KPMG

Manitoba Hydro

Financial Targets Review

Supplementary Update

August 2017

KPMG LLP

Notice on Supplementary Update

KPMG LLP ("KPMG") has drafted this supplementary update ("Update") to the Financial Targets Review Report issued May 2015 (the "May 2015 Report"). This supplementary update and the May 2015 Report were prepared pursuant to our engagement to assist Manitoba Hydro-Electric Board ("Manitoba Hydro" or "MH") in its review of financial targets ("Financial Targets Review") in accordance with the terms of a services agreement dated December 5, 2014.

This Update has been prepared for Manitoba Hydro. Its contents may not be shared with or disclosed to anyone by the recipient without the express written consent of Manitoba Hydro and KPMG, unless Manitoba Hydro files the report or substantive components of the report for its regulatory purposes. KPMG does not accept any liability or responsibility to any third party who may use or place reliance on this Report.

Purpose of the Update

The purpose of this Update is to:

- Provide an update of the background information in the Financial Targets Review,
- Update data and information as at March 2017 for benchmarking and comparisons of government-owned power utilities in Canada; and
- Update the scenario analysis to include IFF16 filed by Manitoba Hydro in May 2017.

Basis of Information

The data and information included in this Update and the May 2015 Report were obtained primarily from secondary sources such as annual reports, financial statements and regulatory filings of MH and other power utilities, Decisions and Orders of the Public Utilities Board of Manitoba ("PUB") and of other regulatory agencies, credit agency reports, bank reports, and other sources of Canadian and international research and statistics. Financial forecasts were derived from MH's Integrated Financial Forecast and similar documents from other select power utilities. Scenario analyses were performed on KPMG's behalf by MH using its own in-house models.

This Update and the May 2015 Report relies on data and information from these secondary sources and KPMG makes no representations with respect to their accuracy or completeness.

The procedures performed do not constitute an audit, examination or review in accordance with standards established by the Chartered Professional Accountants of Canada, and we have not otherwise verified the information we obtained or presented in this Update or Report. KPMG expresses no opinion or any other form of assurance on the information presented in the Update and the May 2015 Report, and makes no representations concerning its accuracy or completeness.

Contents

1 Background

This chapter outlines the objectives, scope and process of the project.

1.1 Objective

In 2014, Manitoba Hydro-Electric Board ("Manitoba Hydro" or "MH") retained KPMG LLP ("KPMG") to undertake a review of its current financial targets (the "Financial Targets Review"). The specific objectives of this engagement were to:

- Provide recommendations with respect to appropriate financial targets for Manitoba Hydro that align with the mandate of Manitoba Hydro and the interests of its stakeholders considering its operating and business outlook and associated risks.
- The financial target recommendations should consider at a minimum the following:
  - The objective 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.
  - The maintenance of Manitoba Hydro's self-supporting status for credit rating purposes.
- Conduct scenario analysis to help address PUB's directive to Manitoba Hydro to review key operating and financial risks in order to assess the adequacy of financial reserves.

The results of this review culminated in a report dated May 2015 (the "May 2015 Report"). The analyses in the 2015 report were based, among other things, on MH's Integrated Financial Forecast ("IFF14"), dated December 2014.

The scope of the work did not involve review or comment on broader policy questions associated with Manitoba Hydro's overall structure, governance framework, and business strategy, including capital plans and IFF strategies and rate decisions.

1.2 Scope and Overview of Update Process

Given the passage of time, which has been accompanied by changes in the economic environment and by changes in Manitoba Hydro's financial outlook, Manitoba Hydro retained KPMG to undertake an update of certain analyses contained in the May 2015 Report. The results of this update process are summarized in this report.

The analysis in this update is intended to supplement that contained in the May 2015 Report. Hence, this "Supplementary Update" should be read in conjunction with the May 2015 Report and does not replace it. We have not updated all of the analyses of the earlier report, nor have we revisited all of discussions of conceptual issues contained in that report. Rather, the intent of this report is to address changes in the environment and to update key financial data and metrics. In particular, we reviewed recent developments at benchmark government-owned power utilities and we updated our financial comparisons with recent financial information.

As per our scope of work, the following Supplementary Update provides updated information for Chapters 3, 4, 5, 6 and 7 of the May 15 Report.

1.3 Summary of the May 2015 Report Recommendations

It should be noted that the updates contained herein have not changed the core recommendations of the May 2015 Report. For greater certainty, we still concur with the recommendations of the May 2015 Report.

The context for the recommendations in the May 2015 Report included the following:

- Relative to other Crown utilities with a significant base of hydro-electric generation, Manitoba Hydro faces a number of heightened risks:
  - Manitoba Hydro has a large capital investment program relative to its current installed asset base and its projected revenues going forward.
  - Manitoba Hydro faces relatively greater hydrology risks than other major utilities.
  - Manitoba Hydro relies on export markets for a significant proportion of its revenue.
  - Utility debt and utility assets in Manitoba are relatively high on a per capita basis compared to other jurisdictions. Manitoba Hydro thus has a relatively limited customer base over which to spread potential future cost overruns or business set-backs.
- As shown through benchmarking, Manitoba Hydro's target equity ratio is at the low end of those maintained or forecast by other government-owned power utilities.
- Manitoba Hydro has limited ability to restrain a drop in financial ratios during adverse conditions, such as a drought. This highlights the risk of having an equity ratio that approaches 10%. For this reason, we believe that equity ratios of 15% or higher are the minimum that should be accepted even for short periods.
- Manitoba Hydro is dependent on an accumulation of retained earnings to build up its equity base. The Manitoba government does not expect to receive dividend income from the utility but nor does it make equity injections during periods of major capital expansion. As a consequence, Manitoba Hydro has few levers with which to adjust its financial position.
- Manitoba Hydro's capital investment program is characterized by periodic "bumps" or "hills" of large magnitude. These fluctuations magnify the challenges associated with Manitoba Hydro's limited levers for financial control.

As further context to this update, the recommendations of the May 2015 Report are repeated below:

Recommendation 1: debt/equity ratio target of 75/25 to 70/30

- Manitoba Hydro's current debt/equity target of 75/25 is a reasonable long-term target. Notwithstanding this finding, we note that a target of 70/30 would provide additional financial strength to address the utility's unique financial challenges and risks. Accordingly, our overall recommendation is that the debt/equity ratio should fall within the range of 75/25 to 70/30.
- 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.
- We have significant concerns that an 11% equity level, as forecast under IFF14, provides a less than desirable equity base to accommodate potential adverse developments. We suggest that Manitoba Hydro's plans be adjusted to maintain an equity ratio no lower than 15% under forecast conditions during the peak periods of its major capital build program when equity ratios are at their lowest levels.
- 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.

- In the long-term, higher equity ratios need not translate into higher rates, because Manitoba Hydro has the option to seek lower rates of return on equity than investor-owned utilities.

Recommendation 2: minimum EBITDA interest coverage ratio target of 1.8 or greater

- As noted in the May 2015 Report, the debt/equity ratio should remain the primary measure of Manitoba Hydro's financial position. An interest coverage ratio is an important element of financial targets and indicator of trends. EBITDA is a widely accepted financial measure and is closer to a cash flow metric than EBIT, albeit with limitations since it does not incorporate capital expenditure requirements or working capital adjustments.
- Our recommendation is an EBITDA interest coverage ratio, at a minimum target level of 1.8 or greater.

Recommendation 3: maintain a minimum capital coverage ratio target of 1.2 or greater

- The capital coverage ratio is also an important financial target and a unique measure to Manitoba Hydro.
- The current minimum target of 1.2 or greater is reasonable in that the corporation should be able to fund its sustaining base capital from current operations without accessing external sources of financing. However, an inherent limitation of this ratio is that it does not reflect the financial challenges associated with major expansion programs. Hence it may be misunderstood or misinterpreted by stakeholders.

Recommendation 4: other metrics to continue to monitor

- Manitoba Hydro should maintain three Financial Targets.
- Manitoba Hydro should also continue to regularly monitor other financial metrics. These include but are not limited to: revenue growth, controllable operating costs, EBITDA, net income, cash flow from operations to net debt, net debt to assets, EBITDA to revenue, capital expenditures to fixed assets, average electricity prices across different customer groups.

In the context of this review, we note that the financial position of Manitoba Hydro has deteriorated in recent years, which increases risk to the corporation and to the Province of Manitoba. Benchmarking comparisons to peer government-owned power utilities show Manitoba Hydro in a relatively worse financial position than comparisons in the May 2015 Report. The Province of Manitoba has experienced credit downgrades from two credit rating agencies since the May 2015 Report. Thus, a return to minimum equity ratio targets, which is fundamental to the financial health of the corporation and the need for a sufficient equity cushion, has increased. With Manitoba Hydro's reliance on retained earnings for equity, the need for growth in sustainable positive cash flow and net income to increase equity has increased. Further, actions at other utilities confirm the importance of a robust equity ratio to support capital expansion and to provide protection against downside risks.

2 Update of Manitoba Hydro's Financial Outlook

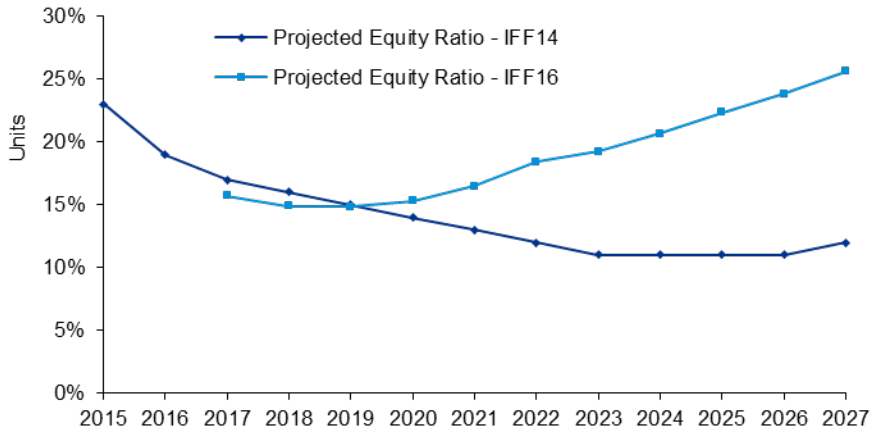
This chapter summarizes Manitoba Hydro's financial outlook under current plans as embodied in IFF16. This chapter updates some of the projections that were contained in Chapter 3 of the May 2015 Report.

2.1 Financial Metrics Forecast Over the Next 10 Years under IFF16

In this section, we compare key metrics for Manitoba Hydro under IFF16 versus IFF14. Manitoba Hydro's revised financial plan, IFF16, proposes annual rate increases in electricity rates of 7.90% for five years, 2017/18 to 2021/22, followed by inflationary increases of approximately 2.00% thereafter.

Figure 2-1 shows the projected equity ratio under the two forecasts. The projected equity ratio under IFF16 starts out from a lower position than under IFF14, but improves much more rapidly after 2020.

Figure 2-1: Projected Equity Ratio – IFF16 versus IFF14



In the short-term (through 2018), the equity ratio continues to fall under IFF16, remaining lower than under IFF14, even with projected 7.90% rate increases. This highlights the challenges related to financing large capital build programs. Given limited cash flows available from operations, Manitoba Hydro must rely significantly on debt to finance its capital expansion.

By definition, equity is a "stock" measure, and adjustments in the equity ratio over time require significant earnings flows to build up the retained earnings base and cash flows to reduce debt. If rate increases are not implemented, deficiencies in the earnings and in the cash flows available from operations could impair improvements in the utility's financial position.

Figure 2-2 below compares projected interest coverage ratios under the two forecasts (IFF16 and IFF14). Interest coverage ratios are consistently better under IFF16 after 2018 under the more recent projection, reflecting higher operating earnings.

Figure 2-2: Projected Interest Coverage Ratio – IFF16 versus IFF14

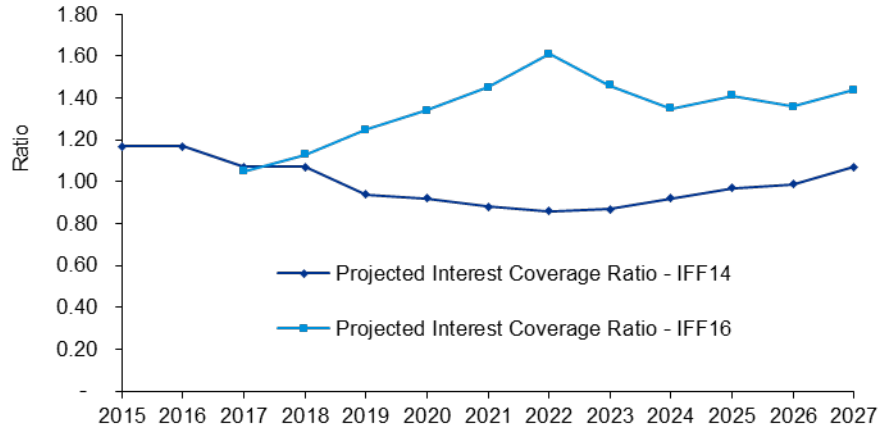


Figure 2-3 below compares projected EBITDA interest coverage ratios under the two forecasts (IFF16 and IFF14). EBITDA interest coverage starts from a slightly lower position in 2017 under IFF16, but then is consistently better than IFF14 for the remainder of the period.

Figure 2-3: Projected EBITDA Interest Coverage Ratio – IFF16 versus IFF14

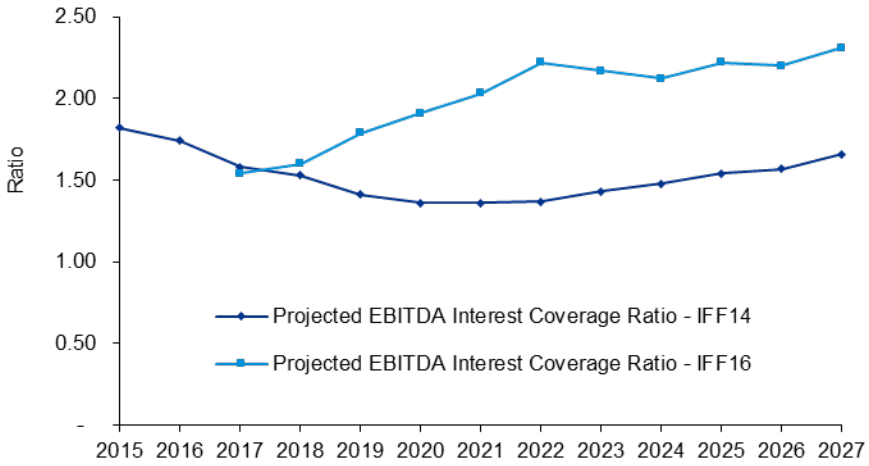
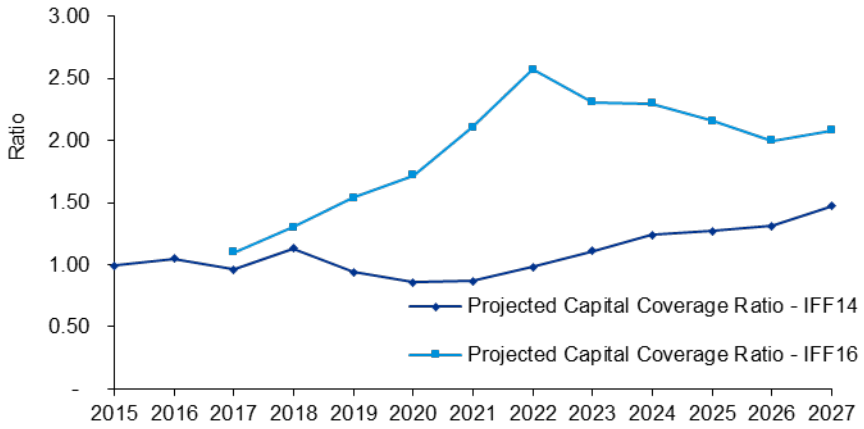


Figure 2-4 below compares projected capital coverage ratios under the two forecasts (IFF16 and IFF14). Capital coverage ratio is consistently better under IFF16. This reflects Manitoba Hydro's improved operating earnings.

Figure 2-4: Projected Capital Coverage Ratio – IFF16 versus IFF14



In evaluating projected trends in the capital coverage ratio, the limitations of this ratio need to be taken into account. As noted in the May 2015 Report, the capital coverage ratio does not take into account the financial impacts associated with major capital programs. Hence, it needs to be interpreted with caution. By definition, the ratio takes into account only base capital expenditures. It excludes projects categorized as Major New Generation and Transmission. It thus excludes:

- Capital expenditures related to large capacity expansions (such as Keeyask).
- Major reliability projects such as Bipole III.
- Some expenditures related purely to asset sustainment, such as the Pointe du Bois Spillway replacement, which are classified as Major New Generation and Transmission projects simply because of their size.

Projects such as Bipole III and major sustainment expenditures are particularly challenging from a financial perspective for Manitoba Hydro because they do not lead to material revenue increases that could help support their carrying costs once they are introduced into service. Bipole III has been built to reduce the risk of transmission outages and sustainment projects are built to ensure the continuation of existing revenue streams.

Furthermore, the capital coverage ratio excludes ongoing cash expenditures that Manitoba Hydro has to make to continue to operate as it currently does. Examples include deferred expenditures such as DSM and mitigation spending.

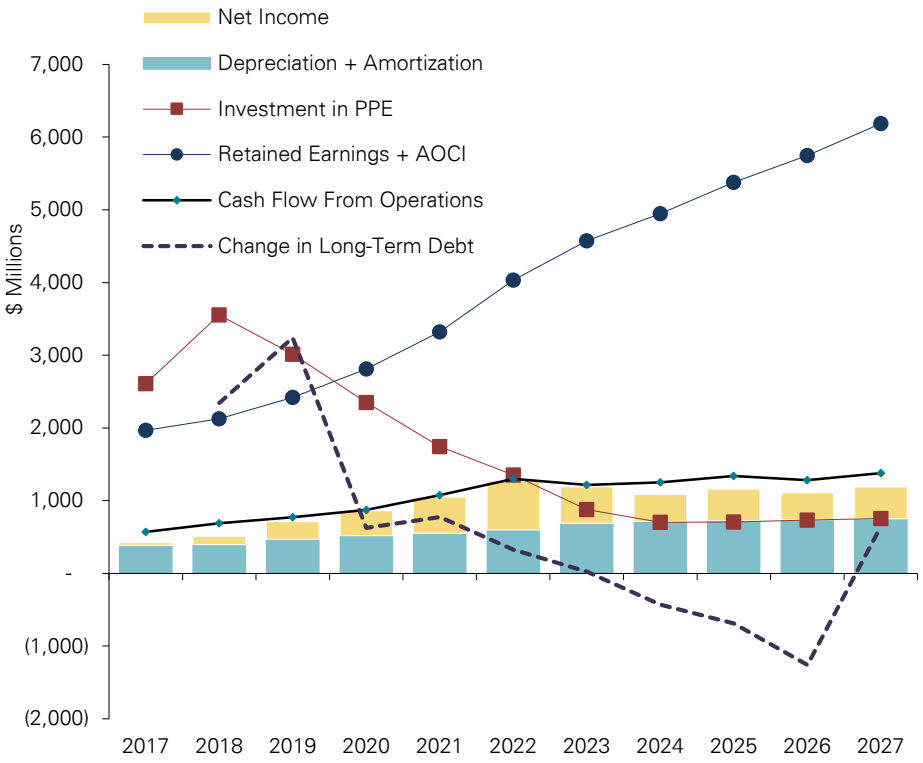
Also, the capital coverage ratio is based on cash flow from operations. This cash flow measure does not reflect the cash flow impact of interest payments that are capitalized for accounting purposes. Major capital projects result in a significant amount of such interest.

We note that Manitoba Hydro has developed an additional metric that examines adjusted cash flow to adjusted capital expenditures. This metric is intended to reflect overall cash flow impacts and related challenges in a more complete way during periods of major capital investment.

2.1.1 Integrated Assessment

Figure 2-5 shows the forecast evolution of Manitoba Hydro's financial position over the next 10 years based on projections in IFF16. This updates the data presented in Figure 3-10 of the May 2015 Report. All figures are shown in nominal dollars and are for Electric Operations alone, in contrast to Figures 2-1 through 2-4 above, which are for the overall corporation.

Figure 2-5: Forecast Evolution of Manitoba Hydro's Financial Position – IFF16



Source: IFF16 Projected Financial Statements for Electric Operations

A review of Figure 2-5 indicates the following:

- Projected capital expenditures in property plant and equipment ("PPE") are at very high levels in the near term, with a peak of $3.6 billion in Fiscal 2018. Thereafter they fall steadily to $700 million by Fiscal 2024 and then remain generally flat through to the end of the projection period. High capital expenditures in the near term reflect work associated with the construction of Keeyask and Bipole III. The capital expenditure profile is similar to that observed in IFF14, although peak spending in 2018 is higher (at $3.6 billion versus $3.2 billion). Overall spending is also higher due to increases in control budgets on the major projects.
- Depreciation and amortization expense is approximately $400 million in 2017, but increases gradually to $751 million by 2027. We note that depreciation expense has historically been significantly lower than actual annual investments in sustaining or business operations capital.
- Under IFF16 for electric operations, net income grows steadily over the period to 2022, from just $34 million in 2017 to $673 million in 2022. This provides support in reducing reliance on new debt to fund capital expenditures.

- Cash Flow from Operations tracks, but is slightly above, the sum of net income and of expenses for depreciation and amortization over the period.
- Given the limited cash flow available from net income and from depreciation and amortization, capital expenditures in the near term must largely be funded by debt. Thus, the annual change in debt during the years 2018 and 2019 is closely related to capital expenditures. The increase in debt highlights the major cash flow shortfall that Manitoba Hydro experiences during major capital projects. It also reflects that the costs of maintaining the existing Manitoba Hydro system have been $150 to $200 million more per year than what is being recognized through depreciation expense.
- Beyond 2022, net income falls again before recovering to $440 million in 2027. Over the same time period, projected capital expenditures are roughly equal to the cash flow available from depreciation and amortization expense. Because net income is retained rather than distributed as dividends, there is increasing growth in retained earnings in this period. Strong cash flow avoids the need to add new debt and, in many individual years, significant reductions in long-term debt balances occur.

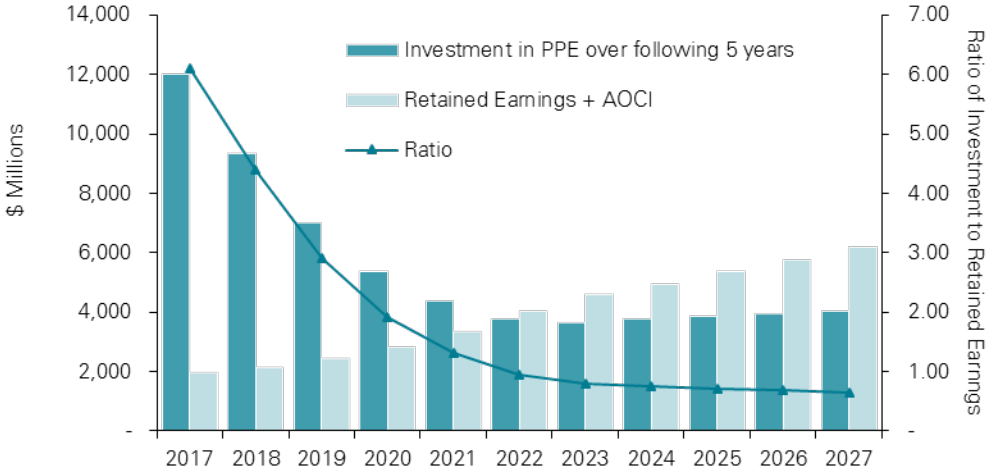
The following observations and conclusions are in order:

- Retained earnings are currently the only source of new equity for Manitoba Hydro, given that the Province has not made a practice of investing new equity into its operations.
- Because annual earnings are relatively modest in comparison to projected capital expenditures in the near term, the equity ratio declines slightly by 2019. As per IFF16, rate increases are assumed to be implemented, however, to avoid any significant reduction in the equity ratio below 15%.
- The increases in rates in the near term allow rate increases to fall to 2.0% annually beyond 2022. With moderate rate increases during this future period, the equity ratio recovers and reaches the minimum target of 25% by 2027.

Figure 2-6 provides an additional approach to examining Manitoba Hydro's financial position. This graph shows retained earnings (including AOCI) in each year as well as projected investments in PPE over the following 5 years.[1] The line shows the ratio between the two values. Higher ratios are indicative of higher capital cost risks, relative to the corporation's existing equity position, than lower ratios. Measured through this metric, capital cost risks are the highest in the first year of the outlook, in Fiscal 2016. The ratio falls rapidly over the period through 2022, as investments in Keeyask and Bipole III are completed. The ratio then continues to fall, although on a much more moderate trajectory.

[1] AOCI stands for Accumulated Other Comprehensive Income. It is a line item of the corporation's equity position.

Figure 2-6: Ratio of Projected Capital Investment to Retained Earnings



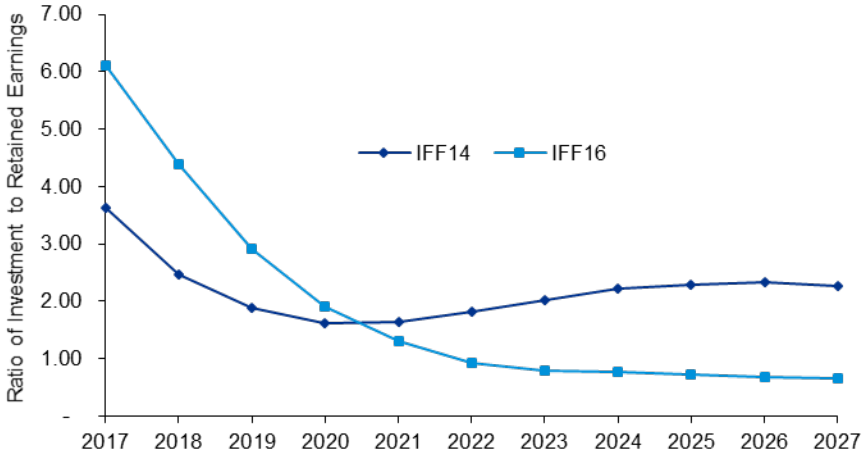
Source: IFF16 Projected Financial Statements for Electric Operations

Our observations with respect to Figure 2-6 are as follows:

- Relative to its equity base, Manitoba Hydro's risk with respect to capital costs is much higher in the next two or three years than it will be over the remaining projection horizon. There are large cash outflows in the near term without corresponding cash inflows until Keeyask is in-service.
- The decline in Manitoba Hydro's relative capital cost risk going forward is contingent on there being no new large capital projects after Keeyask. The introduction of Conawapa into the planned development sequence would result in a significant increase in capital cost risks in the future.
- As noted earlier in this Chapter, the projected equity position of the corporation is contingent on successive annual rate increases of 7.90% to 2022. Rate increases below this level would have a detrimental impact on relative capital cost risks.

Figure 2-7 below compares the ratio of near-term investment to retained earnings, as defined above for Figure 2-6, under IFF16 versus IFF14. The corporation's investment ratio improves more quickly, and more consistently, under IFF16 than under IFF14. This reflects the elimination of the extended period of negative net income that was observed under IFF14. However, the ratio starts from a higher starting point. Under IFF16, the ratio of near-term investment to retained earnings starts out at 6.1, relative to the value of only 3.6 projected for 2017 under IFF14. This indicates that relative investment risk is higher in 2017 than was forecast two years ago. This reflects, in part, delays in the construction of Keeyask, which has pushed some spending forward into the next few years. It is also a consequence of the combined $2.7 billion increase in capital budgets for Keeyask and Bipole III since IFF14.

Figure 2-7: Ratio of Projected Capital Investment to Retained Earnings



Source: IFF16 Projected Financial Statements for Electric Operations

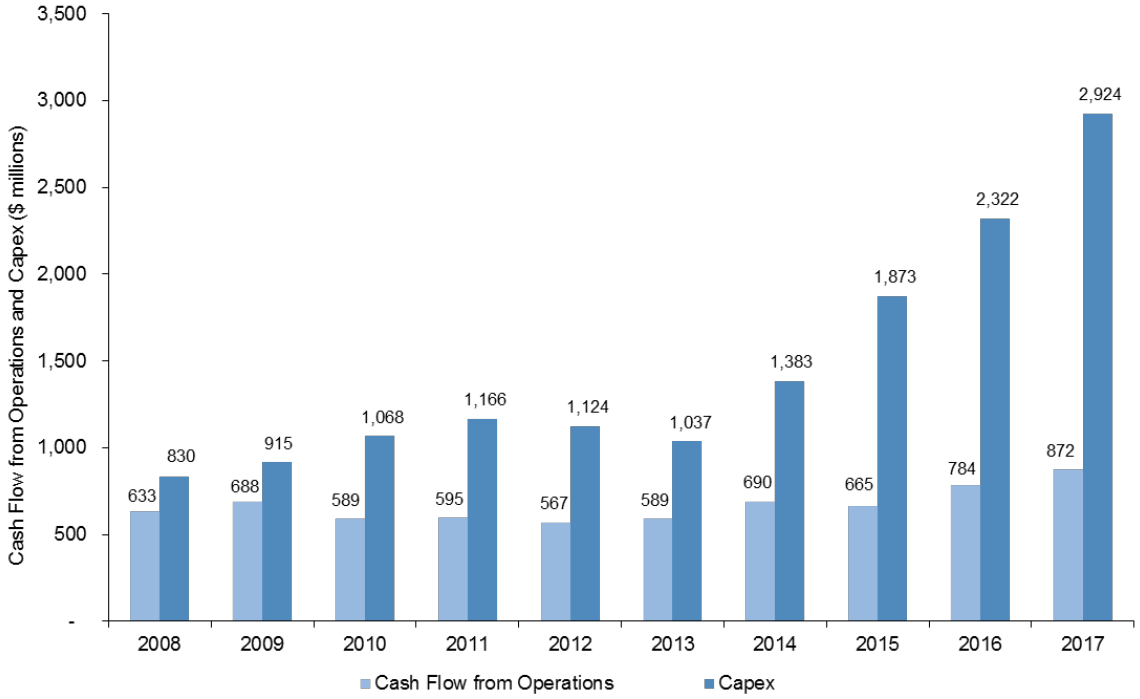
Figure 2-8 shows trends in cash flow from operations and capital expenditures over the past 10 years. Manitoba Hydro's cash flow from operations has grown to $872 million in 2016/17 and has averaged approximately $665 million from 2008 to 2017. A cautionary note with respect to recent growth is the understanding that the total cash flow from operations for the past two fiscal years are significantly higher due to increased payable balances driven by major capital projects. Manitoba Hydro noted in its annual reports for the years ending March 31, 2016 and 2017 that the increase in cash provided from operations largely reflects significantly higher payable balances primarily related to the construction of the Keeyask generation and transmission facilities and of the Bipole III project.[2]

Total capital expenditures have ramped up rapidly since 2008. This has resulted in an increasing gap between the two metrics, which is reflected in an increase in Manitoba Hydro's borrowing needs.

As shown in Figure 2-9, under IFF16, with 7.90% rate increases for the first five years, the gap between cash flow from operations and capex during the next five years is substantial.

