BC Hydro and Power Authority

2017/18 – 2019/20
SERVICE PLAN

September 2017

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Board Chair Accountability Statement

The 2017/18 - 2019/20 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, 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 August 31, 2017, 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

Table of Contents

Strategic Direction and Operating Environment

Strategic Direction

BC Hydro is one of the largest electric utilities in Canada and is publicly owned by the people of British Columbia (B.C.). 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 provide reliable, affordable, clean electricity throughout B.C., safely**.** We have set out a three-year road map with strategies, performance measures and targets, aligned with the objectives in the B.C. Government's Mandate Letter, to fulfill our mission on behalf of our customers and the Province.

BC Hydro operates an integrated system backed by 30 hydroelectric plants and two thermal generating stations, as well as over 79,000 kilometers of transmission and distribution lines. Our partnership with B.C.'s clean energy industry encompasses over 110 projects across the province, including biomass, hydro, wind and solar. Our electricity generation is over 98 per cent clean.

BC Hydro's electricity system was largely built in the 1960s, 1970s and 1980s and B.C.'s population and economy continue to grow with long-term load growth expected across all customer classes. We are investing over $2 billion annually to upgrade aging assets and build new infrastructure so that our customers continue to receive reliable and clean electricity.

Over the past five years, we have completed 540 capital projects at a total cost of $6.4 billion, which is 0.94 per cent under budget overall. To ensure economic and social benefits for ratepayers, BC Hydro manages our capital portfolio with an emphasis on cost consciousness, respect for the environment and communities in which we work and strengthening our relationships with First Nations.

We have the important responsibility to keep electricity rates affordable for our customers, while funding necessary investments in our electricity system. While B.C.'s rates remain among the most competitive in North America, more needs to be done to make life affordable for families. To support this goal, BC Hydro has been asked to freeze rates while a comprehensive review of the corporation is conducted.

Operating Environment

Power Smart is BC Hydro's brand. It reflects our commitment to be smart about power in all we do, and underscores our priority as an organization to meet the evolving needs of our customers, our workforce and the Province.

We have identified four key goals that reflect successfully delivering on our mission: customers will experience reliable and responsive service; their rates will be affordable; we will continue B.C.'s leading commitment to renewable, clean power; and our workforce and the public will be safe.

BC Hydro is regulated by the British Columbia Utilities Commission (BCUC). As the third party 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 proceedings include the Fiscal 2017 – Fiscal 2019 Revenue Requirements Application (RRA) and the Rate Design Application. The Commission is also conducting an inquiry into the Site C Clean Energy Project.

In July 2016, when we filed the RRA with the BCUC, many of our industrial customers had faced declining prices for the commodities they produce, which contributed to $3.5 billion less in forecast revenue to BC Hydro in the period ending Fiscal 2024. To avoid passing these revenue impacts on to our customers, we found new ways to reduce our costs even further, including:

- developing a debt management strategy to lock-in historically low interest rates;
- limiting base operating cost increases to an average of 1.2 per cent per year over the period covered by the RRA;
- implementing a workforce optimization program to replace contractors with internal staff to save $20 million in overall costs over the next three years;
- re-prioritizing capital projects to reduce expenditures by about $380 million over the period covered by the RRA;
- reducing the cost of conservation programs to an average of $22 per megawatt hour;
- reviewing the Standing Offer Program to reflect the declining costs of new power technology; and,
- renewing contracts with independent power producers at prices less than what they are currently paid, recognizing that those producers have typically recovered most of their capital costs over their original contract terms.

Though BC Hydro is developing a refreshed plan to keep electricity rates affordable and predictable, the BCUC is reviewing all of our revenue requirements in our July 2016 RRA filing; including operating costs, capital-related costs, demand-side management expenditures and cost of energy, and will issue a decision based on a comprehensive review of BC Hydro's application and other submissions.

While we have taken significant steps to reduce our costs, we recognize that more needs to be done to make life affordable for families. BC Hydro has been asked to freeze rates while a comprehensive review of the corporation is conducted, and will participate fully and transparently in the BCUC's inquiry into the Site C Clean Energy Project.

