# Nanticoke Wind Farm WELCOME

TCI Renewables & NextEra Energy Canada welcome you to the

## NANTICOKE WIND FARM PUBLIC MEETING

We're here to:

• Describe our Project

- Provide you with information on the Renewable Energy Approvals Process
- Answer your questions
- Consider your comments
- Make documents available to you

We are happy to discuss the Project with you.

## Nanticoke Wind Farm about TCI Renewables

### Air Energy TCI/TCI Renewables

TCI Renewables Ltd is a leading independent renewable energy business. Air Energy TCI Inc was established in 2006 as the North American subsidiary of TCI Renewables Ltd.

TCI Renewables Ltd has offices in Great Britain, Ireland and Canada with interests in over 30 wind power projects, including in the United States.

Air Energy TCI is our Canadian company, whose head office is based in Montreal. Air Energy TCI was established to help develop two projects in Quebec. The St. Valentin (50 MW) and New Richmond (66 MW) projects are both under development and are due to come online in 2012.

### Ontario

Our goal in Ontario is to develop wind power projects to help meet the provincial government's increasing renewable energy targets. The government plans to add around 1,700 megawatts of wind-generated electricity in SW Ontario alone.







## Nanticoke Wind Farm about NextEra Energy

### NextEra Energy Canada

### A Leader in Clean Energy

Our expertise is in wholesale and retail electricity and project development and construction, as well as in offering customers the energy products and services they need. Our parent, FPL Group, is a leading clean-energy company with, approximately 39,000 megawatts of generating capacity and more than 15,000 employees in North America.

### Facts at a Glance

- Largest generator of wind power in North America
- Largest generator of solar power in North America
- Approximately 4,500 employees
- Nearly 90 facilities in operation in 25 states and Canada
- Over 17,000 megawatts of generating capacity in operation

### Our Track Record

- Began development of renewable projects in 1989
- A leading generator of renewable energy in the world and the largest in North America
- Produces more than 7,000 megawatts of electricity from renewable resources



NextEra Energy's Resources' North American Portfolio







# Nanticoke Wind Farm our partnership

Air Energy TCI Inc (AET) has entered into an agreement with NextEra Energy Canada, ULC (NextEra Energy) regarding the Nanticoke Wind Farm Project.

The partnership aligns AET with NextEra Energy, a company with unrivalled wind energy expertise in the North American market. The agreement between the two companies is an outcome of AET's recent strategic evaluation of how best to advance the Nanticoke Wind Farm Project to construction.

NextEra Energy has purchased all rights to the Nanticoke Wind Farm Project from AET and will be the owner and operator of the project.

AET will continue to:

- · Obtain the required permits and consents;
- Be the main point of contact for government agencies, stakeholders, landowners, community members, and First Nations.

Both companies will be working closely over the next 12-18 months to obtain Renewable Energy Approval for the Nanticoke Wind Farm Project. We look forward to discussing this in more detail as the project progresses.







# Nanticoke Wind Farm the project

The Nanticoke Wind Farm Project is located near the community of Nanticoke in Haldimand County. The Project Study Area encompasses approximately 42,000 hectares of privately-owned agricultural land, although some lands are also used for pasture or contain woodlots.

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The Projectis a Class 4 wind facility that will generate up to 199 MW of electricity with up to 133 wind turbines. As shown on the layout below. The Project infrastructure will also include transformers, access roads, substation and electrical cabling.

#### The Project will include:

- Up to 133 wind turbines
- New gravel roads
- Buried cables
- Overhead collector cables
- A transformer substation
- 2 wind measurement masts











## Nanticoke Wind Farm why we are here

### The Green Energy and Green Economy Act

The Green Energy Act, as it is more commonly known, was primarily developed to stimulate the green economy in Ontario and create up to 50,000 jobs. It aims to do this by implementing some of the following key components:

- A streamlined regulatory and approvals process
- · An obligation to purchase green energy
- Priority grid access for renewable energy projects
- Long-term fixed-price power contracts

#### **Provincial Green Energy Incentives**

As part of the Green Energy Act, the Ontario Power Authority (OPA) must grant priority to green energy projects. The Feed in Tariff (FIT) Program, recently launched by the OPA, is North America's first comprehensive guaranteed pricing structure for renewable electricity production.