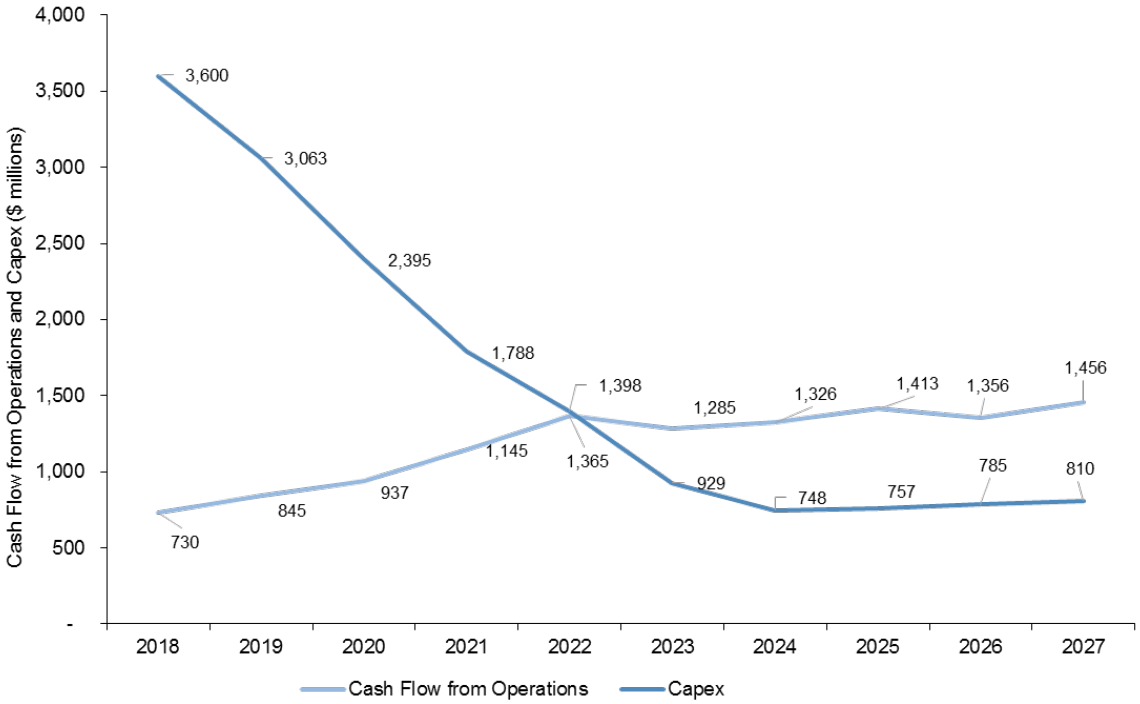
[2] See pages 25 and 31 of the 2016 and 2017 reports respectively.

Figure 2-8: Manitoba Hydro, Cash Flow from Operations and Capex, 2007/08 to 2016/17



Source: Derived from annual report and financial statements for the years ended March 31.

Figure 2-9: Manitoba Hydro, Cash Flow from Operations and Capex under IFF16, 2017/18 to 2026/27 Projections



Source: Derived from IFF16 projected consolidated financial statements.

3 Update of Developments and Issues Raised by Regulatory Bodies and Other Stakeholders in Canada

This Chapter updates the findings of the May 2015 Report with respect to regulatory developments at other utilities in Canada. The earlier findings were found in Chapter 4 of the May 2015 Report.

3.1 Structure of the Chapter

This Chapter reviews a number of recent developments at the following utilities:

- BC Hydro
- Hydro Quebec
- Nalcor
- NB Power.

Developments at these utilities are summarized, in turn, in the sections below.

3.2 BC Hydro

3.2.1 Overview

In the May 2015 Report, we noted that the BC government had put in place a 10-year plan in 2013 to improve the financial position of the utility while reducing rate increases that had been projected by the utility in an earlier rate application. With respect to the rate increases being proposed, the 10-year plan is still in effect and being followed.

On March 22, 2016, the British Columbia Utility Commission (BCUC) approved an interim rate increase of 4.0% effective April 1, 2016. The rate increase adheres to the rate trajectory laid out in the government's 2013 10-year plan. In approving the rate increase, BCUC noted that BC Hydro would actually need a rate increase of 9.7% to recover its forecast Fiscal 2017 revenue requirement during the rate year. The portion of the revenue requirement that will not be recovered as a result of the lower rate increase that was applied will be transferred to a regulatory deferral account for recovery in the future.

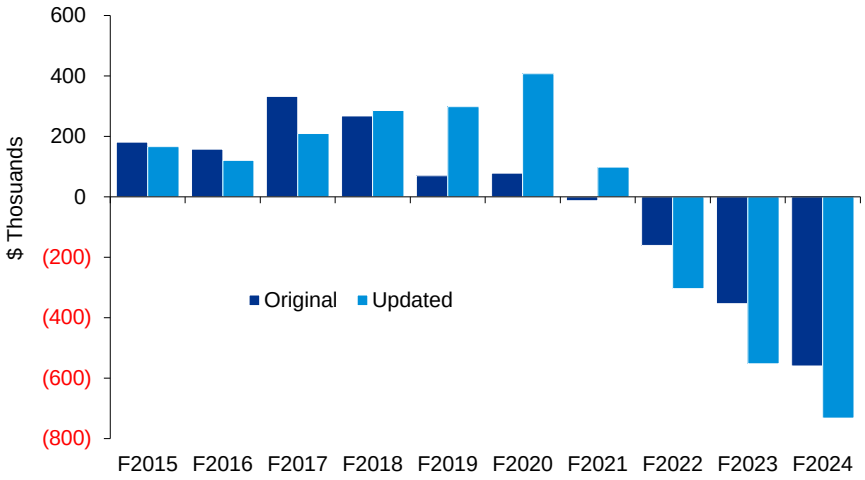
In its application for interim rates, dated February 2016, BC Hydro noted that there had been significant declines in the financial position of key commodity sectors in BC as well as delays in a decision to proceed with a Liquefied Natural Gas (LNG) project. These developments were expected to reduce load in the short term, putting additional upward pressure on rates. Accordingly, BC Hydro requested additional time to review its load and revenue forecast, in advance of submitting a full application that would seek approval of rates on a final basis.

BC Hydro submitted its full application on July 28th, 2016. It covers the 3-year period 2017 through 2019. This application maintains the request for a 3.5% effective rate increase for Fiscal 2017, consistent with the 10-year plan. While this application incorporates a lower load growth forecast in the short-term than earlier projections, BC Hydro is still projecting long-term growth across all three customer sectors (residential, light industrial/commercial, and large industrial).[3] Lower load growth in the short-term means that BC Hydro has had to take additional cost control measures to ensure that it can meet the

[3] BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, July 28, 2016, p. 3-1.

targets set out in the 2013 10-year plan. [4] A particular concern is the need to recover all amounts that have been transferred to the regulatory deferral account for rate smoothing by 2024, thereby bringing balances down to zero by the end of that Fiscal Year. Deterioration in projected revenues relative to the original 10-year plan in the next few years mean that this regulatory deferral account will grow to a much larger amount than originally forecast. Figure 3-1 shows additions and withdrawals to the rate smoothing account in the original plan and as forecast in the rate application filed in 2016. Much greater withdraws from the rate smoothing deferral account will be required during the period Fiscal 2022 through 2024 than was originally forecast.

Figure 3-1: Additions / (Withdrawals) to Rate Smoothing Deferral Account

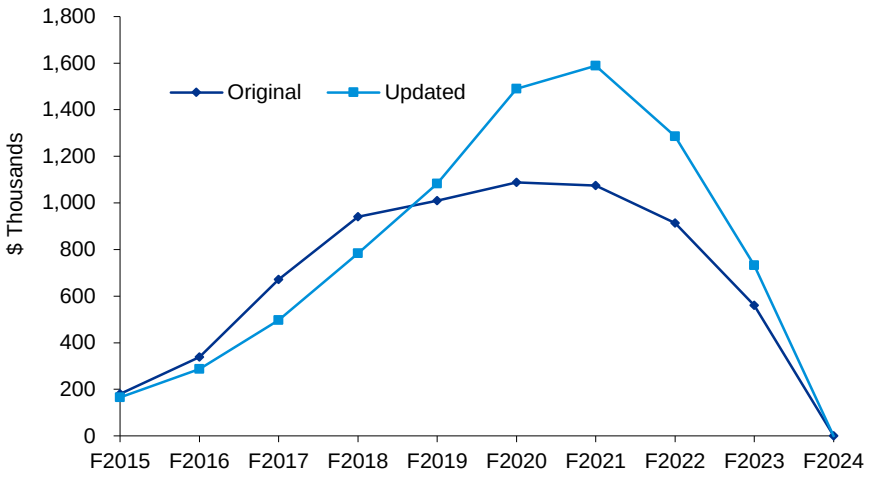


Source: derived from BC Hydro information.

Figure 3-2 shows cumulative balances in the rate smoothing account. Figure 3-2 shows that the cumulative balance grows to $1.59 billion, or almost 50% more than originally forecast. It should be noted that, although the rate smoothing account is projected to be brought down to zero by the end of Fiscal 2024, other regulatory accounts will remain in place. The balances in these other accounts are forecast to be at $3.609 billion at the end of Fiscal 2024, which is down slightly from the original forecast.

[4] BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, July 28, 2016, p. 1-8.

Figure 3-2: Cumulative Balance - Rate Smoothing Deferral Account



Source: derived from BC Hydro information.

3.3 Hydro Quebec

3.3.1 Overview

Hydro Quebec issued a Strategic Plan for the period 2016-2020 on June 8, 2016. The Strategic Plan centres on four major objectives:

- Laying the groundwork to double the utility's revenue over the next 15 years, thereby increasing profits.
- Being a benchmark in customer service.
- Contributing to Quebec's economic development and energy transition to a low-carbon economy.
- Keeping rate increases lower than or equal to inflation.

Specific financial objectives include the following:

- Generating revenue of $27 billion by 2030 (versus $13.75 billion in 2015).
- Reaching net income of $3.2 billion in 2020 and $5.2 billion in 2030.
- Increasing net income by $300 million through new exports.

Reaching these financial targets will require significant business expansion. With only its current base of operations, Hydro Quebec expects that it would achieve nominal net income of just $2.850 billion in 2020 (versus $3.147 billion in 2015) and $4.0 billion by 2030. Projected nominal income of $4.0 billion for 2030 is equivalent to about $3.0 billion in 2015 dollars. [5] Hence, continuation of only its current base of business would result in a relatively steady-state outlook in real dollar terms.

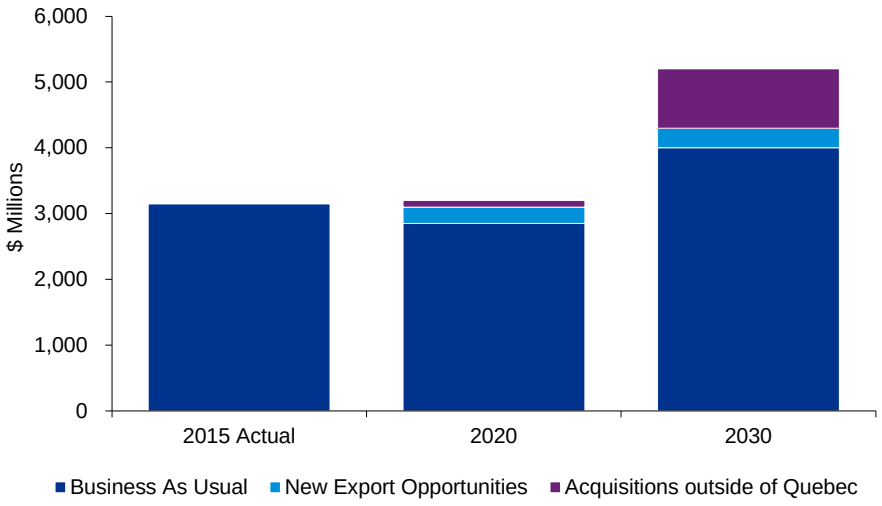
[5] Hydro Quebec, Strategic Plan 2016-2020, pp. 9-12.

To make up the difference between a 'business as usual' scenario and its long-term financial objectives, Hydro Quebec plans an increased focus on new export opportunities and on the acquisition of assets or business interests outside of Quebec. The bulk of growth will come from the acquisition of businesses and assets outside of the province of Quebec: of $1.2 billion in additional net income beyond a business as usual scenario, $900 million will come from out-of-province acquisitions.

The Strategic Plan does not specifically identify the size of investments that will be required to reach the targets for net income growth identified. Nor does it indicate if changes in dividend policy will be required to help fund this expansion through increased retention of utility earnings. Hydro Quebec has traditionally paid out 75% of its net income as dividends to the Province.

Figure 3-3 below shows the target composition of net income as outlined in the Strategic Plan.

Figure 3-3: Projected Sources of Net Income – Hydro Quebec



Source: derived from Hydro Quebec information.

In the Strategic Plan, the utility's forecast capital program over the period 2016 to 2020 is relatively stable, with annual spending of between $3.1 billion (in 2020) and $4.0 billion (in 2018). The capital program includes completion and commissioning of the last two units of the Romaine Dam complex:

- Romaine 3, with 395 MW, will come on-line in 2017, and
- Romaine 4, with 245 MW, will come on-line in 2020.

Over the 2016-2020 period, Hydro Quebec will also undertake preliminary studies to examine the feasibility of various other large-scale hydropower projects in the area of Plan Nord.[6] According to its Strategic Plan, Hydro Quebec will then be in a position to choose the next hydro-electric project, for implementation in the decade following.

[6] Plan Nord is the Province of Quebec's plan for development of Northern Quebec.

One observer has characterized the 2016-2020 years as a period of consolidation, rather than expansion, noting an increased focus on encouraging energy efficiency by customers, and on employee productivity and engagement.[7]

The Provincial government, in parallel, has introduced a new energy policy. This policy aims to make Quebec a North American leader in the fields of renewable energy and energy efficiency, thereby allowing Quebec to prosper in a low-carbon economy. Key elements of the plan:

- Enhancing energy efficiency by 15%.
- Reducing the consumption of petroleum products by 40%.
- Eliminating the use of thermal coal.
- Increasing overall renewable energy output by 25%.
- Increasing bioenergy production by 50%.[8]

Hydro Quebec Strategic Plan will support the broader provincial policy through:

- Support for the electrification of transportation, including through electric vehicle charging networks.
- Development and commercialization of innovative technologies, including battery materials and energy storage systems.
- Continued support to R&D.

3.3.2 Regulated transmission and distribution

As discussed in the May 2015 Report, only the business segments of transmission and distribution are regulated by the provincial utility regulator. The regulator approved a rate increase of 0.7% effective April 1, 2016 for residential customers and the majority of business customers, and also 0.7% for 2017. Industrial customers served under the large-power industrial rate will see no rate increase.[9] The capital structure assumed for the distributor remains unchanged, with a deemed debt/equity ratio of 65:35.

3.4 Nalcor

3.4.1 Overall Structure

On June 24, 2016, Nalcor Energy provided an update on its Muskrat Falls Project. This update indicated that there had been a material deterioration in the outlook for this project, with projected in-service costs escalating from $7.4 billion, as were forecast at project sanction in 2012, to $11.4 billion as projected at the time of the update. Excluding financing and other costs, projected construction costs alone have escalated from $6.2 billion as at project sanction to $9.1 billion currently. The completion date for the full project has also slipped from the second quarter of 2018 to the second quarter of 2020, a delay of about 2 years. These developments will put significant financial pressure on Nalcor and on the Province.

In parallel with the adverse developments noted above, the demand for power in Newfoundland has decreased as a result of the economic downturn and as a result of increased electricity costs. Annual energy deliveries on the island interconnected system are now not expected to reach levels initially forecast for 2020 until 2036.

[7] Erik Richer La Fleche, « Hydro-Quebec Strategic Plan 2016-2020 ». Blog entry posted on July 24, 2015. http://futureimperfect.ca/hydro-qubec-strategic-plan-2016-2020/

[8] Government of Quebec, "The 2030 Energy Policy: Energy in Quebec – A Source of Growth,

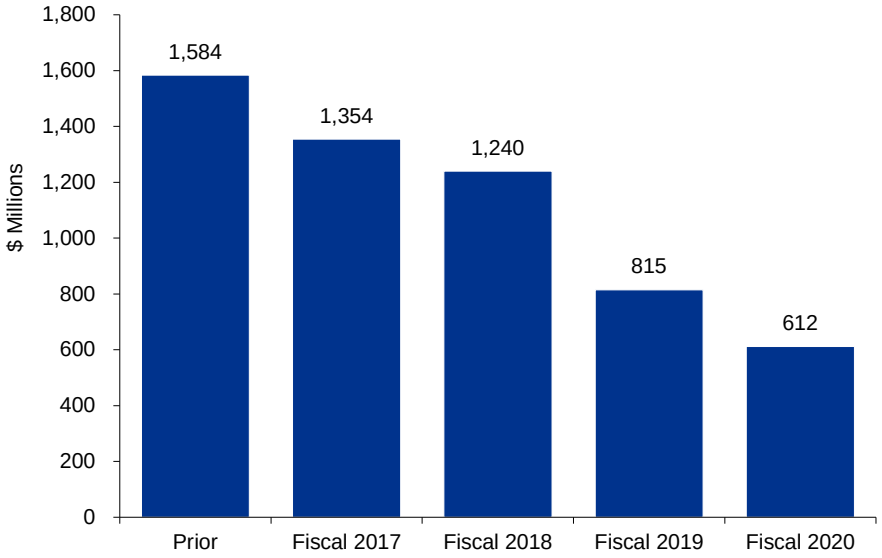
[9] Hydro Quebec press release: "2016-2071 Rate Application – An electricity rate increase below inflation", March 8, 2016.

As a result of the above developments, electricity rates for domestic customers are forecast to rise to 21.4 cents per kWh in 2021. This is about 6.3 cents per kWh more than the rates that were forecast when the Muskrat Falls project was initially approved. [10]

Although the economics of the project have deteriorated, Nalcor has indicated that it is no longer practical to cancel the project, given the amount of funds expended to date and contractual commitments for the delivery of power to Emera.

As a result of the cost overruns noted above, the Province will need to inject significant additional equity into Nalcor Energy. Total provincial equity requirements for the Muskrat Falls project are now $5.6 billion, with annual requirements summarized in Figure 3-4 below. [11]

Figure 3-4: Provincial Equity Requirements – Muskrat Falls Project



Source: derived from Nalcor information.

A DBRS rating report in November 2015 indicated that the Provincial equity commitment for the Lower Churchill Falls project was expected to be $3.2 billion, of which roughly 34% (or $1.09 billion) had already been extended. This forecast was based on then-estimated construction costs of $7.7 billion for the project.[12] As noted earlier, construction costs are now estimated at $9.1 billion, or $1.4 billion more.

Also as noted earlier, projected equity contributions are now estimated at $5.6 billion. Compared to the equity contributions noted in the November 2015 DBRS report (of $3.2 billion), equity contributions are thus now $2.4 billion higher. Increases in equity contributions reflect the increase in time to completion of the project as well as additional construction costs, both of which serve to increase project financing costs.

[10] Nalcor Energy press release: "Nalcor Energy provides update on Muskrat Falls Projects, June 24, 2016. The press release did not provide a definition of a domestic customer.

[11] Nalcor Presentation: "Muskrat Falls Project Update", June 24, 2016, p. 6.

[12] DBRS Rating Report, Province of Newfoundland and Labrador, November 19, 2015, p. 3.

In the May 2015 Report we noted that the Government had contributed $706 million in equity capital to Nalcor in 2013. This equity capital supported initial debt offerings to help fund the Muskrat Falls project. Given the figures presented above, this initial contribution will need to be followed by substantially greater contributions going forward. In the November 2015 report, DBRS had already noted that cost overruns during the construction phase could put pressure on Provincial credit metrics.

3.5 NB Power

3.5.1 Overview

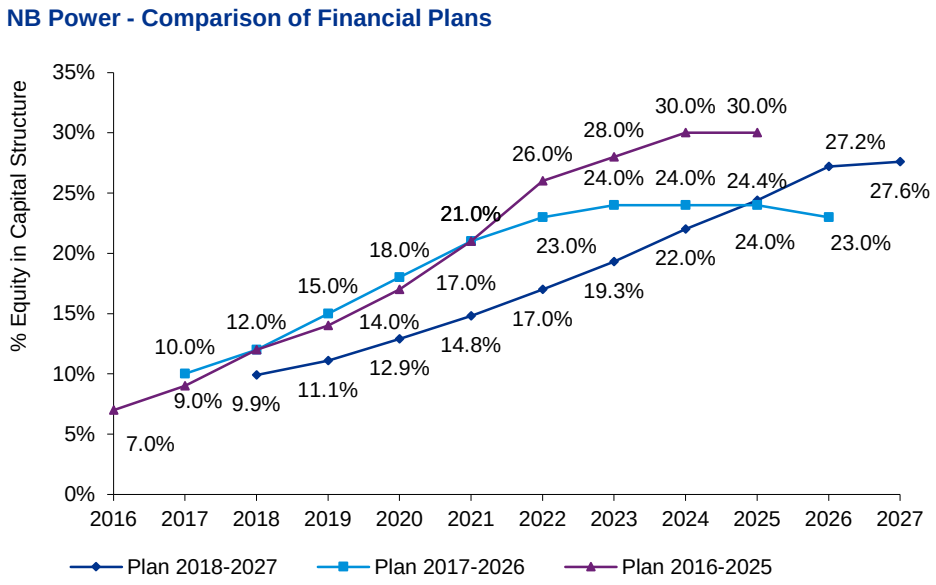
In the May 2015 Report, we noted that NB Power was operating under a long-term plan to significantly improve the utility's financial position. The key target of this plan is to achieve a capital structure with at least 20% equity. Under the plan, improvement of the utility's equity position was to be achieved through even annual rate increases of 2% over the period through 2022, with 1% rate increases thereafter. The approved rate for 2017 was 1.77%.

Since the May 2015 Report, NB Power has prepared two new 10-year plans in succession, covering Fiscal Years 2017 to 2026 and, subsequently, Fiscal Years 2018 to 2027. Under the latest plan, the achievement of at least a 20% equity position has been delayed to Fiscal 2024 from Fiscal 2021. The equity position continues to improve beyond that, to 27.6% by Fiscal 2027. However, this is still less than the 30% equity ratio projected for Fiscal 2024 and 2025 under the initial 2016-2025 plan.[13]

In both of the subsequent 10-year plans (2017-2026 and 2018-2027), rate increases of 2% extend only through to 2021, or one year earlier than under the 2016-2025 plan. Rate increases of 1% follow. The plan that was released for 2017-2026 roughly matched increases in equity shown to 2021 under the 2016-2025 plan but then showed a decline in equity growth thereafter. The most recent plan, for 2018-2027, shows strong increases in equity ratio throughout its planning horizon, although achievement of individual equity levels is considerably lagged. Overall, the deterioration in financial position relative to earlier plans appears largely related to decreases in load growth. Projected equity ratios under the various plans are shown in Figure 3-5 below.

[13] As a result of a typographical error, the May 2015 report stated at page 48 that NB Power would reach a 20% equity target by 2024 under its 10-Year Plan; the correct figure should have been 30%.

Figure 3-5: NB Power's Equity Ratio under Successive 10-Year Plans



Source: derived from NB Power information.

Over the medium to long-term, a key factor that bears on NB Power's financial position is projected spending for the Mactaquac project. Initially, NB Power expected to begin major spending on replacement or refurbishment of this dam in the early part of the next decade. NB Power has now concluded that it can extend the life of the existing facility beyond 2030 through a modified intensive maintenance program and replacement of aged equipment.[14] This has delayed the start of major expenditures to 2027 and should reduce overall total expenditures. Nevertheless, total spending of $2.7 billion for the Mactaquac project is forecast through to 2036. The delay noted above in the expenditure profile accounts for the fact that equity ratios continue to improve through 2027, rather than peaking a number of years earlier. (However, as noted earlier, improvements in the equity ratio are on a delayed trajectory.)

It is instructive to look at the rationale provided by NB Power for reaching a 20% equity target as outlined in its rate filings. In the 2016/17 General Rate Application filed December 28, 2015, NB Power noted the following:

> "The rationale for reaching the 20 per cent equity goal by fiscal year 2020/21 has not changed. First, NB Power recognizes that it requires an equity cushion as a risk management tool. The utility is subject to a variety of operational and financial risks, and an equity cushion will allow the utility to withstand negative contingencies without subjecting customers to sudden, unpredictable rate changes or the utility to financial losses."[15]

In the same application, NB Power went on to note:

> "The second justification for reaching the target of 20 per cent equity by 2021 relates to the timing of anticipated capital expenditures. NB Power needs to work towards reducing debt and improving its

[14] NB Power's 10-Year Plan, Fiscal Years 2018 to 2027. p. 18.

[15] New Brunswick Power Corporation, 2016/17 General Rate Application, December 28, 2015, p. 4.

capital structure due to the relatively low capital investments required in the next five years of the current 10-Year Plan. The current plan contemplates that the period of low capital investment will be followed by a number of years of very high investment, as the utility begins to incur costs associated with the decisions around Mactaquac. In order to prepare for that investment, and maintain stable rates as those costs are incurred, the 10-Year Plan continues to contemplate a series of smaller rate increases to build the necessary equity."[16]

While plans now call for a delay in reaching the 20% target, the underlying justification remains in place.

NB Power ultimately filed formal external evidence on an appropriate capital structure in GRA 2017/18. The evidence is in the form of a report by Elenchus Research Associates Inc.[17] The report does not provide much analysis or external data to support its conclusions but rather focuses on interpreting the government's intentions as laid out in the 2008 Electricity Act. Some highlights of this report are as follows:

- Planned rate increases should take into account the fact that events (e.g. low water-flows) could result in financial results being lower than forecast. Thus, the report notes: "Rates should be set to that there is steady progress toward the 20% target not only at the forecast level of net income but also if actual realized net income in the forecast year is at the lower end of the expected range."[18] This suggests that improvement in the equity position should occur even under adverse conditions.
- NB Power may require that the equity ratio be built up above the 20% minimum in advance of major capital programs. Thus, "projected rate projected rate increases should be high enough prior to the first year of the increased capital requirements so that the forecast equity ratio will not decline to less than 20% during the period when the high capital requirements cause the equity ratio to erode."[19]

While GRA 2017/18 included the external evidence as noted above, it did not then include any update to the 10-year financial plan provided with the GRA 2016/17. NB Power indicated that it would file a new 10-year plan only after its Board had made a decision on the option for replacement of Mactaquac. The 10-year plan for 2018-2027, summarized earlier in Figure 3-5, reflects the Board's subsequent decision to extend the service life of Mactaquac through intensive maintenance.

Based on the various sources of information summarized above, it can be observed that NB Power faces similar circumstances to Manitoba Hydro. Specifically:

- Cyclical patterns in the rate of investment in capital investment may require rate increases in advance of these investments to help bolster the utilities' financial positions.
- The shareholder does not contemplate making direct equity investments. Rather, equity is built up through retained earnings.

As part of its filing for GRA 2017/18, NB Power undertook a series of sensitivities that examined the impact of different rate trajectories over the 10-year plan, along with different scenarios for required capital spending. The different capital spending scenarios incorporated alternative estimates of the costs of Mactaquac refurbishment. As would be expected, these sensitivities showed that higher rate

[16] New Brunswick Power Corporation, 2016/17 General Rate Application, December 28, 2015, p. 5.

[17] Elenchus Research Associates Inc., "Consideration in Determining an Appropriate Long Term Capital Structure for New Brunswick Power", September 2016, filed as Appendix 06 of NB Power's 2017/18 General Rate Application, dated October 4th, 2016.

[18] Elenchus Research Associates Inc., p. 13.

[19] Elenchus Research Associates Inc., p. 14.

increases are required in individual years to maintain a target debt/equity ratio in the absence of strategies to smooth rate increases. Smoothing strategies include building up the equity ratio in advance of periods of high capital spending.[20]

In regard to these sensitivity analyses, NB Power noted in its rate filing:

> "It is NB Power's view that this analysis demonstrates the need for an overall two percent rate increase in the 2016/17 fiscal year, under any scenario in the sensitivity analysis. The need for the requested two per cent increase is enhanced if the Board ultimately approves a long-term capital structure which requires an equity component greater than 20 per cent." [21]

The request for sensitivities was prompted by a desire to see analysis of the impact of deferring achievement of the 20% equity target. The potential for deferral may have been prompted by observations that the equity ratio was projected to increase beyond 20% after the target was reached. In its 2015 Decision, the Board noted:

> "The 10-Year Plan projects that NB Power's equity ratio will increase from 21% in fiscal 2020-21 to 30% in 2024-25. Although this appears to provide NB Power with some degree of flexibility in its plans to improve its equity ratio, the Board did not receive any form of a sensitivity analysis to assess the impact of an extension scenario. A sensitivity analysis in future rate applications would provide the Board with a clear understanding of the impacts of deferring the achievement of the 20% equity goal beyond 2021." [22]

As highlighted in the above quote, the New Brunswick EUB specifically requested sensitivity analysis to better understand the potential impact of uncertainty and of different rate trajectories on achievement of the utility's financial targets. The desire for this type of scenario analysis also underlies Manitoba Hydro's decision to undertake uncertainty and sensitivity analysis with respect to future financial risks.

3.5.2 Costs of Carbon Taxes

In its most recent 10-year plan (for 2018-2027), NB Power has projected additional rate increases to incorporate the impact of federal and/or provincial actions to introduce carbon taxes. These increases will be over and above the 1% and 2% increases noted earlier to accommodate NB Power's own revenue requirement. As a utility that relies extensively on fossil-fueled generating facilities, NB Power will be significantly impacted by climate change initiatives and associated carbon taxes. In the current 10-year plan, total annual rate increases of 3.4% annually are now forecast beyond 2018. This incorporates 1.4% annual increases between 2019 and 2021, and 2.4% annual increases thereafter, to pay for carbon taxes or allowances. (These are added to base increases of 2.0% and 1.0% respectively for these same periods.) Thus, overall rate increases are projected to be much higher than in the initial 10-year plans.

3.6 Summary Observations

Each of the utilities summarized in this Chapter is facing developments that have or could put additional pressure on its financial position:

- BC Hydro has faced declines in demand relative to forecast, which has increased its need to rely on regulator deferral accounts to operate within the rate trajectory outlined in its 10-year plan.

[20] NB Power's 10 Year Plan: Fiscal Years 2017 to 2026, Appendix 2, prepared October 2015, pp. 1 - 4.

[21] New Brunswick Power Corporation, 2016/17 General Rate Application, December 28, 2015, pp. 5 - 6.

[22] New Brunswick Energy and Utilities Board, Reasons for Decision, Matter No. 272, October 28, 2015, p. 24.

- Hydro Quebec has ambitious targets for new business growth, which may require new equity investments to achieve the revenue targets as outlined.
- Nalcor has faced escalating capital costs on the Muskrat Falls project, resulting in the need for significant additional equity capital. The project will also put substantial upward pressure on electricity rates in Newfoundland and Labrador once these expenditures are put into the utility's Rate Base.
- NB Power has lowered its forecast of its equity ratio in the short- to medium-term, reflecting lower load growth and cost pressures. Delays in spending on Mactaquac refurbishment, however, have supported improvements in its projected equity ratio longer-term. NB Power is also forecasting significant additional rate increases as a result of the need to address federal and provincial climate change policies.

