

## DATA, BENCHMARKING AND RATIONALE – BC Hydro Service Plan 2018/19 to 2020/21

BC Hydro relies on various data sources for relevant and accurate reporting of its Performance Measures. This includes, but is not limited to, internal financial records, external research findings, and association indexes. The Performance Measures have unique requirements for source data and accompanying considerations.

Since the 2017/18-2019/20 Service Plan update, BC Hydro has:

- Kept Performance Measures consistent with those used for the September 2017 Service Plan Update.
- Modified the wording of the Goal 2 to “Help make electricity more affordable for our customers” to highlight Government’s commitment to affordability.
- Modified three performance measures’ targets, SAIDI, Energy Conservation Portfolio and Timely Completion of Corrective Actions, to reflect updated performance information.

### Goal 1: Set the Standard for Reliable and Responsive Service

Objective 1.1: 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.

Description of Performance Measure	Rationale/Benchmarking Activities
<p><b>SAIDI</b> is a utility standard measure of the total sustained outage duration (measured in hours) experienced by an average customer over the course of a year.</p>	<p><b>SAIDI &amp; SAIFI:</b> Annual 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. BC Hydro measures reliability under normal operating conditions, because we cannot predict uncontrollable, major weather events.</p>
<p><b>SAIFI</b> is a utility standard measure of how many sustained interruptions (longer than one minute) an average customer will experience over the course of a year, excluding major events.</p>	<p>Annually, BC Hydro participates in the Distribution Service Continuity benchmarking survey conducted by the Canadian Electricity Association (CEA) and the Transmission &amp; Distribution combined benchmarking study conducted by First Quartile Consulting.</p>
<p><b>Key Generating Facility Forced Outage Factor</b> measures the percentage of time key generating units are unavailable when they are needed due to internal unplanned causes. Seven key generating facilities are tracked for total forced outage time in a period relative to the total number of hours in the same period (usually one year).</p>	<p>Our reliability targets are based on specific values; however performance within a 10 per cent bandwidth of our targets is considered acceptable given the wide range of variations in weather patterns and other uncontrollable elements that can significantly disrupt the electrical system. The reliability measures are 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.</p>
<p><b>Customer Satisfaction (CSAT)</b> is the percentage of customers – residential, small and medium-sized businesses and key accounts – who are satisfied or very satisfied with BC Hydro (as measured on a four-point verbal scale) in five equally weighted areas:</p> <ul style="list-style-type: none"> <li>• Providing reliable electricity;</li> <li>• Value for money;</li> <li>• Commitment to customer service;</li> <li>• Acting in the best interest of British Columbians; and,</li> <li>• Efforts to communicate with customers and communities.</li> </ul>	<p><b>Key Generating Facility Forced Outage Factor:</b> A forced outage occurs when a generating unit is unable to start generating or doesn’t stay on line as long as needed. 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). 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. This information is commonly benchmarked with other electric utilities for comparative performance assessment.</p> <p><b>CSAT:</b> BC Hydro maintains a minimum threshold target of 85 per cent for CSAT to ensure we have strong customer support.</p>

**Progressive Aboriginal Relations Designation** is the achievement of a rating by a third party verifier against specific criteria as established by the Canadian Council of Aboriginal Business. (PAR) Gold certification offers BC Hydro the opportunity to demonstrate, with a high level of assurance, 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 helps 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. It requires companies to set goals and assess themselves in four areas - leadership actions, employment, business development, and community relations.

**Progressive Aboriginal Relations Designation:** BC Hydro has successfully attained a gold-level designation from the Canadian Council for Aboriginal Business which is valid for a three year period. BC Hydro's next submission for certification is April 2018 for a further three years.

#### Measurement

**SAIDI & SAIFI:** The data gathered to measure our reliability measures is collected and validated in a process that starts with operational staff recording the start and end time of each power outage as well as the cause. Based on the location of the outage, the number of customers impacted is calculated automatically. This information is collected in a centralized database that allows outage records to be reviewed by managers regularly to ensure accuracy. Outages that impact a significant number of customers or involve lengthy repair times require a formal outage report to be written by an engineer and approved by management. Smart meters provide better outage visibility which helps in faster restoration of service.

