

**WILL RECENT LNG PROPOSALS WITHER FOR LACK OF CLEAN ELECTRICITY?**

In recent weeks there have been a number of announcements concerning potential LNG processing and export terminals in and around Kitimat. While final investment decisions have yet to be made, the provincial government's new energy action framework requires new projects to be "carbon neutral" by 2030 to be considered for provincial approval.

The \$3.3 billion Cedar LNG terminal, headed up by the Haisla First Nation, plans use electricity to compress about 3 million tonnes annually of natural gas for export. The Ksi Lisims project, headed by the Nisga'a First Nation, also proposes to use electricity to compress and export some 12 million tonnes annually. The third potential development is Phase 2 of the LNG Canada project, which has already received regulatory approval.<sup>1</sup> The second phase may use electricity to compress some 14 million tonnes annually.<sup>2</sup>

While this growth of a net zero emission LNG export industry sounds enticing, does not appear to be realistic given the limited supply of hydroelectricity available for the next 10 to 15 years.

**BC Hydro's Current Electricity Demand Forecast**

BC Hydro developed its most recent long-term Integrated Resource Plan (IRP) based on four objectives; keeping costs down for customers, reducing greenhouse gas emissions, limiting land and water impacts, and supporting the growth of B.C.'s economy.<sup>3</sup> The plan shows a surplus of Domestic power until the end of the current decade, then additional generating capacity will be required.<sup>4</sup>

BC Hydro's current three-year rate request to the BC Utilities Commission projects a baseline scenario where most of the growth in GWh sales comes from the oil and gas/LNG sector and from the growth in electric vehicle (EV) GWh requirements. Between 2022/23 and 2032/33, oil and gas/LNG sales are forecast to increase by approximately 3,800 GWh, and remain at this level until 2040/41. An increase of only

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<sup>1</sup> The 14 million tonne per annum Phase 1 is under construction and will use natural gas to compress the gas for export.

<sup>2</sup> LNG Canada has approval to use natural gas powered turbines for Phase 2 pending the availability of clean power; <https://www.reuters.com/business/energy/electricity-constraints-force-canadas-first-lng-terminal-delay-renewable-shift-2023-01-16/>

<sup>3</sup> <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/integrated-resource-plans/current-plan/integrated-resource-plan-2021.pdf> p. 49.

<sup>4</sup> Ibid., p. 51.

some 3,800 GWh in sales for the oil and gas/LNG sector over the next 18 years does not include the larger LNG electrification projects now being proposed. Further details of the forecast are shown in the Appendix.

## Potential New Load Requirements

The recent announcements about new electricity powered “net zero” LNG facilities has prompted some observers to question how BC Hydro will be able to supply enough clean electricity to these projects. On 15 March 2023, Vaughn Palmer, commenting on Premier Eby’s conversion to BC being “a clean energy superpower,” noted that there will be a need for much more generation and transmission infrastructure.<sup>5</sup>

On 22 March 2023, Rob Shaw asked a similar question: “Where’s all that new electrical power going to come from?”<sup>6</sup>

To understand the size of the potential requirement we need to have a reasonable estimate of the current and potential load requirements created by the new LNG initiatives. The following data on estimated GWh requirements was provided by Eoin Finn to the writer. BC Hydro declined to confirm these GWh estimates citing client confidentiality.

### LNG PROJECTS—SIZE AND POTENTIAL GWh REQUIREMENT

		Output*	GWh
1	Woodfibre LNG	2.1	1,200
2	LNG Canada Ph. 1 (gas)	14.0	1,400
3	FortisBC Tilbury	3.8	2,100
4	LNG Canada Ph 2. (elec.)	14.0	6,500
5	Cedar LNG	3.0	1,500
6	Ksi Lisims LNG	12.0	5,800
7	<b>TOTAL</b>	<b>48.9</b>	<b>18,500</b>

\*Output is millions of tonnes per annum (MTPA).

