

# BC Hydro and Power Authority

## 2020/21 – 2022/23 SERVICE PLAN

February 2020



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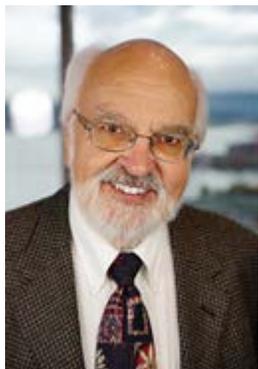
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## Board Chair Accountability Statement



The 2020/21 – 2022/23 BC Hydro Service Plan was prepared under the Board’s direction in accordance with the *Budget Transparency and Accountability Act*. The plan is consistent with government's strategic priorities and fiscal plan. The Board is accountable for the contents of the plan, including what has been included in the plan and how it has been reported. The Board is responsible for the validity and reliability of the information included in the plan.

All significant assumptions, policy decisions, events and identified risks, as of January 31, 2020 have been considered in preparing the plan. The performance measures presented are consistent with the *Budget Transparency and Accountability Act*, BC Hydro’s mandate and goals, and focus on aspects critical to the organization’s performance. The targets in this plan have been determined based on an assessment of BC Hydro’s operating environment, forecast conditions, risk assessment and past performance.

A handwritten signature in black ink, which appears to read "K. Peterson". The signature is stylized and fluid.

Kenneth G. Peterson  
Board Chair

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## Strategic Direction and Alignment with Government Priorities

The Government of British Columbia remains focused on its three strategic priorities: making life more affordable, delivering better services, and investing in a sustainable economy. Crown corporations are essential to achieving these priorities by providing quality, cost-effective services to British Columbia families and businesses.

Additionally, where appropriate, the operations of Crown corporations will contribute to:

- The objectives outlined in the government's newly released *A Framework for Improving British Columbians' Standard of Living*,
- Implementation of the *Declaration on the Rights of Indigenous Peoples Act* and the Truth and Reconciliation Commission Calls to Action, demonstrating support for true and lasting reconciliation, and
- Putting B.C. on the path to a cleaner, better future – with a low carbon economy that creates opportunities while protecting our clean air, land and water as described in the CleanBC plan.

By adopting the Gender-Based Analysis Plus (GBA+) lens to budgeting and policy development, Crown corporations will ensure that equity is reflected in their budgets, policies and programs.

BC Hydro is one of the largest electric utilities in Canada and is publicly owned by the people of British Columbia. We generate and provide electricity to 95 per cent of B.C.'s population and serve over four million people. The electricity we generate and deliver to customers throughout the province powers our economy and quality of life.

Our mission is to safely provide reliable, affordable, clean electricity throughout B.C. We have set out a three-year plan with strategies, performance measures and targets, aligned with the objectives in the [B.C. Government's Mandate Letter to BC Hydro](#), to fulfill our mission on behalf of our customers and the Province.

We have the important responsibility to help keep electricity affordable for our customers, while funding necessary investments in our electricity system. To support this goal, we are implementing the outcomes from Phase 1 of the Comprehensive Review of BC Hydro and making all reasonable efforts to limit rate increases. We are actively participating in Phase 2 of the Comprehensive Review to create a strategy that enables BC Hydro to continue to provide our customers with clean, reliable electricity at competitive rates through our continuing evolution in response to changes in climate, consumer demand, technology and B.C.'s commitment to Indigenous Nations.

BC Hydro's electricity system was largely built in the 1960s, 1970s and 1980s, and B.C.'s population and economy continue to grow. BC Hydro is upgrading and maintaining aging assets and building new infrastructure so that our customers continue to receive reliable and clean electricity. To ensure sustained economic and social benefits for ratepayers, we manage our capital portfolio with an emphasis on cost consciousness, respect for the environment and communities in which we work, and in particular, strengthening our relationships with First Nations communities.

BC Hydro will continue making investments to expand the system and maintain aging infrastructure to meet our customers' growing needs and expectations, while managing our costs, helping keep electricity affordable for our customers and improving our service.

BC Hydro is aligned with the Government’s key priorities:

Government Priorities	BC Hydro Aligns with These Priorities By:
Making life more affordable	<ul style="list-style-type: none"> <li>• Helping keep electricity bills affordable for our customers by managing our costs, exploring innovative solutions to support our customers and making cost-effective investments to maintain and expand our electricity system. (Objective 3.1)</li> </ul>
Delivering the services people count on	<ul style="list-style-type: none"> <li>• Reliably meeting the electricity requirements of customers and responding to their evolving expectations by prudently planning and investing in the system to meet future needs, consistently improving our service and advancing reconciliation with Indigenous Peoples. (Objective 2.1)</li> </ul>
A strong, sustainable economy	<ul style="list-style-type: none"> <li>• Implementing our 10 Year Capital Plan so that our customers can continue to receive clean, reliable and affordable electricity. (Strategy under Objective 3.1)</li> <li>• Supporting the implementation of the CleanBC plan to increase British Columbians’ use of cleaner energy in key sectors of the economy and shift away from reliance on fossil fuels for transportation, buildings and industry. (Strategy under Objective 4.1)</li> </ul>

## Operating Environment

As a utility that operates in a high hazard industry, we are committed to ensuring our workforce goes home safely every day and that the public is safe around our system. We are continuously working to improve our performance by understanding hazards, ensuring appropriate design of assets, related work procedures and competencies.

BC Hydro is regulated by the British Columbia Utilities Commission (BCUC). As the independent regulator of BC Hydro, the BCUC reviews BC Hydro’s costs, proposed rate increases, integrated resource planning and almost all regulatory accounts, programs and capital projects. On February 25, 2019, BC Hydro submitted the Fiscal 2020-Fiscal 2021 Revenue Requirements Application to the BCUC, which reflects our efforts to continue to deliver safe and reliable power, while keeping electricity affordable for our customers.

We are also implementing the outcomes resulting from Phase 1 of the Comprehensive Review by making all reasonable efforts to limit rate increases and managing our costs. We are actively participating in Phase 2 of the Review, which will develop recommendations for how BC Hydro can accomplish the provincial policy objectives in [CleanBC](#), including support of British Columbia’s legislated greenhouse gas reduction targets, in a manner that ensures BC Hydro’s future sustainability for the benefit of British Columbians. The Review will consider the potential impacts of North American energy and market trends, the needs of current and future BC Hydro customers, evolving technologies and utility structures, the affordability of electricity to consumers, and opportunities to involve Indigenous Peoples and communities.