The electricity we generate and deliver throughout B.C. meets a high standard of reliability but we're always looking for ways to improve our service to our customers and help power the new, 21st century economy. We continue to focus on our renewed customer service strategy, with the goal of making it easier to do business with us, and help 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 and businesses. In addition, through an ongoing Rate Design Application process, we will be exploring options to give customers more choice and flexibility with their energy usage.

Working closely with First Nations to build better, more transparent and collaborative relationships is important to us. We seek to develop and sustain positive long-term relationships and better understand First Nations' interests so that those priorities can be incorporated, where possible, into our capital programs and business operations. The approach aligns with BC Hydro's Statement of Aboriginal Principles, our legal obligation to consult with First Nations, and First Nations' expectations with respect to how we address their priorities.

It is only possible to achieve the results we have set out in our Service Plan if our employees and workforce can execute their work safely. As a utility that operates in a high hazard industry, safety is top of mind and we are continuously working to improve our performance by understanding hazards and ensuring appropriate design of assets and related work procedures, while building our safety culture and competencies.

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

Goals, Objectives, Strategies and Performance Measures

Four strategic 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 our core mission to our customers and the Province. BC Hydro's management is responsible for measuring performance against targets, and results are reported to the Board on a quarterly basis and publicly in the Annual Report.

Goal 1: Set the Standard for Reliable and Responsive Service

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.

Strategies

- Ensure the reliability of the generation, transmission and distribution system by effectively implementing capital and maintenance programs to manage overall asset health and secure supply to meet customer load throughout the year.
- Identify and address vulnerabilities in our operating system and develop well practiced emergency response plans to improve overall system reliability.
- Through external benchmarking of North American transmission interconnection practices, review and implement appropriate recommendations to meet customer requirements as identified in the Industrial Electricity Policy Review.

- 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, expanding in-person service areas, and enhanced service training for employees.
- Help customers make smart energy management choices by supporting them with rates and programs including opportunities for conservation and efficiency, as well as low carbon electrification.
- Sustain the highest, gold-level, certification under the Progressive Aboriginal Relations program by maintaining leading practices focused on Aboriginal employment, business development, community investment and community engagement.
- Through early engagement and emphasizing collaboration, respect and mutually beneficial relationships with First Nations, BC Hydro will better incorporate First Nations perspectives and interests in the delivery of our capital projects and define a future together where our business needs and First Nations interests are aligned.

Performance Measures 1-5[1]:

Performance Measure	2016/17 Actual	2017/18 Target	2018/19 Target	2019/20 Target
SAIDI (duration)[2] [Total outage duration (in hours) experienced by an average customer in a year]	3.28	3.30	3.30	3.30
SAIFI (frequency)[2] [Number of sustained disruptions per year (excluding major events)	1.59	1.40	1.40	1.40
Key Generating Facility Forced Outage Factor (%)[3]	1.78	2.0	1.80	1.80
CSAT Index [Customer Satisfaction Index: % of customers satisfied or very satisfied]	87.0	85.0	85.0	85.0
Progressive Aboriginal Relations Designation	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] The Forced Outage Factor metric is reported as a five year rolling average.

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. The 2017/18 targets for SAIDI and SAIFI have been adjusted to reflect these factors but remain in line with historical performance.

Key Generating Forced Outage Factor is defined as the total forced outage time in a period relative to the total number of hours in the same period (usually one year). A forced outage occurs when a generating unit is unable to start generating or does not stay on line as long as needed. Annually, the Forced Outage Factor can be relatively volatile and through applying the historical five year rolling average it can smooth the range to provide a more stable measure for which targets can be set. Therefore, the strategy is to keep the Forced Outage Factor below two per cent of the total number of hours per year. There are seven Key Generating Facilities, representing those plants with installed capacity greater than 200 MW. Together they provide 80 per cent of the average annual electricity generated by BC Hydro's facilities. This measurement will show the trend of how the assets are performing and aligns with how asset management investment decisions are made to maintain asset reliability that is reflected in a low Forced Outage Factor.

Progressive Aboriginal Relations Designation – BC Hydro attained the highest, gold-level, designation from the Canadian Council for Aboriginal Business in 2015/16, which is valid for a three year period. In 2018/19, BC Hydro will apply for the next certification.

