A report on the OEB's cost of capital parameters and the impacts of COVID-19

prepared for the Ontario Energy Board ("OEB") by London Economics International LLC ("LEI")

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Determining the impact of COVID-19 on the cost of capital requires consideration of three factors. First, how have the parameters which make up cost of capital calculations in Ontario been impacted by COVID-19? Second, how were utilities themselves directly impacted? And third, how did the utility industry fare financially relative to other industries and the economy as a whole? Analysis suggests that the cost of debt has fallen while the cost of equity in the market has risen, but that overall, Ontario utilities are being fairly compensated for risk based on current calculations. Furthermore, while LEI observes that a comprehensive review of the parameters from the 2009 decision may be warranted, it is not appropriate to perform this review in the midst of an extremely uncertain outlook for the Ontario economy.[1]

1 Brief review of how cost of capital is set in Ontario

The OEB's current cost of capital policy stems from a 2009 review process, EB-2009-0084, through which a modified capital asset pricing model ("CAPM") methodology and an equity risk premium ("ERP") approach was adopted. Under the cost of capital policy, the OEB uses a formulaic approach to derive values for the return on equity ("ROE"), the deemed long-term debt rate ("DLTDR"), and the deemed short-term debt rate ("DSTDR") on an annual basis.[2] This approach was the result of the OEB's consultative process that began in February 2009 and whose findings shaped the approach adopted by the OEB. Specifically, the following refinements to the previous 1997-2009 formulae were adopted:

(i) for the ROE formula, adding an **initial equity risk premium of 550 basis points** to the **long Canada bond forecast** thereby reducing its sensitivity to changes in government bond yields. This resulted in an initial ROE of 9.75%;

(ii) for the DLTDR formula, adding the spread between an **A-rated utility bond yield index** and the 30-year Government of Canada bond yield; and

(iii) for the DSTDR formula, using real market quotes to determine the spread over the **bankers' acceptance ("BA")** rate.[3]

[1] Updating the cost of capital parameters in the midst of a pandemic and ongoing economic uncertainty may lead to inconsistent results when the calculations are deployed post-pandemic.

[2] OEB. *EB-2009-0084: Report of the Board on the Cost of Capital for Ontario's Regulated Utilities.* December 11, 2009.

[3] Ibid.

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The parameters are updated three months prior to the effective year, usually September, and the results are reviewed and approved by the OEB.[4] The OEB has conducted one review of the formula parameters since 2009, which commenced in 2014 and concluded with a staff report released in January 2016. The report assessed the annual cost of capital parameter updates completed from 2010 to 2015, concluding that the 2009 cost of capital methodology *"worked as intended"* and did not recommend any changes to the approach.[5]

The OEB's most recent determination of the cost of capital parameters for 2021 rates is shown in Figure 1 below, along with the cost of capital parameters for 2020 rates, which highlights the impact of the low interest rate environment on the parameters. Specifically, compared with the OEB's approved cost of capital parameters for rates effective in 2020, the parameters for rates effective in 2021 saw declines of 18 basis points for the ROE, 36 basis points for the DLTDR, and 100 basis points for the DSTDR.

Figure 1. Comparison of cost of capital parameters for 2020 versus 2021

Cost of capital parameter	Value based on September 2019 data (for 2020 rates)	Value based on September 2020 data (for 2021 rates)	Difference
Return on equity	8.52%	**8.34%**	-0.18%
Deemed long-term debt rate	3.21%	**2.85%**	-0.36%
Deemed short-term debt rate	2.75%	**1.75%**	-1.00%

Source: OEB. *2021 Cost of Capital Parameters*. November 9, 2020.

In general, since the OEB's last annual update to the cost of capital parameters, macroeconomic conditions have declined precipitously driven by the COVID-19 pandemic and the resulting economic recession that the International Monetary Fund ("IMF") has termed the Great Lockdown.[6]

[4] The cost of capital formula is discussed in Appendix B. More detailed information can be found in the OEB Staff's Report entitled *Review of the Cost of Capital for Ontario's Regulated Utilities* (January 14, 2016) and the Report of the Board *on the Cost of Capital for Ontario's Regulated Utilities* (December 11, 2009).

