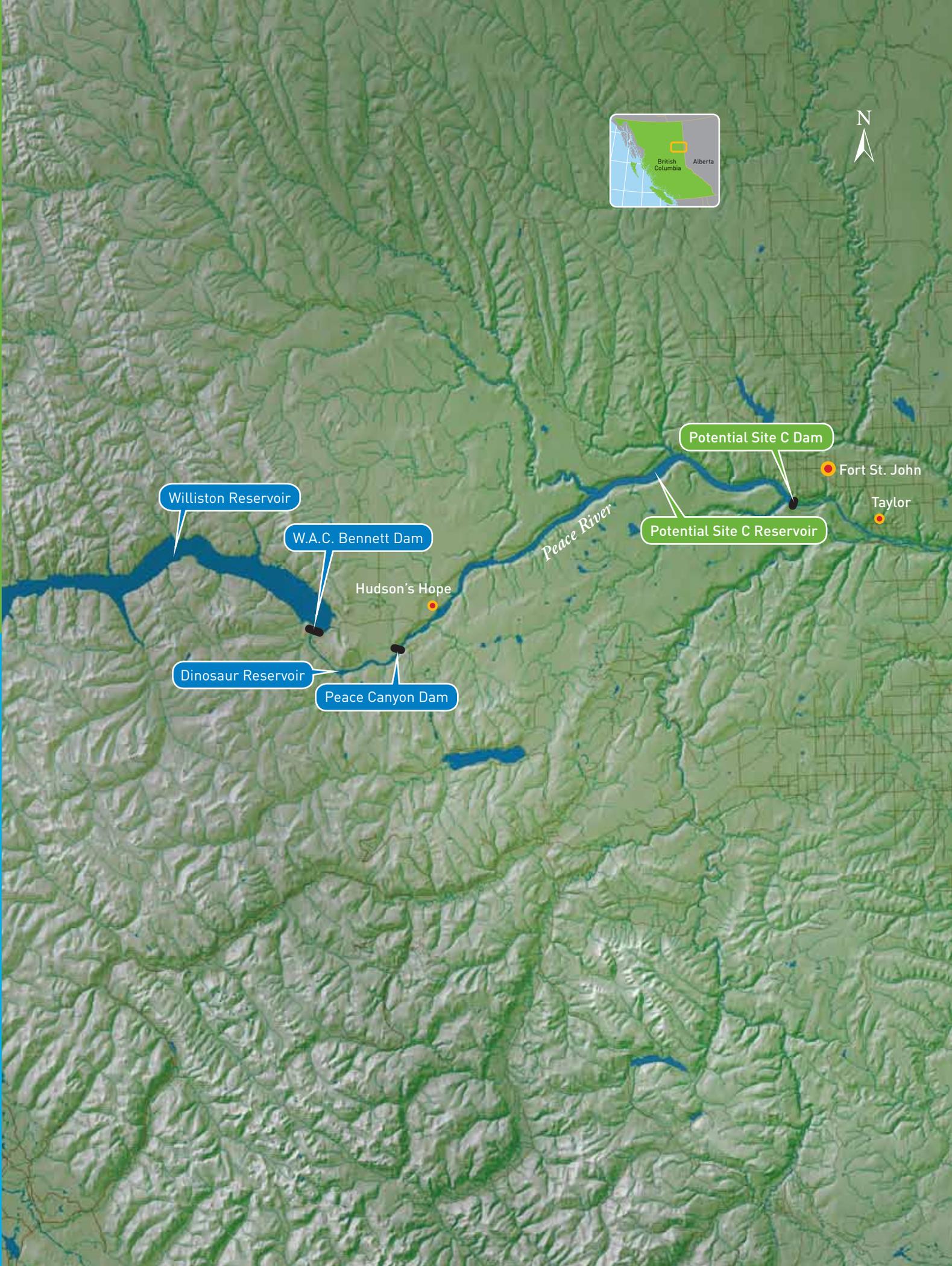


PEACE RIVER SITE C HYDRO PROJECT

A POTENTIAL SOURCE OF CLEAN, RENEWABLE
AND RELIABLE POWER FOR GENERATIONS

STAGE 2 SUMMARY REPORT
FALL 2009



Williston Reservoir

W.A.C. Bennett Dam

Dinosaur Reservoir

Peace Canyon Dam

Hudson's Hope

Peace River

Potential Site C Dam

Potential Site C Reservoir

Fort St. John

Taylor

PEACE RIVER SITE C HYDRO PROJECT

A POTENTIAL SOURCE OF CLEAN, RENEWABLE AND RELIABLE POWER FOR GENERATIONS

STAGE 2 SUMMARY REPORT

The following Stage 2 summary report provides an overview of BC Hydro’s consultation on the potential Site C Hydro Project (Site C), as well as its engineering and environmental work to further define the project.

Stage 2 commenced in the fall of 2007. It included consultations with the public, stakeholders, communities, Aboriginal groups and property owners, as well as early discussions with the Province of Alberta and the Northwest Territories.

As part of Stage 2 work, BC Hydro initiated field studies to better understand current conditions related to the physical, biological and socio-economic environment, and to gather engineering and technical information regarding the design, construction and operation of the potential project.

BC Hydro’s work on Site C was undertaken in the context of B.C.’s future electricity needs and provincial energy policy.

The studies and reports used to compile this Stage 2 report are available at www.bchydro.com/sitec.

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ABOUT SITE C

IF BUILT, SITE C WOULD BE A SOURCE OF CLEAN AND RENEWABLE ELECTRICITY FOR OVER 100 YEARS.

Site C is a potential third dam and hydroelectric generating station on the Peace River in northeast B.C. and is one of several resource options being considered to help meet British Columbia's future electricity needs.

As originally designed, Site C would be located downstream from the existing Williston Reservoir and two existing BC Hydro generating facilities. It would include an earthfill dam, approximately 1,100 metres in length, and 60 metres high above the river bed. The reservoir would be 83 kilometres long and would be, on average, two to three times the width of the current river.

