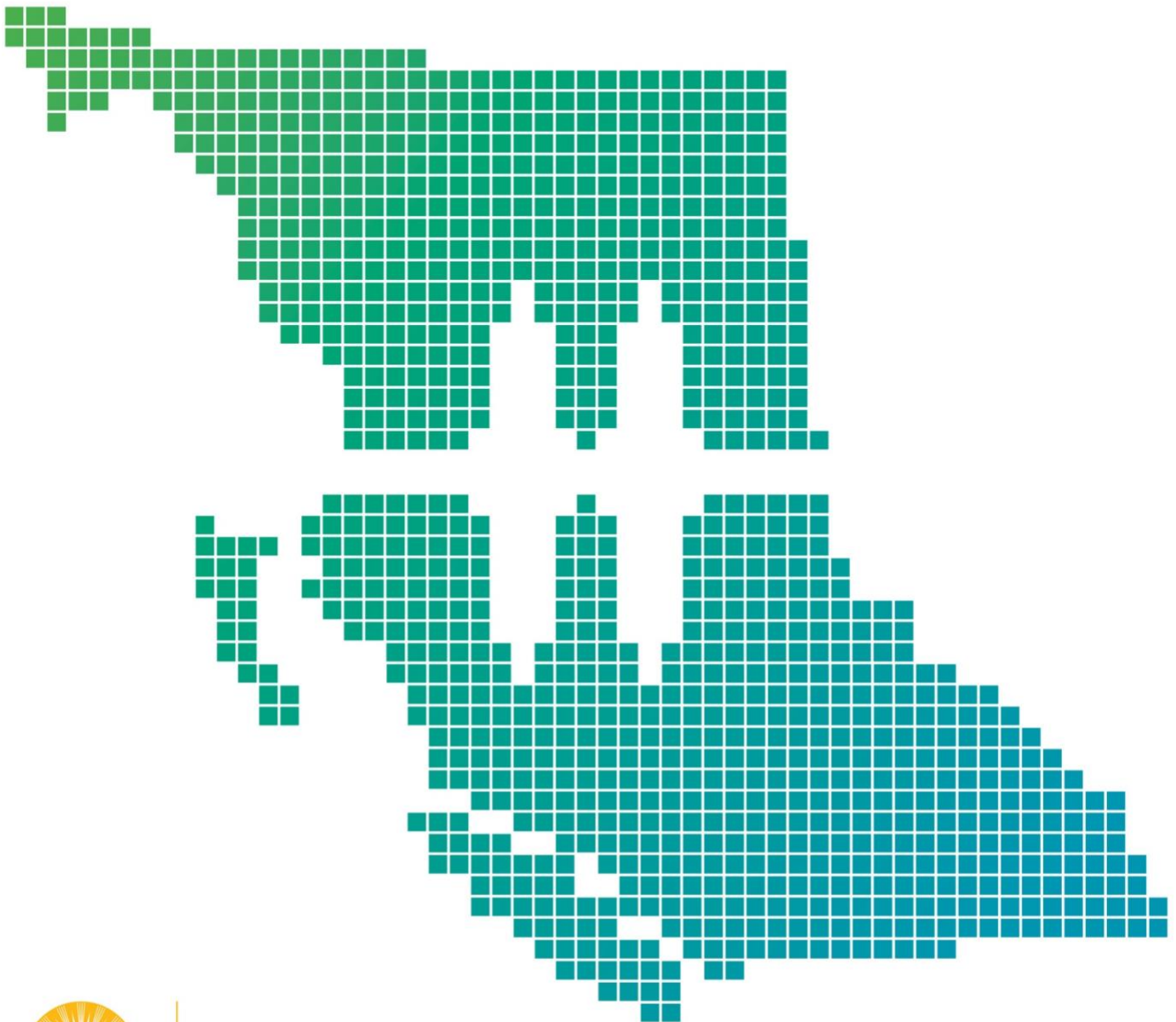


# COMPREHENSIVE REVIEW OF BC HYDRO: Phase 2 Interim Report



Ministry of  
Energy, Mines and  
Petroleum Resources

**COMPREHENSIVE REVIEW OF BC HYDRO:**

**Phase 2 Interim Report**

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# COMPREHENSIVE REVIEW OF BC HYDRO:

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### 1. Purpose

The Government of British Columbia is committed to making life more affordable, delivering the services that people count on, and building a strong, sustainable and innovative economy. The Comprehensive Review of BC Hydro was launched in June 2018 to contain rate increases, control costs, and position BC Hydro for future success.

Completed in February 2019, [Phase 1 of the Comprehensive Review of BC Hydro](#) (Phase 1 Review) identified cost savings, efficiencies and other changes to keep electricity rates affordable and predictable over the long-term, while ensuring BC Hydro continues to provide clean, safe and reliable electricity. The Ministry of Energy, Mines and Petroleum Resources and the Ministry of Finance, along with BC Hydro, examined various aspects of the utility's costs including:

