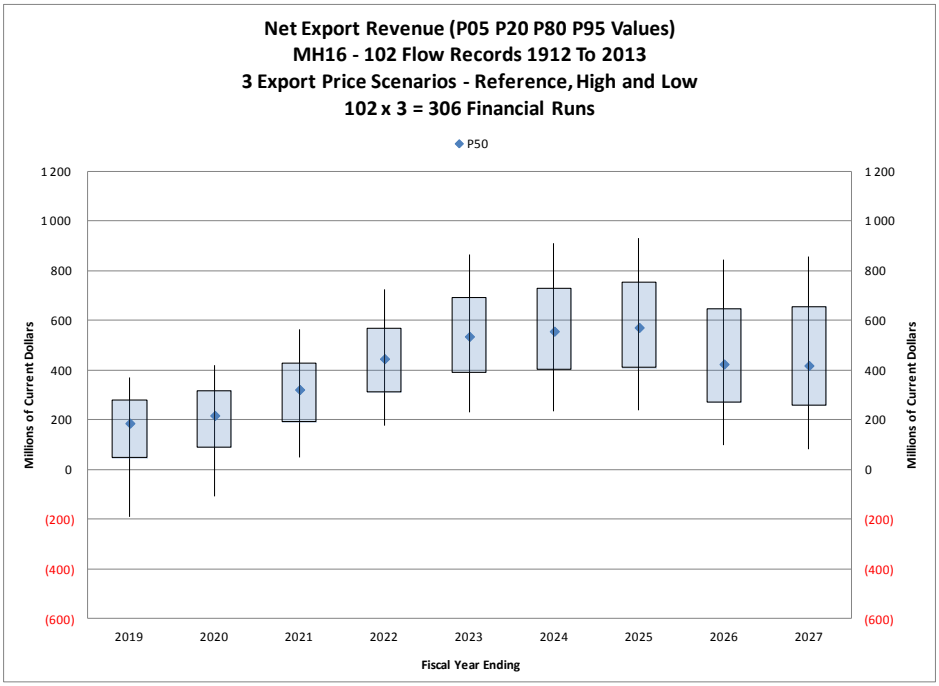


Figure 4.10 shows the annual variability of net extraprovincial revenues factoring in both water flow variability and export price uncertainty for the period 2019 to 2027. The three price forecasts were used in the Corporation's production costing model to generate 306 distinct net extraprovincial revenue forecasts (102 flow cases x 3 price cases). Manitoba Hydro is no longer projecting that dependable energy prices and capacity values will be obtained for available firm energy where Manitoba Hydro does not presently have an export contract in place. This planning assumption change was made to capture changing market dynamics, namely the reduced cost for U.S. renewable supply options (aided in large part by subsidies) that would compete directly with hydro generation, along with reductions to natural gas price fundamentals and elements of the capacity market that are signaling a diminished need for new generation. These developments have had a dampening effect on the net export revenue variability once Keeyask is fully commissioned – 2023/24 and beyond.

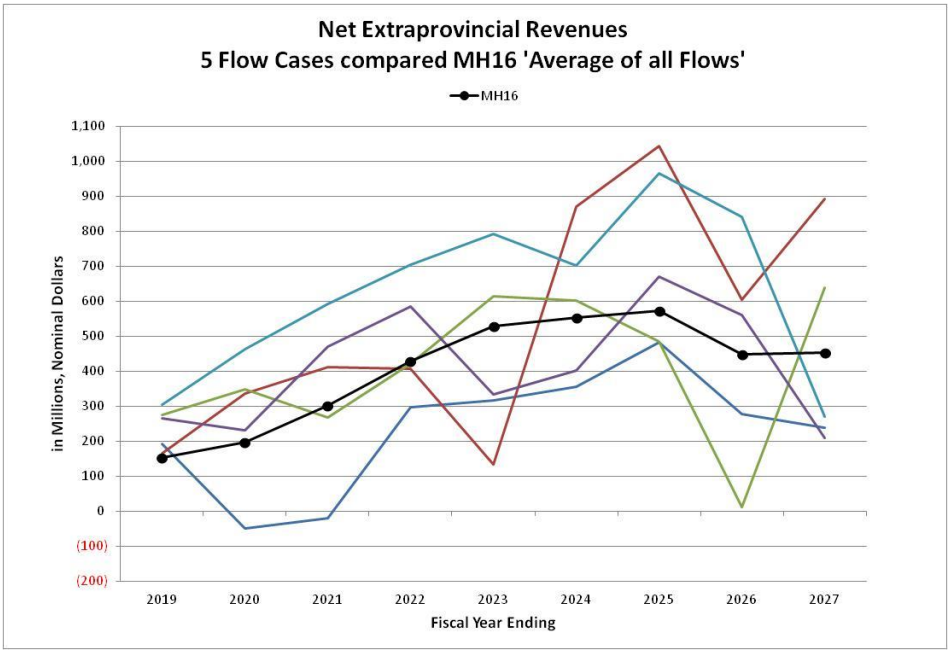
Figure 4.10 Net Export Revenue Variability



While the previous graph displays the possible range in any given forecast year, it does not show how net extraprovincial revenue can vary year to year in any one of the 306 projections.

Figure 4.11 shows the net extraprovincial revenue from a sample of 5 flow cases taken from the 306 different flow cases available. It compares these to the average of all flow cases (at reference export prices) from which MH16 is derived. As shown by these 5 flow cases used, the annual net extraprovincial revenues can vary substantially from what is projected in MH16. The timing of the occurrence of this variability from average (earlier vs. later in the forecast) can have a significant impact on the financial forecast not only in each year but also on a cumulative basis. For example, lower than average net extraprovincial revenues early in the forecast while capital spending is high may result in higher debt levels. The higher levels of debt will put downward pressure on the equity ratio in all future years which can impact how quickly the equity ratio returns to the minimum 25% target. It is thus critical that rates be set on the right trajectory such that future rate increases are not unduly exposed to intervening events (i.e. drought) or adverse forecast error.