Site C would provide approximately 900 megawatts (MW) of capacity, and produce about 4,600 gigawatt hours (GWh) of electricity each year — enough electricity to power approximately 410,000 homes in B.C.

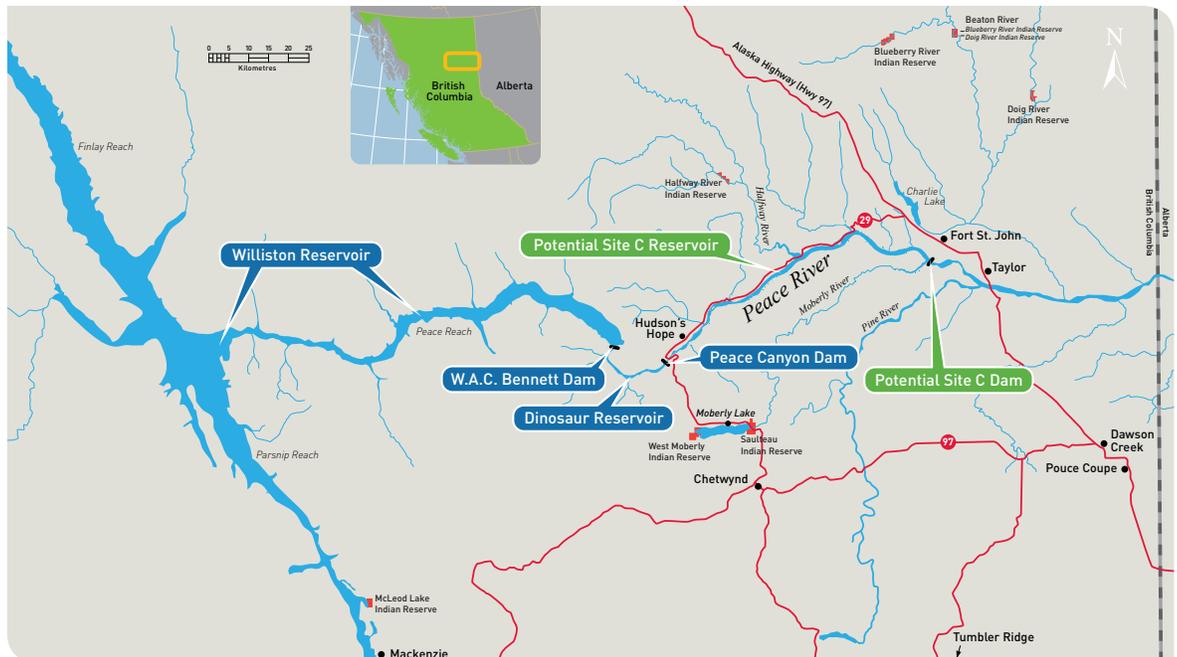
Should the Site C project proceed, it would be a publicly owned heritage asset.



Peace River at the potential Site C dam site.

IF BUILT, SITE C WOULD PROVIDE ENOUGH ELECTRICITY TO POWER APPROXIMATELY 410,000 HOMES.

LOCATION OF THE POTENTIAL SITE C DAM AND RESERVOIR



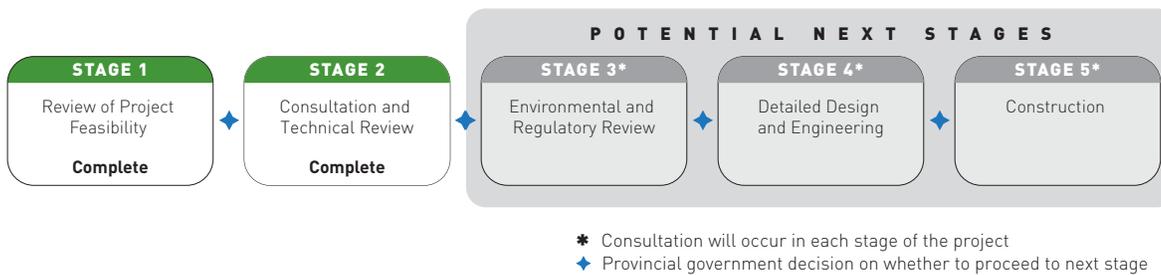
A MULTI-STAGE APPROACH

In keeping with best practices for large capital projects, BC Hydro adopted a multi-stage approach for the potential Site C project to ensure due diligence in project planning. The multi-stage approach provides for an informed decision-making process by allocating multiple milestones for assessing the project and deciding whether to proceed to the next stage.

Stage 1 concluded with the release of the *Site C Feasibility Review: Stage 1 Completion Report* in the fall of 2007. During this initial stage, existing studies and historical information related to engineering, costs, the environment, consultation and First Nations were reviewed. At the end of Stage 1, BC Hydro determined that Site C was still feasible and recommended to the provincial government that the project advance to the next stage.

Stage 2 commenced in the fall of 2007. Activities during this stage included extensive consultations with the public, stakeholders, communities, Aboriginal groups and property owners, as well as early discussions with the Province of Alberta and the Northwest Territories. This stage also included the initiation of field studies to better understand current conditions related to the physical, biological and socio-economic environment, and to gather engineering and technical information regarding the design, construction and operation of the potential project.

MULTI-STAGE EVALUATION, PLANNING AND DEVELOPMENT



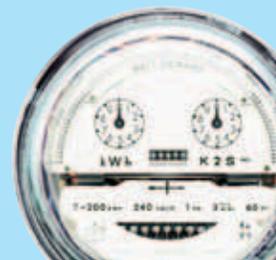
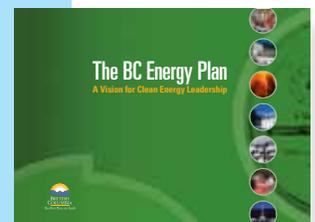
A MULTI-STAGE APPROACH WAS SELECTED TO ENSURE DUE DILIGENCE IN PROJECT PLANNING.