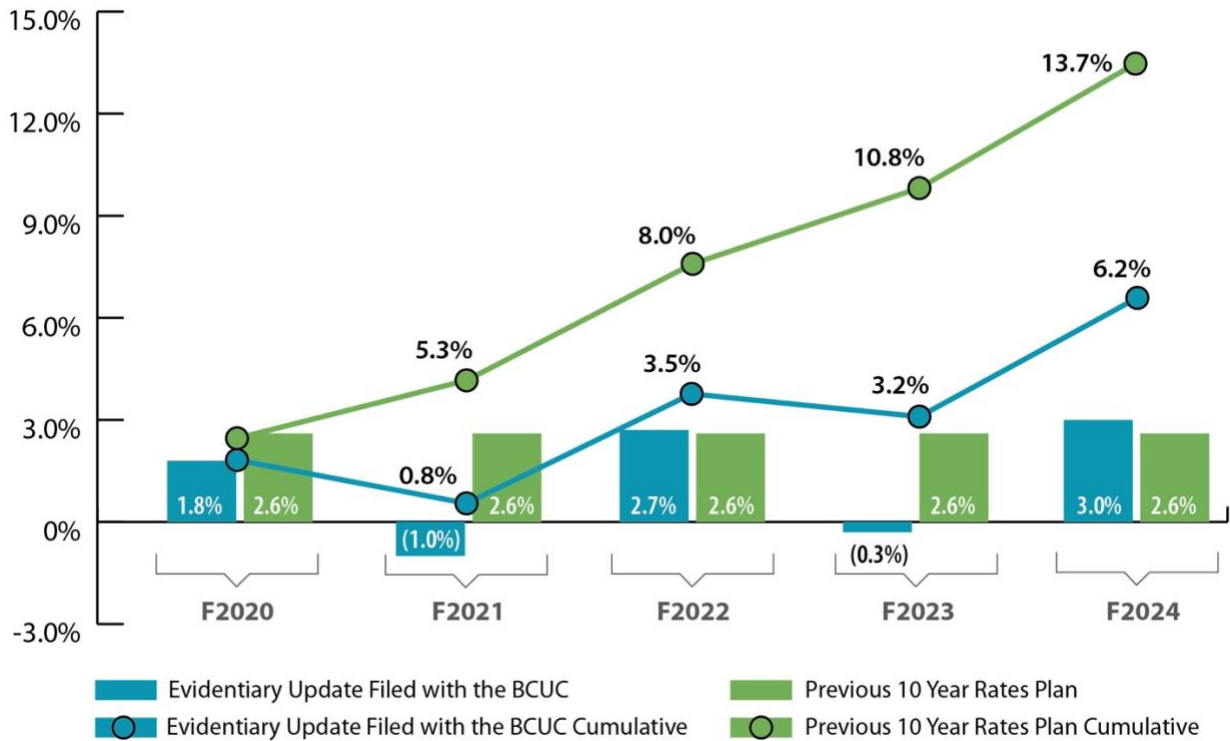
- affordability and rates;
- regulatory accounts;
- cost of energy acquisition;
- revenues;
- operating costs;
- 10-year capital plan; and
- payments to Government, including net income and dividends.

As a result of actions taken by government as part of the Phase 1 Review, particularly the \$1.1 billion write-off of the rate smoothing regulatory account, BC Hydro's updated 5-year rates forecast submitted to the B.C. Utilities Commission (BCUC) is approximately 55% lower than the 13.7% cumulative increase for the same period under the previous government's 10-year rates plan, and more than 40% lower than the 10.7% forecast rate of B.C. inflation over the same period. Critical to managing costs was the decision to curtail the purchase of power, at relatively high prices, from independent power producers during a period where BC Hydro is in surplus and does not need additional supply.

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### Rate Comparison – Previous 10 Year Rates Plan and Phase 1 Updated Rates Forecast



Equally important, the Phase 1 Review focused on expanding sound financial and regulatory oversight of BC Hydro by the BCUC. BC Hydro is currently before the BCUC with a Revenue Requirements Application where its costs and expenditures are being reviewed by the BCUC. For the first time in decades, BC Hydro is requesting a rate decrease of 1% for April 1, 2020.

Also, as a result of the Phase 1 Review, the Auditor General of BC removed her qualification on the Province’s Public Accounts in 2018/19, following qualifications in each of the prior two years. The Auditor General stated that “Government has made a number of changes to the regulatory framework, giving the regulator the ability to influence costs and rates. I believe the changes made to the regulatory framework are sufficient to allow me to remove my qualification on the use of rate-regulated accounting for the year ending March 31, 2019.”

Following the completion of the Phase 1 Review, the [Terms of Reference](#) for Phase 2 of the Comprehensive Review (Phase 2 Review) were released in July 2019. The objective

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of the Phase 2 Review is to develop recommendations that will strategically position BC Hydro for long-term success, while meeting the province's climate goals, keeping rates affordable for British Columbians, furthering reconciliation with Indigenous Nations, and supporting quality economic development. The Phase 2 Review is a broad, transformational review that will consider some of the significant changes and shifts taking place in B.C. and continental energy sectors, in addition to evolving technologies and the changing needs of current and future BC Hydro customers.

The actions taken as part of the Phase 2 Review will support the government's CleanBC plan, including to expand the electrification of our growing economy over the coming decades. As we power more activities from electricity, people from across B.C. will benefit from a clean and reliable source of power, more comfortable buildings, reduced pollution, and cleaner transportation options. BC Hydro has a critical role to play in achieving the province's legislated greenhouse gas reduction targets.

The Phase 2 Review will address four areas of interest:

- Supporting CleanBC **(Section 3)**
- Thriving in an Evolving Electricity Sector **(Section 4)**
- Leveraging Our Strengths **(Section 5)**
- Opportunities for Indigenous Nations and Communities **(Section 6)**

This interim report is designed as a discussion paper. It takes into consideration analysis of emerging trends, feedback from preliminary engagement with Indigenous Nations and organizations, and input from stakeholders and expert advisors. Sections 3 through 6 outline the Phase 2 Review's preliminary work, information and ideas. Each section includes questions to gather further feedback from stakeholders, Indigenous Nations and customer groups. This feedback will support the development of final recommendations by the Ministry of Energy, Mines and Petroleum Resources, which will provide a pathway for BC Hydro's long-term success in the face of an evolving utility, technological, and energy landscape in British Columbia.

