BC Hydro and Power Authority

2019/20 – 2021/22
SERVICE PLAN

February 2019

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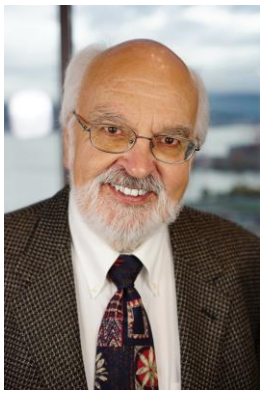
Board Chair Accountability Statement



The 2019/20 – 2021/22 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, 2019 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.

Kenneth G. Peterson
Board Chair

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Strategic Direction and Alignment with Government Priorities

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.

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.

We have the important responsibility to keep electricity rates 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 (the Comprehensive Review) and have made the necessary adjustments to our operating and capital expenditures. We will continue to strive to limit rate increases for our customers, and we will actively participate in Phase 2 of the Comprehensive Review to strategically position the corporation for long-term success in the context of rapid shifts in the global and regional energy sectors, technological changes, and provincial and federal climate strategies.

BC Hydro will continue making investments to expand the system and maintain aging infrastructure to meet our customers' growing needs, while managing our costs, keeping rates affordable 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	• Ensuring our customers will benefit from affordable bills while managing our costs, exploring innovative solutions to support our customers and making investments to maintain and expand our electricity system. (Objective 3.1)
Delivering the services people count on	• Reliably meeting the electricity requirements of customers and responding to their evolving expectations by planning and investing in the system to meet future needs and by consistently improving our service. (Objective 2.1)
A strong, sustainable economy	• Continuing to implement the updated 10 Year Capital Plan so that our customers can continue to receive clean, reliable and affordable electricity. (Strategy under Objective 3.1) • 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, industry, and housing. (Strategy under Objective 4.1)

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 and related work procedures and building and strengthening our safety culture and competencies.

BC Hydro is regulated by the British Columbia Utilities Commission (BCUC). As the independent regulator of BC Hydro, the BCUC is responsible for ensuring that our customers receive safe, reliable and non-discriminatory energy services at fair rates. Current and upcoming proceedings to support affordable rates for our customers include the Fiscal 2020-Fiscal 2021 Revenue Requirements Application, which will be submitted to the BCUC in February 2019, and various Rate Design Applications. The Revenue Requirements Application will be informed by the results of Phase 1 of the Comprehensive Review, which included a full review of our business, with an emphasis on cost consciousness.

BC Hydro is developing and evaluating a number of rate design options that would help make our customers' electricity bills more affordable and provide customers with more choices. We will also continue to advance other affordability initiatives to help our customers save money on their electricity bills.

To help keep electricity more affordable for our customers, we will implement the outcomes resulting from Phase 1 of the Comprehensive Review. We will make all reasonable efforts to limit rate increases, while continuing to make significant investments to expand the system and maintain aging infrastructure.

We continue to advance critical projects to meet our long-term energy needs, including completing the Site C project by November 2024 at a cost of no more than $10.7 billion. Over the past five years (2013/14-2017/18), we have delivered 493 capital projects at a total cost of $6.9 billion, which is 0.40 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.

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, support climate action and help power British Columbia's sustainable, innovative economy.

We are focused on delivering our renewed customer service strategy, with the goal of making it easier to do business with us and helping our customers make smart energy choices through our conservation and energy management programs, including encouraging our customers to use our clean and reliable electricity to power their homes, vehicles and businesses. We will support and align with the Province's new CleanBC plan, which outlines significant greenhouse gas (GHG) reduction measures, by powering British Columbia's economic growth with clean and renewable electricity.