BC ENERGY PLAN: A Vision for Clean Energy Leadership

BC Hydro's actions to ensure our province can meet its future electricity needs are guided by the provincial government's 2007 *BC Energy Plan*. The *BC Energy Plan* directed BC Hydro and the provincial government to "enter into initial discussions with First Nations, the Province of Alberta and communities to discuss Site C to ensure that communications regarding the potential project and the processes being followed are well known."

The plan also set targets to make the province electricity self-sufficient by 2016, while charting a path for conservation, energy efficiency and clean energy.

The *BC Energy Plan: A Vision for Clean Energy Leadership* is available online at www.energyplan.gov.bc.ca.



MEETING FUTURE ELECTRICITY NEEDS

BC HYDRO'S ANALYSIS FOUND THAT SITE C WOULD PROVIDE A LOW-COST, RELIABLE SOURCE OF ELECTRICITY, COMPARED TO ALTERNATIVES.

BC Hydro forecasts that the province's electricity needs will grow by 20 to 40 per cent over the next 20 years. As extensive as BC Hydro's hydroelectric assets are, they will not be enough to provide future generations of British Columbians with electricity self-sufficiency if demand continues to grow as projected.

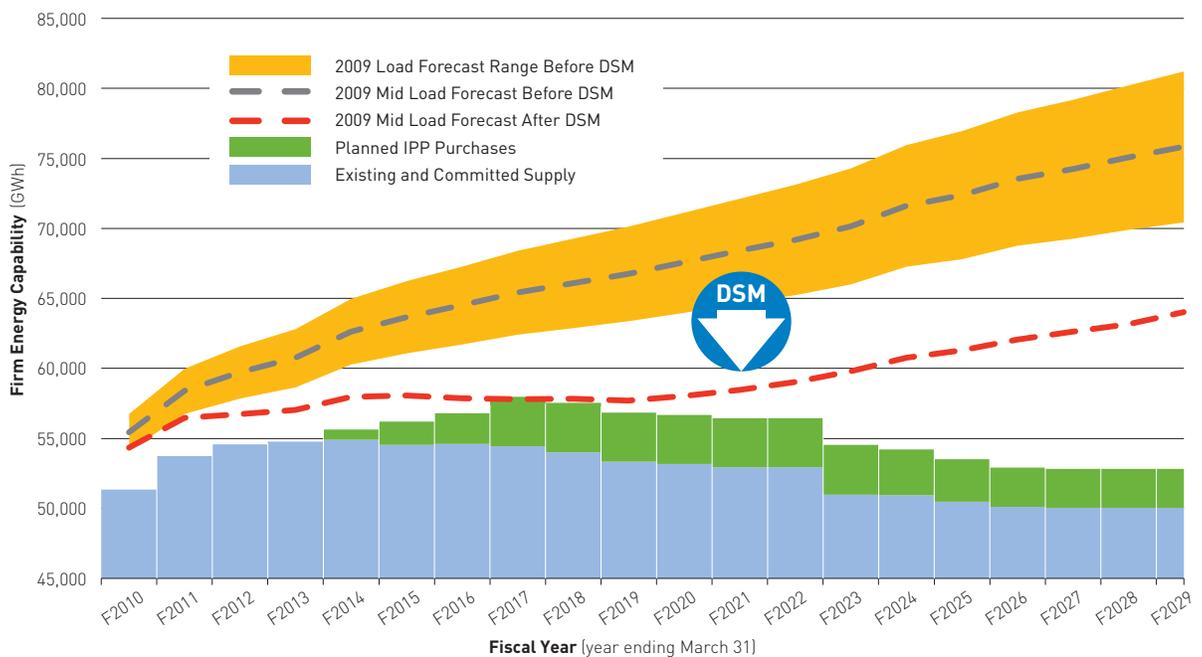
BC Hydro is planning now so that British Columbians will continue to enjoy the benefits of a secure, reliable and affordable electricity supply.

To meet B.C.'s future electricity needs, there is a need to conserve more electricity, to buy more electricity from renewable power projects — such as wind and run-of-river hydro — and to build more by reinvesting in existing assets and considering new resources, such as Site C.

Large projects like Site C require a long lead time — 10 years or more — and require early evaluation and study. Sufficient early work must be completed to maintain the option to build a large hydroelectric project to meet future electricity needs.

THE PROVINCE'S ELECTRICITY NEEDS ARE FORECAST TO GROW BY 20 TO 40 PER CENT OVER THE NEXT 20 YEARS.

ENERGY LOAD/RESOURCE BALANCE AFTER CONSERVATION AND IPP PURCHASES



This figure is based on the load resource information as of October 2009. The blue bar of Existing and Committed Supply reflects the B.C. government's order of October 28, 2009 reducing reliance on Burrard Thermal for firm energy, the latest EPA replacements/amendments, and the Waneta Transaction. The green bar of Planned IPP Purchases includes Clean Power Call and Bioenergy Call Phase II as filed in the 2008 LTAP. The insurance requirement has not been reflected in this figure.

SUPPORTING THE DEVELOPMENT OF RENEWABLE RESOURCES

B.C.'s future electricity needs will require clean and renewable resources, such as wind, run-of-river hydro and solar. However, many renewable resources are intermittent, meaning they are not always available to generate electricity (e.g., when the wind is not blowing, the river is not flowing, or the sun is not shining). To facilitate the development of renewables, there is also a need to back them up with reliable capacity, such as large hydro.

An advantage of a large hydro project like Site C is that, in addition to being consistently available, it is flexible and can be increased or decreased in response to changes in demand or intermittent generation. As a result, the generation from large hydro can be reduced when intermittent resources are available and the additional water can be stored in the reservoir for later use. When intermittent resources are not available, the generation from large hydro can be increased to make sure British Columbians have the electricity they need.

