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Wind farm construction

Foundation rebar

Crane walk

Laydown area

Rotor lift

Completed turbine

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Operating wind farm

Left:
Farming practices after turbine construction is complete

Below left:
Reclaimed access road

Below right:
Final footprint of turbine

Below far right:
Winter access to turbine

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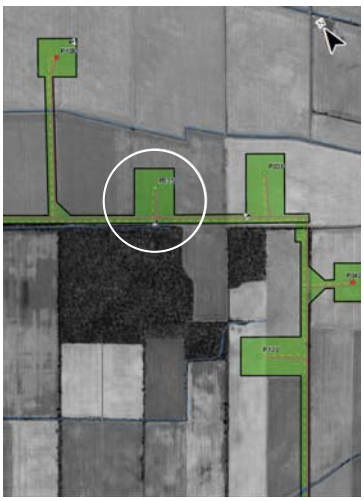
Permanent footprint

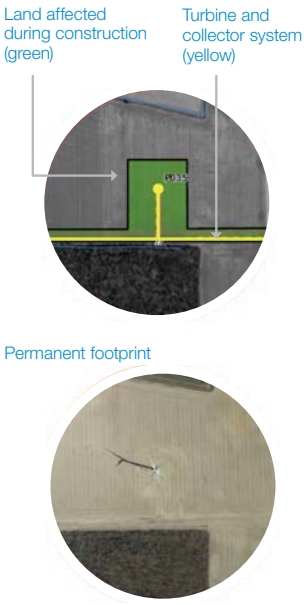
Example: South Kent Wind Power Project

Developer: BowArk Energy Ltd.
Owner and operator: Pattern Energy
Municipality: Chatham-Kent, Ontario
Project size: 270 megawatts
Operations date: 2014

Temporary construction area is significantly smaller than the permanent footprint



Planned temporary construction area showing turbine locations, access roads and collector lines



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Project decommissioning

Following the operations phase, we are committed to repowering or decommissioning the turbines

Most often, wind farm facilities are repowered, where old turbines are replaced with new turbines

Repowering

- Replace the existing turbines with updated technology
- Remove foundations to below plow depth
- Leverage existing infrastructure (substation, transmission, access roads)

Decommissioning

- Remove all turbines and foundations to below plow depth
- Underground collector cables will likely remain in the ground

We will develop a repowering and/or decommissioning plan with the Special Areas Board and the MD of Acadia

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Project schedule

March 21, 2017	First open house
Q2 2017	Submission to the Alberta Utilities Commission for Phase 1 Buildable Areas Application
Spring 2017	Spring environmental studies
September 27, 2017	Second open house
Fall 2017	Submission to the Alberta Utilities Commission for Phase 2 Buildable Areas Application
2018	Alberta Utilities Commission approval anticipated
Fall 2018	Final project engineering complete
Winter 2019	Site mobilization Lanfine North
2019	Commercial operations Lanfine North
Winter 2020	Site mobilization Lanfine South
2020	Commercial operations Lanfine South

Development Timeline
October 2015 – December 2018

Construction Timeline
January 2019 – December 2019

AUC Application
March 2017 – December 2018

Operations Timeline
2019 – 2044

We are committed to engaging with the community throughout the development, construction, and operations phases

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Buildable areas application

We are in the process of submitting a buildable areas application with the Alberta Utilities Commission:

Phase 1 application (Submitted on June 15, 2017)

- Requires identifying a project boundary, as well as the area where we can site turbines, called “buildable areas”

Phase 2 application (Target Q3 2017 submission)

- Requires identifying the turbine type and final infrastructure layout, including turbine locations, collector system routing, and access roads

Each phase requires stakeholder consultation

We will meet with stakeholders who will have an opportunity to provide feedback

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Turbine Option A and Option B

Turbine Option A and Turbine Option B

Because of stakeholder feedback, ongoing engineering design and further environmental studies, we are considering two options for turbine models: Option A – Gamesa 3.465 MW or Option B – Vestas 3.6 MW. The turbine specifications are available in **Table 1. Turbine Option A and Turbine Option B.** We will file the Alberta Utilties Commission application with both turbine options with two separate layouts.

To demonstrate potential Project impacts, we have the results of our shadow flicker study, noise impact analysis, and visual representations available for your review.

Access roads:

- Temporary access roads will be used during construction and are wider than permanent access roads to accommodate cranes
- Permanent access roads will be designed to allow landowners easy crossing by farm machinery

Project collector system and substation:

- Link the turbines to the Lanfine North (SW-19-27-4-W4M) and Lanfine South (NE-8-26-3-W4M) collector substations
- Medium-voltage power collection system
- Combination of above- and below-ground cables

Table 1. Turbine Option A and Turbine Option B

Project Name	Lanfine North Wind Power Project	Lanfine South Wind Power Project
Make and Model	Gamesa 132 – 3.465	Vestas V136 – 3.6
Turbine Capacity	3.465 megawatts	3.6 megawatts
Number of Turbines for Construction	81 turbines	79 turbines
Number of Turbine Locations Considered	83 turbine locations	83 turbine locations
Hub Height	97 metres	105 metres
Rotor Diameter	132 metres	136 metres

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Property Value

Multiple studies show that there is no lasting impact of wind turbines on property value in different jurisdictions across North America.