FIT offers stable prices and long-term contracts to green energy projects as a way of encouraging renewable energy development such as wind farms across the province.

### Combination of Wind Regime and High Voltage Transmission Systems

Wind developers favour south western Ontario because of strong and consistent wind levels, particularly around the Great Lakes, combined with available and adjacent electricity transmission. We have been collecting wind data in the Project Study Area since 2007. A total of four wind measurement masts have measured wind speeds at 40 metres, 50 metres and 60 metres and found that wind speeds are viable for wind energy generation.

As seen on the map below, the Project Study Area is in a region that is well serviced by existing transmission lines that have available capacity. The existing transmission lines can transport electricity to the surrounding communities and larger urban centres, making this area ideal for locating a wind energy generating facility.







## Nanticoke Wind Farm timeline

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Fall 2006	<ul> <li>The Development Phase:</li> <li>Site selection and land acquisition</li> </ul>
	Wind measurements
	<ul> <li>Environmental &amp; technical studies</li> <li>Financial appraisal</li> </ul>
	Permitting & approvals
	Supply agreements with the Ontario Power Authority
	Interconnection agreements with Independent Electricity System
	Operator (IESO)
4	<ul> <li>Securing debt and equity finance</li> <li>Sourcing and purchasing wind turbines</li> </ul>
Summer 2010	<ul> <li>Procuring construction services and materials supply contracts</li> </ul>
Fall 2010	<ul> <li>The Construction Phase:</li> <li>Construction or upgrading of access roads</li> <li>Preparation of temporary facilities and work areas</li> </ul>
1	<ul> <li>Erection of turbines and ancillary equipment</li> </ul>
Spring 2011	<ul> <li>Construction of transformer substation and planned</li> </ul>
Spring 2011	interconnection line
2011	The Operations Phase:
	Expected to last approximately 20-25 years     Scheduled monthly complete for each typics
	<ul> <li>Scheduled monthly service for each turbine</li> <li>Routine annual maintenance</li> </ul>
	<ul> <li>Unscheduled visits for emergencies (wind turbines have a</li> </ul>
2036	reliability of 97%)
2036	The Decommissioning Phase:
A	The removal of turbines
	Dismantling of electrical cables
	<ul> <li>Removal of substation and associated equipment</li> <li>Access roads removed and covered (depending on landowners)</li> </ul>
	<ul> <li>Foundations dug back to 1 m below existing ground level</li> </ul>
2037	Ground returned to its previous condition





## Nanticoke Wind Farm benefits of wind

#### **Clean and Efficient**

- Limited greenhouse gas emissions from electrical generation
- Efficient and highly reliable
- Easily coexists with agricultural land uses

- Does not need water as a cooling source
- Wind farms are low impact projects





### Economic Benefits

- 25% capital cost spent within Ontario
- Full-time employment for 8-10 people
- Direct income to farmers
- Construction jobs for 200-300 people

### **Price Stability**

- · Helps stabilize the cost of power
- Virtually zero fuel costs
- Can be produced domestically
- Contributes to the economy at many levels



#### **Reliable Supply**

 Project cost/benefit considers wind "capacity factor" predicted from wind monitoring and modelling





## Nanticoke Wind Farm turbine specifications

### Safety First

The turbines will include lights to ensure the safety of aircrafts passing overhead. Special lightning protection will also be installed to minimize damage during lightning storms.



### GE 1.5 xle Turbine (1.5 MW)





## Nanticoke Wind Farm construction plan

The wind turbine **foundations** will be made of gravity reinforced concrete. Each foundation will require an excavation of approximately 8 metres by 8 metres and 3.5 m deep. Formwork and rebar will be installed to construct the foundation. Only the tower base portion of the foundation will be left above ground. The turbine tower is then anchored to the foundation by large bolts set in concrete.

The **electrical collection line** consists of a mixture of underground cable, overhead lines, junction boxes and a substation. Ploughing and trenching will be used to install the underground cables. The cabling will be buried at a depth that will not interfere with normal agricultural practices and maps of cable locations will be provided to landowners.