BC Hydro's extensive electricity system, along with our reinvestment and expansion plans, means a significant number of Indigenous communities across the province are, or will be, impacted by our infrastructure. We continue to work to develop and sustain positive long-term relationships and better understand Indigenous interests so that their priorities are recognized in our capital programs and business operations. Our approach and results have been recently recognized through certification at a gold level through the Canadian Council of Aboriginal Business' Progressive Aboriginal Relations program. We are working to further incorporate the Calls to Action in the Truth and Reconciliation Report, the Draft 10 Principles that Guide the Province of British Columbia's Relationship with Indigenous Peoples and the United Nations Declaration on the Rights of Indigenous Peoples into our business and operations.

With thoughtful planning and prudent decision-making, BC Hydro is well positioned to safely deliver affordable, reliable, clean 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 affordable for our customers; and, we will help make renewable, clean electricity British Columbia's leading energy source. The Safety Above All goal has moved from Goal 4 in previous Service Plan documents to Goal 1 to better reflect our commitment to safety. Other Performance Measure changes are outlined in the Discussion sections of this document.

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:

- Continue to work to achieve zero fatalities and zero permanently disabling injuries. Examples of projects include: reducing electrical hazards, updating Limits of Approach; continued work on arc flash work methods; asbestos program updates; and confined space program and training.
- Reduce lost time injuries and medical aid injuries. Examples of projects include: the field/plant ergonomics program; using near misses and good catches to identify improvement opportunities; and the Return to Work/Stay at Work program.
- Build a culture to achieve excellence in safety. Examples of investments include: regular reviews of safety incidents by the senior management team; timely implementation of corrective actions that reduce risk of injuries; and completion of Safe Work Observations that identify hazards before injuries occur.
- Meet regulatory requirements. Examples of planned work include: evaluating the fall protection program; evaluating and implementing a new tracking program; identifying and ensuring compliance with new regulatory requirements when they are enacted; field-based safety audits; and building a new confined space training and certification program, ensuring worker safety and compliance with all regulations while in confined spaces.
- Build corporate systems and tools supporting excellence in safety. Examples of projects include: Safety & Health Management System; Field Access to Safety Information, which continues to improve the quality of safety information; and track Worker Protection Authorizations through a consolidated system.
- Monitor our safety performance and identify safety risks to our workers and the public.

Performance Measure(s)[1]	2017/18 Actuals	2018/19 Forecast	2019/20 Target	2020/21 Target	2021/22 Target
1.a Zero Fatality & Serious Injury[2] [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]	0.88	1.07	0.80	0.80	0.75
1.c Timely Completion of Corrective Actions (%)	93[3]	97	95	95	97

[1] Performance Measure descriptions, rationale, data source information and benchmarking is available online at www.bchydro.com/performance

[2] Zero Fatality and Serious Disabling Injury – BC Hydro's safety performance measures do not include contractor or public safety injuries or fatalities.

[3] Previously reported as 100 per cent in the 2017/18 Annual Service Plan report, based on the previous definition for Timely Completion of Actions (see explanation in Discussion section below).

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 Focusing on Lost Time Injury Frequency indicates if our workers are experiencing fewer work place injuries. The earlier an injured worker is able to safely return to productive employment and maintain a positive connection to the workplace, the more likely the worker will experience a quick recovery.

1.c Timely Completion of Corrective Actions reduces the probability that more workers will be injured and demonstrates that we are a learning organization that is committed to addressing identified deficiencies that have a direct impact on the safety of our workforce. By implementing corrective actions in a timely manner, we will experience fewer work place injuries as systemic deficiencies are corrected.

Discussion:

In 2019/20, BC Hydro will begin to use leading indicators such as Serious Incident and Fatality Frequency to further mitigate safety risks.

Lost Time Injury Frequency's targets trend downward to reinforce our commitment to reduce workplace injuries. However, based on the number of lost time injuries we have seen year-to-date in 2018/19, we do not expect to meet our lost time frequency target of 0.85. The 2020/21 Lost Time Injury Frequency target has been adjusted from 0.75 to 0.80, based on our 2018/19 forecasted result. The implementation of the Safety & Health Management System, together with the following initiatives, will support BC Hydro in achieving future targets: 1) increased safe work observations by managers; 2) increased and more consistent use of the Return to Work/Stay at Work program; 3) increased use of Incident Management System (IMS) review calls with executive; 4) expansion of the ergonomics program; and 5) regional safety discussion calls with crews.

