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SHARP HILLS WIND FARM

WELCOME TO EDPR'S

OPEN HOUSE

FEBRUARY 15, 2017

ADDITIONAL INFORMATION FOUND AT:

SHARPHILLSWINDFARM.COM

EDP RENEWABLES CANADA LTD

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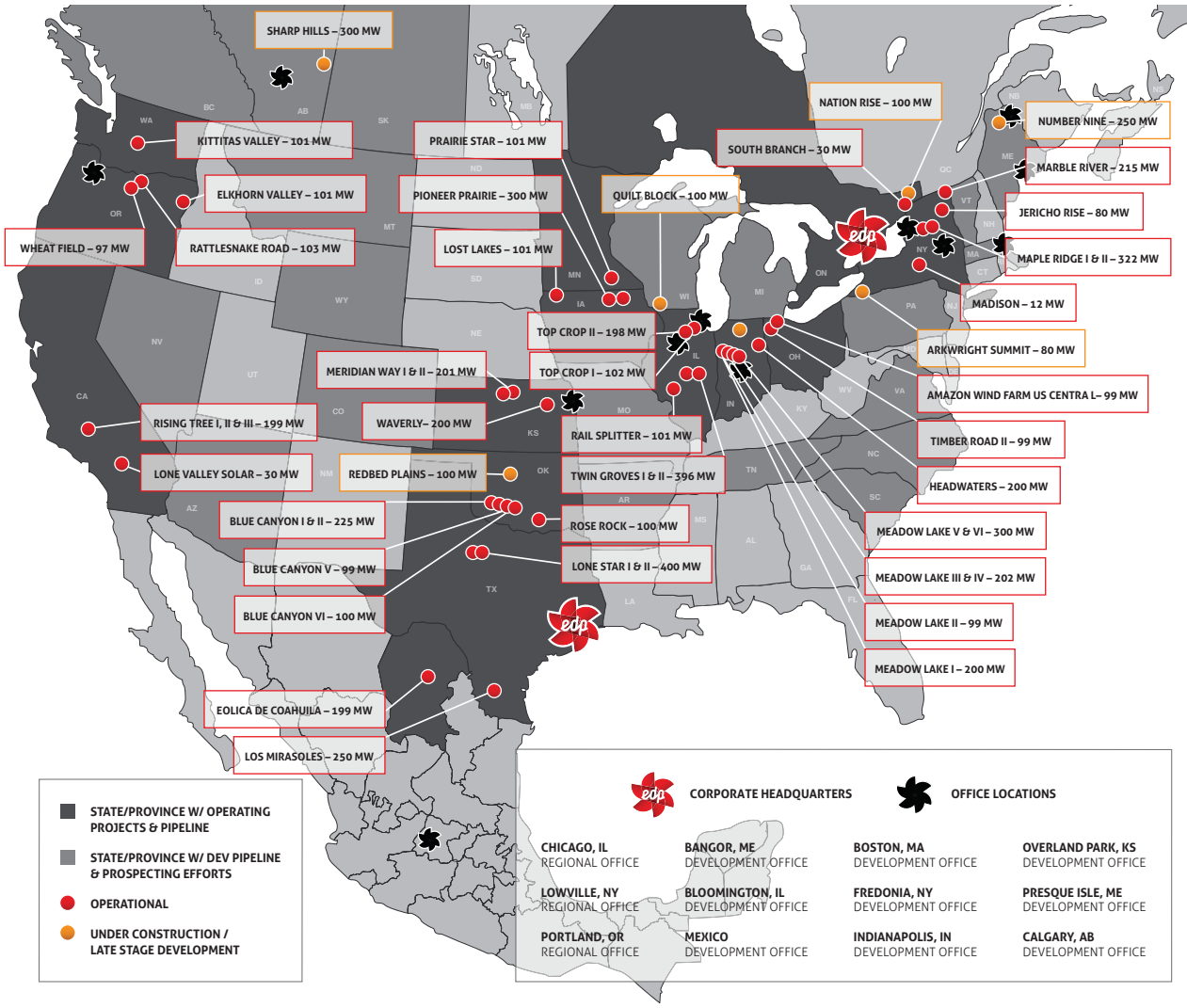
WHO ARE WE?

