



# SERVICE PLAN SUMMARY

BC HYDRO F2012-F2014

For more information,  
please visit [bchydro.com](http://bchydro.com)

**BChydro**   
FOR GENERATIONS



## LETTER FROM THE THE CHAIR

### CELEBRATING 50 YEARS OF CLEAN, RELIABLE ELECTRICITY...

2011 will be a milestone year for BC Hydro, as we celebrate our 50th Anniversary as a Crown corporation and continue to meet the electricity needs of British Columbians and plan for another 50 years and beyond.

The introduction of the Clean Energy Act (CEA) last spring was significant for BC Hydro, the Province and its citizens. Among other important objectives, the Act sets the foundation for British Columbia to unleash its full potential for clean energy development in every region across the province. It also ensures that we all benefit from a safe, secure and reliable supply of power for generations to come through a continuous reinvestment in BC Hydro's Heritage Assets.

To carry this bold vision forward, we know that more supply will be necessary in the longer term if we are to become electricity self-sufficient using clean, renewable power. That's why BC Hydro is investing \$6 billion in the system over the next three years. Currently, there are hundreds of capital projects underway that, together, make up the largest expansion of electrical infrastructure in B.C.'s history.

Today the province is growing and evolving. It is BC Hydro's responsibility to ensure that we continue to have an electricity system that we can all count on to power our economy, create jobs in every region, and keep the lights on. That's why we are building, renewing, and conserving together to meet today's needs and those of future generations, just as our predecessors did 50 years ago.

Dan Doyle, Chair



Dan Doyle  
Chair, BC Hydro

# MEETING THE CHALLENGE...

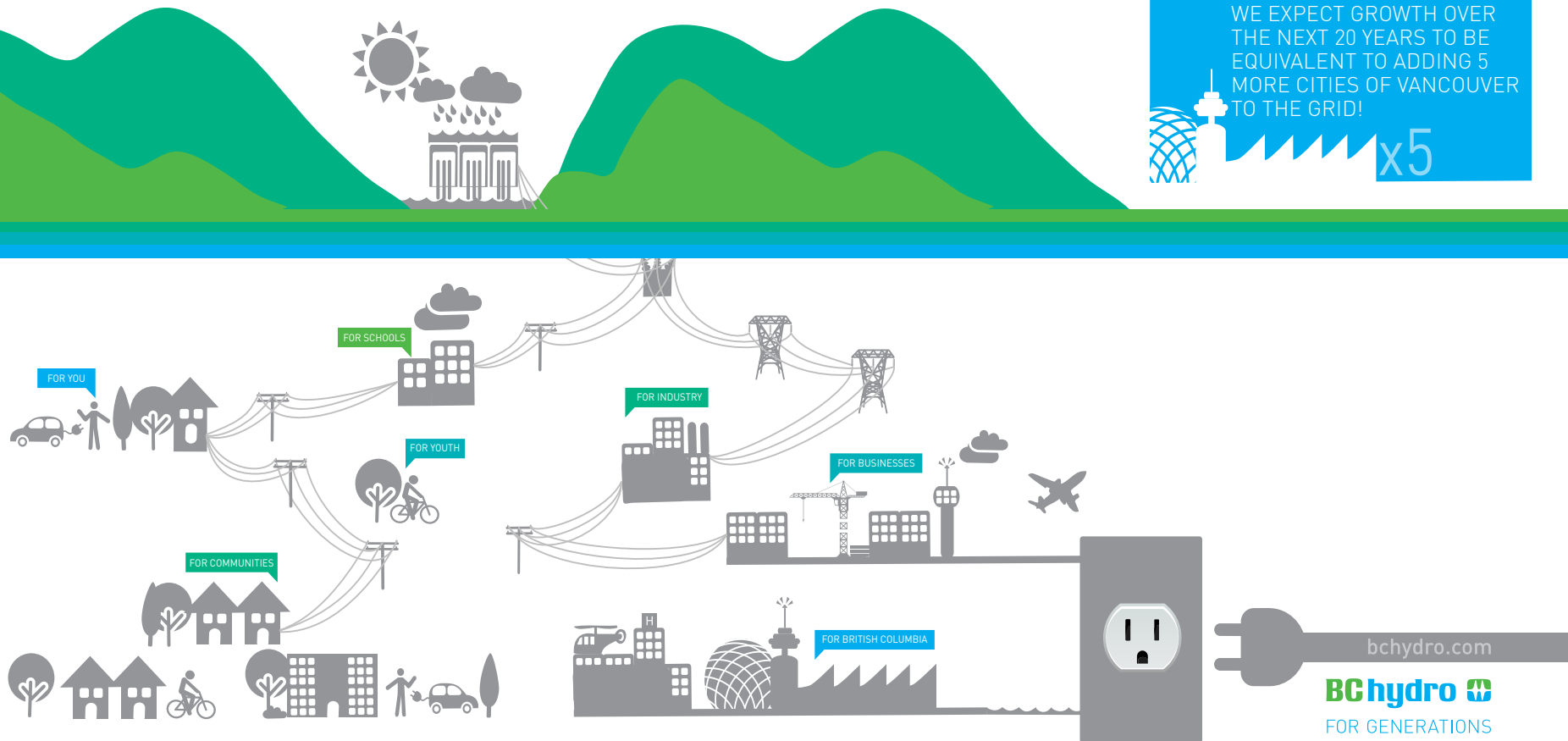
Our province and population continues to grow and so has our need for more electricity. As we look to the future, new technologies, new industry and growing populations are increasing demand for energy.