The electricity we generate and deliver throughout B.C. meets a high standard of reliability, but we are always looking for ways to improve our service to our customers and help power British Columbia's strong, sustainable economy.

BC Hydro is focused on delivering our renewed customer service strategy, with the goal of making it easier to do business with us and helping customers make smart energy choices through our conservation and energy management programs. We will also continue to advance affordability initiatives to help our customers save money on their electricity bills. To help advance the Province's [CleanBC](#) climate and economic development objectives, we are encouraging our customers to use our clean and reliable electricity to power their homes, vehicles and businesses in order to reduce greenhouse gas (GHG) emissions.

We continue to make significant investments to expand the system and maintain aging infrastructure, while prudently managing all costs to help keep electricity affordable for our customers. This includes the development of the Site C project. Over the past five years (2014/15-2018/19), we have delivered 426 capital projects at a total cost of \$8.03 billion, which is 0.34 per cent over budget overall, and well within BC Hydro's +5% to -5% target. We work across teams, suppliers and experts to ensure thoughtful assessment of how to successfully deliver these projects on time and on budget while respecting the unique community, environmental and Indigenous interests associated with each project.

Operating, maintaining and expanding BC Hydro's extensive electricity system impacts a significant number of Indigenous communities across the province. We continue to pursue meaningful, long-term relationships with Indigenous groups to better understand their interests so they can be incorporated in our planning and business operations. With the historic passing of the *Declaration on the Rights of Indigenous Peoples Act* in November 2019, BC Hydro is working to implement the United Nations Declaration on the Rights of Indigenous Peoples, the Calls to Action in the Truth and Reconciliation Report, and the Draft Principles that Guide the Province of British Columbia's Relationship with Indigenous Peoples into our business.

With thoughtful planning and prudent decision-making, BC Hydro is well positioned to safely deliver clean, reliable, affordable, electricity throughout B.C., today and into the future.

## **Performance Plan**

We have identified four key goals that reflect successful delivery of [our mission](#): our workforce and the public will be safe; customers will experience reliable and responsive service; we will help keep electricity bills affordable for our customers; and, we will help make renewable, clean electricity British Columbia's leading energy source.

These four key goals guide our actions, each supported by corresponding strategies, performance measures and targets. Each performance measure has a definition and rationale, as well as relevant benchmarking measures that allow a comparison of performance over time. These measures track our progress on delivering on our mission to our customers and the Province. BC Hydro's management is responsible for measuring performance against targets. Results are reported to the Board on a quarterly basis and publicly in the Annual Service Plan Report.

## Goal 1: Safety Above All

**Objective 1.1:** Safety at BC Hydro is a core value. We are committed to ensuring our workforce goes home safely every day, and that the public is safe around our system.

### Key Strategies:

- Form a strong partnership with operational teams to guide and assist them in creating and sustaining a safe work place.
- Implement an integrated and sustainable safety and health management system with defined processes, accountabilities and responsibilities to manage risk.
- Create a learning culture within BC Hydro by using incident and near miss data to inform improvements in work methods, training and safety programs.
- Continue to standardize and consolidate safety information in one location so employees are able to easily find and understand the rules, procedures and work methods they require to complete their work.
- Continue public education efforts on hazards associated with electricity.
- Protect the public from hazards around our reservoirs and dams through adherence to the Canadian Dam Association Public Safety Around Dams guidelines with controlled access to areas that can be kept safe.
- Develop safety analytic services that will assist the organization to turn data into actionable information that improves safety outcomes.

Performance Measure(s) <sup>1</sup>	2018/19 Actuals	2019/20 Forecast	2020/21 Target	2021/22 Target	2022/23 Target
1.a Zero Fatality & Serious Disabling Injury <sup>2</sup> [Loss of life or the injury has resulted in a permanent disability]	0	0	0	0	0
1.b Lost Time Injury Frequency [Number of employee injury incidents resulting in lost time (beyond the day of the injury) per 200,000 hours worked]	0.87	0.80	0.80	0.76	0.74
1.c Timely Completion of Corrective Actions (%)	98	97	97	97	98

<sup>1</sup> Performance Measure descriptions, rationale, data source information and benchmarking are available online at [www.bchydro.com/performance](http://www.bchydro.com/performance)

<sup>2</sup> Zero Fatality and Serious Disabling Injury – BC Hydro’s safety performance measures do not include contractor or public safety injuries or fatalities.

### Linking Performance Measures to Objectives:

1.a Achieving our target of Zero Fatality and Serious Disabling Injury supports our objective that everyone goes home safely, every day.

1.b Lost Time Injury Frequency (LTIF) is an indicator of the likelihood of a full time employee sustaining a time loss injury in a normal work year and is a comparable metric to other provincial

organizations and the Canadian Electricity Association. LTIF of 1 equates to a 1 per cent chance of a time loss injury for any given employee in a work year.

1.c Timely Completion of Corrective Actions supports our strategy towards becoming a learning organization by addressing systemic improvements to our business to manage risk in a timely manner.

**Discussion:**

In 2020/21, BC Hydro will continue to utilize benchmark metrics such as Serious Incident and Fatality Frequency and LTIF to report on our ability to manage risk to workers and learning from previous incidents.

LTIF targets trending downwards illustrate the continual improvement we have made in controlling safety risks and mitigating hazards. The 2021/22 target has been modified to reflect a 5 per cent adjustment based on the updated 2019/20 forecasted result and the 2022/23 target has been set at a 2.5 per cent adjustment on the 2021/22 target.

Our Timely Completion of Corrective Actions targets trend upward to continue focusing on meeting the due dates of these actions. Results are reported using the definition of the measure introduced in the 2018/19 – 2020/21 Service Plan: the percentage of safety corrective actions closed on or before the scheduled due date on an annual basis, with an aim to improve over time. The 2020/21 target has been adjusted from 95 per cent to 97 per cent based on the updated 2019/20 forecasted result.

**Goal 2: Set the Standard for Reliable and Responsive Service**

**Objective 2.1:** BC Hydro will reliably meet the electricity requirements of customers and respond to their evolving expectations by prudently planning and investing in the system to meet future needs, consistently improving our service and advancing reconciliation with Indigenous Peoples.