Goal 2: Ensure Rates are Among the Most Affordable in North America

BC Hydro customers will benefit from affordable, predictable rates while we efficiently manage our costs and make important investments to maintain and expand our electricity system.

Strategies

- Advance proceedings before the BCUC, including the Fiscal 2017 to Fiscal 2019 Revenue Requirements Application and the Rate Design Application, and prudently implement actions to control costs.
- Freeze rates while a comprehensive review of the corporation is conducted and develop a refreshed plan to keep electricity rates affordable and predictable.
- Participate fully and transparently in the BCUC inquiry into the Site C Clean Energy Project.
- Continue development of the 2018 Integrated Resource Plan in consultation with stakeholders and prudently implement the 10 Year Capital Plan so that our customers can continue to receive clean, reliable and affordable electricity.
- Improve how we operate by focusing on safety, operational excellence, efficiency and reliability by enhancing work delivery methods as well as resourcing and supply chain strategies.
- Maintain scalable, robust, and consistent project delivery practices to actively manage project risks and apply industry best practices to deliver projects on time and on budget.

Performance Measure 6-7[1]:

Performance Measure	2016/17 Actual	2017/18 Target	2018/19 Target	2019/20 Target
Competitive Rates	1st quartile	1st quartile	1st quartile	1st quartile
Project Budget to Actual Cost	-0.94% on $6.36 billion[2]	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] This is a five year rolling data set reflecting 2012/13 to 2016/17

Discussion

Competitive Rates is based on BC Hydro's ranking in the residential category in the annual Hydro Quebec Report on Electricity Rates in North America. 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. The rankings of the 21 participating utilities are then divided into quartiles to determine BC Hydro's ranking. Based on this same methodology, BC Hydro's rates for commercial and industrial customers rank fifth (first quartile) and seventh (second quartile) lowest, respectively, in the report.

Project Budget to Actual Cost data includes Generation, Substation and Transmission Line projects managed by Project Delivery. Annually, BC Hydro reflects the past five years' performance in delivering capital projects. This is a five-year rolling data set of actual costs compared to original approved full scope implementation budgets not including project reserve amounts, for capital projects that were put into service during the period.

Goal 3: Continue British Columbia's Leading Commitment to Renewable Clean Power

BC Hydro will strengthen its legacy of renewable, clean power and conservation investments by expanding its energy-efficiency and conservation programs to include electrification and by identifying and securing new, sustainable, responsibly generated, competitively priced energy and capacity options to meet future customer needs.

Strategies

- Implement the Integrated Resource Plan recommendations to secure an affordable and clean supply of power to meet future customer needs.
- Explore opportunities for BC Hydro and independent power producers to work together in the development of a new, low-carbon economy under the Memorandum of Understanding with Clean Energy BC.

- 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.
- Continue to provide opportunities for First Nations located in remote communities that are not integrated with the BC Hydro system through established renewable energy programs.

Performance Measures 8-10[1]:

Performance Measure	2016/17 Actual	2017/18 Target	2018/19 Target	2019/20 Target
Energy Conservation Portfolio (New incremental GWh/year)	733	600	700	600
Clean Energy (%)	98.4	93.0	93.0	93.0
New Clean Supply (%)	100	100	100	100

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

Discussion

Energy Conservation Portfolio reflects the annual new incremental electricity savings resulting from demand-side management portfolio results including programs, codes and standards and conservation rates. This metric is a reflection of performance within the current period and as such is not impacted by past performance and/or adjustments made to energy savings in prior years (e.g. persistence, evaluations, measurement and verification). In some cases, the implementation date 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 (TMP) projects is incorporated into the plan resulting in the 2017/18 target of 600 gigawatt-hours per year (GWh/year), followed by an increased target of 700 GWh/year in 2018/19, and a return to 600 GWh/year in 2019/20.

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*. BC Hydro's forecast is based on expected generation and is consistent with previous years.

New Clean Supply is a new measure introduced for 2017/18 and reflects the percentage of projects that are designated as clean or renewable in considering all greenfield[1] generation projects that came into service during the year. BC Hydro continues to implement its plan to achieve or exceed the *Clean Energy Act* target that at least 93 per cent of our electricity is generated from clean or renewable energy sources. This new metric is a reflection of performance within the operating period in acquiring 100 per cent of supply for the integrated grid going forward from clean or renewable sources, consistent with government's climate strategies.

