

## STIRLING LLP\*

Suite 1460 | 701 West Georgia Street  
PO Box 10156 LCD Pacific Centre  
Vancouver, BC V7Y 1E4

t. [604.674.3818](tel:604.674.3818)

f. [604.674.3819](tel:604.674.3819)



**STIRLING**  
BUSINESS LAW

For more information contact David Austin  
[daustin@stirlingllp.com](mailto:daustin@stirlingllp.com)

### Calculating the costs of pulling the plug on Site C

By Nelson Bennett | July 18, 2017

Editor's note: The original story has been corrected to change a reference to the joint review panel's recommendations on Site C from "recommended" to "made 50 recommendations."

"I cannot see what is stopping Site C. They [the BC Liberal government] should be carving out their niche with the Site C dam."

That was BC Green Party Leader Andrew Weaver, speaking to the Globe and Mail in 2009, before he had entered politics. As a climate scientist, Weaver had argued in favour of a major clean-energy project for B.C.

Weaver is now opposed to the \$8.8 billion project, which faces the prospect of being halted by a Green-backed minority BC NDP government.

One of the first orders of business for the NDP government's new cabinet will be referring the hydroelectric dam project to the British Columbia Utilities Commission (BCUC) for review. The BC Liberal government deliberately bypassed the BCUC when approving the project.

"It's certainly in the first tier of things that the government will have to address," said Adrian Dix, who, as the NDP's energy critic, has scrutinized both BC Hydro and Site C dam.

Regardless of what the BCUC recommends, it's ultimately up to the new NDP government to decide whether or not to proceed with it.

Marvin Shaffer, an adjunct economics professor at Simon Fraser University's (SFU) public policy program, argued before a joint review panel that the dam is not needed on the current timelines. But halting it now would leave taxpayers on the hook for \$2 billion to \$4 billion of sunk costs, without getting a single electron of new power, he said.

"One way or the other, either ratepayers or taxpayers are going to have to pay the \$2 billion to \$4 billion of sunk costs, without [getting] anything for it," he said.

Site preparation on the new dam began in 2015. The work is now 20% complete, and \$1.75 billion has been spent. Contracts worth a total of \$4 billion have been awarded for work that is either just starting or not yet begun.

Although the government would save \$4 billion to \$5 billion by not building the dam, there would be expenses associated with halting it.

“Assuming that if the government decides to cancel it, they would want the site remediated to the state it was in before the construction started,” said Chris Gardner, president of the Independent Contractors and Businesses Association. “So you’d have the dollars that have already been spent, the penalties that would apply to breaking some of the contracts, and then the remediation costs. So it would be a significant amount of money that taxpayers would be on the hook for.”

Since demand is flat, B.C. does not currently need any major new sources of power. In the long term, however, population growth, wider adoption of electric vehicles and pressure to phase out natural gas for home heating mean B.C. will eventually need more clean power.

Statistics Canada projects B.C.’s population will grow by between 598,000 and two million over the next two decades. That alone will mean a significant demand for additional power.

“If, as suggested, another million people move into British Columbia in the next 20 years, we aren’t going to see a flat demand curve,” said Blair King, an environmental scientist who writes about energy issues on his A Chemist in Langley blog. “Demand is going to rise with the added people coming into the country.”

NDP, Green energy policies could clash

Provided a minority NDP government lasts long enough to have to grapple with the issue, it could find itself at loggerheads with the Green party over meeting B.C.’s future power needs.

In explaining his reversal on Site C, Weaver has said one reason was the negative impact it has had on the independent power sector. The Greens support the idea of revitalizing the sector by building new wind, solar and geothermal power projects.

But the NDP isn’t exactly gung-ho about independent energy. When he was energy critic, new Premier John Horgan referred to the wind, run-of-river and biomass energy projects built by the independent power sector as overpriced “junk power.”

Horgan has argued that B.C. doesn’t need any new clean-energy projects when it can simply exercise its rights to power through the Columbia River Treaty. (Under that treaty, B.C. has an option to use Columbia River hydro power from the United States, but the province has opted to sell its allocation back to the U.S.)

Horgan has an ally there in Harry Swain, the University of Victoria professor who chaired the joint review panel that made 50 recommendations on Site C, and later criticized the panel's mandate as being too restrictive.

He, too, has suggested exercising B.C.'s option on the Columbia River Treaty, which could supply nearly as much power as Site C would at a fraction of the cost. Horgan has also suggested that B.C. could supplement any electricity deficits by buying power on the spot market from Alberta and the U.S. As King points out, however, cheap spot-market power may soon be a thing of the past. California plans to shut down its last nuclear power plant, and Washington and Alberta are phasing out coal power.