**Key Strategies:**

- Ensure the reliability of the generation, transmission and distribution system by effectively implementing capital and maintenance programs to manage overall condition of the power system and ensure supply to meet customer load throughout the year.
- Continue to make it easier for customers to do business with us through a series of customer facing improvements such as: increased mobile access; enabling more self-service features; exploring new, innovative rate options; expanding in-person service areas; and enhancing customer service training for employees.
- Sustain gold-level certification under the Progressive Aboriginal Relations program by advancing practices in the areas of leadership, employment, business development and community relationships.
- Continue to advance reconciliation by incorporating the *Declaration on the Rights of Indigenous Peoples Act*, the Draft Principles that Guide the Province of British Columbia's Relationship with Indigenous Peoples and the Calls to Action of the Truth and Reconciliation Commission into our business.
- Safeguard the system with risk-prioritized security solutions and prepare our operations with well-practiced emergency response plans to support system reliability.

Performance Measure(s) <sup>1</sup>	2018/19 Actuals	2019/20 Forecast	2020/21 Target	2021/22 Target	2022/23 Target
2.a SAIDI (System Average Interruption Duration Index) <sup>2</sup> [Total outage duration (in hours) of sustained interruptions experienced by an average customer in a year (excluding major events)]	2.96	3.21	3.20	3.20	3.20
2.b SAIFI (System Average Interruption Frequency Index) <sup>2</sup> [Total number of sustained interruptions experienced by an average customer in a year (excluding major events)]	1.35	1.54	1.40	1.40	1.40
2.c Key Generating Facility Forced Outage Factor (%)	1.61	1.60	1.80	1.80	1.80
2.d CSAT Index <sup>3</sup> [Customer Satisfaction Index: % of customers satisfied or very satisfied]	87.7	87.0	85.0	85.0	85.0
2.e Progressive Aboriginal Relations Certification <sup>4</sup>	Gold	Gold	Gold	Gold	Gold

<sup>1</sup> Performance Measure descriptions, rationale, data source information and benchmarking are available online at [www.bchydro.com/performance](http://www.bchydro.com/performance)

<sup>2</sup> Reliability targets are based on specific values, however performance within 10 per cent is considered acceptable given the reliability projection modelling uncertainty, the wide range of variations in weather patterns and the uncontrollable elements that can significantly disrupt the electrical system. BC Hydro reports reliability under normal circumstances, because major events are not predictable and largely uncontrollable. The reliability measure is therefore based on data that excludes major events. BC Hydro reviews performance during major events and takes the performance into consideration in reliability improvement initiatives.

<sup>3</sup> Customer Satisfaction Index (CSAT) is an index measuring customer satisfaction of BC Hydro’s three main customer groups (residential, commercial and key accounts). The index is comprised of the five key drivers of satisfaction weighted equally across the three customer types.

<sup>4</sup> Progressive Aboriginal Relations is a certification program by the Canadian Council of Aboriginal Business.

### Linking Performance Measures to Objectives:

2.a & 2.b Customer reliability is measured using the System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI). These, along with correlated cause analysis for customer outages, support targeted investment, planning and process improvements to meet our customers’ needs for reliability.

By measuring the average number of service interruptions and number of hours of sustained interruptions experienced by the average customer in a year, we are able to track our ability to reliably meet the electricity requirements of customers.

2.c A forced outage occurs when a generating unit is unable to start generating or does not stay on line as long as needed. The Key Generating Facility Forced Outage Factor will show the trend of how the generation assets are performing and support investment decisions to maintain asset reliability.

2.d The Customer Satisfaction (CSAT) Index measures customer satisfaction with BC Hydro on five key drivers: value for money; commitment to customer service; providing reliable electricity; acting in the best interest of British Columbians; and efforts to communicate to customers and communities. This measure gauges the degree to which BC Hydro is meeting customers' electricity and service needs.

2.e The Canadian Council of Aboriginal Business's Progressive Aboriginal Relations (PAR) Gold certification offers validation of BC Hydro's sustained actions towards enhanced Indigenous relations. With BC Hydro's extensive footprint throughout the province, and our role as a Crown corporation, the comprehensiveness of the PAR certification acts as a measure for us to ensure relationships with Indigenous peoples are built on mutual respect and appropriately reflect the interests of Indigenous communities.

### **Discussion:**

SAIDI and SAIFI targets are based on a number of factors including long-term historic reliability trending, current year performance, previous years' investments and future years' investment plans while also accounting for annual variability due to weather. Consistent focus on customer reliability has enabled the targets to remain stable at the 2020/21 levels to align with historical performance, trends resulting from investment, planning and ongoing process improvements.

There are seven Key Generating Facilities, representing those plants with installed capacity greater than 200 MW<sup>1</sup>. Together, they provide 90 per cent of the average annual electricity generated by BC Hydro's facilities. Key Generating Forced Outage Factor is reported as a five year rolling average and defined as the total forced outage time in a period relative to the total number of hours in the same period (usually one year). Annually, the Forced Outage Factor can be relatively volatile, and applying the historical five year rolling average smooths the range to provide a more stable measure for which targets can be set. The objective is to keep the Forced Outage Factor below 1.80 per cent of the total number of hours per year.

BC Hydro strives to provide high quality customer experience and must balance its investments with the need to maintain the affordability of its rates. The stable target for the CSAT index reflects that customers' service needs are generally being met; however, continued effort is necessary to address gaps in specific areas, as well as to meet customers' changing expectations from their interactions with other organizations. In the near-term BC Hydro does not have any planned investments that would result in a sustained increase to the index.

The Canadian Council of Aboriginal Business' PAR is a certification program designed to help Canadian businesses benchmark, improve and signal their commitment to progressive relationships with Indigenous communities, businesses and people. It evaluates four areas of performance including: leadership actions; employment; business development; and community relations. PAR certification provides a high degree of assurance to Indigenous communities, as certification every three years is supported by an independent third party verification and is determined by a jury comprised of Indigenous business people. BC Hydro has attained the highest, gold-level designation

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<sup>1</sup> The Waneta Generating Station is not included in the Forced Outage Factor Performance Measure because BC Hydro does not manage or operate the facility.

from the Canadian Council for Aboriginal Business since 2012. In 2018/19, we were re-certified at the gold-level for a three year period.