- Headquartered in Toronto, ON, and has a development office in Calgary, AB
- EDPR Canada Ltd. operates under EDP Renewables North America LLC (EDPR NA). EDPR NA and its subsidiaries develop, construct, own, and operate wind farms and solar parks throughout North America
- EDPR NA has 37 wind farms, two solar parks, and 12 regional and development offices across the United States, Canada and Mexico. EDPR NA operates more than 4,800 MW of renewable energy projects
- EDPR NA is owned by EDP Renováveis, S.A., a global leader in the renewable energy sector that develops, constructs, owns, and operates renewable generation facilities. The company has assets in Canada, United States, Spain, Belgium, Brazil, Canada, France, Italy, Mexico, Poland, Portugal, Romania, and the United Kingdom



SOUTH BRANCH, ONTARIO:
30 MW WIND FARM (OPERATING)

- Located near the town of Brinston, 70 kilometres south of Ottawa
- South Branch is EDPR's first Canadian wind farm, commissioned in 2014
- The project used locally manufactured wind turbine blades and towers

NATION RISE, ONTARIO:
100 MW WIND FARM (IN DEVELOPMENT)

- Located approximately 40 kilometres southeast of Ottawa, near the South Nation River
- Awarded under the 2015 Large Renewable Procurement I competition facilitated by the Independent Electricity System Operator
- Nation Rise was the largest awarded wind power project in Canada in 2016


SOUTH BRANCH, ONTARIO

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PROJECT INFORMATION

DEVELOPER: EDPR Canada Ltd.

PROJECT NAME: Sharp Hills Wind Farm

MUNICIPALITY: Special Areas 3 and 4

PROJECT TYPE: Wind Power

PROJECT SIZE: Up to 300 MW

POINT OF INTERCONNECTION AND SUBSTATION:

- New Brigden 2088S Substation serves as a switching station (to be developed by ATCO Electric Ltd.)
- The proposed Sharp Hills Substation will serve as the Project collector substation (EDPR Canada)
- The New Brigden 2088S and Sharp Hills Substations will be co-located at SW-16-32-5-W4M
- The New Brigden 2088S Substation will connect with the 240 kilovolts (kV) transmission line (9L46)

COLLECTION SYSTEM:

- Medium voltage power collection system consisting of cables that link the turbines to the Sharp Hills collector substation
- May be a combination of underground and overhead cables used to connect the wind turbines to the Sharp Hills Substation

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PROJECT FACTS

- Project is located on approximately 47,000 acres of private land
- Turbine technology and layout:
  - Under consideration are 75 to 100 wind turbine locations with turbine capacity ranging from 3.0 to 4.0 MW
  - Blade tip height of up to 200 m
  - Rotor diameter of up to 145 m
- Final project turbine, access roads and collection system will be determined through consultation, environmental and engineering studies, as well as noise constraints, and constructibility reviews
- Typical Project Infrastructure:
  - Wind Turbines
  - Access Roads
  - Collector System, Collector Substation, and Interconnection Switch Yard
  - Operations and Maintenance Building
  - Temporary Laydown Areas
  - Meteorological Tower(s)

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PROJECT LOCATION MAP

SHARP HILLS WIND FARM
Regional Map

Author: Darren Carl
Date / Time: 03 February 2017 / 02:20 PM
Version: REV.5
Datum: North American 1983
Projection: NAD 1983 UTM Zone 12N
Scale: 1:172,507
Sources: EDPR, ESRI, Ventyx, AltaLIS