KEY FINDINGS

In the 2008 Long-Term Acquisition Plan (LTAP), BC Hydro evaluated the characteristics of Site C as a potential resource option. Based on this assessment, the Site C project would offer the following key benefits:

- Site C would deliver firm, reliable energy and capacity that would be highly flexible.
- Energy would be available during both daily and annual peak periods.
- Site C would optimize upstream storage and regulation by taking advantage of water already stored in the Williston Reservoir.

- Site C would have low greenhouse gas emissions, per gigawatt hour, compared to other electricity supply options.
- Electricity generated at Site C would be unaffected by fluctuations in natural gas costs and carbon pricing that could affect other forms of energy supply.

Site C's unique characteristics of reliability, dependability and flexibility make it an attractive potential resource option to help meet the growing demand for electricity in the future.

BC Hydro's long-term planning indicates that Site C would provide a low-cost, reliable source of electricity, resulting in economic benefits to customers, compared to other resource alternatives.

**BC HYDRO
PROPOSES TO
MEET MORE
THAN 50 PER
CENT OF THE
ENERGY GAP IN
2021 THROUGH
CONSERVATION.**

B.C.'S EMERGING TRENDS

Electric plug-in vehicles and other technologies aimed at reducing fossil fuel dependency may eventually place new demands on our electricity system.

BC Hydro is researching potential increases in demand from the electrification of the transportation sector — including rail, ports and electric plug-in vehicles — and fuel switching (e.g., residential space and water heating).

While these emerging trends are not currently included in BC Hydro's long-term forecast — since the timing of these trends, such as an electric vehicle market, is unknown — they reinforce the advantage of keeping Site C as a resource option.



PUBLIC AND STAKEHOLDER CONSULTATION

CONSULTATION PARTICIPANTS EXPRESSED A STRONG INTEREST IN AVOIDING OR MITIGATING LOCAL IMPACTS FROM THE POTENTIAL SITE C PROJECT.

In February 2007, the provincial government's *BC Energy Plan* directed BC Hydro and the Province to enter into initial consultations on the potential Site C project.

BC Hydro undertook a comprehensive public and stakeholder consultation program that was designed to meet or exceed best practices.

BC HYDRO INVOLVED THE PUBLIC AND STAKEHOLDERS IN DESIGNING THE CONSULTATION PROCESS.



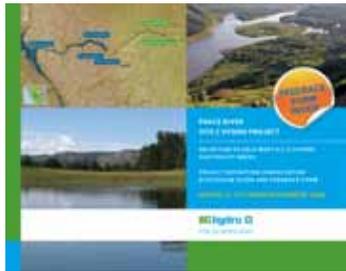
CONSIDERING INPUT

BC Hydro documented how it considered input received from public and stakeholder consultations. A **Consideration Memo** is available at www.bchydro.com/sitec.

During Stage 2, BC Hydro's consultation activities were multi-phased and offered many opportunities for public input. The purpose of the consultation program was to:

- Consult with the public and stakeholders on potential impacts, benefits and features of the Site C project.
- Consider public input, along with technical, environmental and economic information.
- Keep communities, stakeholders and the public informed about the potential project and the many opportunities for public participation.

BC Hydro involved the public and stakeholders in designing the consultation process, consistent with best practices for accountability, inclusiveness, transparency, commitment and responsiveness.



BC Hydro engaged in three rounds of public and stakeholder consultation.

CONSULTATION ACTIVITIES

Between December 2007 and December 2008, BC Hydro conducted three rounds of public and stakeholder consultation. The consultation included Pre-Consultation, which asked stakeholders how they wanted to be consulted and about what topics, followed by two rounds of Project Definition Consultation with the public and local, regional and provincial stakeholders.

Many hundreds of people participated in 121 meetings over the three rounds of consultation, including 103 stakeholder meetings and 18 open houses. In addition, hundreds of participants provided input online, by mail, fax and email, via a Site C toll-free telephone line, and in person at the Fort St. John or Hudson's Hope community consultation offices.

Public notice of consultations included 105 advertisements in 16 newspapers, radio advertisements on 11 stations in northern B.C., and thousands of notification emails to stakeholders. In addition, 21,000 mailers were sent to households in the Peace region prior to the first and second rounds of consultation. Public notice also included a bill insert to 1.3 million BC Hydro residential customers prior to the second round of Project Definition Consultation in October 2008.



Inside the Community Consultation Office in Fort St. John.

WHAT WE HEARD

Consultation participants expressed a strong interest in avoiding or mitigating local impacts from the potential Site C project, particularly possible pressures on community services and infrastructure from the arrival of construction workers. Environmental concerns were also raised, including potential effects to air quality, water and agricultural land.

Participants indicated they want BC Hydro to consider alternatives to Site C, including reinvesting in BC Hydro heritage assets, further promotion of conservation, and renewable electricity sources such as wind, solar, biomass and geothermal.

Participants also indicated an interest in potential community benefits associated with the Site C project, particularly upgrades to infrastructure such as roads, bridges, parks and health facilities.

Overall, 57 per cent of consultation participants “strongly” or “somewhat” agreed with pursuing Site C if conservation, upgrading existing equipment, and investing in new sources were insufficient to meet the electricity needs of B.C.

More than two-thirds (69 per cent) of provincial consultation participants agreed with this statement, while consultation participants from the Peace River area were evenly split (47 per cent agreed and 47 per cent disagreed).

If the Site C project advances to Stage 3, an independent environmental and regulatory review would provide additional consultation opportunities for the public, Aboriginal groups, stakeholders and communities.

103
STAKEHOLDER
MEETINGS AND
18 OPEN HOUSES
WERE HELD
OVER THREE
ROUNDS OF
CONSULTATION.

ABORIGINAL CONSULTATION AND ENGAGEMENT

BC HYDRO AND ABORIGINAL GROUPS ARE ENGAGED IN A THOROUGH CONSULTATION PROCESS THAT WOULD CONTINUE THROUGH ALL STAGES OF THE PROJECT.