### Goal 3: Help Keep Electricity Bills Affordable for our Customers

**Objective 3.1:** BC Hydro will help keep electricity bills affordable for our customers by managing our costs, exploring innovative solutions to support our customers and making cost-effective investments to maintain and expand our electricity system.

#### Key Strategies:

- Advance affordability initiatives with the BCUC to help our customers manage their electricity bills.
- Submit Revenue Requirements Applications to the BCUC consistent with the rates forecast released in Phase 1 of the Comprehensive Review.
- Make all reasonable efforts to keep rates affordable by acting on the outcomes of Phase 1 of the Comprehensive Review, including strategies to reduce future energy procurement costs.
- Participate in Phase 2 of the Comprehensive Review, to create a strategy, for the benefit of British Columbians, for BC Hydro to continue to provide its customers with clean, reliable energy at competitive rates through its continuing evolution in response to changes in climate, consumer demand, technology and B.C.’s commitment to reconciliation with Indigenous Nations.
- Implement our 10 Year Capital Plan so that our customers can continue to receive clean, reliable and affordable electricity.
- Continue to refine and enhance our systematic and disciplined project delivery methodology to ensure that our projects are put into service safely, on time, on budget and to a high standard of quality.
- Under the oversight of the independent Project Assurance Board, complete the Site C Project on schedule and within the approved budget, with a particular focus on managing risks and cost pressures and continue to provide quarterly progress exception reporting.
- Improve how we operate by improving our processes and supply chain strategies.

Performance Measure(s) <sup>1</sup>	2018/19 Actuals	2019/20 Forecast	2020/21 Target	2021/22 Target	2022/23 Target
3.a Affordable Bills <sup>2</sup>	1 <sup>st</sup> quartile	1 <sup>st</sup> quartile	1 <sup>st</sup> quartile	1 <sup>st</sup> quartile	1 <sup>st</sup> quartile
3.b Project Budget to Actual Cost <sup>3</sup>	+0.34% on \$8.03 billion <sup>4</sup>	-1.86% on \$7.23 billion <sup>5</sup>	Within +5% to -5% of budget excluding project reserve amounts	Within +5% to -5% of budget excluding project reserve amounts	Within +5% to -5% of budget excluding project reserve amounts

<sup>1</sup> Performance Measure descriptions, rationale, data source information and benchmarking are available online at [www.bchydro.com/performance](http://www.bchydro.com/performance)

<sup>2</sup> BC Hydro calculates a relative index for each usage level within the residential category and then calculates an average of the index to create an overall ranking based on Hydro Quebec’s annual report on North American electricity rates. The

rankings of the 22 participating utilities are then allocated into quartiles. The 1st quartile ranking represents the six utilities that have the lowest monthly electricity bills on April 1 of a given year.

<sup>3</sup>This measure compares actual project costs at completion to the original approved full scope implementation budgets, not including project reserve amounts, for capital projects that were put into service during the five-year rolling period.

<sup>4</sup>This represents projects that went into service for the five year period 2014/15 to 2018/19.

<sup>5</sup>This represents projects that went or are forecast to go into service for the five year period 2015/16 to 2019/20.

### **Linking Performance Measures to Objectives:**

3.a The Affordable Bills measure is based on BC Hydro's ranking in the residential rates category in the annual Hydro Quebec report, [Comparison of Electricity Prices in Major North American Cities](#). The report is used as a benchmark to demonstrate that our bills are affordable compared to other major North American utilities.

3.b Since 2015/16, BC Hydro has utilized the Project Budget to Actual Cost measure for the delivery of capital projects, with a target of actual project costs to be within +5 per cent to -5 per cent of the budget, excluding project reserves at the portfolio level. The +/- 5 per cent target is the same over the plan period, as it is the objective to have the entire project portfolio in-service within this actual cost range. BC Hydro has consistently met this performance target, as we continue to prudently manage capital expenditures and keep rates affordable for our customers.

### **Discussion:**

BC Hydro's residential bills have consistently been ranked in the first quartile over the past ten years. This year we are ranked third place within the first quartile based on analysis of the 2019 Hydro Quebec report, [Comparison of Electricity Prices in Major North American Cities](#).

The Project Budget to Actual Cost measure includes Dam Safety, Generation, Transmission Line, Substation and large Distribution projects, managed by BC Hydro Capital Infrastructure Project Delivery and Properties for the last five years. Annually, BC Hydro reports the past five years' performance at the portfolio level in delivering capital projects.

## **Goal 4: Help Make Renewable, Clean Power British Columbia's Leading Energy Source**

**Objective 4.1:** BC Hydro will strengthen its legacy of renewable, clean power and conservation investments through its energy-efficiency and conservation programs and support for low-carbon electrification.

### **Key Strategies:**

- Support the implementation of the CleanBC plan to increase British Columbians' use of clean energy in key sectors of the economy and shift away from reliance on fossil fuels for transportation, buildings and industry.
- Support customers with initiatives and rate structures that help them make smart energy management choices through our energy management initiatives (e.g. energy efficiency and conservation programs) and low carbon electrification initiatives.
- Implement our energy conservation and energy management plan, which will exceed the *Clean Energy Act* requirement to meet at least two-thirds of future demand growth by 2020.
- Provide customers with the opportunity to access clean, renewable power to displace the use of higher carbon energy sources.

- As part of the CleanBC plan, partner with the Province and the federal government to implement the Remote Community 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.

Performance Measure(s) <sup>1</sup>	2018/19 Actuals	2019/20 Forecast	2020/21 Target	2021/22 Target	2022/23 Target
4.a Energy Conservation Portfolio (New incremental GWh/year) <sup>2</sup>	868	734	700	500	500
4.b Clean Energy (%)	97.4 <sup>3</sup>	96.4	93.0	93.0	93.0

<sup>1</sup> Performance Measure descriptions, rationale, data source information and benchmarking is available online at [www.bchydro.com/performance](http://www.bchydro.com/performance)

<sup>2</sup> Annual targets are part of a Demand Side Management Plan that is set to fulfill the *Clean Energy Act* requirement to meet at least two-thirds of future demand growth by 2020. BC Hydro's future targets will be informed by the 2021 Integrated Resource Plan.

<sup>3</sup> Previously reported at 97.8 in the 2018/19 Annual Service Plan Report. Prior years' results were calculated based on the latest available data and may be different than previously stated.