The **substation site** will measure no more than 80 m by 80 m and will include a temporary workspace. Once the substation building is finished, the remaining space will be converted to parking.

ΑCΤΙVΙΤΥ	PLANNED DURATION*	
Construction Phase	9 to 12 months	
Turbine Siting and Surveys	1 to 3 weeks	
Access Roads	4 to 5 months	
Equipment delivery	4 to 5 months	
Land clearing	1 month	
Topsoil stripping and salvage	1 month	
Underground collection line	4 to 5 months	
Turbine foundations	9 months	
Equipment laydown	9 months	
Turbine assembly and erection	6 months	
Substations and interconnection	6 months	

\*Pending OPA Aprroval







## Nanticoke Wind Farm construction plan

Site preparation will include final turbine **siting and surveys**. During these surveys, boundaries of turbines sites will be staked and existing buried infrastructure will be located and marked.

Access roads to each turbine site will be constructed before construction equipment and turbine components can be delivered. The access roads will be built 10 m wide, but will be reduced to widths of 5-6 m within 24 months.

The total number of **equipment deliveries** is expected to be between 9 to 13 deliveries per turbine.

Temporary **laydown areas** of 60 m  $\times$  60 m will be created beside each turbine. When equipment is delivered to the site, it will be stored on the laydown area until the construction and assembly crews are ready to use it. The laydown areas will also include temporary crane pads for safety during turbine assembly.

Construction equipment will include:

- Bulldozers
- Excavators
- Compactors
- Graders
- Concrete Pump
- Tippers and Dumpers
- Cranes





## Nanticoke Wind Farm design and operations

We considered a variety of factors when siting the wind turbines and other Project infrastructure. One tool that helped guide us through the pre-planning stage was creating a constraints map, shown below.



#### Renewable Energy Act Setback Distances

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FEATURE	SETBACK DISTANCE
Provincially significant wetland	120 m
Provincially significant Areas of Natural and Scientific Interest (ANSI) (earth science)	50 m
Provincially significant Areas of Natural and Scientific Interest (ANSI) (life science)	120 m
Significant valleyland	120 m
Significant woodland	120 m
Significant wildlife habitat	120 m
High water mark of lake	30 m
Permanent or Intermittent stream	30 m
Seepage Area	30 m
Noise receptor	550 m

The Project design considered setback requirements, and ensured the wind turbines were far enough away from the existing buildings and environmental features in the area. The distances are based on provincial requirements, as outlined in the Renewable Energy Act.

Our main considerations when siting the turbines included:

- Environmentally sensitive features
- Existing roads for site access
- Landowner input
- Weather conditions
- Existing transmission lines
- Noise
- Watercourse crossings





# Nanticoke Wind Farm decommissioning plan

The Project is expected to be operational for 25 years. After 25 years, the turbines will need to be repaired and refurbished, replaced or they will be dismantled and removed. The plan at this time is to remove all turbines to the top of the foundation in 2037.

Items to be dismantled and removed shall include:

- Turbines
- Underground cables
- Overhead lines and poles
- Substation
- Contaminated soil, if any.

The foundations will be back covered with earth to a depth that can be used for agriculture. Access road removal will be dependent on the requirements of the landowner. Areas of land will be reseeded where appropriate.







All materials will be recycled and reused where possible. For example, the copper wiring and aluminium conductor will likely have some value in the scrap metals market.







# Nanticoke Wind Farm regulation 359/09

A Notice of Commencement for an Environmental Screening for the Nanticoke Project was originally issued in October 2008 under the Environmental Assessment Act and Ontario Regulation 116/01.

The Project will now follow the new Renewable Energy Approval (REA) process according to Ontario Regulation 359/09.

Under the new regulation, the Project is considered a Class 4 Wind Facility and must submit a Project Application to the Ministry of the Environment that will assess the Application for completeness.

