VALUATION SERIES

No. 34 / SEPTEMBER 2019

PUBLIC CHOICE ALTERNATIVES

Disaster Averted, Meddling Potential Persists

A VALUATION & STRATEGIC APPRAISAL OF BC HYDRO

BY IAN MADSEN

FRONTIER CENTRE FOR PUBLIC POLICY

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IAN MADSEN

Ian Madsen, B.A. (Alberta), M.B.A. (Toronto), CFA, is a Senior Policy Analyst at the Frontier Centre for Public Policy. He has extensive experience in portfolio and financial analyses, managing investment portfolios, and managing investment research operations (including overseas). He lives in Surrey, B.C.

FRONTIER CENTRE
FOR PUBLIC POLICY

203-2727 Portage Avenue, Winnipeg, Manitoba Canada R3J 0R2
Tel: 204-957-1567
Email: newideas@fcpp.org

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EXECUTIVE SUMMARY

BC Hydro is the electric power generating holding company and retail utility supplying the province of British Columbia (BC). As its name implies, it is nearly entirely a hydro-electric generation-based provider.

The Peace River Site C project is scheduled to be completed sometime in 2024, with full service in 2025. Valuing the company at this point is misleading, as the output from the project will not be fully online for the whole year until 2025.

Using an **intrinsic value method,** and discounting to the 'present', i.e., 2025, shareholder equity in BC Hydro's projected future free cash flows (as BC Hydro will be with Site C in full operation and paying full cash interest on the debt accumulated to build it), but taxed at statutory rates, is estimated at a minimum of $2.36B to a maximum of $16.52B, with a tighter, more plausible range of a median (midpoint of all the relevant values) of $4.13B to a mean (simple average of all the relevant values) of $5.32B.

Under the **market-based valuation system,** using seven viable, standard valuation metrics (such as trailing and forward Price/Earnings, Price/Sales, Price/Book Value, Price/Operating Cash Flow), and comparisons with six Canadian and seven US exchange publicly listed electric-dominated utilities with substantial renewable energy generation capacity, the 2025 value ranges from $2.71B to positive $9.61B, with a median of $5.76B and a median of $5.79B. Renewable energy companies have a premium valuation.

The company has negative free cash flow and low returns on assets, equity and capital employed. Utilities usually pay a dividend to investors. The company is showing sufficient income to pay a dividend, but, given current low cash generation, investors may not consider the dividend sustainable. However, if the company can show a credible, viable plan of redirection and commercial success and resilience to challenges, a share flotation could be successful, which could lead to a dividend thereafter, but its debt burden must be cut by more than half.

Some scenario experiments indicate that BC Hydro should have part of its debt extinguished to optimize total sale proceeds to the citizens of British Columbia. As the utility's debt level is high in relation to its cash generation capacity and its capital expenditure needs exceed operating cash flow, much, if not all of the first sale proceeds of treasury shares in a partial divestiture might or should be used to lower BC Hydro's debt and not go to the provincial treasury. The experiments indicate that using proceeds to retire one quarter of its long-term debt could be the optimal strategy.

Caveat: this report is nothing approaching a prospectus. Only intensive, meticulously minute appraisal of all of BC Hydro's assets, including its physical assets, all its accounts and hidden assets and liabilities, plus all its contractual, legal and regulatory obligations, would give an accurate valuation of the company, albeit still dependent on subjective reasoning and assumptions. Even then it would not necessarily indicate what magnitude of proceeds could or would be garnered in a divestment. The estimates, projections, observations or analyses herein are neither definitive nor authoritative. Other analysts may have valid, alternative ways of scrutinizing and valuing BC Hydro.

INTRODUCTION

History of BC Hydro, its Current State and Operating Status

BC Hydro is the provincial government wholly-owned Crown electric power utility serving the province of British Columbia. It has about thirty hydro-electric generating facilities with a capacity of 11,918 megawatts, 'MW' (98.5 percent of total), two thermal stations with a capacity of 119 MW (1 percent of total), seventeen diesel facilities serving small or remote communities with a capacity of 60.7 MW (approximately 0.5 percent of total capacity).[1]

The precursor of BC Hydro, the Victoria Gas Company, was founded in 1860. Electric lighting, the first in Canada, began in the city twenty-three years later, with a sister company, Victoria Electric Illuminating Company. The first hydro-electric plant was built in 1898. Power Corporation of Montreal took over the firm in 1928. It expanded to the mainland and built more plants. The BC Electric commission, created by the provincial government in 1945 to electrify small towns and rural districts province-wide, taking over many small local utilities in the process, took over BC Electric in 1961 and they were officially amalgamated the next year and renamed BC Hydro. There were various attempts to split the company along functional lines, but none were completed.[2]

The most contentious part of BC Hydro's recent history has been the decision to proceed with the mammoth Site C Dam and generation facility on the Peace River in northeastern British Columbia, where costs have escalated to an estimated $10.7B, for additional capacity of 1,100 megawatts, which would be adequate to provide power for about 450,000 households.[3] The power is considered unnecessary until about 2040, while construction is scheduled to be completed by 2024. The project is a financial drain at present, making valuation of the enterprise difficult.[4]

INTRINSIC VALUE: VALUATION OF BC HYDRO AS A BUSINESS, IN ITS CURRENT STATE

For the intrinsic value, projecting future cash flow growth, and bringing it to a net present value, a relatively conservative approach was taken which could undervalue the company (see Table 1, next page). A simple capitalization perpetuity formula was used, which is appropriate for a mature company. The company's free cash flow nominal (i.e., not adjusted for inflation) growth rate range was held within a restrained 2 to 4 percent range, and the required rate of return or cost of capital range was from 5 to 8 percent.

The firm could theoretically have higher growth in the future, so a modest growth rate was considered reasonable. Its cost of capital, given low expectations, the high quality of the renewable assets, and high current valuations in the stock market, could well be lower than the range used (and thus raise its estimated value), although there is also a chance that interest rates and the rate of return investors demand on equity (share) investment could increase.

The statutory tax rate used in calculations may be lower in the future, as there is continued global pressure to lower corporate tax rates, exemplified by the recent drop in US corporation income tax rates, the slow decrease in Quebec, and a recent more ambitious schedule of decreases announced by the new government in Alberta, the neighbouring, and sometimes rival, province to BC.