Figure 4.11 Net Export Revenue - 5 Flow Cases



Interest Rates

In 2015, Manitoba Hydro undertook significant additional work to develop and validate the interest rate scenarios used in its uncertainty analysis. Manitoba Hydro set out to test the impacts of different interest rate scenarios that encompass both rising and declining paths, interest rate shocks as well as steady-state scenarios that are consistent with history. A publically available stochastic[1] interest rate generator developed by the American Academy of Actuaries and the Society of Actuaries was used to produce the interest rate forecasts used in this analysis. This model is based on historical U.S. interest rates (Treasury Bills) and produces a time series going forward for bonds of different durations (3-month, 1-year, 10-year, etc.) and captures both longer-term multi-year trends and shorter-term intra-annual variation. Manitoba Hydro engaged the Berkeley Research Group (BRG) to recommend an approach that made use of available data on current futures and options prices to establish and calibrate an appropriate range of interest rates emerging from the stochastic interest rate generator. BRG's scope of work, methodology and findings are discussed in Appendix 4.3 of this filing.

[1] Randomly determined.

MH16 reflects Manitoba Hydro's revised debt management strategy that opts to shorten the weighted average term to maturity of new debt issuance to 12 years from 20 years. On a forecast basis, new long-term debt generated by the financial forecasting model is fixed at an interest rate that reflects this change and a 12-year average term to maturity. In MH15, new long-term debt was fixed at an interest rate that reflected a 20-year average term to maturity.

Manitoba Hydro updated the stochastic interest rate generator with December 2016 futures and options prices. Notably, the results aligned with the timing of the consensus projection of interest rates obtained from various external forecasters and used in MH16. **Figures 4.12** and **4.13** show the mean, upper and lower bounds for the Canadian short term and long term interest rates resulting from the stochastic interest rate generator and compare these to the consensus forecast assumed in MH16. Overall, the mean interest rates for both short-term and long-term Canadian interest rates (the red line) closely mirror the consensus forecast interest rates. As well, with the exception of 2017/18, the interest rate sensitivity one percent higher or lower than the consensus forecast also falls within the upper and lower bounds produced by the stochastic interest rate generator.

Figure 4.12 Short Term Interest Rates

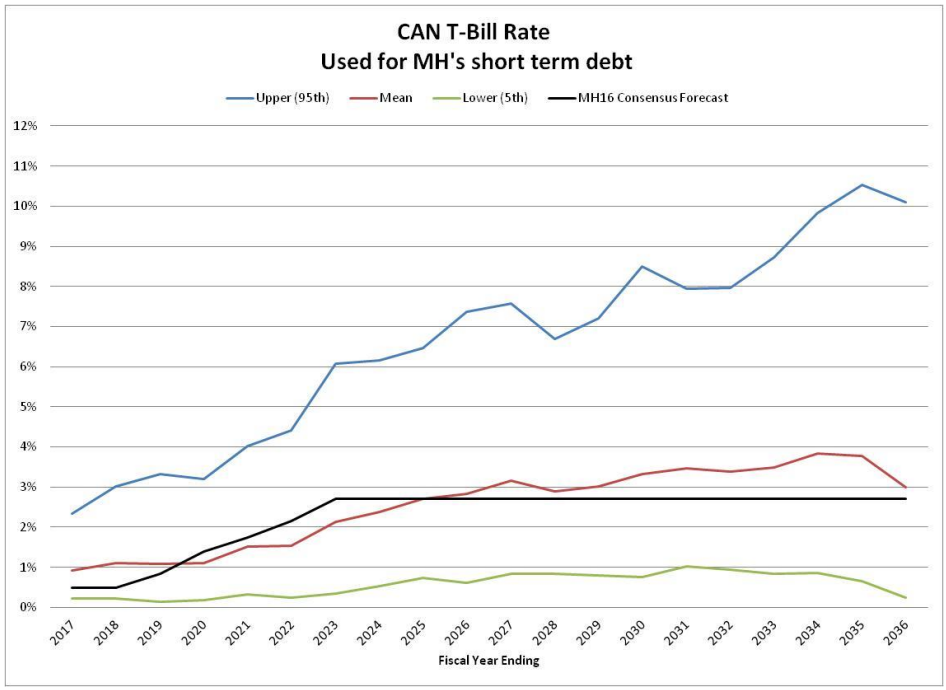
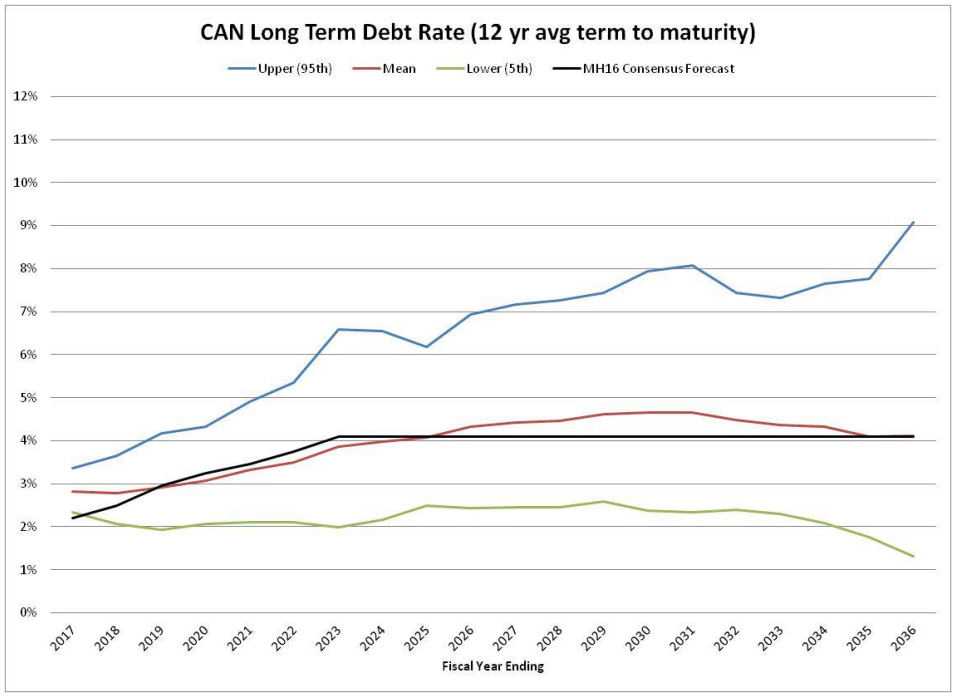