These various developments reinforce the need for utilities to have robust financial targets, to cushion against adverse developments in their financial outlook.

4 Comparison to Other Government-owned Power Utilities in Canada

This chapter summarizes the findings from benchmarking and review of the developments, targets and plans of government-owned power utilities in other jurisdictions. Financial data and information for government-owned power utilities are updated to the latest audited fiscal year, ending either December 31st, 2016 or March 31st, 2017. This reflects three additional years of financial data from the May 2015 Report in most cases.

4.1 Structure of the Chapter

This chapter is organized into the following sections:

- Section 4.2 provides an overview of government-owned power utilities in Canada, which have been selected as the peer benchmarking group, along with key operational metrics and comparisons on a per capita and per customer basis.
- Section 4.3 compares current debt/equity ratios and capital structures.
- Section 4.4 compares interest coverage ratios among the Canadian peer group.
- Section 4.5 looks at cash flow to capital expenditure comparisons among the Canadian peer group.
- Section 4.6 compares a number of other financial metrics among the Canadian peer group.
- Section 4.7 provides a comparison of recent electricity prices and analysis of trends in electricity prices in Canada over the next ten years based on various assumptions.
- Section 4.8 discusses financial targets and plans of other government-owned utilities in Canada.
- Section 4.9 outlines summary points of the benchmarking comparisons.

4.2 Overview of Government-owned Power Utilities in Canada

4.2.1 Overview of key operational metrics

Figure 4-1: Overview of Operating Information on Government-owned Power Utilities

Overview of Operating Information	Installed Capacity (MW)	Peak Demand (MW)	Total Electric System Deliveries (TWh)	% Hydro generation	Number of Electricity Customers
Manitoba Hydro	5,679	4,801	33.2	97%	573,438
BC Hydro	12,053	10,194	57.7	98%	1,988,167
Hydro Quebec	36,908	36,005	202.0	99%	4,244,541
Nalcor Energy	7,210	8,864	39.9	96%	> 38,000
Ontario Power Generation	16,177	n/a	78.2	40%	n/a
NB Power	3,513	3,000	16.7	25%	401,166

Source:
1. Manitoba Hydro Annual Report for the year ended March 31, 2017.
2. BC Hydro Annual Service Plan Report for the year ended March 31, 2017.
3. Hydro-Quebec Annual Report for the year ended December 31, 2016.
4. Nalcor Energy Annual Report for the year ended December 31, 2016. Note Churchill Falls represents installed capacity of 5,428 MW and its electricity is primarily exported to Hydro-Quebec. Number of customers is direct customers only, there are substantially more indirect customers through third party sales.
5. Ontario Power Generation Inc. Annual Report for the year ended December 31, 2016. All electricity generated is sold through Ontario's Independent Electricity System Operator.
6. NB Power Annual Report for the year ended March 31, 2017.

Government-owned power utilities with a significant reliance on hydroelectric generation are the most appropriate peer utilities in Canada for benchmarking the financial and operational position of Manitoba Hydro. These utilities are: BC Hydro, Hydro-Quebec, and Nalcor Energy ("Nalcor").

In the analysis, NB Power and Ontario Power Generation ("OPG") are also included, as both of these utilities have significant hydro assets and are Crown owned. NB Power is owned by the Province of New Brunswick and is the largest electric utility in Atlantic Canada. OPG is owned by the Province of Ontario, and operates a portfolio of hydroelectric, nuclear and other generating assets.

This group of six power utilities including Manitoba Hydro will represent the Canadian peer group for benchmarking and analysis in this Chapter.

To put into context the size of these power utilities in relation to their jurisdiction, the following is noted from comparisons in Figure 4-2:

- On a per capita basis, Manitoba Hydro has more installed generation capacity than BC Hydro, similar installed capacity as Hydro-Quebec and NB Power, and much higher capacity than OPG (although note that OPG is not the sole supplier in Ontario). It is lower only in comparison to Nalcor. (Figures for Nalcor, however, are distorted by the sale of power from Churchill Falls to Hydro-Quebec under long-term contract, which boosts its figures for capacity and sales per capita.)
- Manitoba Hydro's total power generation per capita is generally in line with per capita levels for Hydro-Quebec and NB Power, higher than BC Hydro, much higher than OPG, and much lower than Nalcor.
- Extra-provincial electricity sales represent 24% of total electricity sales, which is a very significant level and a higher share than for other power utilities. BC Hydro categorizes its extra-provincial activity as "trade" revenues and these represent approximately 11% of electricity revenues, a much smaller share than in the May 2015 Report (when the figure was 20%). Hydro-Quebec, the largest electricity exporter in Canada, also has a lower share with exports representing approximately 12% of its total sales.

Figure 4-2: Operational Metrics Per Capita and Value of Export Sales

Select Operational Metrics Per Capita					
	Provincial Population (2016)	Installed Capacity kW per capita	Electric System Deliveries thousands kWh per capita	Extraprovincial Electricity Sales ($ millions)	Extraprovincial / Trade Sales %electric sales
Manitoba Hydro	1,318,100	4.3	25.2	460	24%
BC Hydro	4,751,600	2.5	12.1	674	11%
Hydro-Quebec	8,326,100	4.4	24.3	1,626	12%
Nalcor	530,100	13.6	75.4	47	8%
Ontario Power Generation	13,983,000	1.2	5.6	n/a	n/a
NB Power	756,800	4.6	22.1	251	15%

Source:

1. Manitoba Hydro Annual Report for the year ended March 31, 2017.
2. BC Hydro Annual Service Plan Report for the year ended March 31, 2017. Extraprovincial exports reflects "trade" revenues.
3. Hydro-Quebec Annual Report for the year ended December 31, 2016.
4. Nalcor Annual Report for the year ended December 31, 2016. Extraprovincial sales from Churchill Falls and NLH's Energy Marketing.
5. Ontario Power Generation Inc. Annual Report for the year ended December 31, 2016.
6. NB Power Annual Report for the year ended March 31, 2017. Extraprovincial exports reflects "interconnection" revenues.
7. Populations from Statistics Canada as of July 1, 2016.

Figure 4-3 indicates the size of Manitoba Hydro, BC Hydro, Hydro-Quebec and NB Power in relation to the size of their domestic customer base. (Nalcor and OPG are not included in this figure as their customer bases are not comparable – Nalcor's customer base includes Hydro-Quebec and one major wholesale customer, Newfoundland Power Inc., and OPG is one of many suppliers to the broader Ontario market.) For the utilities that are included in Figure 4-3, note the following:

- As in the May 2015 Report, Manitoba Hydro has more installed capacity and electricity system deliveries per domestic customer than the other three electric utilities.
- Manitoba Hydro's domestic electricity revenues per customer is higher than BC Hydro, close to Hydro-Quebec and lower than NB Power.
- Manitoba Hydro has significantly more extra-provincial export revenues in relation to its domestic customer base than BC Hydro, Hydro-Quebec and NB Power.

Figure 4-3: Operational and Financial Information on a Per Customer Basis

Select Operational and Financial Information on a Per Customer Basis					
	Electricity Customers	Installed Capacity kW per Customer	Electric System Deliveries thousands kWh per Customer	Electricity Revenues per Customer	Extraprovincial Electricity Sales per Customer
Manitoba Hydro	573,438	9.9	58.0	$3,360	$802
BC Hydro	1,988,167	6.1	29.0	$2,954	$339
Hydro-Quebec	4,244,541	8.7	47.6	$3,110	$383
NB Power	401,166	8.8	41.7	$4,038	$626

Source:
1. Manitoba Hydro Annual Report for the year ended March 31, 2017.
2. BC Hydro Annual Report for the year ended March 31, 2017.
3. Hydro-Quebec Annual Report for the year ended December 31, 2016.
4. NB Power Annual Report for the year ended March 31, 2017.

Figure 4-4 provides an overview of key financial metrics for the Canadian peer group for 2016/2017. (Appendix A provides, in addition, financial data for Manitoba Hydro and the other government-owned power utilities over the past seven fiscal years.)

Hydro-Quebec is considerably larger than the other utilities of the peer group, with annual revenues of over $13 billion, approximately 5.7 times that of Manitoba Hydro, and total assets of over $75 billion, approximately 3.4 times those of Manitoba Hydro. (The ratio of assets is down from the May 2015 Report, when it stood at 4.7, reflecting Manitoba Hydro relatively greater investments over the intervening period.) BC Hydro is the next largest. Manitoba Hydro is in the middle of the group, with revenues that are significantly larger than for NB Power and Nalcor. It should be noted, however, that Nalcor's revenues will grow with the completion of the Lower Churchill Project and Muskrat Falls.

Relative to utilities with fossil-fuel generation, the utilities based primarily on hydropower generally have significantly better operating margins and relatively higher EBITDA, EBIT and net income as a share of revenues. Hydro-Quebec's high levels of EBITDA, net income and cash flow relative to other utilities reflect its larger size and is partially due to the benefits of very low-cost electricity received under its long-term power contract with Churchill Falls in Newfoundland and Labrador.

Figure 4-4: Overview of Financial Information, Government-owned Power Utilities in Canada

Overview of Financial Information - Select Canadian Electric Power Utilities (CDN$ millions)					
($CDN millions)	Annual Revenues	EBITDA	EBIT	Depreciation & Amortization	Net Income
Manitoba Hydro	2,327	1,106	704	402	59
BC Hydro	5,874	2,521	1,289	1,232	684
Hydro Quebec	13,339	7,990	5,393	2,597	2,861
Nalcor Energy	824	343	208	135	136
Ontario Power Generation	5,653	1,998	741	1,257	453
NB Power	1,696	540	307	233	27

Overview of Financial Information - Select Canadian Electric Power Utilities (CDN$ millions)						
($CDN millions)	Total Assets	Net Debt	Interest on Debt	Retained Earnings & Other Equity	Cash Flow from Operations	Capex
Manitoba Hydro	22,338	15,792	711	2,360	872	2,924
BC Hydro	31,888	19,975	767	4,909	1,327	2,513
Hydro Quebec	75,167	44,673	2,510	19,704	5,504	3,363
Nalcor Energy	14,062	6,440	273	4,263	222	2,741
Ontario Power Generation	44,372	5,336	298	10,508	1,705	1,704
NB Power	6,968	4,900	207	320	253	278

Source:
1. Manitoba Hydro Annual Report for the year ended March 31, 2017.
2. BC Hydro Annual Report for the year ended March 31, 2017.
3. Hydro-Quebec Annual Report for the year ended December 31, 2016.
4. Nalcor Annual Report for the year ended December 31, 2016.
5. Ontario Power Generation Inc. Annual Report for the year ended December 31, 2016.
6. NB Power Annual Report for the year ended March 31, 2017.

Note: Retained earnings and other equity includes share capital or contributed capital, accumulated other comprehensive income and non-controlling interest. Net debt includes long-term debt, short-term borrowings and current portion of long-term debt less sinking funding investments and cash and cash equivalents.

4.3 Capital Structure – Equity Ratio Comparisons

Manitoba Hydro's equity ratio was 16% as at March 31, 2017. This ratio is based on Manitoba Hydro's formula, which uses net debt in its calculation and includes contributions in aid of construction ("CIAOC") as part of equity, thus providing a debt/equity ratio of 84/16.

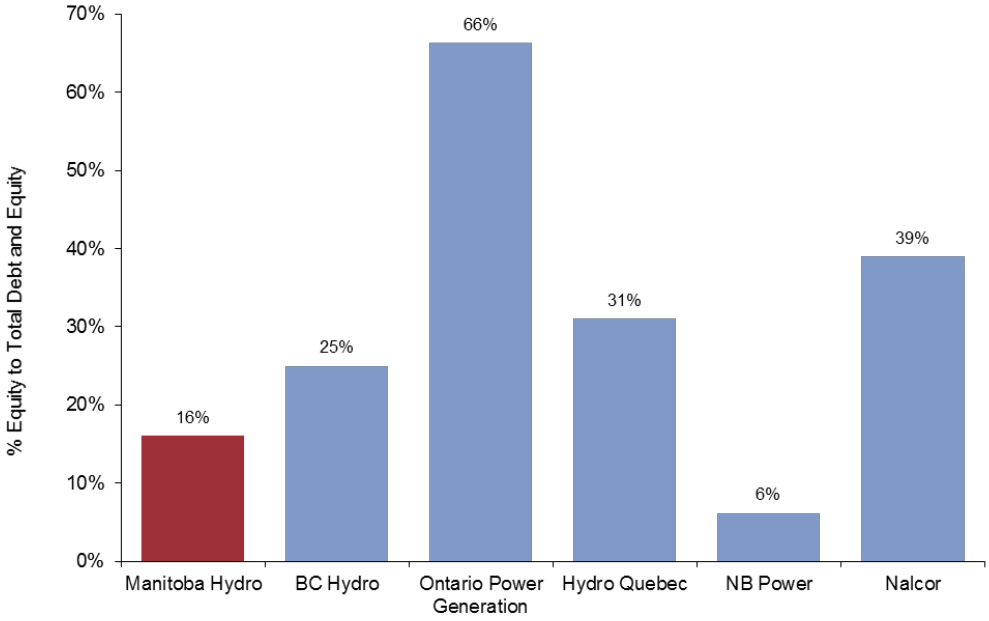
In comparing the equity ratios of government-owned electric power utilities in Canada, adjustments were made to reflect Manitoba Hydro's formula for calculating equity ratios. For example, BC Hydro's reported equity ratio has been 20% over the past five years. Making adjustments for Manitoba Hydro's definition of net debt and including CIAOC in equity, however, results in an equity ratio of 25%. Even with these adjustments, there are still some differences remaining in accounting and reporting frameworks among utilities. However, the adjustments that have been made enable better direct comparison.

Retained earnings represent the large majority of equity for most of the government-owned power utilities in Canada. Of the Canadian utilities in the benchmarking group, all include Accumulated Other

Comprehensive Income ("AOCI") as part of their equity. Like Manitoba Hydro, some utilities such as Hydro-Quebec, OPG and Nalcor have also included contributed capital as part of their equity. Manitoba Hydro also has a relatively small amount of non-controlling interest included in equity.

Investor-owned power utilities in Canada tend to have equity ratios of about 40%, but a more appropriate comparison for Manitoba Hydro is to government-owned utilities, particularly those with significant hydro-electric power. Manitoba Hydro's current equity ratio is at the lower end of those observed among government-owned power utilities. Only NB Power is lower, as NB Power has undergone considerable financial challenges and restructuring. Results are shown in Figure 4-5.

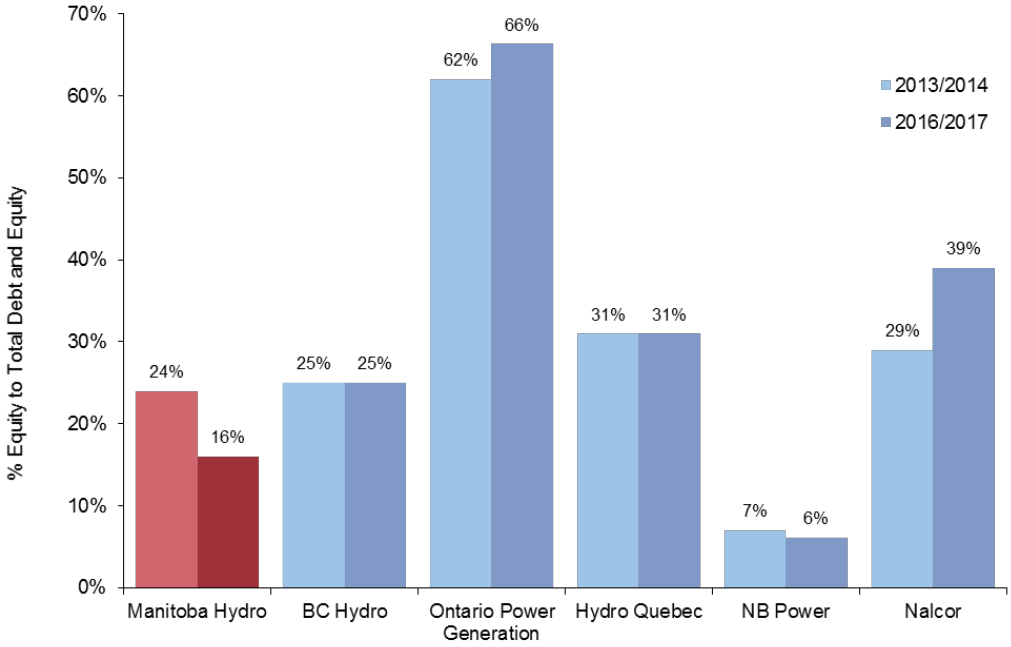
Figure 4-5: Comparison of Government-owned Power Utilities in Canada, Capital Structure – Equity Ratio, 2016/2017



Source: Derived from annual reports and financial statements for the year ended March 31, 2017 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 for OPG, Hydro Quebec and Nalcor.. Subject to adjustments due to some differences in accounting and reporting. For direct comparison to Manitoba Hydro, equity includes contributions in aid of construction ("CIAOC"), and net debt includes long-term debt, current portion of long-term debt and other current borrowings less sinking fund investment and cash and cash equivalents. Note BC Hydro reports equity to debt at 20:80, but with CIAOC, equity ratio is 25%.

Figure 4-6 compares current ratios (in 2016/17) with those presented in the May 2015 Report, representing 2013/14 data. Manitoba Hydro's equity ratio has declined markedly, from 24% in 2013/14 to 16% in 2016/17. NB Power's equity ratio also significantly declined during this period, while those of BC Hydro and Hydro Quebec were relatively unchanged. Nalcor's equity ratio increased from 29% to 39%; this was due to its shareholder's contribution of $734.6 million in 2015 and another $656.1 million in 2016 in relation to Nalcor's capital expenditures.

Figure 4-6: Comparison of Government-owned Power Utilities in Canada, Capital Structure – Equity Ratio, 2013/2014 and 2016/2017

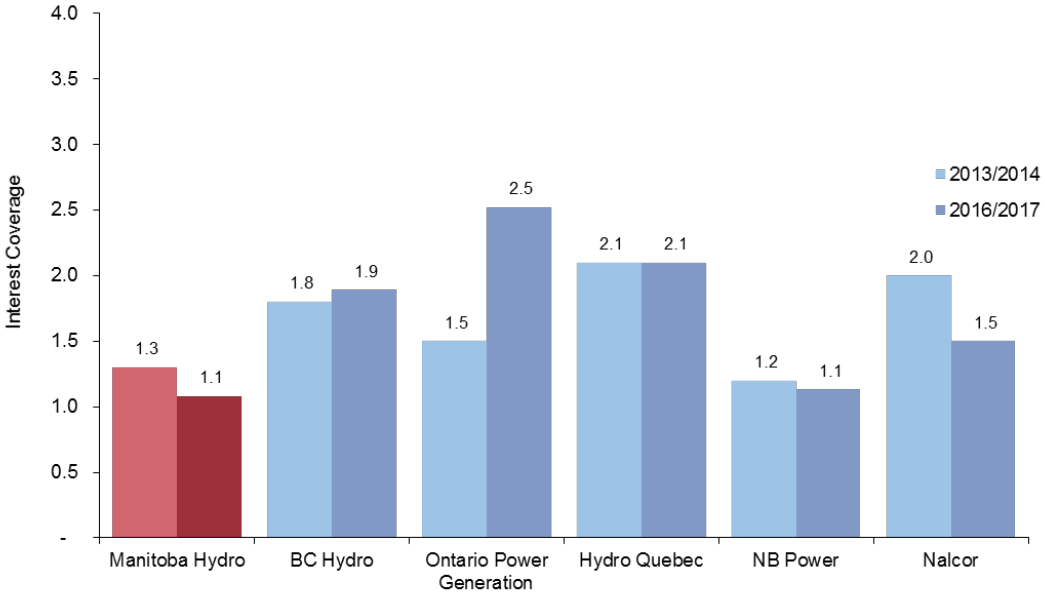


Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting. For direct comparison to Manitoba Hydro, equity includes contributions in aid of construction ("CIAOC"), and net debt includes long-term debt, current portion of long-term debt and other current borrowings less sinking fund investment and cash and cash equivalents. Note BC Hydro reports equity to debt at 20:80, but with CIAOC, equity ratio is 25%.

4.4 Interest Coverage Comparisons

For the year ending March 31, 2017, Manitoba Hydro was below its historical interest coverage target of greater than 1.20. Figure 4-7 provides a comparison of interest coverage ratios among government-owned power utilities in Canada as of the latest fiscal year as well as from the previous report (2013/2014). Nalcor experienced a substantial decline in its interest rate coverage ratio from 2.0 in 2013 to 1.5 in 2016. The ratio at OPG significantly improved. The other government-owned power utilities had ratios that were relatively unchanged in 2016/2017 compared to three fiscal years earlier.

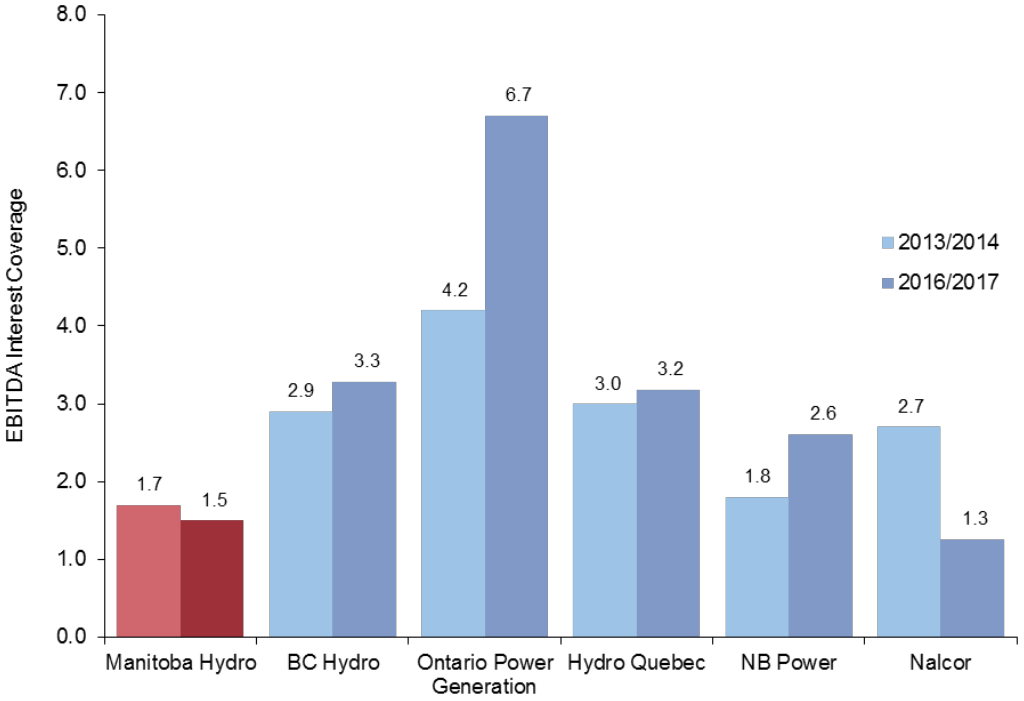
Figure 4-7: Comparison of Government-owned Power Utilities in Canada, Interest Coverage, 2013/2014 and 2016/2017



Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting. Interest coverage reflects total interest paid on debt and net income divided by total interest paid on debt.

Figure 4-8 provides a comparison of EBITDA interest coverage ratios among government-owned power utilities in Canada. Manitoba Hydro's EBITDA interest coverage was down (to 1.54) from the previous report. Most of the other government-owned power utilities experienced improvements in the EBITDA interest coverage ratios in 2016/2017 compared to the three years earlier in the previous report. The notable exception was Nalcor, which experienced a substantial deterioration in its EBITDA interest rate coverage from 2.7 in 2013 down to 1.3 in 2016.

Figure 4-8: Comparison of Government-owned Power Utilities in Canada, EBITDA Interest Coverage, 2013/2014 and 2016/2017



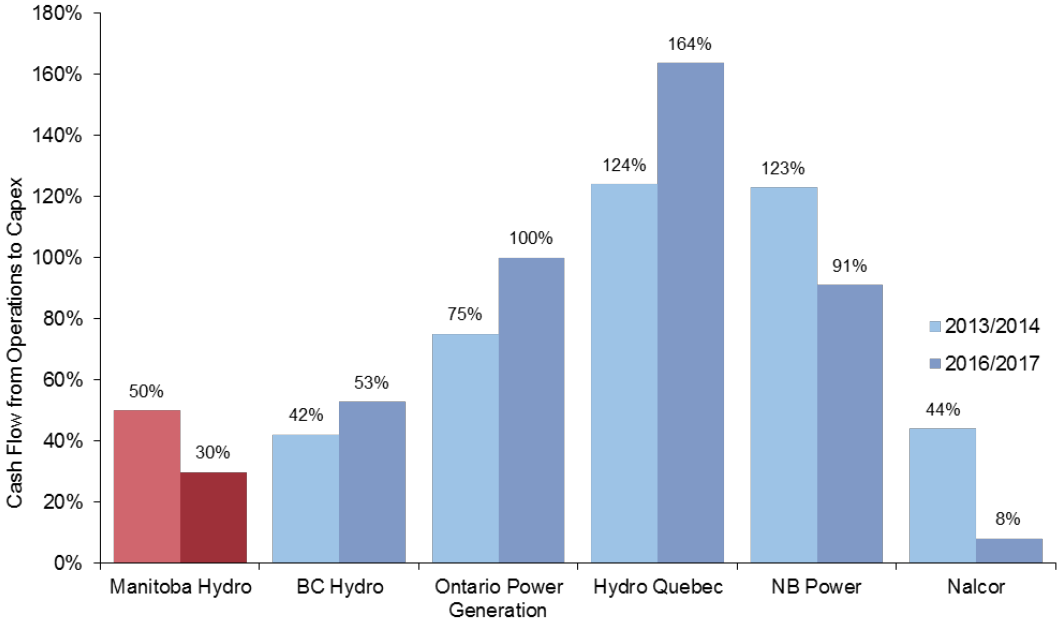
Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting. EBITDA (earnings before interest, taxes and depreciation and amortization) does not include capitalized interest. Property and capital taxes are operating expenses and are not added back to EBITDA calculations; only income taxes, if any, are part of the EBITDA calculations.

4.5 Capital Coverage or Cash Flow to Capex Comparisons

For Manitoba Hydro, the ratio of cash flow from operations to total capital expenditures dropped from 50% in 2013/14 to 30% in 2016/17. As shown in Figure 4-9, the 30% ratio was higher than at Nalcor, which is also in the process of completing major hydroelectric capital projects; Nalcor's cash flow position as measured through the capital coverage ratio substantially deteriorated between 2013 and 2016. In contrast to the other utilities, OPG and Hydro-Quebec had cash flows above their current capital expenditures in the latest available fiscal year.

Note that the ratio of cash flow to capex is subject to wide variation from year-to-year depending on the timing of major capital projects.

Figure 4-9: Comparison of Government-owned Power Utilities in Canada, Cash Flow from Operations to Capex, 2013/2014 and 2016/2017



Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting.

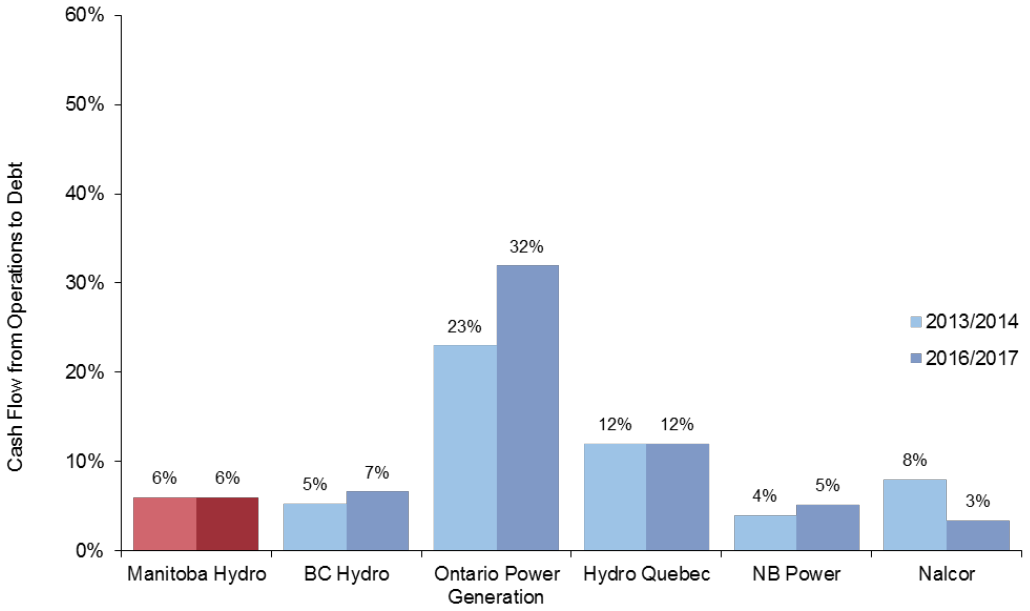
4.6 Other Financial Metrics Comparisons

The ratio of cash flow from operations to debt is one of the key measures monitored by credit rating agencies. Note that the figures for cash flow from operations shown in this section are as reported in audited cash flow statements; they have has not been adjusted for capitalized interest, which may be reported differently among utilities.

As noted earlier, Manitoba Hydro's increase in cash flow from operations grew significantly in 2016/17, reflecting significant growth in the balance of accounts payables primarily related to the construction of major capital projects. The understanding is that payables related to major capital projects will eventually reverse, which likely means that cash flow from operations for the reference year is overstated. Similarly, there may be other particular situations at other utilities that impact cash flow from operations in the reference year.

Figure 4-10 compares cash flow from operations to net debt. The ratio for Manitoba Hydro was approximately 6% as of March 31, 2017, higher than at Nalcor and NB Power, but considerably lower than Hydro-Quebec and OPG.

Figure 4-10: Comparison of Government-owned Power Utilities in Canada, Cash Flow from Operations to Net Debt, 2013/2014 and 2016/2017



Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting.

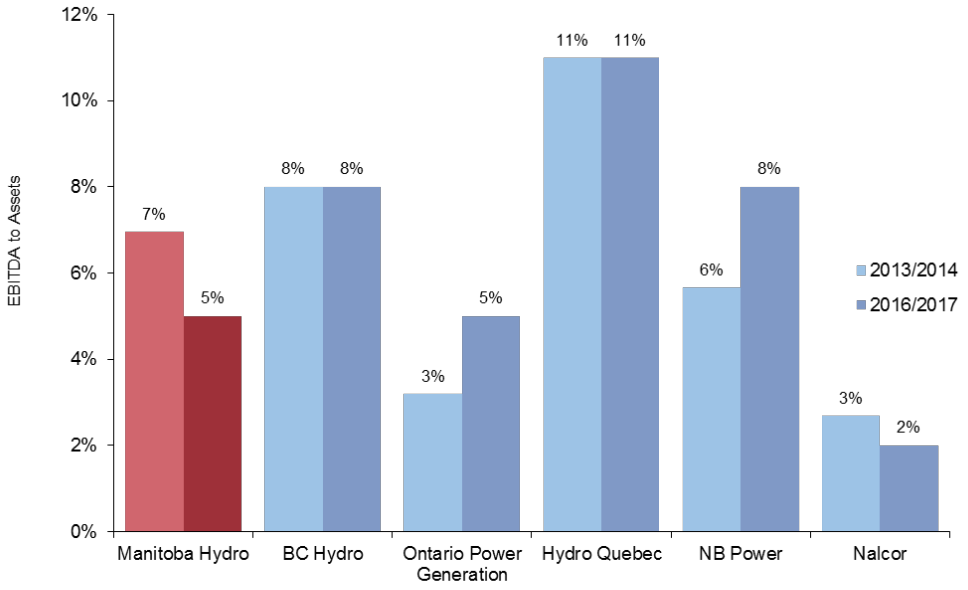
Figure 4-11 compares the ratio of EBITDA to total assets with significant growth in assets during a period of major construction. With significant growth in assets during this period of major construction, Manitoba's ratio of EBITDA to assets decreased from 7% in 2013/14 to 5% in 2016/17, with Nalcor lowest at 2% and Hydro Quebec highest at 11%.