[1] BC Hydro defines a Project to be "greenfield" when the generation system is a new facility, and not the renovation, refurbishment, re-commissioning and/or use of an existing facility.

Goal 4: Safety Above All

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.

Strategies

- Continually refresh the five-year safety plan to ensure the priority risk areas are identified and implement safety improvement projects that drive towards:
- Achieving zero fatalities and zero disabling injuries. Examples of projects include: the use of Safety Stops, accounting for full extension of reach in minimum approach distances, and increased use of line guards and cover up; Life Saving Rules training and competency assessments; and implementing arc flash work methods, training and personal protective equipment to reduce burns and injuries.
- Year-over-year reduction in lost time injuries and medical aid injuries. Examples of projects include: the knife cut reduction program and the field/plant ergonomics program.
- Meeting new regulatory requirements. Examples of projects include: asbestos management and abatement in our generation plants, substations and underground ducts; procedures, training and equipment to ensure safe work in confined spaces; and revising work procedures to manage lead and silica hazards.
- Building a culture to achieve excellence in safety. Examples of investments include: regular reviews of safety incidents by 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.
- Building corporate systems and tools supporting excellence in safety. Examples of projects include: Field Access to Safety Information which improves both the ease of access and quality of safety information; and improved safety analytics capabilities.

Performance Measures 11-13[1]:

Performance Measure	2016/17 Actual	2017/18 Target	2018/19 Target	2019/20 Target
Zero Fatality & Serious Injury [Loss of life or the injury has resulted in a permanent disability]	0	0	0	0
Lost Time Injury Frequency [Number of employee injury incidents resulting in lost time (beyond the day of the injury) per 200,000 hours worked]	1.04	0.90	0.85	0.80
Timely Completion of Corrective Actions (%)	96	93	95	97

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

Discussion

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

Focusing on Lost Time Injury Frequency encourages managers to identify modified work duties for job categories and locations where workers experience injury, enabling injured workers to stay on the job while they recover. The earlier an injured worker is able to safely return to productive employment and maintain his/her positive connection to the workplace, the more likely he/she is of obtaining maximum recovery. With the increased granularity this metric provides, the organization is better able to focus its efforts on managing the hazards that can lead to Lost Time injuries.

Timely Completion of Corrective Actions is defined as the percentage of safety corrective actions closed within 30 days of the original scheduled due date on an annual basis, with an aim to improve over time.

Financial Plan

Summary Financial Outlook

Consolidated Statement of Operations[1] ($ millions)	2016/17 Actual	2017/18 Budget	2018/19 Budget	2019/20 Budget
Total Revenue				
Domestic	5,199	5,474	5,687	5,762
Trade	675	824	803	824
Total Revenues	**5,874**	**6,298**	**6,489**	**6,587**
Total Expenses				
Operating Costs				
Cost of Energy	2,094	2,382	2,442	2,543
Personnel expenses, materials & external services[2]	946	1,017	1,045	1,033
Amortization	1,232	1,231	1,274	1,301
Finance charges	605	661	706	653
Grants and taxes	234	239	245	251
Other Operating Costs	79	71	66	94
Total Expenses	**5,190**	**5,600**	**5,777**	**5,875**
Net Income	**684**	**698**	**712**	**712**
Dividends	**259**	**159**	**59**	**-**
Net Debt[3]	**19,796**	**20,514**	**21,267**	**22,489**
Equity	**4,909**	**5,448**	**6,101**	**6,828**
Capital Expenditures	**2,444**	**2,421**	**2,434**	**2,961**

[1] Does not include the purchase of the remaining two-thirds interest in the Waneta Dam and Generating Station. Completing this transaction is subject to a number of conditions, including approval by the BC Utilities Commission; table may not add due to rounding.

[2] These amounts are net of capitalized overhead and consists of the following:

	2016/17	2017/18	2018/19	2019/20
Domestic Base Operating Costs	737	747	759	765
Other	209	270	286	268
	946	1,017	1,045	1,033

Commencing in 2016/17, Domestic Base Operating Costs include net sustainment costs related to the Smart Metering & Infrastructure Program which were incurred in previous years but which were subject to regulatory deferral in those years. For 2016/17, these net sustainment costs are $22 million. Other largely consists of Powerex & Powertech operating costs, operating costs related to energy purchase agreements accounted for as capital leases, and the transitioning of IFRS-ineligible capital overhead into operating costs over a 10-year period.

