

Clean Energy Association of British Columbia

Submission on BC Hydro DRAFT 2021
Integrated Resource Plan

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Clean Energy British Columbia (CEBC) appreciates the opportunity to provide its perspectives and recommendations in this submission to BC Hydro on the 2021 Draft Integrated Resource Plan (“IRP”).

CEBC represents over 120 developers, operators, service providers, First Nations, and academic institutions contributing to British Columbia’s renewable energy industry. CEBC members own and operate the majority of the 123 renewable energy projects representing billions of dollars of direct and indirect renewable energy investments throughout all regions of the province.

BC Hydro’s 2021 Draft IRP proposes to increase existing energy efficiency and conservation programs, including demand response rates and programs, upgrade transmission capacity to southern Vancouver Island and the Lower Mainland, recontract some independent power projects at a price linked to the spot market, and determine how to address small BC Hydro generating facilities that are approaching end of life. CEBC respectfully provides the following comments on the 2021 Draft IRP.

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1. Electrification of British Columbia's Economy – Achieving Public Policy Targets

BC Hydro's previous IRP was completed 8 years ago, and since then, global energy priorities have shifted to low carbon electrification. This drive to net-zero serves as the backdrop and the key policy driver for BC Hydro's long-term integrated resource planning.

BC Hydro states that it anticipates there will be a need for more frequent updates to the IRP. This is understandable, as load forecasting is always challenging. CEBC supports frequent updates especially given the considerable degree of fuel switching that is required to meet GHG reduction objectives. The IRP should make every effort now to identify and plan for the requirements of existing and expected policies.

Planners in other jurisdictions in North America are generally moving to more frequent plans, which is clearly needed in the context of global efforts to decarbonize and electrify their economies. For example, Ontario's Independent Electricity System Operator develops a 20 year plan annually, and an 18 month plan every quarter. The Alberta Electric System Operator produces a plan outlook every two years.

a. *CleanBC*, Electrification and Renewable Energy

CleanBC lays out an encouraging vision of a low-carbon future. In meeting this future, the plan describes many programs relating to significant electrification of industry, transportation and the built environment.

Unfortunately, the required policies are not yet in place to adequately translate these targets into actual industrial, commercial, and residential electricity demand. BC's 2020 Climate Change Accountability Report shows that it is not on track to meet *CleanBC* interim targets.¹ While a collective mandate to achieve certain GHG-reduction outcomes through electrification does exist in broad policy across the province, there is a need for companion policies and mechanisms to translate this collective responsibility into obligations and incentives for firms or individuals to switch from fossil fuels to electricity. Without them the market is not driving the change required to achieve the targets.

CEBC is optimistic that these demand-creating policies will emerge from government in the near future, and that tangible demand, of the kind now recognized by BC Hydro in its "base" forecasting, can, with good planning, emerge as a result.

However, the absence of those policy implementation mechanisms today should not deter BC Hydro in this 2021 IRP process from incorporating the extent of electrification required to meet the policy objectives in the planning exercise itself. The effect of maintaining a forecast that is too static will delay the planning and building of the new electricity and transmission supply that will be required to meet a

growing future demand – demand that all social, environmental, and policy trends are squarely pointing to.

Ignoring this latent demand that will be unlocked by coming policy change cannot easily be remedied, without cost, in the next round of forecasting and planning. Failing to plan now for coming policy change will drive long-term problems. When customers, particularly industrial customers, seek to electrify in response to new policy mandates or incentives, yet cannot succeed because of supply constraints, the lost opportunity lasts for the lifetime of the fossil-fuel-powered equipment that is installed instead. That can mean a decades long delay in fuel switching and the resultant GHG mitigation.

CEBC’s 2018 White Paper on Electrification of BC² identifies the electricity demand required to meet provincial GHG emission reduction targets. Coordinating a plan that specifically addresses reduction targets will avoid potentially missing critical economic opportunities. For example, the LNG industry requires a relatively short build-out time to ensure it captures preferential market conditions. To meet these timeframes from the LNG and other industries, planning of clean generation sources and transmission is required in advance.

This concern is not conceptual. It is exactly what has happened in much of the LNG, pipeline and gas processing industries in BC to-date. It will happen with electric vehicles if BC Hydro’s distribution system is not upgraded to meet faster-than-expected adoption of electric cars. BC cannot afford yet another generation of fossil-fueled industry simply because it failed to plan for where its own policies, and the global scientific consensus, are clearly telling us we need to be going.

2. Load Balance Forecast

a. Recommendations

Considering the following key factors:

1. The 1,100 MW (5,100 GWh/yr) Site C Hydro project is forecast to come into service in 2025.
2. *CleanBC* is intended to meet aggressive GHG emissions targets and a significant portion of that plan relies on low carbon electrification.