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### 2. Emerging Trends

Climate action, the evolution of energy markets, technological innovations and changes in energy consumption are fundamentally changing the way electrical utilities do business. Utilities are evolving their business models in order to expand their value proposition and stay relevant. This can include supplementing and changing their current offerings, or diversification and structural changes to their traditional operating model. In addition, customers are looking for more choices and flexibility in how they manage their energy use and are increasingly interested in clean and renewable energy.

#### **Changes in Traditional Load Profile**

The industrial sector traditionally makes up approximately one-third of BC Hydro's demand, also known as load. Today's industrial customer base is made up primarily of the forestry sector (approximately 50%), mining (approximately 30%) and the oil and gas industry (approximately 10%). Because commodity prices can impact traditional resource-based industries, BC Hydro's industrial load has a degree of uncertainty. Significant decreases in load would mean that more of BC Hydro's existing system costs would need to be recovered by other customers, which could have rate impacts. Through initial stakeholder engagement for the Phase 2 Review, industrial customers emphasized that their competitiveness depends on BC Hydro's ability to provide reliable, clean and cost-effective electricity to its customers. At the same time, government wants to leverage BC Hydro's strategic advantages to both maintain and grow industrial load in B.C.

A new and growing area of load is transportation. B.C. is currently leading North America in the sale of electric vehicles, reaching 10% of all new cars sold in the province during the third quarter of 2019. With the passing of the *Zero-Emission Vehicle Act*, by 2040 every new light-duty vehicle sold will be a zero-emission vehicle. Translink and BC Transit are both moving to replace their diesel buses with battery electric versions. Other opportunities for electric transport include medium and heavy duty on-road EVs, such as port drayage trucks and urban delivery trucks, as well as off-road transportation, such as ferries and other marine, airport ground support equipment, forklifts and mining conveyance. BC Hydro will be working with its customers to manage charging for transportation.

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New load presents an opportunity for BC Hydro and may mitigate the risk of declines in traditional load, but it also often requires new infrastructure to serve. BC Hydro needs to take steps to limit the costs of serving new or different load or ensure it receives sufficient revenues to offset these costs.

#### Evolving Technologies

Over the past several years the costs of solar and wind generation and small-scale battery storage have decreased significantly. This change in cost has at least two significant impacts on the utility industry. At the wholesale market level, the lower cost of adding new incremental clean energy coupled with production subsidies and renewable energy targets in various states has resulted in substantial additions of wind and solar generation. This is placing downward pressure on wholesale prices in western North America in the hours of the day (either sunny hours or more variable windy hours) when those resources are producing. This can impact the revenues that utilities recover when they sell excess generation in the wholesale market. At the retail level, the availability of consumer scale systems (e.g. rooftop solar) has led to customers self-generating and displacing utility sales and therefore revenues. This has led to challenges for traditional electrical utilities in the United States whose rates were designed to recover costs under historic business models (e.g. via energy sales). Utilities must maintain a reliable electricity system, including the costs of refurbishing and upgrading infrastructure. Though those customers that are self-generating still rely on many of the services from the system, they no longer fully contribute to fund the services they receive. This can create a situation where costs shift to remaining customers who end up disproportionately funding an electricity system that still provides benefits to self-generating customers.

While wind and solar generation do not have the operational flexibility of traditional generation resources – in that operators cannot ramp them up and down to follow changing demand on the grid – new technology is making it possible to control some of the demand to compensate for that. From a planning perspective, the traditional utility model of forecasting demand and dispatching supply may need to be enhanced, where the enhanced model may include forecasting and dispatching both supply and demand. This means that another consideration as an emerging trend is demand-response technology – the ability to manage vehicle charging and home appliances like hot water

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heaters, air conditioners and refrigerators to reduce electricity demand. Demand-response is a growth area facilitated by technology, artificial intelligence and entrepreneurship, and could enable the management of demand rather than supply.

#### **Changing Customer Preferences**

Customers expect more from energy providers than merely a commodity service. Traditionally conservative utilities face the challenge of meeting customer expectations for customized services set by more agile and innovative industries such as online retail.

Factors affecting changing customer expectations include:

- The growth of digitization and the evolution of how customers interact with their energy provider (i.e. self-service via use of online tools), resulting in more technologically savvy customers with changing demands and expectations.
- Utilities must figure out their role (leaders, innovators, etc.) with new technologies like electric vehicles and charging, LED streetlights and advanced data management.
- New product and service offerings, including behind the meter services. Behind the meter refers to products or services offered by a utility that go beyond simply providing power for a price, usually with the goal of improving energy efficiency or reducing greenhouse gas emissions, such as hot water tank rentals or new home energy management services.
- Customers are increasingly concerned about the environmental impact of their energy choices.

It is important for the electricity sector to determine how to effectively engage customers given the advancement of new energy choices such as small-scale battery storage, self-generation and new ways to manage energy use. Further, integration of new technologies and services into the electricity system will be a key consideration for the future.



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#### Evolution of Electricity Trade

British Columbia's electricity grid is embedded in a much larger grid that covers B.C. and Alberta plus portions of 14 western U.S. states and a small part of Mexico. Trade is important both to B.C. and its neighbours for reliability and for lowering the costs to provide service.