Capital expenditure in recent years has exceeded operating cash flow. The assumption was made that capital spending would stay restrained in growth but projections indicate that it will likely remain higher than operating cash flow.

The proprietary model used in projecting the line items that determine the various inputs into the intrinsic value employ calculations based on recent and historic trends in those line items. Then it uses formulas to project the line item numbers for the following year. All main constituent line-item factors that determine net income, operating and free cash flow were projected on the basis of historic behaviour and mathematical analysis.

2019 projections show a negative value for the company. Hence, projections were made for 2025, for both free cash flow and net income used as a proxy for free cash flow. This latter approach, i.e., using net income, makes some conceptual sense, as, over time, a steady-state mature company will generally have capital expenditures that roughly cover depreciation expense, which, arithmetically, would make net income equal to free cash flow.

Table 1

Intrinsic Value, 2025, Using Free Cash Flow

CASE 1: Present Value of Projected Fully Taxed Free Cash Flow for FY2025 ($B)

Present Value of Discounted Free Cash Flow = Estimated Next Year Free Cash Flow (Required Rate of Return ['r'] = Growth Rate ['g'])

Projected Fully Taxed Free Cash Flow Estimate for FY2025 ($B): $ 0.1645

Matrix Values ($B) g==v; r==>	4.00%	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%
0.00%	$ 4.11	$ 3.29	$ 2.74	$ 2.35	$ 2.06	$ 1.83	$ 1.65
1.00%	$ 5.48	$ 4.11	$ 3.29	$ 2.74	$ 2.35	$ 2.06	$ 1.83
2.00%	$ 8.23	**$ 5.48**	**$ 4.11**	**$ 3.29**	**$ 2.74**	**$ 2.35**	$ 2.06
3.00%	$ 16.45	**$ 8.23**	**$ 5.48**	**$ 4.11**	**$ 3.29**	**$ 2.74**	$ 2.35
4.00%	--	**$ 16.45**	**$ 8.23**	**$ 5.48**	**$ 4.11**	**$ 3.29**	$ 2.74
5.00%	–$ 16.45	--	$ 16.45	$ 8.23	$ 5.48	$ 4.11	$ 3.29
6.00%	–$ 8.23	–$ 16.45	$ --	$ 16.45	$ 8.23	$ 5.48	$ 4.11
7.00%	–$ 5.48	–$ 8.23	–$ 16.45	$ --	$ 16.45	$ 8.23	$ 5.48

	Minimum	Maximum	Median	Mean (Average)
Total Market Value ($B)	$ 2.35	$ 16.45	$ 4.11	$ 5.29

Note: 'g' is Growth Rate in Free Cash Flow or Proxy, 'r' is the Required Rate of Return; Bold font figures are used in the Mean, Median, Minimum and Maximum determinations.
Source: Author's calculations based on reports made available by the company.

Using this method, the calculations resulted in estimates of a minimum of $2.11B to a maximum of $14.75B, with a tighter, more plausible range of a median (midpoint of all the relevant values) of $3.69B to a mean (simple average of all the relevant values) of $4.75B. Please see the results below in Table 2.

Table 2

Intrinsic Value, Using Net Income as a Proxy for Free Cash Flow

CASE 2: Projected Fully Taxed Net Income as a Proxy for Fully Taxed Free Cash Flow for FY2025 ($B)

Present Value of Discounted Free Cash Flow = Estimated Next Year Free Cash Flow (Required Rate of Return ['r'] = Growth Rate ['g'])

Projected Fully Taxed Net Income as Proxy for Fully Taxed Free Cash Flow for FY2025 ($B): $ 0.1475

Matrix Values ($B) g==v; r==>	4.00%	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%
0.00%	$ 3.69	$ 2.95	$ 2.46	$ 2.11	$ 1.84	$ 1.64	$ 1.48
1.00%	$ 4.92	$ 3.69	$ 2.95	$ 2.46	$ 2.11	$ 1.84	$ 1.64
2.00%	$ 7.38	**$ 4.92**	**$ 3.69**	**$ 2.95**	**$ 2.46**	**$ 2.11**	$ 1.84
3.00%	$ 14.75	**$ 7.38**	**$ 4.92**	**$ 3.69**	**$ 2.95**	**$ 2.46**	$ 2.11
4.00%	--	**$ 14.75**	**$ 7.38**	**$ 4.92**	**$ 3.69**	**$ 2.95**	$ 2.46
5.00%	–$ 14.75	--	$ 14.75	$ 7.38	$ 4.92	$ 3.69	$ 2.95
6.00%	–$ 7.38	–$ 14.75	$ --	$ 14.75	$ 7.38	$ 4.92	$ 3.69
7.00%	–$ 4.92	–$ 7.38	–$ 14.75	$ --	$ 14.75	$ 7.38	$ 4.92

	Minimum	Maximum	Median	Mean (Average)
Total Market Value ($B)	$ 2.11	$ 14.75	$ 3.69	$ 4.75

Note: 'g' is Growth Rate in Free Cash Flow or Proxy, 'r' is the Required Rate of Return; Bold font figures are used in the Mean, Median, Minimum and Maximum determinations.
Source: Author's calculations based on reports made available by the company.

As the second, alternative method did not yield a result that was theoretically or practically superior, the **first method, i.e., projected free cash flow,** was used as the preferable Intrinsic Value; i.e., rather than using net income as a proxy.

MARKET-BASED VALUE: VALUATION OF BC HYDRO USING STOCK MARKET AND FINANCIAL METRICS

With respect to the market-peer comparison valuation, there are a few complications. The Canadian electric utility sector includes a number of companies with depressed free cash flow, at least at this time. With U.S. peers, the most similar companies have substantially negative free cash flow, meaning they require further financial inflow (i.e., they must borrow more or issue more share capital). Their recent net income is also depressed. As noted in the Executive Summary, using six standard valuation metrics (Trailing and Forward Price/Earnings, Price/Sales; Price/Book Value; Enterprise Value to Earnings Before Interest, Taxes & Depreciation & Amortization [EV/EBITDA]; Revenue/EBITDA; Price/Operating Cash Flow), the current value ranges from $10.3B to $22.5B, with a median of $16.53B and a median of $16.56B. The very close proximity of the two latter figures does not indicate that they are precise or accurate in any absolute way. Please see the details of the models' results in Table 3.