Annually, circuits are benchmarked to prioritize investment for sustained reliability improvement on the worst performing circuits. The most significant outages are reviewed regularly to ensure accuracy of data, effectiveness of restoration actions, and to better understand vulnerabilities. As a second check for accuracy, trends in recent performance measures are compared against past results and forecast performance. The Reliability Improvement Team reviews the monthly performance measures and takes action when actual performance deviates from forecast.

**Key Generating Facility Forced Outage Factor:** BC Hydro has seven key generating facilities which are defined as plants with installed capacity greater than 200 MW. Together they provide 90% of the average annual electricity generated by BC Hydro's facilities. The measure aims to keep the Forced Outage Factor below 2% for the total number of hours generated per year. This measurement shows the trend of how the assets are performing and aligns with how asset management investments decisions are made to maintain asset reliability that is reflected in a low forced outage factor.

**CSAT:** Customer Satisfaction is measured through a survey.

**PAR:** The Progressive Aboriginal Relations program is a third party verified certification program (three year period) through the Canadian Council for Aboriginal Business.

## Goal 2: Help Make Electricity More Affordable for our Customers

Objective 2.1: BC Hydro customers will benefit from affordable, predictable rates while we manage our costs, explore innovative solutions to support our customers and make investments to maintain and expand our electricity system.

Description of Performance Measure	Rationale/Benchmarking Activities
<p><b>Competitive Rates</b> measures BC Hydro’s residential rates against other utilities across North America. The analysis is from the annual Hydro Quebec report, Comparison of Electricity Rates in Major North American Cities.</p>	<p>Pursuant to Rate Comparison Regulation under the <i>Clean Energy Act</i>, Ministerial Act No. 167, issued on June 28, 2011, BC Hydro provides an Electricity Rate Comparison Annual Report to the Minister of Energy and Mines and Petroleum Resources.</p>
<p><b>Project Budget to Actual Cost</b> measures actual costs of capital projects that were put into service compared to original approved full scope implementation budgets (excluding project reserve funds) over a five-year period.</p>	<p>BC Hydro regards Project Budget to Actual Costs as an important measure for evaluating its performance in delivering capital projects and compares actual costs to full scope implementation budgets (excluding project reserve funds).</p>
<p><b>Measurement</b></p>	
<p>The <b>Competitive Rates</b> measure is based on survey information taken from the annual Hydro Quebec report, <i>Comparison of Electricity Rates in Major North American Cities</i>, which compiles monthly bills and average prices of 22 Canadian and U.S. Utilities. BC Hydro calculates a relative index for each usage level within the residential, small, medium, and large power categories and then calculates an average of the index to create an overall ranking. The rankings of the 22 participating utilities are then divided into quartiles to determine BC Hydro’s ranking in the four power categories.</p> <p><b>Project Budget to Actual Costs</b> is measured using a five year rolling data set of actual costs compared to original approved full scope implementation budgets excluding project reserve funds, for capital projects that were put into service during the period. The data set includes Generation, Substation, Transmission Line and major Distribution projects.</p>	

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

Objective 3.1: BC Hydro will strengthen its legacy of renewable, clean power and conservation investments by expanding its energy-efficiency and conservation programs to include low-carbon electrification and by identifying and securing new, sustainable, responsibly generated, competitively priced energy and capacity options to meet future customer needs.