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

Key Forecast Assumptions, Risks and Sensitivities

Key Assumptions	2016/17 Actual	2017/18 Budget	2018/19 Budget	2019/20 Budget
Growth and Load				
B.C. Real Gross Domestic Product Growth (%)[1]	3.0	2.2	2.3	2.3
Domestic Sales Load Growth (%)[2, 3]	1.71	(0.14)	1.63	0.70
Residential Sales Load Growth (%)[2]	4.25	1.08	(0.07)	0.45
Light Industrial and Commercial Sales Load Growth (%)[2]	2.97	(1.50)	1.16	0.81
Large Industrial Sales Load Growth (%)[2]	(3.61)	(0.35)	4.67	0.28
Domestic Load (GWh):				
Domestic Sales Volume (GWh)[3]	51,895	51,820	52,664	53,033
Surplus Sales Volume (GWh)	5,757	7,188	5,070	3,730
Line Loss and System Use (GWh)	4,936	5,272	5,426	5,468
Total Domestic Load (GWh)	62,588	64,281	63,160	62,232
Energy Generation				
Total System Water Inflows (% of average)	101	105	100	100
Sources of Supply to Meet Domestic Load:				
Net Hydro Generation (GWh)[2]	48,621	48,805	47,186	45,714
Market Electricity Purchases (GWh)[2]	131	262	561	833
Independent Power Producers and Long-term Purchases (GWh)	13,644	14,956	15,057	15,326
Thermal Generation & Other (GWh)	192	258	356	359
Sources of Supply for Domestic Load (GWh)	62,588	64,281	63,160	62,232
Average Mid-C Price (U.S.$/MWh)	21.22	20.89	21.49	22.06
Average Natural Gas Price at Sumas (U.S.$/MMBTU)	2.43	2.68	2.39	2.21
Financial				
Canadian Short-Term Interest Rates (%)[2]	0.91	0.64	1.13	1.54
Canadian Long-Term Interest Rates (%)[6]	2.10	2.77	3.36	3.68
Foreign Exchange Rate (U.S.$:Cdn$)[6]	0.7618	0.7390	0.7642	0.7833

[1] Economic assumption based on calendar year, from Ministry of Finance September 2016 First Quarter Report.
[2] Includes the impact of Demand-Side Management programs.
[3] Excludes surplus sales.
[4] Surplus sales volume can vary year to year, and increase in fiscal 2017/18 is due to above forecast inflows during the first three months of the fiscal year. These additional inflows carry over into subsequent fiscal years via system storage.
[5] Initial system storage at the start of fiscal 2017/18 was above average and is forecast to return to near historical average by the end of fiscal 2018/19. This drawdown in storage combined with above average forecast inflows in 2017/18 results in higher hydro generation, returning to forecast average hydro generation in fiscal 2018/19 and beyond.
[6] Assumes that gas fired power generation capability available to service domestic demand is sometimes displaced by more cost-effective market purchases.

Sensitivity Analysis

Factor	Change	Approximate change in remainder of 2017/18 earnings before regulatory account transfers (in $ millions)
Hydro Generation (GWh)[1]	+/- 1%	5
Electricity trade margins	+/- 10%	15
Interest rates	+/- 100 basis points	30
Exchange rates (US/ CDN)	$0.01	5
Customer Load	+/-1%	35

Management's Perspective on the Financial Outlook

In November 2013, the Province, as part of the 10 Year Rates Plan, announced rate increases for BC Hydro in 2014/15 and 2015/16 of 9 per cent and 6 per cent, respectively, with rate increases for 2016/17 to 2018/19 capped at 4 per cent, 3.5 per cent and 3 per cent. The 10 Year Rates Plan includes several actions to reduce pressure on rates including prioritizing and reducing capital spending, limiting operating costs, implementing a debt management strategy, updating our Demand-Side Management Plan, eliminating tier three water rental rates, lowering the return on equity, reducing dividends and smoothing general rate increases through the use of a regulatory account.