Retiring coal fleets, increasingly available and cost-competitive intermittent renewables and low natural gas prices are some of the factors shaping the industry in the western U.S. and Canada. Senate Bill 100 approved in California in 2018 stipulates that eligible renewable energy resources and zero-carbon resources supply 100% of all retail sales of electricity to California end-use customers by 2045. Washington State passed its own 100% Clean Energy Bill in April 2019. In contrast to this focus on clean energy and decarbonization, some states are continuing to support coal generation.

While the cost of energy in the market may be relatively inexpensive, capacity and flexibility are increasingly valuable in a landscape where jurisdictions are adding more intermittent renewables to their supply mix. Capacity is produced by a firm, dependable source of power like hydroelectricity that can be relied upon to meet peak demand, unlike intermittent renewable sources like wind and solar which produce energy only when the wind is blowing or the sun is shining. Utilities with hydroelectric generation systems have a strategic advantage, as these types of systems provide clean, flexible power that operators can ramp up and down in response to fluctuations in demand and fluctuations in the availability of other renewables.

The increased penetration of renewables creates oversupply in some periods and regions, which has led to negative market prices and renewable resource curtailments. Given the output of many of these renewable resources is a function of environmental conditions, integrating these resources requires backstopping by other non-intermittent resources that provide the dependable capacity at peak times and the flexibility associated with storage.

Hydroelectric generation with short- or long-term storage (i.e., with a reservoir behind a dam or upstream of a dam) is a clean way of providing this backstop. Long-term storage hydro is also beneficial, as water can be stored during periods of high supply/low

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demand and used for generation in periods of low supply/high demand. B.C. is in an advantageous position given so much of BC Hydro's power is generated through storage hydroelectricity.

While small-scale battery storage technology has evolved and the cost has decreased significantly, grid scale batteries are still an emerging technology that has its challenges. Grid scale batteries can provide short-term storage and shifting of output from renewables into periods with more demand. However, grid scale battery technology remains relatively expensive and has limited storage duration. Though expectations are for grid scale battery technology to continue to improve, the future of this technology remains uncertain. In the short-to-medium term, utilities could avoid substantial costs if they have the ability to leverage their existing systems while grid-scale battery technology advances to a level that provides adequate storage at a lower cost.

### **3. Supporting B.C.'s Energy and Economic Development Goals through CleanBC**

Released in December 2018, CleanBC is a pathway to a more prosperous, balanced and sustainable future. Over the next decade and beyond, the plan outlines how the increased use of clean and renewable energy in transportation, buildings and industry will make things better and more affordable for all British Columbians. CleanBC is central to reducing greenhouse gas emissions while meeting British Columbia's energy and economic development goals. British Columbia has a large, hydroelectric system where nearly 98% of the electricity BC Hydro generates is clean. BC Hydro has a critical role to play in achieving the electrification goals in CleanBC.

Achieving British Columbia's legislated greenhouse gas emission targets will require a major shift from fossil fuels to clean electricity generated by BC Hydro and other low-emission energy sources, such as hydrogen. The policies and strategies in the CleanBC plan are expected to require additional electricity over and above currently projected demand growth to electrify key segments of our economy.

Along with actions to reduce greenhouse gas emissions, CleanBC provides an effective blueprint to grow our economy. British Columbia already has among the cleanest industries in the world, and B.C. companies can be first movers and capture a larger

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share of the growing clean energy and low-carbon products market. As industry continues to work with the cleantech sector to develop innovative solutions to reduce emissions, British Columbia can market our products, services and technology to a world that is increasingly interested in clean solutions.

#### **Rate Design**

Under BC Hydro's tiered residential rate structure, customers pay a higher rate for electricity usage over a certain monthly volume. This rate structure was designed to provide an incentive for customers to conserve energy so that BC Hydro could avoid building or procuring new resources. This two-tier rate structure made sense when BC Hydro was in deficit and when the marginal cost of additional electricity supply was much higher than it is today. BC Hydro applied in February 2020 to extend the pricing principles for this rate by two years. Pricing principles determine how general rate increases are applied to the various charges under a rate schedule, in this case the Basic Charge, Step 1 Energy Charge and Step 2 Energy Charge. If BC Hydro were to make any changes to its default residential rate, it would file a rate design application for review and approval with the BCUC that would be informed by feedback from customers and stakeholders

Optional rates can provide customers with more choice, make electricity more affordable and reduce emissions. New rates, which customers would be able to opt-in to, can help shift demand to times when BC Hydro's system has more capacity to provide service. Making greater use of existing capacity can make it less expensive to expand the use of clean electricity in support of CleanBC. Optional rates can also help manage transmission and distribution-related costs. In the Phase 2 Review, stakeholders and experts have noted the importance of ensuring that rates send the right price signals to the market as well as the fact that load growth can benefit all ratepayers.

BC Hydro is conducting preliminary analysis on a number of optional rate designs as part of the Phase 2 Review. Based on feedback from the Phase 2 Review, with further analysis, and engagement with stakeholders and customers as part of a BCUC rate design application process, BC Hydro will determine which optional rates to pursue.

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For **residential** customers, optional rate designs could include (but are not limited to):

- An optional time-of-use rate that could use a variable rate based on when customers use electricity. This may appeal to customers who have an electric vehicle that they charge overnight, and also lower electricity usage during peak demand times of the day.
- An interruptible rate that could allow customers to receive a reduction in their bill in exchange for providing BC Hydro the ability to manage non-essential services, such as hot water heat and electric baseboards.
- A discounted rate for customers with heat pumps.