Manitoba Hydro has consistently generated relatively strong EBITDA and net operating margins, reflecting its position as a power utility that is dominantly based on hydropower. Figure 4-12 compares EBITDA to total revenue. In 2016/17, Manitoba Hydro's EBITDA was approximately 47% of total revenues, among the highest ratios found among large power utilities in Canada. Of the group of government-owned power utilities, only Hydro Quebec had a higher level, at 60% EBITDA to total revenue.

Figure 4-13 compares net debt as a share of total assets. Manitoba Hydro is the highest in net debt to assets (at 71%) with NB Power second at 70%. Since the May 2015 Report, Manitoba Hydro and BC Hydro have had similar increases in this ratio. Nalcor experienced a significant decline in net debt to assets in the past three years related to significant shareholder contributions in 2015 and 2016.

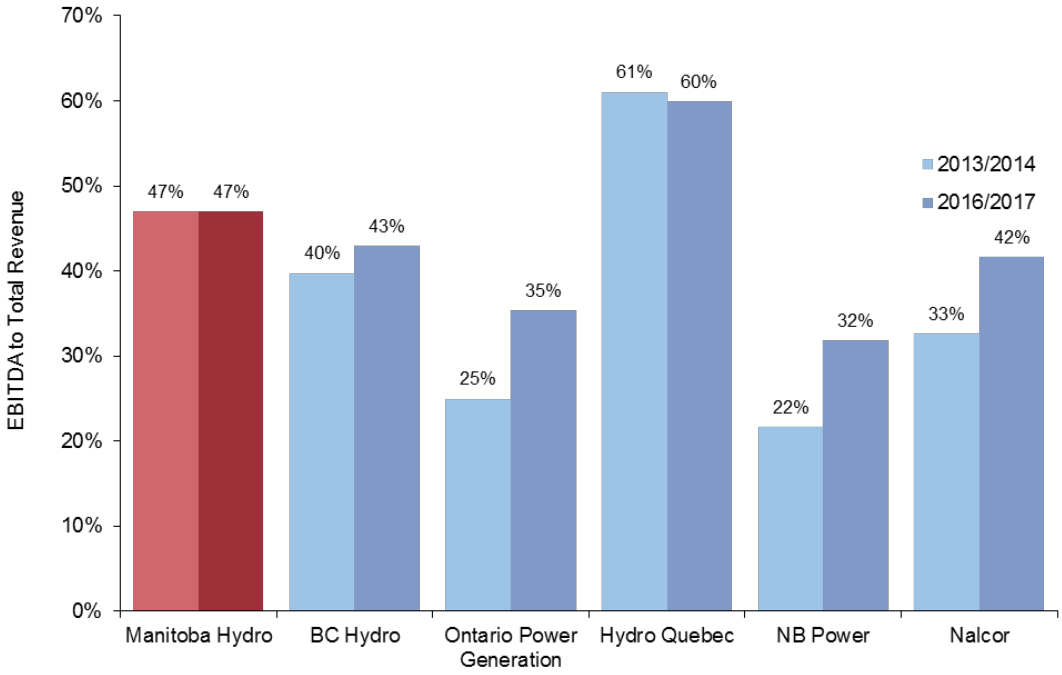
Figure 4-14 compares net debt to EBITDA which varies considerably, from 2.7 for OPG to 18.8 for Nalcor. Manitoba Hydro's ratio increased from 9.8 in 2013/14 to 14.3 in 2016/17.

Figure 4-11: Comparison of Government-owned Power Utilities in Canada, EBITDA to Assets, 2013/2014 and 2016/2017



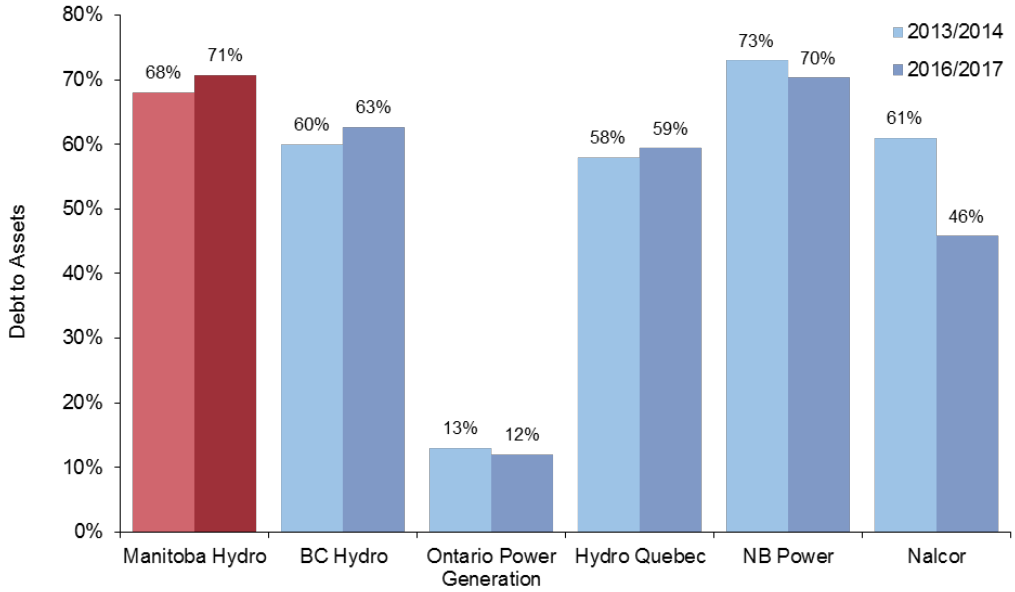
Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting.

Figure 4-12: Comparison of Government-owned Power Utilities in Canada, EBITDA to Total Revenue, 2013/2014 and 2016/2017



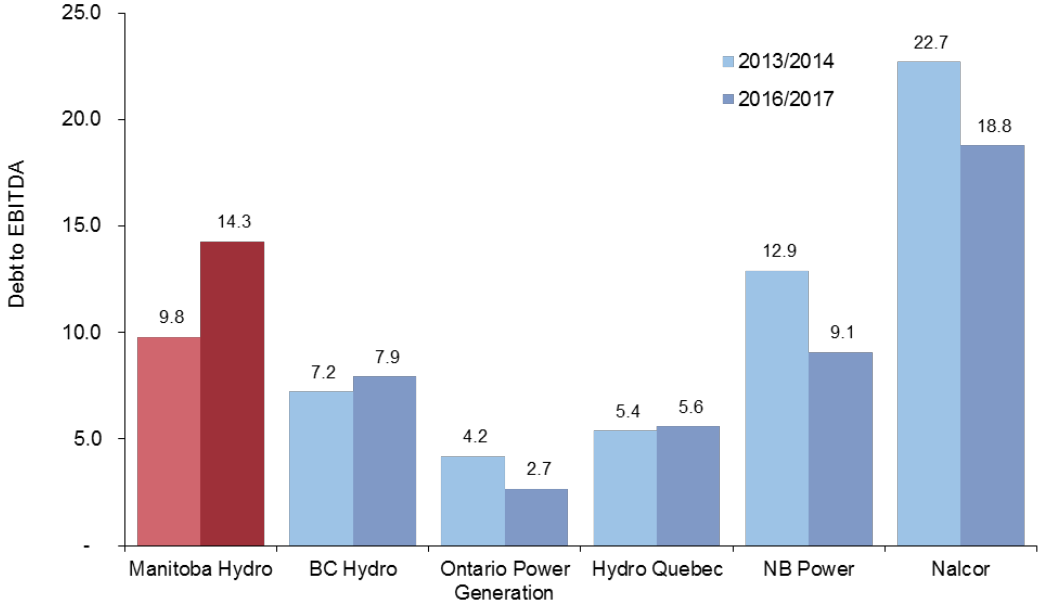
Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting.

Figure 4-13: Comparison of Government-owned Power Utilities in Canada, Net Debt to Assets, 2013/2014 and 2016/2017



Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting.

Figure 4-14: Comparison of Government-owned Power Utilities in Canada, Net Debt to EBITDA, 2013/2014 and 2016/2017



Source: Derived from annual reports and financial statements for the year ended March 31, 2017 and March 31, 2014 for Manitoba Hydro, BC Hydro and NB Power, and for the year ended December 31, 2016 and December 31, 2013 for OPG, Hydro Quebec and Nalcor. Subject to adjustments due to some differences in accounting and reporting.

4.7 Electricity Price Comparison

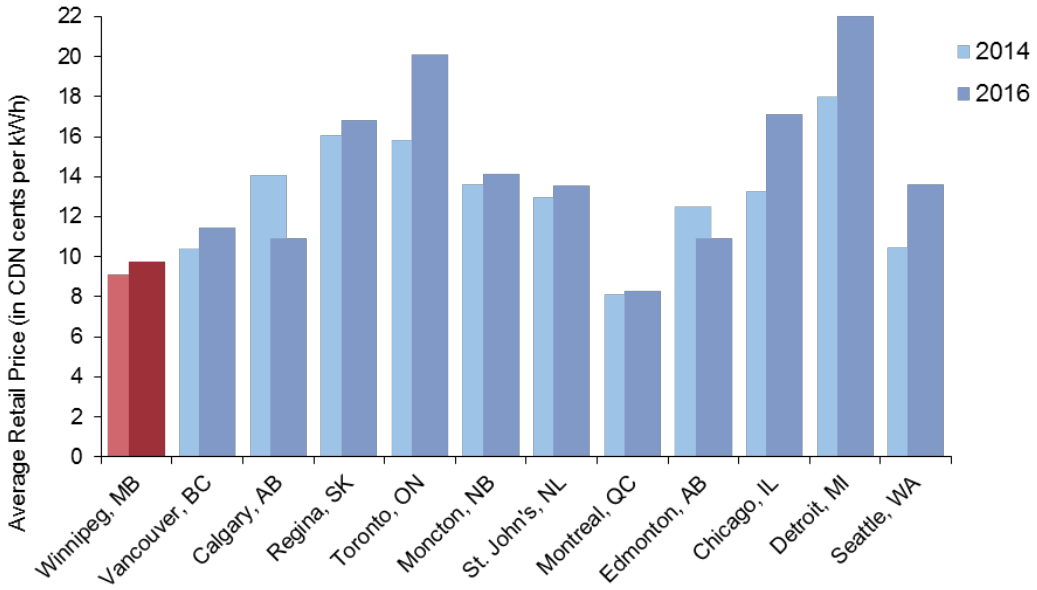
4.7.1 Manitoba Hydro's current competitive position

In this section, we have updated the comparison of retail electricity rates in Manitoba with those in a number of other North American jurisdictions. We present figures for 2016 as well as 2014, with figures for 2014 taken from the May 2015 Report. All figures are based on data from Hydro-Quebec's annual electricity price survey and are as at April 1 of the relevant year.

The analysis of electricity rates across jurisdictions can provide an indication of Manitoba's competitiveness with respect to energy costs. Manitoba Hydro has relatively low electricity rates, providing Manitoba Hydro with greater ability to raise rates in the future without causing undue adverse impact on Manitoba's attractiveness as a location for new business investment. Rate increases are necessary to ameliorate Manitoba Hydro's deteriorating equity position.

Figures 4-15, 4-16 and 4-17 below compare rates for residential, medium and large users. Figures for residential use assume monthly electricity consumption of 1,000 kWh, while those for medium and large assume monthly consumption of 400,000 and 30.5 million kWh respectively.

Figure 4-15: Comparison of Average Prices of Electricity, Residential, 2014 and 2016



Source: Hydro-Quebec. Comparison of Electricity Prices in Major North American Cities, Rates in effect April 1, 2016 and April 1, 2014 (including taxes). Residential assumption - power consumption 1,000 kWh. Hydro-Quebec study notes that these bills have been estimated by Hydro-Quebec and may differ from actual bills.

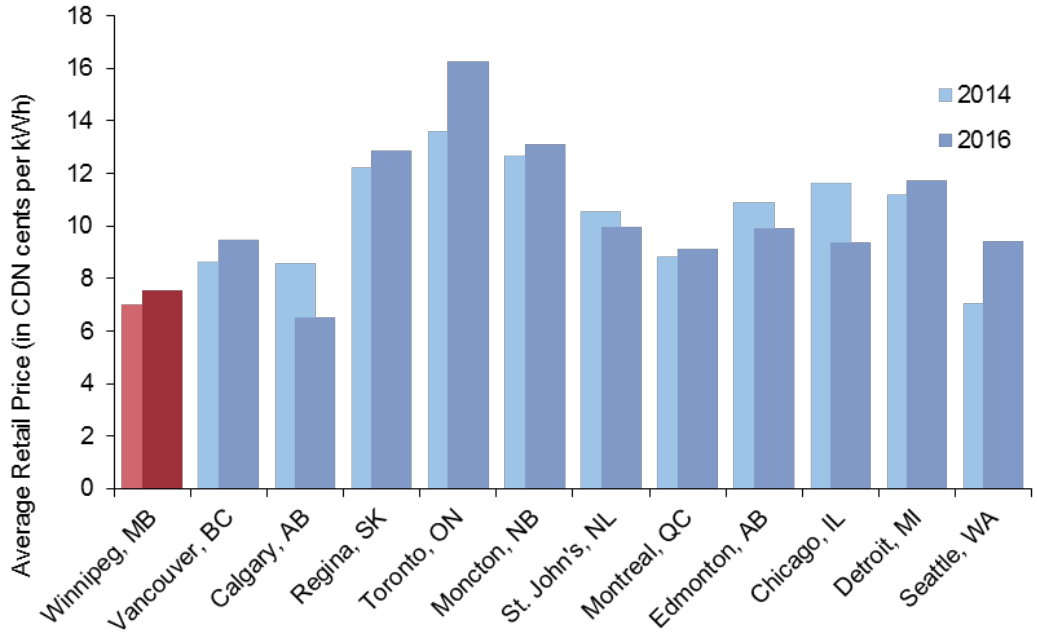
Based on Figure 4-15 we note the following:

- Manitoba currently has the second lowest electricity prices in the country for residential consumers (next to Quebec). The average price for residential customers in Winnipeg (including taxes) was 9.75 cents per kWh compared to an average of 14.1 cents per kWh among 12 Canadian cities in the survey. Manitoba prices are thus approximately 30% lower than the 12-city average.
- Residential rates in Manitoba increased somewhat between 2014 and 2016, as in many other jurisdictions, while rates in Toronto showed much larger increases (both in percentage and absolute terms). Rates in Calgary and Edmonton actually fell, reflecting lower electricity market prices in 2016. These were likely as a result of both low natural gas prices (which affect generation dispatch

costs) and a downturn in electricity market demand in the province. Both factors contributed to a decrease in prices in the competitive electricity market.

- Rates shown for US cities also increased sharply, although this may be largely attributable to changes in Canada / US exchange rates over the period.

Figure 4-16: Comparison of Average Prices of Electricity, Medium Power, 2014 and 2016

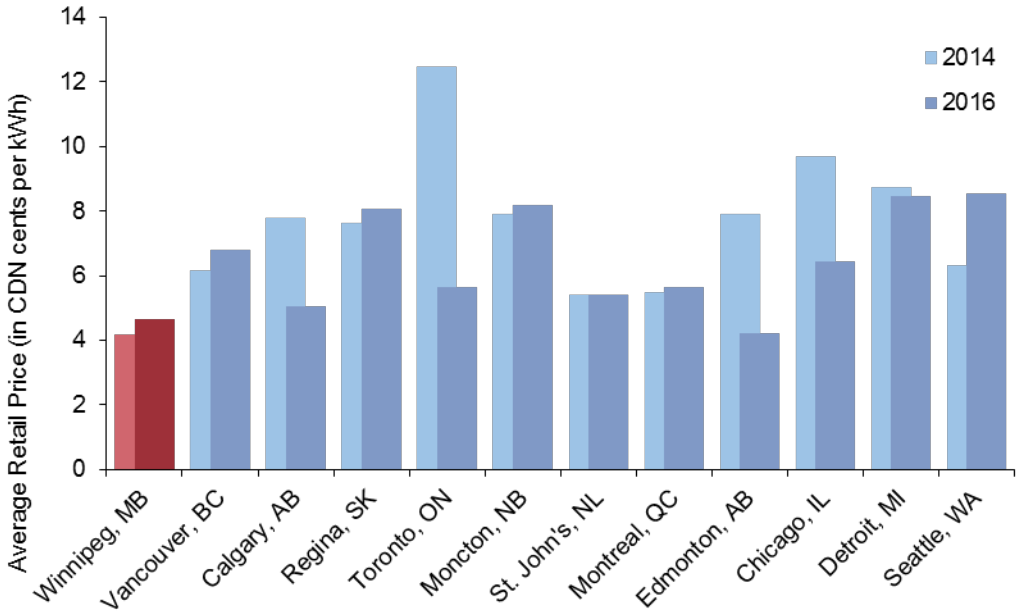


Source: Hydro-Quebec. Comparison of Electricity Prices in Major North American Cities, Rates in effect April 1, 2016 and April 1, 2014 (including taxes). Medium Power assumption - power demand 1,000 kW, power consumption 400,000 kWh, load factor 56%. Hydro-Quebec study notes that these bills have been estimated by Hydro-Quebec and may differ from actual bills.

Based on Figure 4-16 we note the following:

- Manitoba has the second lowest electricity prices for medium power consumers. The average price for "medium power" in Winnipeg (including taxes) was 7.5 cents per kWh compared to an average of 11.7 cents per kWh among 12 Canadian cities in the survey.
- As found in the residential rate comparison, retail prices for Toronto increased sharply, resulting in Toronto remaining the highest cost jurisdiction among those shown on the chart (and tied with Charlottetown, PEI, at 16.27 cents per kWh).
- Calgary had the lowest prices for 2016, representing a change in its relative position vis-à-vis 2014. Prices declined in both Calgary and Edmonton relative to 2014. This was driven by significant declines in the Alberta economy. Alberta is subject to relatively wide fluctuations in electricity prices.
- Rates for US jurisdictions showed both increases and decreases, showing that exchange rates were not the only factor affecting costs for medium power users in the US jurisdictions that were included.

Figure 4-17: Comparison of Average Prices of Electricity, Large Power, 2014 and 2016



Source: Hydro-Quebec. Comparison of Electricity Prices in Major North American Cities, Rates in effect April 1, 2016 and April 1, 2014 (including taxes). Large Power assumption - power demand 50,000 kW, power consumption 30,600,000 kWh, load factor 85%. Hydro-Quebec study notes that these bills have been estimated by Hydro-Quebec and may differ from actual bills.

Based on Figure 4-17 we note the following:

- Manitoba has the second lowest electricity prices for large power consumers. The average price for "large power" customers in Winnipeg (including taxes) was 4.7 cents per kWh compared to the 12-city average of 6.7 cents per kWh.
- Consistent with patterns observed for residential medium consumers, rates for large power users in Calgary and Edmonton fell between 2014 and 2016. Hydro Quebec reports that Edmonton is now the lowest cost jurisdiction for this class of users.
- Interestingly, the price shown for large power consumers in Ontario also fell sharply, in contrast to patterns observed for residential and medium power users (whose rates showed large increases). This fall may be attributable to the ability of large power users to avoid certain electricity costs in Ontario if they can reduce usage during system demand peaks.[23]

Overall, analysis of current price levels suggests that Manitoba remains a very low cost jurisdiction with respect to electricity rates. Accordingly, it should have relatively more ability to increase rates without jeopardizing the province's competitive position.

[23] Users classified as Class A can avoid costs associated with the "Global Adjustment" by reducing usage during the 5 hours of peak usage in the province in a year. Actual effective electricity costs can vary markedly based on usage profiles.

4.7.2 Manitoba Hydro's projected future competitive position

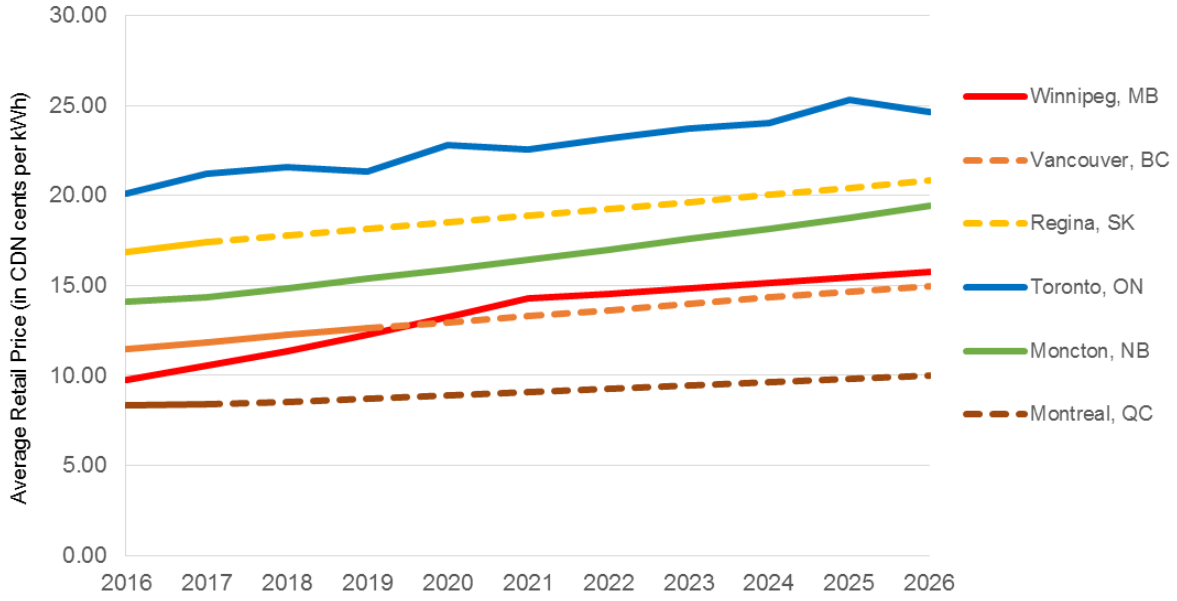
Figures 4-18, 4-19 and 4-20 indicate scenario forecasts of electricity prices over the next 10 years. These scenarios are based on public plans where available. The basis of these electricity price projections and assumptions is as follows:

- Manitoba electricity prices are based on proposed rate increases under Manitoba Hydro's IFF16.
- For BC Hydro, rate increases are based on the Province of British Columbia's 10 Year Plan, within which rate increases are prescribed for the next three years (applications for an increase of 4.0% in fiscal 2017, 3.5% in fiscal 2018 and 3.0% in fiscal 2019), and a target of 2.6% is identified for the next five years thereafter.
- For NB Power, rate increases are based on NB Power's 10 Year Plan, which outlines rate increases for the next ten years.
- For Ontario, rate increases are based on the projected increase in the unit cost of electricity as forecast by the Independent Electricity System Operator ("IESO"). Percentage increases are based on Outlook B contained in the IESO's Ontario Planning Outlook, dated September 1, 2016. As these figures reflect total system costs divided by total deliveries, they are not differentiated by customer class.
- Hydro-Quebec's rate increase is for 2016 and 2017 and SaskPower, rate increases are outlined for the next two years.
- For Nalcor, St. John's is excluded because the Muskrat Falls project is projected to lead to significant rate increases in the near and medium-term, however, there is no information at this time on projected rate increases.
- Where rate plans are not known, an assumption of 2% annually is applied.

Key findings from the review of Figures 4-18 through 4-20 are as follows:

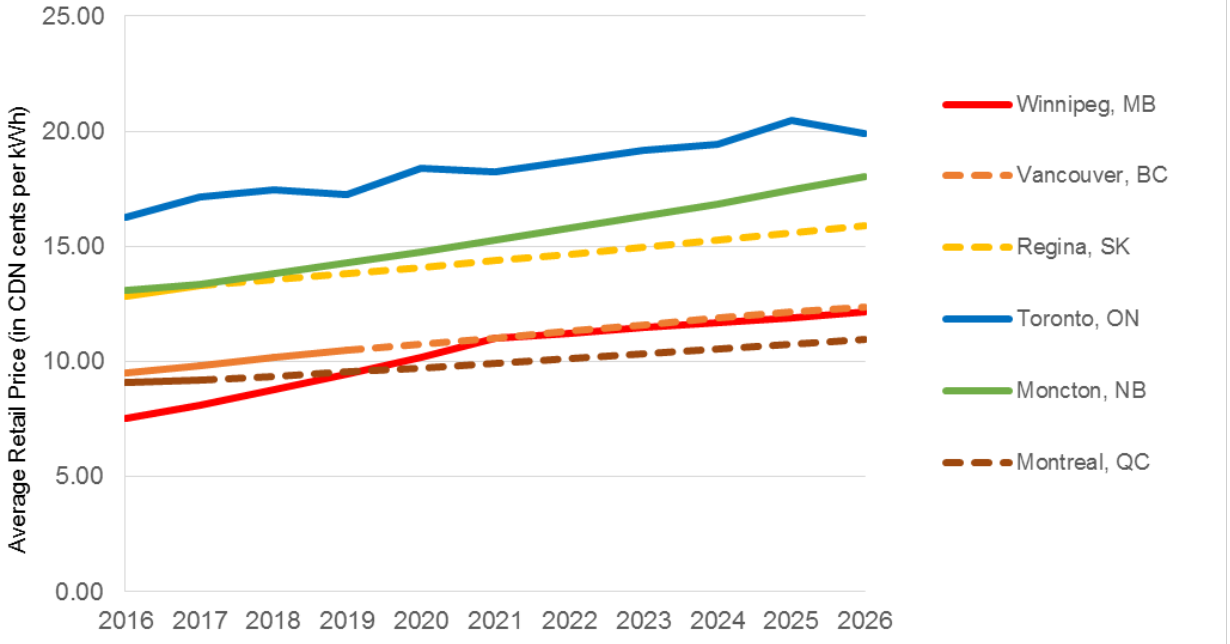
- Under 7.9% annual rate increases over the next five years, and 2.0% annual rate increases in the subsequent five years, these scenario graphs show Manitoba Hydro maintains its position as among the lowest electricity prices in Canada.

Figure 4-18: Comparison of Average Prices of Electricity in Canada, Scenario Projection 2016-2026, Residential



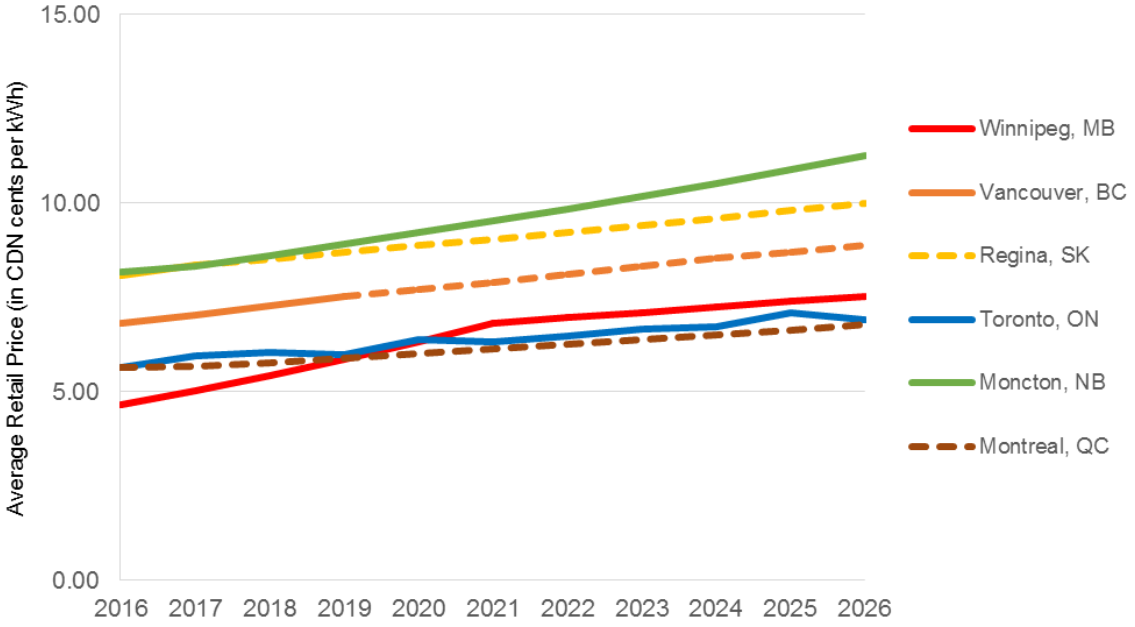
Source: 2016 base data from Hydro-Quebec Comparison of Electricity Prices in Major North American Cities, rates in effect April 1, 2016. Residential assumption - power consumption 1,000 kWh. Hydro-Quebec study notes that these bills have been estimated by Hydro-Quebec and may differ from actual bills. For jurisdictions, projected rate increases reflect projected plans and/or approved rates where available (see text for assumptions used). For all utilities and years where there is not a published plan, annual increases of 2% are used.

Figure 4-19: Comparison of Average Prices of Electricity in Canada, Scenario Projection, 2016-2026, Medium Power



Source: 2016 base data from Hydro-Quebec Comparison of Electricity Prices in Major North American Cities, rates in effect April 1, 2016. Medium Power assumption - power demand 1,000 kW, power consumption 400,000 kWh, load factor 56%. Hydro-Quebec study notes that these bills have been estimated by Hydro-Quebec and may differ from actual bills. For jurisdictions, projected rate increases reflect projected plans and/or approved rates where available (see text for assumptions used). For all utilities and years where there is not a published plan, annual increases of 2% are used.

Figure 4-20: Comparison of Average Prices of Electricity in Canada, Scenario Projection, 2016-2026, Large Power Users



Source: 2016 base data from Hydro-Quebec Comparison of Electricity Prices in Major North American Cities, rates in effect April 1, 2016. Large Power assumption - power demand 50,000 kW, power consumption 30,600,000 kWh, load factor 85%. Hydro-Quebec study notes that these bills have been estimated by Hydro-Quebec and may differ from actual bills. For jurisdictions, projected rate increases reflect projected plans and/or approved rates where available (see text for assumptions used). For all utilities and years where there is not a published plan, annual increases of 2% are used.

4.8 Financial Targets/Plans of Government-owned Power Utilities in Canada

Most of the government-owned power utilities in Canada include, as two of their primary financial metrics, one measure of capitalization (a debt to capital or debt/equity ratio) and one measure of interest coverage. Other metrics may be monitored in addition. Figure 4-21 indicates the financial targets/metrics highlighted in annual reports of select government-owned power utilities.