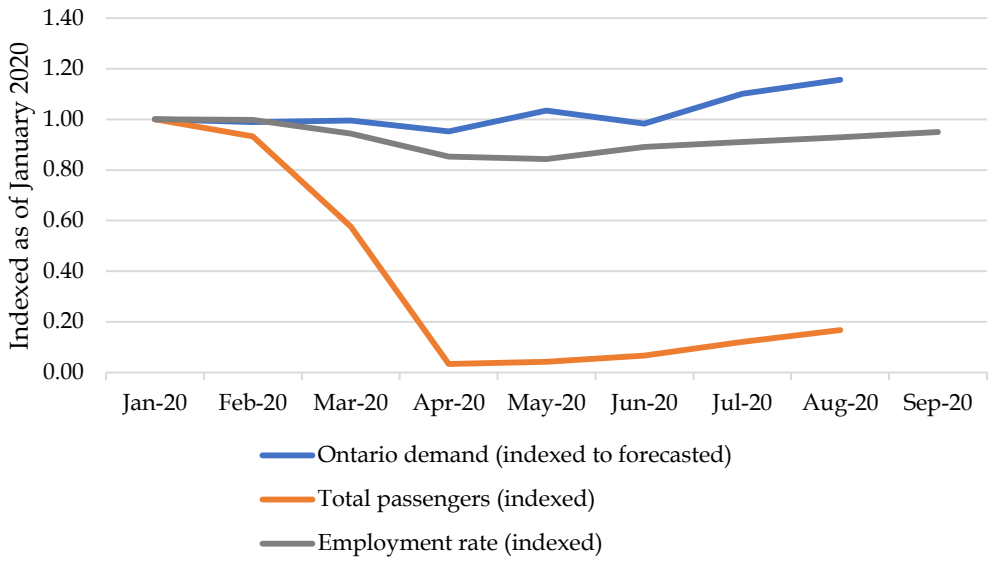
[5] OEB. *Staff Report EB-2009-0084: Review of the Cost of Capital for Ontario's Regulated Utilities.* January 14, 2016. p. 4.

[6] International Monetary Fund. *World Economic Outlook, April 2020: Chapter 1: The Great Lockdown.* April 2020.

2 Impact of COVID-19 on cost of capital parameters

COVID-19 responses to date have tended to depress the cost of debt and increase the cost of equity in the capital markets. However, while the global COVID-19 pandemic and the resulting economic crisis have had a profound impact on all sectors of the economy, utilities have been somewhat insulated. Figure 2 below illustrates the dramatic decline in various metrics in Ontario indexed relative to January 2020. Specifically, we look at parameters in the energy sector (electric load) and the aviation sector (passengers), as well as at the employment rate. Compared to measures of economy-wide activity, or to those of specific sectors such as aviation or hospitality, electricity load has been less impacted.

Figure 2. Assessing economic impact of COVID-19 in Ontario



Notes: Ratio of Ontario actual 2020 demand to forecasted demand in December 2019, indexed to January start date. Total passengers at Pearson Airport comprises Domestic, International and Transborder traffic. The employment rate is the number of persons employed expressed as a percentage of the population 15 years of age and over.

Sources: Statistics Canada. *Labour force characteristics, monthly.* October 2020; IESO. *Reliability Outlook: From January 2020 to December 2024.* December 19, 2019; Toronto Pearson Airport data.

To assess the impact of COVID-19 on Ontario cost of capital parameters, LEI reviewed forward data for each parameter as of January 1st, 2020, where applicable, and compared expectations from forwards to current levels. Where Canada-specific forwards were not available, LEI used similar metrics from the US. We emphasize that the "COVID-19 period" is a relatively short datastream, and conclusions can change with a larger dataset.