Table 3

Market Valuation Using Financial Metrics from Comparable Companies

Method 2: BC Hydro Projections are for FY2025; Fully Taxed, Debt Free

Valuation metrics applied to BC Hydro; ie, Market Value of Common Equity. Figures in $B.	Price to Sales	Forward P/E (Market Value to Estimated Net Income)	Enterprise Value/Revenue (subtracting net debt)	Price to Book Value	Enterprise Value/EBITDA (subtracting net debt)	Price to Operating Cash Flow
Average Six Canadian Renewable-Dominated Utility Companies	$ 8.05	$ 6.14	$ 37.20	$ 15.07	$ 46.60	$ 18.63
Average Six Canadian Non-Renewable-Dominated Utility Companies	$ 4.10	$ 6.50	$ 16.91	$ 7.34	$ 1.49	$ 14.14
Average Seven US-Listed Renewable-Dominated Utility Companies	$ 1.87	$ 1.87	$ 1.87	$ 1.87	$ 8.79	$ 22.87
Average of All Above	$ 4.27	$ 5.43	$ 22.50	$ 10.31	$ 11.34	$ 18.78

Source: Capital IQ via Yahoo!Finance, additional material from BMO-Investorline, Valuation model formulae.

Market Value Using Comparable Companies and Five Viable Valuation Ratios

	Minimum	Maximum	Median	Mean (Average)
Total Market Value ($B)	$ 4.27	$ 22.50	$ 10.83	$ 12.10

Source: Calculations based on Annual Report financial data, comparison company data from Capital IQ via Yahoo!Finance.

FINANCIAL PERFORMANCE OF BC HYDRO, AND TRENDS IN SAME

As shown in Table 4, below, all of BC Hydro's returns on assets, equity, and capital employed, have deteriorated over the past nine years whether the numerator in the ratios is Earnings Before Interest, Taxes and Depreciation and Amortization (EBITDA); net income; operating cash flow; or free cash flow. While this may not be a problem unique to BC Hydro, as other utilities appear to have similar issues of low profitability, low returns on investment, and negative free cash flow, some of these ratios have improved for those other companies in recent years. These return ratios are also lower than the weighted average interest rates of 4.3 percent that the firm is paying on the debt capital it is borrowing.[5]

