Wind Power information

Noise

One of the most frequent arguments wind farm developers face is that wind turbines are noisy. It is true that anything with moving parts will emit some level of sound and wind turbines are no exception.

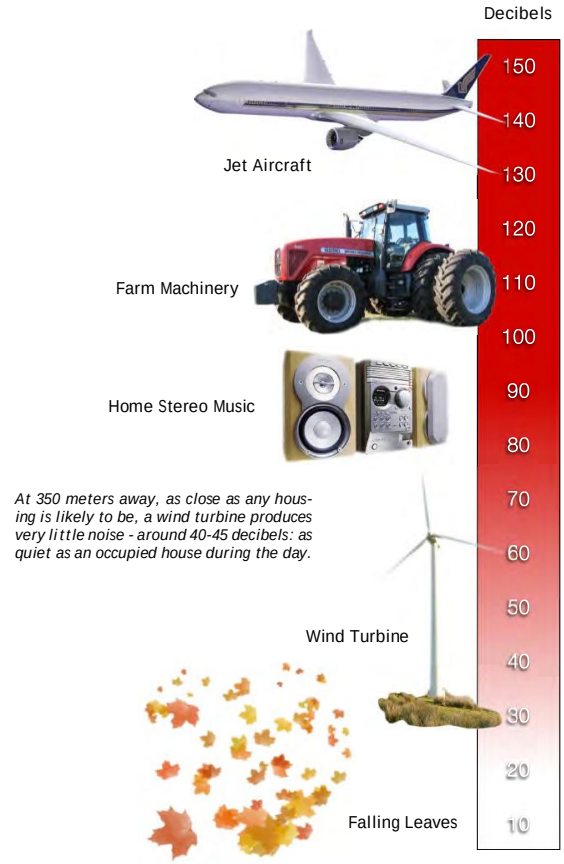
The principle sources of noise are the turbine blades passing through the air and the internal machinery such as the gearbox and generator. But wind turbine blades are carefully designed to minimise noise, and the nacelle which houses the mechanical equipment at the top of the tower is sound insulated. Modern turbines are so quiet it's possible to carry on a normal conversation at the base.

There are also well defined noise guidelines in all developed wind markets, which stipulate that wind turbines should be located at least 300 metres from a private dwelling or other problem locations. Good wind developers will always follow this best practice guidance and in most cases go well beyond the minimum recommendations to make absolutely sure there is no inconvenience to neighbours from increased noise levels.

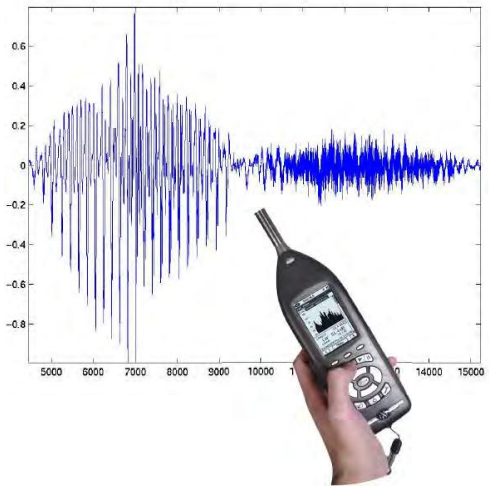
The wind industry has spent a lot of time and resource in addressing this issue and fortunately it is fairly easy to calculate predicted noise levels at a property.

Noise is therefore not considered to be a significant issue by the wind industry today as not only can it be readily predicted but it is also easily mitigated by locating at a suitable distance from houses.

Advanced monitoring technology and software is used by developers for measuring, calculating and mapping sound levels allowing for suitable turbine placement.



At 350 meters away, as close as any housing is likely to be, a wind turbine produces very little noise - around 40-45 decibels: as quiet as an occupied house during the day.