N W E S

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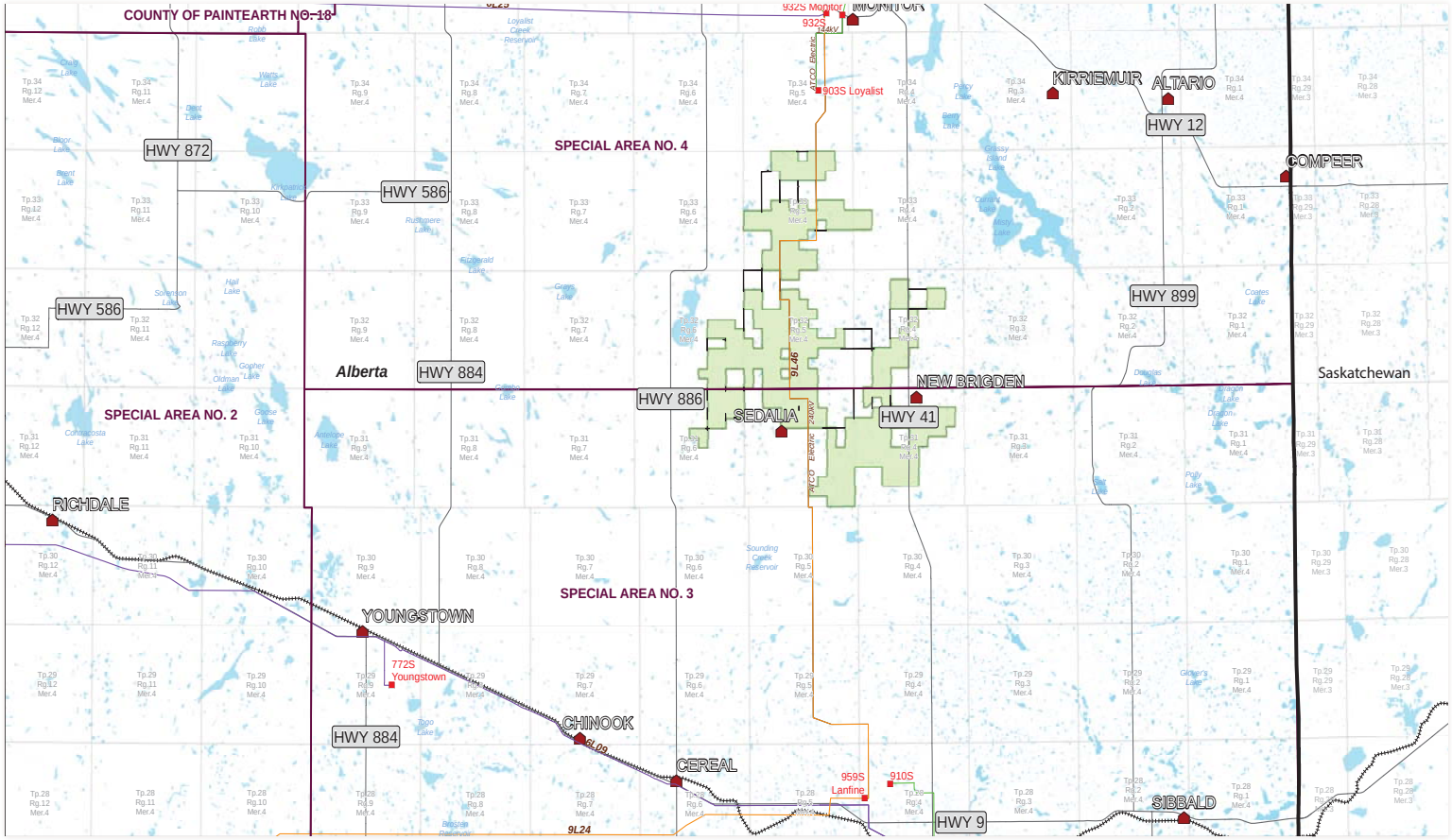
0 10 20 30 40
Kilometers

Legend

- Substations
- AB - SK Border
- County Boundary
- Transmission Line Voltage
  - 69kV
  - 100-161kV
  - 240kV (Single Circuit)
- Town
- Numbered Highways
- Railroad
- Project Access Roads
- Project Boundary
- Township
- Waterbody



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STUDIES COMPLETED AND UNDERWAY

WIND RESOURCE ASSESSMENT

There will be up to three permanent meteorological towers (locations to be determined) for the project that measure wind speed and direction

ENVIRONMENTAL FIELD WORK

Completed birds, bats, sensitive species, wetland studies, habitat mapping, and native prairie grassland studies

Results of these studies will be integrated into the project layout

GEOTECHNICAL STUDIES

Preliminary geotechnical studies have been conducted

Further studies will be conducted as the project progresses through development and into construction

NOISE IMPACT ASSESSMENT

The initial impact assessment is underway

HISTORICAL RESOURCES ASSESSMENT

Includes archaeological and historic resource studies

Preliminary assessment has been submitted to Alberta Culture and Tourism on January 11, 2017

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KEY REGULATORY AGENCIES & PERMITTING BODIES

AUC
Alberta Utilities Commission

Alberta Environment and Parks

Alberta Culture and Tourism

NAV CANADA

Environment and Climate Change Canada / Environnement et Changement climatique Canada

Alberta Transportation

Transports Canada / Transport Canada

Special Areas Board
est. 1938

- ALBERTA UTILITIES COMMISSION
- ALBERTA ENVIRONMENT AND PARKS
- ALBERTA CULTURE & TOURISM
- NAV CANADA
- ENVIRONMENT AND CLIMATE CHANGE CANADA
- ALBERTA TRANSPORTATION
- TRANSPORT CANADA
- SPECIAL AREAS BOARD

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WHY WAS THIS SITE CHOSEN FOR THE PROJECT?