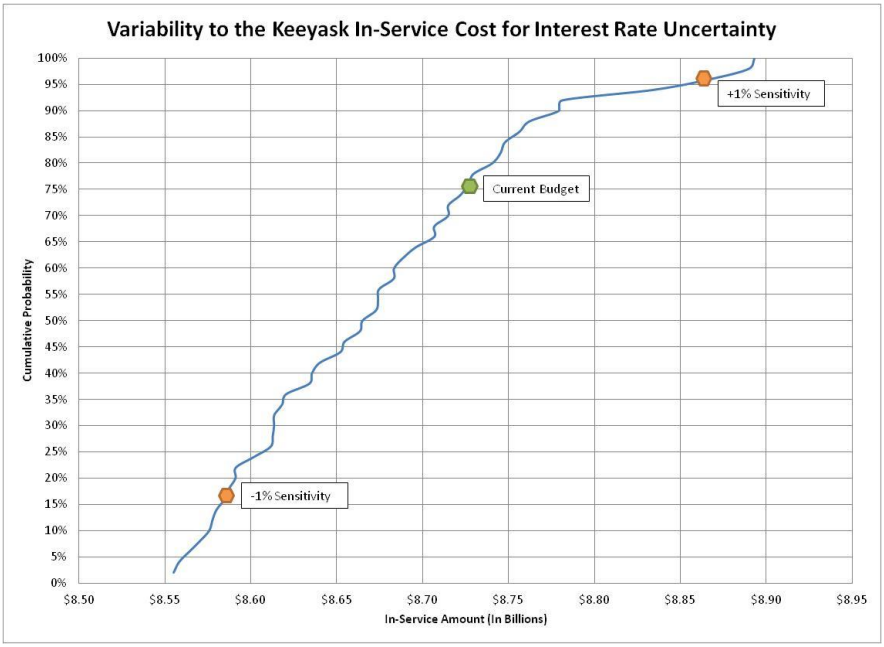
Figure 4.13 Long Term Interest Rates



Interest is capitalized on Manitoba Hydro's capital projects at the weighted average rate of the Corporation's entire debt portfolio. During the early years of the forecast, the weighted average rate does not fluctuate as much as the incremental cost of borrowing when forecast interest rates are varied through the uncertainty analysis. This is arising from the fact the average rate is so highly weighted with Manitoba Hydro's embedded costs that it is not until new debt is either generated in the forecast and/or existing debt that is maturing is refinanced that the incremental borrowing costs can impact the weighted average rate.

The Keeyask project is an exception as the majority of the interest capitalized on the project is calculated using the incremental cost of borrowing. The Project Financing Agreement, a schedule to the Joint Keeyask Development Agreement, outlines how interest is to be calculated during construction using incremental costs for the Keeyask HydroPower Limited Partnership (KHLP) assets. **Figure 4.14** shows the impacts to the $8.7 billion in-service cost of the Keeyask project from the sample set of 50 interest rate cases generated by the stochastic interest rate generator model as well as the +/-1% sensitivity to the consensus projection of interest rates used in MH16. The blue line represents the range of in-service amounts that result from the 50 interest rate cases. The current budget and the +/- 1% sensitivities have also been included in the graph. The impact of varying interest rates is +/- $170 million or 2% of the budget in-service cost.

Figure 4.14 Impact of Interest Rates on Keeyask In-Service Costs



Uncertainty Analysis Results

The uncertainty analysis was initially prepared using two different approaches to the development of its interest rate assumptions. One approach uses the consensus forecast of interest rates with two sensitivities, the first being one percent higher and the second being one percent lower, and requires the generation of 918 discrete financial projections. The other approach uses a representative sample set of 50 interest rate cases from the stochastic interest rate generator described above and produces 15,300 discrete financial projections. Both approaches are summarized in **Figure 4.15.**

Figure 4.15 Uncertainty Analyses Approaches

	3 Interest Rate Cases	**50 Interest Rate Cases**
Rate Increases	7.9% FY2018 to FY2022, 2%	7.9% FY2018 to FY2022, 2%
Water Flow Cases	102	102
Electricity Export Prices	3	3
Interest Rate Cases	3	50
Discrete Financial Projections	**918 (102 x 3 x 3)**	**15,300 (102 x 3 x 50)**

A considerable amount of time and effort is required to prepare the uncertainty analysis under the second approach. The processing time required to generate 15,300 scenarios was considered a major obstacle and Manitoba Hydro sought out to test whether generating a smaller set of discrete financial projections would render reasonably indicative results compared to the generation of a full set of 15,300 financial runs.

Figure 4.16 compares the results of the projected equity ratio from the two approaches listed above.