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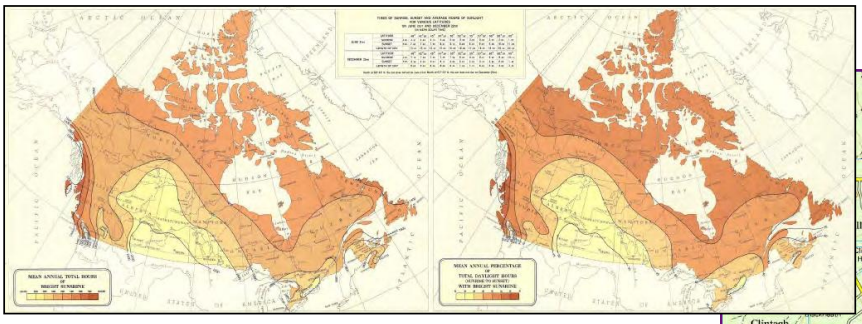
Shadow Flicker

Shadow flicker from wind turbines occurs when a particular combination of weather conditions coincide in specific locations at particular times of the day and year. It usually occurs when the sun is low in the sky and shines on a building or location from behind a turning rotor. The shadow of the turbine blade appears to flick on and off as the turbine rotates.

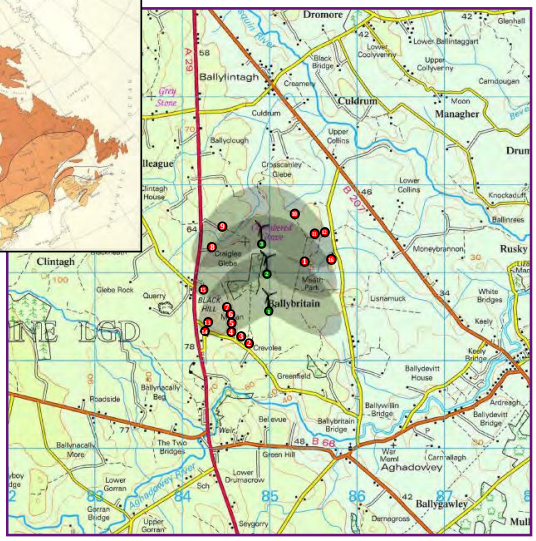
Using proprietary software, levels can be calculated for the number of hours per year likely to be experienced under exceptional circumstances using the geometry of the machine and the latitude of the potential site. If shadow flicker does occur at nearby properties, the duration of any shadow flicker event should be short enough to have only a temporary effect and not exceed the guideline limits.



The shaded areas on the map (right) indicate the extent of the shadow flicker from the three turbines as the effect progresses throughout the year. The butterfly shape is determined by the changing position of the sun in different seasons.

The shadow flicker model is based on an unimpeded view of the turbine in front of a low sun in a clear cloudless sky - usually in late winter and early autumn. The effects of prevailing weather conditions - as in total sunshine hours, above - distance to surrounding buildings, hedgerows and trees all need to be taken into account.

Combining these factors can result in the actual effect being substantially reduced if not completely eliminated.



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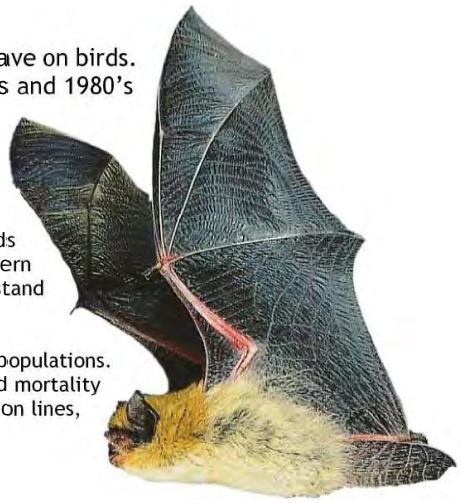
Birds and Bats