"There isn't going to be any cheap power to buy," King said. "I'm not sure who he thinks we're buying the power from, if we can't buy it from Alberta, we can't buy it from Washington, we can't buy it from California. Any excess power Washington or Oregon might produce is going south to California because they can get huge bucks from it."

He added that exercising its rights to power under the Columbia River Treaty might allow the province to meet its additional power needs for population growth – but would fall far short of satisfying demand if there were a massive increase in electric vehicle adoption and a phasing out of natural gas.

"If you think that we're going to keep using natural gas and gasoline, then maybe the Columbia will provide us with enough power for the million people that come to B.C.," he said. "If we actually are going to meet our climate change needs, then it's not going to come close."

Hydro versus wind, solar and geothermal

While wind, solar and geothermal may be the best clean-energy alternatives for regions that aren't blessed with hydro power, King said he thinks Site C dam is the best option for B.C.

"BC Hydro has done the math," he said. "It's not like they've been ignoring this. They've priced it out. They've brought in consultants who looked for where we can do this, and the actual numbers that they've produced – which are entirely defensible – show that these fuels are not as cheap as they make them out to be."

Andrew Rowe, director of the Institute for Integrated Energy Systems at the University of Victoria, appears to agree.

"While other renewables can and should be exploited to provide energy services, it is problematic to argue that as solutions solar and wind are cheaper than Site C," he recently wrote in Policy Options.

David Austin, a lawyer specializing in energy for Clark Wilson LLP, disagrees. The cost of large-scale hydro and run-of-river hydro haven't gone down, whereas the cost of wind and solar power continue to fall, he said.

"Thirty years ago, when we did a large hydro project, it was the only renewable in sight," Austin said. "Now it's got competition from wind and solar, and as wind and solar continue to drop, once I've locked into my large hydro, I've locked it in for 70 years.

"You've locked into that for 70 years and what's happening is there's this huge technological revolution that you're ignoring."

While it's true the costs of wind turbines and photovoltaics have been dropping dramatically, there are other costs associated with wind and solar energy – transmission, for example.

SFU's Shaffer said not only the costs need to be considered, but also the value. Because hydro power is reliable and flexible, it is more valuable than intermittent power. Dams are like big batteries that can be turned on or off as needed, allowing the province to trade power at a profit. It gives B.C. a major advantage over other states or provinces.

"Wind and solar don't provide any of that," Shaffer said. "In fact, they're the opposite. You accept that power whenever it comes, even if there are enormous surpluses in adjacent jurisdictions, such that the power prices are lower or even negative. That's why Site C is a much more valuable source of supply than wind and solar and some of the others."

The best wind assets in B.C. are in remote locations, which means they require transmission lines to tie them into the grid. Wind farms produce power only 30% to 40% of the time – when the wind is blowing – and have an average lifespan of about 25 years, according to the National Renewable Energy Laboratory (NREL), whereas a hydroelectric dam has a typical lifespan of 50 to 100 years.

Solar is more predictable, producing power in daylight hours, but would be appropriate for only the more arid areas of B.C., like the Okanagan. And like a wind turbine, a typical solar installation lasts about 25 years before it needs to be replaced, according to the NREL.

Other than hydro power, B.C.'s best option for firm renewable energy may be geothermal, though it wouldn't be cheap.

B.C. has good geothermal potential, due to its location within the Pacific Ring of Fire. Once tapped, hot saline aquifers can provide a constant source of steam to drive turbines to generate power around the clock. In some cases, that saline brine could also be used to produce lithium – a commodity that is growing in demand, thanks to lithium-ion batteries in electric vehicles (see Q+A on page 11).

But as King points out, some of the best geothermal assets in B.C. are located in parks and wilderness protected areas, may require hydraulic fracturing and could be very expensive to develop.

“Geothermal is an excellent energy potential but it’s got some very serious challenges as well,” King said. “Because of the nature of our geology, oftentimes you drill a \$10 million hole and you can’t use it for geothermal because it’s too tight. So even the best locations are going to have to massively frack in order to get the geothermal energy available for your unit.

“So if you don’t like fracking, then geothermal isn’t for you; if you don’t like drilling in parks, then geothermal isn’t for you. We also have regulatory challenges right now that maybe the new government can fix with regards to how tenure is developed for geothermal.”

He said tenures B.C. provides for geothermal are not long enough for investors to justify their upfront investments.

“If you want to invest, you can make it happen,” King said. “But it’s not going to be cheap power.”

nbennett@biv.com

@nbennett\_biv

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