BC Hydro prepared the current financial projections for revenues and expenses through 2019/20 which were approved by the Board and submitted to the Ministry of Finance in August 2017. These financial projections are consistent with the 10 Year Rates Plan and do not include potential changes related to the recent change in government, in particular the rate freeze and comprehensive review mentioned in Goal 2. These projections also do not include the purchase of the remaining two-thirds interest in the Waneta Dam and Generating Station. Completing this transaction is subject to a number of conditions, including approval by the BC Utilities Commission.

[1] 2016/17 three months rate for short term and 10 years for long term. 2017/18 to 2019/20, financial assumptions from Ministry of Finance, May 2017.

Capital Plan and Major Projects

Capital Expenditure by Year and Type and Function

($millions)	2016/17 Actual	2017/18 Forecast	2018/19 Forecast	2019/20 Forecast
Capital Expenditures by Type[1]				
Sustaining	1,158	1,245	1,200	1,232
Growth	1,286	1,176	1,234	1,729
Subtotal – BC Hydro Capital Expenditures before CIA	**2,444**	**2,421**	**2,434**	**2,961**
Contributions-in-Aid (CIA)[2]	(138)	(100)	(106)	(116)
Total – BC Hydro Capital Expenditures net of CIA	**2,306**	**2,321**	**2,328**	**2,845**
Generation	585	537	425	488
Transmission and Distribution	966	941	964	1,023
Properties, Technology and Other	230	226	216	192
Site C	663	717	829	1,258
Subtotal – BC Hydro Capital Expenditures before CIA	**2,444**	**2,421**	**2,434**	**2,961**
CIA	(138)	(100)	(106)	(116)
Total BC Hydro Capital Expenditures net of CIA	**2,306**	**2,321**	**2,328**	**2,845**

[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 is required to meet customer load growth and other business investments. Growth capital expenditures relate to the expansion of existing generation assets as well as expansion and reinforcement of the transmission and distribution system, and includes Site C.

[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 $50 million)	Targeted Completion Date (Year)	Project Cost to June 30, 2017 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Projects Recently Put Into Service				
Big Bend Substation The South Burnaby, Big Bend area required a new, 100 MVA, 69/12 kV substation to meet local residential and commercial load growth.	2017 In-Service	$65	$7	$72
Ongoing				
Ruskin Dam Safety and Powerhouse Upgrade Improve seismically deficient dam and rehabilitation/replacement of powerhouse equipment that was brought into service between 1930 and 1950. The project includes: upgrading of the right abutment; redeveloping the dam and powerhouse to meet current seismic standards for earthquakes; and replacing major generation equipment which is in poor or unsatisfactory condition.	2018 Targeted In-Service	$549	$199	$748
Horne Payne Substation Project Expand 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.	2018 Targeted In-Service	$35	$58	$93

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to June 30, 2017 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Ongoing				
John Hart Generating Station Replacement Replace the existing six-unit 126 MW generating station (in operation since 1947) and add integrated emergency bypass capability to ensure reliable long-term generation and to mitigate earthquake risk and environmental risk to fish and fish habitat.	2019 Targeted In-Service	$743	$350	$1,093
Cheakamus Unit 1 and Unit 2 Generator Replacement Replace 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	$18	$56	$74
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.	2019 Targeted In-Service	$2	$51	$53
W.A.C Bennett Dam Riprap Upgrade Project This project will address inadequate erosion protection on the upstream face of the W.A.C Bennett Dam. The primary driver of the project is safety of the dam itself as well as safety of the public, property, and environment downstream.	2019 Targeted In-Service	$76	$94	$170

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to June 30, 2017 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Ongoing				
South Fraser Transmission Relocation Project In September 2013, the Province of B.C. announced that the George Massey Tunnel will be replaced with a new bridge. The construction of the new bridge, modifications to Highway 99 and the decommissioning of the George Massey tunnel will require BC Hydro 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. 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.	2019 Targeted In-Service	$17	$59	$76
Bridge River 2 Units 5 and 6 Upgrade Project* The Bridge River 2 powerhouse Generator Units 5 and 6, which were placed in service in 1960, are in unsatisfactory condition and unreliable. This project will replace the two generators and other related equipment to restore the historical operating capacity. ***Bridge River 2 Units 5 and 6 Upgrade Project was not reflected in the 2017/18 – 2019/20 Service Plan as the project was approved after the filing of the February 2017 Service Plan.*	2019 Targeted In-Service	$11	$75	$86