Table 4

Capital Efficiency Performance Metric

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. RETURN ON ASSETS											
Return on Assets Using EBITDA (Earnings Before Interest, Taxes and Depreciation & Amortization)											
EBITDA ($M)	$ 832	$ 690	$ 411	$ 947	$ 1,024	$ 1,057	$ 1,049	$ 1,147	$ 1,213	$ 1,407	$ 1,289
Average Assets ($M)	$ 13,634	$ 15,388	$ 17,159	$ 18,794	$ 20,690	$ 22,841	$ 24,747	$ 26,792	$ 28,894	$ 30,961	$ 32,815
RoA, EBITDA	6.09%	4.48%	2.40%	3.05%	4.95%	4.69%	4.24%	4.29%	4.20%	4.34%	3.93%
Return on Assets Using Fully Taxed Net Income											
Fully Taxed Net Income ($M)	$ 273	$ 270	$ 331	$ 436	$ 413	$ 377	$ 406	$ 430	$ 485	$ 506	$ 506
Average Assets ($M)	$ 13,634	$ 15,388	$ 17,159	$ 18,794	$ 20,690	$ 22,841	$ 24,747	$ 26,792	$ 28,894	$ 30,961	$ 32,815
RoA, NI	2.00%	1.76%	1.99%	2.99%	2.00%	1.65%	1.64%	1.61%	1.68%	1.69%	1.54%
Return on Assets Using Fully Taxed Operating Cash Flow											
Fully Taxed Operating Cash Flow ($M)	$ 836	$ 254	$ 373	$ 665	$ 816	$ 888	$ 788	$ 1,018	$ 1,060	$ 1,327	$ 1,725
Average Assets ($M)	$ 13,634	$ 15,388	$ 17,159	$ 18,794	$ 20,690	$ 22,841	$ 24,747	$ 26,792	$ 28,894	$ 30,961	$ 32,815
RoA, OCF	6.12%	1.65%	2.17%	3.57%	3.94%	3.89%	3.18%	3.81%	3.67%	4.29%	5.26%
Return on Assets Using Fully Taxed Free Cash Flow											
Fully Taxed Free Cash Flow ($M)	–$ 149	–$ 1,050	–$ 1,919	–$ 739	–$ 794	–$ 922	–$ 1,128	–$ 910	–$ 1,042	–$ 1,186	–$ 1,439
Average Assets ($M)	$ 13,634	$ 15,388	$ 17,159	$ 18,794	$ 20,690	$ 22,841	$ 24,747	$ 26,792	$ 28,894	$ 30,961	$ 32,815
RoA, FCF	–1.09%	–6.82%	–11.18%	–3.94%	–3.84%	–4.04%	–4.56%	–3.40%	–3.61%	–3.89%	–4.39%
2. RETURN ON EQUITY											
Return on Equity Using EBITDA (Earnings Before Interest, Taxes and Depreciation & Amortization)											
EBITDA ($M)	$ 832	$ 690	$ 411	$ 947	$ 1,024	$ 1,057	$ 1,049	$ 1,147	$ 1,213	$ 1,407	$ 1,289
Average Equity ($M)	$ 1,852	$ 2,050	$ 2,427	$ 2,777	$ 3,050	$ 3,360	$ 3,683	$ 4,018	$ 4,335	$ 4,705	$ 5,188
RoE, EBITDA	44.92%	33.66%	16.94%	94.10%	33.58%	31.46%	28.49%	28.55%	27.98%	29.91%	24.87%
Return on Equity Using Fully Taxed Net Income											
Fully Taxed Net Income ($M)	$ 273	$ 270	$ 331	$ 436	$ 413	$ 377	$ 406	$ 430	$ 485	$ 506	$ 506
Average Equity ($M)	$ 1,852	$ 2,050	$ 2,427	$ 2,777	$ 3,050	$ 3,360	$ 3,683	$ 4,018	$ 4,335	$ 4,705	$ 5,188
RoE, NI	14.74%	13.18%	13.63%	15.70%	13.54%	11.21%	11.03%	10.70%	11.18%	10.76%	9.77%
Return on Equity Using Fully Taxed Operating Cash Flow											
Fully Taxed Operating Cash Flow ($M)	$ 836	$ 254	$ 373	$ 665	$ 816	$ 888	$ 788	$ 1,018	$ 1,060	$ 1,327	$ 1,725
Average Equity ($M)	$ 1,852	$ 2,050	$ 2,427	$ 2,777	$ 3,050	$ 3,360	$ 3,683	$ 4,018	$ 4,335	$ 4,705	$ 5,188
RoE, OCF	45.14%	12.39%	15.37%	24.05%	26.76%	26.43%	21.40%	25.34%	24.45%	28.21%	33.29%
Return on Equity Using Fully Taxed Free Cash Flow											
Fully Taxed Free Cash Flow ($M)	–$ 149	–$ 1,050	–$ 1,919	–$ 739	–$ 794	–$ 922	–$ 1,128	–$ 910	–$ 1,042	–$ 1,186	–$ 1,439
Average Equity ($M)	$ 1,852	$ 2,050	$ 2,427	$ 2,777	$ 3,050	$ 3,360	$ 3,683	$ 4,018	$ 4,335	$ 4,705	$ 5,188
RoE, FCF	–8.05%	–51.22%	–79.09%	–26.61%	–26.04%	–27.44%	–30.63%	–22.65%	–24.04%	–25.21%	–27.77%
3. RETURN ON CAPITAL EMPLOYED (Cash, Restricted Cash and Short Term Investments were Subtracted from Total Liabilities + Shareholders Equity)											
Return on Capital Employed Using EBITDA (Earnings Before Interest, Taxes and Depreciation & Amortization)											
EBITDA ($M)	$ 832	$ 690	$ 411	$ 947	$ 1,024	$ 1,057	$ 1,049	$ 1,147	$ 1,213	$ 1,407	$ 1,289
Average Capital Employed ($M)	$ 13,639	$ 15,282	$ 17,060	$ 18,716	$ 20,670	$ 22,805	$ 24,663	$ 26,639	$ 28,852	$ 30,915	$ 32,770
RoCE, EBITDA	6.10%	4.52%	2.41%	5.06%	4.25%	4.63%	4.25%	4.30%	4.20%	4.55%	3.29%
Return on Capital Employed Using Fully Taxed Net Income											
Fully Taxed Net Income ($M)	$ 273	$ 270	$ 331	$ 436	$ 413	$ 377	$ 406	$ 430	$ 485	$ 506	$ 506
Average Capital Employed ($M)	$ 13,639	$ 15,282	$ 17,060	$ 18,716	$ 20,670	$ 22,805	$ 24,663	$ 26,639	$ 28,852	$ 30,915	$ 32,770
RoCE, NI	2.00%	1.77%	1.94%	2.33%	2.00%	1.65%	1.65%	1.61%	1.68%	1.64%	1.54%
Return on Capital Employed Using Fully Taxed Operating Cash Flow											
Fully Taxed Operating Cash Flow ($M)	$ 836	$ 254	$ 373	$ 665	$ 816	$ 888	$ 788	$ 1,018	$ 1,060	$ 1,327	$ 1,725
Average Capital Employed ($M)	$ 13,639	$ 15,282	$ 17,060	$ 18,716	$ 20,670	$ 22,805	$ 24,663	$ 26,639	$ 28,852	$ 30,915	$ 32,770
RoCE, OCF	6.13%	1.66%	2.19%	3.57%	3.95%	3.89%	3.20%	3.82%	3.67%	4.29%	5.26%
Return on Capital Employed Using Fully Taxed Free Cash Flow											
Fully Taxed Free Cash Flow ($M)	–$ 149	–$ 1,050	–$ 1,919	–$ 739	–$ 794	–$ 922	–$ 1,128	–$ 910	–$ 1,042	–$ 1,186	–$ 1,439
Average Capital Employed ($M)	$ 13,639	$ 15,282	$ 17,060	$ 18,716	$ 20,670	$ 22,805	$ 24,663	$ 26,639	$ 28,852	$ 30,915	$ 32,770
RoCE, FCF	6.13%	1.66%	2.19%	3.57%	3.95%	3.89%	3.20%	3.82%	3.67%	4.29%	5.26%

Source: Company Financial Statements. Taxes were calculated using current federal and provincial rates applied retroactively for comparability.

As the following table shows, the ratios of debt to equity, total debt to EBITDA, and the growth rate of debt divided by the growth in EBITDA have all shown worrisome trends. There are still two more years of substantial capital spending to go, albeit with much lower funding needs than in the past. The rest of this study will address how BC Hydro, and its owner, the provincial government, might have to grapple with its debt, and not let it get out of hand again.

Table 5

Solvency, Interest Coverage, Capital Expenditure Coverage

Financial Strength and Solvency	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Debt/Equity	610%	644%	573%	576%	580%	579%	565%	566%	567%	550%	518%
Debt/Total Assets	81%	86%	85%	85%	85%	85%	85%	85%	85%	85%	84%
Debt/Total Capital Employed	81%	87%	85%	85%	85%	85%	85%	85%	85%	85%	84%
EBITDA/Finance Charges	149%	87%	189%	235%	212%	194%	192%	192%	187%	213%	205%
EBITDA/Finance Charges+Capex	48%	23%	34%	56%	50%	45%	46%	47%	49%	41%	48%
Quick Ratio ({Current Assets – Inventories}/Current Liabilities)	78%	43%	34%	21%	20%	21%	24%	19%	24%	28%	36%
Quick Ratio Excluding "Restricted Cash"	78%	43%	34%	21%	20%	21%	24%	19%	24%	28%	36%
EBITDA/Net Interest Paid	149%	87%	189%	235%	212%	194%	192%	192%	187%	213%	205%
Pre-Tax Operating Cash Flow/Net Interest Paid	181%	54%	75%	154%	164%	164%	132%	161%	141%	219%	264%
Total Debt/EBITDA	1,700%	3,415%	1,617%	1,621%	1,767%	1,933%	1,905%	1,944%	1,815%	2,093%	2,116%
Growth in Debt/Growth in EBITDA	–88%	–49%	7%	103%	389%	–1,132%	83%	138%	52%	-67%	130%

Source: Company Financial Statements. Debt and Equity are the averages for the year. Taxes were calculated using current federal and provincial rates applied retroactively for comparability.