The primary objective of consultation and engagement with Aboriginal groups is to share information about the potential Site C project, identify their interests and concerns, obtain their feedback, and increase knowledge and understanding about potential project impacts. During Stage 2, BC Hydro initiated consultation and engagement with 41 Aboriginal groups consisting primarily of Treaty 8 First Nations in B.C., as well as Aboriginal groups in Alberta and the Northwest Territories (NWT).

CONSULTATION ACTIVITIES

Prior to any substantive consultation and engagement, BC Hydro identified the Aboriginal groups who may exercise traditional practices or interests in the Peace River area.

Aboriginal groups who were likely to experience little or no impact were notified of the potential Site C project. Consultation agreements were negotiated with Aboriginal groups where more in-depth consultation was required. During Stage 2, eight consultation agreements representing 13 Aboriginal groups were negotiated.

ONGOING CONSULTATION

If the Site C project proceeds to Stage 3, Aboriginal engagement would continue, with a greater focus on impact assessment, mitigation and accommodation.

WHAT WE HEARD

In general, grievances related to past BC Hydro projects are raised by most of the Aboriginal groups consulted. In addition, cumulative effects of past and current projects on the region, including those from other industry sectors (e.g., oil and gas, mining), are also a common concern expressed by many Aboriginal groups.

Short- and long-term employment and economic opportunities related to the potential Site C project are of significant interest to the Aboriginal groups consulted. BC Hydro is working with Aboriginal groups to identify opportunities for Aboriginal participation in the potential project.

BRITISH COLUMBIA

In B.C., Aboriginal people consulted during Stage 2 expressed significant concern about potential direct effects on land and water where treaty rights to hunt, fish and trap may be exercised, as well as the possible impacts on their cultural and heritage resources.

BC Hydro is seeking input from Treaty 8 First Nations on a wide range of issues related to the environment, archaeology, socio-economic conditions, and land use.

ALBERTA AND THE NORTHWEST TERRITORIES

Issues related to fish and hydrology (water temperature, flows and quality) are of concern to Aboriginal groups downstream in Alberta and in the Northwest Territories. In communities where people continue to rely daily on the river for critical transportation routes and food sources, even minor fluctuations in water levels are of interest.

If the project advances to the next stage, which includes an independent environmental and regulatory review, BC Hydro would assess potential impacts of the Site C project on fish and hydrology.

BC HYDRO INITIATED A CONSULTATION AND ENGAGEMENT PROGRAM WITH 41 ABORIGINAL GROUPS.

PROPERTIES AND HIGHWAY 29 CONSULTATION

BC HYDRO REPRESENTATIVES MET WITH INDIVIDUALS WHOSE PROPERTY COULD BE DIRECTLY IMPACTED BY THE REALIGNMENT OF FOUR SECTIONS OF HIGHWAY 29 AND/OR FLOODING.

BC Hydro is committed to consultation and effective communications with property owners in the potential Site C project area. During Stage 2, BC Hydro consulted with property owners to provide information about potential changes to sections of Highway 29, to gather input specific to individual properties, to determine property owner preferences about the potential highway alignment options, and to document property owner concerns.

To facilitate this consultation, BC Hydro established dedicated properties representatives to consult and inform potentially impacted property owners and leaseholders about the project.

CONSULTATION ACTIVITIES

Meetings with property owners took place between November 2008 and February 2009. BC Hydro identified 42 land holdings potentially impacted by Highway 29 realignment and/or flooding. BC Hydro corresponded with these property owners and met with all property owners who chose to participate.

If a decision is made to advance the potential Site C project to the next stage, BC Hydro would continue to consult and liaise with affected property owners and leaseholders. Key issues that would require ongoing consultation, and further design and engineering work, include:

- Continued discussion regarding Highway 29 realignment options
- Reservoir impact lines
- Shoreline protection
- Dam site and powerhouse
- Sourcing construction materials
- Access roads and powerhouse access bridge

THE PURPOSE OF THIS CONSULTATION WAS TO KEEP PROPERTY OWNERS INFORMED ABOUT THE POTENTIAL SITE C PROJECT AND GATHER FEEDBACK.



Highway 29 at Farrell Creek.

PROPERTIES AND HIGHWAY 29 CONSULTATION

CONTINUED

MAPPING THE POTENTIAL RESERVOIR AREA

During Stage 2, BC Hydro conducted more detailed mapping of the lands that would be affected by the potential reservoir area. This land includes provincial Crown land, private property and BC Hydro-owned property. Mapping work indicates that there are approximately 9,310 hectares in the potential reservoir surface area, comprising 5,340 hectares of flooded land and 3,970 hectares of current river area.

As shown in the table below, in terms of the flooded land area, approximately 81 per cent is Crown land (4,318 hectares), including unclassified land and road allowances. A further 12 per cent is owned by BC Hydro (662 hectares) and seven per cent is privately owned land (360 hectares comprising 20 land holdings).



Highway 29 crossing the Halfway River.

POTENTIAL PROPERTY REQUIREMENTS WOULD BE DETERMINED IF THE PROJECT PROCEEDS TO STAGE 3.

CROWN AND PRIVATE LAND POTENTIALLY IMPACTED BY RESERVOIR SURFACE AREA ¹		
	Potential Area of Flooding (hectares)	Percentage of Flooded Land Area
Crown land	4,318	81%
BC Hydro-owned land	662	12%
Private land ²	360	7%
Total Flooded Land Area	5,340	100%
Current river area ³	3,970	
Total Reservoir Area	9,310	

In addition to land in the potential reservoir surface area, additional land or rights would be required if a future decision is made to build Site C. This includes land or rights required for reservoir impact lines, Highway 29 realignment, and construction materials. Potential property requirements would be determined if the project proceeds to Stage 3.

GAINING EFFICIENCIES

As a potential third dam on the Peace River, Site C would take advantage of water already stored in the Williston Reservoir. This means that Site C would generate 30 per cent of the electricity produced at the W.A.C. Bennett Dam with only five per cent of the reservoir area.