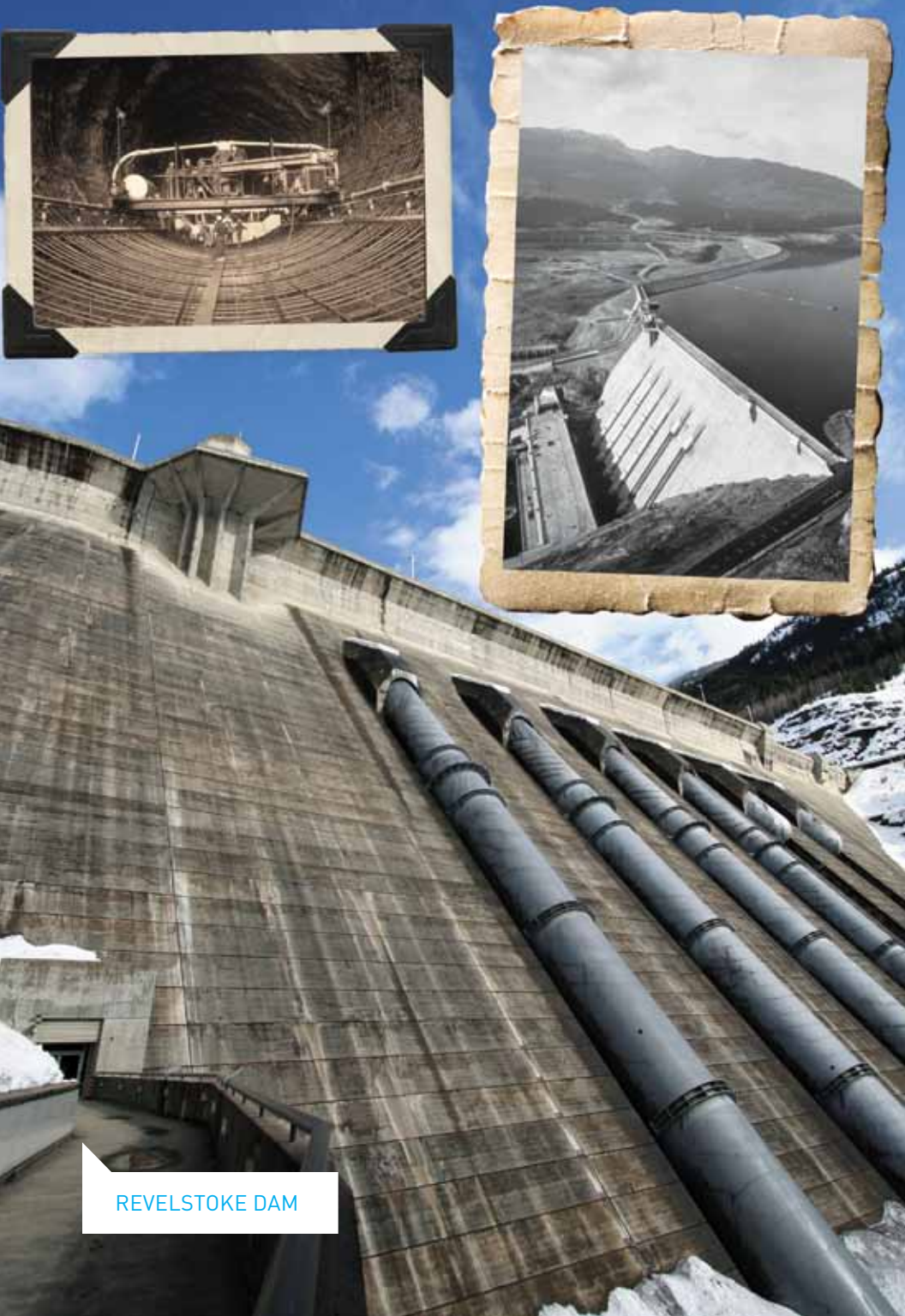
Meeting current and future demand for electricity in B.C. must be the foundation of our planning activities. We are now forecasting that the province's electricity needs will grow by as much as 40 per cent over the next 20 years, due to industrial activity, general economic growth and electrification.