² Electrification of British Columbia: Assessing the Economic and Environmental Benefits of Extensive Electrification in BC published by the Clean Energy Association of BC on October 15, 2018 found at: <https://www.cleanenergybc.org/wp-content/uploads/2018/10/Electrification-of-BC.-CEBC-White-Paper-Oct-2018.pdf>

3. BC Hydro's current base level forecast and its approach to classifying required electrification as part of an "uncertainty band" is inconsistent with the achievement of *CleanBC* and legislated targets.
4. There is an imminent capacity constraint affecting the Lower Mainland, and a looming energy constraint across the province, even with modest levels of demand growth. Reliance on spot markets can provide a useful tool for system optimization and short-term supply bridging, but they are not suited to a secure long-term planning.
5. Achieving reconciliation in accordance with the Declaration on the Rights of Indigenous Peoples Act and the Province's Draft Reconciliation Principles is a top priority of the Province. Energy sector opportunity is of critical importance to British Columbia First Nations, who are heavily invested in renewable energy as owners or partners. Foregoing electrification opportunities, or relying on imports, both reduce the already limited tangible opportunities for First Nations to achieve self-reliance and self-determination, as reconciliation requires.
6. The need to stimulate a robust economic recovery from the COVID-19 pandemic.

We recommend that BC Hydro:

1. Modify its base (or "Reference") forecast for the purposes of this IRP to reflect the extent of electrification required to meet BC's GHG reduction targets, in a manner consistent with, among other things:
 - prevailing self-sufficiency requirements;
 - good utility planning;
 - realistic and cost-effective DSM penetration; and
 - the timing, development, and investment requirements of those customers whose electrification investment is critical to meeting the *CleanBC* targets.
2. Given that CEBC requested but was unable to obtain for review BC Hydro's Resource Options Database, which is fundamental to the generation and DSM options considered to meet the energy and capacity forecasts that are at the root of the IRP, BC Hydro should make available its cost assessment for the clean energy technologies that are developed by IPPs, any associated cost adders, and the cost path for those technologies over time.
3. Revise BC Hydro's approach to assessing and assigning capacity costs and values to clean energy projects, including by contemplating assessments of value beyond apparent trading profits when considering about how it "optimizes" the Heritage Resources for the benefit of British Columbians.
4. Request legislation and/or direction from the legislature or minister responsible regarding *CleanBC*-related planning and expenditures by BC Hydro. This is essential to align BC Hydro's

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- IRP and its resulting expenditures with BC’s legislated GHG mitigation targets, and the other objectives of *CleanBC*.
5. To ensure that the demand response is equal to the planning and investment response, create incentives, technology mandates, cost burdens (such as supporting a higher carbon tax), and rates and programs in addition to the *CleanBC* Industrial Electrification Rates (Rate Schedules 1894 and 1895) and the *CleanBC* Facilities Electrification Fund to encourage fuel switching from fossil fuels to clean electricity. In the transportation sector BC Hydro should facilitate:
 - Light-duty on road (more charging station incentives & lower rates)
 - Heavy-duty on road (demos, incentives, truck charging & green H² fueling stations)
 - Off road (from heavy haul trucks to lawn mowers)
 - Rail (electrification in key corridors such as the Lower Mainland & mountain passes)
 - Marine (e.g., shore charging infrastructure for hybrid ferries)
 - Air (e.g., charging for electric “Beaver” aircraft)
 6. To the extent that the various measures throughout the system required to achieve widespread electrification³ raise energy poverty concerns, consider cost reallocations between regressive electricity rates and progressive form of taxation, and/or consider introducing “life-line” or other targeted rates to protect low-income consumers and trade-exposed or economically marginal industries.
 7. Actively market the *CleanBC* Industrial Electrification Rates (Rate Schedule 1894 and 1895) to attract industrial and commercial activity to BC especially for:
 - Electro-chemical processes
 - computer server farms
 - greenhouses for food production
 - electrolytic hydrogen production to displace fossil fuels, and
 - recycling of metals, plastics, paper & other materials
 8. Revise its Indigenous Relations Principles to include reconciliation objectives and acknowledge Indigenous economic interests and self-determination as a central aspect of Indigenous reconciliation⁴.

³ For an overview of the widespread electrification costs of supply (generation, transmission, distribution) and demand (transportation, built environment, industry), see www.nrel.gov/analysis/electrification-futures.html

⁴ <https://www.bchydro.com/community/indigenous-relations/principles.htm>

9. Clarify whether the approximately 5,000 GWh that is targeted to result from BC Hydro's two new rate options (Rate Schedule 1894, the Clean Industry and Innovation Rate, and Rate Schedule 1895, the Fuel Switching Rate) are included in the Reference (base) load forecast⁵.

b. Reducing uncertainty in scenario forecasting

In addition to a Base Resource Plan, the Draft 2021 IRP contains three additional scenarios: low carbon electrification; increased load from industrial activity, and lower load than in the base plan.