¹ The surface area of the reservoir is based on topography at the elevation of 461.8 metres.

² 25.1 hectares of private land is within the existing river channel.

³ Based on maximum normal operating discharge from Peace Canyon and an estimated average annual flow from the Halfway River.

ENGINEERING AND OPERATIONS

BC HYDRO FOUND THAT A REFINED AND UPDATED DESIGN IS REQUIRED TO MEET CURRENT SEISMIC, SAFETY AND ENVIRONMENTAL GUIDELINES AND TO INCORPORATE INPUT FROM CONSULTATION.

Stage 2 engineering activities provided BC Hydro with new technical information regarding the design, construction and operation of the potential Site C dam.

As would be expected, there have been many changes in guidelines and construction practices since the majority of design work was done on Site C in the 1980s. These changes range from new information on seismic conditions and environmental considerations to new guidelines for the construction of hydroelectric facilities.

In 2007, the Canadian Dam Association (CDA) issued new guidelines for dam safety in Canada. During the 1981 design and 1989 review of the Site C project, no such Canadian guidelines existed. As a result, technical studies and analysis were initiated during Stage 2 to ensure that the Site C design, as conceived in the 1980s, would meet or exceed these guidelines.

ENGINEERING WORK – KEY FINDINGS

As a result of Stage 2 engineering work, BC Hydro has concluded that a refined and updated design is required to meet current seismic, safety and environmental guidelines and to incorporate input from consultation. In doing so, an optimized design would meet current practices for a hydroelectric facility.

A summary of BC Hydro's engineering work during Stage 2 is described below.

Seismic: Since the 1980s, there has been a greater understanding of seismic activity in the Peace River region. As a result, the original Site C design would require changes to withstand the maximum potential earthquake in the region. This could be achieved by contouring the north bank slope above the earthfill dam to a flatter slope, reinforcing the foundation of the spillway headworks, buttressing the power intakes and penstocks, and providing extensive drainage measures beneath the spillway and power intakes.

AN OPTIMIZED DESIGN WOULD MEET CURRENT PRACTICES FOR A HYDROELECTRIC FACILITY.



Major components of the Site C dam site (historic conceptual design).

ENGINEERING AND OPERATIONS

CONTINUED

Construction Materials: Construction of the dam facilities would require a considerable volume of earth and rock materials. In addition, excavations would be required for construction of the dam, spillway, power intakes and powerhouse. Much of this material would be unsuitable for construction and would need to be relocated.

As shown in the diagram below, impervious material such as glacial till would be used to construct the core of the dam (Zone A). Filter zones consisting of sand (Zone B) and fine gravel (Zone C) would isolate the impervious core from the granular materials (mainly sand and gravel) that form the shells of the dam (Zone D). The filter zones protect against seepage carrying the fine material from the core of the dam into the shell.

The upper part of the upstream face of the dam would be protected from wave erosion by coarse rock riprap (Zone F) on a bedding of fine rock (Zone E).

It is anticipated that the majority of materials necessary for construction of the earthfill dam will be available in the vicinity of the potential dam.

During Stage 2, field work was initiated to determine the availability of impervious material in the area, including drilling and test pits. If the project advances to the next stage, work to identify the best option for impervious material and related extraction and transportation details would continue.

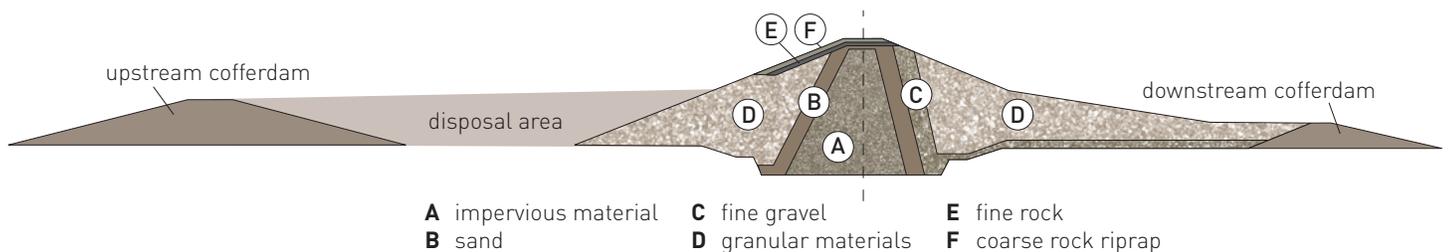
Impact Lines: BC Hydro's approach to impact lines for the potential Site C project is to consider safety and flexibility for land use next to the reservoir, such as allowing grazing in areas that would not be suitable for residential use. During Stage 2, BC Hydro developed a methodology and criteria to prepare impact lines, and preliminary work was initiated to outline areas potentially affected by flooding, slope stability, wave erosion, groundwater and slide-generated waves.

Hudson's Hope Shoreline Protection:

Stage 2 studies verified that parts of the shoreline at Hudson's Hope are erodible. In the 1980s Site C design, a berm was proposed to protect the residential portions of the shoreline and sewage lagoons where the shoreline is erodible. If the project proceeds to Stage 3, BC Hydro would conduct a detailed assessment of shoreline impacts and protection measures at Hudson's Hope.

IT IS ANTICIPATED THAT THE MAJORITY OF MATERIALS NECESSARY FOR CONSTRUCTION... WILL BE AVAILABLE IN THE VICINITY OF THE POTENTIAL DAM.

CONSTRUCTION MATERIALS FOR THE POTENTIAL SITE C DAM



Highway 29: Four segments of Highway 29 would be flooded by the reservoir if Site C were to proceed. During Stage 2, the historically identified realignment options for each relocated segment were updated to current Ministry of Transportation and Infrastructure design standards. Further consultation and study would be required to determine the preferred alignment based on an assessment of potential impacts on private property, the environment and heritage resources.