Since the late 1990s, BC Hydro has depended on electricity imports to meet the demand for power. The Province has established a goal of achieving electricity self-sufficiency by 2016—meaning that BC Hydro must be able to supply British Columbia's electricity needs through domestic sources of power.

To meet B.C.'s future electricity needs, BC Hydro must invest in our generation and transmission assets and adopt new technologies that prepare us for the future. By upgrading our existing facilities, securing new supplies of clean energy, building new transmission and distribution infrastructure, and encouraging conservation and energy efficiency, BC Hydro will keep meeting the electricity needs of British Columbians today and for future generations.

# FOR GENERATIONS





## INVESTING IN OUR SYSTEM: PAST TO PRESENT

At the same time that electricity demand is growing, BC Hydro's network of dams and transmission and distribution systems is getting older. Our generating facilities are, on average, approximately 50 years old and much of our transmission and distribution system is more than 40 years old.

British Columbia's economy depends on the supply of reliable electricity. In order to meet the needs of our customers both now and in the future, we must invest in our vast network of dams, turbines, generators, substations, transformers, high voltage transmission lines, power lines and meters.

That's why BC Hydro is investing \$6 billion in the system over the next three years alone.

For example, the Vancouver City Central Transmission Project is the most significant investment in central Vancouver's electrical system in almost 30 years.

A turbine rehabilitation project at the G.M. Shrum Generating Station will replace 1960s-era turbines in GMS Units 1 to 5. The work on these five units, which represent 12 per cent of BC Hydro's generating capacity, will ensure ongoing reliability, availability and operational flexibility.

At the Revelstoke Dam and Generating Station, BC Hydro has added a fifth unit which will add 500 megawatts of capacity. That's enough electricity to service the equivalent of 40,000 homes during peak demand.

Even more jobs and economic activity will be created by major upgrades to our facilities, including projects at the Ruskin, Mica, John Hart, Revelstoke and G.M. Shrum dams and generating stations. As well as transmission line projects, including lines in the Northwest, Interior to Lower Mainland and Dawson Creek-Chetwynd areas.

REVELSTOKE DAM

For more information,  
please visit [bchydro.com](http://bchydro.com)

## VANCOUVER CITY CENTRAL TRANSMISSION

The Vancouver City Central Transmission Project is the most significant investment that BC Hydro has made in central Vancouver's electrical system in almost 30 years.



This is an artists rendering.



## GM SHRUM GENERATING STATION

Work at G.M. Shrum includes replacing the turbines in order to reduce the risk of runner failure; decrease maintenance costs; and improve operating efficiency.