STRATEGIES AND ALTERNATIVES FOR COMMERCIALIZATION, DIVESTITURE OR PRIVATIZATION

1. Partial divestment

Quite often when a state-owned enterprise is divested or 'privatized', it is not done entirely at once. This is because it may not be possible to sell the whole company into the stock market and get the maximum price for the seller, especially if the firm has assets in the billions of dollars, or if there are unusual aspects to the nature of the company, or the circumstances in which it operates. Hence, an initial, small minority allotment of shares are sold to help establish at least a crude market valuation of the company's shares as they become openly traded.

However, having a majority stake retained by a government introduces some doubt about the true independence and commercial status of the partially divested firm. There could be fear on the part of investors that politicians may interfere with the strategy or operations of the firm. This could result in there being a discount that the firm's shares suffer in the market. In the case of BC Hydro, the fears could be related to earlier mismanagement of the company, particularly the politically-driven decision to embark on the Site C project, and the inadequate controls, poor cost, and completion guarantees, and other indications of failure in governance or risk assessment.

As the company's extraordinary capital expenditures are scheduled to continue through 2024, and the company does not forecast full capacity power generation from Muskrat Falls until later that year; i.e., fiscal 2025, the company will likely not be fully saleable, in whole or in part, until late 2025 or beyond. Unlike Manitoba Hydro or Nalcor, its Newfoundland & Labrador counterpart, Site C is not the company-killer that either Keeyask or Muskrat Falls, respectively, were to those other two considerably smaller provincial Crown utilities. However, interest on and repayment of the debt from building Site C will be a drag on BC Hydro's cash flow for many years to come. Selling part or all of the company, with much of the proceeds used to reduce the debt, would make the company much healthier, and also allow it to fetch a higher price upon its sale, benefiting BC citizens, ratepayers and taxpayers. Hence, a couple of different scenarios were explored.

Scenario One:
One Quarter Long-term Debt Retired; Proceeds Net of Debt Paid Back

Table 6

Intrinsic Value, One Quarter of Long-term Debt Extinguished

CASE 1: Present Value of Projected Fully Taxed Free Cash Flow for FY2025 ($B); One Quarter of Long-term Debt Retired

Present Value of Discounted Free Cash Flow = Estimated Next Year Free Cash Flow (Required Rate of Return ['r'] = Growth Rate ['g'])

Projected Fully Taxed Net Income as a Proxy for FCF for FY2019 ($B): $ 0.4746

Matrix Values ($B) g==v; r==>	4.00%	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%
0.00%	$ 11.87	$ 9.49	$ 7.91	$ 6.78	$ 5.93	$ 5.27	$ 4.75
1.00%	$ 15.82	$ 11.87	$ 9.49	$ 7.91	$ 6.78	$ 5.93	$ 5.27
2.00%	$ 23.73	**$ 15.82**	**$ 11.87**	**$ 9.49**	**$ 7.91**	**$ 6.78**	$ 5.93
3.00%	$ 47.46	**$ 23.73**	**$ 15.82**	**$ 11.87**	**$ 9.49**	**$ 7.91**	$ 6.78
4.00%	--	**$ 47.46**	**$ 23.73**	**$ 15.82**	**$ 11.87**	**$ 9.49**	$ 7.91
5.00%	–$ 47.46	--	$ 47.46	$ 23.73	$ 15.82	$ 11.87	$ 9.49
6.00%	–$ 23.73	–$ 47.46	$ --	$ 47.46	$ 23.73	$ 15.82	$ 11.87
7.00%	–$ 15.82	–$ 23.73	–$ 47.46	$ --	$ 47.46	$ 23.73	$ 15.82

	Minimum	Maximum	Median	Mean (Average)
Gross Value ($B)	$ 6.78	$ 47.46	$ 11.87	$ 15.27
Minus Sale Proceeds Used to Retire One Quarter Long-term Debt	$ 6.34	$ 6.34	$ 6.34	$ 6.34
Net Value ($B)	$ 0.44	$ 41.12	$ 5.52	$ 8.93

Source: Calculations from model derived from Company Annual Reports.

This Scenario One for the intrinsic value yields (net of the amount of proceeds used to extinguish one quarter of the firm's long-term debt) a minimum of $440M to a maximum of $41.1B, with a more plausible range of a median (midpoint of the array of projected values) of $5.52B to a mean (simple average) of $8.93B.

Table 7

Market Value, One Quarter of Long-term Debt Extinguished; Net Proceeds

CASE 2: BC Hydro Projections are for FY2025; Fully Taxed, Debt Free

Valuation metrics applied to BC Hydro; ie, Market Value of Common Equity. Figures in $B.	Price to Sales	Forward P/E (Market Value to Estimated Net Income)	Enterprise Value/Revenue (subtracting net debt)	Price to Book Value	Enterprise Value/EBITDA (subtracting net debt)	Price to Operating Cash Flow
Average Six Canadian Renewable-Dominated Utility Companies	$ 24.98	$ 19.04	$ 37.20	$ 30.70	$ 53.00	$ 18.63
Average Six Canadian Non-Renewable-Dominated Utility Companies	$ 12.73	$ 20.16	$ 16.91	$ 14.95	$ 7.89	$ 14.14
Average Seven US-Listed Renewable-Dominated Utility Companies	$ 5.82	$ 5.80	$ 5.82	$ 5.80	$ 17.91	$ 22.87
Average of All Above	$ 13.23	$ 16.84	$ 22.50	$ 21.20	$ 17.73	$ 18.78

Source: Capital IQ via Yahoo!Finance, additional material from BMO-Investorline, Valuation model formulae.