Figure 4-21: Key Financial Metrics or Targets of Government-owned Power Utilities in Canada

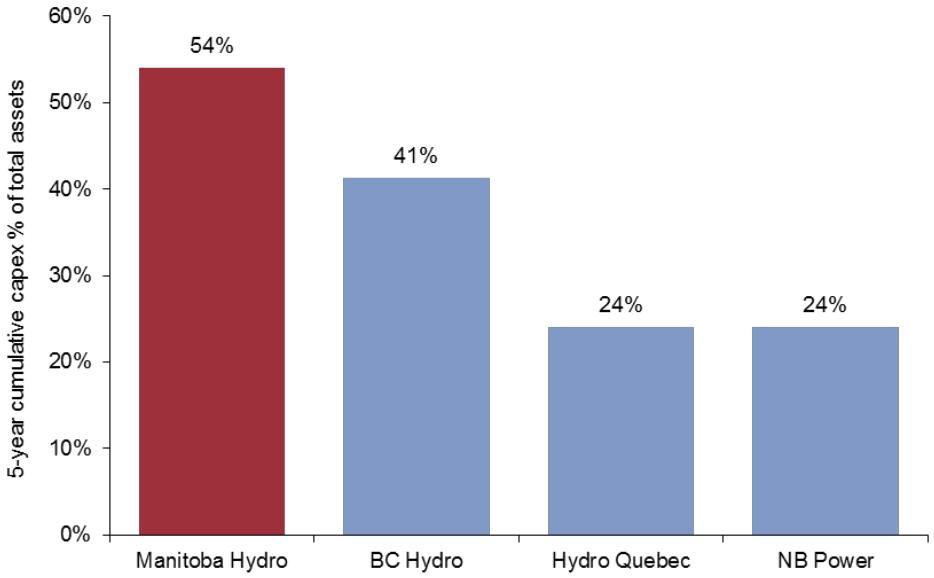
Key Financial Metrics or Targets of Government-Owned Power Utilities in Canada					
	Manitoba Hydro	**BC Hydro**	**Hydro-Quebec**	**Nalcor**	**NB Power**
Debt / Equity	• Long-term target of **75:25**, had been near target range from 2008 to 2014 • Forecast to deteriorate over the next decade due to major expansion	• Long-term target recently increased under new 10 Year Plan from **80:20** to **65:35** in 10 years • Target of 60:40 in the long-term	• Minimum requirement of **75:25**, practically has been steady in the range of **70:30** for several years • Expected to continue in the near term	• Minimum target of **70:30** for Nalcor and regulated hydro operations of NLH • Large increase in 2013 due to debt and equity for Lower Churchill Falls project	• Long-term target of **70:30** under new 10 Year Plan
Debt / Equity (as reported in latest annual report)	**84:16** (2016/17)	**80:20** (2016/17)	**69:31** (2016)	**61:39** (2016)	**96:04** (2016/17)
Interest Coverage	**> 1.8** EBITDA	target not stated	target not stated	**> 1.5** EBIT	target not stated
EBITDA interest coverage (as reported in latest annual report)	**1.54** (2016/17) • Has been significantly below target in recent years	**3.3** (2016/17) • Has averaged near 3x in recent years	**3.2** (2016) • Has averaged over 3x in recent years	**1.3** (2016) • Had averaged over 2x in recent years, but declined sharply in 2015 and 2016	**2.6** (2016/17) • Wide variance in recent years
Other financial metrics (highlighted in Annual Reports or Plans)	• Capital coverage of >1.2. **1.48** (2016/17) • Reflects cash flow to cover sustaining capital expenditures (excluding major generation and transmission expansion projects). Measure is challenged by the high amount of capitalized interest during high construction periods, and exclusion of certain capital, deferred and mitigation measures.	• Maintain rates in the first quartile. • Project Budget to Actual Cost within +5% to -5% of budget for five-year rolling data of generation, substation and transmission data.	• Return on equity from continuing operations 13.1% (2016), has ranged from 13-16% in recent years. • Profit margin from continuing operations 21.4% (2016), has ranged from 20-25% in recent years. • Self-financing, defined as cash flow from operations less dividends paid, divided by cash flows from investing activities, 58.8% (2016).	• Fixed rate debt as % of total debt, 91% (2016). • Return on capital employed (7.9% in 2016).	• Sets annual targets for net earnings, operating, management and administration costs, and net debt.

Source: Derived from annual reports, Manitoba Hydro, BC Hydro and N.B. Power for the year-ending March 31, 2017, Hydro-Quebec and Nalcor for the year-ending December 31, 2016. Also from latest published plans for various utilities.

Over the past decade, Manitoba Hydro's equity ratio climbed from 15% to be slightly over its long-term target of 25% in 2008 and 2010-2013. As Manitoba Hydro ramps up major generation and transmission projects, its equity ratio has significantly deteriorated and is forecast to deteriorate further. It will then recover after these new assets are in-service, and approach its long-term equity target. As of March 31, 2017, the equity ratio declined to 16%.

On a relative basis to assets, Manitoba Hydro's capital expansion program is larger than other government-owned power utilities in Canada. Projected capital expenditures over the next five year period are approximately 54% of the current asset base. Although this share is significantly lower than 83%, the number stated in the May 2015 Report (as significant capex is well underway now), it is still considerably higher than other government-owned utilities as shown in Figure 4-22.

Figure 4-22: Projected Capital Expenditures over the Next Five-Year Period Compared to Current Asset Base



Source: Derived from from annual reports and plans.

Hydro-Quebec

Hydro-Quebec has consistently maintained its equity ratio at slightly over 30% during the past decade, and this ratio is expected to remain near 30% over the next decade.

NB Power

NB Power has faced a number of financial challenges and this resulted in it having very low equity ratios over the past decade. Recognizing that its capital structure must improve, NB Power introduced a new 10 Year Plan, with the support of its owner, the Province of New Brunswick. The initial plan provided for a significant increase in its equity ratio over the next decade, with a target of 20% by 2021. NB Power's updated 10 Year Plan issued in 2017, indicates that various operating pressures and increased capital expenditure requirements results in a delay in meeting the internal capital structure target of 20% equity until 2024. However, recent results have continued to deteriorate, with the corporation having an equity ratio of only 6% in 2016/17.

BC Hydro

BC Hydro has maintained an equity ratio of 20% over the past decade. However, under the B.C. Government's recent 10-year plan for the utility, the Province directed that the utility move to a more robust capital structure. Under the Plan, BC Hydro targets to increase its equity ratio to 40% in the longer term (beyond the 10-year plan). The specific details of the 10-year plan, and the context for its development, are discussed in more detail in Chapter 4 of the May 2015 Report.

Nalcor

Nalcor is a holding company that holds the Government of Newfoundland and Labrador's interests in a number of energy companies, including Newfoundland and Labrador Hydro ("NLH"), which is a regulated utility whose activities encompass generation, transmission and electricity sales. Nalcor also holds entities created in the Lower Churchill Project and related investments. Nalcor's major new generation investment in the Lower Churchill Project is being undertaken outside of the regulated utility NLH. Its financial position has deteriorated in recent years, although its equity ratio was improved to 39% as a result of equity contributions in 2015 and again in 2016 from the Government of Newfoundland and Labrador.

4.9 Summary Observations – Benchmarking

Based on benchmarking and various comparisons of government-owned power utilities, particularly with hydro-based peer utilities in Canada, the following are summary observations:

- Manitoba Hydro has been and currently is at the low end of the peer group of government-owned power utilities in terms of key financial metrics including equity ratio, interest coverage ratio, cash flow comparison metrics, and other financial metrics. In benchmarking against government-owned power utilities in Canada, the gap in Manitoba Hydro's performance versus most other utilities has widened since the May 2015 Report.
- At a level of 25%, Manitoba Hydro's equity ratio target is below the current equity ratio observed at Hydro-Quebec and at Nalcor's regulated hydro operations. BC Hydro is currently near a 25% equity ratio, but plans to increase to 35% over the next decade, facilitated by a sharp drop in dividends paid to the Province of B.C. and by higher rate increases. Of the Canadian peer group, only NB Power has a lower equity ratio; however, NB Power has undergone financial challenges and its new plan is to ramp up to a minimum equity ratio of 20% over the next decade. Where government-owned power utilities have specified a plan to restore or achieve a target equity level, the planned time frame of ten years is consistent with that planned by Manitoba Hydro in IFF!6.
- Manitoba Hydro has a relatively high EBITDA to revenue ratio. The nature of the development of hydroelectric generation is that it entails very long development cycles, with very high capital expenditures during construction and relatively low operating costs and relatively strong operating margins once in service.
- Manitoba Hydro has very competitive electricity rates in Canada and North America, providing a significant advantage for ratepayers compared to other jurisdictions.
- Manitoba Hydro has relatively larger installed capacity and electric power generation per capita than most utilities, and extra-provincial electricity sales represent approximately 24% of total electricity sales, down somewhat in recent years, but a larger share than at other utilities and a very significant part of electricity operations.
- Manitoba Hydro's current capital expansion program is relatively much larger as a share of its existing asset base in comparison to other government-owned utilities in Canada (Figure 4-23).
- We note that the financial health of Manitoba Hydro has markedly deteriorated relative to forecast in the fiscal years that have passed since the May 2015 Report. For example, actual net income was significantly lower than forecast and retained earnings less AOCI dropped to $2.2 billion. These are concerning indicators for a utility in the midst of a large capital program. To be significantly off projection in the early years of a large capital program, further heightens risks and accelerates the need to return to better financial health.

Figure 4-23: Forecast under IFF14 versus Actual Results

IFF14 Projected versus Results ($ millions)						
	IFF14 Projected 2015/16	Actual 2015/16	% change	IFF14 Projected 2016/17	Actual 2016/17	% change
Revenues	2,337	2,258	-3%	2,387	2,327	-3%
Net income	126	39	-69%	67	59	-12%
Long-term debt	13,825	14,527	5%	16,698	16,438	-2%
Retained earnings less AOCI	2,502	2,052	-18%	2,559	2,190	-14%
Equity Ratio	19%	17%		17%	16%	

Source:
1. Manitoba Hydro Integrated Financial Forecast (IFF14).
2. Manitoba Hydro Annual Report for the year ended March 31, 2016 and for the year ended March 31, 2017.

5 Financial Targets in a Capital Markets Context

This chapter updates some of the credit rating perspectives as well as data on government-owned utilities in relation to their respective provincial economies and debt, from the May 2015 Report (in Chapter 6).

5.1 Overview of Credit Rating Reports on Manitoba and Manitoba Hydro

The Province of Manitoba has maintained a solid credit rating from three credit-rating agencies as indicated in the May 2015 Report (see Figure 5-1). However, since the May 2015 Report, Manitoba's credit rating from Moody's was downgraded in July 2015, and Standard and Poor's downgraded Manitoba's rating twice, in July 2016 and again in July 2017. The Moody's downgrade in July 2015 was Manitoba's first credit rating downgrade in nearly three decades.

Figure 5-1: Province of Manitoba Credit Rating

	Standard & Poor's	Moody's	DBRS
Rating	**A+**	**Aa1**	**A (High)**
Rating Outlook	Stable	Stable	Stable
Rating History	In July 2017, downgraded from AA-/Negative to A+/Stable. In July 2016, downgraded to AA-/Negative from AA/Stable Last upgrade was to AA/Stable from AA-/Positive in December 2007. Previous upgrade was in November 2006 to AA-/Positive from AA-/Stable since November 2002.	In July 2015, downgraded to Aa2 from Aa1. Outlook downgraded from Stable to Negative in August 2014. Last upgrade was November 2006, Aa2 to Aa1. Previously upgraded from Aa3 to Aa2 in January 2003, and after 13 years of A1 upgraded to Aa3 in September 1998.	Last upgrade was from A to A (High) in 2003 where it has remained since.

Source: Derived from information in credit agency rating reports – Standard and Poor's; Moody's; DBRS. Note: some credit agencies also issue a separate report on Manitoba Hydro, which reflect that Manitoba Hydro's debt is guaranteed by its owner, the Province of Manitoba.

Sovereign analysts from credit rating agencies review a number of factors in assigning ratings to governments including:

- Fiscal position and performance,
- Debt burden,
- Economy and economic fundamentals,
- Operating environment,
- Institutional framework,
- Contingent liabilities, and

- Other factors.

The Province of Manitoba's credit rating has typically been in the middle of those of Canadian provinces, lower than the Western provinces, and higher than the Atlantic Provinces and Quebec.

The credit rating agencies also issue separate analyses on Manitoba Hydro, although these reflect the fact that Manitoba Hydro's debt is guaranteed by the Province of Manitoba as its owner. Thus, Manitoba Hydro's credit rating is effectively a flow-through of the Province's credit rating. Most other government-owned utilities also receive the benefit of the credit rating of their provincial owner.

Comments from recent reports of individual credit ratings agencies are summarized in the sections below.

5.1.1 Standard and Poor's

In July 2017, Standard and Poor's lowered Manitoba's rating from "AA-" to "A+". Comments from the Standard and Poor's ratings report included:

> "Although Manitoba is taking clear steps to improve its fiscal sustainability in the long term, it faces large projected budget deficits and further growth in its already-high debt burden over the next two years. We are therefore lowering our long-term issuer credit and senior unsecured debt ratings on the Province of Manitoba to 'A+' from 'AA-'.
>
> Our assessment of the province's debt burden fully incorporates the debt on-lent to MHEB, which accounts for more than 40% of total tax-supported debt and for which the province expects to borrow heavily to finance capital projects over the next several years. We do not view MHEB as self-supporting due to its very high and rising leverage."[24]

One year earlier, in July 2016, Standard and Poor's[25] downgraded Manitoba's rating from "AA" to "AA-". Standard and Poor's commented:

> "The ratings on the Province of Manitoba reflect S&P Global Ratings' assessment of the significant rise in Manitoba's debt burden. This stems from the Province's ongoing fiscal shortfalls and significant debt on-lend to MHEB, which we no longer consider self-supporting mainly due to its high and rising leverage."[26]
>
> "Our assessment of the province's debt burden fully incorporates the debt on-lend to MHEB (nearly 40% of total tax-supported debt), whereas previously we had considered MHEB's status as a self-supporting entity to be a mitigating factor. We also expect Manitoba's interest expense will remain close to 6% of operating revenues over the next two years."[27]

The Standard and Poor's analysis outlined a number of key strengths for Manitoba including:

- Manitoba's very strong and diversified economy;
- Strong budgetary flexibility;
- Strong financial management;

[24] Standard and Poor's. Research Update: Province of Manitoba, July 21, 2017.

[25] Standard and Poor's. Supplemental Analysis: Province of Manitoba, July 29, 2016.

[26] Standard and Poor's. Supplemental Analysis: Province of Manitoba, July 29, 2016.

[27] Standard and Poor's. Supplemental Analysis: Province of Manitoba, July 29, 2016.

- Low contingent liabilities;
- Adequate liquidity;
- Canada's provincial-federal institution framework is very predictable and well-balanced.

5.1.2 Moody's

In August 2014, Moody's lowered its outlook on its rating for the Province of Manitoba from Aa1 stable to Aa1 negative. In July 2015, Moody's downgraded Manitoba's rating from Aa1 negative to Aa2 with a stable outlook.

> "The downgrade to Aa2 reflects the deterioration in 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." [28]

In its August 2016 rating report, Moody's[29] noted that Manitoba's ratings benefit from:

- Strong economic growth with a diversified economy;
- High debt affordability;
- Mature and supportive institutional framework and solid governance practices.

Moody's commented that the rating is challenged by the Province's elevated debt burden, substantial forecasted deficits over an extended time horizon, declining levels of liquidity, and contingent liability risk of Manitoba Hydro.

Moody's report noted the inherent risks related to increasing debt at Manitoba Hydro.

> "The province issues debt on behalf of its wholly-owned electric utility company Manitoba Hydro. Given its steady revenue stream that generates sufficient cash flow to support operations including interest payments, we view Manitoba Hydro as a self-supporting entity and therefore exclude the related debt from our debt metrics of the province.
>
> "We note, however, that Manitoba Hydro's total reported debt net of sinking of funds has risen considerably, doubling from CAD6.9 billion at March 31, 2008 to an estimated CAD14.2 billion as of March 31, 2016. We expect that its debt will continue to rise over the medium-term as the utility moves forward with construction projects, including the Keeyask hydroelectric station and the Bipole III transmission line, in anticipation of demand increases over the next few years and in order to boost electricity exports. 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." [30]

[28] Moody's Investors Service, Rating Action, July 10, 2015.

[29] Moody's Investors Service, Credit Opinion, Province of Manitoba, August 3, 2016, p.3.

[30] Moody's Investors Service, Credit Opinion, Province of Manitoba, August 3, 2016, p.4.

In its February 2017 update, Moody's confirmed its rating and Manitoba Hydro's self-supporting status, but noted the growing contingent liability risk of Manitoba Hydro:

> "Given its revenue stream that generates sufficient cash flow to support operations including interest payments, we view Manitoba Hydro as a self-supporting entity and therefore exclude the related debt from our debt metrics of the province.
>
> We note however that Manitoba Hydro's total reported debt net of sinking funds has risen considerably, doubling over the last eight years to CAD14.4 billion as of March 31, 2016, as the province moves ahead with several large capital projects. These include the Keeyask hydroelectric station and the Bipole III transmission line, which are being built to enhance reliability, meet anticipated demand increases over the next few years and boost electricity exports. We expect that the utility's debt may increase substantially by up to 70% over the medium-term from current levels just to complete these two projects, which are being hampered by significant delays and cost overrruns. The anticipated increase in debt has put growing pressure on the province's rating since it raises the contingent liability of the province (anticipated to exceed 40% of the province's total debt by 2017-18) and has increased the risk that Manitoba Hydro could require a capital injection or other support from the province."[31]

5.1.3 DBRS

In July 2017, DBRS confirmed the Province of Manitoba's "A (high)" rating with a trend of stable.[32] In its rating consideraitons, DBRS[33] outlined the following strengths and challenges:

Strengths

- Diversified and resilient economy,
- Favourable demographics,
- Prudent debt management practices,
- Abundant low-cost hydroelecricity.

Challenges

- Substantial deficits,
- Relatively high taxes,
- Moderate reliance on federal transfers,
- Below-average incomes and GDP per capita.

In July 2017, DBRS confirmed the rating of Manitoba Hydro obligations are a flow-through of the rating of the Province of Manitoba, as the Province unconditionally guarantees almost all of Manitoba Hydro's outstanding third-party debt.

> "DBRS fully expects the utility to recover its costs from the electricity rate base. As such, DBRS will continue to exclude the hydro-related debt from the calculation of tax-supported debt."[34]

[31] Moody's Investors Service, Credit Opinion, Province of Manitoba, February 24, 2017, p.4.

[32] DBRS Rating Report, Province of Manitoba, July 12, 2017.

[33] DBRS Rating Report, Province of Manitoba, July 12, 2017.

[34] DBRS Rating Report, Province of Manitoba, July 12, 2017, p.6.

DBRS notes the strengths of Manitoba Hydro including:

- Debt is a direct obligation of the Province,
- Low-cost hydro-based generation, and
- Access to favourable export markets.

Challenges of Manitoba Hydro noted by DBRS include:

- Hydrology risks,
- High leverage, and
- High level of planned capex.

The November 2016 DBRS report on Manitoba Hydro noted:

> "A new board appointed at Manitoba Hydro in 2016 intends to limit the deterioration in the Utility's balance sheet. As a result, the Utility has begun reviewing initiatives to help alleviate pressure on its key financial ratios, such as improving operating efficiencies, requesting annual rate increases higher than the previously planned 3.95%, as well as potential equity injection from the Province. DBRS sees these initiatives, if actualized, as positive to Manitoba Hydro's financial profile, as they will provide some financial flexibility for the Utility, especially in the event of adverse drought conditions or further cost overruns on the projects.
>
> DBRS continues to view Manitoba Hydro as self-supporting, as its earnings and cash flows continue to be sufficient to cover its operating expenses and to service its outstanding debt. 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. Similarly, a large equity injection by the Province that materially increases tax-supported debt could also put downward pressure on the Province's credit profile. At this time, however, DBRS expects the Province's ratings to remain stable."[35]

5.2 Government-owned Power Utilities and Relation to Provincial Economies

5.2.1 Public power utilities in relation to provincial economies

As Government Business Entities and self-supporting entities, the assets and debt of Manitoba Hydro and other provincially-owned power utilities in Canada are not consolidated within the balance sheets of their respective provincial governments in Summary Financial Statements. Figure 6-6 illustrates the size of utility net debt in relation to provincial government net debt. It also shows the relative size of the combined net debt in relation to provincial population and GDP. Credit rating reports on governments in Canada focus their key debt metrics, such as net debt to GDP, on tax-supported debt, and do not include the self-supporting debt of Crown utilities. However, they do take utility debt into account and continue to monitor levels of debt. Rating agencies have generally commented that the combined debt burden is manageable for provinces.

In 2013/14, the utility net debt of Manitoba Hydro was approximately 38% of combined provincial net debt and utility net debt, slightly lower than the figure for Nalcor (39%), and higher than values for NB Power and BC Hydro (which are near 30%). As a share of GDP, combined provincial net debt and utility net debt is highest in Quebec (at 62%), followed by New Brunswick (at 51%), and then Manitoba (at 46%).

[35] DBRS Rating Report, The Manitoba Hydro-Electric Board, November 25, 2016, p.1-2.

Updated data to 2015/16 in Figure 5-2 incorporate general increases across the provinces in the past two years in combined provincial net debt and utility net debt. Data for 2015 and 2015/16 was utilized for direct comparison to audited financial statements of provinces as 2016/17 Public Accounts was not available as of August 2017 for Manitoba and most provinces.

In 2015/16, the utility net debt of Manitoba Hydro increased slightly to approximately 39% of combined provincial net debt and utility net debt, the highest share of the five provinces. As a share of GDP, combined provincial net debt and utility net debt is highest in Newfoundland at 63% (a sharp increase from 42% in 2013/14 as the province's GDP declined significantly), followed by Quebec at 60%, New Brunswick at 56% and Manitoba at 53% (up from 46% in 2013/14).

While audited financial statements were not available at this time for most provinces, we note that Manitoba Hydro net debt rose significantly to $15.8 billion in 2016/17, an increase of $2.2 billion from 2015/16 (see Figure 5-2). Provincial net debt for Manitoba is forecast at $23.1 billion for 2016/17 (from 2017 Manitoba Budget), an increase of $1.7 billion from 2015/16. Thus for 2016/17, combined provincial and utility net debt for Manitoba is estimated at $38.9 billion, which would be approximately 58% of provincial GDP.

Figure 5-2: Overview of Utility Asset and Net Debt Information and Relationship to Provincial Economy, 2015/2016

Overview of Utility Asset and Debt Information and Relationship to Provincial Economy									
($CDN billions)	Provincially-Owned Utility	Utility Assets 2015/16	Utility Net Debt at Year End	Provincial Net Debt at Year End	Prov. Net Debt & Utility Net Debt	Utility Net Debt % of Combined Provincial & Utility Net Debt	Provincial Population 2015	Provincial GDP 2015	Provincial Net Debt and Utility Debt % of GDP
Manitoba	Manitoba Hydro	19.8	13.6	21.4	35.0	39%	1,296,000	65.9	53%
B.C.	B.C. Hydro	30.0	18.2	39.6	57.8	31%	4,693,000	250.0	23%
Quebec	Hydro Quebec	75.2	43.3	185.0	228.3	19%	8,259,500	381.0	60%
Newfoundland	Nalcor Energy	12.3	6.2	12.7	18.9	33%	528,700	30.1	63%
New Brunswick	New Brunswick Power	6.9	4.9	13.7	18.6	26%	754,300	33.1	56%

Source:
1. Manitoba Hydro Annual Report for the year ended March 31, 2016
2. B.C. Hydro Annual Report for the year ended March 31, 2016
3. Hydro-Quebec Annual Report for the year ended December 31, 2015
4. Nalcor Annual Report for the year ended December 31, 2015
5. New Brunswick Power Annual Report for the year ended March 31, 2016
6. Province of Manitoba Public Accounts, 2015/16
7. Province of B.C. Public Accounts, 2015/16
8. Province of Quebec Public Accounts, 2015/16
9. Province of Newfoundland and Labrador, 2015/16
10. Province of New Brunswick Public Accounts, 2015/16
11. Statistics Canada

Figure 5-3 indicates that Manitoba has a relatively high level of utility assets and net debt on a per capita basis, as Manitoba Hydro plays a significant role in its provincial economy.

Manitoba Hydro's net debt per capita is nearly $12,000, slightly below Nalcor, and substantially above other government-owned power utilities in Canada. Manitoba Hydro's net debt per capita increased by approximately 43% in only three years, from 2013/14 to 2016/17. This rate of growth in net debt and net debt per capita significantly exceeded that of the other government-owned power utilities.

Nalcor has the highest level of assets per capita of the government-owned power utilities in Canada, followed by Manitoba Hydro.

Manitoba Hydro's assets per capita increased from $12,359 per capita in 2013/14 to $16,947 per capita in 2016/17, an increase of approximately 37% over the past three years and a growth rate significantly higher than other government-owned power utilities except for Nalcor.

Figure 5-3: Overview of Utility Asset and Net Debt Information Per Capita, 2016/2017

Overview of Utility Asset and Debt Information Per Capita				
($CDN)	Provincially-Owned Utility	Utility Net Debt Per Capita	Utility Assets Per Capita	Net Debt/ Assets
Manitoba	Manitoba Hydro	11,981	16,947	70.7%
B.C.	B.C. Hydro	4,204	6,711	62.6%
Quebec	Hydro Quebec	5,365	9,028	59.4%
Newfoundland	Nalcor Energy	12,149	26,527	45.8%
New Brunswick	NB Power	6,475	9,207	70.3%

Source:
1. Manitoba Hydro Annual Report for the year ended March 31, 2017.
2. B.C. Hydro Annual Report for the year ended March 31, 2017.
3. Hydro-Quebec Annual Report for the year ended December 31, 2016.
4. Nalcor Annual Report for the year ended December 31, 2016.
5. New Brunswick Power Annual Report for the year ended March 31, 2017.
6. Statistics Canada

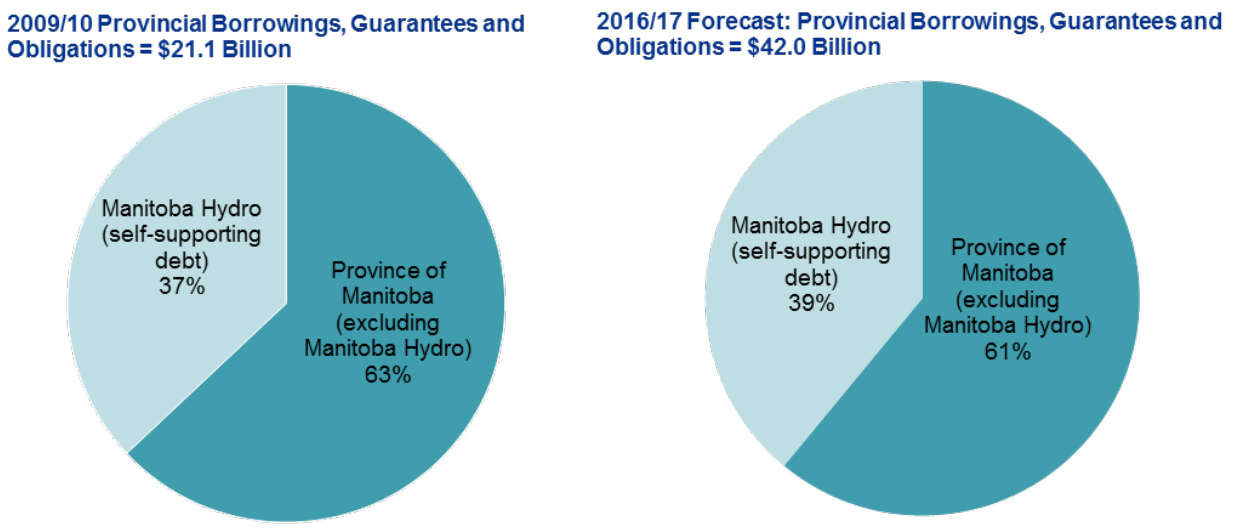
Figure 5-4 shows the level of Manitoba Hydro's self-supporting debt in conjunction with the Province of Manitoba's total borrowings, guarantees and obligations (net of sinking funds). From 2009/10 to 2013/14, this share had been relatively constant at approximately 37%.

Debt advances to Manitoba Hydro are forecast in 2016/17 to be approximately 39% of total Provincial borrowings, guarantees and obligations, a marked increase in two years from 37% as Manitoba Hydro borrowings have increased from $12.5 billion in 2014/15 to a forecast level of $16.4 billion in 2016/17.

This share is expected to continue to increase in the medium term, depending upon the level of increase in the Province of Manitoba's tax-supported debt. Based on projections of Province of Manitoba borrowings outlined in the Manitoba Budget 2017, Manitoba Hydro's share is projected to significantly increase to 42.5% in 2017/18. [36] Based on Manitoba Hydro's projected debt under IFF16, self-supporting debt as a share of total Provincial borrowings, guarantees and obligations could increase to percentage range in the mid-40s by 2019/20, depending on the rate of increase of provincial tax-supported debt.

[36] Manitoba Budget 2017. Supplementary Financial Information, pg. B2.

Figure 5-4: Province of Manitoba Borrowings, Guarantees and Obligations, 2009/10 and 2016/17 Forecast



Source: 2009/10 from Province of Manitoba 2014 Budget Summary Financial Statistics. 2016/17 forecast from Province of Manitoba 2017 Budget Summary Financial Statistics. (Provincial borrowings, guarantees and obligations are net of sinking funds.)

5.2.2 Government contributions from public-owned power utilities in Canada

Figure 5-5 provides a breakdown of contributions paid to governments from Manitoba Hydro and four other government-owned power utilities in the peer group. Of these five government-owned power utilities, only BC Hydro and Hydro-Quebec currently pay a direct annual dividend to their provincial owner. In both cases, dividends are based on a formula and are capped to ensure that a minimum equity ratio is maintained.

Most government-owned utilities pay a debt guarantee fee based on a percentage of outstanding debt to their respective provincial owner.

- Manitoba Hydro pays a 1.0% fee on outstanding applicable debt, which is the highest percentage fee in the group. The Province of Manitoba's debt guarantee fee was increased from 0.5% to 0.65% effective April 1, 2000 and to 0.95% effective April 1, 2001. [37] The fee was subsequently increased to 1.0% during fiscal 2006/07.
- NB Power pays a 0.65% fee on outstanding debt.
- Hydro-Quebec pays guarantee fees to the Quebec government related to debt securities. In 2014, these fees were $205 million in 2014 which represents slightly under 0.5% on outstanding debt. [38]
- In 2008, the Government of Newfoundland and Labrador temporarily waived the guarantee fee paid by Nalcor until 2011. Upon reinstatement in 2011, the fee was reduced from 1.0% of outstanding debt to a fee of 0.5% on outstanding debt with a remaining term of over 10 years and 0.25% on outstanding debt with a remaining term of under 10 years. The new fee rates were designed to better reflect the value of the debt guarantee, and are based on a comparison of yields on bonds issued by the Province to bonds with similar maturities issued by a group of investment-grade

[37] PUB Board Order 7/03, p. 26.