Figure 4.16 Projected Equity Ratios from Uncertainty Analyses

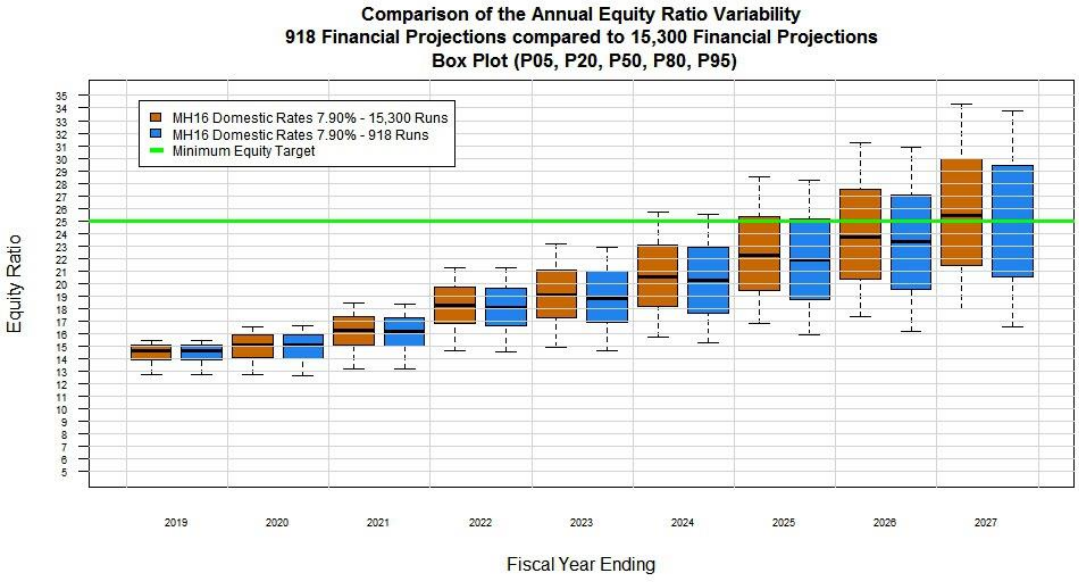


Figure 4.16 shows that the first approach that produces 918 discrete financial projections generates a reasonable and unbiased representation of the key financial risks that Manitoba Hydro is facing when compared to the approach that uses 50 interest rate cases. A comparison of the two approaches also highlights the fact that water flow variability is Manitoba Hydro's largest risk factor.

Each of the 918 discrete financial projections is given an equal likelihood of occurring (i.e. 1/918 = 0.11%) and the uncertainty analysis was run with two different domestic rate increase scenarios:

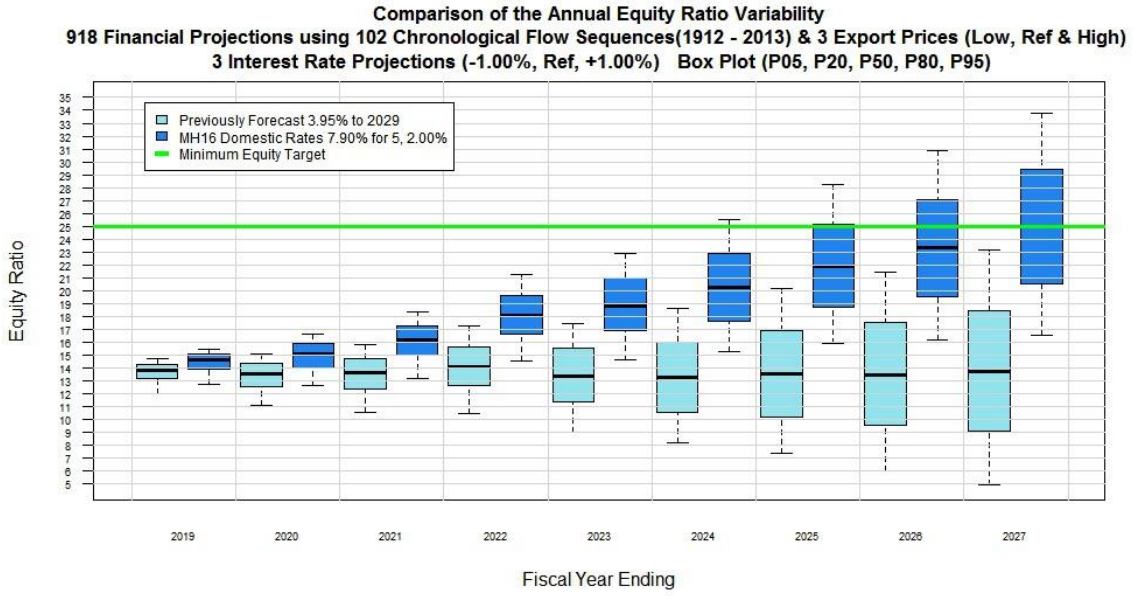
1) The MH16 proposed rate increases of 7.90% annually from 2017/18 to 2021/22, and then 2.00% rate increases thereafter, and

2) The previously forecast 3.95% annually from 2017/18 to 2028/29, followed by 2.00% rate increases thereafter.

Projected Equity Ratios

Figure 4.17 shows the equity ratios under the financial projections incorporating water flow, export price and interest rate risks.

Figure 4.17 Comparison of Equity Ratio Variability



From **Figure 4.17**, it can be observed that:

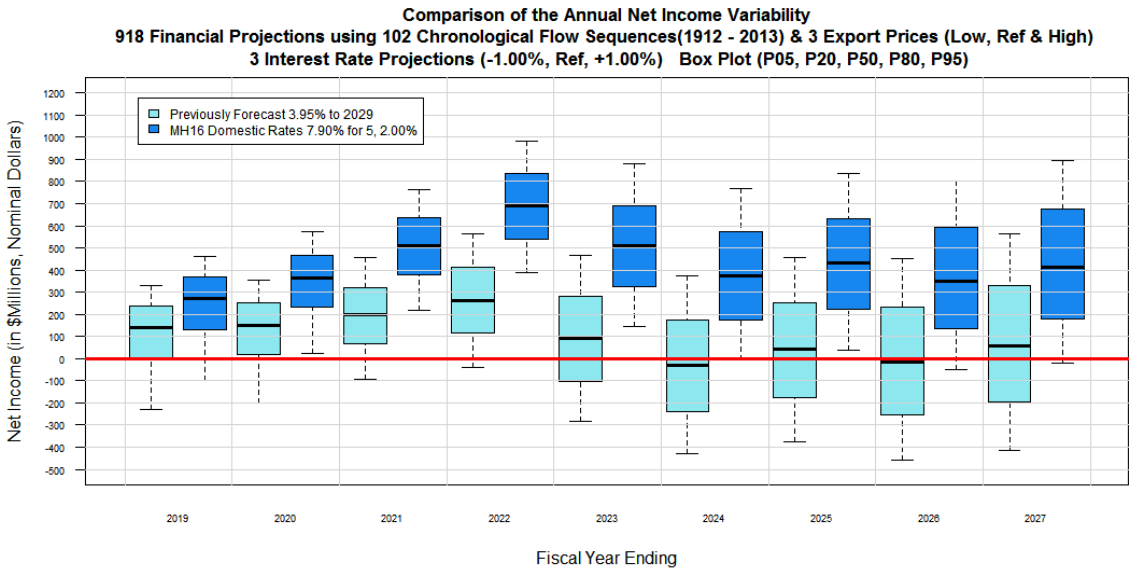
- With 7.90% rate increases, the chance of the equity ratio being below 15% goes from an 80% probability in 2018/19 to being only a 20% probability in 2020/21. By 2023/24, there is less than a 5% chance that the equity ratio will be below 15%. By the end of the 10-year forecast period, there is a 50% chance that Manitoba Hydro will achieve the minimum 25% equity ratio target.
- With 3.95% rate increases, there is roughly only a 20% chance that the equity ratio will be above 15% during the five year period 2018/19 to 2022/23. Over the entire forecast period shown above, there remains a 50% chance that the equity ratio will be either above or below 13% while the overall variability of the equity ratio grows (as shown by the increase to the size of the boxes) once Keeyask is commissioned. 3.95% annual rate increases does not provide a sufficient financial cushion to absorb the key risks Manitoba Hydro is facing over

the period 2018/19 to 2026/27. By the end of the 10-year forecast period, there is very little chance the minimum 25% equity ratio target will be achieved.