Reducing GHG emissions is the overriding public policy issue facing British Columbia now and for generations to come. In this context, the Draft 2021 IRP significantly underestimates the electrification needs required to meet government mandated GHG emission reduction targets. The only clear inclusion of electrification in BC Hydro's demand forecasts is electric vehicle (EV) targets. Any additional planning for electrification is aggregated in an "uncertainty band" that does not fully capture the extent of electrification that will be needed to meet *CleanBC* and other policy targets.

BC's GHG mitigation policies and targets should not be treated by the Crown electric utility as an "uncertain" or "possible" outcome. To do so implies that BC Hydro is a passive and reactive actor in government's electrification goals.

BC Hydro can play a more active role. As the monopoly delivery agent for much of British Columbia, BC Hydro's ability over time to meet requests for new power service is the central factor in realizing latent demand stimulated by existing and expected government policy.

We know that adding new generation including purchases from IPPs and transmission to the BC Hydro system takes time. Crucially, it typically takes longer than designing and building most new plants and factories or making retrofit decisions at existing facilities. It takes much longer than regular consumer decisions like buying a new electric car.

Evidently, then, a model where BC Hydro is identifying in its "base" planning only immediately apparent and imminent requests for service – and, by extension, relegating to a band of uncertainty the required outcome of legislated GHG mitigation goals – will end with unfulfilled electricity demand. Which, in this case, means unrealized GHG reduction targets. This cannot be the planning result that government or British Columbians expect of BC Hydro.

The IPP industry is nimble. With regular, transparent, and public evidence of demand – in part through regular and robust IRP processes – IPPs can react quickly. With retail access in place, it could meet new

⁵ "BC Hydro's two new rate options; 1) the Clean Industry and Innovation Rate; and 2) the Fuel Switching Rate. Both rates are available until March 31, 2030, and qualifying industrial customers can enjoy discounted rates for seven years. The *CleanBC* Industrial Electrification Rates have an energy cap of 5,000 gigawatt hours (GWh) a year for all customers, of which 1,500 GWh/year is allocated to customers under the Clean Industry and Innovation Rate and 3,500 GWh/year to customers under the Fuel Switching Rate."

demand directly. But in any case, BC must create an environment where mobile investment capital is interested and active in BC. Without such an environment, there is a very real risk that capital will flow to other markets, BC's industry will fall dormant, and the province will be unable to react to new demand within the time frames that industry requires.

Private sector forecasts, including those identified and referenced by BC Hydro, provide a further window into the extent of the problem. Some of these forecasts are set out in the following section, and even the most conservative ones are multiples of BC Hydro's base forecast.

For electrification of transportation alone, Dr. Curran Crawford of the University of Victoria's Institute for Integrated Energy Systems stated that from a 2015 baseline British Columbia's electricity generation capacity would need to double to 37 GW. This is not taking into consideration electrification of the built-environment and industry, which both *CleanBC* and BC Hydro's own analysis show will require material generation and wires additions.

Importantly, CEBC is not aware of any forecasts that imagine BC meeting its GHG mitigation targets with electrification consistent with BC Hydro's base forecast.

BC Hydro's recent forecasts, such as those included in recent revenue requirements filings, have encouraged us to imagine that new Demand Side Management (DSM) measures will provide a ready alternative to supply-side electrification. And while CEBC is a strong advocate of pursuing cost-effective DSM, the viability and costs of the aggressive DSM levels in BC Hydro's recent forecasts should be given a careful review. BC Hydro has not, to date, provided adequate information about how it intends to meet its highly ambitious DSM targets, and how much it will need to spend to meet even the levels that might be viable, or what the cost impacts will be to the ratepayer and taxpayer.

Moreover, BC's targets require GHG reductions from current levels, not simply a slowing of the rate of growth in GHG emissions. A considerable level of existing fossil-fuel powered horsepower will need to be converted to electric power, not simply conserved away. Continuing to focus on reducing demand unnecessarily excludes decarbonization of the economy as an overriding objective at all levels of government and among the Canadian public.

BC Hydro's "base" forecast should be that consistent with meeting legislated targets, even when current policy gaps are temporarily failing to translate GHG mitigation requirements into customer demand. By failing to plan for this looming electrification, BC Hydro is focusing keenly – and almost singularly -- on the risk of stranded or surplus assets. At the same time, it is under-emphasizing the corollary risk: an inability to meet emerging electrification demand. It is the latter risk that BC will regret as the consequences – political, social, economic, and environmental – emerge as an outcome of an electricity supply deficit.

