Welcome to Capital Power’s Whitla Wind Project Open House #2
ABOUT CAPITAL POWER

RESPECTED, RELIABLE, COMPETITIVE

Capital Power is a growth-oriented North American power producer headquartered in Edmonton, Alberta. The company develops, acquires, owns and operates power generation facilities using a variety of energy sources. Capital Power owns approximately 4,500 megawatts of power generation capacity at 24 facilities and is pursuing contracted generation capacity throughout North America.

ALBERTA-FOCUSED OPERATIONS

Capital Power is one of Alberta’s largest and most experienced power generation companies, in terms of both building and operating energy facilities.

Within the province, we have interests in nine existing power facilities and currently own 2,400 MW of power generation, including the 150 MW Halkirk Wind Facility in Paintearth County.
We continue to expand our renewable power generation portfolio, investing in six wind projects and one solar project since 2012.

**INCREASE IN RENEWABLE ENERGY CAPACITY**

<table>
<thead>
<tr>
<th>IN 2010</th>
<th>TODAY</th>
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<tr>
<td>45 MW</td>
<td>919 MW</td>
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**WIND PROJECTS IN DEVELOPMENT**

- We are furthering our development of Halkirk 2 Wind Project, a proposed 148 MW (approx.) facility in Paintearth County, Alberta.
- We continue to advance our work on development sites in Ohio, Wisconsin, North Dakota, Washington, Illinois, Oregon and Arizona.
- Construction on our 99 MW New Frontier Wind Project is underway in North Dakota, with commercial operation expected in December 2018.

March 2018
The proposed approximate 300 megawatt (MW) wind power project (developed in two phases) is located near Bow Island in Forty Mile County, Alberta.

**GENERAL BOUNDARIES:**

NORTH  Township Road 92  
SOUTH  Forty Mile Coulee  
WEST  Forty Mile Coulee  
EAST  Range Road 85

The final Project design includes **83 wind turbine generators** (WTGs).
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- **WEST** Forty Mile Coulee
- **EAST** Range Road 85

The final Project design includes **83 wind turbine generators** (WTGs) in two phases:

- **PHASE 1** 56 turbines (REP 1)
- **PHASE 2** 27 turbines

March 2018
The proposed wind turbine technology consists of 11 separate pieces: one nacelle, one hub, three blades, five tower sections and one gearbox.

**TECHNOLOGY**

**RATED POWER GENERATION**

3.6 MW

**TOWER HEIGHT**

105 metres

**BLADE ROTOR DIAMETER**

136 metres
CONNECTING TO THE GRID

Additional wind facility features will include: access roads and crane paths, collector lines and Shamrock collector station, transmission line (i.e. interconnection) to AltaLink's Substation and Operations & Maintenance (O&M) Building.

PROPOSED SHAMROCK COLLECTOR STATION:
NW-15-8-10-W4

ALTALINK TRANSMISSION INTERCONNECTION PROCESS

Capital Power requested access to the transmission system by connecting AltaLink's existing Whitla Substation to Capital Power's proposed Shamrock Substation. AltaLink is proposing to build approximately 12.5 km of 240 kilovolt (kV) single circuit transmission line. The final transmission line length is dependent on the route approved by the Alberta Utilities Commission (AUC). AltaLink's AUC application is separate from Capital Power's AUC process for the Whitla Wind Project. More on AltaLink's proposal can be found at www.altalink.ca/projects.
The Project is being developed to meet anticipated increases in power generation requirements from renewable energy sources arising from the Alberta Climate Leadership Plan (CLP).

Under Alberta’s CLP, emissions from coal-fired electricity generation will cease by 2030, and be replaced by renewable energy and natural gas-fired electricity, or by using technology to produce zero pollution.

Result: An overall reduction in greenhouse gas emissions from electricity generation in Alberta.

Capital Power is developing the Project to support the Alberta Electric System Operator’s (AESO) Renewable Electricity Program (REP) goal to bring on new renewable generation capacity by 2030.

The Project has the potential to generate enough electricity to meet the average annual power needs of 100,000 Alberta homes (based on an average household energy usage of 1,000 kW/month).

SUCCESS IN ALBERTA’S RENEWABLE ELECTRICITY PROGRAM

In December 2017, Capital Power’s Whitla Wind Project was selected to provide 201.6 megawatts of capacity in the first round of the Renewable Electricity Program (REP 1). In a highly competitive process that attracted global competition, Capital Power was one of only three successful companies selected, and we are proud to be the only Alberta-based company with a successful bid in REP 1.

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In October 2017, Capital Power applied to the Alberta Utilities Commission (AUC) for approval to construct and operate the Project and associated Shamrock substation. The AUC Facility Application material can be viewed on Capital Power’s website at www.capitalpower.com/whitla.