For **commercial** customers, BC Hydro is exploring optional rate designs including those that encourage workplace electric vehicle charging, that promote the conversion of district energy systems from natural gas to electricity, and that improve competitiveness of electricity as a fuel choice.

Most large **industrial** customers take service at the Transmission Service stepped rate. Eliminating the higher Tier 2 energy charge may increase the affordability of electricity and could be done by flattening the energy charge or increasing the demand charge. Industrial stakeholders have provided the feedback that the two-tier design successfully focused on long-term conservation and load reductions, but that many customers are now facing exposure to the second tier as recognition of their conservation investments reaches expiration. Flattening the two-tier industrial rate would also support CleanBC by making increased consumption of clean electricity more competitive, thereby removing a barrier for electrification.

Stakeholder sessions provided the feedback that competitiveness should be kept at the forefront of the Phase 2 Review, as an important issue facing both B.C.-based businesses and industry. These stakeholders noted that low cost electricity has always been an advantage in B.C. and that it is important that BC Hydro continue to focus on affordability because a strong private sector in B.C. can help to generate new economic development opportunities and improve the standard of living for British Columbians.

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Affordable rates are important for all customers. In particular, for industrial customers that operate in energy-intensive and trade-exposed resource industries, access to reliable and secure power at competitive, fair and stable rates is central to their ability to remain competitive. For certain sectors, energy can represent one of the largest operating costs and is often managed by shifting production and investment to the lowest cost jurisdictions. Lower electricity costs make more capital available for investment and enable job growth that benefits communities where these industries operate. Competitive electricity rates are important to the future success of industry in B.C. Stakeholders also provided the feedback that a rate that is competitive with alternative energy sources (i.e., fossil fuels) would allow companies to make strategic decisions on the electrification of future projects and encourage clean growth in B.C.

British Columbia also has the opportunity to attract new clean industries, such as hydrogen, renewable fuel production and carbon capture, which will help grow the economy and reduce or avoid emissions from existing industries. Attracting new BC Hydro customers could provide benefits to all ratepayers by increasing revenues to BC Hydro. BC Hydro could target potential new industrial customers through an economic development rate, including for energy-intensive low-carbon industries.

#### **Time and Cost for Industrial Customers to Connect**

Stakeholders noted that the time and cost for customers to connect to BC Hydro's system can be barriers to electrification, meaning that greenhouse gas emissions may not be reduced or avoided if customers choose more carbon-intensive energy sources. For those customers with a close, more carbon-intensive alternative, impediments to interconnecting can result in emissions being locked in for decades. Some industrial customers also noted that there is an economic barrier to the electrification of B.C.'s upstream oil and natural gas industry specifically, given the currently low gas prices that favour self-supply. As discussed above, there is also an opportunity for BC Hydro to offer a rate that incentivizes the use of electricity as an alternative to fossil fuels.

Also considering this feedback, BC Hydro's interconnection tariffs could be amended to streamline processes and reduce costs and risks for new customers. One option would be for BC Hydro to modify or eliminate its 150 MVA threshold.

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Under Tariff Supplement 6, system reinforcements to be funded by the customer do not include additions or alterations to generation plant and associated transmission, or transmission lines at 500 kV and over, unless the new or incremental loads exceed 150 MVA. The inclusion of the 150 MVA threshold is an attempt to insulate existing ratepayers from large rate increases should an extremely large industrial customer interconnect to the BC Hydro system, since bulk generation costs are the most significant costs for a utility (versus bulk transmission). However, the October 2013 final report from the Industrial Electricity Policy Review singled out the 150 MVA threshold, noting that it “presents a cost barrier not found in other jurisdictions, and sends a signal that new large electric loads are not supported in British Columbia.”

A timely build-out of the transmission system will be necessary to support electrification of industry. Customers have noted that additional electricity transmission infrastructure is critical to achieving industrial electrification, especially in areas that do not have access to the BC Hydro system. Under an August 2019 Memorandum of Understanding between the Province of British Columbia and the Government of Canada, a number of transmission projects were identified for co-funding that would support the electrification of the natural gas sector. In addition to funding, regulatory changes could help ensure BC Hydro can meet customer timelines, as well as removing the obligation for customers to bear the cost of infrastructure.

#### **Diesel Reduction**

To support the CleanBC plan, BC Hydro is partnering with the Province and the federal government to implement the Remote Community Clean Energy Strategy to help remote communities, with a focus on Indigenous communities, reduce or eliminate diesel generation and replace it with energy from cleaner sources. Diesel generated electricity represents less than 0.5% of all electricity generated in the Province.

Many Indigenous Nations have interests and goals focused around environmental stewardship, energy self-sufficiency and economic sustainability. There are Indigenous communities that continue to rely on diesel for their community’s energy needs as they do not have access to the integrated BC Hydro grid to receive clean electricity due to their geographic location. In these areas that are not integrated to the grid, the cost of clean and renewable resources can, in most cases, be substantially higher than in areas

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connected to the integrated system due to a combination of the remoteness of the sites, loss of economies of scale due to the size of the grid, and lower local capacity, including equipment availability to build and/or operate a facility.

Experts in the Phase 2 Review support a reduction of diesel consumption balanced with maintaining reliability in non-integrated areas, with an emphasis on investment in early engagement with Indigenous Nations to identify opportunities, and implementing clean generation resources that are less costly than BC Hydro's marginal cost of existing operations.