Projected Net Income or Losses

Figure 4.18 shows the annual projected net income under the range of projections.

Figure 4.18 Comparison of Net Income Variability



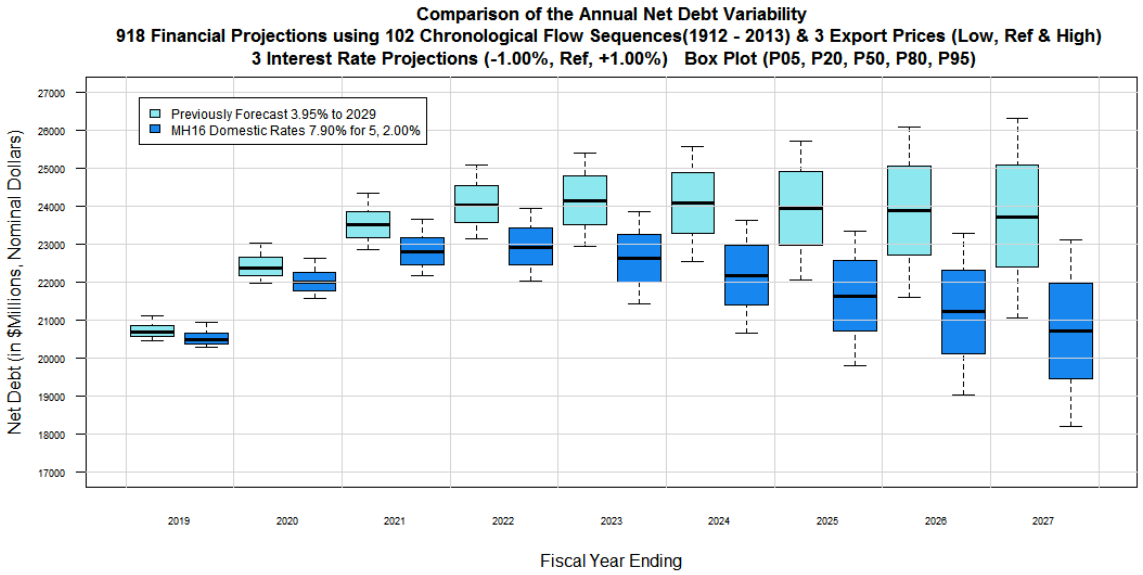
From **Figure 4.18**, it can be observed that:

- With 7.90% rate increases, there is only a very small chance of a net loss either before or after Keeyask is commissioned, thus allowing Manitoba Hydro to build its reserves and progress towards the minimum 25% equity ratio target. It must be recognized that as the Corporation's net plant in service doubles between 2016/17 and 2023/24, annual earnings will need to average approximately $400 million over the 10-year forecast period to achieve the minimum 25% equity ratio target by the 10th year of the forecast.
- With 3.95% rate increases, the domestic revenue projection does not build sufficient reserves during the construction phase and cannot adequately support the carrying costs of the Bipole III and Keeyask projects once they are both fully commissioned. From 2023/24 to 2026/27, there is only roughly a 50% chance that the Corporation will record a profit and considerable potential of significant losses.

Projected Net Debt Balances

Figure 4.19 shows the annual projected net debt balances under the range of projections.

Figure 4.19 Comparison of Net Debt Variability



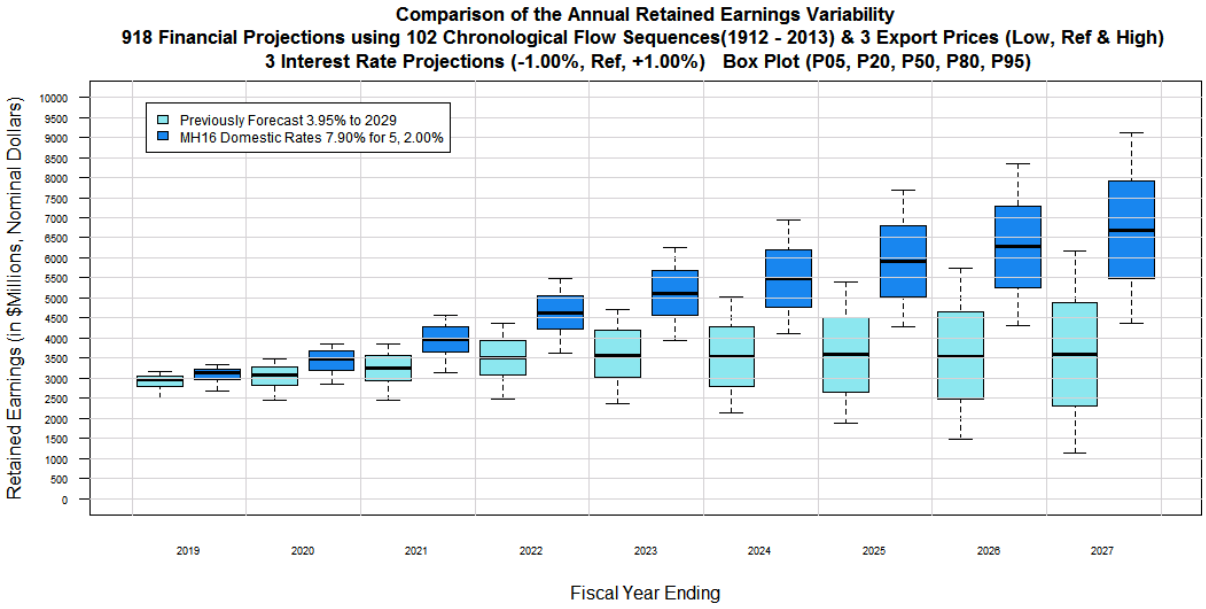
From **Figure 4.19**, it can be observed that:

- With 7.90% rate increases, net debt rises to $23 billion and is able to recover to less than $21 billion by 2026/27 in 50% of the financial projections; over $3 billion lower than with 3.95% rate increases by the end of the 10-year forecast period.
- With 3.95% rate increases, net debt rises to $24 billion by 2021/22 and remains at that level in 50% of the cases for the remainder of the forecast period.