Capital Power completed detailed baseline environmental surveys for the Project in accordance with the requirements outlined in the *Wildlife Directive for Alberta Wind Energy Projects* (GOA, 2017).

The in-service date for the project is anticipated in late 2019.
PROJECT LAYOUT AND DESIGN CONSIDERATIONS

Various factors are considered during development of the Project design layout:

- Wind resource potential
- Transmission access
- Noise impacts to nearby dwellings
- Environmental constraints:
  - Wildlife
  - Wetlands
  - Native prairie
- Historical and Paleontological Resources
- Municipal land use bylaws
- Use of existing roadways
- Avoiding existing infrastructure
- Stakeholder and Indigenous input and feedback

The Project layout is developed in compliance with setbacks outlined in the County of Forty Mile bylaw regulations (for Wind Energy Facility District) and other provincial regulatory requirements.

The Project design layout considers all Alberta Environment and Parks (AEP) and AUC setback requirements with respect to wildlife, wetlands, rare plants, native prairie and noise.

Environmental setback requirements are detailed in the current AEP *Wildlife Directive for Alberta Wind Energy Projects (2017).*

March 2018
MUNICIPAL BYLAW REQUIREMENTS

In the first half of 2018, Capital Power will be applying for a Land Use Amendment to the WEF District and development permit for Phase 1 of the Project in compliance with the County of Forty Mile’s Land Use Bylaw (No. 10/2009) and provincial regulatory requirements.

WIND ENERGY FACILITY DISTRICT (WEFD)

<table>
<thead>
<tr>
<th>ATTRIBUTE</th>
<th>SETBACK¹</th>
</tr>
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<tbody>
<tr>
<td>UNDEVELOPED OR DEVELOPED MUNICIPAL ROADWAYS</td>
<td>Total height + 10%</td>
</tr>
<tr>
<td>PROVINCIAL HIGHWAY</td>
<td>As per AB Transportation</td>
</tr>
<tr>
<td>ADJACENT RESIDENCES</td>
<td>As per AUC Rule 012: Noise (formerly Directive 038: Noise Control)</td>
</tr>
<tr>
<td>ADJACENT PROPERTIES (inside WEFD) without a road allowance separation</td>
<td>Min. of 7.5 m from outside of rotor arc</td>
</tr>
<tr>
<td>ADJACENT PROPERTIES (outside WEFD) without a road allowance separation</td>
<td>No less than total height + 10% (unless a caveat is registered on title²)</td>
</tr>
<tr>
<td>BLADE CLEARANCE</td>
<td>7.6 m (25 ft.)</td>
</tr>
</tbody>
</table>

¹ Setback (i.e. the minimum distance between the wind turbine base and a specific attribute, e.g. house, road, etc.).

² Waiver may be granted.
PROJECT CONSTRUCTION ACTIVITIES

Upon the decision to proceed, construction activities would include:

- Road construction
- Concrete foundation pouring
- Transportation of wind turbine components (to site)
- Wind turbine generator assembly
- Collector line installation
- Substation construction
ENVIROMENTAL AND NOISE IMPACT STUDIES

Capital Power and Stantec conducted baseline studies to assess and minimize potential effects of the proposed Project on the environment and community. Surveys or studies completed include:

- Spring and fall bird migration surveys
- Raptor nest surveys
- Breeding bird surveys
- Spring and fall acoustic bat surveys
- Burrowing owl survey
- Sharp-tailed grouse survey
- Wetland surveys
- Native prairie surveys
- Potential historical, paleontological, and archaeological resource evaluation
- Noise impacts

Stantec’s environmental team supports regulatory permitting and consultation and a variety of pre-construction, construction and operational services including biophysical studies (wildlife, vegetation, wetlands, soils), noise, hydrogeology, historical resources and GIS.

Using the information from these baseline surveys, Capital Power designed a Project that can be constructed and operated in an environmentally responsible manner. Capital Power submitted its biophysical survey program and Project design layout to Alberta Environment and Parks (AEP) for review and obtained sign-off from AEP for the Project.
Sources of noise typically emitted from wind projects may include:
- Mechanical
- Aerodynamic

Total noise emissions from the Project will comply with the Alberta Utilities Commission's (AUC) **Rule 012** – Noise Control. The Rule allows for the “permissible sound levels” (PSLs) at dwellings (without adjustments) during summertime conditions to be:

- **40 dBA Leq** at nighttime
- **50 dBA Leq** at daytime

**dBA = A-weighted decibel level**

**Leq = Equivalent continuous sound level**

The Project will also comply with the noise level requirements in the County of Forty Mile Land Use Bylaw and regulation for a Wind Energy Facility (WEF) District.

*PSLs in the Bylaw are aligned with those in AUC Rule 012.*
As part of the County’s Development Permit application, Capital Power will provide a description of potential measures to decommission and reclaim any of the sites or tower locations for review and approval.