As noted earlier, most of this potential LNG processing growth in electricity sales is not in BC Hydro’s current long term load plan. The plan, with Site C’s 5,100 GWh coming fully onstream by 2026, shows a surplus in Domestic generation for most of this decade, swinging to a deficit by 2030/31. By 2036/37 the plan forecasts a shortfall of some

<sup>5</sup> <https://vancouversun.com/opinion/columnists/vaughn-palmer-ebys-2030-green-plan-needs-more-hydro-fast>  
See also <https://vancouversun.com/opinion/columnists/vaughn-palmer-lng-hopefuls-falling-in-line-with-net-zero-if-b-c-hydro-can-deliver>

<sup>6</sup> <https://biv.com/article/2023/03/rob-shaw-ebys-banks-electricity-now-we-just-have-find-it>

5,200 GWh.<sup>7</sup> If all of the potential LNG electrification demands materialize (items 3 to 7 in Table 1) the shortfall would increase to approximately 21,000 GWh.<sup>8</sup> This is equivalent to four additional Site C dams.

Some of the growth may be mitigated by enhanced conservation (demand side management) and time of use billing features, but these offsets have already been included in BC Hydro's forecast. However, if the IPP purchases were maintained at current levels the shortfall would decline by some 5,000 GWh, or one Site C (see Appendix).

### **Is the New Energy Action Framework Realistic?**

The cap on emissions that is at the heart of the new action framework has been applauded by some key environmental groups. The Pembina Institute stated that; "Before this announcement, LNG production was simply incompatible with the CleanBC plan. The production of gas and the process of liquifying it requires enormous amounts of energy. Now, we will have policies that ensure B.C.'s 2030 oil and gas sector target will be met and B.C. will be doing its part to meet the federal oil and gas cap."<sup>9</sup>

Yet without the generation of much more hydroelectricity, or other forms of clean power, the equation does not add up. Either the new LNG projects are stillborn, or they use natural gas to condense the product (the practice of most LNG plants in the world) and compromise the government's net zero emissions objective.

### **The Price to Generate More Hydroelectric Power**

At some point the economics of constructing new generation plants and transmission lines must be considered. No doubt the proponents of the new LNG projects are now calculating the economics of their business cases in light of the new requirement to use clean energy to compress the natural gas.

But what is the cost to BC Hydro customers of new generation and transmission lines? Power from the \$16 billion Site C project could cost about \$130/MWh to \$150/MWh to produce, and sell for a Large Industrial price of approximately \$65/MWh (2021/22 price).<sup>10</sup> The agreement that the BC government signed with LNG Canada, which will be

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<sup>7</sup> [https://docs.bccub.com/Documents/Proceedings/2021/DOC\\_65128\\_B-8-BCH-responses-to-Interveners-IR-No1-Public.pdf](https://docs.bccub.com/Documents/Proceedings/2021/DOC_65128_B-8-BCH-responses-to-Interveners-IR-No1-Public.pdf) pdf 1264/3232.

<sup>8</sup> The IRP forecast of a 6,000 GWh shortfall plus 15,900 GWh for the four LNG projects.

<sup>9</sup> <https://energi.media/opinion/bc-energy-action-framework-closes-a-major-gap-in-cleanbc-plan/>

<sup>10</sup> Currently, the export price of surplus Domestic power is higher due to higher natural gas prices, see <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/accountability-reports/financial-reports/annual-reports/21-22-bc-hydro-annual-service-plan-report-final.pdf> p. 22.

the template for other agreements, committed BC Hydro power for approximately \$48/MWh, well below the price charge to other Large Industrial users.<sup>11</sup>

Are future BC Hydro customers to fund a subsidy to the LNG proponents if the power is sold at less than cost (including rising debt service cost)? Premier Eby said the creation of new generation and transmission capacity would not negatively impact the cost to BC Hydro's customers; "It's a complicated piece of work, but it's a critical piece of work that we need to deliver."<sup>12</sup>

This appears to be another fundamental issue that is being lost in the spin of a net zero emission future.

### **Additional Independent Power?**

The Independent Power Producers (IPP) see the net zero plan as an opportunity to have BC Hydro fund a new dawn for privately owned power generation. Premier Eby announced a new major-projects office to fast-track "clean-energy" projects together with a task force at BC Hydro aimed at accelerating electrification. Cole Sayers of the Clean Energy BC (the IPP association) was optimistic that the new focus on the expansion of clean energy would result in more private power generation: "The next logical step is going to be my industry, that they realize even with (the Site C dam) we're going to need a lot more power."<sup>13</sup>

As a result of the surplus in recent years in Domestic generation BC Hydro has not approved any significant number of new IPP projects. In fact, BC Hydro is forecasting a significant decline in IPP power purchases. This forecast may change with the potential increase in demand for clean energy. However, many of the IPP projects are run-of-the-river generators with little or no storage capability. This means that most of the power is generated in the spring and fall when there is an abundance of hydro power (and lower prices for export).