Market Value Using Comparable Companies and Five Viable Valuation Ratios

	Minimum	Maximum	Median	Mean (Average)
Gross Value ($B)	$ 13.23	$ 22.50	$ 18.25	$ 18.35
Minus Proceeds of Sale Used to Extinguish 1/4 LT Debt ($B)	$ 6.34	$ 6.34	$ 6.34	$ 6.34
Total Market Value ($B)	$ 6.89	$ 16.15	$ 11.91	$ 12.01

Source: Calculations based on Company Annual Report financial data, comparison company data from Capital IQ via Yahoo!Finance.

This Scenario One for the market value method yields (net of the amount of proceeds used to extinguish one quarter of the firm's long-term debt) a minimum of $6.89B to a maximum of $16.15B, with a more plausible range of a median (midpoint of the array of projected values) of $11.91B to a mean (simple average) of $12.01B.

Scenario Two:
One Half Long-term Debt Retired; Proceeds Net of Debt Paid Back

Table 8

Intrinsic Value, One Half of Long-term Debt Extinguished; Net Proceeds

CASE 1: Present Value of Projected Fully Taxed Free Cash Flow for FY2025 ($B); Half of Long-term Debt Retired

Present Value of Discounted Free Cash Flow = Estimated Next Year Free Cash Flow (Required Rate of Return ['r'] = Growth Rate ['g'])

Projected Fully Taxed Free Cash Flow for FY2025 ($B): $ 0.6764

Matrix Values ($B) g==v; r==>	4.00%	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%
0.00%	$ 16.95	$ 13.53	$ 11.27	$ 9.66	$ 8.46	$ 7.52	$ 6.76
1.00%	$ 22.55	$ 16.91	$ 13.53	$ 11.27	$ 9.66	$ 8.46	$ 7.52
2.00%	$ 33.82	**$ 22.55**	**$ 16.91**	**$ 13.53**	**$ 11.27**	**$ 9.66**	$ 8.46
3.00%	$ 67.64	**$ 33.82**	**$ 22.55**	**$ 16.91**	**$ 13.53**	**$ 11.27**	$ 9.66
4.00%	--	**$ 67.64**	**$ 33.82**	**$ 22.55**	**$ 16.91**	**$ 13.53**	$ 11.27
5.00%	–$ 67.64	--	$ 67.64	$ 33.82	$ 22.55	$ 16.91	$ 13.53
6.00%	–$ 30.82	–$ 67.64	$ --	$ 67.64	$ 33.82	$ 22.55	$ 16.91
7.00%	–$ 5.65	–$ 30.82	–$ 67.64	$ --	$ 67.64	$ 33.82	$ 22.55

	Minimum	Maximum	Median	Mean (Average)
Gross Value ($B)	$ 9.66	$ 67.64	$ 16.91	$ 21.76
Minus Sale Proceeds Used to Retire Half Long-term Debt	$ 12.68	$ 12.68	$ 12.68	$ 12.68
Net Value ($B)	–$ 3.02	$ 54.46	$ 4.23	$ 9.08

Source: Calculations from model derived from Company Annual Reports.

This Scenario Two yields (net of the amount of proceeds used to extinguish one quarter of the firm's long-term debt) a minimum of negative $3.02B to a maximum of $54.96B, with a more plausible range of a median (midpoint of the array of projected values) of $4.23B to a mean (simple average) of $9.08B.

Table 9

Market Value, One Half of Long-term Debt Extinguished; Net Proceeds

CASE 2: BC Hydro Projections are for FY2025; Fully Taxed, Debt Free

Valuation metrics applied to BC Hydro; ie, Market Value of Common Equity. Figures in $B.	Price to Sales	Forward P/E (Market Value to Estimated Net Income)	Enterprise Value/Revenue (subtracting net debt)	Price to Book Value	Enterprise Value/EBITDA (subtracting net debt)	Price to Operating Cash Flow
Average Six Canadian Renewable-Dominated Utility Companies	$ 36.00	$ 27.44	$ 37.20	$ 30.70	$ 59.34	$ 23.42
Average Six Canadian Non-Renewable-Dominated Utility Companies	$ 18.35	$ 29.05	$ 16.91	$ 14.95	$ 14.23	$ 17.77
Average Seven US-Listed Renewable-Dominated Utility Companies	$ 8.38	$ 8.35	$ 8.38	$ 8.35	$ 17.91	$ 28.74
Average of All Above	$ 19.07	$ 24.27	$ 22.50	$ 21.20	$ 24.07	$ 23.60

Source: Capital IQ via Yahoo!Finance, additional material from BMO-Investorline, Valuation model formulae.

Market Value Using Comparable Companies and Five Viable Valuation Ratios

	Minimum	Maximum	Median	Mean (Average)
Gross Value ($B)	$ 19.07	$ 22.50	$ 18.25	$ 18.35
Minus Proceeds of Sale Used to Extinguish 1/2 LT Debt ($B)	$ 12.68	$ 12.68	$ 12.68	$ 12.68
Total Market Value ($B)	$ 6.38	$ 11.58	$ 10.36	$ 9.74

Source: Calculations based on Company Annual Report financial data, comparison company data from Capital IQ via Yahoo!Finance.

Source: Capital IQ via Yahoo!Finance, additional material from BMO-Investorline, Valuation model formulae.

For easier comparison, the three cases are presented together in the following table.

Table 10

Comparison of Intrinsic & Market Values for One Quarter, Half & No Debt Reduction

	Intrinsic Value (Average of Mean & Median)			Market Value (Average of Mean & Median)		
	2025 Valuation=v	2025 Valuation=v	2025 Valuation=v	2025 Valuation=v	2025 Valuation=v	2025 Valuation=v
Figures in $B.	No Extinguishing of L-T Debt	Extinguishing of 1/4 of L-T Debt	Extinguishing of 1/2 of L-T Debt	No Extinguishing of L-T Debt	Extinguishing of 1/4 of L-T Debt	Extinguishing of 1/2 of L-T Debt
Gross Value (Average of Mean & Median)	$ 4.70	$ 13.57	$ 19.34	$ 11.48	$ 18.30	$ 22.73
Minus Sale of Proceeds Used to Retire Debt	$ 0.00	$ 6.34	$ 12.68	$ 0.00	$ 6.34	$ 12.68
Net Value	$ 4.70	$ 7.23	$ 6.65	$ 11.48	$ 11.96	$ 10.05

Calculations used models incorporating financial results from Company Annual Reports, key financial statistics from peer companies. Note: The Mean and Median for each Case in each Scenario were averaged.