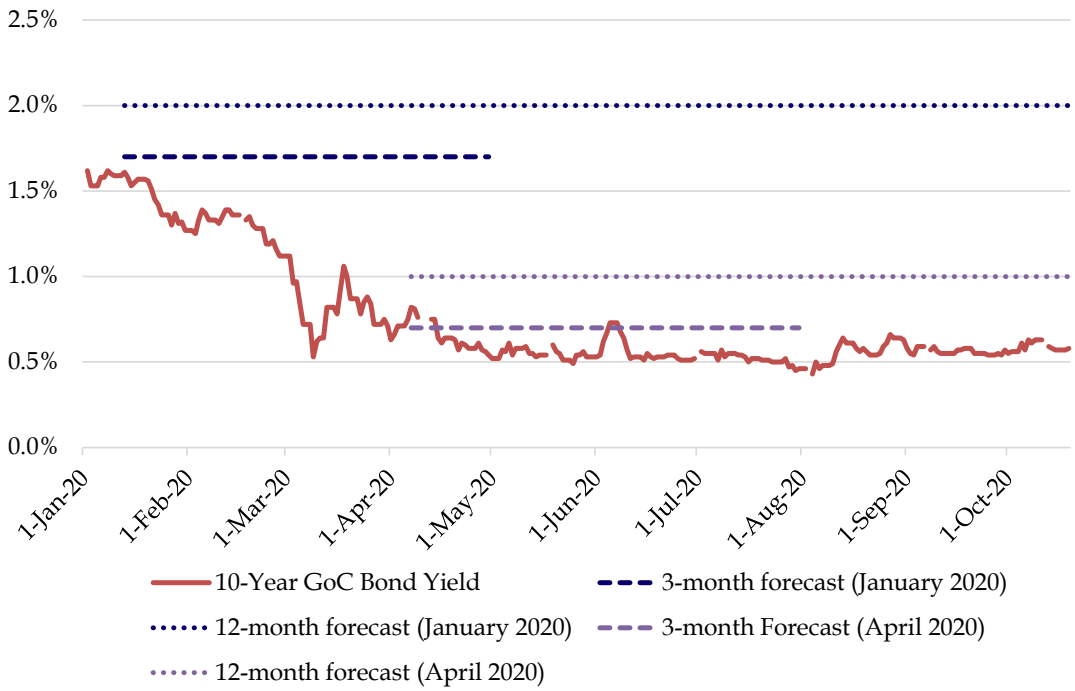
Long Canada Bond Forecast

In the January issue of the Consensus Forecast, the 10-year Government of Canada Bond Yield was forecasted as 1.7% and 2.0% for the 3-month and 12-month forecast, respectively. Canada

and Ontario's first presumptive COVID-19 case was reported on January 25th in Toronto.[7] By April, following action by the Bank of Canada in response to the economic crisis, the forecasts had fallen to 0.7% and 1.0% for the 3-month and 12-month forecasts.

Actual bond yields for the 10-Year Government of Canada Bond in this period have tended to be below the forecasts. Figure 3 shows the relationship between the 3-month and 6-month forecast between January and April and the actual yield relative to the forecast.

Figure 3. Forecasted and actual 10-Year Government of Canada Bond Yield



Source: Consensus Forecasts; Government of Canada.

Market Risk Premium ("MRP")

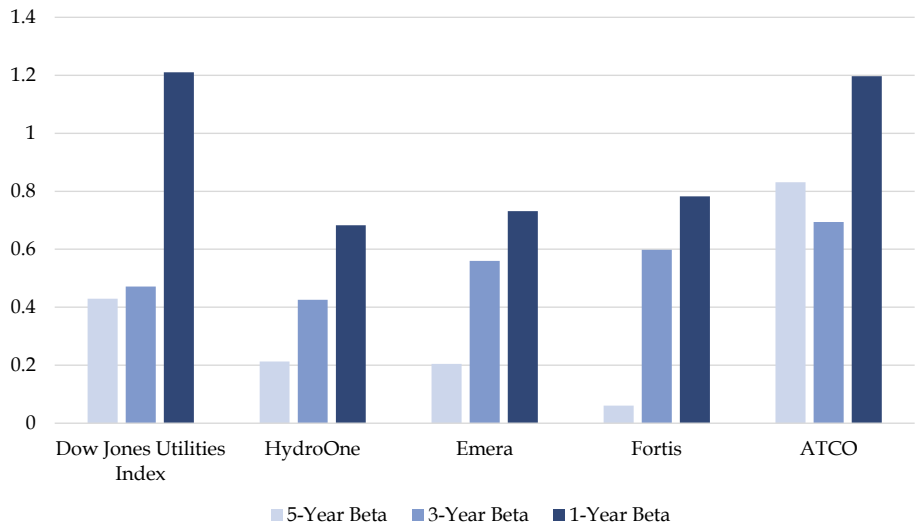
The cost of equity is made up of the risk-free rate plus an industry specific market risk premium. The Market Risk Premium is based on long-term equity market returns adjusted by the beta (a measure of relative volatility) for the sector. To explore impacts on the cost of equity, we focus first on the beta. Specifically, LEI has considered the betas of the Dow Jones Utilities Index ("DJU") and selected Canadian investor-owned utilities ("IOUs") relative to historical.