CEBC urges that this IRP recognize the stranding risk of over-building, but only in the context of discussing, understanding, and costing the counter risk of inadequate electricity supply.

c. Policy & Action: Closing the Electrification Gap

In the recent BC Hydro Long Term Resource Plan Filing Date (“LTRP”) proceeding, BC Hydro references electrification measures included in the March 2020 Load Forecast as well as an electrification scenarios report by Navius Research Inc.⁶ The report concludes that all BC Hydro electrification scenarios are required in order to achieve the *CleanBC* GHG reduction goals for 2030

According to Navius, “strong policies” will result in additional electrical loads within the next two decades amounting to:

- 7,000 GWh for light-duty EV load, plus 700 GWh for medium & heavy-duty vehicle electrification (mostly after 2030)
- 5,600 GWh for Oil & Gas subindustry load (mostly before 2030)
- 3,000 GWh from electrification of the Oil & Gas subindustry
- 4,000 GWh for built environment, primarily on the South Coast (more than half before 2030)
- 10,000 GWh for LNG & Mining electrification (mostly before 2030)

d. Industry Electrification: LNG & Mines

The DRAFT 2021 IRP does not fully address the anticipated electrification of existing and new LNG projects, pipeline compressor stations and upstream facilities - even though Enbridge, FortisBC, TC Energy and others are actively working on electrification of compressor stations. LNG plants continue to be planned in BC. This is a significant inconsistency in the Draft 2021 IRP.

It is not reasonable to expect LNG, oil and gas, or other industrial firms to plan electric solutions for their rotating equipment – machines designed to last decades – if their review of BC Hydro’s supply, including transmission, forecast shows that it is inadequate to meet their lifecycle demand.

Moreover, since the design decision between gas and electric power is taken early in a carefully timed project design process, development timelines encourage a default to gas solutions where early indications are that electric solutions are not readily and reliably available. If BC Hydro waits for firm electricity requests to trigger new supply solutions, the lead time on that new electricity infrastructure development (and cost assignment determinations) will inevitably be too slow for the pace of industrial project planning, design, and development. In these cases, electrification potential will be lost for a generation.

If these planning and institutional barriers are not removed, BC Hydro’s forecasts and planning will always reflect the passing of electrification opportunities, rather than demonstrating the actions

⁶ “British Columbia Electrification Impacts Study Forecasting the Impact of Achieving British Columbia’s Greenhouse Gas Emissions Targets on Provincial Electricity Consumption.” *Navius Research Inc.* September 29th, 2020. <<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/integrated-resource-plans/current-plan/bc-electricification-impacts-study-draft-for-discussion-20200929-navius.pdf>>.

necessary for achieving these opportunities. And missed GHG mitigation targets will be among the costs.

This pattern of electrification investment lagging demand and, by extension, thwarting it, risks being repeated in many other sectors that could otherwise play a key role in helping BC achieve its GHG mitigation targets.

Several studies estimate a larger market penetration of heavy-duty EVs than appears in IRP. For example, growth of Fuel Cell EVs (FCEVs) in the heavy trucking & industry is not mentioned. This is the primary target for FCEVs because of their significant advantage over battery EV for this industry⁷.

The Draft 2021 IRP does not contain estimates for increasingly economical electric off-road transportation - truck, rail, marine (short run ferries, e-drive LNG for long range marine).

Copper, nickel, cobalt, and other metals are experiencing demand surges due to worldwide electrification. The connection between electrification and mining is being discussed in the mining industry but is not addressed in the Draft 2021 IRP.⁸ To achieve accurate energy demand forecasting, the electrification of British Columbia's rapidly expanding mining industry cannot be overlooked.

Private capital in these critical sectors cannot plan to electrify if it does not see concomitant planning on the part of its putative electricity supplier.

BC Hydro's planning is not incidental to electrification. Nor, as they would have it, can its planning be entirely reactive to customer demand, because the time frames of planning, and the stickiness of a fuel choice once made, do not allow for that approach. If BC is to rely on the electrification by private industry and individuals to meet its environmental targets, then BC Hydro must plan for, and be prepared to meet that electricity demand, on the time frames required by firms and individuals. Condemning the level of electrification necessary to meet GHG mitigation targets to an "uncertainty band" of demand is not simply a neutral, or prudent, planning approach. It is, instead, a decision to forego meaningful electrification, and this is not an approach that is consistent with the expectations of those British Columbians who overwhelmingly endorse the objectives of *CleanBC*.

3. Resource Options

With the inclusion of BC Energy Objectives in the Clean Energy Act, the BC Legislature sought to expand the range of objectives considered by BC Hydro as it planned its system, and the British Columbia Utilities Commission as it reviewed that planning. The intent of the Legislature, in short, was to prevent

⁷ See, for example: <https://www.uvic.ca/news/topics/2019+lowcost-renewable-vehicles-crawford+media-release>

⁸ "According to the World Bank, the large-scale energy transition underway to meet the Paris Agreement's climate targets will drive significant demand for the minerals & metals [British Columbia] produce[s] — such as aluminum, copper, gold, zinc & metallurgical coal — to build the clean technologies & infrastructure needed to reduce global [GHG] ... these commodities must come from responsible sources ... This puts our industry & BC's economic potential in an enviable position."