### Linking Performance Measures to Objectives:

4.a The Energy Conservation Portfolio performance measure reflects new incremental energy savings from programs, codes and standards and conservation rates that measure BC Hydro's performance against annual energy targets. This measures the success of BC Hydro's planned conservation targets. Targets are rounded values and considered to be achieved if performance is within 10 per cent of the stated values.

4.b The Clean Energy performance measure demonstrates BC Hydro's efforts to generate clean, sustainable, affordable electricity in order to reduce GHG emissions in the province and continue to meet the 93 per cent minimum clean energy objective in the *Clean Energy Act*. The higher the per cent clean energy that BC Hydro achieves, the lower the GHG emissions in the province.

### Discussion:

The targets for Energy Conservation Portfolio are based on BC Hydro's forecast of annual new incremental energy savings and do not reflect past performance and/or adjustments made to energy savings in prior years (e.g., persistence, evaluations, measurement and verification). In some cases, the timing of savings for anticipated codes and standards and timing of large customer projects can shift, which will cause actual incremental energy savings to vary from the targets that have been set for the period.

The Clean Energy performance measure represents the minimum threshold generation output in accordance with the B.C. Government's requirement that at least 93 per cent of electricity generation in the province be from clean or renewable resources, as specified in the *Clean Energy Act*. While actual output of the non-clean resources in the system supports system reliability and can vary depending on market conditions and water inflows to our reservoirs, BC Hydro expects that the actual performance will remain close to 98 per cent.

## Financial Plan

### Summary Financial Outlook

Consolidated Statement of Operations <sup>1</sup> (\$ millions)	2019/20 Forecast	2020/21 Budget	2021/22 Budget	2022/23 Budget
<b>Domestic</b>	5,459	5,670	5,719	5,838
<b>Trade</b>	665	786	817	832
<b>Total Revenues</b>	<b>6,124</b>	<b>6,456</b>	<b>6,536</b>	<b>6,669</b>
<b>Operating Costs</b>				
<b>Cost of energy</b>	2,225	2,284	2,435	2,510
<b>Personnel expenses, materials &amp; external services<sup>2</sup></b>	1,219	1,239	1,243	1,248
<b>Amortization</b>	989	1,006	1,028	1,019
<b>Grants and taxes</b>	261	271	285	295
<b>Finance charges</b>	1,177	706	627	601
<b>Other</b>	124	88	89	107
<b>Total Expenses</b>	<b>5,994</b>	<b>5,594</b>	<b>5,706</b>	<b>5,779</b>
<b>Net Income before movement in regulatory balances</b>	<b>130</b>	<b>862</b>	<b>830</b>	<b>890</b>
<b>Net movement in regulatory balances</b>	<b>577</b>	<b>(150)</b>	<b>(118)</b>	<b>(178)</b>
<b>Net Income</b>	<b>707</b>	<b>712</b>	<b>712</b>	<b>712</b>
<b>Other Selected Financial Information:</b>				
<b>Dividends</b>	-	-	-	-
<b>Net Debt<sup>3</sup></b>	<b>23,445</b>	<b>24,731</b>	<b>25,871</b>	<b>26,886</b>
<b>Equity</b>	<b>5,654</b>	<b>6,366</b>	<b>7,078</b>	<b>7,790</b>
<b>Capital Expenditures</b>	<b>3,045</b>	<b>3,092</b>	<b>2,970</b>	<b>2,905</b>

<sup>1</sup> Table may not add due to rounding.

<sup>2</sup> These amounts are net of capitalized overhead and consist of the following:

	2019/20	2020/21	2021/22	2022/23
Domestic Base Operating Costs	794	805	831	839
Other	425	434	412	409
	<u>1,219</u>	<u>1,239</u>	<u>1,243</u>	<u>1,248</u>

Other largely consists of Powerex & Powertech operating costs, IFRS-ineligible capital overhead that is being phased into operating costs over a 10-year period, and expenses subject to regulatory deferral.

<sup>3</sup> Debt figures are net of sinking funds and cash and cash equivalents.

## Key Forecast Assumptions, Risks and Sensitivities

Key Assumptions	2019/20 Forecast	2020/21 Budget	2021/22 Budget	2022/23 Budget
<b>Growth and Load</b>				
B.C. Real Gross Domestic Product Growth (%) <sup>1</sup>	2.4	2.3	2.1	2.0
Domestic Sales Load Growth (%) <sup>2, 3</sup>	(0.14)	2.52	(0.97)	1.31
Load and Surplus Sales:				
Domestic Sales Volume (GWh)	52,337	53,656	53,138	53,833
Surplus Sales Volume (GWh)	182	3,032	3,463	2,633
Line Loss and System Use (GWh)	4,991	5,594	5,552	5,533
Total Load and Surplus Sales (GWh)	57,511	62,281	62,153	61,998
<b>Energy Generation</b>				
Total System Water Inflows (% of average)	93	100	100	100
Sources of Supply:				
Net Hydro Generation (GWh)	37,483	46,614	45,376	44,945
Market Electricity Purchases (GWh)	5,071	436	410	596
Independent Power Producers and Long-term Purchases (GWh)	14,674	14,933	16,036	16,124
Thermal Generation & Other (GWh)	283	298	332	333
Sources of Supply (GWh)	57,511	62,281	62,153	61,998
Average Mid-C Price (U.S.\$/MWh)	25.98	27.67	30.45	31.13
Average Natural Gas Price at Sumas (U.S.\$/MMBTU)	2.65	2.16	2.13	2.12
<b>Financial</b>				
Canadian Short-Term Interest Rates (%) <sup>4</sup>	1.63	1.47	1.82	2.32
Canadian Long-Term Interest Rates (%) <sup>4</sup>	2.18	2.43	2.77	3.40
Foreign Exchange Rate (U.S.\$:Cdn\$) <sup>4</sup>	0.7559	0.7616	0.7650	0.7714

<sup>1</sup> Economic assumption based on calendar year, from Ministry of Finance February Budget 2019.

<sup>2</sup> Includes the impact of Demand Side Management programs.

<sup>3</sup> Excludes surplus sales.

<sup>4</sup> Financial assumptions from Ministry of Finance, October 2019.