To do this we consider the one-year beta versus the three-year and five-year betas to illustrate the change in volatility of the index since the onset of the COVID-19 pandemic, observing that a higher beta relative to the historical average indicates increased relative volatility. This is illustrated in Figure 4 below. We note that the Canadian betas are relative to US markets, but we

[7] Government of Canada website. *Coronavirus disease (COVID-19): Outbreak update*. Accessed on October 21st, 2020.

believe the broader market perspective is more meaningful. Betas for the sector appear to have increased during the COVID-19 period.

Figure 4. Historical betas for the Dow Jones Utilities Index and selected Canadian utilities



Note: The DJU comprises 15 stocks traded on the New York Stock Exchange ("NYSE") that are selected by the editors of The Wall Street Journal based on reputation and financial performance.

Source: Data retrieved from S&P Capital IQ.

Next, to examine impact on MRP, we considered the difference between the long-term market returns on the S&P 500 through 2019 and the risk-free rate,[8] and compared this difference with the time series for both elements through to October 2020. We observe an increase in the MRP by 20 to 40 basis points by extending the data series to 2020 from 2019, depending on the time period considered. This is illustrated in Figure 5 below.

Figure 5. Risk free rate and historical market returns following COVID-19

	Annual equity return (S&P 500)	Risk-free rate (10-Year US Treasury)	Implied MRP
Average (1928-2019)	11.4%	5.2%	6.2%
Average (1928-2020)	11.6%	5.2%	6.4%
Average (1970-2019)	11.9%	7.4%	4.5%
Average (1970-2020)	12.0%	7.2%	4.9%

Source: Board of Governors of the Federal Reserve System (St Louis Fed); S&P Capital IQ data; Damodaran, A. *Historical returns: Stocks, Bonds & T.Bills with premiums*. January 2020.

[8] Risk-free rate is defined as the 10-year US Treasury yield.

Given that both the MRP and the beta have increased, logically the cost of equity increases.

Bankers' Acceptance Rates

For the Banker's Acceptance Rate, we compare the actual BA rate to the forwards for the Canadian Dollar Offered Rate ("CDOR"). The CDOR is a benchmark reference rate for BA borrowings denominated in Canadian dollars and is the reference rate at which the submitting bank is willing to lend funds against primary BA issuances.[9] In other words, as noted by the Bank of Canada, the BA market is intrinsically linked to the CDOR.[10]

While historical forwards are not publicly available, a review of market expectations from data providers shows that as of October 2019, the one-year forwards for the 3-month CDOR was anticipated to be just under 2%. In October 2020, the CDOR was trading at 0.49%. This is consistent with the decline in the actual BA rate; in October 2019, the 3-month BA rate was an average of 1.84% and has since declined to 0.25%.[11]

In general, we observe lower-than-anticipated pre-pandemic values across some parameters, driven by a low interest rate environment that has been implemented in response to the COVID-19 pandemic. Specifically, we observe lower market bond yields, and lower-than-anticipated short term borrowing rates. Conversely, we see increased perceived riskiness in the market, shown by increasing market risk premia, as demonstrated by higher betas relative to historical.

We note that although COVID-19 is not the only event that has driven this variance between forwards and actuals, it is likely the most significant driver of the market trends in 2020.

3 Consistency with fair return standard

The Fair Return Standard ("FRS") as described by the OEB is "*the over-arching principle for setting the cost of capital*" and is a legal requirement for the Board.[12] Specifically, application of the FRS requires consideration of three standards, focused on comparable investments, financial integrity, and capital attraction. Each is described briefly below, coupled with an analysis of data since the onset of COVID-19 in Ontario. Given the limited number of publicly traded utilities that primarily serve Ontario, where appropriate we consider data on other Canadian utility holding companies, some of which have operations in Ontario.

[9] Auger & McRae. *A Primer on the Canadian Bankers' Acceptance Market.* Bank of Canada Staff Discussion Paper. June 2018.

[10] Ibid.

[11] Data sourced from Investment Industry Regulatory Organization of Canada and Chatham Financial.

[12] OEB. *EB-2009-0084: Report of the Board on the Cost of Capital for Ontario's Regulated Utilities.* December 11, 2009. p. 8.