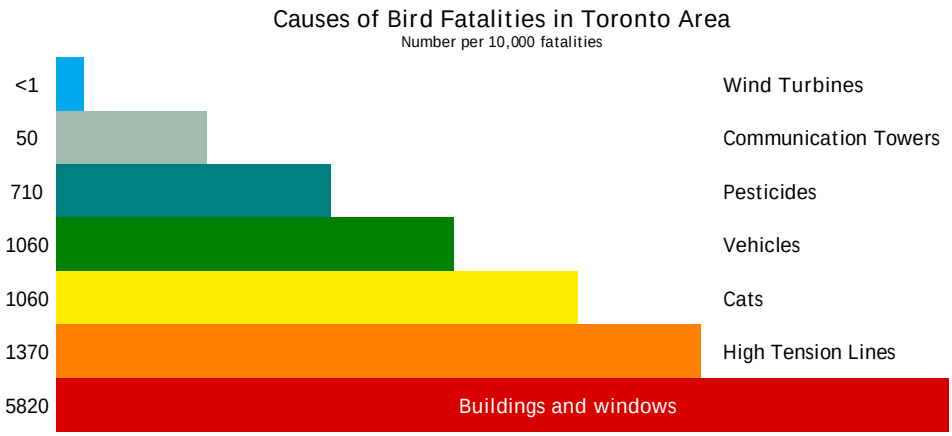
Wind farms are often criticised for the perceived impacts a project can have on birds. Most of this criticism stems from the earliest wind farms from the 1970's and 1980's which were sited before such impacts were fully understood.



Wind farms, it was claimed, will affect birds and bats by encroaching on their habitat or through collision with the wind turbine blades.

In response to these criticisms the wind industry engaged heavily in research into birds and bats, migration routes, population concentrations and possible impacts. Any modern wind energy development company will undertake significant bird studies to understand and qualify potential risks before progressing to construction

The reality is that a well sited wind farm will have minimal impacts upon local bird populations. In fact, as you can see in the graphic, there are much more significant causes of bird mortality than any wind farm development – but these rarely receive any attention; transmission lines, windows, domestic cats, etc.



"It is estimated that more than 10,000 migratory birds are killed in Toronto each year between the hours of 11:00 p.m. and 5:00 a.m. in collisions with brightly lit office towers."

Source: http://www.flap.org

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Wind Data

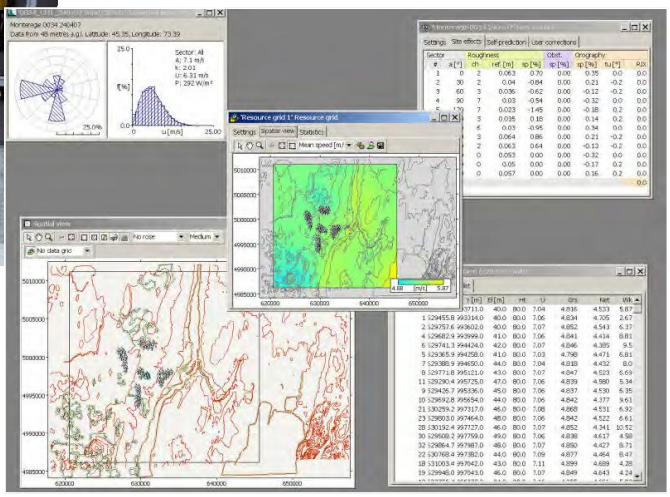
One of the most important elements of any wind project is a robust and accurate wind measurement campaign. Predicting the wind is crucial for evaluating project feasibility and securing financing for a project.

Normally there is an on-site wind measurement station and the information gathered is correlated with longer term data from nearby sources such as weather stations or airports.

Wind measurement towers, or met masts as they are often called, not only record wind speed and direction but usually also collect temperature, humidity and even barometric pressure information.

All of this information is used to predict the likely performance of a wind project at a given site and is a vital aid in selecting the right turbine for the wind conditions.

Today's wind measurement systems are very sophisticated. The data is collected at the mast, stored on a memory card for later collection and can also be sent via email to a remote desktop.



