McCULLOUGH RESEARCH

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PRINCIPAL

BACKGROUNDER

DELOITTE LLP's TWO SITE C REPORTS

On Friday, September 8, 2017, Deloitte issued two complex technical reviews of British Columbia Hydro's Site C project. The first reviews the construction plans, contracts, and progress at the project. The second report opines on the load forecast, resource alternatives, and overall modeling.

The two reports largely agree with the thousands of pages of submissions submitted by opposing third parties to the British Columbia Utilities Commission on or before August 30, 3017, although a number of Deloitte's estimates are more favorable to Site C than official estimates from elsewhere in the U.S. and Canada.[1]

A reply submission including a further report on the implications of the Deloitte Reports for the future of Site C will be released on Wednesday, September 13, 2017.

Key Deloitte Findings:

On Delays and Cost Overruns – There is likely to be a cost overrun of $.8 to $4.3 Billion or ten percent to fifty percent.

1. Site C faces a real risk that it could miss the 2019 Start of River Diversion costing BC Ratepayers $.8 to $4.3 billion more.[2]

2. Canadian hydroelectric dams usually experience significant delays and cost overruns. Recent projects in Manitoba and Newfoundland had cost overruns of 55% to 90%.[3]

[1] Wind is a good example. Although expansion of wind resources is proceeding rapidly elsewhere in North America, British Columbia Hydro has determined these options are not feasible in British Columbia. Neighboring (and similar) jurisdictions like the U.S. states of Oregon and Washington have developed ten times the level of existing wind capacity as British Columbia at considerably less than British Columbia Hydro's assumed costs.
[2] Site C Construction Review, Deloitte, September 8, 2017, page 16.
[3] Ibid., page 36.

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On Energy Demand – Site C is not needed.

3. BC Hydro systematically overestimates demand for electricity by up to 30.8%.

4. Deloitte's revised forecast shows that Site C is not needed. Put another way, the amount by which BC Hydro has exaggerated forecast demand for electricity is larger than the capacity and energy provided by Site C – 1,100 MW and 5,100 GWh respectively.

5. Both Deloitte and BC Hydro forecast higher inputs for the demand for electricity than Bloomberg, Wood Mackenzie, ABB Power and PIRA Energy.

On Alternatives to Site C – There are environmentally friendly and less costly alternatives to Site C.:

6. Deloitte used their revised electricity demand forecast and power generation options to produce an environmentally friendly and with an apparently less costly power generation portfolio existing hydro upgrades, geothermal, and wind.

7. In its power generation portfolio, Deloitte used a price for wind power that is higher than the price achieved elsewhere in North America.

Report 1: Deloitte's Site C Construction Review

Overall, Deloitte reports that Site C is likely to miss the 2019 Start of River Diversion. Deloitte predicts a possible delay costing as much as $.8 to $4.3 billion.[4] Although possible delay milestone is pivotal, the British Columbia Hydro submission makes passing references to it – none of which specifically addresses the significance or the potential cost.[5]

Suspending the project will cost $1.4 billion.[6] British Columbia Hydro estimates that suspension will cost $1.2 billion.[7]

[4] Site C Construction Review, Deloitte, September 8, 2017, page 2.
[5] BC Hydro Submission to the British Columbia Utilities Commission Inquiry into the Site C Clean Energy Project, British Columbia Hydro, August 30, 2017, pages 35 and 37.
[6] Site C Construction Review, Deloitte, September 8, 2017, page 3.
[7] BC Hydro Submission to the British Columbia Utilities Commission Inquiry into the Site C Clean Energy Project, British Columbia Hydro, August 30, 2017, page 5.