Projected Retained Earnings Balances

Figure 4.20 summarizes the retained earnings results for the range of projections.

Figure 4.20 Comparison of Retained Earnings Variability



From **Figure 4.20**, it can be observed that:

- With 7.90% rate increases, the retained earnings balance grows between 2018/19 and 2021/22 to keep pace with the net debt balance. From 2022/23 and on, the retained earning balance continues to grow as the equity ratio progresses from 19% to 25% by 2026/27 in 50% of the financial projections.
- With 3.95% rate increases, the retained earnings balance is expected to grow by only $500 million over the 10-year forecast period in 50% of the financial projections while at the same time the net debt balance is expected to grow by $4 billion. As such, 3.95% rate increases do not enable any progress on the Corporation's equity ratio over the next decade.

Conclusions

Overall, the approach to the uncertainty analysis that incorporates 3 interest rate scenarios and generates 918 financial projections produces a reasonable and unbiased representation of the financial risk facing the Corporation. This is based on the similarity of outcomes achieved when results are compared to the uncertainty analysis with 15,300 projections.

The uncertainty analysis demonstrates that with 7.90% rate increases, Manitoba Hydro would make steady progress towards the minimum 25% equity ratio target and achieve/exceed the target in the 10th year of the forecast in 50% of the cases. The proposed 7.90% rate increases provide a level of domestic revenue that results in steady earnings growth such that the net debt begins to decline following the commissioning of the Bipole III and Keeyask projects.

The uncertainty analysis also demonstrates that 3.95% rate increases fail to provide sufficient earnings both before and after the commissioning of Bipole III and the Keeyask projects to make any improvement to the equity ratio or make any strides to minimize the financial risks facing Manitoba Hydro over the next ten years. Given there is only a 50% chance that the projected equity ratio will be either higher or lower than 13% while the overall variability of the equity ratio grows over the entire 10-year forecast, 3.95% rate increases could place Manitoba Hydro at a higher risk that its debt may not be viewed as self-supporting in the eyes of the credit rating agencies and lenders.

4.6 CREDIT RATING AGENCY PERSPECTIVES

The vast majority of Manitoba Hydro's investment in new plant and assets is funded by way of debt issuance advanced and guaranteed by the Province of Manitoba. While Manitoba Hydro also uses internally generated cash flows to fund some level of investment, due to the capital intensity of the Corporation's business, debt financing is both significant and essential.

Manitoba Hydro's long and short term credit ratings are a flow-through of the Province of Manitoba's credit ratings (as highlighted in green in **Figure 4.21** below):

Figure 4.21 Province of Manitoba Credit Ratings

S&P		Moody's		DBRS	
Long Term	**Short Term**	**Long Term**	**Short Term**	**Long Term**	**Short Term**
AAA	**A-1+**	Aaa	**P-1**	AAA	R-1 high
AA+		Aa1		AA high	
AA		**Aa2**		**AA**	**R-1 middle**
AA-		Aa3		AA low	
A+	A-1	A1		**A high**	R-1 low
A		A2		A	
A-	A-1/A-2	A3	P-1/P-2	A low	
BBB+	A-2	Baa1	P-2	BBB high	R-2 high
BBB	A-2/A-3	Baa2	P-2/P-3	BBB	R-2 middle
BBB-	A-3	Baa3	P-3	BBB low	R-2 low/R-3

Since the 2015/16 Electric GRA, the Province of Manitoba's credit rating has been downgraded by both Moody's and S&P. The credit rating has come under increasing pressure as the province's debt burden grows. **Figure 4.22** shows the comparative long term credit ratings for each of the Canadian provinces.

Figure 4.22 Provincial Long Term Credit Ratings Comparison

Province	Standard & Poors	DBRS	Moody's Investors Service
British Columbia	AAA	AA (high)	Aaa
Alberta	AA #	AA (high)	Aa1 #
Saskatchewan	AA+ #	AA	Aaa
Manitoba	AA- #	A (high)	Aa2
Ontario	A+	AA (low)	Aa2
Québec	A+ *	A (high)	Aa2
New Brunswick	A+	A (high)	Aa2
Nova Scotia	A+	A (high)	Aa2
Prince Edward Island	A	A (low)	Aa2
Newfoundland & Labrador	A#	A (low)	Aa3 #