3.1 Comparable investment standard

The comparable investment standard is defined as a fair or reasonable return on capital that should be comparable to the return available from the application of invested capital to other enterprises of like risk.

To assess this, we compared the historical allowed return on equity for utilities to the annual equity returns in the US markets, defined as the returns for investors on the S&P 500 index. For 2020, we show the allowed ROE for utilities compared to the market returns from January 2nd, 2020 (i.e., the 'COVID-19 period'). This is shown in Figure 6 below.

Figure 6. Annual returns for Ontario utilities versus stock markets

Item	Units	Pre-COVID (2010-2019)	Post-COVID (2020)
Allowed ROE for Ontario utilities	Period average, %	9.21%	8.52%
Annual return (S&P 500)	Period average, %	9.6%	7.1%
Ratio of Ontario allowed ROE to S&P 500	%	95.8%	120.3%

Notes: Stock index annual returns calculated as percentage change from the last trading day of each year from the last trading day of the previous year. For 2020, "post-COVID" returns calculated as percentage change from last trading day of 2019 to October 2020.

Sources: OEB; S&P Capital IQ data.

Over the past 10 years, the average allowed ROE for Ontario utilities has averaged 95.8% of the return to the S&P 500 during the same period. By contrast, during the COVID-19 period, it has averaged 120.3%. It is important to be cautious about drawing conclusions about short time periods; however, the change in the ratio over the period suggests that the comparable investment standard has been more than adequately met, as allowed returns on equity relative to benchmark equity returns have actually improved.

3.2 Financial integrity standard

The financial integrity standard stipulates that the return should enable the financial integrity of the regulated enterprise to be maintained. LEI has assessed this metric through a comprehensive qualitative review of the utility landscape in Ontario, and reviewed rating agency outlooks for utilities. In general, we find no evidence of Ontario utility defaults since the beginning of the pandemic, and that notes from both Canadian and global ratings agencies have generally been stable.

Of significance is a note by S&P Global in June of 2020, where it observed that the six major investor-owned utilities in Canada improved their business and financial risk profiles in 2019,

assessing all as having "strong" or "excellent" business risk profiles.[13] Only Fortis had a "negative" outlook, but Hydro One maintained a stable credit rating. An excerpt of the agency's rating summary is shown in Figure 7 below.

Figure 7. Risk profile of Canadian investor-owned utilities by S&P

S&P criteria	ATCO Ltd	Emera Inc.	Fortis Inc.	Hydro One Ltd
Business risk profile	Excellent	Excellent	Excellent	Excellent
Financial risk profile	Significant	Aggressive	Significant	Significant
Issuer credit rating	A-	BBB	A-	A-
Outlook	Stable	Stable	Negative	Stable
FFO to debt range	14%-15%	11%-11.5%	10.5%-11%	10.5%-11%
Downside threshold	15.0%	10.0%	10.5%	11%
Upside threshold	20.0%	13.0%	10.5%	16%
Most recent rating action	Affirmed	Ratings lowered	Affirmed	Outlook revised to stable

Source: Adapted from S&P Global Ratings. *Can Canadian Regulated Utilities Sustain 2019 Improvements Amid COVID-19 and an Oil Price Slump?* June 11, 2020.

Consistent with this analysis, DBRS Morningstar (a Canadian ratings agency) has issued ratings reports for the Canadian IOUs since the start of the pandemic: for Hydro One, in April it affirmed the utility's existing debt issues as A (high) based on the utility's "*key credit metrics which are expected to remain supportive of the current ratings*."[14]

More generally in Ontario, we have not seen reports of utilities subject to financial distress or receiving negative attention from ratings agencies, suggesting they have maintained their financial integrity throughout the COVID-19 pandemic.[15]

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[13] S&P Global Ratings. *Can Canadian Regulated Utilities Sustain 2019 Improvements Amid COVID-19 And an Oil Price Slump?* June 11, 2020.

[14] DBRS Morningstar. *Hydro One Inc. Rating Report.* April 9, 2020.