Terminating the project will cost $1.2 billion.[8] British Columbia Hydro estimates that termination direct costs are approximately the same.[9]

Deloitte found substantial evidence that Canadian hydroelectric dams usually experienced significant delays and cost overruns – summarizing recent projects in Manitoba and Newfoundland with overruns ranging from 55% to 90%.[10] British Columbia Hydro rejected the peer-reviewed research on the issue as being "swayed by outliers" with no mention of recent and current Canadian projects.[11]

Report 2: Deloitte's Site C Alternative Resource Options and Load Forecast Assessment

The second report is even more critical of British Columbia Hydro's analyses, but significantly more complex to read. The primary conclusions are:

Deloitte extensively documents the upward bias of previous British Columbia Hydro forecasts citing overestimates from past forecasts:

- by 4.5% of actual loads over five years,
- 12.2% of actual loads over ten years,
- 15-year forecasts were overestimated on average by 18.0% of actual loads,
- forecasts were overestimated on average by 30.8% of actual loads over twenty years.[12]

Deloitte's more accurate load forecast indicates that capacity loads will be lower by 1,140 to 1,160 megawatts.[13] Corresponding energy loads are overstated by 6,000 to 6,500 GWh.[14] The exaggerated British Columbia Hydro forecasts are actually larger than the capacity and energy provided by Site C – 1,100 MW and 5,100 GWh.[15] In its submission, BC Hydro maintains that their forecasts are dependable.

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[8] Site C Construction Review, Deloitte, September 8, 2017, page 4.
[9] BC Hydro Submission to the British Columbia Utilities Commission Inquiry into the Site C Clean Energy Project, British Columbia Hydro, August 30, 2017, page 62.
[10] Site C Construction Review, Deloitte, September 8, 2017, page 36.
[11] BC Hydro Submission to the British Columbia Utilities Commission Inquiry into the Site C Clean Energy Project, British Columbia Hydro, August 30, 2017, Appendix T, page 6.
[12] Site C – Alternative Resource Options and Load Forecast Assessment, Deloitte, September 8, 2017, page 63.
[13] Site C – Alternative Resource Options and Load Forecast Assessment, Deloitte, September 8, 2017, page 6.
[14] Ibid., page 6.
[15] BC Hydro Submission to the British Columbia Utilities Commission Inquiry into the Site C Clean Energy Project, British Columbia Hydro, August 30, 2017, Appendix P, page 12.

Both forecasts – Deloitte and British Columbia Hydro are likely to be higher than actual loads since British Columbia Hydro loads have been flat for the past decade and a return to rapid growth seems doubtful given challenges facing British Columbia's paper and LNG sectors. Alternative load forecast inputs provided by Bloomberg, Wood Mackenzie, ABB Power and PIRA Energy are lower than British Columbia Hydro's.[16]

Deloitte identified a wide variety of resources generally not described in British Columbia Hydro's submissions. The most significant of these are additions to existing hydro projects that can be implemented at much lower costs.[17]

Backed by extensive research, Deloitte questions British Columbia's rejection of wind and geothermal projects.[18] Deloitte maintains a less positive view of the price of wind power than authorities in the United State who estimate that prices have fallen 65% since 2010.[19]

Finally, Deloitte used their load forecast and revised resources to produce an environmentally friendly and potentially less costly resource portfolio that does not include Site C.[20]

It should be noted that Deloitte has not provided an apples to apples comparison with British Columbia Hydro's portfolio, but the components in their portfolio are less expensive than those chosen by British Columbia Hydro and it is rational to expect that the entire portfolio will be less expensive than Site C.

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[16] Site C – Alternative Resource Options and Load Forecast Assessment, Deloitte, September 8, 2017, page 74.
[17] Site C – Alternative Resource Options and Load Forecast Assessment, Deloitte, September 8, 2017, page 40.
[18] Site C – Alternative Resource Options and Load Forecast Assessment, Deloitte, September 8, 2017, page 39.
[19] For example, "Levelized Cost of Energy Analysis – Version 9.0.", Lazard, December 2016, page 3.
[20] Site C – Alternative Resource Options and Load Forecast Assessment, Deloitte, September 8, 2017, page 113.