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to June 30, 2017 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Ongoing				
G.M. Shrum G1-G10 Control System Upgrade The condition of the legacy controls for GMS generating units, which were originally installed in the 1960s and 1970s, is of growing concern due to increasing maintenance requirements, lack of spare parts availability and decreasing reliability. The controls are well beyond their expected life, cause operating problems, and increase the risk of damage to major equipment. The project will replace the controls equipment, provide full remote control capability from the remote control center and rectify deficiencies in the current system.	2021 Targeted In-Service	$15	$45	$60 (Partial Implementation Funding)
UBC Load Increase Stage 2 Project* BC Hydro is undertaking the UBC Load Increase Stage 2 project on behalf of its customer, the University of British Columbia, to continue to reliably meet the growing electricity needs of its Point Grey campus and the surrounding community. **UBC Load Increase Stage 2 Project was not reflected in the 2017/18 – 2019/20 Service Plan as the project was approved after the filing of the February 2017 Service Plan.*	2021 Targeted In-Service	$3	$52	$55

Major Capital Projects (over $50 million)	Targeted Completion Date (Year)	Project Cost to June 30, 2017 ($ millions)	Estimated Cost to Complete ($ millions)	Approved Anticipated Total Capital Cost of Project ($ millions)
Ongoing				
Mica Replace Units 1-4 Transformers Project* The Unit 1-4 Generator Step-up Unit transformers at the Mica Generating Station 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. The project was initiated to address reliability and safety risks associated with operating the existing transformers. **Mica Replace Units 1-4 Transformers Project was not reflected in the 2017/18 – 2019/20 Service Plan as the project was approved after the filing of the February 2017 Service Plan.*	2022 Targeted In-Service	$nil	$82	$82
Site C Clean Energy Project Site C will be a third dam and 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 project was approved by the Provincial Government in December 2014. 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. Total cost excludes the Project Reserve of $440 million (established by Government to account for events outside of BC Hydro's control that could occur during construction) which is held by the Treasury Board.*	2024* Targeted In-Service	$1,800	$6,535	$8,335**

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 Operating Environment 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, Powerex Corp. and Powertech Labs Inc. are subject to the same corporate governance practices as BC Hydro. Both BC Hydro and its wholly-owned subsidiaries 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 energy, natural gas, ancillary services, and financial energy products and services. Established in 1988, its export, marketing and trade activities help manage BC Hydro's electric system resources and provide significant economic benefits to B.C.

Powerex supports BC Hydro's electric system requirements through importing and exporting energy as required in addition to meeting its own trade commitments. Powerex also markets, on behalf of the Province, the Canadian Entitlement to the Downstream Benefits of the Columbia River Treaty.

The Chief Executive Officer (CEO) of Powerex reports directly to the Board of Directors of Powerex. The Powerex CEO and the Chair of the Powerex Board ensure that BC Hydro's President, BC Hydro's Executive Team and the Board of BC Hydro are informed of Powerex's key strategies and business activities.

Powerex operates in complex and volatile energy-markets, which can cause net income in any given year to vary significantly. Market and economic conditions, reduced BC Hydro system flexibility, income timing differences 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 2017/18 to 2019/20. For more information, visit powerex.com.

Board of Directors:
- Len Boggio
- James Brown
- James Hatton

Powertech Labs Inc.
Powertech Labs, operating in Surrey since its inception in 1979, is a wholly-owned subsidiary of BC Hydro. Powertech is internationally recognized as holding expertise in various fields of operation, and provides research and development, testing, technical services and advanced technology services to the international energy community, including BC Hydro.

The Service Plan forecast includes annual net income from Powertech ranging from approximately $4 million to $5 million for 2017/18 to 2019/20. For more information, visit powertechlabs.com**.**
Board of Directors:
- Chris O'Riley
- Mark Poweska
- David Lebeter

Other Subsidiaries

BC Hydro has created or retained a number of other subsidiaries for various purposes, including holding licenses 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 March 31, 2017, 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.