### **Other Sources of Clean Power**

The Columbia River Treaty is in the early stages of re-negotiation and could contain approximately 4,400 GWh of hydroelectric power for repatriation (the Canadian Entitlement).<sup>14</sup> To reclaim this power to fund some of the LNG need would have a variety of ramifications.

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[https://policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2019/05/CCPA\\_BC%20Critiquing%20the%20LNG%20Canada%20agreement\\_FINAL\\_190506.pdf](https://policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2019/05/CCPA_BC%20Critiquing%20the%20LNG%20Canada%20agreement_FINAL_190506.pdf) p. 3.

<sup>12</sup> <https://vancouver.sun.com/opinion/columnists/vaughn-palmer-ebys-2030-green-plan-needs-more-hydro-fast>

<sup>13</sup> <https://vancouver.sun.com/business/energy/bc-hydro-task-force-kindles-hope-for-independent-power-producers>

<sup>14</sup> [https://en.wikipedia.org/wiki/Columbia\\_River\\_Treaty](https://en.wikipedia.org/wiki/Columbia_River_Treaty)

A second source of power would come from imports from other (mostly US) jurisdictions. There are issues of cost involved, as well as certifying that this power is from clean sources, rather than being produced by fossil fuels.

### **The Policy Trade-Off**

The apparent lack of a significant source of new hydroelectricity will pose a major hurdle for the proponents of additional LNG export projects who must now achieve a net zero emission target by 2030. BC Hydro simply does not have the owned MW capacity, and relying on additional run-of-the-river private generation projects may not produce sufficient base power at all times of the year.

The government appears too sanguine that its new net zero emissions policy will achieve its environmental goals and allow new LNG export projects to proceed. The fundamental dilemma was apparent as early as 2017, when an energy planning consultancy stated: “Unfortunately, and despite outward confidence on the part of [BC Hydro], it is increasingly unlikely that BC Hydro will have the electricity required to support both baseline provincial demand and the future demand growth driven by electrification. Changes in electric generation planning ...will be necessary, as BC Hydro will need more electricity, and it will need it a lot sooner than the utility thinks it will.”<sup>15</sup>

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The writer is a retired senior BC government public servant whose paper describing the BC government’s manipulation of the finances of BC Hydro from 2008 to 2014 was published by *BC Studies* in November 2016. *BC Studies* published his paper on the 40-year financial history of ICBC in 2013. He is an intervener in the BC Utilities Commission’s reviews of ICBC’s and BC Hydro’s rate requests.

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<sup>15</sup> <https://www.keppelgate.com/policy/2019/2/7/bc-hydro>

## APPENDIX

BC Hydro provided the following system demand and supply forecast in response to information requests in November 2021. This was part of the current BCUC review of its 2022/23 to 2024/25 rate request submission.

BC Hydro is forecasting an increase in owned supply resulting from the operation of the Site C generating facility, but a major reduction in IPP purchases.

Growth in the electronic vehicle (EV) and in the oil and gas and LNG sectors are shown separately but included in the total demand figures.

### SYSTEM LOAD FORECAST WITH EXISTING AND COMMITTED RESOURCES (GWh)

	2023/24	2029/30	2035/36	2040/41
Supply –owned	46,900	52,184	52,184	52,184
IPP	13,590	11,892	8,611	7,631
Total	60,490	64,076	60,795	59,815
Demand –EV	400	e1,500	2,840	4,270
Oil/Gas/LNG	3,964	6,664	6,678	6,662
Total	61,545	68,130	72,371	75,829
DSM incl Net Metering	(1,938)	(4,710)	(7,049)	(8,442)
Surplus/(Deficit)	882	659	(4,527)	(7,572)

Source: BCUC, BC Hydro RRA F23 to F25, Exhibit 8;

[https://docs.bcuc.com/Documents/Proceedings/2021/DOC\\_65128\\_B-8-BCH-responses-to-Intervenors-IR-No1-Public.pdf](https://docs.bcuc.com/Documents/Proceedings/2021/DOC_65128_B-8-BCH-responses-to-Intervenors-IR-No1-Public.pdf) pdf 1264/3232. EV from pdf 1324/3232 and oil/gas/LNG from pdf 1310/3232.

Most of the deficit in supply could be made up if BC Hydro retained its IPP purchases at the 2023/24 level.