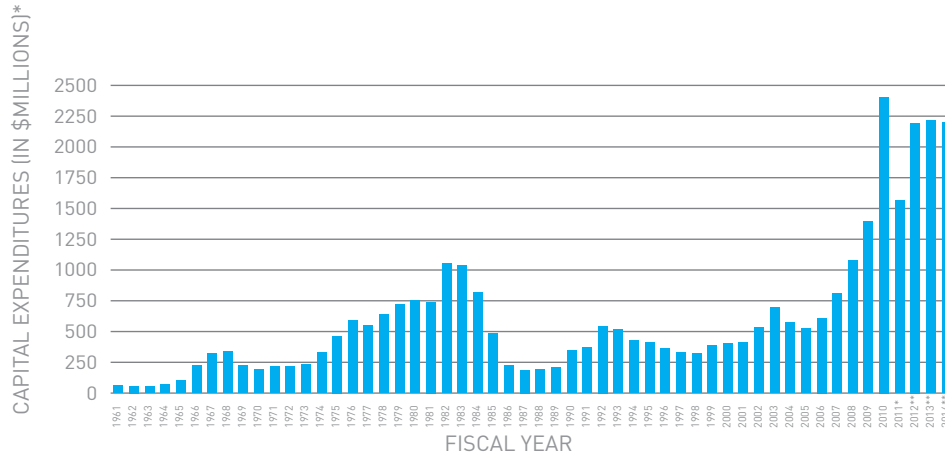
## CAPITAL INVESTMENTS

BC Hydro's capital plan calls for investments in our infrastructure of approximately \$2 billion per year for the next three years. Since most of BC Hydro's generating, transmission and distribution systems were built in the 1960s, 1970s and 1980s, as they age they need to be renewed and upgraded.

The chart below shows that BC Hydro has made no major infrastructure investments in the last 20 years.

A reliable domestic electricity supply has been a standard that British Columbians have enjoyed for generations. Ensuring electricity security means more than keeping the lights on at 6 p.m. on the coldest day of the year when consumption is at its peak. It means more than having enough electricity to keep our businesses and industries operating efficiently. In a competitive, ever-changing economy where energy is expected to become more expensive, electricity security is also about ensuring future generations enjoy the benefits of clean, affordable and reliable electricity.

BC HYDRO-CAPITAL EXPENDITURES 1961-2014\*\*  
ACTUAL SPEND (\$ MILLIONS)



\* Excluding Demand-Side Management (DSM).

\*\* Forecast.

Source: BC Hydro Service Plans (F2005-F2011), BC Hydro Annual Reports (F1990-F2005).

BC Hydro's planned capital investments span the range of generation, transmission, and distribution projects. For example, over the next several years, we will:

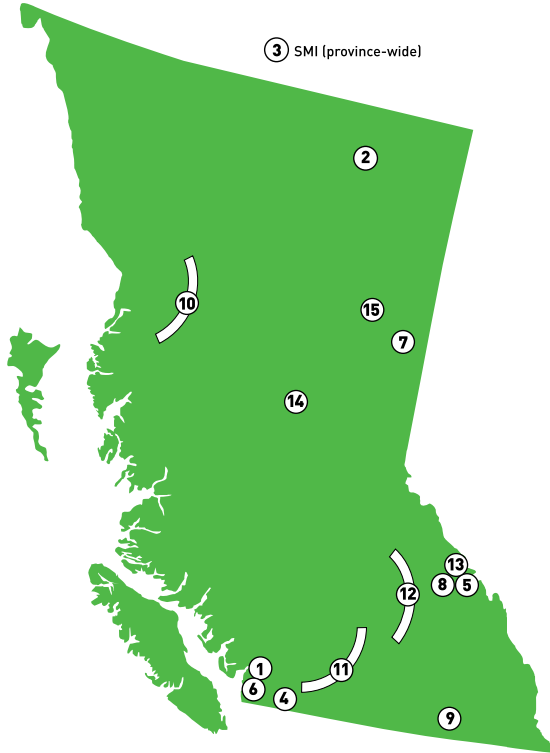
- Install two additional 500 MW generating units into existing turbine bays at the Mica Generating Station.
- Replace the turbines for Units 1 to 5 at the G.M. Shrum generating facility to reduce the risk of runner failure.
- Build a 340 km Northwest Transmission Line between Terrace and Bob Quinn Lake to ensure a reliable supply of clean power to potential industrial developments in northwest B.C.
- Build a 255 km Interior-to-Lower Mainland Transmission Line between Merritt and Coquitlam to help meet growing demand for electricity in the Lower Mainland.
- Install 1.8 million smart meters for BC Hydro customers to enhance safety, reliability and improve customer service, while providing customers with new conservation tools to help them manage their own energy use.
- Build a substation and two new underground transmission lines as part of the Vancouver City Central Transmission project to serve the growing population of the Mt. Pleasant/False Creek neighbourhood and improve reliability in other parts of central Vancouver.