* positive / # negative outlook

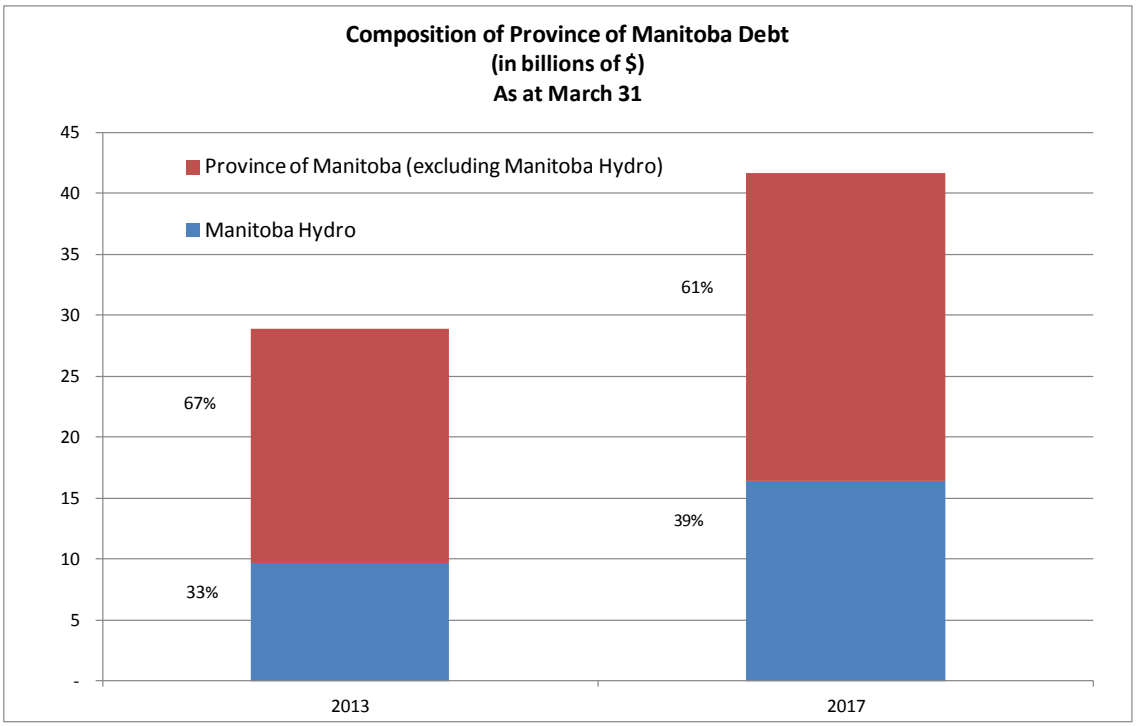
Figure 4.23 shows the downgrades of the western provinces that have occurred since the last Electric GRA.

Figure 4.23 Downgrades of Western Provinces

Province	Standard & Poors	DBRS	Moody's Investors Service
British Columbia	0	0	0
Alberta	2	1	1
Saskatchewan	1	0	0
Manitoba	1	0	1

The province's credit rating should be of concern to Manitoba Hydro's customers as it impacts the cost of borrowing that the Corporation must recover in its rates. As demonstrated in **Figure 4.24**, debt advances to Manitoba Hydro form a significant and growing portion of the total provincial debt and the Corporation's financial performance is therefore a contributing factor toward the financial strength and assessment of the Province's credit rating.

Figure 4.24 Composition of Province of Manitoba Debt



The credit rating agencies assign credit ratings based on their independent evaluations. Each rating agency considers Manitoba Hydro's financial risk profile including financial performance, ratios and forecasts as well as the business risk profile in assessing whether or not Manitoba Hydro is self-supporting. Providing that the rating agency views Manitoba Hydro's long term debt advances from the Province of Manitoba to be self-supporting, the credit rating agencies have stated that they will not include Manitoba Hydro's debt levels (the blue portion in the bar chart) in the net tax-supported provincial debt. This exclusion of Manitoba Hydro's debt is significant when assessing the Province of Manitoba's ratio of net tax-supported provincial debt as a percent of provincial GDP; a critical ratio for the provincial financial risk profile. Should Manitoba Hydro lose its self-supporting status and the contingent liability represented by Manitoba Hydro's debt to the Province of Manitoba materialize, the implication to the Province of Manitoba and its taxpayers is a higher risk of further downgrades.

On July 10, 2015 **Moody's downgraded** the Province of Manitoba's long term debt credit rating, and revised the outlook on the Province of Manitoba's long term debt

rating from negative to stable. As indicated in the Moody's report on the Province of Manitoba:

> *"the downgrade reflects the deterioration of Manitoba's financial metrics leading to an increased debt burden and our expectation that the province will face significant challenges in achieving fiscal balance by 2018-19"*.

The credit rating and outlook from Moody's has remained unchanged since July 10, 2015. Moody's report on Manitoba Hydro from November 16, 2016 stated that:

> *"Moody's continues to expect Manitoba Hydro to operate as a self-sufficient corporation to service its debt and afford payments to the Province such as water rentals and assessments".*

However in Moody's report on the Province of Manitoba dated August 3, 2016, with respect to Manitoba Hydro, Moody's states:

> *"The anticipated increase in debt continues to pressure the province's rating since it raises the contingent liability of the province. Manitoba Hydro has flexibility to increase utility rates to ensure that its own revenues will continue to support its operations and debt payments. Political willingness to approve rate increases when Manitoba Hydro's credit metrics will reach their low point will be critical to recover expected capital expenditures and restore credit metrics."*

On July 14, 2016 **S&P downgraded** the Province of Manitoba's long term debt credit rating and placed the outlook as negative. The negative outlook reflects the view that there is at least a one-in-three chance that S&P could lower the province's ratings by one notch in the subsequent 12 to 24 month period should the Province of Manitoba fail to meet its fiscal targets. As indicated in this S&P report on the Province of Manitoba:

> *"the downgrade reflects our assessment of the significant rise in Manitoba's debt burden. This stems from the province's ongoing fiscal shortfalls and significant*

debt on-lent to the MHEB which we no longer consider to be self-supporting mainly due to its high and rising leverage."

S&P has clarified its rating methodology such that it now defines "self-supporting" as maintaining stand-alone investment grade credit metrics. Since Manitoba Hydro does not meet this standard, Manitoba Hydro's debt is now **included** in the tax supported debt of the Province. S&P considers Manitoba Hydro to have a "highly leveraged" financial risk profile.

The S&P report on the Province of Manitoba from July 29, 2016 stated that:

"The province has run fiscal deficits since fiscal 2010 and MHEB is currently undertaking a large capital program to renew and expand its generating assets. The result has been a steady increase in the province's tax-supported debt burden to a level that we view as very high and that is significantly higher than that of its domestic and international peers. In addition, although we had previously expected that Manitoba's debt burden would continue to grow, the pace of borrowing in fiscal years 2016 and 2017 was greater than we had previously expected."

The credit rating and outlook from DBRS has remained unchanged since Manitoba Hydro's last GRA in 2015.