1

EDPR ACQUIRED TWO WIND POWER DEVELOPMENTS FROM:

Alberta Wind Energy Corporation (2015)

Eolectric Development Inc. (2016)

2

EDPR COMBINED AND EXPANDED THESE SITES TO FORM THE SHARP HILLS WIND FARM

3

STRONG WIND RESOURCE

4

PROXIMITY TO EXISTING TRANSMISSION LINE

5

COMPATIBLE WITH EXISTING AGRICULTURAL USE

LOCAL SPENDING ON GOODS AND SERVICES DURING ALL PHASES OF THE PROJECT

DEVELOPMENT AND CONSTRUCTION PHASE BENEFITS:

- Anticipated creation of up to 300 construction jobs
- Road Use Agreement with the potential for upgrades to local roads
- Landowner lease payments and Setback Waiver agreements
- Contract opportunities during construction in excavation and civil works, aggregate supply, etc.

OPERATIONS PHASE BENEFITS:

- Anticipated creation of 15-20 permanent local jobs during the operations and maintenance phase
- Property tax payments
- Contract opportunities for local businesses in snow clearing, road maintenance, fencing, reclamation, etc.
- Neighbour Agreements for landowners in proximity to the Project

ENVIRONMENTAL CONSIDERATIONS

INITIAL ENVIRONMENTAL EVALUATION

- This document identifies characteristics, potential impacts, and potential mitigation measures for the Project that is used for Phase 1 Buildable Areas application to the AUC
- Submitted to Alberta Environment and Parks for review and the wind wildlife referral report was issued in Q4 2016

STUDIES INITIATED TO DATE INCLUDE:

- Wildlife – Birds, bats, sensitive species
- Vegetation – Habitat delineation, native prairie grassland
- Wetlands – Delineation

ADDITIONAL ENVIRONMENTAL STUDIES WILL BE COMPLETED IN ANTICIPATION OF THE PHASE 2 APPLICATION

EDPR WILL BE PURSUING A PHASED APPLICATION TO THE AUC COMMENCING WITH A "BUILDABLE AREAS" APPROACH FOR PHASE 1. PHASE 2 WILL BE SUBMITTED LATER IN 2017

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NOISE ASSESSMENT

- All wind energy projects must meet AUC Rule 012: Noise Control. This is the same regulation for all energy facilities in Alberta
- A cumulative noise impact assessment will be completed for all residences and dwellings within 1.5 kilometres of the Project
- Noise impact assessment results will be used to determine the final turbine layout
- Ambient wind sound level surveys and wind measurements must be conducted in accordance with Rule 012

EDPR MAY APPLY FOR A CLASS C2 ADJUSTMENT IN ACCORDANCE WITH AUC RULE 012:

- This accounts for sound caused by high wind speeds masking the wind turbine noise
- Under the Class C2 adjustment there can be an increase to the permissible sound level up to a maximum of 10 dB

Q: DOES LOW FREQUENCY SOUND AND INFRASOUND NEGATIVELY IMPACT HUMAN HEALTH?

A: Studies by Health Canada and Front Public Health determined that there was no association found between decibels (dB levels amd any of the self-reported illnesses or chronic health conditions assessed (e.g., migraines, tinnitus, high blood pressure, etc.)

For infrasound, measured levels were generally below the levels pre-existing in the environment

SOURCES:

Health Canada, "Wind Turbine Noise & Health Study: Summary of Results." http://www.hc-sc.gc.ca/ ewh-semt/noise-bruit/ turbine-eoliennes/summary-resume-eng.php

Front Public Health, Knopper LD, Ollson CA, McCallum LC, Whitfield Aslund ML, Berger RG, Souweine K, McDaniel M., "Wind Turbines and Human Health.'