## Sensitivity Analysis

Factor	Change	Approximate change in 2020/21 earnings before regulatory account transfers (in \$ millions)
Customer Load <sup>1</sup>	+/- 1%	35
Interest Rates <sup>2</sup>	+/- 100 basis points	30
Electricity/Gas trade margins <sup>3</sup>	+/- 10%	25
Hydro Generation (GWh) <sup>4</sup>	+/- 1%	10
Exchange rates (US/ CDN)	+/- \$0.01	5

<sup>1</sup>Assumes a percentage change is applied equally to all customer classes. Assumes a change in customer load is offset by a corresponding change in market electricity purchases or surplus sales.

<sup>2</sup>Relates to debt subject to interest rate variability.

<sup>3</sup>Trade revenues less trade energy costs.

<sup>4</sup>Assumes a change in hydro generation is offset by a corresponding change in market electricity purchases or surplus sales.

## Management's Perspective on the Financial Outlook

In February 2019, BC Hydro filed an application with the BCUC for its revenue requirements for a two-year test period covering 2019/20 and 2020/21. In August 2019, BC Hydro provided an Evidentiary Update to its application. BC Hydro expects a decision in spring 2020 which may change the financial projections for revenues and expenses.

The current financial projections for revenues and expenses through 2022/23 were approved by the BC Hydro Board of Directors and submitted to the Ministry of Finance in January 2020.

This plan contains forward looking statements, including statements regarding the business and anticipated financial performance of BC Hydro. These statements are subject to a number of risks and uncertainties such as customer load, interest rates, electricity/gas market conditions and our ability to deliver our capital projects on-time and on-budget. These and other risks and uncertainties may cause actual results to differ from those contemplated in the forward-looking statements.

## Major Capital Projects

### Capital Expenditure by Year and Type and Function

(\$millions)	2019/20 Forecast	2020/21 Forecast	2021/22 Forecast	2022/23 Forecast
<b>Capital Expenditures by Type<sup>1</sup></b>				
Sustaining	964	1,004	1,146	1,259
Growth	2,081	2,088	1,824	1,646
Subtotal – BC Hydro Capital Expenditures before CIA	3,045	3,092	2,970	2,905
Contributions-in-Aid (CIA) <sup>2</sup>	(169)	(160)	(214)	(167)
Total – BC Hydro Capital Expenditures net of CIA	2,876	2,932	2,756	2,738
Generation	283	351	388	427
Transmission and Distribution	919	891	995	1,091
Properties, Technology and Other	249	224	226	210
Site C Project	1,594	1,626	1,361	1,177
Subtotal – BC Hydro Capital Expenditures before CIA	3,045	3,092	2,970	2,905
CIA	(169)	(160)	(214)	(167)
Total BC Hydro Capital Expenditures net of CIA	2,876	2,932	2,756	2,738

<sup>1</sup>. BC Hydro classifies capital expenditures as either sustaining capital or growth capital:

- Sustaining capital includes expenditures to ensure the continued availability and reliability of generation, transmission and distribution facilities. It also includes expenditures to support the business, such as vehicles and information technology.
- Growth capital includes expenditures to meet customer load growth and other business investments. Growth capital includes expenditures to expand existing generation assets as well as expand and reinforce the transmission and distribution system, and includes Site C.

<sup>2</sup>. Contributions in aid of construction are amounts paid by certain customers toward the cost of property, plant and equipment required for the extension of services to supply electricity.

## Projects over \$50 million

BC Hydro has the following projects, each with capital costs expected to exceed \$50 million, listed according to targeted completion date. These projects have been approved by the Board of Directors.

Major Capital Projects (over \$50 million)	Targeted Completion Date (Calendar Year)	Project Cost to Dec 31, 2019 (\$ millions)	Estimated Cost to Complete (\$ millions)	Approved Anticipated Total Capital Cost of Project (\$ millions)
<b>Projects Recently Put Into Service</b>				
<p><b>Horne Payne Substation Upgrade Project</b></p> <p>This project expanded the Horne Payne Substation with the addition of two 230/25kV, 150MVA transformers, gas-insulated feeder sections, and a new control building. This project increased the firm capacity of the substation, added needed feeder positions, facilitate the gradual conversion of the area supply voltage from 12kV to 25kV, and allowed for the implementation of an open-loop distribution system.</p>	2019 In-Service	\$69	\$1	\$70
<p><b>John Hart Generating Station Replacement</b></p> <p>This project replaced the existing six-unit 126 MW generating station (in operation since 1947) and added integrated emergency bypass capability to ensure reliable long-term generation and mitigated earthquake risk and environmental risk to fish and fish habitat.</p> <p><i>*John Hart forecast and life-to-date amounts include both capital costs and expenditures subject to regulatory deferral.</i></p>	2019 In-Service	\$974	\$6	\$980*
<p><b>Cheakamus Unit 1 and Unit 2 Generator Replacement</b></p> <p>This project replaced the two generators at Cheakamus generating station (in operation since 1957), addressed their poor condition and known deficiencies, and increased the capacity of each unit from 70 MW to 90 MW.</p>	2019 In-Service	\$61	\$1	\$62

Major Capital Projects (over \$50 million)	Targeted Completion Date (Calendar Year)	Project Cost to Dec 31, 2019 (\$ millions)	Estimated Cost to Complete (\$ millions)	Approved Anticipated Total Capital Cost of Project (\$ millions)
<b>Projects Recently Put Into Service</b>				
<p><b>Bridge River 2 Units 5 and 6 Upgrade Project</b></p> <p>This project replaced the two generators and other related equipment at Bridge River 2 and restored the historical operating capacity. These two generator units were placed in service in 1960 and were in unsatisfactory condition and unreliable.</p>	2019 In-Service	\$68	\$10	\$78
<b>Ongoing</b>				
<p><b>South Fraser Transmission Relocation Project*</b></p> <p>This project is intended to relocate certain sections of two 230kV transmission circuits (Circuit 2L62 and Circuit 2L58) from their present location adjacent to Highway 99 and in the George Massey tunnel to accommodate the replacement of the tunnel. These two 230kV circuits form a critical part of BC Hydro's transmission network supplying power to customers in Richmond, Delta and the Greater Vancouver area.</p> <p><i>*Construction work on the South Fraser Transmission Relocation project is currently suspended pending the government's review of the George Massey Tunnel replacement.</i></p>	TBD	\$30	\$46	\$76
<p><b>Downtown Vancouver Electricity Supply: West End Strategic Property Purchase</b></p> <p>This project is to acquire property rights to build and connect a new underground substation that will upgrade the aging electricity system in downtown Vancouver.</p>	2020 Targeted In-Service	\$67	\$14	\$81