#### **Demand Side Management and Fuel Switching Investments**

Demand-side management refers to programs, investments or other actions taken to reduce energy demand or shift energy use to periods of lower demand. Demand-side management is an important part of BC Hydro's resource plan, providing the flexibility to meet future supply needs by reducing demand through conservation or shifting demand, depending on system needs. Demand-side management is a low-cost energy resource with little to no environmental impact.

BC Hydro has a successful history of conservation and energy management programs through Power Smart, including [programs specifically for income-qualifying customers](#). The *Clean Energy Act* contains an energy objective for BC Hydro to take demand-side measures to reduce its expected increase in demand for electricity by the year 2020 by at least 66%. BC Hydro has surpassed the objective and currently spends approximately \$85 million annually on its traditional demand-side management portfolio, which is approximately equivalent to 1.5% of BC Hydro's domestic revenues. This amount is a decrease from the \$120 million spent in 2014, as BC Hydro reduced its traditional demand-side management spending in order to manage upward pressure on rates during an energy surplus.

The current level of investment was deemed to be appropriate in both Phase 1 of the Comprehensive Review and in the Fiscal 2017 – Fiscal 2019 Revenue Requirements Application to the BCUC. Maintaining spending at this level preserves the ability to ramp up investment in the future if it is required. The BCUC will play a greater role in

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reviewing BC Hydro's demand-side investments through its review of future Integrated Resource Plans.

In addition to demand-side management, new programs to encourage electrification of transportation, buildings and industry will be required to achieve the greenhouse gas reduction goals set out in CleanBC. Some of these types of initiatives are currently enabled by the Greenhouse Gas Reduction (Clean Energy) Regulation under the *Clean Energy Act*. Future proposals for electrification initiatives will be reviewed by the BCUC.

#### **Internal Carbon Pricing and Electrification**

The future path of carbon pricing in B.C. will directly influence the cost-effectiveness of fuel-switching and the amount of electrification that will occur.

For the transportation sector, there are two key carbon price tools in B.C. that encourage a transition toward less carbon-intensive fuels like electricity. In B.C. the carbon tax is applied at the pump and applies to the emissions associated with the purchase or use of transportation fuels such as gasoline, diesel, natural gas, and propane unless a specific exemption applies. The effect of this is to increase the price of fossil fuels for transportation as compared to electricity.

The other pricing mechanism positively influencing the adoption of electric vehicles in B.C. is the Renewable and Low Carbon Fuel Requirements Regulation. This regulation requires fuel suppliers to reduce the carbon content of the fuels they supply to the transportation sector and is driving the adoption of low-emitting fuels like electricity, hydrogen and biofuels. The low-carbon fuel credit market established under that Regulation provides a significant incentive to use low-carbon electricity for transportation.

For industry, the intensity benchmarks that are currently being developed for the CleanBC Industrial Incentive Program will affect the cost-effectiveness of fuel switching, as the benchmarks will determine the eligibility and level of incentive payments, and therefore the effective carbon price faced by industry.



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An internal carbon price for BC Hydro could be used to guide decision-making on programs and investments that reduce greenhouse gas emissions. The City of Vancouver and Metro Vancouver have both adopted internal carbon prices, as have a number of U.S. electric utilities and private sector energy companies. Introducing an internal carbon price or value for greenhouse gas emission reductions for electric utilities would support development of programs to encourage customer fuel-switching to electricity. An internal carbon price for BC Hydro would also provide a stable and predictable price signal and allow a consistent and efficient approach to fuel switching across the economy.

Utilities in other jurisdictions such as Washington state and Minnesota are required to incorporate a cost of carbon into the development of their long-term resource plans.

#### **What do you think?**

*What factors are important to consider when looking at optional rates to support electrification?*

*How can competitiveness for business and industry be prioritized in an electrified future?*

*How can BC Hydro reduce barriers to electrification for existing and new customers?*

*What are key considerations for programs to reduce reliance on diesel for non-integrated communities?*

*Are there new types of community projects or education programs that should be considered as part of an offering for new services either at or behind the meter?*

*How should BC Hydro use a value for greenhouse gas emission reductions (for example, a carbon price) in its evaluation of investments?*

#### **4. Thriving in an Evolving Electricity Sector**

Phase 2 of the review is expected to identify trends in technology, changes in electricity markets and transformative approaches used by other electric utilities, for example

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distributed generation, microgrids and digital utilities. Recommendations of the Phase 2 Review will address how BC Hydro must adapt to a broad range of future scenarios and evolve to support long-term sustainability.

#### **Grid modernization**

The distribution system provides the greatest opportunity for innovation for utilities, since they can take advantage of infrastructure that is built into every neighbourhood and communication systems that operate it. To take advantage of smart and flexible end-use devices or community-based energy resources, BC Hydro's distribution infrastructure must continue to evolve its smart-grid technology. For example, demand forecasting tools, distributed energy management systems, communication and control technologies. The grid also needs to support flexibility such as automation of switches and other grid assets.

Defining a successful grid modernization strategy is complex because it has the potential to enable such a wide variety of objectives and business opportunities. For example, it can yield vast amounts of data that can be leveraged to provide tailored customer products and services, and can be used to optimize the grid to improve the reliability and cost of conventional service.

#### **New products and services**

New product and service offerings are emerging for electric utilities that provide benefits to ratepayers, including services behind the meter like demand-response for vehicle charging and water heating to shift demand for power to off-peak hours. The Phase 2 Review is looking at different roles that BC Hydro could play behind the meter. There could be an opportunity for BC Hydro to offer new products and enhance existing products. BC Hydro could provide customers a discount in exchange for managing non-essential services, such as hot water heating and electric baseboards, in order to shift demand to off-peak hours and therefore keep costs down.