- Michael Goehring, President and CEO, Mining Association of British Columbia (Source: [The Province, May 2021](#))

BC Hydro and the Utilities Commission from having a singular focus on ratepayer costs and, instead, to consider a broader suite of policy goals to improve the lives of British Columbians. In making these changes, the Legislature understood the central role that the energy industry can play, including both its development and operation, to support the province in achieving its wide-ranging social and environmental objectives.

a. Recommendations

CEBC respectfully suggests that the public policy objectives in *CleanBC* are not reflected in BC Hydro's Draft 2021 IRP. A full accounting of the costs and benefits of adding independent power production to the system must include its contribution to economic growth, taxes to all levels of government, its unique role in fostering First Nation reconciliation and economic development, and its environmental benefits over other types of generation.

BC Hydro's public consultation survey results reported much lower levels of public support for renewable energy than reported by well-known and credible research companies. For example, a recent Angus Reid survey found that 54% of Canadians and 51% of British Columbians say renewable energy sources such as wind, solar, and hydrogen, should be the most important priority for the federal government's energy policy. The second priority is *protecting the environment* (BC 49%) and third is *not depending on other countries for supply/energy independence* (BC 43%). The third priority, moreover, suggests that British Columbians value power generated domestically over imports.

In addition, British Columbians' top choices for type of energy production are solar (88%) and wind (83%), followed by nuclear (46%), oil & gas (43%) and hydraulic fracturing (24%). See tables 1 and 2 below.

Table 1: Top Priority for Canada's Energy Industry

Top priority for Canada's energy industry – rank up to two options Top two highlighted								
	Total (n=4,948)	Region						
		BC (n=623)	AB (n=600)	SK (n=487)	MB (n=504)	ON (n=1,016)	QC (n=832)	ATL (n=886)
Renewable energy	49%	51%	32%	36%	44%	50%	57%	48%
Protecting the environment	47%	49%	31%	32%	40%	48%	55%	45%
Not depending on other countries for supply/ energy independence	46%	43%	60%	60%	51%	43%	43%	47%
Stability of supply	32%	32%	38%	39%	38%	35%	25%	30%
Economic growth	26%	25%	39%	33%	27%	25%	21%	30%

Source: Angus Reid Institute, July 2021, [Energy: Canadians tilt towards prioritizing renewables; one-third would split investments between green and oil](#), Page 5.

Table 2: Percentage that support each form of energy production

Percentage that support each form of energy production:								
	Total (n=4,948)	Region						
		BC (n=623)	AB (n=600)	SK (n=487)	MB (n=504)	ON (n=1,016)	QC (n=832)	ATL (n=886)
Solar panel farms	84%	88%	69%	71%	85%	84%	91%	89%
Wind turbine farms	77%	83%	60%	65%	77%	72%	88%	87%
Nuclear power generation	51%	46%	62%	71%	47%	64%	28%	50%
Oil and gas operations (crude oil)	49%	43%	75%	74%	58%	48%	33%	59%
Hydraulic fracturing, sometimes called "fracking," for oil and natural gas	28%	24%	51%	49%	34%	25%	22%	24%
Coal mining	19%	17%	35%	42%	23%	17%	11%	20%

Source: Angus Reid Institute, July 2021, [Energy: Canadians tilt towards prioritizing renewables; one-third would split investments between green and oil](#), Page 10

CEBC also believes that the BC Hydro's perceived cost of clean renewable energy produced by IPPs in the IRP is inflated. This occurs because BC Hydro has failed in this IRP to accurately reflect both the current costs of generation and the projected future cost of additional IPP energy generation as a result of dramatic cost reductions of some renewable energy technologies, and the continued path of decline in those costs that is forecast globally.

In addition, the draft IRP does not acknowledge the increased capacity and security of supply benefits related to geographically distributed and technologically diverse renewable energy projects throughout BC's varied terrain.

In assessing the cost of clean energy projects, BC Hydro is viewing the capacity burden of these projects too narrowly. First, it has failed to properly reflect the cost and technological dynamics of clean capacity projects such as geothermal energy that deliver both capacity and energy. Second, it has failed to credit the collective of clean energy projects with the capacity value inherent in project diversity. Third, it has failed to accurately account for the cost and technology improvements in energy storage systems, notably batteries. And finally, it has failed to describe and open for discussion possible alternative approaches to "optimizing" the existing flexibility inherent in the Heritage generation resources. By describing an "optimized" system purely in terms of maximized trading profits, BC Hydro has failed to consider how, differently applied, these resources could support other policy goals such as GHG mitigation, benefits to the economy or Indigenous reconciliation. CEBC recommends that BC Hydro include the full range of costs and benefits of the resource options, including revenues to all governments, GDP, procurement, First Nations reconciliation and environmental benefits and impacts.

b. Renewable energy is an important contributor to decarbonization and for British Columbia's economic recovery

Renewables are central to the energy transition required to move our economies to achieve low carbon electrification targets. [Bloomberg New Energy Finance](#) projects that, between now and 2050, 80% of all global investment in new power-generating capacity will go to wind, solar and batteries. Renewables offer many benefits to British Columbia:

- **Mitigation of ratepayer risk:** IPPs transfer responsibility for rising costs (labour, taxes, refurbishments) and unforeseen risks away from the ratepayer and are instead absorbed by private industry.
- **Reconciliation:** IPPs provide reliable, long-term revenues to First Nation communities that support self-determination and economic reconciliation, employment benefits, environmental, and infrastructure improvements.
- **Private investment capital and economic contributions:** IPPs bring investment dollars to all regions throughout British Columbia. IPPs provide long-term and well-paying jobs, contribute to government budgets annually through taxes (e.g., water rental and property tax), and generate valuable revenues for host communities. IPPs also invest in maintenance and upgrades to resource roads and bridges which are often utilized by the public and may be relied on by local businesses and other industries.