It is apparent that the optimum amount of debt to be extinguished would be one-quarter of long-term debt. However, more sophisticated sensitivity analysis could determine a different proportion.

2. Break-up: Geographic, by Asset Type, Other

BC Hydro is a very widely-dispersed entity, which brings with it the possibility of splitting it into several companies, some of which could be sold off or partially sold off to investors to bring in some cash. As there are so many different ways to do this, the full possibilities are not explored here. Another method could be to separate the company into three entities: generation, transmission, and distribution-retail. This has been done in Ontario and in other jurisdictions.

3. Disruptions from evolving competitive and technological forces

The greatest disruptions affecting the electrical power generating industry currently are a mix of commercial, regulatory, and technological developments. The cost of solar, wind, and other renewable energy has been steadily and substantially declining, and is projected to continue in this trajectory.[6/7] New forms of energy storage, and falling prices of batteries, will make these renewable sources more practical and commercially viable, as well as enable some other new developments outlined later on in this study. Efficiency improvements in horizontal drilling and hydraulic fracturing ('fracking') have helped American shale oil production soar, and the associated gas along with it. This is also becoming a major phenomenon in Canada, and in BC Hydro's territory in the northeastern part of the province. This abundance of gas is a key competitor to many other forms of energy and is projected to remain in surplus for decades, even if exports from North America increase.[8]

While cost is a major attractive feature of natural gas, the flexibility of gas-fired generation is another key factor in its increasing acceptance and big increase in the total generation capacity of North America in the past several years. This flexibility is also very helpful in dealing with the intermittent and undependable nature of renewable power, in that gas generation can be ratcheted up or down without much disruption to the utility.

New or improved batteries will also make it easy for BC Hydro and other utilities to handle demand fluctuation, as well as supply fluctuation, the latter from renewable sources, and there could even be faster growth in capital expenditure on storage than generating capacity in the next few years.[9] However, this revolution in batteries will also enable customers, even relatively small ones, such as small businesses, hotels, hospitals, retirement homes, office buildings, and apartment complexes, smooth out their electricity purchases, and buy when costs are lower. It can also enable them to adopt renewable sources such as rooftop solar panels, and potentially go 'off-grid.' This could be a challenge for the firm in the future.

Other challenges are increasingly affordable fuel cell-type small electric generating facilities using natural gas (there are several competing technologies, many of which are commercially available), or larger, more conventional co-generation ones that also produce heat for industrial or other purposes. As natural gas is available nearly everywhere in BC Hydro's out-of-province territory, it could become a rival to it, unless it gets involved in this line of business itself. Another threat, or opportunity, is merchant power. Customers in Alberta, Washington State, Idaho, and elsewhere already take advantage of this.

4. Readying BC Hydro for Sale

Utilities usually pay a dividend to investors. The company is showing sufficient income statement accounting-based net income to pay a small dividend, but, given current low cash generation, investors may not consider the dividend sustainable. So, some investors that like a substantial and growing dividend my not find BC Hydro attractive once it is floated, if its Board decides that it cannot afford such a dividend. The company currently has negative free cash flow and low returns on assets, equity and capital employed. There will need to be operational improvements to foster a period of improved margins before the company issues any equity to the public so that higher value can be realized in any such sale. Fortunately, capital spending is falling, which will improve free cash flow.

It is not crucial that the company have positive free cash flow, but improving operating cash flow (cash income before capital expenditures) will be encouraging to prospective investors. If the company has a credible plan to improve its fleet of assets and to address most, if not all, of the challenges noted above in its competitive strategy, and can show it can be resilient if electric demand growth is slow or variable and customers are fickle, then it can be sold at an attractive valuation for the seller, even if the growth outlook is modest and the array of threats noted earlier remain formidable. However, the low metrics for returns on capital are cautionary; they need to be improved, or there needs to be a logical and confidence-inspiring plan to do so.

Finally, and obviously the company's heavy debt load needs to be reduced. There is a chance that use of some of the sale proceeds to reduce the overall debt outstanding will make it tolerable for the future shareholders. Some examples of such scenarios were shown earlier.

CONCLUSION

In general, entirely private sector companies tend to perform better than those within the government orbit or ownership. Crown ownership of a company exposes taxpayers, citizens, and even customers and suppliers to the risks of business and economic and technological trends that are unnecessary to experience; that is what private investors, institutional, individual or corporate undertake in nearly every sector of the economy. In the past, these sorts of risks did not seem to apply to such a staid, dull, slow-change industry such as electric utilities. That is not true anymore.

Merchant power producers are stirring up change, and regional governments in North America are encouraging them to compete with the established utilities such as BC Hydro. In addition, large, and, now, even some smaller consumers of power are entertaining the idea of producing some or all of their own power. New advances in battery technology and natural gas generation are making that feasible. BC Hydro's hydro-electric facilities are a low-marginal cash cost fleet of assets, aside from the debt burden, but hard to expand, and face investor reluctance to finance such expansion, given projected low demand growth for electricity in North America.

Even harder to do will be to make BC Hydro, whether or not it is divested in whole or in part, a flexible, versatile, dynamic, and fast-evolving competitive, customer-responsive player in the new energy marketplace, given its limited potential roster of customers. It could actually become so, as its abundant hydro-electric power make it an ideal 'virtual battery' for intermittent wind and solar power elsewhere in North America. This may require additional capital investment, and of the right kind, with the right strategy, to become successful and a valuable company for its new owners, or, at least, to become not a burden if it stays a Crown entity.

A successful flotation requires explicit and credible declarations from the current owner that it will not meddle in any aspect of BC Hydro's operations, strategy, or governance, no matter how tempting that may be for populist politicians. There must be institutional mechanisms created so that near-fatal disasters like the Peace River Site C project are nearly impossible to happen again.