Our Timely Completion of Corrective Actions targets trend upward to continue focusing on meeting the due dates of these actions. 2017/18 Actuals were reported as 100 per cent in the 2017/18 Annual Service Plan Report, based on the previous definition for Timely Completion of Actions (the percentage of safety corrective actions closed within 30 days of the original scheduled due date on an annual basis). Results are now reported using the new 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.

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 planning and investing in the system to meet future needs and by consistently improving our service.

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 secure supply to meet customer load throughout the year.
- Safeguard the system with risk-prioritized security solutions and prepare our operations with well-practiced emergency response plans to improve overall system reliability.
- Sustain the highest, gold-level certification under the Progressive Aboriginal Relations program by maintaining leading practices focused on Indigenous employment, business development, community relationships and leadership actions.
- Continue to advance reconciliation by incorporating the United Nations Declaration on the Rights of Indigenous Peoples, the Draft 10 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.
- 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.

- Support customers with initiatives that help them make smart energy management choices through conservation and energy efficiency, capacity reduction and low carbon electrification.

Performance Measure(s)[1]	2017/18 Actuals	2018/19 Forecast	2019/20 Target	2020/21 Target	2021/22 Target
2.a SAIDI (System Average Interruption Duration Index)[2] [Total outage duration (in hours) of sustained interruptions experienced by an average customer in a year]	3.07	3.10	3.25	3.20	3.20
2.b SAIFI (System Average Interruption Frequency Index)[2] [Total number of sustained interruptions experienced by an average customer in a year (excluding major events)]	1.51	1.37	1.40	1.40	1.40
2.c Key Generating Facility Forced Outage Factor (%)	1.81	1.80	1.80	1.80	1.80
2.d CSAT Index[3] [Customer Satisfaction Index: % of customers satisfied or very satisfied]	86.0	86.0	85.0	85.0	85.0
2.e Progressive Aboriginal Relations Designation[4]	Gold	Gold	Gold	Gold	Gold

[1] Performance Measure descriptions, rationale, data source information and benchmarking is available online at www.bchydro.com/performance

[2] 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 measures 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.

[3] 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.

[4] The Canadian Council of Aboriginal Business' Progressive Aboriginal Relations (PAR) Program 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 requires companies to set goals and assess themselves in four areas: leadership actions; employment; business development; and community relations. Each company must be certified every three years through a comprehensive review process that involves independent verification. BC Hydro was recertified at the gold level in 2018/19.

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 of 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. Given BC Hydro's extensive footprint throughout the province, and its role as a Crown corporation, the comprehensiveness of the PAR certification acts as a measure for BC Hydro to ensure it is establishing relationships with First Nations built on mutual respect and that appropriately reflect the interests of First Nations communities.

Discussion:

System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (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. SAIDI's 2020/21 target has been lowered to align with improved historical performance, trends resulting from investment, planning and process improvements.

There are seven Key Generating Facilities, representing those plants with installed capacity greater than 200 MW[1]. 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 can smooth the range to provide a more stable measure for which targets can be set. The objective is to keep the Forced Outage Factor below 1.8 per cent of the total number of hours per year.

Progressive Aboriginal Relations Designation – BC Hydro attained the highest, gold-level designation from the Canadian Council for Aboriginal Business in 2018/19, which is valid for a three year period.

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

Goal 3: Help Keep Electricity Affordable for our Customers

Objective 3.1: BC Hydro customers will benefit from affordable bills while we manage our costs, explore innovative solutions to support our customers, and make investments to maintain and expand our electricity system.