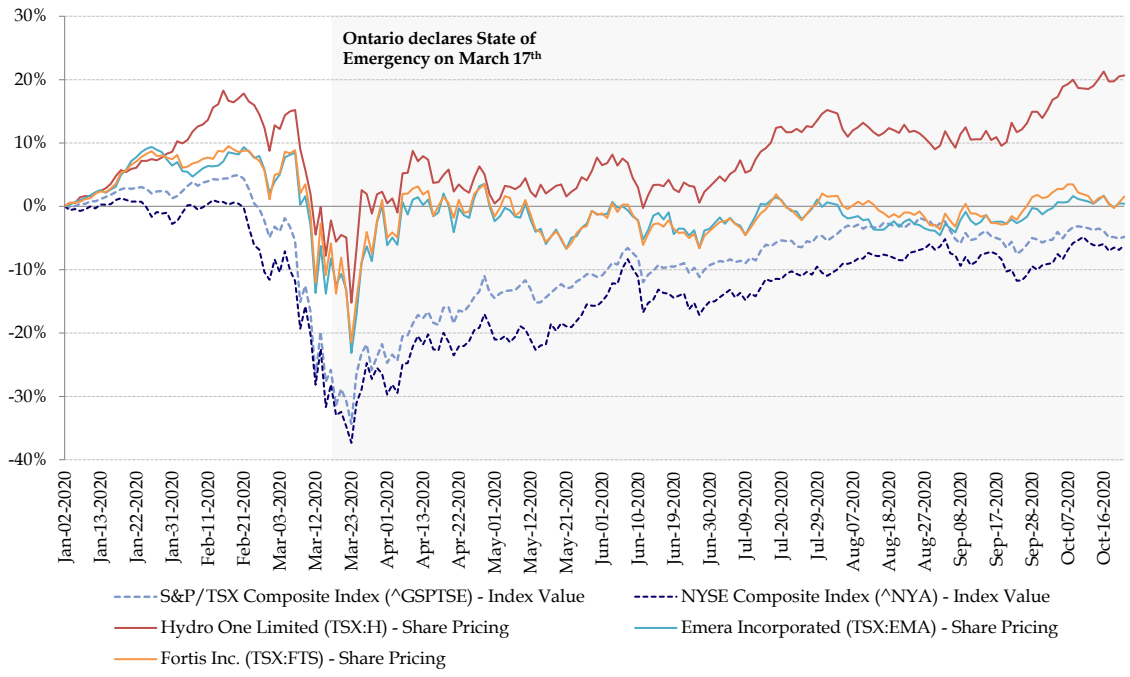
[15] S&P credit ratings for Toronto Hydro, Hydro One Limited, Ontario Power Generation, and Enbridge Gas Inc. have all been reviewed in April 2020 or later, with these reviews resulting in no ratings changes. Data for remaining smaller utilities is limited; however, as part of the OEB's monitoring of the impact that the COVID-19 pandemic has had on utility financial health using confidential monthly data submitted by individual utilities, the Board has noted "that reporting has not identified any acute financial issues for utilities." Quote source: OEB. *Re: Consultation on the Deferral Account – Impacts Arising from the COVID-19 Emergency – Next Steps [EB-2020-0133].* September 24, 2020.

3.3 Capital attraction standard

Finally, the capital attraction standard stipulates that the earned return should permit incremental capital to be attracted to the enterprise on reasonable terms and conditions.

To assess this, we show the stock performance of Hydro One (the lone publicly traded utility that exclusively serves Ontario) relative to overall market indices (specifically, the TSX and NYSE). In addition, we show the performance of other selected publicly traded Canadian utilities which have a large proportion of their assets in Canada, namely Fortis and Emera. We note that these indices are indexed to January 2nd, 2020. This is shown in Figure 8 below.

Figure 8. Stock performance of Canadian utilities relative to market indices



Sources: S&P Capital IQ data.

This data suggests that in general, Canadian utilities have been successful at maintaining investor confidence in their shares throughout the pandemic. Affirming this generally favorable outlook, in October 2020, Hydro One issued $1.2 billion medium term notes comprising of $200 million re-opening of 2.71% (Series 47) due in 2050, $600 million at 0.71% (Series 48) due in 2023, and $400 million 1.69% (Series 49) due in 2031, and were deemed as "A (high)" by Canadian rating agency DBRS Morningstar.[16] This suggests that the capital attraction standard continues to be met.

[16] DBRS Morningstar. *DBRS Morningstar Assigns Ratings of A (high) with Stable Trends to Hydro One Inc.'s $1.2 Billion Medium-Term Notes Issues.* October 9, 2020.