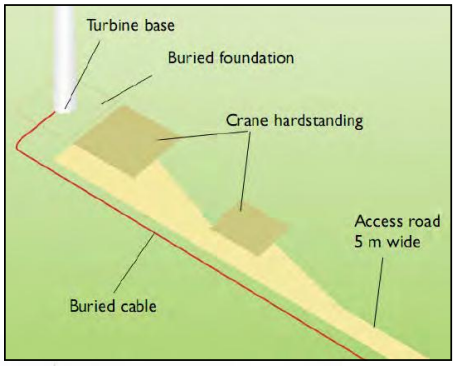
This data is then processed to provide wind speed patterns, annual averages and windroses, which show the frequency of the wind in all directions.

Wind Power information

Foundations & Roads

Wind turbines require very little land in comparison to other forms of electricity generation. A typical wind farm will occupy less than five percent of the land it is located on, through the need for tracks and turbine bases.

Farmers can normally graze and plant crops quite close to the base of a wind turbine and tracks are designed to be farm friendly, keeping impacts to a minimum.



Building the base

The concrete foundation is fairly large, but it is buried, with only the flanged steel base section showing above ground level in readiness for connection to the tower.

When completed, the only inaccessible part of the land is around the base of the actual turbine itself. The natural ground conditions and vegetation return to normal very quickly.

Wherever possible, developers will use existing tracks as well as follow hedgerows and property lines to help minimise impacts to land owners and their normal agricultural practices.

This also helps to cut construction costs and maintains a low visual impact on the existing landscape.

PROJECT INFORMATION SHEET - PROPOSED WINDFARM, ADELAIDE, ONTARIO

INTRODUCTION

The Ontario Power Authority is looking to increase the amount of electricity that comes from renewable forms of generation. Air Energy TCI Inc of Montreal are proposing to develop a wind farm on agricultural land to the North of Highway 402 in the municipality of Adelaide-Metcalfe. It is anticipated that this would generate enough pollution-free electricity to meet the domestic electricity requirements of approximately 19,000 homes and save around 45,000 tonnes of CO_2 annually. [1]

Air Energy TCI Inc (trading as TCIR) is a wholly owned subsidiary of the UK based wind farm developer TCI Renewables Limited. TCIR has extensive experience in the development of wind farm projects and has approximately thirty projects in development across England, Northern Ireland, the USA and Canada.

THE PROPOSED LOCATION

The proposed site lies on agricultural land North of Highway 402 and in the vicinity of Adelaide village. It is envisaged that the proposed site occupies an area of land approximately 10km (East to West) by approximately 5km (North to South).

THE PROPOSED PROJECT

The site is capable of accommodating in the order of forty to fifty turbines with significant spacing between each turbine so as to minimise the visual impact and optimise the turbine efficiency. The project will also comprise of upgrading of existing access tracks and construction of new tracks where required. The turbines will be interconnected with high voltage cabling to a centrally located substation, from where a new interconnection line will lead to the existing Ontario Power Authority high voltage transmission line, running parallel to the Kerwood Road.

The type of turbine has yet to be finalised. It is likely that turbines with a hub located at either 80 or 100m will be selected with an approximate blade diameter of 80-84m. The capacity of this size of turbine is in the 2-3MW range

ONTARIO POWER AUTHORITY RFP

The project will be bid in to the Ontario Power Authority (OPA) Request for Proposals (RFP) for 2000 MW of wind power, anticipated for delivery between 2010 and 2015. The timeframes for bid submission and delivery have yet to be finalised but it is expected that the first 500MW will be submitted during the summer of 2008, for delivery between 2010-2012, with the remaining 2000MW being bid early in 2009 for delivery between 2012-2015. The RFP will require significant pre-evaluation by proponents and in order to comply with these anticipated requirements TCIR erected two 60m guyed met masts across the proposed site domain during late 2007. The OPA timetable for contract award has yet to be finalised. It is anticipated that both stages of the RFP (ie the first 500MW and subsequent 1500MW) will be significantly oversubscribed and thus not all projects submitted will be successful. Successful companies will be awarded a twenty one year power purchase agreement for their projects.

COMMUNITY BENEFITS

The local communities will benefit in many ways from the realisation of the proposed wind farm. The host municipality will receive annual royalties from the project that will provide many opportunities for local elected representatives to address their funding and taxation choices going forward. The project will also create significant local employment during the development, construction and twenty one year operation.