<b>Major Capital Projects (over \$50 million)</b>	<b>Targeted Completion Date (Calendar Year)</b>	<b>Project Cost to Dec 31, 2019 (\$ millions)</b>	<b>Estimated Cost to Complete (\$ millions)</b>	<b>Approved Anticipated Total Capital Cost of Project (\$ millions)</b>
<p><b>Fort St. John and Taylor Electric Supply</b></p> <p>This project will maintain adequate supply capability, reduce line losses and improve reliability to the loads in the Fort St. John and Taylor areas by re-terminating 138kV transmission lines at the new Site C switchyard, and the addition of a 75 MVA transformer and new feeder positions.</p>	2020 Targeted In-Service	\$44	\$9	\$53
<p><b>UBC Load Increase Stage 2 Project</b></p> <p>This project is on behalf of BC Hydro's customer, the University of British Columbia, to continue to reliably meet the growing electricity needs of its Point Grey campus and the surrounding community.</p>	2021 Targeted In-Service	\$33	\$22	\$55
<p><b>Peace Region Electricity Supply (PRES) Project</b></p> <p>This project is needed to provide sufficient transmission system capacity to serve load growth and increase the reliability of electricity supply to existing customers in the South Peace. This project will facilitate reductions in provincial greenhouse gas emissions by enabling electrification of natural gas production, processing, and compression.</p> <p><i>*The total cost represents the gross cost of the project and has not been netted for Federal Government contributions.</i></p>	2021 Targeted In-Service	\$131	\$154	\$285*
<p><b>LNG Canada Load Interconnection Project</b></p> <p>This project is to facilitate the interconnection of LNG Canada's facility. A new double circuit 287kV transmission line will be constructed from Minette Substation (MIN) to LNG Canada's facility and system reinforcements at MIN will also be implemented. Under BC Hydro's standard tariffs, the customer is required to pay for a portion of this project's costs.</p> <p><i>*The total cost represents the gross cost of the project and has not been netted for a customer's contribution of \$24M.</i></p>	2021 Targeted In-Service	\$29	\$53	\$82*

Major Capital Projects (over \$50 million)	Targeted Completion Date (Calendar Year)	Project Cost to Dec 31, 2019 (\$ millions)	Estimated Cost to Complete (\$ millions)	Approved Anticipated Total Capital Cost of Project (\$ millions)
<p><b>Bridge River 2 Upgrade Units 7 and 8 Project</b></p> <p>This project will replace the two generators and other related equipment to restore the historical operating capacity. Units 7 and 8 were placed into service in 1960, are unreliable and in poor and unsatisfactory condition.</p>	<p>2021 Targeted In-Service</p>	<p>\$13</p>	<p>\$73</p>	<p>\$86</p>
<p><b>Wahleach Refurbish Generator Project</b></p> <p>This project will improve the reliability of the generator at Wahleach Generating Facility, and its scope includes replacement of the stator and rotor poles, refurbishment of the remaining major components, and a combination of new, replacement, and refurbishment of the auxiliary components. The project also includes the installation of a new powerhouse crane and structural upgrades to the powerhouse building.</p>	<p>2021 Targeted In-Service</p>	<p>\$12</p>	<p>\$39</p>	<p>\$51</p>
<p><b>Mica Replace Units 1 to 4 Generator Transformers Project</b></p> <p>This project will address the reliability and safety risks of the Unit 1-4 Generator Step-up Unit transformers at the Mica Generating Station, which are nearing end of life. There is a heightened reliability and safety risk from continuing to operate these transformers in an underground powerhouse as they age.</p>	<p>2022 Targeted In-Service</p>	<p>\$33</p>	<p>\$49</p>	<p>\$82</p>

Major Capital Projects (over \$50 million)	Targeted Completion Date (Calendar Year)	Project Cost to Dec 31, 2019 (\$ millions)	Estimated Cost to Complete (\$ millions)	Approved Anticipated Total Capital Cost of Project (\$ millions)
<p><b>G.M. Shrum G1 to 10 Control System Upgrade</b></p> <p>This project will replace the controls equipment, provide full remote control capability from the remote control center, and rectify deficiencies in the current system. The condition of the legacy controls for the GMS generating units, which were originally installed in the 1960s and 1970s, is of growing concern due to increasing maintenance requirements, lack of available spare parts and decreasing reliability. The controls are well beyond their expected life, which causes operating problems and increases the risk of damage to major equipment.</p>	2022 Targeted In-Service	\$41	\$34	\$75
<p><b>Mount Lehman Substation Upgrade Project</b></p> <p>This project will increase the firm capacity of the Mount Lehman Substation to address safety and asset health concerns at both the Clayburn and Sumas Way substations.</p>	2022 Targeted In-Service	\$5	\$54	\$59
<p><b>Capilano Substation Upgrade Project</b></p> <p>This project will address the existing asset health, reliability, safety, and environmental issues associated with the Capilano Substation, and to ensure that the capacity of the substation meets the long term area needs. The project will also introduce a 25kV source to enable 25kV voltage conversion and facilitate the execution of other future substation projects in the North Shore area.</p>	2024 Targeted In-Service	\$6	\$81	\$87
<p><b>Sperling Substation (SPG) Metalclad Switchgear Replacement Project</b></p> <p>This project will address the existing asset health, reliability and safety risks associated with the 12kV 60 series feeder section and the bulk oil breaker in the 12 kV 70/80 series feeder section, insufficient electrical clearances in the 60 series feeder section, and arc flash safety risks associated with the 12kV indoor metalclad switchgear.</p>	2024 Targeted In-Service	\$2	\$52	\$54

Major Capital Projects (over \$50 million)	Targeted Completion Date (Calendar Year)	Project Cost to Dec 31, 2019 (\$ millions)	Estimated Cost to Complete (\$ millions)	Approved Anticipated Total Capital Cost of Project (\$ millions)
<p><b>Site C Project</b></p> <p>This project will construct a third dam and a hydroelectric generating station on the Peace River approximately seven kilometres southwest of Fort St. John. It will be capable of producing approximately 5,100 gigawatt-hours of electricity annually and 1,100 megawatts of capacity. Site C will provide clean, renewable and cost-effective power in B.C. for more than 100 years.</p> <p><i>*Planned in-service date for all units.</i></p> <p><i>**Site C forecast and life-to-date amounts include both capital costs and expenditures subject to regulatory deferral. The amount includes a reserve of \$708 million.</i></p>	<p>2024*</p> <p>Targeted In-Service</p>	<p>\$4,691</p>	<p>\$6,009</p>	<p>\$10,700**</p>

### Significant Information Technology (IT) Projects over \$20 million

BC Hydro has the following IT project with capital costs expected to exceed \$20 million. This project has been approved by the Board of Directors.