Key Strategies:

- Advance affordability initiatives and rate structures with the BCUC to help our customers manage their electricity bills.
- 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.
- Submit a Revenue Requirements Application consistent with the rates forecast released in Phase 1 of the Comprehensive Review.
- Participate in Phase 2 of the Comprehensive Review, which will strategically position BC Hydro for long-term success, within the context of a rapidly evolving international and continental energy sector and provincial and federal climate action strategies.
- Implement an updated 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 by November 2024 at a cost of no more than $10.7 billion, and provide quarterly progress updates to Treasury Board.
- Improve how we operate by improving our processes and supply chain strategies.

Performance Measure(s)[1]	2017/18 Actuals	2018/19 Forecast	2019/20 Target	2020/21 Target	2021/22 Target
3.a Affordable Bills[2]	1st quartile	1st quartile	1st quartile	1st quartile	1st quartile
3.b Project Budget to Actual Cost[3]	+0.40% on $6.9 billion[4]	+0.46% on $8.0 billion[5]	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

[1] Performance Measure descriptions, rationale, data source information and benchmarking is available online at www.bchydro.com/performance

[2] 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.

[3] 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.

[4] This represents projects that went or were forecasted to go into service for the five-year period 2013/14 to 2017/18.

[5] This represents projects that went or are forecasted to go into service for the five-year period 2014/15 to 2018/19.

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 and predictable 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% to -5% of the budget, excluding project reserves at the portfolio level. BC Hydro has consistently met this performance target, as we continue to prudently manage capital expenditures and keep affordable rates for our customers.

Discussion:

The Competitive Rates performance measure was revised to Affordable Bills to better align with the Government's affordability commitment. Affordable Bills is a more accurate name for this performance measure, as the Hydro Quebec report compares customer electricity bills in its report.

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 2018 Hydro Quebec report, Comparison of Electricity Prices in Major North American Cities. In February 2019, BC Hydro will submit the Fiscal 2020 to Fiscal 2021 Revenue Requirements Application that reflects the projected rates forecast from Phase 1 of the Comprehensive Review.

The Project Budget to Actual Cost measure includes Generation, Substation and Transmission Line projects managed by BC Hydro Capital Infrastructure Project Delivery. 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, capacity reduction initiatives and support of low-carbon electrification.

Key Strategies:

- Support 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, industry, and housing.
- Support customers with initiatives that help them make smart energy management choices with conservation, efficiency, capacity reduction and low carbon electrification.
- 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 a new 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.

Performance Measure(s)[1]	2017/18 Actuals	2018/19 Forecast	2019/20 Target	2020/21 Target	2021/22 Target
4.a Energy Conservation Portfolio (New incremental GWh/year)[2]	741	800	700	700	500
4.b Clean Energy (%)	98.0	97.6	93.0	93.0	93.0

[1] Performance Measure descriptions, rationale, data source information and benchmarking is available online at www.bchydro.com/performance

[2] Annual targets are part of a longer-term 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 and BC Hydro's long term planning needs.

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% of the stated values.

4.b The Clean Energy performance measure demonstrates BC Hydro's efforts to supply clean, sustainable, responsibly generated, 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. Updated customer information on the timing of thermo-mechanical pulp projects and the timing of energy savings from lighting regulations resulted in increased targets for 2018/19 and 2019/20 of 800 GWh/year (gigawatt-hours per year) and 700 GWh/year respectively, followed by 700 GWh/year in 2020/21. The target of 500 GWh for 2021/22 reflects the forecasted incremental energy savings related to government enacted codes and regulations.

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.

The New Clean Supply performance measure was removed from the 2019/20 –2021/22 Service Plan. BC Hydro will develop a new measure next year to support and align with the Government's new CleanBC plan.