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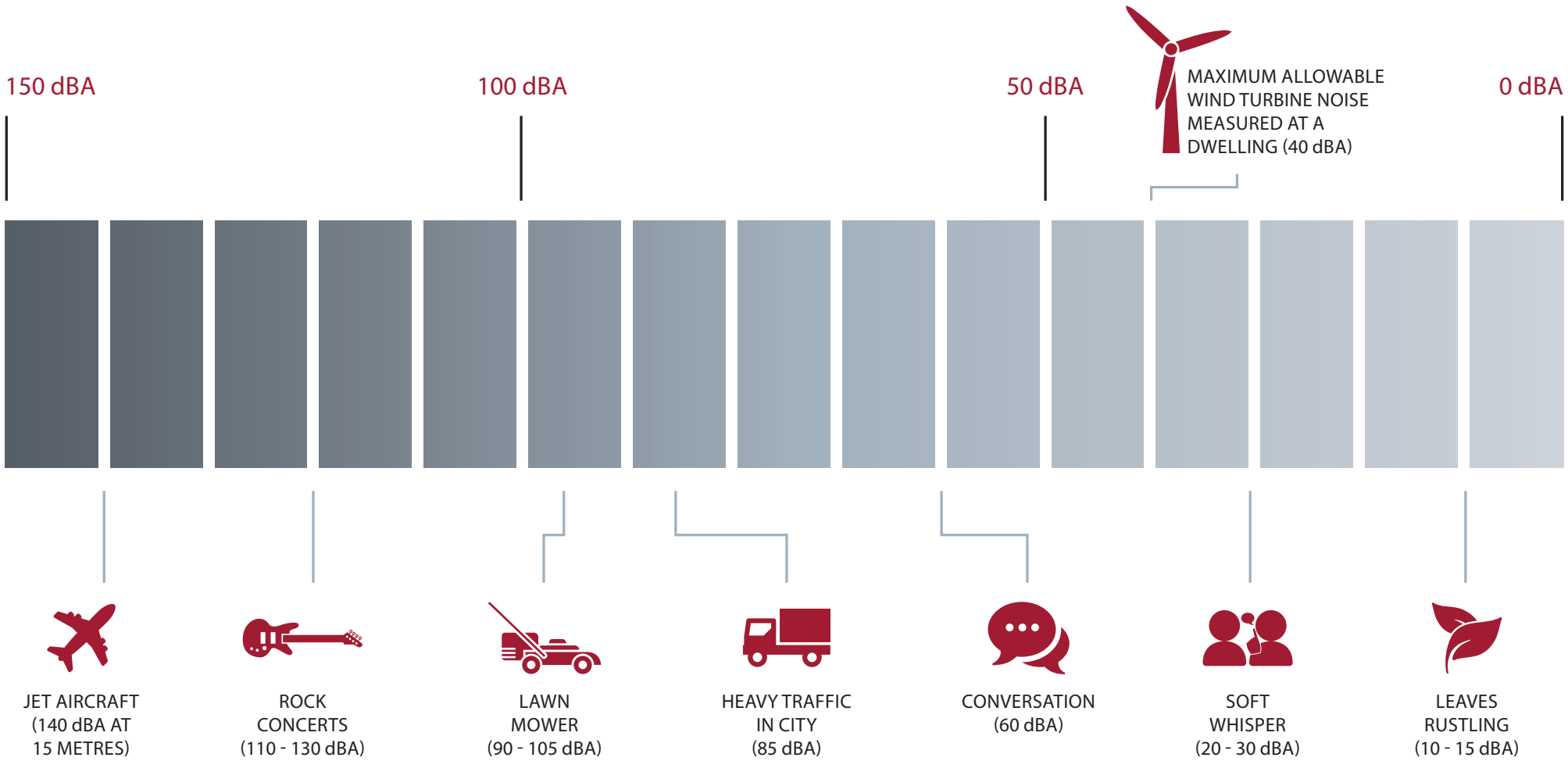
NOISE ASSESSMENT



VISUAL

- EDPR will complete visual representations for the next open house, expected Q2-Q4 2017. These representations demonstrate how the Project will look from key viewpoints in the community
- Turbine lighting is required for air traffic safety. This will require lighting at the top of the turbine, and potentially at the mid-way point

SHADOW FLICKER

- Created by rotating blades casting a shadow
- Study results will be considered in the Project design and provided at the next open house