# PLANNED PROJECTS OVER \$50 MILLION

BC Hydro has planned for numerous projects designed to ensure that British Columbia is equipped to meet our current and future electricity demand.

<b>1. Cheakamus Spillway Gate Reliability Upgrade</b>	F2012 Targeted completion	\$64–73 Total cost (\$ millions) <sup>1</sup>
Upgrade the spillway gates to enhance public and employee safety and ensure the gates meet Flood Discharge Reliability requirements.		
<b>2. Fort Nelson Generating Station Upgrade</b>	F2012 Targeted completion	\$139–150 Total cost (\$ millions) <sup>1</sup>
Increase generating capacity by 24.5 MW to ensure an adequate supply of electricity to the Fort Nelson area.		
<b>3. Smart Metering &amp; Infrastructure Program</b>	F2013– F2014 Targeted completion	\$930 Total cost (\$ millions) <sup>1,3</sup>
Introduce new digital smart meters that support two-way communications to approximately 1.8 million BC Hydro customers throughout the province. Includes in-home feedback options, metering communication infrastructure, system metering to reduce electricity theft, and advanced telecommunications infrastructure.		
<b>4. Stave Falls Spillway Gate Reliability Upgrade</b>	F2013 Targeted completion	\$67–72 Total cost (\$ millions) <sup>1</sup>
Upgrade the spillway gates <sup>2</sup> to increase public and employee safety and ensure the gates meet Flood Discharge Reliability requirements.		
<b>5. Columbia Valley Transmission Project (CVT)</b>	F2013 Targeted completion	\$132–209 Total cost (\$ millions) <sup>1</sup>
Construct a new 230kV transmission line from the existing Invermere substation to a new substation (called Kicking Horse); construct a new 69kV transmission line between the new Kicking Horse substation and existing substation; expand Golden and Invermere substations and modify the Cranbrook substation—all to meet increased demand for electricity in the Columbia Valley area.		



<sup>1</sup> The capital expenditure amounts are presented in accordance with Canadian GAAP and have not been adjusted to reflect the impact of IFRS.

<sup>2</sup> Smart Metering & Infrastructure Program amount includes both capital costs and operating expenditures subject to regulatory deferral.

<sup>3</sup> Some of these ranges may be large, particularly for projects still in Definition phase, as scope, final costs and completion dates are still to be determined.