An independent study commissioned by the Canadian Wind Energy Association was completed for Chatham-Kent, Ontario.[1] It found that "In the study area, where wind farms were clearly visible, there was no empirical evidence to indicate that rural residential properties realized lower sale prices than similar residential properties within the same area that were outside of the viewshed of a wind turbine."

While there are no property value studies that consider Alberta, the AUC has ruled the following in the Grizzly Bear Creek Wind Power Project[2]:

"The Commission was not presented with sufficient evidence in this proceeding to suggest that the project will result in an adverse impact on property values of parcels adjacent to the project".

1. *Wind Energy Study – Effect on Real Estate Values in the Municipality of Chatham-Kent* (Canning Consultants Inc. and John Simmons Realty Services Ltd., February 2010)
2. Paragraph 310. ***Grizzly Bear Creek Wind Power Project.*** E.ON Climate & Renewables Canada Ltd. May 2016

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Shadow Flicker:

- Created by rotating blades casting a shadow on residences
- We have studied the Project impacts of shadow flicker on nearby residences through a third-party consultant
- The impacts are represented as a colour-scale for each residence, which demonstrates the hours of shadow flicker anticipated on an annual basis
- The results do not consider the probability for cloud cover, or consider potential mitigation of shadow flicker impact from the orientation of windows or from shading of nearby trees
- If requested, additional studies can be undertaken at residences to consider potential shading and the orientation of windows

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Visual Representation

- This visual representation includes simulated turbines on all 83 identified turbine locations
- This was completed for both Turbine Option A and Turbine Option B
- Turbine lighting will be required for some of the turbines, and is determined through consultation with Transport Canada

The following viewpoints were simulated:

1. Highway 570 at Range Road 39 Facing South West
2. Oyen Facing South West
3. Range Road 53 between Township Road 274 and 280 Facing South East
4. Highway 570 between Range Road 44 and Range Road 51 Facing East
5. Range Road 52 South of Township Road 260 Facing North

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Construction Impacts

During construction of the Project, we understand that there will be a few impacts experienced in the community. These can include:

- dust from construction, and potentially settling over water wells;
- increased traffic; and
- hours of construction

We will work with the Special Areas Board and the Municipal District of Acadia to develop a construction management plan. This plan may include:

- a public notification protocol, identifying timing of public notice and the expected communication medium;
- dust management strategies, including water wells;
- identified haul routes for the Project infrastructure; and
- construction time windows, to prevent disruption to the community

The construction management plan will be completed in 2018-2019, prior to construction.

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Health Impacts

We understand that there may be some concerns about the potential impact of wind turbines on human health. Frequently asked questions include:

Q: What is the impact of noise from wind turbines on human health?

A: Health Canada conducted a study[1] in 2012-2015 that shows there are no direct, long-term human health effects from wind turbine noise.

Q: Does shadow flicker impact human health?

A: While annoyance may increase toward shadow flicker effects, there are no directly anticipated impacts of shadow flicker on human health.

Q: Will turbines impact my ability to sleep?

A: We have sited the turbines to comply with Alberta Utilities Commission Rule 012: Noise Control for day and nighttime sound levels, as per Provincial regulations. The Health Canada study also found that, "calculated outdoor wind turbine noise levels near the participants' home was not found to be associated with sleep efficiency, the rate of awakenings, duration of awakenings, total sleep time, or how long it took to fall asleep."

1. Health Canada. (2014). *Wind Turbine Noise and Health Study: Summary of Results.*

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Aerial Applications

We understand that there are aerial crop sprayer applications near the Project. We have identified aerial sprayer owners near the area and consulted with them for feedback.

Did you know?

Aerial sprayers are typically operated at low wind speed conditions to more effectively apply fertilizer or pesticides to the crops. This means that aerial spraying and wind turbine operations do not typically overlap.

If you have concerns regarding aerial spraying applications and its ability to coexist with wind power projects, please contact us.

We have also consulted with private airstrip owners, and registered airstrip owners.

As per federal regulations, we have integrated TP 312 setbacks for non-instrument landing at registered airstrips near the Projects.

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Emergency Response

We value safety of the community and the environment. We have consulted the following agencies to open the conversation for 24-hour emergency response protocols:

Special Areas Fire Department

RCMP – Oyen Detachment

STARS

Alberta Health Services – Provincial Air Ambulance Operations

We will continue the dialogue as we approach construction. Emergency response protocol will be established and reviewed by emergency responders for both construction and operations phases.

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Thank you for attending!

- We value stakeholder input
- We commit to working safely, responsibly, and with integrity
- We also commit to working respectfully and collaboratively with local communities

We'd like to hear from you.
Tell us what you think.
We're listening!

Did you fill out a feedback form?

Contact Us

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