The November 25, 2016 DBRS rating report on Manitoba Hydro stated that:

"DBRS considers Manitoba Hydro to be self-supporting, as it is able to fund its own operations and service debt obligations. However, DBRS could consider reclassifying a portion of the Utility's debt to be tax-supported should the financial health of the Utility deteriorate to the point where its expenses cannot be recovered through rates. If this were to occur, it could potentially put downward pressure on the Province's credit rating."

"DBRS had noted that rate increases of 3.95% were expected to be insufficient for Manitoba Hydro to recover costs related to major projects for the medium term."

Attached as Appendix 4.4 are the following credit reports that have recently been issued by DBRS for Manitoba Hydro and the Province of Manitoba:

- DBRS Manitoba Hydro November 25, 2016
- DBRS Province of Manitoba September 12, 2016
- DBRS Manitoba Hydro November 26, 2015
- DBRS Province of Manitoba August 17, 2015

The following credit reports and ratings actions from Moody's and S&P for Manitoba Hydro and the Province of Manitoba have been filed in confidence with the PUB. These reports are proprietary and Manitoba Hydro has not received permission to file these on the public record.

- Moody's Manitoba Hydro November 16, 2016
- Moody's Province of Manitoba August 3, 2016
- S & P Province of Manitoba July 29, 2016
- S & P Province of Manitoba December 21, 2015
- Moody's Manitoba Hydro November 6, 2015
- Moody's Province of Manitoba July 16, 2015

In addition, the following ratings actions (downgrades) have recently been issued by Moody's and S&P with respect to long term credit ratings, and have been filed in confidence with the PUB:

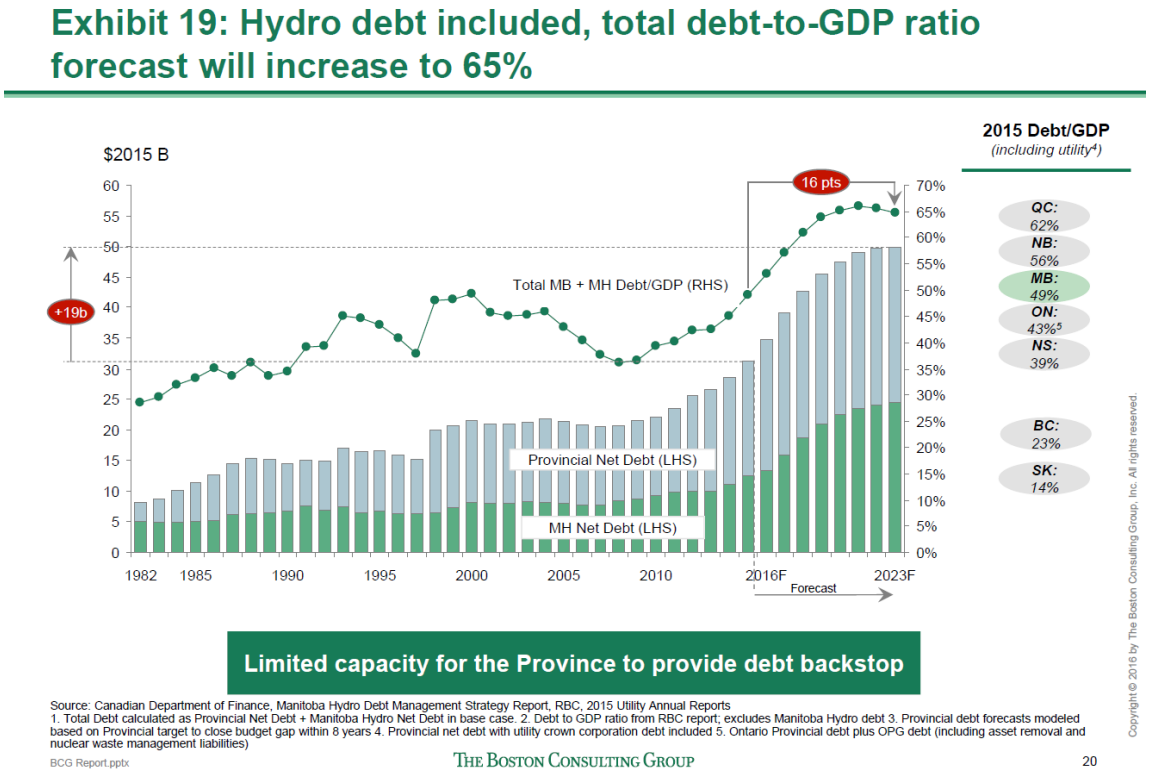
- S & P Province of Manitoba July 14, 2016
- Moody's Province of Manitoba July 10, 2015

Credit rating agencies, in their review of provincial sovereign debt, take into consideration the ratio of debt to GDP as one indicator of the financial health of the bond issuer. Credit rating agencies are willing to exclude Manitoba Hydro's debt from the calculation of total provincial debt so long as Manitoba Hydro is deemed to be self-supporting in its ability to adequately support the cost of its borrowing. In the event

that Manitoba Hydro's financial situation deteriorates to a level whereby the credit rating agency no longer views it as self-supporting, the level of total provincial debt must then include that attributed to Manitoba Hydro.

Figure 4.25 below illustrates that the level of borrowing required for Manitoba Hydro's capital expansion will dramatically increase the total level of debt taken on by the Province. If Manitoba Hydro is no longer considered to be self-supporting (as S&P has now concluded), Manitoba Hydro's debt would need to be included in the tax supported debt of the Province for purposes of ratio calculation for assessing the financial strength of the Province. In combination with the Province's estimated borrowings over the course of the next few years, BCG projected that the debt-to-GDP ratio would increase to 65% by the fiscal year 2023.

Figure 4.25 Manitoba Debt to GDP Ratio



As shown in the Figure above, the circumstances facing the Province of Manitoba and Manitoba Hydro at this time are far different from those experienced in the past, in terms of the level of debt compared to GDP.

Therefore, it is critical that credit rating agencies view Manitoba Hydro's debt as self-supporting and that weakened financial ratios as a result of major capital investments and reinvestments do not negatively impact the credit rating of the Province. An implication of the recent and potential future downgrades is an increased cost of borrowing.

The proposed rate increases are necessary to demonstrate to the credit rating agencies that Manitoba Hydro is on a path to maintain its self-supporting financial status.