That independence and removal of the risk of bad governance can only be guaranteed if BC Hydro is totally removed from politicians' clutches; i.e., if it is divested to other, private sector investors. The province will almost certainly have to do so anyway, as BC Hydro's massive debt should be restructured to be more sustainable, and it is unreasonable to expect provincial taxpayers fund such a restructuring through higher taxes or ever-escalating power rates (currently planned) if the provincial government does not contribute to the restructuring itself.

APPENDIX 1:

RATIONALE FOR DIVESTITURE OR PRIVATIZATION

While it is up to the people through their elected representatives to decide if a Crown corporation or other government agency or entity should be sold or otherwise privatized and the proceeds used for the benefit of all citizens and taxpayers, there are some established reasons to embark on such a path, some or all of which are cited for divestiture of such enterprises but may not be applicable in any single, specific case.

1. The government has no mandate to own or run a commercial enterprise. The provision of citizens' safety, security and justice is the government's primary role, and its involvement in the economy should generally not extend beyond this.

2. Regulation can usually accomplish any public policy reason for direct involvement in an industry. If regulation is not easily feasible, then a direct contract or subsidy to any affected individuals, entity or entities may be more efficient or effective and less economically disruptive or costly.

3. If a government-controlled or sponsored enterprise has a monopoly position, near-monopoly, or effective monopoly in a line or lines of business or businesses, then opportunities are lost in one or more commercial or potentially commercial sectors for entrepreneurs and investors to try to create and grow businesses to enrich and sustain themselves, employees, suppliers, and others.

4. A monopoly, near-monopoly, or effective monopoly market position by a government-owned or sponsored entity could result in far higher prices for customers, the general public, or a section of the public, than would be the case in a fully competitive marketplace for the industry involved.

5. A government-owned or -sponsored enterprise may compete directly against private sector firms, which are owned by or employ citizens, or against individual citizens, all of whom the government is supposed to serve, not disadvantage.

6. The government-owned or -sponsored enterprise may compete unfairly against its private sector rivals in that it had or has access to lower-cost government-sourced and -guaranteed capital (debt). It may have a much larger debt component in its capital versus that which would be tolerated in the private sector. Thus, it may not have to meet high standards for profit and cost control, allowing it to offer lower than true free market-based competitive pricing.

7. Government-owned firms may not need to pay provincial or federal income taxes. This can allow such firms to supply goods or services more cheaply than the private sector companies they are competing with.

8. Government-owned or -sponsored enterprises may not have any kind of profit orientation or target, may be used as public policy vehicles and may be given preference in their activities or even in their transgressions, such as labour or environmental abuses.

9. Government-owned or -sponsored enterprises, by virtue of being public sector vehicles overseen by bureaucrats and politicians, may be places where favoured individuals find employment, particularly at management levels.

10. Since profit is a secondary goal of a government-owned or -sponsored enterprise, it is difficult to evaluate the effectiveness, efficiency or productivity of the enterprise or its employees. Consequently, these employees and assets may not be very productive or effective.

11. Government-owned or -sponsored enterprises are often creations of certain time-fixed circumstances and outlive whatever use or public policy role their creators may have conceived. Often, advances in technology; the modernization of transport, telecommunication or information technology; the evolution of the economy and available products and services and the increasing standard of living make these enterprises potentially obsolete. In the private sector, firms and individuals must adapt and evolve, or decline.

12. Government-owned or -sponsored enterprises perpetuate their possibly obsolete existences by virtue of the constituencies that build up around them: employees, managers, directors and bureaucrats, customers, suppliers and associated advocates or consultants. They can lobby to keep the enterprise going, despite dysfunction or losses. They are far more motivated to do so than are the taxpayers, whose average cost is much less per person and may be indirect, hidden or difficult to calculate.

13. Because they are not profit-oriented, government-owned or -sponsored enterprises are usually less efficient, and thus they lower the overall efficiency of the entire economy. This can make a whole nation less competitive than its global rivals are, whether nations or individual companies. The effects are worse the greater the government involvement in the economy. When taken to its most extreme, as happened in 20th-century communist nations, the countries were unable to compete against capitalist companies, despite their immense direct and indirect subsidies, government support and the lack of profit requirement.

14. Funds tied up in the capital of government-owned or -sponsored enterprises could be used to reduce government debt or lower taxes on individuals or corporations, which they could then spend or invest as they freely choose, and thus they could inject money back into the economy in more-lucrative and -constructive ways.

15. Governments, generally, have a poor record of picking winners, or creating or owning enterprises that have market-competitive profitability, or attractive returns on assets, equity, or even returns that exceed governments' own cost of debt service. If, rarely, they actually do, it generally turns out that they have been provided unusually good market, operational, regulatory, or other conditions not available to other, investor-owned firms.

16. The greater the number and size of government owned or government sponsored enterprises in an economy, the greater the size and power of the government, which is usually the largest single entity in society, increasing the dangers of abuse of power, including injuring individual citizens, companies, or groups. Effective capacity of opposition or recourse against this power diminishes as the portion of the economy the government occupies increases.

ENDNOTES

1. See: https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/accountability-reports/financial-reports/annual-reports/BCHydro-Quick-Facts-2018.pdf.
2. See: https://www.bchydro.com/about/who_we_are/history.html#gaslights.
3. See: http://www.prhp.ca/.
4. See: https://business.financialpost.com/commodities/energy/b-c-to-proceed-with-controversial-site-c-dam-cost-soars-to-10-7-billion.
5. See: https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/accountability-reports/financial-reports/annual-reports/BCHydro-Crown-Corporation-2017-18-Annual-Report.pdf, p 70 [8].
6. See: http://www.reeem.org/wp-content/uploads/2018/04/Pablo-Ralon-IRENA.pdf.
7. See: http://www.reeem.org/wp-content/uploads/2018/04/Pablo-Ralon-IRENA.pdf.
8. See: https://www.mckinsey.com/solutions/energy-insights/north-american-gas-outlook-to-2030.
9. See: https://www.mckinsey.com/business-functions/sustainability/our-insights/battery-storage-the-next-disruptive-technology-in-the-power-sector.

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