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CONSTRAINTS INTEGRATED INTO PROJECT DESIGN

1) TRANSPORTATION INFRASTRUCTURE
   - Highways, roads, railways
2) STRUCTURES
   - Residences, secondary buildings, known heritage sites
3) PROPERTY BOUNDARY
4) RADIO & RADAR COMMUNICATION INFRASTRUCTURE
5) ELECTRICAL INFRASTRUCTURE
   - Transmission and distribution lines
6) WATERBODIES
7) TRANSPORTATION INFRASTRUCTURE
8) ENVIRONMENTAL CONSIDERATIONS
   - Sensitive Wildlife Features
9) OIL AND GAS INFRASTRUCTURE
   - Wells, pipelines, facilities
10) NOISE REQUIREMENTS
    - Under AUC Rule 012
11) LANDOWNER FEEDBACK
12) STAKEHOLDER FEEDBACK

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EXPECTED PROJECT SCHEDULE

PROJECT LIFE CYCLE TIMELINE

- Consultation will be ongoing throughout development, construction, and operational phases
- Development Phase (18 to 48 months)
- Construction Phase (up to 18 months)
- Operations Phase (20 to 25 years, or beyond)
- Decommissioning Phase (6 to 12 months)

TIMELINE	PROJECT MILESTONE
Q3 2015	EDPR acquired the southern portion of the Project from Alberta Wind Energy Corporation
Q2–Q3 2016	Completed environmental field studies
Q4 2016	EDPR acquired the northern portion of the Project from Eolectric
Q1 2017	First open house
Q1 2017	Submission to AUC for Phase 1 Buildable Areas Application
Q2–Q4 2017	Second open house
Q2–Q4 2017	Submission to AUC for Phase 2 AUC Approval
2018	AUC approval anticipated
Q2–Q3 2018	Final Project engineering complete
Q3 2018	Site mobilization
Q4 2019	Anticipated commercial operation date

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ALBERTA ELECTRIC SYSTEM OPERATOR'S
RENEWABLE ELECTRICITY PROGRAM

THE RENEWABLE ELECTRICITY PROGRAM WILL DEPLOY

5,000 MW

OF RENEWABLE ELECTRICITY GENERATION IN THE PROVINCE BY

2030

- Alberta is changing the mix of power generation to include a larger portion of renewable energy
- Wind power is low cost, emissions free electricity and can help Alberta diversify its power sources and reduce emissions from the electricity sector
- EDPR intends to submit the Sharp Hills Wind Farm to the first competitive procurement of the Renewable Electricity Program

DIRECT BENEFITS TO THE LOCAL AREA

- Long term lease and easement agreements, property tax payments, and local job creation

SUSTAINABLE BENEFITS

- Equivalent to taking more than 175,000 cars off of the road
- Does not use or pollute water during operation

COST CERTAINTY

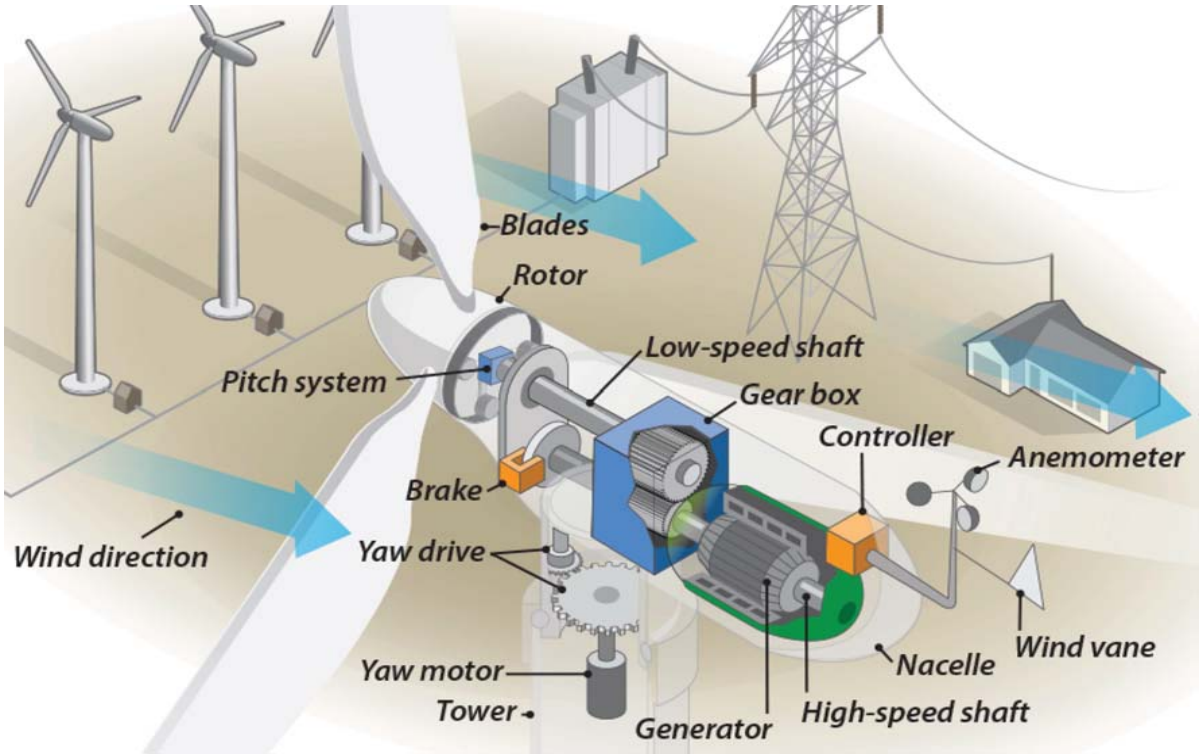
- Can protect consumers from the volatility of thermal power prices