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4 Concluding remarks

A review of cost of capital parameters used in Ontario suggests that COVID-19 has decreased the cost of debt for those who can find credit, while moderately increasing the cost of equity in the market. Additionally, assessing the three standards of the FRS suggests that each component and the FRS itself have been met.[17] Utilities in Ontario appear to be fairly compensated for their risks based on current parameters. Furthermore, making significant changes to how the cost of capital is calculated in Ontario during a period of ongoing uncertainty may undermine both the financial integrity and capital attraction standards.

Conversely, it is difficult to justify granting utilities increased compensation for risk. Recognition of an allowed return on equity acknowledges that utilities are not risk free; utilities cannot expect to both earn an equity return and have the financial consequences of risk eliminated. Rate design already incorporates a number of shock absorbers for utilities, including a portion of rates which are not volumetric,[18] treatment of bad debt expense (although recoverability is not assured), and some compensation for lost volumes associated with energy efficiency.[19] Increases in residential load have in some cases offset declines in other customer loads.[20] Furthermore, the overall drop in weather-normalized demand is far lower than the decline in business experienced by many industries, ranging from transportation to dining.

While the impact of COVID-19 on consumer behaviour may continue to be felt for upwards of two years, there is little evidence to date that utilities have suffered consequences of COVID-19 for which they are not already being compensated.[21] Provided utilities are allowed a reasonable opportunity to recover their costs from ratepayers (including carrying costs), specific risks to the utilities sector should not impact their cost of capital.

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[17] We note that the full impact of untargeted lockdowns has yet to be felt, and thus our conclusions on the FRS are based on the best available information as of this writing.

[18] Rates for distribution utilities in Ontario are comprised of a fixed charge and a volumetric or usage-based charge.

[19] The Lost Revenue Adjustment Mechanism ("LRAM") allows for distribution utilities with variable distribution rates to recover revenues lost in the past because a conservation and demand management ("CDM") program has reduced load. It is a retrospective adjustment as the utility recovers these lost revenues through higher distribution rates in a future period. (Source: OEB. *Conservation and Demand Management Requirement Guidelines for Electricity Distributors.* EB-2014-0278. August 2016.)

[20] Although electricity distributors have mostly transitioned to fixed monthly charges for residential customers, meaning that in these instances residential load increases offsetting load declines in rate classes with volumetric billing determinants would not translate into offsetting revenues.

[21] Further information on the impact the COVID-19 pandemic has had on the perceived financial health of utilities can be found in Section 3 of LEI's 'COVID-19 Impact Study', prepared for the OEB's 'Utility Remuneration' and 'Responding to Distributed Energy Resources' consultations (EB-2018-0287 and EB-2018-0288, respectively).

5 Appendix A: Works cited

Auger & McRae. *A Primer on the Canadian Bankers' Acceptance Market.* Bank of Canada Staff Discussion Paper. June 2018

Damodaran, A. *Historical returns: Stocks, Bonds & T.Bills with premiums*. January 2020

DBRS Morningstar. *Hydro One Inc. Rating Report*. April 9, 2020

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OEB. *2021 Cost of Capital Parameters*. November 9, 2020

OEB. *Accounting Order for the Establishment of Deferral Accounts to Record Impacts Arising from the COVID-19 Emergency*. March 25, 2020

OEB. *Conservation and Demand Management Requirement Guidelines for Electricity Distributors.* EB-2014-0278. August 2016

OEB. *EB-2009-0084: Report of the Board on the Cost of Capital for Ontario's Regulated Utilities.* December 11, 2009

OEB. *Staff Report EB-2009-0084: Review of the Cost of Capital for Ontario's Regulated Utilities.* January 14, 2016

S&P Global Ratings. *Can Canadian Regulated Utilities Sustain 2019 Improvements Amid COVID-19 And An Oil Price Slump?* June 11, 2020

Statistics Canada. *Labour force characteristics, monthly.* October 2020

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6 Appendix B: The OEB's cost of capital formula

Return on Equity

The formula used by the OEB to calculate ROE is shown in Figure 9 below. Notably, there are a few static "Base" parameters, including the Base ROE of 9.75%, the Base Long Canada Bond Forecast ("LCBF") of 4.25% and Base Utility Bond Spread of 1.415%, which were established by the OEB in the EB-2009-0084 proceeding.