BC Hydro could act as a platform for behind the meter activities which would enable other organizations to offer additional services. The use of BC Hydro's infrastructure and information technology could facilitate services behind the meter through partnerships.

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#### **Innovation**

BC Hydro must prepare itself for technological change that is already occurring in the electricity sector. Experts recommended looking to incentivize and encourage innovative thinking throughout the organization. Some other jurisdictions have created the concept of an innovation sandbox that advances pilots for programs and services. This would entail an annual budget to try new technologies or services that would not be subject to cost disallowance by the BCUC.

#### **Resource Options**

Phase 1 of the Comprehensive Review enhanced regulatory oversight of BC Hydro by the BCUC. This included the restoration of the BCUC's authority to review and approve BC Hydro's Integrated Resource Plan, which outlines how BC Hydro plans to safely provide reliable, affordable, clean electricity to meet customers' needs, now and into the future.

BC Hydro's decisions on assets and resources to meet demand are central to the Integrated Resource Plan. There are currently constraints that limit BC Hydro's ability to maximize its integrated system to provide the most cost-effective clean supply to customers. In particular, the self-sufficiency provision in the *Clean Energy Act* restricts BC Hydro to planning to acquire resources within B.C. until self-sufficient, even in cases where clean and renewable resources in other jurisdictions could be more affordable. Eliminating the self-sufficiency requirement could provide BC Hydro the flexibility to meet future demand at the least cost, as BC Hydro would be able to meet demand not only through electricity generating facilities within British Columbia but also through importing power from clean and renewable resources. Self-sufficiency is a planning criterion for average water years; in low water years, BC Hydro already acquires cost-effective clean energy from the market to serve domestic needs. Eliminating the self-sufficiency provision would also have the benefit of lowering the cost of adding new generation due to timing flexibility. Further, it would also mean it would be unnecessary for BC Hydro to commit to long-term resources when facing only short-term energy deficits. When developing its Integrated Resource Plan, BC Hydro will look at the impact of the elimination of the self-sufficiency provision.

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Further, if both public and private entities could develop small-scale generation, BC Hydro would have more choice and flexibility when determining least cost solutions for meeting demand while still pursuing environmental and social benefits, all under the increased oversight of the BCUC.

#### **What do you think?**

*What are important considerations to empower BC Hydro to make the most cost-effective decisions on resource options, under the oversight of the BCUC, with respect to clean electricity?*

*What should BC Hydro be aware of when considering partnerships for behind the meter services?*

*Other jurisdictions, including Ontario and Quebec, invest in research and development in the electricity space to expand their customer offerings. How can BC Hydro best position itself to drive innovation? What is the best way to fund these efforts?*

### **5. Leveraging Our Strengths**

The Phase 2 Review will consider whether opportunities exist to enable greater participation in external markets. The review will consider what legislative or regulatory constraints reduce Powerex's trading ability in the West now or in the future and how BC Hydro should consider cost-effective clean electricity outside of B.C. if it is available. The Phase 2 Review will also consider whether there are opportunities to own, operate or partner with others with respect to clean energy resources and services.

BC Hydro's integrated system is interconnected with the western U.S. and Alberta. Powerex Corp. – BC Hydro's wholly-owned subsidiary – was established to participate in energy markets throughout the western states and Alberta. More than 90% of Powerex's trade activity occurs with the three west coast states. The capability of BC Hydro's system can vary over time with the amount of precipitation that falls across the province. Currently, in most years, BC Hydro has surplus energy unless precipitation across the province is very low on an annual basis. If BC Hydro needs additional energy

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to meet its customers' needs, it purchases that energy from Powerex. Likewise, when BC Hydro has surplus energy above and beyond its customers' needs, it can sell that energy to Powerex. BC Hydro and Powerex can also transact if there is residual capability in BC Hydro's system after meeting customer needs.

B.C. is not alone in focusing on reducing greenhouse gas emissions associated with the generation of electricity. Many parties have an interest in reducing emissions and the relative value of clean resources has increased accordingly. Powerex has not directly contracted with coal or gas generation facilities outside the province for many years. Its portfolio today comes from a combination of low-carbon resources and wholesale market electricity. In the past decade, Powerex has been a net exporter of low-carbon resources from B.C. to external markets, which helps to lower emissions in those jurisdictions receiving the energy.

A number of B.C.'s neighbours are embarking on policies to achieve emission-free energy and clean economies. States such as California, Washington, Nevada, Colorado and New Mexico have all set targets to achieve 100% clean energy standards in the 2040/2050-time frame. With more jurisdictions pursuing 100% clean standards, emitting resources will have diminishing market opportunities compared to non-emitting resources.

Maintaining alignment of clean policy with trade partners in the West would leverage BC Hydro's strength as a clean supplier of energy, capacity and flexibility, thereby maintaining and potentially enhancing opportunities for Powerex to generate income. These jurisdictions generally have requirements to generate or import enough non-emitting energy to meet 100% of their domestic retail sales over a period of several years. Washington State, one of B.C.'s largest electricity trading partners, uses a four-year period to accommodate year-to-year variations in hydroelectric generation.

Maintaining alignment of clean policy also provides an opportunity to potentially lower costs of acquiring clean energy as other regions produce clean energy surplus to their needs or have lower cost clean resources available for development. For jurisdictions with large fuel (e.g. inflow) variability like that in the BC Hydro system, the

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requirements are generally for over a multi-year period so as to relax the requirement for unusual conditions such as low inflow years.