Financial Plan

Summary Financial Outlook

Consolidated Statement of Operations[1, 2] ($ millions)	2018/19 Forecast	2019/20 Budget	2020/21 Budget	2021/22 Budget
Domestic	5,441	5,654	5,708	5,895
Trade	653	651	682	706
Total Revenues	**6,095**	**6,304**	**6,390**	**6,600**
Operating Costs				
Cost of energy	2,094	2,367	2,441	2,500
Personnel expenses, materials & external services[3]	1,259	1,204	1,234	1,209
Amortization	881	925	946	966
Grants and taxes	254	258	271	293
Finance charges	685	756	726	679
Other	82	108	87	94
Total Expenses	**5,255**	**5,619**	**5,704**	**5,741**
Net Income before movement in regulatory balances	**840**	**685**	**686**	**860**
Net movement in regulatory balances	**(1,264)**	**27**	**26**	**(148)**
Net Income (Loss)	**(424)**	**712**	**712**	**712**
Dividends	**59**	**-**	**-**	**-**
Net Debt[4]	**22,233**	**23,419**	**24,654**	**25,857**
Equity	**4,973**	**5,684**	**6,396**	**7,108**
Capital Expenditures[2]	**3,923**	**2,999**	**3,115**	**3,153**

[1] Table may not add due to rounding.

[2] Includes the purchase of the remaining two-thirds interest in the Waneta Dam and Generating Station in 2018/19. The transaction was approved by the BCUC in July 2018.

[3] These amounts are net of capitalized overhead and consist of the following:

	2018/19	2019/20	2020/21	2021/22
Domestic Base Operating Costs	769	778	788	793
Other	489	426	446	416
	1,259	1,204	1,234	1,209

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

[4] Debt figures are net of sinking funds and cash and cash equivalents.

Key Forecast Assumptions, Risks and Sensitivities

Key Assumptions	2018/19 Forecast	2019/20 Budget	2020/21 Budget	2021/22 Budget
Growth and Load				
B.C. Real Gross Domestic Product Growth (%)[1]	2.2	1.8	2.0	2.0
Domestic Sales Load Growth (%)[2, 3]	0.96	1.83	(0.59)	(0.30)
Domestic Load (GWh):				
Domestic Sales Volume (GWh)[3]	52,604	53,567	53,253	53,093
Surplus Sales Volume (GWh)	2,230	2,409	3,087	4,402
Line Loss and System Use (GWh)	5,173	5,554	5,553	5,538
Total Domestic Load (GWh)	60,007	61,530	61,893	63,033
Energy Generation				
Total System Water Inflows (% of average)	88	100	100	100
Sources of Supply to Meet Domestic Load:				
Net Hydro Generation (GWh)	43,015	44,268	44,893	45,939
Market Electricity Purchases (GWh)[4]	2,077	1,504	648	404
Independent Power Producers and Long-term Purchases (GWh)	14,631	15,449	16,040	16,346
Thermal Generation & Other (GWh)	284	309	312	344
Sources of Supply for Domestic Load (GWh)	60,007	61,530	61,893	63,033
Average Mid-C Price (U.S.$/MWh)	33.40	25.88	24.97	28.00
Average Natural Gas Price at Sumas (U.S.$/MMBTU)	3.14	2.18	2.01	1.93
Financial				
Canadian Short-Term Interest Rates (%)[5]	1.72	2.37	2.59	2.96
Canadian Long-Term Interest Rates (%)[5]	3.08	3.50	3.86	4.23
Foreign Exchange Rate (U.S.$:Cdn$)[5]	0.7755	0.7910	0.7973	0.8013

[1] Economic assumption based on calendar year, from Ministry of Finance September 2018 First Quarter Report.
[2] Includes the impact of Demand-Side Management programs.
[3] Excludes surplus sales.
[4] Assumes that gas fired power generation capability available to service domestic demand is sometimes displaced by more cost-effective market purchases.
[5] Financial assumptions from Ministry of Finance, October 2018.