The Project Application will include the following reports:

- Project Description Report
- Wind Turbine Specifications Report
- Construction Plan Report
- Design and Operations Report
- Decommissioning Report
- Consultation Report
- Heritage and Culture Report
- Noise Report
- Natural Heritage Report
  - Water
  - Birds
  - Bats
  - Significant Features

Technical Studies

Social Studies

Environmental Studies



Environmental studies for the Project have been underway for the past 12-18 months and we expect to release these draft reports soon. A written copy of the complete Project Application will be made available at the Haldimand County office in Cayuga and the Six Nations of the Grand River and Mississaugas of the New Credit Band offices. The Project Application will also be available on the Nanticoke Wind Facility website www.nanticokewindfarm.ca or www.CanadianWindProposals.com.





# Nanticoke Wind Farm natural heritage - water

Aquatic features within 120 m of turbines, access roads or underground cables are being assessed to ensure no significant effects result from the Project.

All watercourses within the Project Study Area have been mapped using Ontario Base Maps (OBM) and refined based on field surveys.

The aquatic field work completed focused on confirming the base maps for drainage features and examinations of proposed watercourse crossings and locations of other proposed infrastructure in proximity to watercourses.

The proposed underground cables will cross watercourses several times by means of an open trench when the watercourse is dry (i.e. summer) or when the work area is isolated and dewatered. Access roads will cross watercourses several times.

The design of access road crossings will ensure that there is no disruption of flow to downstream areas and no barriers to fish passage.

Before construction begins on any watercourse crossing, we will obtain all applicable permits from the approval agencies (e.g. Long Point Conservation Authority, *M*inistry of Natural Resources).







# Nanticoke Wind Farm natural heritage - birds

Bird surveys conducted in the Project Study Area during the summer, fall and winter of 2008 and spring of 2009 observed 132 different species.

The most common bird species observed within the Project Study Area were:

- European starling
- Red-winged blackbird
- Common grackle
- Canada goose
- Red-breasted merganser

Four species at risk were identified within the Project Study Area:

- Bald eagle
- Golden eagle
- Short-eared owl
- Rusty blackbird

Songbirds were the most abundant bird group throughout the field work, making up more than 67% of all birds recorded. The second most abundant group was waterfowl at almost 20% of birds recorded.

Birds were observed at different heights to determine the potential impact that wind turbines could have on the bird population. The rotor blade sweep is assumed to be between 39 and 121 metres above ground.

As seen in the pie chart on the left, the large majority of birds observed in the Project Study Area were flying below the sweep of the rotor baldes.





2%

84%

Percentage of Birds observed flying Below, Within and Above the sweep of the Rotor Blades







# Nanticoke Wind Farm natural heritage - bats

Two years (2008 and 2009) of bat field surveys took place during the late swarming season and fall migration using ultrasonic bat detectors at stations distributed throughout the Project Study Area.

The bat detectors collected nightly bat echolocation information by measuring the number of bats that passed by each night. Detector locations were chosen by identifying optimum bat habitat within the Project Study Area. Particular focus was paid to the shore of Lake Erie and the Sandusk Creek, as well as forest edges and recent clearings. All eight species known to occur in Ontario were detected within the Project Study Area at various relative activity levels.

The Project Study Area is flat in topography, with a few river valleys where bats may congregate, but the area is primarily agricultural. Bat habitat is limited to the small blocks of woodland, old buildings and very few wetlands located within the Project Study Area.

A precautionary approach has been taken to minimize turbine interaction with migrating bats that may use the shoreline as a guide. Levels of potential bat mortality have been reduced by siting turbines away from woodlots, wetlands, watercourses and potential roost buildings.









# Nanticoke Wind Farm significant features

The Project Study Area includes locally, regionally and provincially designated natural features, some of which or within 120 meters of Project infrastructure. As part of the Project Application, the boundaries of all designated features will be mapped and the potential effects of the Project infrastructure on the form and function of these areas will be evaluated.

There are ten provincially significant wetlands (PSWs) and 5 Environmentally Significant Areas (ESA) within 120 meters of the Project infrastructure.

Sandusk Falls and Hemlock Creek Limestone are the two Earth Science Areas of Natural and Scientific Interest (ANSIs) in the Project Study Area. The Oriskany Sandstone and Woodlands are also within the Project Study Area and are considered an Earth Science ANSI, a PSW, a municipally designated ESA and a Carolinian Canada site.