[38] Hydro-Quebec 2014 Annual Report. Financial statements Note 6.

utilities comparable to Hydro. [39] NLH's recent rate application notes the cumulative impact of these fee initiatives to 2015 is $62.3 million.[40]

In fiscal 2016/17, Manitoba Hydro paid $136 million in debt guarantee fees to the Province of Manitoba, an amount that is expected to increase significantly over the next five years as borrowings ramp up to complete major generation and transmission projects.

Manitoba Hydro, BC Hydro and Hydro-Quebec pay annual water rental charges to their respective provinces. Manitoba Hydro's water rental charge is $3.34 per MW, which is a similar rate to Hydro-Quebec, and significantly lower than BC Hydro, which pays $6.896 per MW plus capacity charges. Under the *Water Power Act*, the Province of Manitoba approximately doubled water rental rates to its current level of $3.34 per MW effective April 1, 2001. Manitoba Hydro paid $131 million to the Province of Manitoba in water rental charges in 2016/17.

All utilities pay local property and related taxes in their respective jurisdictions. In addition to these taxes, Manitoba Hydro pays capital taxes to the Province of Manitoba ($84 million in 2016/17), and Hydro-Quebec pays a Provincial Public Utility Tax to the Government of Quebec.

Figure 5-5: Contributions Paid to Governments from Public-Owned Canadian Power Utilities (FY2016 or FY2016/17 in annual $ millions)

	Manitoba Hydro	BC Hydro	Hydro-Quebec	NB Power	Nalcor
Dividend (1)	n/a	$259	$2,146	n/a	n/a
Debt guarantee fee	$136		$218	$32	$4.5
Water rental charges	$131	$349	$673		$4.9
Property, capital & other taxes	$135	$234	$372	$43	not available
Total	$402	$842	$3,409	$75	$9.4
Total % revenues	17%	14%	26%	4%	1%
Per Capita (rounded dollars)	*$305*	*$177*	*$409*	*$99*	*$18*

Note: derived from annual reports and financial statements, for the year-ending March 31, 2017 for Manitoba Hydro, BC Hydro and NB Power and for the year-ending December 31, 2016 for Hydro-Quebec and Nalcor.

(1) No dividends are paid by Manitoba Hydro, NB Power and Nalcor. For Hydro-Quebec, dividend paid the Quebec government is 75% of net income; no dividend if it effectively reduced the cap rate/equity ratio to less than 25%. For BC Hydro, dividend is 85% of net income, subject to an 80:20 debt to equity cap. Dividend for the year ending March 31, 2016 and for the year ending March 31, 2017 is less than 85% due to the cap. Special Directives from the Province of BC define a minimum annual payment which was $259 million for the 2016/17 fiscal year. Note that BC Hydro's dividend payments to the Province of BC have been higher in previous years.

[39] Newfoundland and Labrador Hydro – 2013 General Rate Application, p. 3.31.

[40] Newfoundland and Labrador Hydro – 2013 General Rate Application, p. 3.32.

Based on information disclosed in annual financial statements, as noted in Figure 5-5, Manitoba Hydro's payments to government represent approximately 17% of total revenues. This is a similar share to BC Hydro (although BC Hydro's dividend payments to the Province of B.C. have been lower in recent years), a much higher proportion than government-owned utilities in Atlantic Canada, but significantly lower than Hydro-Quebec. Hydro-Quebec contributes approximately 26% of its total revenues to government, with nearly two-thirds of its government contributions in the form of dividends to its owner.

5.3 Summary Observations

Key conclusions from the analysis in this chapter are the following:

- Since the May 2015 Report, two credit rating agencies have issued a total of three credit downgrades for the Province of Manitoba. One credit rating agency no longer views Manitoba Hydro debt as self-supporting due to high and rising leverage. Two other credit rating agencies continue to view Manitoba Hydro as self-supporting.
- The combined debt of the Province of Manitoba and Manitoba Hydro has significantly increased in the past two fiscal years, and Manitoba Hydro's share of Provincial borrowings, guarantees and obligations now exceeds 40%.

6 Scenario Analysis and Testing

This chapter revisits some of the scenario analyses undertaken in the May 2015 Report (in Chapter 7) and reviews some additional scenario analyses that have been undertaken subsequently.

6.1 General Approach

In this Chapter, we have, in general, focused the analyses on differences between IFF14 and IFF16. This reflects the fact that the outlook for IFF14 was the basis of our prior analysis and that IFF16 is Manitoba Hydro's most current financial projection. In this context, figures for IFF15 are of secondary interest. Figures for IFF15 can shed light on changes in expectations over time but they are not as directly relevant to a discussion of how the environment and outlook have now changed or of the implications for Manitoba Hydro's financial targets.

6.2 Maintaining Profitability

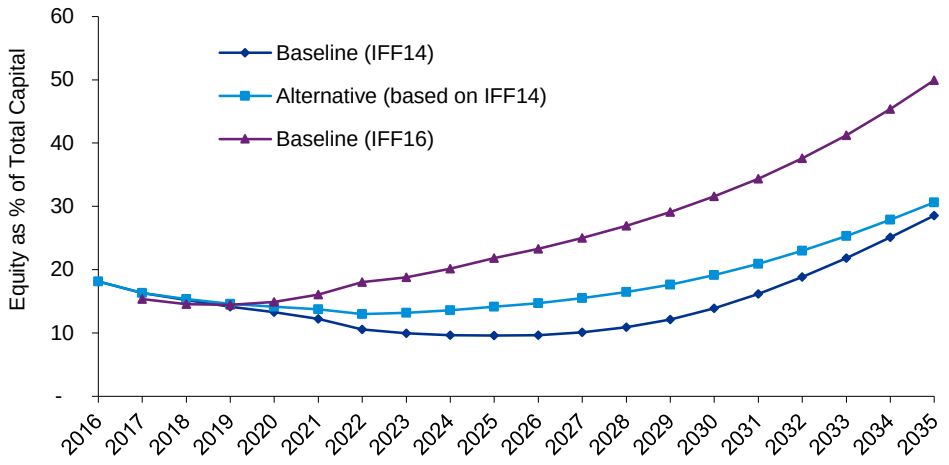
In the May 2015 Report, we noted that projections within IFF14 showed eight consecutive years of negative net income beginning in 2019. We then examined an alternative scenario with higher rate increases than under IFF14, with the rate increases set to restore profitability under expected conditions.

With IFF16, the projected outlook for Manitoba Hydro has substantially improved. The improvement relative to IFF14 is largely attributable to increases in rates, which have been used to bolster Manitoba Hydro's equity position and cash flow in parallel with large capital investments. IFF16 also reflects Manitoba Hydro's recently announced plans to reduce staff and operating costs. The improvement in outlook is also partly attributable to lower forecast interest rates, which reduce financing costs associated with Manitoba Hydro's ongoing capital program. Lower interest costs help offset reductions that are also projected in long term electricity export prices.

Figure 6-1 shows the new forecast compared to IFF14 and the alternative scenario presented in the May 2015 Report. This figure shows that IFF16 results in debt/equity ratios that improve more rapidly than before, even compared to our earlier alternative scenario, which also entailed higher rate increases than the IFF14 base scenario.

Beyond 2029, the rate of increase in equity position under IFF16 is similar to that under the IFF14 base scenario. This is the case even though IFF16 has rate increases of only 2.0% beyond 2023, while IFF14 had rate increases of 3.95% annually over the forecast horizon. This indicates the substantial benefit of restoring the equity position of the utility earlier rather than later.

Figure 6-1: Equity Ratio under IFF14, IFF16 and the IFF14 Alternative Scenario



6.3 Probabilistic Analysis

In the May 2015 Report, we summarized some scenario testing that Manitoba Hydro had undertaken based on examining potential variation in four input parameters. This scenario testing considered variation in:

- Interest rates (3 possible outcomes)
- Energy and Export prices (3 possible outcomes)
- Capital Expenditures (3 possible outcomes)
- Water Flow Sequence (99 possible scenarios).

By varying each of the inputs noted above, Manitoba Hydro obtained 2,763 distinct financial projections (calculated as 3 x 3 x 3 x 99).

As shown above, Manitoba Hydro examined just three individual scenarios for interest rates in its probabilistic analysis. These included a scenario with interest rates as forecast under IFF14, and scenarios with interest rates either one percentage point higher or lower.

6.3.1 Modelling of interest rate uncertainty

In the period since the 2015 report, Manitoba Hydro has explored a more sophisticated approach to modelling interest rate uncertainty. There has been a concern that the scenario testing undertaken in the context of IFF14, which examined interest rates just one percentage point higher or lower than forecast, did not adequately capture the actual uncertainty associated with interest rate movements. This concern arose from the observation that consensus forecasts, which are the basis of the reference case used for IFF purposes, tend to assume faster convergence of interest rates to their historical means than has been observed in practice in the past.

As an alternative to assuming a fixed adjustment above or below the reference case forecast for scenario testing, Manitoba Hydro has implemented a new approach based on using a stochastic interest rate generator. The generator is calibrated to produce outputs that are consistent with the interest rate uncertainty implied by futures market data.

As implemented for the purpose of scenario testing, the interest rate generator is used to prepare 50 interest rate trajectories. Each of these are assumed to be equally probable. The interest rate trajectories (or scenarios) are then combined with energy and export price scenarios (3 scenarios) and water flow sequences (102 scenarios) to produce a total of 15,300 outcomes.

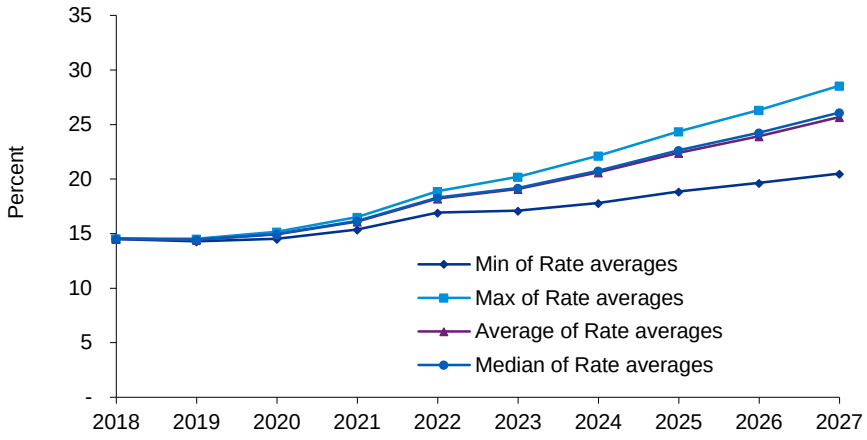
Figure 6-2 examines the impact of interest rate uncertainty on the outcomes observed. The figures presented in this chart require some explanation, and this is provided below.

As noted above, Manitoba Hydro has prepared a total of 15,300 runs, combining uncertainties in energy and export prices, water flows and interest rates. Each individual run is a combination of:

- One water flow sequence,
- One interest rate trajectory, and
- An assumption on energy and export prices (either Low, High or Reference Case).

To examine the impact of interest rates on overall outcomes, we examined, in turn, those runs associated with each individual interest rate trajectory. For each interest rate trajectory, there are 306 separate runs (which result from looking at the combination of 3 price scenarios combined with 102 water flow sequences). For each interest rate trajectory, we then calculated the average equity ratio in each year across the 306 runs and summarized these averages in a table. For these averages in each year, we then calculated the minimum, median, average, and maximum values observed across the 50 interest rate scenarios. These figures are presented in Figure 6-2 below.

Figure 6-2: Equity Ratio under Alternative Interest Rate Scenarios for IFF16



As noted in Figure 6-2 above, the minimum average equity ratio observed across the interest rate trajectories is about 14.3% in 2020. This means that the most unfavourable interest rate scenario in respect of the year 2020 showed an average equity ratio of 14.3% across the 306 runs associated with that interest rate input. Since this average is calculated across the combination of 102 water flow sequences with 3 energy and export price scenarios, the 14.3% is not the minimum observed across all runs. Rather, 14.3% is itself the average of a distribution produced by the 306 underlying runs associated with one interest rate trajectory.

The rationale for looking at the distribution of the averages calculated for each interest rate trajectory is that it shows the contribution of the interest assumption to the variation in outcomes across the 15,300

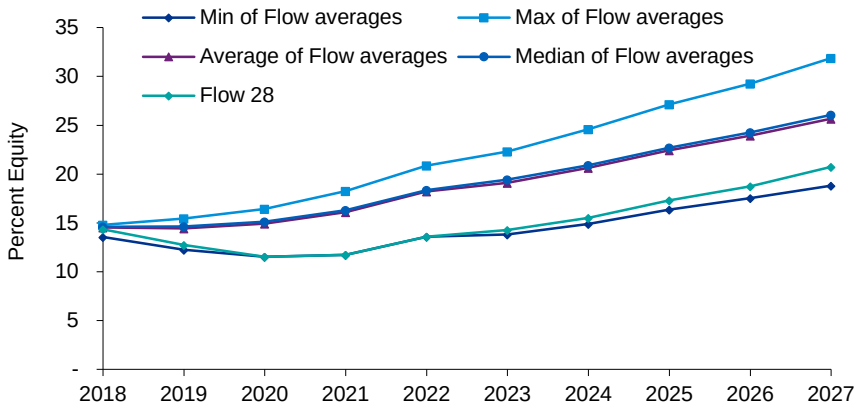
individual projections. Variation in other assumptions is averaged out from the average calculated for individual groups of trajectories, when trajectories are grouped by interest rate assumption.

6.3.2 Impact of water flow uncertainty

In this sub-section, we focus on the impact of water flow uncertainty. In Figure 6-3 below we prepare an analysis of outcomes across the 102 water flow sequences. Our approach to the preparation of this graph was similar to that used for Figure 6-2 above, but involved grouping outcomes by water flow sequences.

For each water flow sequence, there are 150 associated runs. These result from the combination of 50 interest rate trajectories with 3 energy and export price scenarios. For each water flow sequence, we calculate the average equity ratio across these 150 runs and summarized the averages in a table. In Figure 6-3, we show the minimum, maximum, median and average value for these averages in each year.

Figure 6-3: Equity Ratio under Alternative Water Flow Scenarios for IFF16



From the results shown above, it can be observed that minimum average equity values of about 11.5 percent are observed in each of the years 2020 and 2021. As there are 102 water flow sequences, the minimum value observed could be considered to have about a 1 percent probability of being underachieved in practice (given that 1 divided by 102 equals about 0.01).

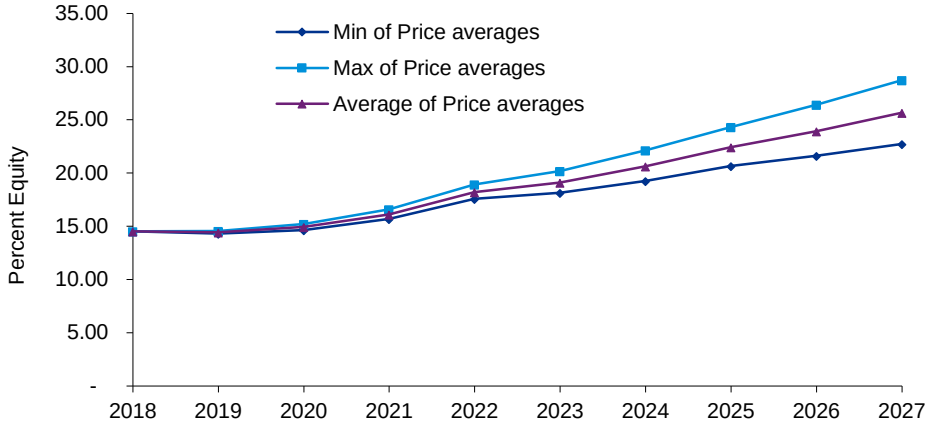
To provide greater insight on the circumstances that lead to the values shown, Figure 6-3 also shows the average equity values associated with water flow sequence 28 (labelled "Flow 28"). This line shows the average of equity values observed when water flow sequence 28 is selected, and interest rates and energy prices are varied. It can be seen Flow Run 28 accounts for the minimum average equity values observed in years 2020 and 2021. Although it does not account for the minimum values in other years, it provides values that are close to the minimum values. Accordingly, it can be seen that close to minimum values can persist for many years under certain hydrology scenarios.

6.3.3 Impact of energy and export price variation

In this sub-section, we focus on the uncertainty in energy and export prices. (Recall that energy and export price uncertainties are combined: for example, high energy prices are associated with high export prices.) In Figure 6-4 below we prepare an analysis of outcomes across the 3 scenarios ("High", "Low" and "Reference") for energy and export prices. Our approach to the preparation of this graph was similar to that used for Figures 6-2 and 6-3 above but involved grouping outcomes by price scenarios (instead of by interest rate trajectories or water flow sequences).

For each price scenario, there are 5,100 associated runs. These result from the combination of 50 interest rate trajectories with 102 water flow sequences. For price scenario, we calculate the average equity ratio across these 5,100 runs and summarized the averages in a table. In Figure 6-4, we show the minimum, maximum, median and average value for these averages in each year.

Figure 6-4: Equity Ratio under Alternative Energy and Export Price Scenarios for IFF16



From the results shown above, it can be seen that the spread in equity values produced by variation in energy and export prices is less than that associated with individual water flow sequences or with individual interest rate trajectories. In part, this can be attributed to the greater averaging of results when we look just at variation in price inputs. There are just 3 price scenarios and when we calculate average equity values for each such scenario, these are associated with 5,100 runs (the combination of 102 water flow sequences with 50 interest rate scenarios). In this analysis, it turns out that the minimum values are all accounted for by the low export price scenario. Similarly, and not unexpectedly, all of the maximum values are accounted for the high export price scenario.

6.3.4 Comparison of Impacts

In this section, we directly compare the minimum and maximum values observed under each of the analyses above. In other words, we first compare the minimum values observed in each of Figures 6-2, 6-3, and 6-4. We then compare maximum values observed in each of these figures. This presentation shows more directly the nature of variation observed when we examine differences resulting from variation in one input parameter (e.g. water flows), while averaging results across scenarios capturing variation in other parameters (e.g. interest rates and energy and export prices).

Figure 6-5 shows the minimum values taken from Figures 6-2, 6-3 and 6-4. We can see that the analysis for water flow variation results in the minimum values observed for all years.

Figure 6-5: Minimum Values for Alternative Scenario Sets under IFF16

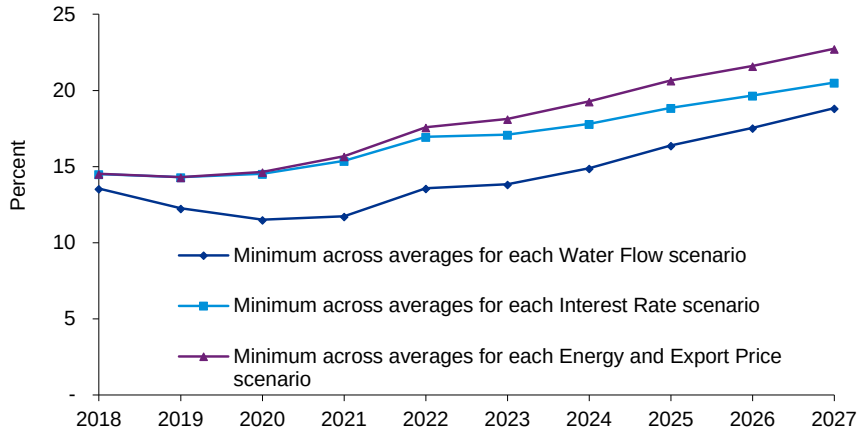
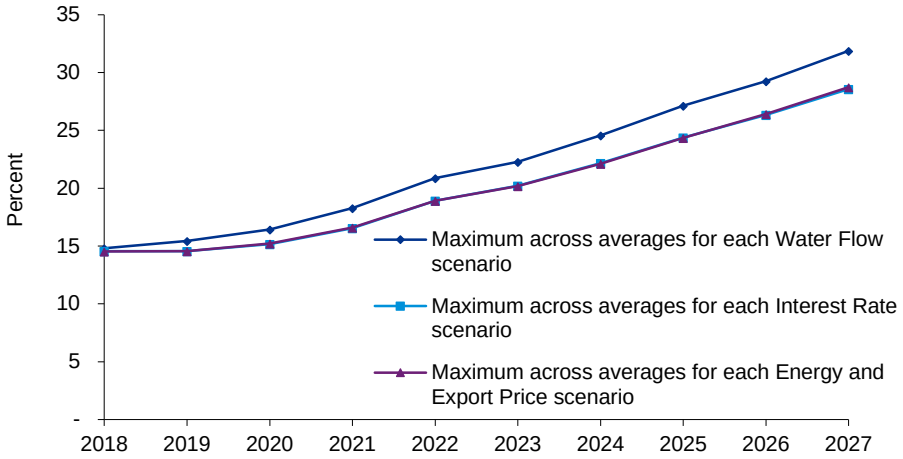


Figure 6-6 shows the minimum values taken from Figures 6-2, 6-3 and 6-4. We can see that the analysis for water flow variation results in the maximum values observed for all years for the averages found when grouping scenarios by particular input conditions. Taking into account both Figures 6-5 and 6-6, it is reasonable to conclude that water flow variation remains the biggest driver of uncertainty for Manitoba Hydro.

Figure 6-6: Maximum Values for Alternative Scenario Sets under IFF16



6.3.5 Contribution of different factors to overall variability

As an alternative approach to quantifying the relative impact of different factors on financial results, we looked at the impact on the full range of outcomes of adding different sources of uncertainty in turn. The approach is as follows:

- As a first step, we examine the range of outcomes when considering just water flow variability, Thus, financial results are forecast for each of the 102 water flow sequences, using Reference export prices

and Reference interest rates. For each year, we then calculate the range of outcomes, or the difference between the minimum and maximum equity ratio observed across all runs.

- As a second step, we examine, in addition, the impact on variability by adding High and Low export prices to the set of financial runs. Compared to step one above, we then calculate the increase in the range of outcomes observed. (At the end of step two, we have 306 runs, obtained from 102 water flow sequences combined with 3 export price scenarios.)
- As the final step, we examine, in addition, the impact on variability by adding High and Low export prices to the set of financial outcomes obtained above. Comparing to step two above, we then calculate the increase in the range of outcomes observed. The range between the minimum and maximum equity values in each year is thus calculated based on 918 runs (102 water flow sequences, with 3 export price scenarios and 3 interest rate scenarios).

In this alternative analysis, we have examined interest rate uncertainty with 3 scenarios rather than 50 trajectories. Analysis by Manitoba Hydro shows that the 3 interest rate scenarios achieves similar outcomes to that obtained with the full 50 interest rate trajectories.

The range of outcomes observed at each of steps 1, 2 and 3 is shown in sequence in Figures 6-7 through 6-9 below.

Figure 6-7: Range of Outcomes from Water Flow Variability

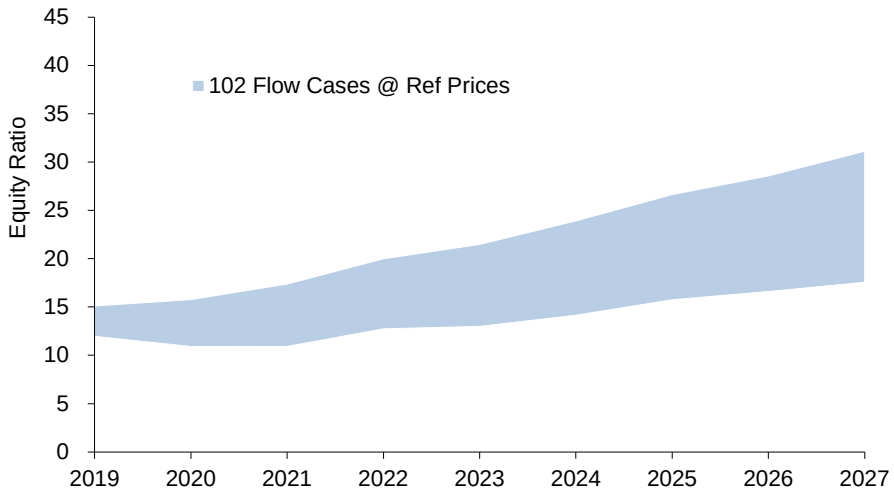


Figure 6-8: Range of Outcomes from Water Flow and Export Price Variability

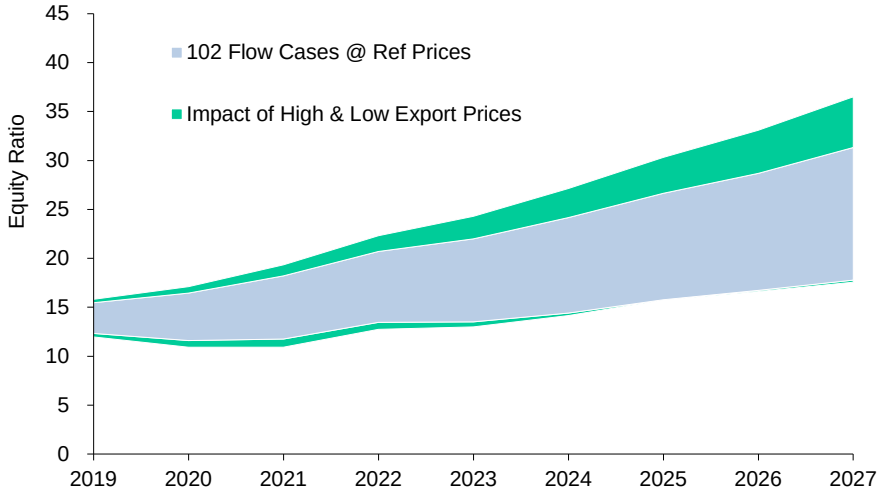


Figure 6-9: Range of Outcomes from Water Flow, Export Price and Interest Rate Variability

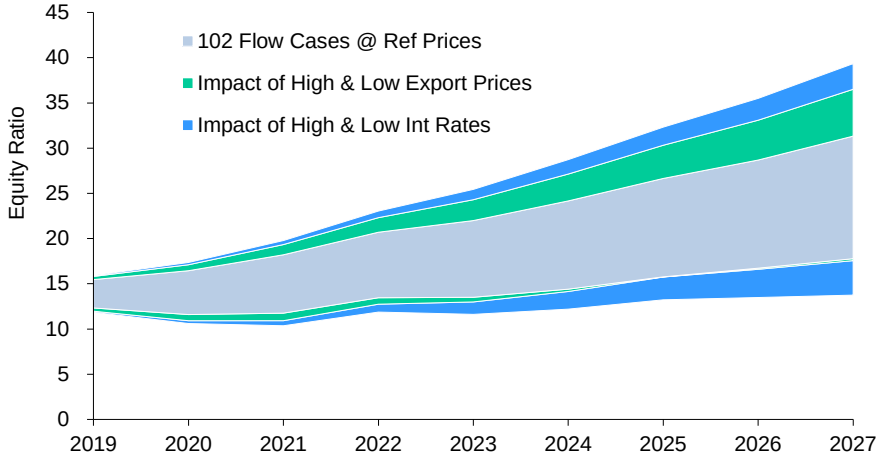


Figure 6-10 below summarizes the contribution that each factor made to total variability observed in each year. As expected, water flow remains the key contributor to the variability observed in each year through to the end of the projection period, accounting for over three-quarters of variability in 2019 and still over half in 2027. However, interest rates account for an increasing share of variability as time passes: interest rates account for 26% of variability in 2027 versus only 5% in 2019. This reflects the persistence of interest rate deviations in the modelling approach and the compounding effect that higher or lower interest rates can have on financial outcomes. Energy and export prices account for a relatively stable share of variability over the forecast period.

Figure 6-10: Factor Contribution to Total Variability

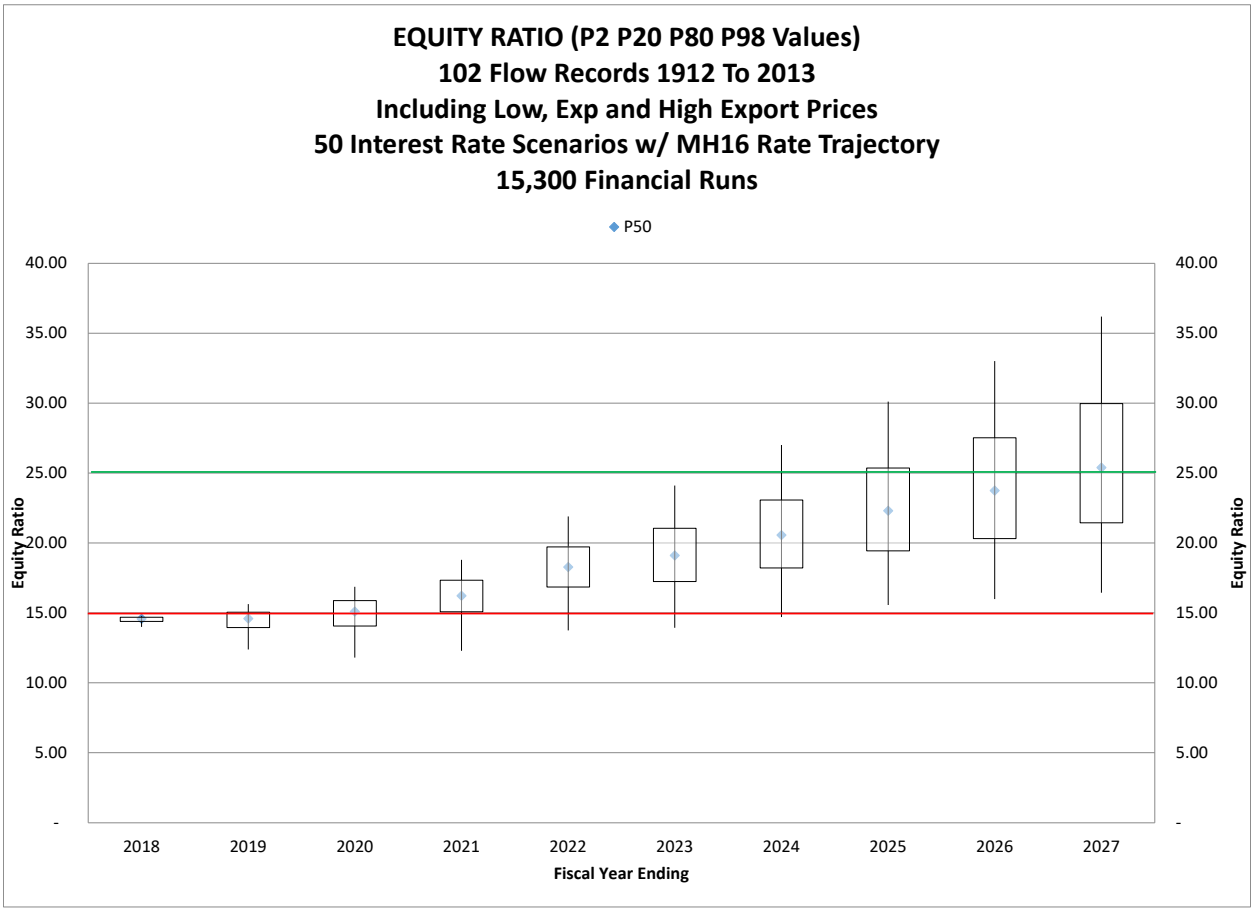
Percentage Contribution to Total Variability									
Year	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Factor									
Water Flow	77%	72%	68%	65%	61%	59%	57%	54%	53%
Energy and Export Prices	17%	20%	21%	21%	20%	20%	19%	21%	21%
Interest Rates	5%	8%	11%	14%	18%	21%	24%	25%	26%
	100%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

6.3.6 Combined impact

Figure 6-11 below shows the combined impact of variation across all three dimensions used in the scenario analyses (water flow, interest rate, and energy and export prices). This graph is in the form of a "box and whisker" chart. The box shows the range from the 20th to 80th percentile. The lines above and below show the range from the 2nd to 98th percentiles. The format of this graph is based on that currently used by Manitoba Hydro to present the results of its scenario analyses. We have changed the format to show values for 2nd to 98th percentiles, however, rather than for the 5th and 95th percentiles. For the consideration of financial risks, a broader distribution provides a more conservative perspective on potential variability.