- **Environmental:** IPP revenues support habitat management and wildlife monitoring programs, information which is shared with government to inform decision-making and conservation initiatives.⁹
- **Electricity system reliability:** The 1,300+ MW of dependable IPP power provides critical system reliability that is within the system controlled by BC Hydro, ensuring that British Columbians receive the electricity they need when they need it.
- **Energy resiliency:** The role of diversified power projects, both geographically and by generation source, becomes even more important in the context of climate change, to enable the electricity system to withstand changing environmental conditions and recover quickly from events that cause outages or constraints.

c. Economic Benefits of IPPs

IPP investments bring significant benefits to local communities throughout the life cycles of these projects and a backbone for future growth of the economy.

In its draft IRP however, BC Hydro assesses socio-economic and environmental attributes narrowly, based on direct employment and geographic footprint only. This fails to account for the range of benefits and impacts that normally comprise project assessments and are of considerable importance to British Columbians. Table 1 shows our recommended additions to the scope of socio-economic and environmental attributes in the assessment of resource options.

Table 1: CEBC Recommended Resource Option Attributes

Type	Current	Recommended Additions
Environmental	Footprint (hectares)	<ul style="list-style-type: none"> • Typical impacts and benefits to terrestrial and marine resources (flora, fauna), Indigenous rights, interests and culture, archaeological resources • Avoided environmental impact of the alternative supply choices, including local air impacts and GHG mitigation. • Cumulative impacts benefits, including the opportunity cost of foregone investment that cannot be accommodated in a region where less clean generation had been developed in favour of clean generation
Socio-economic	Direct jobs (person-years)	<ul style="list-style-type: none"> • Government tax revenue: local (property taxes, licenses & permits), provincial (taxes and fees)

⁹ [Hocking, M. D., S. Faulkner, K. Akaoka, A. Harwood, T. Hatfield, and F. J. A. Lewis. 2021. Surprising salmonid response to water diversion at four run-of-river hydroelectric projects in British Columbia. Can. J. Fish. Aquat. Sci. doi:10.1139/cjfas-2020-0246](https://doi.org/10.1139/cjfas-2020-0246)

		<ul style="list-style-type: none"> • Direct, indirect and induced benefits: local spending (goods and services) • Employment/labour income: direct, indirect and induced
Reconciliation	N/A	<ul style="list-style-type: none"> • Revenues/royalties, capacity investments, employment, business opportunities, alignment with values and priorities • Contribution to DRIPA objectives, including Indigenous self-determination and self-reliance.

First Nations & IPPs: Years of Successful Partnerships

CEBC does not speak for First Nations, however 30 First Nations are members of CEBC and we are currently working closely with First Nations organizations.

Many BC First Nations regard the electricity industry (generation and transmission) as an important avenue for reconciliation. As in other parts of Canada, IPPs and First Nations in BC are highly collaborative and integrated in the energy market. Most IPPs are either 100% First Nation owned or are partnerships that benefit First Nations through majority ownership, equity participation, or revenue/royalties agreements. Therefore, many First Nations in BC strongly support the private clean energy industry - they are part of it.

The Draft 2021 IRP states that BC Hydro “has a mandate to incorporate the *UNDRIP* into its business within our specific mandate and context.”

Incorporating the UNDRIP articles and the Truth & Reconciliation Commission’s Calls to Action into all government actions is key to reconciliation. BC’s Draft Principles that Guide the Province of British Columbia’s Relationship with Indigenous Peoples (“BC’s Principles”) state that:

BC’s principles are about renewing the Crown-Indigenous relationship. They are an important starting point to move away from the status quo and to empower the Province to fundamentally change its relationship with Indigenous peoples, a process that will take time and will call for innovative thinking and action. This is necessary to ensure a modernized Crown-Indigenous relationship in BC

CEBC suggests that this promise of innovative thinking and action on reconciliation is not evident in the draft 2021 IRP and in particular First Nations interests and reconciliation opportunities are not reflected in planning choices. Indeed, the IRP fails to establish how reconciliation objectives will be addressed or specifically how this will affect IPP electricity purchase agreement renewals or new opportunities to supply electricity. Considering the importance of reconciliation and Indigenous self-determination, several First Nations have expressed concern about the omission of reconciliation objectives in this long-term plan.