Significant IT Projects (over \$20 million in total)	Targeted Completion Date (Calendar Year)	Project Cost to Dec 31, 2019 (\$ millions)	Estimated Cost to Complete (\$ millions)	Approved Anticipated Total Capital Cost of Project (\$ millions)
<b>Ongoing</b>				
<p><b>Supply Chain Applications Project</b></p> <p>This project will replace BC Hydro’s existing PassPort supply chain information technology (IT) system with an SAP-based IT system and make improvements to BC Hydro’s supply chain business processes for third-party materials and service acquisitions.</p> <p><i>*The BCUC issued an Order, dated April 9, 2019, which accepted the expenditures to complete the Implementation Phase of the project.</i></p>	2020 Targeted In-Service	\$54	\$14	\$68*

## **Appendix A: Hyperlinks to Additional Information**

### **Corporate Governance**

Information about Corporate Governance can be found at:

[http://www.bchydro.com/about/accountability\\_reports/financial\\_reports/service\\_plan.html](http://www.bchydro.com/about/accountability_reports/financial_reports/service_plan.html).

This includes links to information regarding, and includes all information detailed in the Best Practice Guidelines: Governance and Disclosure Guidelines for Governing Boards of British Columbia Public Sector Organizations:

- Board of Directors
- Executive Team
- Code of Conduct
- Board Governance Manual

### **Organizational Overview**

Information about BC Hydro's organizational overview can be found at:

<https://www.bchydro.com/toolbar/about.html>

This includes links to information about BC Hydro's operations, governance and mandate.

## **Appendix B: Subsidiaries and Operating Segments**

As wholly-owned subsidiaries, and like BC Hydro itself, Powerex Corp. and Powertech Labs Inc. follow best practices in corporate governance and subsidiary activities align with BC Hydro's mandate, strategic priorities and fiscal plan.

### **Powerex Corp.**

Powerex Corp., an energy marketer, is a wholly-owned corporate subsidiary of BC Hydro and a key participant in wholesale energy markets across North America. Powerex's business consists of trading wholesale power and natural gas, environmental products (renewable energy credits or other similar products), carbon products (allowances and other similar products), ancillary energy services, and financial energy products.

Through its contractual agreements with BC Hydro, Powerex supports BC Hydro's system requirements by importing and exporting energy. Powerex also markets, through a contractual agreement with the Province, the Canadian Entitlement to the Downstream Power Benefits under the Columbia River Treaty.

The Chief Executive Officer (CEO) of Powerex reports directly to the Board of Directors of Powerex. The Chair of the Powerex Board ensures the Board of BC Hydro is informed of Powerex's key strategies and business activities. The Powerex CEO also informs the BC Hydro President & CEO and Executive Team of Powerex's key strategies and business activities.

Powerex operates in competitive and complex wholesale energy-markets, which can cause net income in any given year to vary significantly. Market, economic and weather conditions, reduced hydro system flexibility, unrealized mark-to-market gains or losses and the strength of the Canadian dollar can materially impact Powerex net income. The Service Plan forecast includes annual net income from Powerex of approximately \$180 million per year for 2020/21 to 2022/23, based on the average earnings over the last five fiscal years. For more information, visit [powerex.com](http://powerex.com)

### **Board of Directors:**

- Ken Peterson – Chair
- Len Boggio
- James Hatton
- Valerie Lambert
- Chris O'Riley

### **Powertech Labs Inc.**

Powertech Labs Inc., operating in Surrey since its inception in 1979, is a wholly-owned subsidiary of BC Hydro. Powertech is internationally recognized as holding expertise in a range of fields related to the electrical industry and offers services and products including: research and development, testing, technical services, software and advanced technology services to energy clients, including BC Hydro, and other sectors globally.

The President and CEO of Powertech reports to the BC Hydro President and CEO. The Powertech Board is chaired by BC Hydro's President and CEO and its Directors include senior Executives of BC Hydro.

The Service Plan forecast includes annual net income from Powertech of approximately \$4 million per year for 2020/21 to 2022/23. For more information, visit [powertechlabs.com](http://powertechlabs.com).

### **Board of Directors:**

- Chris O'Riley - Chair
- Melissa Holland
- Kip Morison
- David Wong

### **Other Subsidiaries**

BC Hydro has created or retained a number of other subsidiaries for various purposes, including holding licences in other jurisdictions, to manage real estate holdings and to manage various risks.

All the staff and management needs of the active subsidiaries below are fulfilled by BC Hydro employees, who perform these duties without additional remuneration. Three of these subsidiaries are considered active:

#### **BCHPA Captive Insurance Company Ltd.**

Procures insurance products and services on behalf of BC Hydro.

#### **Columbia Hydro Constructors Ltd.**

Administers and supplies the labour force to specified projects.

#### **Tongass Power and Light Company**

Provides electrical power to Hyder, Alaska from Stewart, B.C. due to its remoteness from the Alaska electrical system.

**Nominee Holding Companies and/or Inactive/Dormant Subsidiaries**

BC Hydro's remaining subsidiaries either serve as nominee holding companies (indicated with an \*) or are considered to be inactive/dormant. The inactive/dormant subsidiaries do not carry on active operations. As of December 31, 2019, these other subsidiaries consisted of the following:

1. British Columbia Hydro International Limited
2. British Columbia Power Exchange Corporation
3. British Columbia Power Export Corporation
4. British Columbia Transmission Corporation
5. Columbia Estate Company Limited\*
6. Edmonds Centre Developments Limited\*
7. Fauquier Water and Sewerage Corporation
8. Hydro Monitoring (Alberta) Inc.\*
9. Victoria Gas Company Limited
10. Waneta Holdings (US) Inc.\*
11. 1111472 BC Ltd.