In the near term, the lines below the boxes appear longer than the lines above, suggesting that the range of outcomes on the downside is wider than those on the upside. Figure 6-10 helps explain this result as water flow variation in early years has a far more profound impact on equity level than either of energy and export prices or interest rates. Moreover, as discussed earlier, water flow is an asymmetric risk for Manitoba Hydro – the negative financial impacts of low water flows are greater than the financial gains associated with high water flows. This reflects limitations in Manitoba Hydro's generating capacity and that high water flows tend to result in greater water spillage.

Figure 6-11: Combined Distribution from Uncertainty Modelling for IFF16



6.3.7 Review of a sample of runs

As an alternative approach to presenting the results, we examined about 13 individual runs, selected from across the 15,300 total runs undertaken in total. To select the 13, we plotted the 1st run out of the 15,300 total runs and then every 1,253th run thereafter. This fixed sampling approach captured results across a range of scenarios in combination.[41]

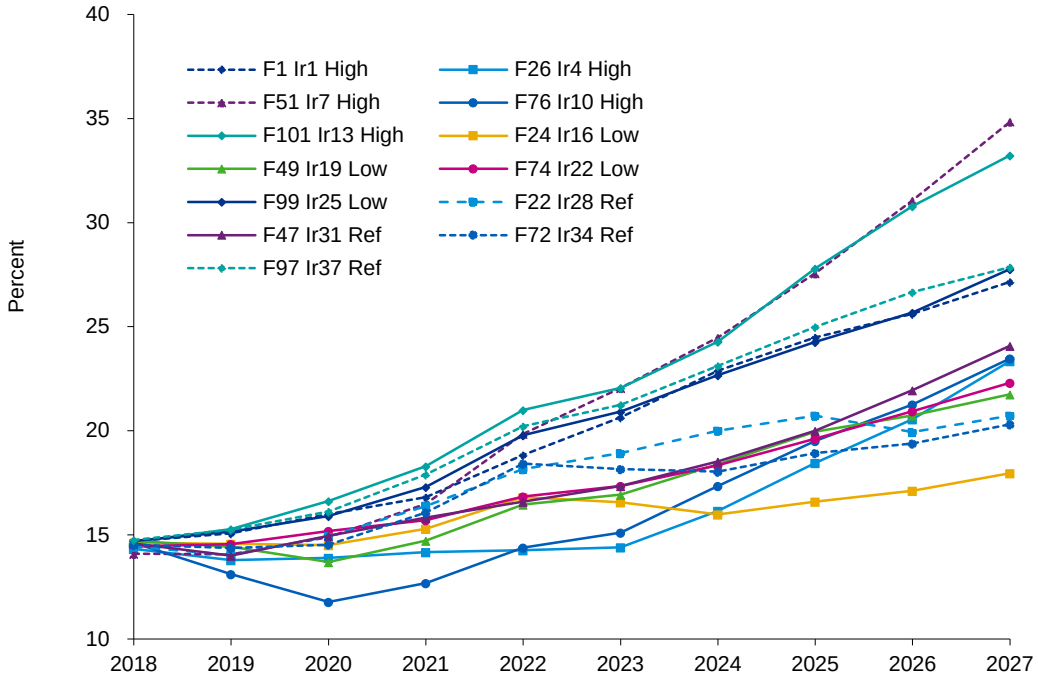
In labelling the various runs selected, the following approach is used:

- The first set of characters (with the prefix "F") indicates the water flow sequence.
- The second set of characters (with the prefix "Ir") indicates the interest rate trajectory.
- The third set of characters ("Low", "High", or "Ref") indicates the energy and export price scenario.

Figure 6-12 below shows the runs selected through this fixed sampling approach.

[41] Given the way that runs were constructed, we needed to avoid multiples of 3, 50 and 102 in setting the intervals, or periodicity, at which runs were selected for presentation. Otherwise, the scenarios presented would not show variation in the three input dimensions.

Figure 6-12: Selected Runs from Uncertainty Modelling for IFF16



The rationale for looking at individual runs is that it provides some additional insight on how various input conditions interact to produce an outcome within the overall distribution. In particular, an individual run shows how outcomes might evolve from year to year in response to a combination of input assumptions. For example, we note that the scenario defined by flow sequence 76, interest rate trajectory 10 and high energy and export prices (labelled "F76 Ir10 High") shows poor results in the initial years but improves rapidly after 2021. This trajectory is somewhat unusual amongst those plotted in that it moves from the bottom to the middle of the distribution over the forecast period. Many of the other runs plotted stay in about the same place relative to the broader group. For example, the run "F74 Ir22 Low" stays roughly in the middle of the group throughout the period. In a similar way, "F101 Ir3 High" remains at or near the top of the thirteen runs throughout. In other words, the runs selected tend to show little change over time in their relative positioning within the sample group.

6.4 Comparison of Probability Distributions

6.4.1 IFF16 versus IFF14

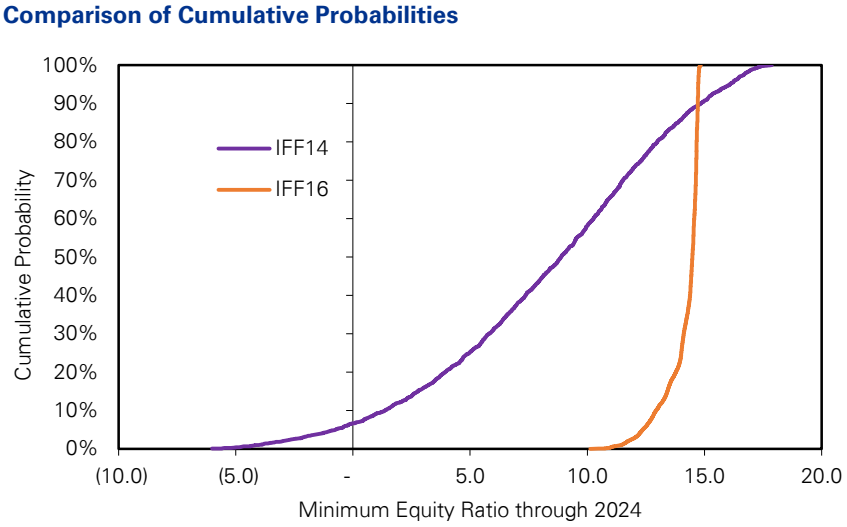
As noted at the beginning of this Chapter, the outcomes projected under IFF16 are significantly more favourable than under IFF14. One way of showing this is by comparing probability distributions for the minimum equity value observed during the period 2018 through 2024. Figures 7-7 and 7-11 of the May 2015 Report provided such distributions. Please note that the minimum equity values examined in this section are the minimum values observed over the full data set (all runs considered). They are not the minimums observed for averages calculated across groups of runs (which was the approach taken in Sections 6.3.3 and 6.3.4 earlier.)

As noted in the May 2015 Report, the interpretation of cumulative probability curves is as follows:

- For any given value on the "x" axis (representing, in this case, the minimum equity value observed through 2024), the line indicates a probability level on the "y" axis.
- The probability level observed above is the percentage of runs for which a lower equity value was observed than that corresponding to the "x" value.

In Figure 6-13 below compares the cumulative probability under IFF14 and IFF16 of various values for the minimum absolute equity ratio observed over the period to 2024. It can be seen that the line for IFF16 has been shifted considerably to the right relative to that for IFF14. There is now essentially no probability of having a minimum absolute equity value less than zero percent, versus a probability of about 7% under scenario modelling for IFF14.

Figure 6-13: Minimum Equity Value Observed 2018 through 2024 under Scenario Modelling



The dispersion of outcomes for the period 2018 through 2024 is much narrower under IFF16 than under IFF14. This reflects the following:

- Improved earnings under IFF16 as a result of higher rate increases reduce the risk of a fall in retained earnings relative to the forecast starting point.
- Because the base year (or starting point) for IFF16 is two years later than for IFF14, uncertainties have less time to evolve. For IFF16, the period 2018 to 2024 is closer to the base year from which the projection is made.
- The dispersion of input interest rates appears is narrower under IFF16 than IFF14.

6.4.2 Comparison of approaches to modelling uncertainty

As noted earlier in this Chapter, in Section 6.3, Manitoba Hydro moved to a new approach to modelling uncertainty when it presented results for IFF15 and now IFF16. The key differences are that Manitoba now uses a more sophisticated approach to representing interest rate uncertainty and it no longer accounts for construction cost variation. Because of changes in scenario modelling, some of the differences between the probability distributions for IFF14 and IFF16, as illustrated in Figure 6-13, reflect differences in the approach for modelling uncertainty rather than differences in the inherent risk associated with the baseline projections.

To help isolate differences in observed risk that are attributable to modelling approach, we asked Manitoba Hydro to model uncertainty under IFF16 using the same methodology as it had originally used for IFF14. This entailed considering uncertainty for IFF16 by taking into account 3 scenarios for each of:

- Interest rates (Reference Case, and +/- one percent point)
- Energy and Export prices (Reference Case, plus High and Low)
- Capital Expenditures (Reference Case, plus High and Low)

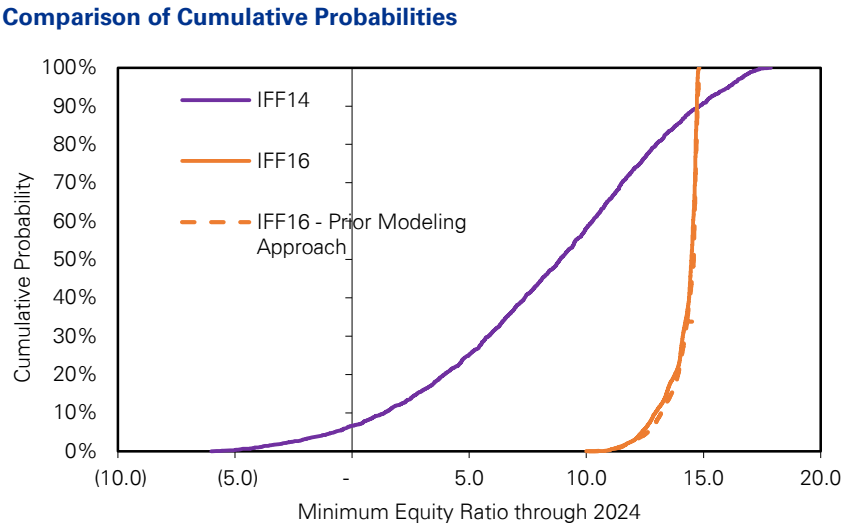
For IFF14, the combination of 27 scenarios thereby obtained was applied against 99 water flow sequences, for a total of 2673 runs.

In applying the above modelling approach to IFF16, Manitoba Hydro made a number of small changes to reflect issues of data availability:

- Capital expenditure uncertainty was modelled with annual expenditures adjusted up or down by $100 million, relative to the Reference Case, rather than by $50 million. A data set containing the higher level of cost variance ($100 million) was more readily available.
- Water flow uncertainty was modelling using 102 water flow sequences, reflecting the greater length of water flow data now available, rather than the 99 sequences used previously. This resulted in an output set of 2,754 runs rather than the 2,673 runs for the IFF14 stochastic analysis.

The probability distribution for this new set of runs has been added to the figure presented first in Figure 6-13 above. This is shown in Figure 6-14 below.

Figure 6-14: Minimum Equity Value Observed 2018 through 2024 – Alternative Scenarios



In Figure 6-14, the distribution of outcomes under IFF16 as estimated using the prior modelling approach (with adjustments as noted above) is shown with the dashed orange line. This line is virtually indistinguishable to the base analysis for IFF16 (the solid orange line), than to the outcomes shown for IFF14 (the solid purple line). This shows that the improvement in the distribution of forecast outcomes is related almost entirely related to improvement in underlying conditions, with very limited impact to results from changes in the approach for modelling uncertainty.

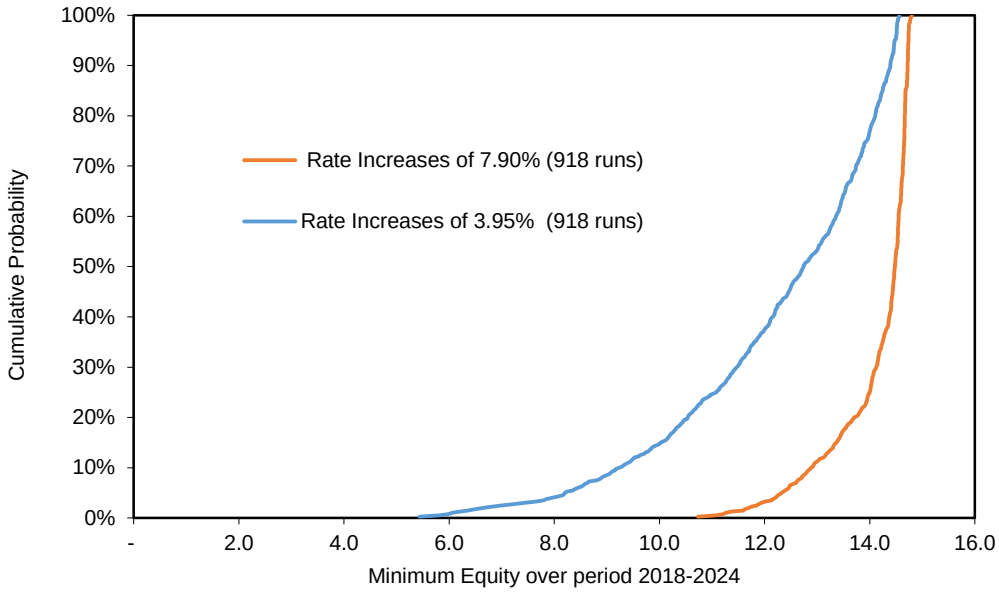
6.4.3 Impact of lower rate trajectory

As noted elsewhere in this report, IFF16 is based on the implementation of 7.90% rate increases for the first 5 years of the forecast, with increases thereafter to be in line with expected general price inflation (2.0%). Rate increases help to increase Manitoba Hydro's equity cushion. Manitoba Hydro, however, has also provided analyses of the impact of rate increases at a lower level, specifically at 3.95% over the entire projection period rather than at 7.90% in the initial years of the forecast. This lower rate trajectory follows that which had been assumed in IFF14 and IFF15.

To illustrate the impact of lower rate increases, we have prepared a cumulative probability chart that compares the two different rate trajectories in terms of the minimum equity values observed 2018 through 2024. Other assumptions are as for IFF16. Figure 6-15 shows that under the 3.95% trajectory, the risk that the equity ratio will fall below 10% is about 15%. In contrast, there is essentially no risk that the minimum equity ratio will fall below 10% under the 7.90% rate trajectory.

The probability distributions in this chart are based on an alternative scenario modelling approach than was used for earlier charts in this Chapter. For the runs summarized in Figure 6-15, Manitoba Hydro applied 102 water flow sequences against 3 energy price scenarios and 3 interest rate scenarios. This resulted in a total of 918 runs for each rate trajectory. Interest rate scenarios cover the consensus forecast, as well as plus/minus 1 percentage point. For the runs with a 7.90% rate trajectory, we confirmed that the distribution of outcomes is roughly similar to that for the same trajectory analyzed with the stochastic modelling approach with 15,300 runs as described earlier. Hence, the analysis with just 918 runs provides a reasonable assessment of the relative impacts of different rate trajectories on equity position.

Figure 6-15: Minimum Equity Value Observed 2018 through 2024 – Alternative Scenarios for IFF16

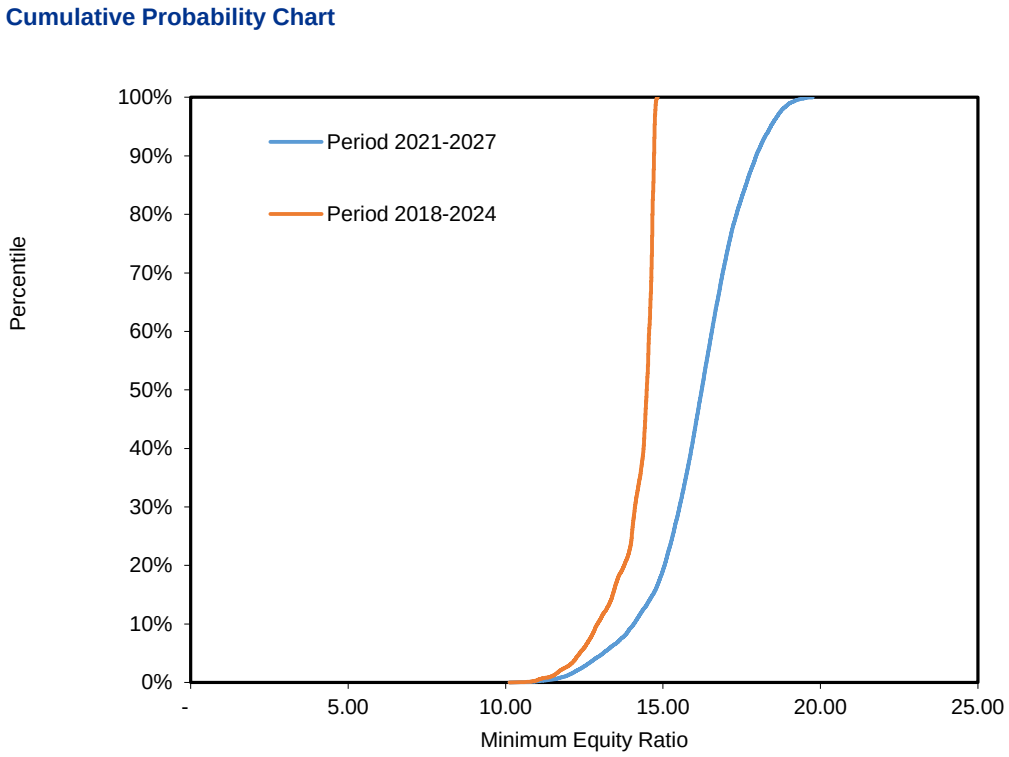


6.4.4 Comparison of different time periods under IFF16

Figure 6-16 examines the minimum equity ratio observed over various periods for the IFF16 scenario modelling. The orange line is the same as in Figures 6-14 and 6-15 above. For the period 2021-2027, relative to 2018-2024, the distribution of minimum equity values broadens, covering a wide range of values, as indicated by the spread in values at the top and bottom of the distribution. This is not

unexpected, given that the greater passage of time with a later summary period allows uncertainties to evolve and have greater impact on outcomes.

Figure 6-16: Minimum Equity Value Observed Under IFF16 Scenario Modelling – Alternative Time Periods



6.5 Changes in Equity

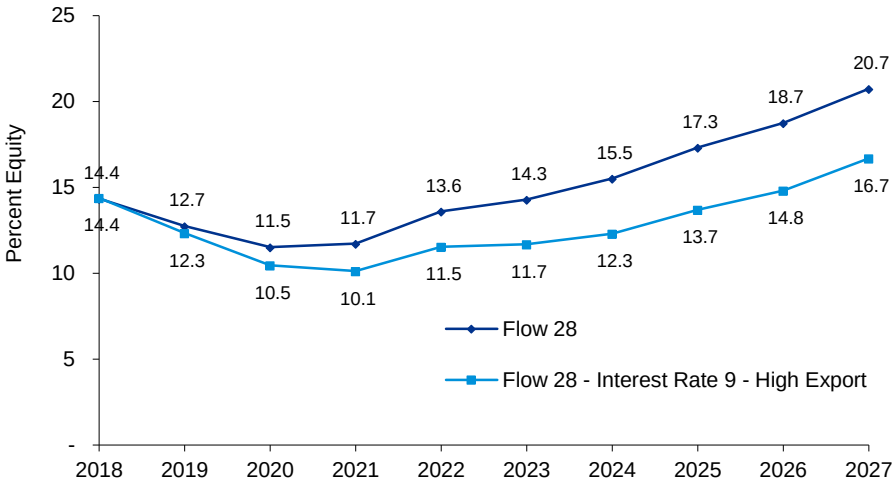
6.5.1 Analysis of selected scenarios

A particular concern for Manitoba Hydro is the potential for its equity position to deteriorate rapidly over a short time period as a result of adverse developments. Given the inherent variability in Manitoba Hydro's water flows, the potential for adverse developments is often closely associated with the potential for drought, particularly over a multi-year period. Other developments, however, such as increases in interest rates or a deterioration in export prices, can also contribute to a deterioration in financial position.

This potential for multiple factors to cause a deterioration in financial position is illustrated through Figure 6-17 below. Within this figure, we show two lines:

- Flow 28 shows the average results (in terms of equity ratio) for all runs associated with water flow sequence 28. This sequence was highlighted earlier in Figure 6–3 as contributing to the minimum average equity value observed in the years 2020 and 2021.
- The line labelled "F28 Ir9 High" shows an individual run from within the group of 150 runs associated with Flow 28. This line was highlighted because it shows a greater deterioration in equity ratios than the average. For the period 2018 through 2021, equity ratio declines by 4.3 percentage points even with the substantial rate increases proposed under IFF16; this drop is the largest decrease observed for this period amongst all 15,300 runs within the overall stochastic analysis. (The equity ratio falls from 14.4% to 10.1% over this period.)

Figure 6-17: Equity Ratio – Flow 28 Average and an Individual Run



Although the individual scenario "F28 Ir9 High" shows a notable fall, the following additional points should be noted:

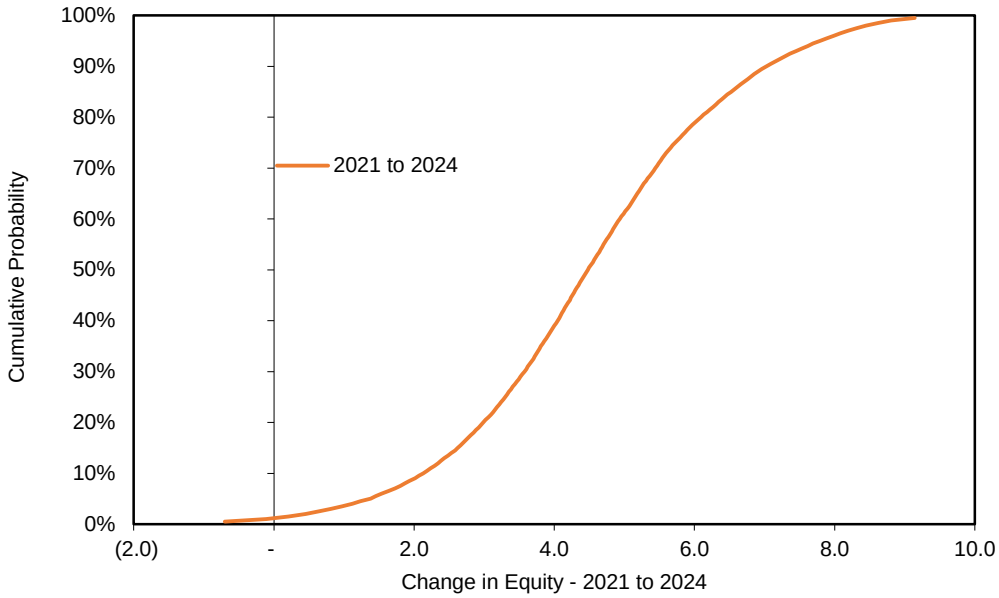
- Manitoba Hydro would likely seek to take corrective measures to ensure financial deterioration was minimized under any individual outcome.
- The scenario "F28 Ir9 High" can be assumed to be relatively improbable. It was selected because it had the worst equity drop in the period 2018 through 2021. Since it represents the maximum drop observed over 15,300 runs, it has a very small probability of occurring, assuming the various runs are equally probable and that input assumptions with respect to probability distributions are roughly accurate. (One individual run represents only 0.0065% of the total number of runs in the stochastic analysis; this number is calculated as 1 divided by 15,300).

Although any individual run may be relatively improbable, the example from Figure 6-13 highlights the fact that it may be useful to understand the probability distribution of changes in the equity ratio over multi-year periods. Events that put pressure on Manitoba Hydro's equity ratio over, say, a three to five year period, are a concern because of the difficulty that Manitoba Hydro has in bolstering its equity position through rate increases to compensate. It is difficult to raise rates quickly enough given lags in the regulatory process and general resistance to increases in rates that are above general price inflation. As a result and as noted in the May 2015 Report, the amount of additional equity that can, in practice, be made available through additional rate increases in the short term is small relative to the financial shocks that Manitoba Hydro can undergo. This was highlighted through the example provided in Section 7.9.1 of the May 2015 Report. Because we are interested in the probability of large reductions in Manitoba Hydro's equity position, we examine the probabilities of various reductions in the section below.

6.5.2 Analysis of overall results

To look at the overall distribution of equity ratio changes, we examined the change in equity ratio between 2021 and 2024 over the 15,300 runs included in the stochastic analysis. The cumulative probability distribution of the change in equity ratio is shown in Figure 6-18 below.

Figure 6-18: Change in Equity Value Observed 2021 to 2024



As noted above, the run with the largest decrease in equity ratio over this period had a fall in equity ratio of 2.81 percentage points. Over all runs, the "median" change in equity ratio was 4.48 percentage points, indicating that half of the runs showed an increase in equity of 4.48 percentage points or more. From a slightly different perspective, only 1.1% of runs had a decrease in equity. (This can be seen in Figure 6-18, where the line crosses the zero point on the "x" axis at a cumulative probability value of 1.1%.) Overall, the runs suggest that equity will likely increase over the period 2021 to 2024.

The line in Figure 6-18 was plotted using data for intervals of 0.5% probability, starting from a 0.5% cumulative probability level. As such the line does not capture or represent very small probability levels. Hence, the minimum value that appears on the graph is roughly (0.7) percentage points, rather than the true minimum value of (2.81) percentage points observed when examining the full data set. The approach of graphing values at 0.5% intervals was done for ease of graphical preparation and presentation.

Figure 6–19 takes the same approach as Figure 6–18, but looks at additional time periods. It adds data sets corresponding the change in equity value over the periods 2018 to 2021, and 2024 to 2027. Thus, it looks, in addition, at the 3-year periods before and after the 2021 to 2024 period used in Figure 6–18.

Figure 6-19: Change in Equity Value Observed – Alternative 3-Year Periods within IFF16

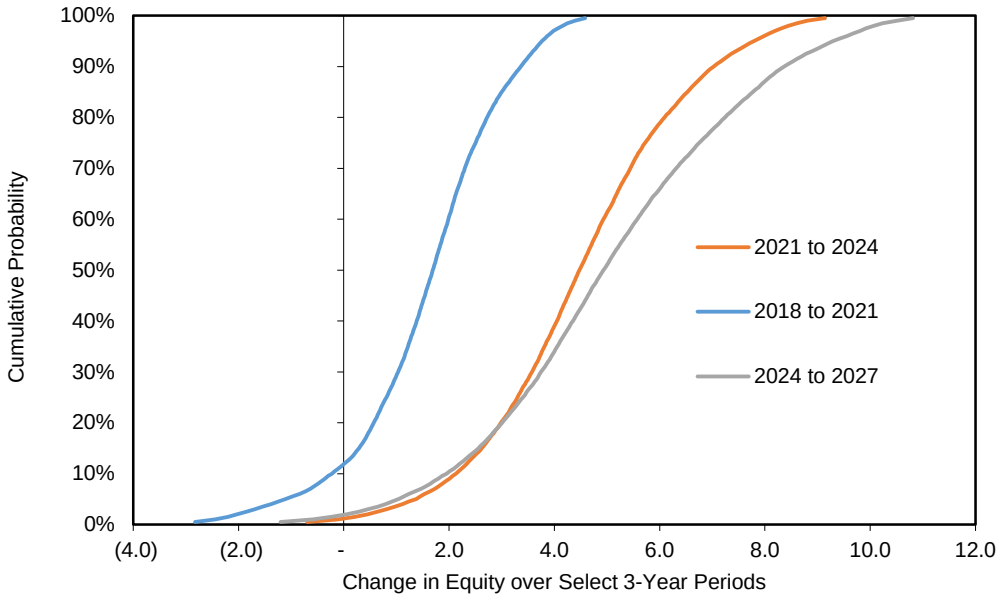
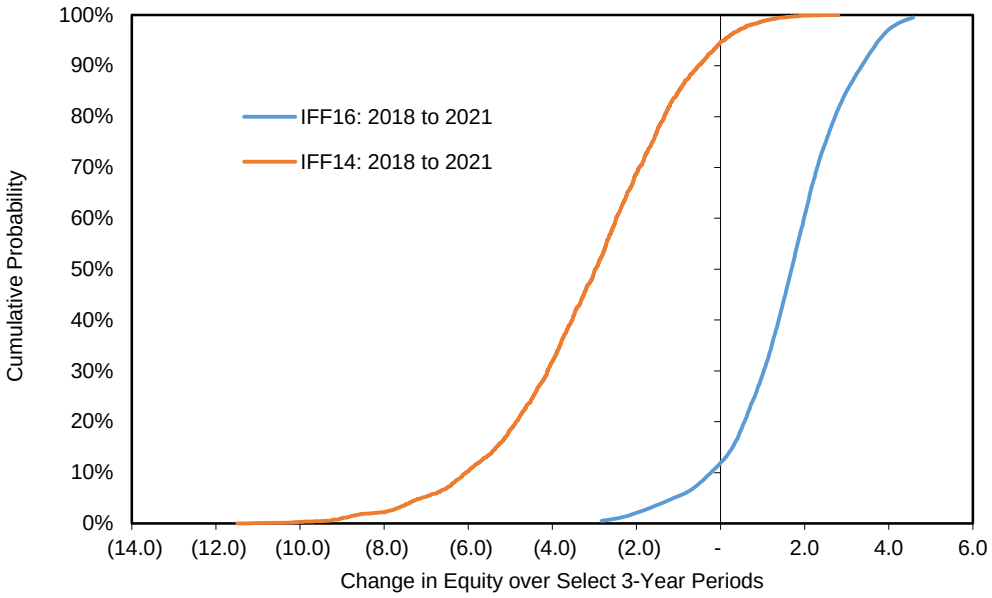


Figure 6-19 above shows that the probability of a decrease in equity ratio over a three-year lowers as you move farther out in time. About 12% of runs over the initial period from 2018 to 2021 showed a decrease in equity ratio. The share of runs with decreases in equity falls to less than 2% for the periods 2021 to 2024 and 2024 to 2027.

6.5.3 Comparison of IFF14 and IFF16

Figure 6-20 compares the probability distribution of changes in the equity ratio over the period 2018 through 2021 for IFF16 versus IFF14. It can be seen that the probability distribution shifts considerably to the right. Under IFF14, the median change in equity value (corresponding to the 50th percentile point on the orange curve) is about negative 3.0 percentage points. For IFF16, the same point is 1.66 percentage points (positive). The shape of the curves is roughly similar, although the distribution for IFF16 appears slightly steeper. This indicates that the spread in values for the change in equity is also smaller for IFF16 than for IFF14, suggesting relatively lower risk.