Some considerations relevant to reconciliation include:

- Increased independent power production and improved terms for net metering that would strengthen reconciliation with First Nations and result in impactful regionally diverse economic stimulus.
- The devastating impacts of mega-hydropower projects on Indigenous peoples and their territories continue to have lasting effects. With BC's adoption of *UNDRIP*, reducing impacts and creating pathways for First Nations to build their economies in a self-determined manner, including by using the infrastructure that was placed on and over First Nations' traditional territory without their consent, is more important than ever.

d. Renewable Technology: The Decreasing Cost Trend

Although BC Hydro acknowledges the falling cost of renewable technology, including wind, solar, certain types of hydro and batteries, the magnitude of this cost reduction is not well articulated in the Draft 2021 IRP. The costs of these renewables are now much lower than: (a) what BC Hydro will pay for electricity from Site C; and (b) the cost of any other reliable supply option that is non-GHG emitting.

Solar and wind have continued to see dramatic reductions in cost and simultaneous increases in efficiency, and in many jurisdictions are competitive with existing assets (see *Figure 1*).

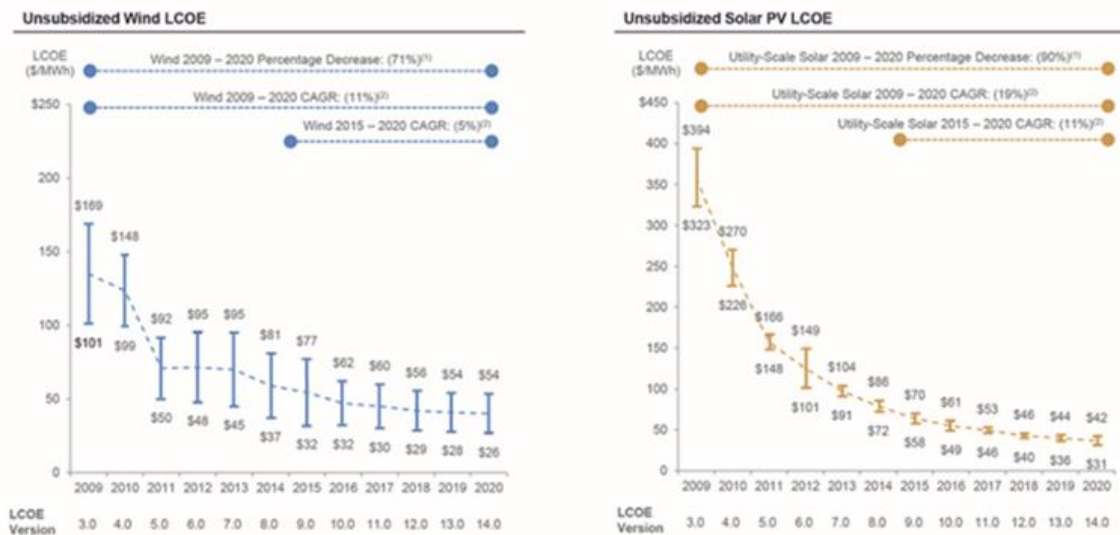


Figure 1. Levelized cost of energy comparison – Historical Renewable Energy LCOE declines (2009-2020). Source: [Lazard Estimates](#).

Utility-scale battery storage costs are also declining drastically. This greatly enhances the cost-effective options for integrating intermittent renewables and does so without diminishing the overall system flexibility already available from storage hydro.

Cost declines are projected to continue over the coming decade. These price trends are now well understood and relatively predictable, and are critical for consideration in this current planning, as they affect how the system will likely evolve over time. At the same time, BC Hydro should be prepared to frequently revisit its planning over time, to account for new technologies and cost reductions or performance improvements in renewables and storage systems that are beyond even what is anticipated today.

IPPs have the expertise to deliver cost-competitive renewable projects, and many CEBC members are pioneers in designing and constructing innovative hybrid systems by pairing solar or wind generation with battery storage. However, BC has not had a competitive process to procure energy since 2010. As such, our economy has yet to benefit from innovation and the significantly reduced cost of these technologies.

4. Pricing for Renewals of Independent Power Electricity Purchase Agreements

a. Recommendations

CEBC recognizes that BC Hydro's ratepayers have an interest in enjoying the depreciation in IPP generation plants which are up for contract renewal, in much the way that they enjoy the benefits of depreciation on BC Hydro's own plants. However, this interest must be balanced against the imperative of ensuring that the plants subject to contract renewal remain economically viable, including being adequately capitalized for required re-investment, and able to earn a fair return on their investment. While finding this price is properly the subject of future negotiation, CEBC respectfully submits that BC Hydro should expect the price to be in excess of the prevailing spot market price. CEBC proposes that it work with BC Hydro to develop a framework for contract renewal that will both satisfy the BC Hydro's need to demonstrate ratepayer protection and the IPP sector's need to attract and service investment capital. In CEBC's view, finding a model to realize such pricing is essential to prevent the wasteful and unnecessary stranding of high-quality projects that are already in service of BC Hydro's customers.