Powerhouse Access Bridge: As part of the Site C project, a two-lane bridge would be required across the Peace River during construction to provide access to the Site C powerhouse. During public consultations, many participants expressed the opinion that, if a new bridge is constructed, it should be accessible to the public after construction. However, some participants also expressed concerns about the need to restrict access to promote conservation and to avoid the potential socio-economic impacts on Hudson's Hope and Dawson Creek.

No decision has been made regarding public use of the bridge. Further consultation with governments, stakeholders, First Nations and the public would be required if the project advances to Stage 3.

Transmission: As currently designed, Site C would be connected to the existing provincial transmission line system by two 500 kilovolt (kV) transmission lines. The lines would run from Site C to the existing Peace Canyon Generating Station along an existing right-of-way that is currently used by two 138 kV transmission lines. The existing 118-metre right-of-way would need to be expanded by 34 metres to accommodate both 500 kV lines.

Based on an analysis by the British Columbia Transmission Corporation (BCTC), no new transmission lines past the point of interconnection at Peace Canyon would be required specifically for the Site C project. However, upgrades would be required at some existing transmission facilities.

BC Hydro also conducted initial field studies during Stage 2 related to the foundation rock, the probable maximum flood, and reservoir clearing considerations. If the project advances to the next stage of planning and development, further field, laboratory and analytical work would be required.

IF THE PROJECT
ADVANCES...
FURTHER FIELD,
LABORATORY
AND ANALYTICAL
WORK WOULD BE
REQUIRED.

FINANCIAL UPDATE ON SITE C

As part of Stage 1 work, BC Hydro produced a preliminary cost estimate in 2007 based on the historic design of the project from the 1980s. The interim project cost estimate at the end of Stage 1 was \$5.0 to \$6.6 billion. Interim cost estimates are useful in comparing the project to alternatives under consideration today and making a decision on whether it is prudent to investigate the project further. However, there is always uncertainty associated with interim cost estimates as there may be changes to project scope, schedule, and/or market factors.

If the project advances to Stage 3, the interim project cost estimate would be updated to reflect current market conditions such as commodity prices, and labour prices. In addition, the historical project design is almost 30 years old and would also be updated to reflect current environmental, seismic and safety guidelines, as well as input from public consultation. Due to the increases in modern design and seismic standards, BC Hydro believes these design changes would increase the total project cost. However, compared to alternatives, Site C would still be among the most cost-effective options to meet future electricity needs in B.C.

ENVIRONMENT AND SOCIO-ECONOMIC

FIELD STUDIES PROVIDED BC HYDRO WITH INFORMATION ABOUT THE CURRENT PHYSICAL, BIOLOGICAL AND HUMAN ENVIRONMENT.

For any large project in the early planning stages, the first step in regards to environmental and socio-economic considerations is to gather baseline information on current conditions.

During Stage 2, BC Hydro conducted environmental and socio-economic studies, which were informed by input from regulatory agencies, First Nations and the public. Based on this work, BC Hydro has built on its historic understanding of issues and current conditions in the potential Site C project area.

The potential environmental and socio-economic impacts from the Site C project have not been determined at this early stage. Should the project proceed to the environmental assessment stage, studies would advance from baseline work to impact assessment, including measures to avoid or mitigate impacts.

ENVIRONMENTAL AND SOCIO-ECONOMIC STUDIES – KEY FINDINGS

Environmental and socio-economic studies were completed for the following topics during Stage 2:

Fish: Site C fish and aquatic studies conducted since 2005 provide information about existing fish habitat, habitat use, water quality, species composition and movement in the upper Peace River and its tributaries. Site C fish studies have identified 31 fish species, of which mountain whitefish is the most abundant species. Other key species present include bull trout, Arctic grayling, walleye, rainbow trout and goldeye.

Vegetation: Ecosystem mapping was completed for a wide corridor, comprising 63,965 hectares, along the Peace River and the transmission line. The mapping identified 22 ecological communities and 17 non-vegetated habitats altered by human activities, and provides a useful base for current and potential future vegetation and wildlife studies and analysis.

Wildlife: Baseline wildlife surveys focused on habitat use and presence in the area of the potential project. Surveys were conducted for amphibians (frogs and toads), reptiles (snakes), butterflies, dragonflies, bats, fur-bearers, deer, elk, moose, sheep, owls, raptors, songbirds and waterfowl.

Local Climate: During public consultations, BC Hydro heard concerns about the potential for Site C to cause local climate changes and related effects on transportation, safety and agriculture. In Stage 2, BC Hydro focused on the development of a sophisticated local weather model that can predict changes to climate variables, such as humidity and fog, ice formation and air temperature. This approach provides the tools to predict potential climate changes — and to better understand whether these changes are beneficial or undesirable — and to establish a program to monitor climate conditions over time.

Heritage Resources: During Stage 2, BC Hydro reviewed previous Site C archaeological surveys spanning 27 years. The reviews were made in relation to current regulatory requirements and identified the need for a new, systematic inventory and assessment of heritage resources, including reassessing previously recorded sites. While no field work was initiated in Stage 2, an archaeological-potential model was developed to guide potential future heritage field surveys.

SHOULD THE PROJECT PROCEED TO THE ENVIRONMENTAL ASSESSMENT STAGE, STUDIES WOULD ADVANCE FROM BASELINE WORK TO IMPACT ASSESSMENT.

Economic: If the project were to proceed to construction in the future, there would be a significant increase in the number of jobs and business opportunities in the region. Based on the historic design of the project, it is estimated that Site C would create 7,650 person-years of construction employment during the seven-year construction period. In total, it is estimated that Site C would create 35,000 jobs through all stages of the project.

Community Services and Infrastructure: During public consultations, communities expressed concerns about the potential for increased pressure on local services and infrastructure with an influx of workers during construction. Concerns were also raised about where workers and their families would be housed. Should the project advance, BC Hydro would continue to consult with communities and local stakeholders on these topics, including potential measures to avoid or minimize adverse effects.