Sensitivity Analysis

Factor	Change	Approximate change in 2019/20 earnings before regulatory account transfers (in $ millions)
Customer Load	+/- 1%	35
Interest Rates	+/- 100 basis points	35
Electricity/Gas trade margins	+/- 10%	20
Hydro Generation (GWh)[1]	+/- 1%	10
Exchange rates (US/ CDN)	+/-$0.01	5

[1] Assumes change in hydro generation is offset by corresponding change in net market electricity sales (i.e. increase in hydro generation is offset by increase in net market electricity sales).

Management's Perspective on the Financial Outlook

The results of Phase 1 of the Comprehensive Review were announced by Government in February 2019, and include a number of actions intended to enhance the BCUC's oversight of BC Hydro, keep rates affordable, and mitigate impacts to the Government's Fiscal Plan. The results of Phase 1 of the Comprehensive Review have been included as key assumptions in preparing the current financial projections.

The current financial projections for revenues and expenses through 2021/22 were approved by the BC Hydro Board of Directors and submitted to the Ministry of Finance in January 2019.

Major Capital Projects

Capital Expenditure by Year and Type and Function

($millions)	2018/19 Forecast	2019/20 Forecast	2020/21 Forecast	2021/22 Forecast
Capital Expenditures by Type[1]				
Sustaining	980	978	1,093	1,175
Growth	2,943	2,021	2,022	1,978
Subtotal – BC Hydro Capital Expenditures before CIA	3,923	2,999	3,115	3,153
Contributions-in-Aid (CIA)[2]	(147)	(158)	(148)	(150)
Total – BC Hydro Capital Expenditures net of CIA	3,776	2,841	2,967	3,003
Generation	1,589	345	436	512
Transmission and Distribution	930	895	947	1,175
Properties, Technology and Other	217	229	197	148
Site C Project	1,187	1,530	1,535	1,318
Subtotal – BC Hydro Capital Expenditures before CIA	3,923	2,999	3,115	3,153
CIA	(147)	(158)	(148)	(150)
Total BC Hydro Capital Expenditures net of CIA	3,776	2,841	2,967	3,003

1. 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 and the Waneta 2/3 Interest Acquisition.
2. 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 $50 million)	Targeted Completion Date (Year)	Project Cost to Dec 31, 2018 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Projects Recently Put Into Service				
Ruskin Dam Safety and Powerhouse Upgrade This project improved a seismically deficient dam and rehabilitated / replaced powerhouse equipment that was brought into service between 1930 and 1950. The project included: upgrading of the right abutment; redeveloping the dam and powerhouse to meet current seismic standards for earthquakes; and replacing major generation equipment which was in poor or unsatisfactory condition.	2018 In-Service	$621	$21	$642
W.A.C Bennett Dam Riprap Upgrade Project This project addressed inadequate erosion protection on the upstream face of the W.A.C Bennett Dam. The primary driver of the project was safety of the dam itself as well as safety of the public, property, and environment downstream.	2018 In-Service	$118	$1	$119
Waneta 2/3 Interest Acqusition BC Hydro purchased Teck Resources Ltd.'s two-third interest in the Waneta Dam and associated assets in July 2018.	2018 In-Service	$1,220	$1	$1,221
Kamloops Substation This project constructed a new 100MW 138/25kV substation in the west side of Kamloops to meet expected load growth in the Kamloops service area.	2018 In-Service	$50	$6	$56

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to Dec 31, 2018 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Ongoing				
Horne Payne Substation Upgrade Project This project expands the Horne Payne Substation with the addition of two 230/25kV, 150MVA transformers, gas-insulated feeder sections, and a new control building. This project will increase the firm capacity of the substation, add needed feeder positions, facilitate the gradual conversion of the area supply voltage from 12kV to 25kV, and allow for the implementation of an open-loop distribution system.	2019 Targeted In-Service	$63	$30	$93
John Hart Generating Station Replacement This project replaces the existing six-unit 126 MW generating station (in operation since 1947) and adds integrated emergency bypass capability to ensure reliable long-term generation and mitigate earthquake risk and environmental risk to fish and fish habitat. **John Hart forecast and life-to-date amounts include both capital costs and expenditures subject to regulatory deferral.*	2019 Targeted In-Service	$954	$31	$985*
Cheakamus Unit 1 and Unit 2 Generator Replacement This project replaces the two generators at Cheakamus generating station (in operation since 1957) to address their poor condition and known deficiencies, and increase the capacity of each unit from 70 MW to 90 MW.	2019 Targeted In-Service	$52	$22	$74