Figure 9. ROE formula

where:

- ROE_t = Return on Equity
- $LCBF_t$ = Long Canada Bond Forecast
- Base LCBF = 4.25%
- $UtilBondSpread_t$ = the average spread of 30-year A-rated Canadian Utility bond yields over 30-year Government of Canada bond yields over all business days in the month that is three months in advance of the implementation date for rates
- BaseUtilBondSpread = 1.415%

Source: OEB. *Staff Report EB-2009-0084: Review of the Cost of Capital for Ontario's Regulated Utilities.* January 14, 2016; Based on methodology determined in: OEB. *Report of the Board – on Cost of Capital for Ontario's Regulated Utilities [EB-2009-0084].* December 11, 2009.

The Base ROE was determined as the sum of the Base LCBF and 550 basis points, which represents the initial Equity Risk Premium. The 550 basis points were the average of the empirical analyses and recommendations provided in the proceeding.

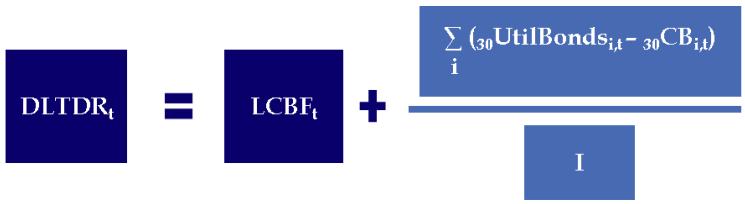
The Base LCBF represents the forecasted Canadian Long-Term bond yield at the time of the proceeding, and the corresponding spread of 1.415% was the spread between this yield and 30-year A-Rated utility bond yields.

The 0.5 adjustment factor was determined as a result of the empirical analysis and consultations undertaken in the proceeding. The adjustment factor allows for the ROE to be sensitive to changes in the long Canada bond yields.

Deemed Long-Term Debt Rate

The DLTDR reflects the interest rate that would be charged to an A-rated commercial business customer for a long-term (30-year) commercial loan, and is calculated using the formula in Figure 10 below.

Figure 10. DLTDR formula



where:

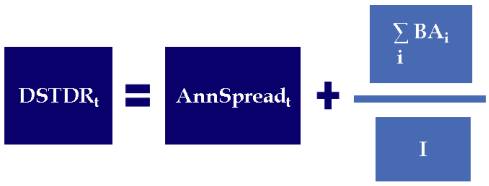
- $DLTDR_t$ = Deemed Long-Term Debt Rate
- $LCBF_t$ = Long Canada Bond Forecast
- ${}_{30}UtilBonds_{i,t}$ = the average 30-year A-Rated Canadian Utility bond yield rate, from Bloomberg L.P., for business day i of the month that is three months in advance of the implementation date for rates
- ${}_{30}CB_{i,t}$ = the benchmark bond yield rate for the 30-year Government of Canada bond at the close of day i of the month that is three months in advance of the implementation date for rates
- I = number of business days for which Government of Canada and A-rated Utility bond yield rates are published in the month that is three months in advance of the implemented date for rates

Source: OEB. *Staff Report EB-2009-0084: Review of the Cost of Capital for Ontario's Regulated Utilities.* January 14, 2016; Based on methodology determined in: OEB. *Report of the Board – on Cost of Capital for Ontario's Regulated Utilities [EB-2009-0084].* December 11, 2009.

Deemed Short-Term Debt Rate

The DSTDR reflects the interest rate that would be charged to an A-rated commercial business customer for a short-term (e.g. 3-month) loan by a commercial bank. The formula used by the OEB to calculate the DSTDR is summarized in Figure 11 below.

Figure 11. DSTDR formula



where:

- $DSTDR_t$ = Deemed Short-Term Debt Rate
- $AnnSpread_t$ = the average annual spread in short-term debt issuances for an R1-low utility over 3-month Banker's Acceptance rates for the test year t, calculated using a confidential survey
- BA_i = the 3-month Bankers' Acceptance Rate for day i in the selected month, as published by Statistics Canada and the Bank of Canada
- I = number of business days for which Government of Canada and A-rated Utility bond yield rates are published in the month that is three months in advance of the implemented date for rates

Source: OEB. *Staff Report EB-2009-0084: Review of the Cost of Capital for Ontario's Regulated Utilities.* January 14, 2016; Based on methodology determined in: OEB. *Report of the Board – on Cost of Capital for Ontario's Regulated Utilities [EB-2009-0084].* December 11, 2009.