Year after year, BC Hydro continues to exceed the objective of the *Clean Energy Act* that at least 93% of electricity generation in the province be from clean or renewable resources. Last year, BC Hydro generated nearly 98% clean energy. Building on the *Clean Energy Act* and in line with neighbouring jurisdictions, BC Hydro could become the first jurisdiction to implement a 100% clean electricity standard. Therefore, BC Hydro will assume a 100% clean electricity standard for the integrated grid when developing its Integrated Resource Plan.

#### **What do you think?**

*What are important considerations for a 100% clean electricity energy standard for BC Hydro's integrated system?*

*What factors should be considered if BC Hydro looks to expand its business interests including considering new opportunities outside of B.C. via Powerex or a new subsidiary?*

## **6. Advancing Reconciliation through New Partnerships with Indigenous Nations**

The provincial government passed legislation in November 2019 to implement the UN Declaration on the Rights of Indigenous Peoples. The B.C. [\*Declaration on the Rights of Indigenous Peoples Act\*](#) recognizes the human rights of Indigenous peoples and provides a path forward on reconciliation that will build a stronger B.C.

The Phase 2 Review is exploring future opportunities or new roles for Indigenous Nations in the development, ownership or operation of electrical infrastructure or services with the goal of enhancing Indigenous Nations' participation in the energy sector.

Over the last decade BC Hydro has made a strong commitment towards building and sustaining long-term relationships with Indigenous Nations, particularly with those

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communities where BC Hydro has a large infrastructure footprint. Despite the unresolved impacts from BC Hydro's historic infrastructure, BC Hydro and several Indigenous Nations have made progress to build a future together that reflects each other's mutual interests. As an organization, BC Hydro is guided by its [Statement of Indigenous Principles](#) and has made a commitment to incorporate the United Nations Declaration on the Rights of Indigenous Peoples and the Calls to Action of the Truth and Reconciliation Commission into its business.

Through various engagements with Indigenous Nations over the last several years, several themes have emerged that have been shared with both the Province and BC Hydro as relating to the energy sector. These themes are summarized as follows:

- Many Indigenous Nations have experienced significant impacts from BC Hydro's legacy infrastructure, most of which was built in the 1960s, 1970s and 1980s. BC Hydro has provided little in the way of benefits for the continued operation of this legacy infrastructure with the exception of a few agreements providing historic redress for small number of Indigenous Nations who are among the most impacted by BC Hydro's footprint. A major theme in discussions with Indigenous Nations over the last decade is the importance of sharing BC Hydro revenue with communities who experience the impacts of this historic infrastructure.
- For more than a decade, many Indigenous Nations across B.C. have embraced the opportunity to participate in the clean energy sector by pursuing independent power producer (IPP) opportunities selling electricity to BC Hydro. Successful IPPs can provide Indigenous Nations in B.C. a long-term stable source of revenue from clean energy development. Since BC Hydro currently has a surplus of electricity, new IPP opportunities are not available at this time. As a result, there is an increased interest in other energy sector opportunities – such as ownership in transmission assets, BC Hydro generation assets, or establishing Indigenous utilities to serve Indigenous members on reserve lands or to serve non-Indigenous customers beyond reserve lands.

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- To enable these types of energy sector opportunities, Indigenous Nations have provided the feedback that capacity (e.g. governance, financial, etc.) support would lead to more successful outcomes.
- Consistent with the United Nations Declaration on the Rights of Indigenous Peoples, Indigenous Nations have continued to emphasize:
  - The need for the Crown to consult and cooperate in good faith in order to obtain their free, prior and informed consent for building and operating electricity infrastructure in their territories.
  - Their own stewardship responsibilities and the importance of their involvement in decisions affecting lands and resources.
  - The importance of early engagement with Indigenous Nations on strategic level decisions and plans affecting them.
  - Concern around the impact of BC Hydro's projects and ongoing operations (particularly water operations) and more generally cumulative impacts in their territories and surrounding areas. As a result, Indigenous Nations have sought to co-plan or co-manage BC Hydro's use of resources in their territories.
  - There are opportunities for BC Hydro to take a more regional approach to its planning and engage Indigenous Nations earlier and more effectively on these issues.

Indigenous Nations have emphasized the importance of building relationships with BC Hydro that are founded on recognition of their rights, respect for their culture and protocols, and an appreciation for what Indigenous peoples, businesses and communities contribute to the province now and how they can contribute much more when they become full participants in British Columbia's economy.



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### Engagement with Indigenous Nations and Organizations

The Phase 2 Review will undertake further engagement with Indigenous Nations and organizations on these topics, which will inform the content of the final report. The intent is to better understand what are considered to be opportunities and barriers on key areas of the Interim Report, and the potential impacts from an economic, social and cultural perspective.

#### **What do you think?**

*What emerging issues and trends will BC Hydro need to address in the Phase 2 Review and beyond?*

*What are the key issues and trends for Indigenous and non-Indigenous communities related to electricity and BC Hydro?*

### **7. Next Steps**

This interim report is now available on the website for the Ministry of Energy, Mines and Petroleum Resources. The Ministry will continue to engage with stakeholders and seek more extensive feedback from Indigenous Nations and organizations to support the development of final recommendations of the Phase 2 Review.

A final report will be completed in Spring 2020 that will provide detailed recommendations on policy, governance and strategy to position BC Hydro for the future, while meeting provincial climate objectives, keeping rates affordable for British Columbians, furthering reconciliation with Indigenous peoples, and supporting quality economic development.