COST COMPETITIVE

- Compared to new gas, coal, hydro, or nuclear energy facilities

- Modern turbines consist of three components: the tower, the blade, and the nacelle

- Most of the action takes place in the nacelle, where the wind's power is turned into electricity. The blades are attached to a gearbox in the nacelle, which turns a generator and produces electricity. The electricity then enters the electrical grid through a substation after being converted to transmission level voltage



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RELATIVE COST OF WIND POWER

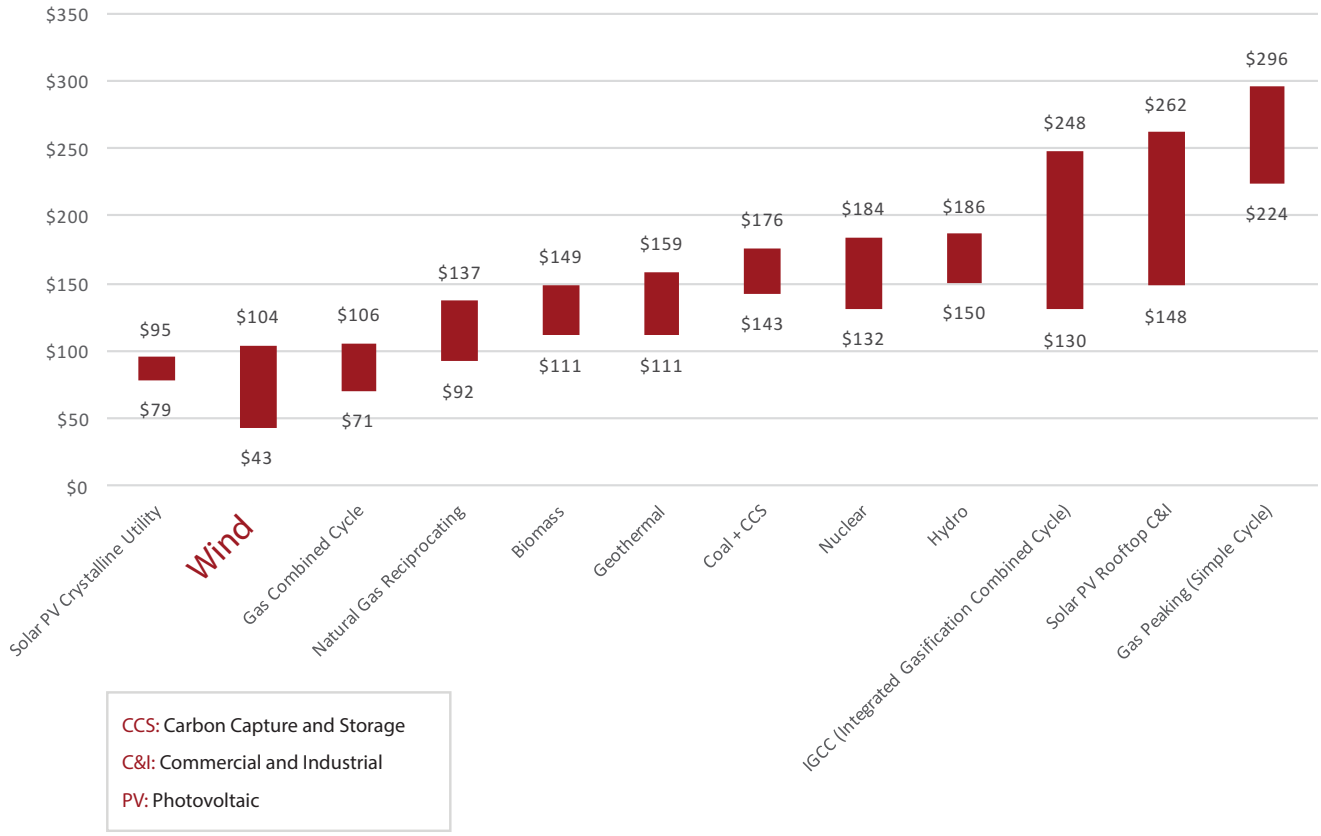
- Studies show that wind power is among the lowest cost options for new electricity generation