**LEGEND**  
 Transmission Lines Planned Projects

<b>6. Vancouver City Central Transmission (VCCT)</b>	F2013 Targeted completion	\$177–195 Total cost (\$ millions) <sup>1</sup>
Build an enclosed 230/12 kV substation in the Mt. Pleasant area and two new underground 230 kV transmission lines connecting the new substation to the existing transmission network to serve growing loads in the Mt. Pleasant/False Creek area and maintain a reliable supply of electricity to other areas of central Vancouver.		
<b>7. Dawson Creek/Chetwynd Area Transmission (DCAT)</b>	F2014 Targeted completion	\$150–250 Total cost (\$ millions) <sup>1</sup>
Extend the 230 kV transmission system to Bear Mountain terminal and Dawson Creek to meet the area's high load growth (primarily from oil and gas development) and integrate potential wind generation resources in the region.		
<b>8. Mica Gas Insulated Switchgear Replacement</b>	F2014 Targeted completion	\$181–200 Total cost (\$ millions) <sup>1</sup>
Replace the switchgear system at the Mica Generating Station to ensure the reliability of this key generating station and reduce SF <sub>6</sub> (a greenhouse gas) leakage.		
<b>9. Hugh Keenleyside Spillway Gate Reliability Upgrade</b>	F2014 Targeted completion	\$91–102 Total cost (\$ millions) <sup>1</sup>
Upgrade the spillway gates <sup>2</sup> at the Hugh Keenleyside dam to increase public and employee safety and ensure the gates meet Flood Discharge Reliability requirements.		
<b>10. Northwest Transmission Line Project (NTL)</b>	F2014 Targeted completion	\$364–525 Total cost (\$ millions) <sup>1</sup>
Construct a 340 km, 287 kV transmission line between Skeena substation near Terrace and a new substation to be built near Bob Quinn Lake to ensure a reliable supply of clean power to potential industrial developments in the area; provide a secure interconnection point for clean generation projects; and potentially help certain northwest communities to get their power from the electricity grid rather than diesel generators.		
<b>11. Interior to Lower Mainland (ILM)</b>	F2015 Targeted completion	\$540–780 Total cost (\$ millions) <sup>1</sup>
Construct a new 500 kV transmission line approximately 255 km in length between the Nicola substation near Merritt and the Meridian substation in Coquitlam and build a new series capacitor station at Ruby Creek near Agassiz to help meet increased demand for electricity growth in the Lower Mainland.		
<b>12. Seymour Arm Series Capacitor Station (SASC)</b>	F2015 Targeted completion	\$50–100 Total cost (\$ millions) <sup>1</sup>
Construct a new 500 kV series capacitor station adjacent to the existing corridor for lines 5L71 and 5L72 near the mid-point between the Mica Generating Station and the Nicola Substation near Merritt to securely deliver the expanded generation output of the Mica generating station.		
<b>13. Mica Units 5 and 6</b>	F2015– F2016 Targeted completion	\$700–800 Total cost (\$ millions) <sup>1</sup>
Install two additional 500 MW generating units into existing turbine bays at the Mica Generating Station. To be undertaken in conjunction with the construction of a series capacitor station located near the mid-point on the existing Mica-Nicola 500kV transmission lines.		
<b>14. Gordon M. Shrum Units 1 to 5 Turbine Rehabilitation</b>	F2017 Targeted completion	\$247–314 Total cost (\$ millions) <sup>1</sup>
Replace the turbines for Units 1 to 5 to reduce the risk of runner failure; decrease maintenance costs; and improve operating efficiency.		
<b>15. Site C Clean Energy Project<sup>2</sup></b>	F2021 Targeted completion	TBD Total cost (\$ millions) <sup>1</sup>
Build a third dam and hydroelectric generating station on the Peace River in northeast B.C. Site C will provide approximately 900 MW of capacity and 4,600 GWh of energy—enough electricity to power more than 400,000 homes per year in B.C. Subject to environmental certification and required regulatory approvals, Site C will be a source of clean and renewable power for more than 100 years.		



## CLEAN AND RENEWABLE

The *Clean Energy Act* sets the foundation for a new future of electricity self-sufficiency powered by unprecedented investments in clean, renewable energy across the province. During F2010, Independent Power Producers (IPPs) provided 8,893 GWh of energy to the BC Hydro system, which accounted for about 16 per cent of total domestic electricity requirements. By 2016, the first year of electricity self-sufficiency, we expect the contribution from IPPs and other long-term purchase commitments to increase to 20 to 25 per cent of total supply. Power procurement processes now underway or planned to acquire additional clean or renewable energy in the future include our:

- Standing Offer Program for small, clean projects with a maximum size of 15 MW.
- Community-Based Biomass Call for innovative, community level energy supply solutions (5 MW or less) using carbonneutral biomass fuel sources.
- Bioenergy Phase 2 Call for larger-scale biomass projects (minimum of 5 MW), including forest-based biomass in six designated areas of the province.
- Integrated Power Offer for industrial and commercial customers that combines energy efficiency savings with electricity generation opportunities.

## CONSERVATION AND ENERGY EFFICIENCY

BC Hydro has a long history of encouraging customers to be Power Smart, providing customer information and education programs, and offering incentives and rebates to promote energy efficiency. BC Hydro's Power Smart program is a world leader in the promotion of conservation and energy efficiency, and this has seen us achieve our energy savings targets which in turn reduces the amount of new energy we have to secure.