Land and Resource Use: During technical advisory meetings, provincial government agencies provided BC Hydro with input into potential land and resource management considerations for the potential project. In addition, during public consultations, there was interest expressed on topics such as forests and reservoir clearing, recreation, oil and gas, mining and gravel. BC Hydro has initiated baseline data collection to understand current land and resource use within the vicinity of the project. If the project advances to an environmental and regulatory review, impacts on land and resource use — including agriculture and forestry — would be part of a socio-economic effects assessment.



Construction project in Fort St. John.

IT IS ESTIMATED
THAT SITE C
WOULD CREATE
35,000 JOBS.

RESERVOIRS AND CLIMATE CHANGE

When reservoirs are developed, vegetation and trees are cleared and the area is flooded. Scientists have identified that Canadian boreal reservoirs incur an initial spike in greenhouse gas (GHG) emissions in the first few years as the carbon stored in the cleared and flooded vegetation is released, followed by a sharp decline to levels similar to nearby water bodies. For example, GHG emission rates from some of BC Hydro's established reservoirs have been measured, and show similar emission rates to lakes and rivers in the same areas.

Hydroelectric reservoirs in Canada have low GHG emissions compared to other forms of electricity generation. For example, Canadian hydroelectric projects emit no more than 10 per cent of the emissions per unit of energy produced from other common dependable electricity options, such as natural gas, diesel or coal. As a result, hydroelectric projects can play a role in combating climate change.

ENVIRONMENT AND SOCIO-ECONOMIC

CONTINUED

GREENHOUSE GAS EMISSIONS

During Stage 2, BC Hydro commissioned the development of a greenhouse gas (GHG) emissions model based on the Intergovernmental Panel on Climate Change (IPCC), as well as construction phase emissions based on preliminary estimates for fuel, electricity and materials.

Preliminary results from GHG modelling found that the Site C project would produce among the lowest emissions, per gigawatt hour, when compared to other options for electricity generation in B.C.

As expected, the Site C project would produce significantly less GHGs per gigawatt hour than fossil fuel sources such as natural gas, diesel or coal. However, preliminary estimates also suggest that GHG emissions per gigawatt hour from Site C would fall within the ranges expected for other renewable sources, such as wind and geothermal, while outperforming solar.

Preliminary results found that about 85 per cent of total net emissions would occur in the first 10 years of the Site C project. Net emissions would be much lower from years 11 to 35, and would be about the same as the existing (pre-reservoir) landscape after 35 years.

If the Site C project proceeds to Stage 3, these GHG estimates would be updated to reflect any refinements to the project plans and design.

SITE C WOULD PRODUCE AMONG THE LOWEST GHG EMISSIONS, PER GIGAWATT HOUR, WHEN COMPARED TO OTHER OPTIONS FOR ELECTRICITY GENERATION IN B.C.

CLEAN AND RENEWABLE

Hydroelectric reservoirs in Canada are considered to be one of the cleanest ways to generate electricity because they have low GHG emissions compared to other forms of electricity generation.

EMISSIONS INTENSITY (TONNES OF GHG/GWH) AVERAGE VALUES FOR RENEWABLE GENERATION TECHNOLOGIES

TECHNOLOGY TYPE	DATA SOURCE	EMISSIONS INTENSITY AVERAGE
Site C hydro reservoir and construction	BC Hydro construction emissions estimate and IPCC Tier 3 model	11
Wind	World Energy Council, 2004	14
Geothermal	Hondo, H. 2005	15
Solar photovoltaics	World Energy Council, 2004	48

The comparisons made between Site C and the technologies are for illustration purposes only, based on a preliminary estimate of emissions for Site C and published emission estimates for other technologies.

CONCLUSION AND RECOMMENDATION

BASED ON STAGE 2 KEY FINDINGS, BC HYDRO RECOMMENDS PROCEEDING TO THE NEXT STAGE OF PROJECT PLANNING AND DEVELOPMENT, INCLUDING AN ENVIRONMENTAL AND REGULATORY REVIEW.

BC Hydro's recommendation to advance the Site C project to Stage 3 considers the following key findings:

- Compared to other resource alternatives, Site C continues to be an attractive resource option from the perspective of reliability and cost.
- If built, Site C would be a clean and renewable source of firm and dependable electricity for over 100 years.
- Public and stakeholder consultation was comprehensive and province-wide, and helped to inform BC Hydro on the potential impacts and benefits of the Site C project.
- Consultation with Aboriginal groups is ongoing. During Stage 2, BC Hydro initiated a consultation and engagement program with 41 Aboriginal groups.
- Site C would produce among the lowest GHG emissions, per gigawatt hour, when compared to other forms of electricity generation.
- Site C would create an estimated 35,000 jobs through all stages of the project.
- As the third project on one river system, Site C would gain significant efficiencies by taking advantage of water already stored in the Williston Reservoir. This means that Site C would generate 30 per cent of the electricity produced at the W.A.C. Bennett Dam with only five per cent of the reservoir area.

MORE INPUT AND CONSULTATION

An environmental and regulatory review of Site C would include opportunities for consultation and input by the public, First Nations, stakeholders, communities and customers.

- As a source of dependable and flexible electricity, Site C would provide significant capacity to facilitate the development of clean and renewable energy projects.

WHAT'S NEXT

Should the provincial government decide to advance Site C to Stage 3, key components of this stage would include:

- An independent environmental and regulatory review.
- Refining and updating the historic project design to reflect current environmental, seismic and safety guidelines.
- Updating the interim project cost estimate based on an optimized project design.
- Advancing environmental and socio-economic studies from baseline work to impact assessment, including measures to avoid or mitigate impacts.
- Consulting with Aboriginal groups, the public, communities and property owners, as well as the Province of Alberta and Northwest Territories.

COMPARED TO OTHER ALTERNATIVES, SITE C CONTINUES TO BE AN ATTRACTIVE RESOURCE OPTION.

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