SOURCES:

- Lazard's Levelized Cost of Energy Analysis – Version 9.0
- Alberta WindVision Technical Overview Report (Solas Energy Consulting Inc.)

- Prices escalated with 2% inflation to 2016 dollars
- USD to Canadian dollar exchange rate: 1.33 (Jan. 20, 2017)

LEVELIZED COST OF ENERGY COMPARISON ($CAD, 2016)



CCS: Carbon Capture and Storage
C&I: Commercial and Industrial
PV: Photovoltaic

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TYPICAL WIND FARM CONSTRUCTION

Q: HOW CAN LOCAL COMPANIES BE INVOLVED IN THE CONSTRUCTION AND OPERATION OF THE PROJECT?

A: EDPR has begun initial conversations with local businesses and is committed to involving qualified applicants in contract opportunities. EDPR plans to conduct a supply chain session closer to the construction timeframe to identify local businesses that can provide services.

Q: WHAT IS EDPR DOING TO MITIGATE IMPACTS ON WILDLIFE?

A: EDPR avoids or minimizes impacts to wildlife habitats for many species through effective Project design, such as:

- Moving proposed turbine locations to avoid significant wildlife habitats or to reduce potential strikes;
- Establishing setbacks between turbines and sensitive areas such as wetlands

Q: DO WIND TURBINES NEGATIVELY IMPACT HUMAN HEALTH?

A: Health Canada completed a study evaluating the impacts of wind turbines on human health. The following were not found to be associated with wind turbine noise exposure:

- Self-reported sleep issues (e.g., general disturbance, use of sleep medication, diagnosed sleep disorders);
- Self-reported illnesses (e.g., dizziness, tinnitus, prevalence of frequent migraines and headaches) and chronic health conditions (e.g., heart disease, high blood pressure and diabetes);
- Self-reported perceived stress and quality of life impacts
  - While some individuals reported some of the health conditions above, the prevalence of self reported issues was not found to change in relation to wind turbine noise levels.
  - Reference: Health Canada, "Wind Turbine Noise & Health Study: Summary of Results." http://www.hc-sc.gc.ca/ewh-semt/noise-bruit/turbine-eoliennes/summary-resume-eng.php

Q: HOW CAN YOU ENSURE THAT WIND TURBINES WILL BE DECOMMISSIONED AT THE END OF THE PROJECT'S LIFE?

A: Every lease has an escrow fund maintained by EDPR to ensure decommissioning is completed.

Q: IS THERE A CHANCE OF TURBINE FAILURE?

A: A turbine tower collapse is a rare event. In the history of the Canadian Wind Industry, only 2 tubular towers have failed in Nova Scotia compared to the 5,172 turbines that have been installed since 2007. With over 300,000 wind turbines operating worldwide, there has been no injury to the general public from turbine failures. These statistics are created by analyzing multiple projects from different technology periods.

- EDPR will conduct detailed engineering studies to ensure that foundations are properly designed for the specific soil characteristics of each turbine location.

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THANK YOU FOR ATTENDING

HAVE YOU FILLED OUT A COMMENT SHEET?
YOUR FEEDBACK IS IMPORTANT TO US!

WE WILL BE HAPPY TO FOLLOW UP WITH YOU IF
YOU HAVE ANY QUESTIONS ABOUT THE PROJECT

PLEASE CONTACT US AT:

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