LOCATION MAP

ENVIRONMENTAL ASSESSMENT

TCIR has appointed Golders Ltd, to assist in evaluating the environmental impacts of the proposed project. The first part of this work has been to produce constraints maps highlighting sensitive habitats, features etc and apply adequate set backs for the placement of turbines. Bird and ecology survey work commenced in January 2008. A full Environmental Impact Assessment (EIA) will be submitted to provincial and federal regulators in the summer of 2009 in order to obtain their approval. Concurrent with this process TCIR will continue to hold regular public information sessions to ensure the local community are kept

For Further Information please contact: Mark Gallagher on cell: 514 805 3243 or by e-mail mark.gallagher@tcir.net or visit our website at www.tcir.net

up to date with the project's progress and to receive feedback.

The EIA will cover a range of issues and the scope will be agreed in consultation with provincial and federal authorities. The scope is likely to include landscape and visual amenity, noise, ecological impact, archaeology, geology, hydrology and soils, roads, air and climate, health and safety and electromagnetic interference.

INFORMATION TIMETABLE

As wind energy is a relatively new form of electricity generation, those living close to the proposed project will have questions and will need an opportunity to see what is involved. For this reason, in parallel to the research being undertaken for the EIA, TCIR will inform and consult the local community, including the following activities:

- Presenting their proposals to the local municipality in October 2007.
- Holding two public information events during 2008, the first being February.
- Meeting with key community groups (ongoing)
- Visiting residents close to the site (commenced in November 2006)
- Informing the local press of the proposed project (2-3 press releases + information event adverts)
- Equally we would be happy to answer any specific questions by way of the contact details provided below

WIND ENERGY

The OPA has taken a leading role in ensuring that Ontario remains at the forefront of encouraging energy efficiency and the continued growth in developing renewable forms of electricity generation. The principle goals being to:

- Reduce the threat of climate change caused by the combustion of coal, oil and gas. Climate change could affect weather patterns in the area leading to changes in land use and lifestyles. The proposed project will help us play our part in meeting our international commitments to reduce carbon dioxide emissions.
- Create 'diversity of supply' in the electricity industry, providing greater stability from price fluctuations in coal, oil and gas.
- Stimulate the Canadian manufacturing and service industries to take a lead in the rapidly expanding North American markets for renewable energy.
- Bring local employment during the development, construction and twenty one year operational life of the project.

Useful websites include:
www.canwea.ca
www.awea.com
www.centreforenergy.com

[1] Based on annual average usage of 900kWh per household and 220g of CO_2 per kWh for Ontario electricity generation mix [National Inventory Report 1990-2005]

Photomontage looking West along Egremont Drive

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Adelaide Wind Farm

WELCOME

Air Energy TCI* welcomes you to the

ADELAIDE WIND FARM OPEN HOUSE

We're here to to:

- Provide you with information about the project and the environmental assessment process
- Give you an update on the project's progress so far
- Keep you updated on recent energy policy and contracting mechanisms (e.g. Green Energy Act)
- Answer your questions and listen to your opinions and ideas

Please feel free to introduce yourself to a member of the TCIR staff or to one of our environmental specialists on-hand from Golder Associates.

We'll be happy to discuss the project with you.