Figure 6-20: Change in Equity Value Observed – IFF16 versus IFF14



In summary:

- The shift in the distribution to the right indicates a much reduced risk of a fall in equity ratio over the period, consistent with the improved performance of IFF16 relative to IFF14 generally.
- The steeper curve for IFF16 implies that risks of deviating from expected values are also slightly smaller.

6.6 Summary Observations

Key conclusions to be drawn from the analysis in this chapter are the following:

- Forecast financial returns under IFF16 are better than those forecast under IFF14. This is mainly due to a financial plan that accelerates rate increases under IFF16 as compared to IFF14. As a result of this improvement in baseline financial condition, the risk of a fall in equity position to below zero, as observed in Manitoba Hydro's current scenario analysis, has been largely eliminated relative to the analysis for IFF14. This is consistent with a more robust financial condition.
- As expected, the dispersion observed in equity ratios under Manitoba Hydro's scenario analysis widens as you move farther into the future. (This can be seen from Figure 6-19.) The increase in dispersion simply reflects the fact that uncertainty is inherently greater as you move farther into the future.
- Water flow uncertainty remains the single largest risk factor with respect to results in the short term. This conclusion is based on examining the minimum average equity values observed when equity ratios under runs encompassing all interest rate and energy price scenarios are averaged for each water flow sequence, and the minimum value observed taken. (The results of this analysis are shown in Figure 6-3 and again in Figure 6-5.) Similar analysis for each interest rate scenario (averaging across water flows and energy price scenarios), and as summarized in Figure 6-2, shows higher minimum equity ratios throughout the forecast horizon. In addition, the analysis in Section 6.3.5 showed that water flow was the largest contributor to the range of outcomes, or difference between absolute high and low values observed.

7 Summary Observations

As noted in the background (section 1.3) to this supplementary update, KPMG reaffirms the recommendations in the May 2015 Report. These recommendations are that Manitoba Hydro should maintain the following:

- A long-term debt/equity target of 75/25 to 70/30, with a minimum of 85/15 during major capital programs.
- A minimum EBITDA interest coverage ratio target of 1.8 or greater.
- A minimum capital coverage ratio target of 1.2 or greater.

Manitoba Hydro relies on retained earnings as its sole source of equity. Thus, it requires sustained positive cash flow and net income to get back to its minimum equity target.

Further, as noted in the May 2015 Report, decreases in the equity ratio as a result of major capital expansions should be limited to 5 to 10 percentage points from the recommended target level of 25% to 30%. Implicit in these recommendations is that deviations from target should be for the minimum period of time possible.

Over the medium- to longer-term, we note that IFF16 provides for an improvement in Manitoba Hydro's financial outlook relative to that forecast in IFF14. However, this improvement is contingent on achievement of much higher rate increases under IFF16 than IFF14 in the near term (7.90% for five years versus 3.95% annually for 16 years in IFF14) and it takes into account current high reservoir levels, which help to increase forecast export earnings.

For 2017 and 2018, the projected equity ratio for Manitoba Hydro under IFF16 is actually below that originally forecast under IFF14. (See Chapter 2 of this update for a comparison of outlooks.) The EBITDA coverage ratio for 2017 is also lower for IFF16 versus IFF14. Relative investment risk, as measured by the ratio of projected investment to retained earnings, is also considerably higher now than forecast in IFF14. (See Figure 2-7.) Further, projected capital expenditures as a percent of the current asset base are significantly higher at Manitoba Hydro than at BC Hydro, Hydro Quebec and NB Power. (See Figure 4-22.)

Developments in other provinces illustrate the risks that can impede improvements in a utility's financial position, notwithstanding initial plans:

- At Nalcor, cost increases for the Lower Churchill Falls project have significantly increased the amount of equity capital that will be needed to support project completion.
- As outlined in its 2017-2018 Strategic Plan, NB Power is projecting a delay of three years in reaching its 20% equity target (to Fiscal 2024 from Fiscal 2021). This partly reflects decreases in load growth.
- As a result of reduced load growth, BC Hydro projects much larger growth in its rate smoothing deferral account (to $1.59 billion).

In comparing government-owned power utilities in Canada, we note that Manitoba Hydro remains at the low end of power utilities in terms of key financial metrics including equity ratio, interest coverage ratio, and cash flow comparison metrics. The gap in Manitoba Hydro's performance versus most other utilities has widened since the May 2015 Report.

Manitoba Hydro still has very competitive electricity rates compared to other Canadian and North American jurisdictions, giving the utility some flexibility in raising rates to respond to its current financial challenges.

Standard and Poor's downgraded the Province of Manitoba's debt rating in 2016 from "AA" to "AA-" and downgraded again in 2017 from "AA-" to "A+", citing fiscal deficits and significant debt loads at Manitoba Hydro. Most notably, Standard and Poor's indicated that it no longer considers Manitoba Hydro to be self-supporting. Moody's has also highlighted increasing debt loads at Manitoba Hydro as a concern and, although it continues to consider the utility to be self-supporting, it too has downgraded the Province of Manitoba's credit rating since the May 2015 Report.

DBRS, in November 2016, cited Manitoba Hydro's request for rate increases greater than 3.95%, "if actualized", as a positive factor for the utility's financial profile. While DBRS continues to view Manitoba Hydro as self-supporting, it noted that it could consider reclassifying a portion of Manitoba Hydro's debt to be tax-supported if the financial health of the utility deteriorates such that its expenses cannot be recovered in rates.

As noted in Chapter 5, the combined debt of the Province of Manitoba and Manitoba Hydro has significantly increased in the past two fiscal years, and Manitoba Hydro's share of Provincial borrowing, guarantees and obligations now exceeds 40%.

The scenario analysis in Chapter 6 suggests that Manitoba Hydro has an improved financial outlook under IFF16 than under IFF14. However, this improvement is largely contingent on higher rate increases. As shown in Figure 6-15, the distribution of minimum equity values observed over the period 2018 through 2024 is both wider and much lower if rate increases of only 3.95% are implemented. Even with 7.90% rate increases, uncertainty modelling shows that the median value for equity ratio begins to recover only after 2020.

All of these factors suggest that a continued focus on improving Manitoba Hydro's financial position is paramount to prudent risk management. Manitoba Hydro is in an environment of continued uncertainty and inherent business risk. In the near term, Manitoba Hydro remains particularly vulnerable to interest rates and drought as its debt leverage increases substantially to complete the Keeyask and Bipole III projects. In the longer term, water flow uncertainty will remain the paramount factor in evaluating appropriate financial targets. This and other fundamental business risks have not changed for Manitoba Hydro since the May 2015 Report, reinforcing the need to maintain its financial targets.

Appendices

Appendix A: Financial Information of Government-owned Power Utilities

(source: from audited financial statements)

Manitoba Hydro Financial Information, 2011 to 2017 ($ millions)							
For the year ended March 31	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**
REVENUES							
Electric - Manitoba	1,419	1,399	1,424	1,405	1,341	1,219	1,218
Electric - extraprovincial	460	415	384	422	353	363	398
Other	106	91	81	70	69	-	-
Gas - commodity	342	353	274	252	182	197	261
Gas - distribution	-	-	153	163	147	132	143
Total Revenues	**2,327**	**2,258**	**2,316**	**2,312**	**2,092**	**1,911**	**2,020**
EXPENSES							
Cost of gas sold	183	181	266	252	182	197	261
Operating and administrative	608	614	614	558	533	481	463
Water rentals and assessments	131	126	125	125	118	119	120
Fuel and power purchased	132	117	129	160	133	146	106
Capital and other taxes	135	123	115	117	105	103	102
Finance expense	645	620	551	470	489	423	425
Depreciation and amortization	402	394	378	442	423	381	393
Other expenses	104	114	77	36	30	-	-
Finance income	(17)	(23)	(26)				
Total Expenses	**2,323**	**2,266**	**2,229**	**2,160**	**2,013**	**1,850**	**1,870**
Net income before net movement in regulatory changes	4	(8)	87	152	79	61	150
Net movement in regulatory balances	55	47	38				
NET INCOME	**59**	**39**	**125**	**152**	**79**	**61**	**150**
Net income attributable to Manitoba Hydro	71	49	136	174	92	61	150
Net loss attributable to non-controlling interest	12	10	11	22	13	-	-
Interest on debt	711	654	581	654	636	603	573
Interest capitalized	(248)	(177)	(145)	(142)	(141)	(170)	(138)
Other finance expenses / adjustments	182	143	115	(41)	(6)	(10)	(10)
Finance Expense	**645**	**620**	**551**	**471**	**489**	**423**	**425**
ASSETS							
Net plant in service	12,671	12,371	11,944	10,684	10,541	8,647	8,215
Construction in progress	7,086	4,837	3,278	2,943	1,967	3,150	2,739
Cash and cash equivalents	646	955	494	142	32	50	70
Other current assets	616	529	573	601	518	438	492
Goodwill and intangible assets	400	301	290	281	276	268	260
Regulated assets / deferral balance	566	486	410	360	306	310	309
Sinking fund investments	-	-	114	111	352	372	282
Other non-current assets	353	300	464	517	550	556	515
Total Assets	**22,338**	**19,779**	**17,567**	**15,639**	**14,542**	**13,791**	**12,882**
LIABILITIES AND EQUITY							
Long-term debt net of sinking fund investments	16,102	14,201	12,303	10,349	8,977	8,729	8,335
Current portion of long-term debt	336	326	377	408	656	281	30
Other current liabilities	1,284	906	719	661	500	465	431
Sinking fund investments shown as assets				111	352	372	282
Contributions in aid of construction	455	434	408	381	340	318	295
BiPole III contribution	196	100	49				
Employee future benefits	818	859	804				
Provisions	70	53	17				
Other liabilities	640	656	688	844	781	749	666
Total Liabilities	**19,901**	**17,535**	**15,365**	**12,754**	**11,606**	**10,914**	**10,039**
Retained earnings	2,899	2,828	2,779	2,716	2,542	2,450	2,389
Accumulated other comprehensive income	(709)	(776)	(720)	96	299	327	367
Non-controlling interest	170	140	120	73	95	100	87
Equity	**2,360**	**2,192**	**2,179**	**2,885**	**2,936**	**2,877**	**2,843**
Total liabilities and equity before regulatory deferral balance	22,261	19,727	17,544	15,639	14,542	13,791	12,882
Regulatory deferral balance	77	52	23				
Total Liabilities & Equity	**22,338**	**19,779**	**17,567**	**15,639**	**14,542**	**13,791**	**12,882**
Equity with CIAOC	**3,011**	**2,726**	**2,636**	**3,266**	**3,276**	**3,195**	**3,138**
Net Debt	**15,792**	**13,572**	**12,072**	**10,615**	**9,601**	**8,960**	**8,295**
Cash provided by operating activities	**872**	**784**	**665**	**690**	**589**	**567**	**595**
Cash provided by financing activities	**1,855**	**2,111**	**1,560**	**1,125**	**635**	**725**	**674**
Cash used for investing activities	**(3,036)**	**(2,434)**	**(1,873)**	**(1,706)**	**(1,242)**	**(1,312)**	**(1,373)**
Capex	**2,924**	**2,322**	**1,802**	**1,457**	**1,037**	**1,124**	**1,166**

BC Hydro Financial Information, 2011 to 2017 ($ millions)							
For the year ended March 31	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**
REVENUES							
Domestic	5,199	5,056	4,829	4,319	4,038	3,748	3,438
Trade	675	601	919	1,073	860	982	578
Total Revenues	**5,874**	**5,657**	**5,748**	**5,392**	**4,898**	**4,730**	**4,016**
EXPENSES							
Cost of energy	1,576	1,345	1,707	1,607	1,291	1,382	924
Water rentals	349	366	358	361	352	346	305
Transmission charges	169	141	138	178	163	148	186
Personnel expenses	541	527	534	538	527	521	541
Materials and external services	608	605	593	579	606	586	585
Grants and taxes	1,232	220	209	203	196	184	184
Finance charges	605	752	632	598	540	499	435
Depreciation and amortization	234	1,241	1,205	995	953	793	533
Other	55	8	15	28	20	(6)	4
Capitalized costs	(179)	(203)	(224)	(244)	(259)	(281)	(270)
Total Expenses	**5,190**	**5,002**	**5,167**	**4,843**	**4,389**	**4,172**	**3,427**
NET INCOME	**684**	**655**	**581**	**549**	**509**	**558**	**589**
Interest on long-term debt	767	771	685	731	647	612	549
Interest capitalized	(93)	(61)	(69)	(106)	(73)	(49)	(52)
Other finance expenses / adjustments	(69)	42	16	(27)	(34)	(64)	(62)
Finance Charges	**605**	**752**	**632**	**598**	**540**	**499**	**435**
ASSETS							
Cash and cash equivalents	49	44	39	107	60	12	27
Accounts receivable and accrued revenue	808	655	627	1,073	721	595	569
Inventories	185	155	122	114	173	142	128
Property, plant and equipment	22,998	21,385	19,933	18,525	17,226	15,991	15,211
Intangible assets	601	609	547	501	438	412	335
Regulatory assets	6,127	6,324	5,714	4,928	4,741	4,314	2,436
Sinking funds	-	-	-	129	112	105	97
Other assets	1,120	862	771	334	311	329	676
Total Assets	**31,888**	**30,034**	**27,753**	**25,711**	**23,782**	**21,900**	**19,479**
LIABILITIES AND EQUITY							
Accounts payable and accrued liabilities	1,190	1,725	1,708	1,886	1,544	1,423	1,515
Current portion of long-term debt	2,878	2,376	3,698	4,087	3,288	2,888	2,793
Long-term debt	17,146	15,837	13,178	11,610	10,846	10,062	8,851
Contributions in aid of construction	1,765	1,669	1,583	1,291	1,196	1,106	1,012
Other liabilities	4,000	3,927	3,416	2,972	3,408	3,202	2,428
Total Liabilities	**26,979**	**25,534**	**23,583**	**21,846**	**20,282**	**18,681**	**16,599**
Contributed surplus	60	60	60	60	60	60	60
Retained earnings	4,822	4,397	4,068	3,751	3,369	3,075	2,747
Accumulated other comprehensive income	27	43	42	54	71	84	73
Total Equity	**4,909**	**4,500**	**4,170**	**3,865**	**3,500**	**3,219**	**2,880**
Total Liabilities & Equity	**31,888**	**30,034**	**27,753**	**25,711**	**23,782**	**21,900**	**19,479**
Equity with CIAOC	**6,674**	**6,169**	**5,753**	**5,156**	**4,696**	**4,325**	**3,892**
Net Debt	**19,975**	**18,169**	**16,837**	**15,461**	**13,962**	**12,833**	**11,520**
Cash provided by operating activities	**1,327**	**1,060**	**1,018**	**788**	**888**	**816**	**668**
Cash provided by financing activities	**1,191**	**1,047**	**842**	**1,175**	**970**	**779**	**757**
Cash used for investing activities	**(2,513)**	**(2,102)**	**(1,928)**	**(1,916)**	**(1,810)**	**(1,610)**	**(1,407)**
Capex	**2,513**	**2,102**	**1,928**	**1,916**	**1,810**	**1,610**	**1,483**

Hydro-Quebec Financial Information, 2010 to 2016 ($ millions)							
For the year ended December 31	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**
REVENUES							
Electricity sales	13,339	13,754	13,652	12,878	12,136	12,245	12,019
Other							465
Total Revenues	**13,339**	**13,754**	**13,652**	**12,878**	**12,136**	**12,245**	**12,484**
EXPENSES							
Operations	2,438	2,527	2,366	2,460	2,364	2,410	2,579
Electricity and fuel purchases	1,866	1,938	1,968	1,568	1,183	1,154	1,390
Depreciation and amortization	2,597	2,713	2,593	2,483	2,415	2,603	2,565
Taxes	1,045	980	975	1,000	997	864	909
Finance expenses	2,532	2,449	2,425	2,429	2,441	2,528	2,526
Total Expenses	**10,478**	**10,607**	**10,327**	**9,940**	**9,400**	**9,559**	**9,969**
Result from discontinued operations				4	(1,876)	(75)	
NET INCOME	**2,861**	**3,147**	**3,325**	**2,942**	**860**	**2,611**	**2,515**
Interest on debt securities	2,510	2,552	2,594	2,584	2,576	2,662	2,495
Interest capitalized	(194)	(211)	(318)	(294)	(306)	(300)	(276)
Other finance expenses	216	108	149	139	171	166	307
Finance Expenses	**2,532**	**2,449**	**2,425**	**2,429**	**2,441**	**2,528**	**2,526**
ASSETS							
Cash and cash equivalents	1,243	2,648	1,271	1,695	2,183	1,377	80
Short-term investments (includes sinking fund)	2,184	1,895	1,664	1,689	609	1,102	1,230
Accounts receivable and other receivables	2,049	2,242	2,171	2,177	1,911	1,744	1,814
Derivative instruments	384	402	263	883	1,052	1,322	889
Regulatory assets	4,360	4,061	4,741	9	26	39	30
Materials, fuel and supplies	219	212	199	194	178	236	314
Property, plant and equipment	62,691	61,558	60,413	59,077	57,174	56,901	55,537
Intangible assets	938	1,014	1,062	2,323	2,241	2,187	2,083
Other assets	1,099	1,167	1,324	5,063	5,134	4,729	3,832
Total Assets	**75,167**	**75,199**	**73,108**	**73,110**	**70,508**	**69,637**	**65,809**
LIABILITIES AND EQUITY							
Borrowings	7	9	23	23	19	52	18
Accounts payable and accrued liabilities	2,199	2,278	2,257	2,229	2,069	2,099	1,987
Dividend payable	2,146	2,360	2,535	2,207	645	1,958	1,886
Accrued interest	894	913	907	890	835	862	909
Current portion of long-term debt	1,398	2,059	906	1,157	694	1,025	1,933
Long-term debt	44,218	43,613	43,579	43,067	42,555	40,744	36,439
Other liabilities	4,308	4,181	4,673	3,890	4,434	3,782	3,783
Perpetual debt	293	311	267	253	275	281	288
Total Liabilities	**55,463**	**55,724**	**55,147**	**53,716**	**51,526**	**50,803**	**47,243**
Share capital	4,374	4,374	4,374	4,374	4,374	4,374	4,374
Retained earnings	17,261	16,546	15,759	15,568	14,833	14,618	13,965
Accumulated other comprehensive income	(1,931)	(1,445)	(2,172)	(548)	(225)	(158)	227
Total Equity	**19,704**	**19,475**	**17,961**	**19,394**	**18,982**	**18,834**	**18,566**
Total Liabilities & Equity	**75,167**	**75,199**	**73,108**	**73,110**	**70,508**	**69,637**	**65,809**
Equity	**19,704**	**19,475**	**17,961**	**19,394**	**18,982**	**18,834**	**18,566**
Net Debt	**44,673**	**43,344**	**43,504**	**42,805**	**41,360**	**40,725**	**38,598**
Cash provided by operating activities	**5,504**	**6,235**	**5,873**	**5,017**	**4,768**	**5,161**	**4,639**
Cash provided by financing activities	**(3,200)**	**(1,276)**	**(2,286)**	**(127)**	**(639)**	**(185)**	**(1,725)**
Cash used for investing activities	**(3,693)**	**(3,644)**	**(3,755)**	**(5,386)**	**(3,321)**	**(3,683)**	**(3,302)**
Capex	**3,363**	**3,340**	**3,675**	**4,055**	**3,673**	**3,508**	**3,916**

Nalcor Energy Financial Information, 2010 to 2016 ($ millions)							
For the year ended December 31	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**
REVENUES							
Energy sales	779	761	756	785	726	700	589
Other revenue	45	50	42			14	31
Total Revenues	**824**	**811**	**798**	**785**	**726**	**714**	**620**
EXPENSES							
Fuels	168	193	268	191	182	155	140
Power purchased	61	61	68	63	61	53	44
Operating costs	207	244	249	212	207	200	182
Net finance expense	72	74	67	74	74	71	105
Depreciation, amortization and depletion	135	159	93	90	79	85	68
Other	46	38	4	11		(3)	3
Total Expenses	**689**	**768**	**749**	**640**	**603**	**561**	**543**
Regulatory adjustments	1	(58)	66	(57)	(30)	(24)	
NET INCOME	**136**	**(16)**	**116**	**88**	**93**	**129**	**77**
Interest on long-term debt	273	275	276	100	91	91	92
Interest capitalized during construction	(198)	(162)	(133)	(15)	(3)	(2)	(1)
Other finance income / expenses	(3)	(39)	(76)	(11)	(14)	(18)	15
Net Finance Expense	**72**	**74**	**67**	**74**	**74**	**71**	**105**
ASSETS							
Cash and cash equivalents	143	149	61	94	12	19	45
Accounts receivable	294	271	249	150	125	164	94
Inventory	93	78	97	75	62	64	63
Property, plant and equipment	11,417	8,325	5,659	3,743	2,435	2,110	1,969
Petroleum and natural gas properties	-	-	-		376	304	269
Regulatory deferrals	164	144	124	64	65	66	70
Other assets	1,951	3,356	4,453	5,398	372	316	296
Total Assets	**14,061**	**12,322**	**10,643**	**9,524**	**3,447**	**3,042**	**2,805**
LIABILITIES AND EQUITY							
Short-term borrowings	435	97	53	41	125	-	-
Accounts payable and accrued liabilities	1,162	997	672	412	198	156	152
Current portion of long-term debt	143	233	8	82	8	8	8
Current portion of regulatory liabilities	-	-	-	-	169	138	119
Limited partnership units	399	207	79	73	-	-	-
Long-term debt	5,873	6,008	6,241	6,048	1,126	1,132	1,137
Other liabilities	1,438	973	616	342	256	179	124
Total Liabilities	**9,449**	**8,516**	**7,669**	**6,997**	**1,882**	**1,612**	**1,539**
Share capital	123	123	123	123	123	123	123
Contributed capital	2,861	2,204	1,469	1,142	436	391	374
Accumulated other comprehensive income	-	-	-	-	44	46	27
Retained earnings	1,280	1,149	1,130	1,004	963	870	742
Total Equity	**4,263**	**3,475**	**2,722**	**2,268**	**1,565**	**1,430**	**1,265**
Regulatory deferrals	348	330	252	259			
Total Liabilities & Equity & Regulatory Deferrals	**14,060**	**12,322**	**10,643**	**9,524**	**3,447**	**3,042**	**2,805**
Contributions in aid of construction	11	11	15	11	44	26	121
Sinking funds	267	243	228	303	263	247	208
Equity with CIAOC	**4,274**	**3,486**	**2,737**	**2,279**	**1,609**	**1,455**	**1,387**
Net Debt	**6,440**	**6,155**	**6,092**	**5,847**	**984**	**874**	**892**
Cash provided by operating activities	**222**	**227**	**146**	**441**	**300**	**167**	**211**
Cash provided by financing activities	**1,397**	**186**	**(195)**	**5,159**	**204**	**63**	**11**
Cash used for investing activities	**(1,625)**	**(327)**	**16**	**(5,487)**	**(510)**	**(256)**	**(192)**
Capex	**2,741**	**2,421**	**1,774**	**985**	**449**	**254**	**196**

NB Power Financial Information, 2011 to 2017 ($ millions)							
For the year ended March 31	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**
REVENUES							
Sales of power							
In province	1,369	1,336	1,374	1,328	1,269	1,266	1,246
Out of province	251	370	346	391	254	225	250
Transmission revenue						90	91
Other	76	85	71	78	82	65	29
Total Revenues	**1,696**	**1,791**	**1,791**	**1,797**	**1,605**	**1,646**	**1,616**
EXPENSES							
Fuel and purchased power	702	830	825	834	807	742	874
Operations, maintenance and administration	483	450	419	437	449	409	416
Depreciation and Amortization	233	226	230	198	184	217	199
Property and other taxes	43	41	37	36	39	40	40
Finance costs	280	285	327	136	143	95	114
Other	(84)	(66)	(164)	101	(82)	(30)	(94)
Total Expenses	**1,657**	**1,766**	**1,674**	**1,742**	**1,540**	**1,473**	**1,549**
Net earnings before changes in regulatory balances	39	25	117	55	65	173	67
Net changes in regulatory balances	(12)	(13)	(17)				
NET INCOME	**27**	**12**	**100**	**55**	**65**	**173**	**67**
Interest expense	207	212	221	222	249	201	202
Interest capitalized	(4)	(5)	(6)	(53)	(99)	(113)	(97)
Other finance expenses / adjustments	77	78	112	(33)	(7)	7	9
Finance Charges	**280**	**285**	**327**	**136**	**143**	**95**	**114**
ASSETS							
Cash	1	2	3	3	1	4	10
Accounts receivable and prepaid expenses	255	235	269	313	265	278	275
Materials, supplies and fuel	168	204	148	211	206	221	252
Property, plant and equipment	4,280	4,237	4,382	4,072	4,072	3,909	3,773
Nuclear decommissioning & used nuclear fuel management funds	690	673	720	611	612	584	497
Long-term receivable	-	16	16	17	18	-	-
Derivative assets	4	1	6	157	25	-	18
Regulatory balances	1,009	1,021	1,034	1,052	1,072	943	728
Sinking funds receivable	503	464	471	404	376		
Other assets	58	63	113	23	42	67	79
Total Assets	**6,968**	**6,916**	**7,162**	**6,863**	**6,689**	**6,006**	**5,632**
LIABILITIES AND EQUITY							
Short-term indebtedness	977	855	784	858	687	583	483
Accounts payable and accruals	257	255	262	236	227	227	199
Accrued interest	40	41	47	46	50	37	38
Current portion of long-term debt	420	400	580	-	322	481	550
Current portion of derivative liabilities	14	95	73	13	60	77	27
Long-term debt	4,007	4,124	4,025	4,567	4,370	3,469	3,417
Other liabilities	933	939	1,055	744	696	678	612
Total Liabilities	**6,648**	**6,709**	**6,826**	**6,464**	**6,412**	**5,552**	**5,326**
Capital stock		-	-	-	-	140	140
Contributed surplus		-	-	-	-	187	187
Accumulated other comprehensive income	(127)	(213)	(72)	147	95	3	12
Retained earnings	447	420	408	252	182	124	(33)
Total Equity	**320**	**207**	**336**	**399**	**277**	**454**	**306**
Total Liabilities & Equity	**6,968**	**6,916**	**7,162**	**6,863**	**6,689**	**6,006**	**5,632**
Equity	**320**	**207**	**336**	**399**	**277**	**454**	**306**
Net Debt	**4,900**	**4,913**	**4,915**	**5,018**	**5,002**	**4,529**	**4,440**
Cash provided by operating activities	**253**	**183**	**365**	**223**	**104**	**191**	**1**
Cash provided by financing activities	**7**	**20**	**(83)**	**(42)**	**185**	**67**	**188**
Cash used for investing activities	**(261)**	**(204)**	**(282)**	**(179)**	**(294)**	**(264)**	**(183)**
Capex	**278**	**231**	**264**	**182**	**296**	**279**	**238**

Ontario Power Generation Financial Information, 2010 to 2016 ($ millions)							
For the year ended December 31	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**
REVENUES							
Revenues	5,653	5,476	4,963	4,863	4,732	4,964	5,367
Revenue limit rebate							
Total Revenues	**5,653**	**5,476**	**4,963**	**4,863**	**4,732**	**4,964**	**5,367**
Fuel expense	727	687	641	708	755	754	900
	4,926	**4,789**	**4,322**	**4,155**	**3,977**	**4,210**	**4,467**
EXPENSES							
Operations, maintenance and administration	2,747	2,783	2,615	2,747	2,648	2,781	2,913
Depreciation and amortization	1,257	1,100	754	963	664	694	688
Property taxes	46	45	32	53	47	50	77
Net interest expense	120	180	80	86	117	154	176
Income tax expense (recovery)	168	92	139	31	67	(27)	(60)
Other	135	172	134	140	67	220	24
Total Expenses	**4,473**	**4,372**	**3,754**	**4,020**	**3,610**	**3,872**	**3,818**
Extraordinary item			243				
NET INCOME	**453**	**417**	**811**	**135**	**367**	**338**	**649**
Interest on debt	298	293	300	289	267	258	260
Interest capitalized	(141)	(102)	(135)	(127)	(126)	(86)	(76)
Other finance expenses / adjustments	(37)	(11)	(85)	(76)	(24)	(18)	(8)
Net Interest Expense	**120**	**180**	**80**	**86**	**117**	**154**	**176**
ASSETS							
Cash and cash equivalents	186	464	610	562	413	630	280
Accounts receivables and prepaid expenses	915	843	618	550	567	526	312
Fuel inventory	310	344	334	390	505	655	734
Materials and supplies	445	433	432	425	445	462	485
Property, plant and equipment	19,998	20,595	17,593	16,738	15,860	14,633	13,555
Intangible assets	99	98	76	59	52	50	48
Nuclear fixed asset removal & nuclear waste management funds	15,984	15,121	14,354	13,471	12,690	11,878	11,246
Regulatory assets	5,855	5,868	7,191	5,400	6,478	5,017	1,559
Other assets	580	497	437	496	591	592	1,358
Total Assets	**44,372**	**44,263**	**41,645**	**38,091**	**37,601**	**34,443**	**29,577**
LIABILITIES AND EQUITY							
Accounts payable and accrued charges	1,164	1,199	1,151	1,026	891	825	762
Short-term debt	2	225	-	32	-	60	155
Long-term debt due within one year	1,103	273	503	5	5	403	385
Long-term debt	4,417	5,186	5,227	5,620	5,109	4,341	3,843
Fixed asset removal & nuclear waste management liabilities	19,484	20,169	17,028	16,257	15,522	14,392	12,704
Other liabilities	7,694	7,163	8,269	6,817	8,170	6,796	3,643
Total Liabilities	**33,864**	**34,215**	**32,178**	**29,757**	**29,697**	**26,817**	**21,492**
Common shares	5,126	5,126	5,126	5,126	5,126	5,126	5,126
Retained earnings	5,534	5,098	4,696	3,892	3,757	3,390	3,024
Accumulated other comprehensive income (loss)	(295)	(319)	(496)	(684)	(979)	(890)	(69)
Non-controlling interest	143	140	141				4
Total Equity	**10,508**	**10,045**	**9,467**	**8,334**	**7,904**	**7,626**	**8,085**
Total Liabilities & Equity	**44,372**	**44,260**	**41,645**	**38,091**	**37,601**	**34,443**	**29,577**
Equity	**10,508**	**10,045**	**9,467**	**8,334**	**7,904**	**7,626**	**8,085**
Net Debt	**5,336**	**5,220**	**5,120**	**5,095**	**4,701**	**4,174**	**4,103**
Cash provided by operating activities	**1,705**	**1,465**	**1,433**	**1,174**	**876**	**1,179**	**817**
Cash provided by financing activities	**(176)**	**(58)**	**160**	**543**	**310**	**320**	**337**
Cash used for investing activities	**(1,807)**	**(1,553)**	**(1,545)**	**(1,568)**	**(1,403)**	**(1,138)**	**(945)**
Capex	**1,704**	**1,376**	**1,545**	**1,568**	**1,427**	**1,145**	**978**