The Project Study Area contains one International Biological Program Site, the Nanticoke Creek Mouth. The Haldimand Conservation Area lies partially within the Project Study Area boundary and Selkirk Provincial Park lies immediately adjacent to the boundary, along the Lake Erie shoreline.

Other ecological features such as woodlots, wetlands and valley lands found throughout the Project Study Area were mapped and field-verified. Significant wildlife habitat in or within 120 meters of the Project infrastructure was determined through the compilation of existing information and field surveys.







## Nanticoke Wind Farm noise studies

Noise studies will be used to help us decide on a final layout for the Project.

The first step in the noise studies is to identify points of reception - people who may be affected by the operating turbines. *Most* points of reception are typcially nearby houses.

The second step will be to get the turbine specifications from the manufacturer. The sound a turbine makes depends on the size of the motor, rotating speed and other specifics.

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The thirdstep will be to choose turbine locations and add them to a model. The model shows us the overall noise levels from all Project turbines.

Turbines are often moved around several times during modelling to minimize noise levels at identified receptors. We can't decide on a final layout until we can ensure that noise guidelines will be met.



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Decibels



### Renewable Energy Approval Noise Requirements

- 550 m from any turbine to any point of reception
- Meet provincial noise limits



# Nanticoke Wind Farm archaeology & heritage

Archaeological potential is established by determining the likelihood that archaeological resources may be present. The Ontario Ministry of Culture's criteria for archaeological potential include:

- Distance to water sources
- Soil texture and drainage
- Glacial geomorphology
- General topographic variability

The high potential for archaeological resources during the Stage 1 work indicated that field work would be required. The Stage 2 archaeological assessment has begun in the Project Study Area, and has included full participation of First Nations Monitors from the Six Nations Eco Centre.

The field work involves walking plowed fields at 5 metre intervals throughout the Project Study Area. Artifacts are identified visually and locations are logged. Where diagnostic artifacts are discovered, they are collected and catalogued at the laboratory. The field work is scheduled to be complete in the summer of 2010. Artifacts from Aboriginal groups and Euro-Canadian landowners have been found, some of which are shown in the pictures on the right.

A heritage assessment is also being conducted for the Project Study Area. This heritage assessment will identify if there are built heritage resources or cultural landscapes within 120 metres of Project infrastructure and assess their significance. Significance is based on a series of criteria, including:

- National historic site
- Designation under the Ontario Heritage Act
- Listed on a municipal heritage register or provincial register
- · Within or adjacent to a Heritage Conservation District
- Documentation existing to suggest built heritage or cultural heritage landscape potential
- Existing buildings and/or structures over 40 years old



Two projectile points dating between 1900 and 1400 B.C.



A spear head and wood working tool.



Two spear heads. The one on the left is dating between 950 and 400 BC.





# Nanticoke Wind Farm public consultation

- Public formally introduced to the Project in October 2008
- Project was presented at an energy symposium
  - Hosted by MPP Toby Barret
  - November 2008 at Jarvis Community Hall
  - Over 250 people attended
- •New regulation came into law October 2009
  - Renewable Energy Approval (REA)
  - •Regulation 359/09
- Provided a Draft Project Description November 2009

We hope you have seen our Draft Project Description and will take this opportunity to comment and identify issues about the Project. We will make note of your comments and incorporate them into our draft reports.

To learn more about the Project, please contact us:

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Toll Free: 1-888-842-1923 Email: nanticoke@tcir.net Website: www.nanticokewindfarm.ca www.CanadianWindProposals.com







# Nanticoke Wind Farm aboriginal engagement

We have requested a list of Aboriginal communities with an interest in the Project from the Director of the Ministry of the Environment (MOE).

Our current understanding of Aboriginal Communities with an interest in the Project include:

- Six Nations of the Grand River and Haudenosaunee Development Institute (HDI)
- Mississaugas of the New Credit

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Métis Nation of Ontario

Our Aboriginal Engagement activities to date have included:

- Meeting with Chiefs and HDI leadership
- Sharing draft Project Description
- Requesting information that should be considered when preparing the Project application

SIX NATIONS COUNCIL

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Our planned activities include:

- Presentation to Six Nations Council
- Meetings to discuss possible protocol agreements
- · Participation in community events
- Open House at Six Nations