* The Canadian subsidiary of TCI Renewables

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Adelaide Wind Farm about us

TCI Renewables/Air Energy TCI

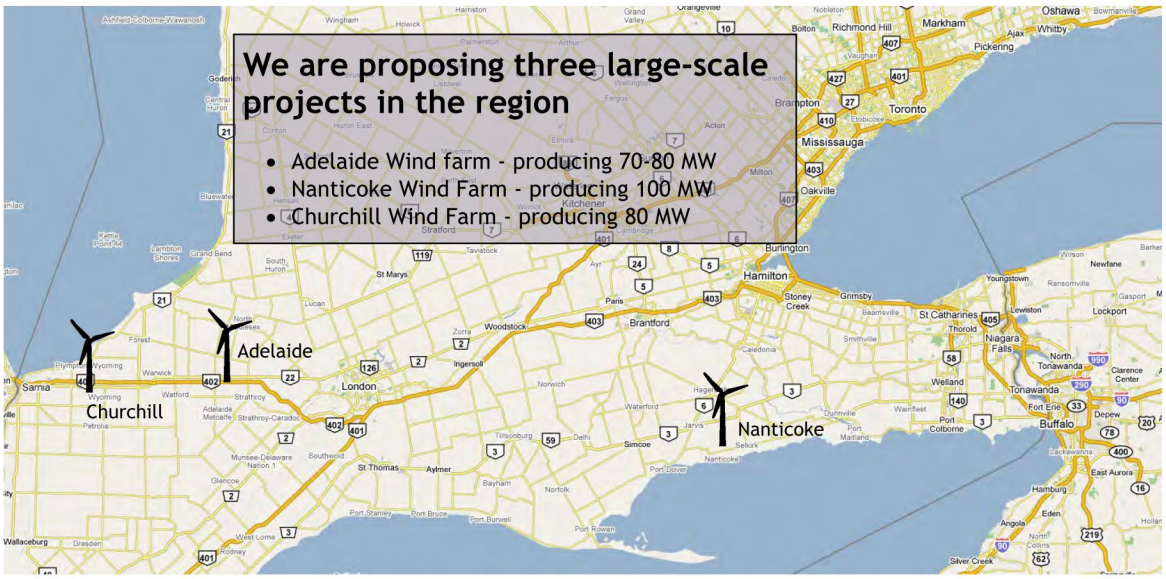
Air Energy TCI was established in 2006 as the North American subsidiary of TCI Renewables Limited, a leading, independent renewable energy business.

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

The Montreal office was first established to help develop two projects in Quebec. TCIR was subsequently awarded contracts in the 2007 Hydro Quebec RFP for two wind power developments: St Valentin (50MW) and New Richmond (66MW). Both projects are under development and 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. Ontario is aiming to add around 1,700 megawatts of wind-generated electricity in SW Ontario alone.



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Adelaide Wind Farm
the project

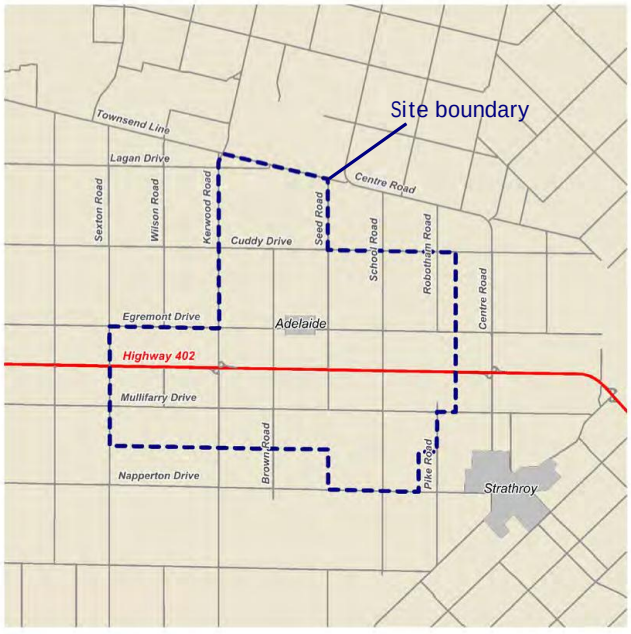
tcir

The Adelaide Wind Farm will have up to 40 turbines

The preferred turbine is the Vestas V90. With a 95 meter tower and 90 meter diameter rotor, each turbine has the capacity to produce up to 1.8 MW.

That's a total of 72 MW of renewable power delivered to the Ontario grid and enough to provide electricity for up to 17,000 homes.

As well as the 40 turbines the development will include access tracks, underground and overhead cabling, a 34.5 kilovolt collector system and a transformer substation where the electricity is exported into the transmission system at 115 kVs.



Located on privately owned parcels of farm land located north and south of Highway 402, the project has been designed to have minimal effects on the existing physical, biological and human environment.

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