b. Market-Based Pricing

The Draft 2021 IRP states that IPP contract renewals will be based on 'market-based pricing.' BC Hydro characterizes market-based pricing as the Mid-Columbia spot market (Mid-C). This market is based on the short-run marginal cost of excess energy that U.S. generation plants sell into Mid-C. The proceeds from sales are used to reduce fixed costs when sales cannot be made at the higher long-run marginal cost

The Mid-C index price is a poor price signal for determining the cost of generating clean energy in British Columbia as it is being impacted by the generator mix including thermal plants, distortions in the market reflecting US government incentives for renewable energy, utility portfolio standards and the corresponding impact of the sale of the renewable energy credits elsewhere while clearing the associated electricity into Mid-C, and 'must run' contracts. These distortions are easily demonstrated by the negative prices occasionally seen during freshet.

There is no direct relationship between Mid-C prices and the long-run marginal cost that a new or operating generation plant must expect to recover over time, to make a reasonable return and to service its capital.

By basing contract renewal prices on Mid-C, BC Hydro is effectively arguing that the price for these existing clean generators should be sufficient only to cover the cost elements of the plant's short run marginal cost. This is a bad outcome for all parties. Investors – including First Nations – will be left with plants which are inevitably subject to failure. This will remove from the system otherwise strong projects that will require expensive decommissioning. Finally, for reasons elaborated in the next section, BC Hydro will ultimately be faced with returning to more expensive new power sources (i.e., that have no benefit of depreciation, as does recontracting IPPs), as the reliability and energy security problems of relying on the energy-only spot markets become manifest.

While CEBC understands the cost pressures facing BC Hydro, it is not appropriate for BC Hydro to use its market power (monopoly) to make its long-term independent electricity suppliers take write-offs of their facilities, or to economically strand their facilities forcing a shut-down. As noted above, this is not in our members interests, nor is it in the interests of BC Hydro's ratepayers.

c. Imported Energy & Self-Sufficiency

In June 2020, the Government introduced the Clean Energy Act Amendment Act (Bill 17). The purpose of this Act was, among other things, to facilitate BC Hydro's greater reliance on imported energy to meet its domestic load obligations. We were surprised to learn of this, particularly a decade ahead of when BC Hydro claims new energy will be required for domestic need.

However, Government quickly withdrew Bill 17, apparently in response to opposition from First Nations, municipalities, and others. These opponents argued that Bill 17 would seriously damage the benefits and opportunities that the renewables industry affords them. CEBC endorses the First Nation and municipal position in this regard and applauds Government for withdrawing the Bill.

CEBC expects that this debate is not over, and there is evidence (such as BC Hydro's reliance on Mid-C spot market pricing for the purposes of re-contracting), that the utility is expecting to attempt to increase its reliance on the Mid-C market as part of its future energy and capacity portfolio.

This raises serious concerns, in addition to the failure to align with reconciliation objectives that will need to be addressed in this IRP process. CEBC will elaborate on these concerns as the process unfolds, but in summary the potential risks and costs that arise from reliance on imports, particularly spot-market sourced imports, includes:

- Environmental "Leakage": generation technologies (coal, nuclear, natural gas) that BC would not tolerate domestically are imported in the Mid-C energy mix.
- Economic "Leakage": when BC Hydro chooses US sourced power over domestic purchases, it not only imports electrons but it exports investment. Socio-economic benefits accruing to BC from investments in renewable energy are significantly undervalued in the IRP. The

relative value of these flows should be part of any discussion about relying on domestic generation versus imports.

- **Reliability and Energy Security:** the Mid-C market is currently comparatively cheap because it is supplied by transitory surpluses from other jurisdictions. As we are seeing in BC, surpluses erode, and spot markets offer no useful price signal for developers to build new supply (because they tend to clear at or near the short-run marginal price, not above the higher long-run marginal price that developers must expect to justify new project construction). As these surpluses erode over time, supply constraints can hit quickly, especially given the increasingly correlated supply and demand profiles of markets that supply electricity for short term trading (for example, hotter summers mean both BC and California have higher more correlated air-conditioning demand than in the past). When this happens, electricity may not be available for purchase at any price. Moreover, transmission lines may become constrained, so power can be bought but not delivered. This is why energy systems are planned on a capacity basis, not an energy basis and, by extension, why planning to rely on spot markets carries unacceptable risks.

5. Closing

CEBC and the clean energy industry seeks to work with the Province and BC Hydro to foster sustainable development through low-carbon electricity production and electrification, innovation, partnering with First Nations within the *UNDRIP* framework, regional economic development and diversification for the benefit of British Columbians.

The negative narrative that has been created about the private power industry in BC over recent years is inaccurate. Many other jurisdictions are benefiting from accelerated private investment in renewables and clean technology and are growing the key industries that will create resilient economies of the future. BC already has an advantage with a mature, low-cost, jobs- and economic development-creating, ready-to-invest renewables industry. Decisions made today that discourage investment and investor confidence in BC will impact this province for decades to come.