BC Hydro's leadership in creating a permanent conservation culture in B.C. will continue, as the *Clean Energy Act* calls for BC Hydro to meet 66 per cent of future incremental power demand from conservation and energy efficiency by 2020.

In order for BC Hydro's conservation initiatives to continue filling a large part of the gap between energy demand and supply, we will work with the Province to implement new programs, codes and standards, and will continue to encourage customers to be smart with their power.

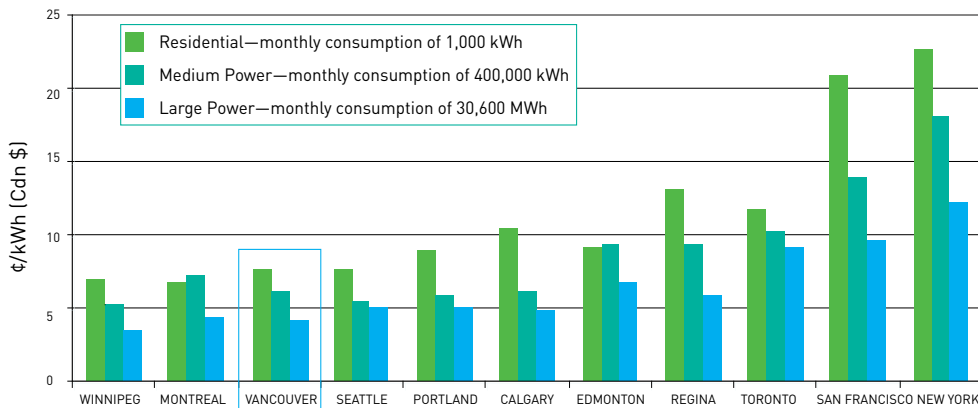
**BC**hydro   
**powersmart**

## ELECTRICITY RATES REMAIN AMONG THE LOWEST IN NORTH AMERICA

In large part due to the investments made in BC Hydro assets in past decades, our electricity rates remain among the lowest in North America (see chart below) and the Clean Energy Act confirms the government's objective of keeping BC Hydro's rates low.

Rates are rising across North America as utilities upgrade their infrastructure and meet the increasing demands of their customers. Our rates, too, will increase in the future as we reinvest in our assets, take steps to meet growth in demand by securing new sources of supply, and continue our strong commitment to social and environmental responsibility. The challenge facing BC Hydro will be to balance our many objectives and requirements with the need to carefully manage our costs and keep customer rates affordable.

### BC HYDRO ELECTRICITY RATE COMPARISON -APRIL 1, 2010 (F2011)



Source: "2010 Comparison of Electricity Prices in Major North American Cities" (Hydro-Quebec, November, 2010). Rates are presented in Canadian currency as of April 1, 2010. BC Hydro rates reflect impact of F2011 Revenue Requirements Application settlement agreement. For utilities in other cities, chart does not reflect changes implemented since April 1, 2010.

### WITH CHANGE COMES OPPORTUNITY AND EXCITEMENT.

Since the enactment of the *Clean Energy Act* in June 2010, we have revised our Vision and Strategic Objectives to build momentum across the organization, provide clarity around our priorities, and ensure that BC Hydro is positioned for success.



## VISION

Powering B.C. with clean, reliable electricity for generations.

## STRATEGIC OBJECTIVES

### SAFELY KEEP THE LIGHTS ON

Reliably meet the electricity needs of our customers through integrated planning, technology and safely operating, maintaining and advancing our system.

### MIND OUR FOOTPRINT

Create a sustainable energy future in B.C. by carefully managing our impacts on the environment and fostering an energy conservation and efficiency culture.

### SUCCEED THROUGH RELATIONSHIPS

Gain support for our work by building trusted relationships with customers, suppliers, First Nations and the communities we serve.

### FOSTER ECONOMIC DEVELOPMENT

Foster economic development opportunities across B.C. through our projects, practices and advancement of the clean energy sector.

### MAINTAIN COMPETITIVE RATES

Deliver value for British Columbia and maintain competitive rates by efficiently and responsibly managing our business.

### ENGAGE A SAFE & EMPOWERED TEAM

Empower a team that is innovative, prepared for the future and committed to safety.