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to Dec 31, 2018 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
South Fraser Transmission Relocation Project* 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. ***Construction work on the South Fraser Transmission Relocation project is currently suspended pending the government's review of the George Massey Tunnel replacement.*	TBD	$32	$44	$76
Bridge River 2 Units 5 and 6 Upgrade Project This project will replace the two generators and other related equipment at Bridge River 2 to restore the historical operating capacity. These two generator units were placed in service in 1960 and are in unsatisfactory condition and unreliable.	2019 Targeted In-Service	$53	$33	$86
Downtown Vancouver Electricity Supply: West End Strategic Property Purchase This project is to acquire property rights to build a new underground substation that will upgrade the aging electricity system in downtown Vancouver.	2020 Targeted In-Service	$67	$14	$81

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to Dec 31, 2018 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Fort St. John and Taylor Electric Supply 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.	2020 Targeted In-Service	$30	$23	$53
UBC Load Increase Stage 2 Project 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.	2021 Targeted In-Service	$14	$41	$55
Peace Region Electricity Supply Project 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.	2021 Targeted In-Service	$56	$229	$285
LNG Canada Load Interconnection Project 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.	2021 Targeted In-Service	$4	$78	$82

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to Dec 31, 2018 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Mica Replace Units 1-4 Transformers Project 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.	2022 Targeted In-Service	$4	$78	$82
G.M. Shrum G1-G10 Control System Upgrade 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.	2022 Targeted In-Service	$31	$44	$75
Site C Project 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. **Planned in-service date for all units.* ***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.*	2024* Targeted In-Service	$3,206	$7,494	$10,700**

Significant Information Technology (IT) Projects over $20 million

BC Hydro has the following IT project with capital costs expected to exceed $20 million, listed according to targeted completion date. This project has been approved by the Board of Directors.

Significant IT Projects (over $20 million in total)	Targeted Completion Date (Year)	Project Cost to Dec 31, 2018 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Ongoing				
Supply Chain Applications Project 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. **Anticipated Total Capital Cost for the Implementation Phase portion of the funding is pending approval by the BCUC.*	2020 Targeted In-Service	$27	$41	$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.

This includes links to information regarding:
- Board of Directors
- Executive Team
- Code of Conduct

Organizational Overview

Information about BC Hydro's organizational overview can be found at:
http://www.bchydro.com/about/accountability_reports/financial_reports/service_plan.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. is a wholly-owned subsidiary of BC Hydro and a key participant in energy markets across North America, buying and supplying wholesale power, renewable and low-carbon energy and products, natural gas, ancillary services, and financial energy products. Established in 1988, its export, marketing and trade business provides significant economic benefits to British Columbia.

Through its contractual agreements with BC Hydro, Powerex supports BC Hydro's electric 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 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 keeps the BC Hydro President and Chief Operating Officer (COO) and Executive Team informed of Powerex's key strategies and business activities.

Powerex operates in competitive, complex and volatile energy-markets, which can cause net income in any given year to vary significantly. Market and economic 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 $125 million per year for 2019/20 to 2021/22. For more information, visit 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 COO. The Powertech Board is chaired by BC Hydro's President and COO 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 2019/20 to 2021/22. For more information, visit powertechlabs.com.

Board of Directors:

- Chris O'Riley - Chair
- David Lebeter
- Mark Poweska

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, 2018, 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.