Description of Performance Measure	Rationale/Benchmarking Activities
<p><b>Energy Conservation Portfolio (New Incremental GWh/year)</b> Reflects the annual new incremental electricity savings resulting from the energy conservation portfolio including programs, codes and standards and conservation rates.</p>	<p>New Incremental <b>Energy Conservation Portfolio</b> Energy Savings (GWh/yr) replaces the previous Cumulative Demand Side Management Energy Savings. BC Hydro continues to implement its plan to achieve or exceed the <i>Clean Energy Act</i> target to meet at least 66% of incremental demand from 2008 to 2020 through conservation. This metric is a better reflection of performance within the operating period because it is based on the new incremental energy savings from programs, codes and standards and conservation rates that are implemented within the period. In some cases, the implementation date for anticipated codes and standards and/or large, complex incented projects can shift, which will cause actual incremental energy savings to vary from the targets that have been set for the period.</p>
<p>The <b>Clean Energy</b> measure represents a 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 (i.e. from biogas, biomass, energy recovery generation, geothermal, hydro, solar, tidal, wave, wind, or other potential clean or renewable electricity sources recognized by the B.C. government.) Consistent with B.C. regulation, this measure does not include electricity to serve demand from facilities that liquefy natural gas for export.</p>	<p>The <b>Clean Energy</b> target aligns with the objectives set forth in the 2010 <i>Clean Energy Act</i>. BC Hydro does not benchmark its results for this performance measure against other utilities as there are only a couple of other hydro utilities that have achieved anything close to 93% clean.</p>
<p><b>New Clean Supply</b></p>	<p><b>New Clean Supply</b> reflects the percentage of projects that are designated as clean or renewable in considering new supply agreements for all greenfield generation projects entered into during the year. The target is that 100 per cent of new supply projects for the integrated grid for the year come from clean or renewable sources.</p>
<p><b>Measurement</b></p>	
<p>BC Hydro undertakes a comprehensive approach to estimating energy conservation savings. Depending on the initiative, there can be up to four distinct areas of activity that ultimately contribute to the confirmation of energy conservation savings estimates: technical reviews of programs and energy conservation projects; site inspections on a sample of projects; measurement and verification of project performance; and evaluation of programs, conservation rates, building codes and product standards.</p> <p>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. The generation data is reviewed and verified internally at BC Hydro for reliability, consistency and data integrity.</p>	

## Goal 4: Safety Above All

Objective 4.1: 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.

Description of Performance Measure	Rationale/Benchmarking Activities
<p><b>Zero Fatality and Serious Injury</b> is a measure of an incident where there has been a loss of life or the injury has resulted in a permanent disability (for which a disability pension has been received or is expected).</p>	<p>The measure of Zero Fatality and Serious Injury is unique to BC Hydro and is not benchmarked against other Canadian Electricity Association (CEA) member utilities.</p>
<p><b>Lost Time Injury Frequency (LTIF)</b> is a standard Canadian Electricity Association measure and is defined as the total number of employee Lost Time injuries per 200,000 hours worked. Lost time injuries are those where the employee was absent beyond the day of injury.</p>	<p>The CEA does report on fatalities. BC Hydro had one of the six fatalities among CEA members in the nine-year period from 2009 to 2017. We also have had eight on the job employee fatalities since 1999.</p>
<p><b>Timely Completion of Corrective Actions (%)</b> is defined as 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.</p>	<p>Both Severity and LTIF measures are, as defined in the CEA Standard, generally harmonized with the U.S. Occupational Safety and Health Administration Standards for safety statistics.</p> <p>BC Hydro benchmarks its Severity and LTIF performance against available CEA composite results.</p> <p>Timely Completion of Corrective Actions - The purpose of this measure is to track corrective actions that have been put in place from safety incidents (injuries and near misses) to improve our safety performance. It demonstrates that we are a learning organization with a focus on improving practices in a timely way from identified deficiencies that have a direct impact on the safety of our workforce. By implementing this measure, we will see an improvement in our safety performance over time as systemic deficiencies are corrected and workers experience a lower frequency of recurring issues. The CEA does not report on the timely completion of corrective actions.</p> <p>BC Hydro will continue to benchmark its safety results against CEA participants in 2018/19. In parallel, BC Hydro will explore opportunities to use other benchmarking associations.</p>

### Measurement

Zero Fatality and Serious Injury / LTIF - The data source for all safety performance metrics are incidents reported through the Incident Management System. To ensure accuracy and reliability of the data, each incident is reviewed to ensure that it meets the CEA reporting criteria, the correct injury category and seriousness has been assigned, and the appropriate calendar days lost have been assigned to lost time injuries. This approach does exclude a small number of accepted WorkSafeBC claims that do not meet the CEA reporting criteria.

Timely Completion of Corrective Action Plans - The definition used for Timely Completion of Corrective Actions has changed from the previous Service Plans. Previously, this performance measure was defined as the percentage of safety corrective actions closed within 30 days of the scheduled due date on an annual basis, with an aim to improve over time. The new definition removes the 30 day buffer and the performance measure is now defined as 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.