The Wind Energy Facility will be decommissioned and reclaimed in accordance with all applicable legislative requirements, including those of the Alberta Utilities Commission.

Final reclamation will be completed in consultation with landowners.

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**Reclamation** – process of reconverting disturbed land to its former or other productive uses.

**Decommissioning** – permanent closure of all/part of an industrial facility, followed by removal of process equipment, buildings and other structures, and the decontamination of the surface and subsurface.
WIND ENERGY AND HEALTH

ALBERTA EXPERIENCE

Wind energy is a safe and healthy form of power generation, with over 300,000 wind turbines in operation around the world. Alberta has been home to commercial wind power development since 1993, longer than any other province in Canada. There are over 900 wind turbines that have a generating capacity of almost 1,500 MW in Alberta.

Despite the long-standing history of wind power in Alberta and the world, a small number of people have raised concerns that wind turbines could negatively affect human health. These concerns have focused on the production of audible sound (noise), shadow flicker, electromagnetic fields (EMF), and low frequency noise/infrasound.

THE SCIENCE

These issues have been investigated by scientists, medical experts, and government agencies from around the world who have contributed to a growing body of over 100 articles, studies, reviews and reports that address what is known about human health and wind turbines. Evaluated as a whole, the weight of evidence provides that properly sited, wind turbines do not have an adverse effect on human health.
WIND ENERGY AND HEALTH

WIND TURBINES ARE REGULATED IN ALBERTA TO PROTECT HEALTH

The Alberta Utilities Commission (AUC) Rule 012 regulates sound emission from wind turbines. Rule 012 requires the cumulative sound (wind turbine and all other industrial sources) to be less than 40 dBA outside homes. The sound limit is comparable to other provincial and federal noise guidance, and is one of the lowest sound limits in the world.

Health Canada’s 2014 landmark study on wind turbine noise (WTN) and health concluded:

_Beyond annoyance, results do not support an association between exposure to WTN up to 46 dBA and the evaluated health-related endpoints._

ALBERTA DECISIONS ON HEALTH ISSUES

The AUC has held two significant application hearings for the Grizzly Bear Creek Wind Project (2016) and the Bull Creek Wind Project (2013). They heard four weeks of testimony on appropriateness of the Rule 012 and the 40 dBA standard to protect human health. The AUC issued approval for both projects.

_Regarding the social effects of the project, the Commission finds that the construction and operation of the project will not affect the health and safety of nearby residents._

—AUC Decision 3329-D01-2016 Grizzly Bear Creek Wind Power Project
Shadow flicker occurs when the blades of a turbine pass in front of the sun to create a recurring shadow on an object.

Shadow flicker may be experienced at locations in close proximity to turbines.

Capital Power undertook a shadow flicker assessment that used conservative assumptions:
- Sun is always shining
- Turbine blades are always spinning
- Wind direction is aligned with the direction from the turbine to the receptor

Results of the assessment indicate:
- 28 of 31 receptors (dwellings) in the Project area will experience no shadow flicker
- 3 receptors may be affected by shadow flicker to varying degrees (See Predicted Noise And Shadow Flicker Assessment North)
- No affected receptor will experience more than 30 minutes of flicker in any one day

Capital Power will employ mitigation measures to reduce impacts caused by shadow flicker on a case-by-case basis.

Representation of Shadow Flicker Impact
WHITLA WIND PROJECT AREA:
Predicted Levels of Noise and Shadow Flicker at Receptors/Dwellings

March 2018
The community and economic benefits for the Project would include a new and steady stream of municipal tax revenue, and annual lease revenues to Project landowners.

A wind facility the size of Whitla Wind could provide employment opportunities for 10 to 15 people, including a full-time facility site manager and service and maintenance personnel.

One year of construction employment will create hundreds of construction jobs. As the Project develops, there will be a process to manage interested local contractors.

Capital Power is committed to being a good neighbour. Some examples of our activities and support for local Alberta community groups include:

- Halkirk Elks Bullarama
- Genesee Heritage Park
- Castor Fire and Rescue
- Warburg Heritage Days
- Crime Stoppers
- Castor and District Museum
- Warburg Minor Hockey Association
- Warburg Family and Community Support Services
- Leduc & District Food Bank Association
- Stony Plain Public Library Summer Reading Program

More information about Capital Power’s community involvement is available at: capitalpower.com > Corporate Responsibility
YOUR INPUT IS IMPORTANT

Share your comments about the proposed Whitla Wind Project. Complete a feedback form (available at the registration table).

MORE INFORMATION:

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E: canadadevelopment@capitalpower.com
W: capitalpower.com/Whitla

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ALBERTA UTILITIES COMMISSION (AUC)
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