

## The FairWinds Turbine Project

### FAIRWINDS TURBINE PROJECT FEATURES

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#### Intent

Cuyahoga County and the Cuyahoga County Agricultural Society (Fair Board) installed a 5000 kW wind turbine generator on the grounds of the Cuyahoga County Fair in Berea.

#### Purpose

The purpose of the installation was to promote the utilization of Renewable Energy in Northeast Ohio, by the installation of wind turbines and solar arrays. The immediate benefits will be the reduction in the burning of fossil fuels to generate electricity. This will result in less air pollution, a slowing of global warming and a reduction in America's dependence on foreign oil and gas.

#### Goals

The ultimate goal of such installations is to project a wind-friendly image and to attract wind industry manufacturing expansions to locate in Northeast Ohio, creating new manufacturing jobs in this depressed area.

#### Other Benefits

The wind turbine would be seen by 500,000 visitors to the Fairgrounds each year and would attract even more, thus increasing the attendance and the economic viability of the Fairgrounds. As a medium-size utility turbine, the unit would be twice the size and twice the electricity production of the turbine at the Great Lakes Science Center in downtown Cleveland. With the moderate winds at the Fairgrounds, it is expected to generate an amount of electricity to result in a \$35,000 per year 40% savings in the Fairgrounds' electricity bills. After maintenance costs, tis savings will be utilized for the outreach programs of the Sustainability Department including the operation of the Energy Education Center.

#### Community Benefits

The residents of the City of Berea will see this wind turbine as a symbol of a progressive, leading edge, eco-friendly city. We know that they point with pride to this icon of Renewable Energy.

## Supporters & Funding

The State of Ohio and the Department of Energy awarded this project \$1,275,000 million in a competitive grant encouraging the deployment of wind energy installations. Another \$400,000 in federal Department of Energy funds was obtained from an EECBG award to the County. The County funded the balance of \$476,000 for the Energy Education Center building.

## Scope

The proposed project consisted of the erection of a 500 kW generator in a nacelle mounted on a 200' monopole tower. The generator is wind-driven by a 3-blade motor with each blade being 61' long. The overall height to tip of rotating blade is 262'. The location is in Berea, in the center of the horse track, opposite the Gate #2 entrance (Center Drive).

Because there are no U.S.-manufactured turbines in this size range, the turbine was obtained from Germany, where it was scheduled to be decommissioned and replaced by a larger turbine. It was shipped to the USA and re-manufactured in the USA. A 65' extension was added to the tower in order to benefit from higher wind speeds aloft.

## Cost

The total cost of the turbine installation was \$1, 675,000 million and the cost of the Energy Education Center was \$476,000.

## Jobs

Construction of the massive foundation (about 400 cubic yards of concrete), the electrical installation and the turbine erection created jobs, which were temporary, but prepared workers and companies for future opportunities.

## Design Precautions

People are free to be under the turbine, as they are at all installations, including the Great Lakes Science Center. Turbines on a properly designed foundation can withstand winds up to 110 mph. Turbines do not fall over. But, as a prudent precaution, the turbine is located so as to be at least 287' (1.10 x o.a.h.) from any structure or power line. It is approximately 1,000' from all property lines of the Fairgrounds.

## Safety

The safety record of wind turbines in their 25 years in Europe and about 10 years in the U.S. is excellent. Virtually, all incidents have involved construction workers not following strict U.S., OSHA safety procedures, principally, not being tied off when working on top of the nacelle mounted on a 200' tower. Even with the incidents that have occurred, the safety record for erection of wind turbines is many times better than for construction in general.

## Insurance Coverage

As Owner of the Fairgrounds and its improvements (including a wind turbine), Cuyahoga County carries a Property Damage policy through FM Global with a \$1 million deductible. The County is self-insured for Public Liability.

## Studies

A Feasibility Study was prepared by The Renaissance Group. Winds were monitored for 14 months by Green Energy Ohio. A comprehensive Environmental Assessment was conducted for the U.S. Department of Energy.

## Approvals

FAA, ODOT Aviation and MedEvac approved the installation at a 295' height. Actual blade tip length is 262'. The coordinates are: Lat. 41-21-59.50N, Long. 81-50-21.10W. U. S. Fisheries & Wildlife had no issues; Western Reserve Audubon Society supports the clean-air project. FirstEnergy has signed final agreements for Interconnection and Net Metering.

## Objectors

Quadax, Inc. on Old Oak Blvd was opposed: their CEO did not want to see the turbine, nor have his workers distracted by seeing it. In the revised location, existing trees will block views from his office. Century Oak Care Center on Old Oak Blvd was opposed, again not wanting to view the turbine. In the revised location, the turbine will be another 600' away from them, reducing the visual impact. At most, turbine flicker, shadows on the nursing home might occur at sunset on 3 days a year.

American Tower, of Woburn, Massachusetts, which has a land lease from the Fairgrounds for their cell phone transmission tower, was opposed, claiming possible radio frequency interference. As part of the Environmental Assessment, a microwave study concluded that there would be no interference.

American Tower's main concern is not degradation of signal, but unfavorable perception by potential leases for tower space (i.e., reduced marketing potential).

Mayor and Council of the City of Middleburg Heights were not receptive to our application to locate the turbine in the Fairgrounds main parking lot, where the wind was expected to be somewhat better. Consideration of future availability of that land may have been a factor.

#### Proponents

The Sun News poll indicated that 80% of the residents favored approval of this project. A Middleburg Heights councilman reported that he received about 80 letters, with 90% in favor. Baldwin Wallace University and Polaris Career Center are very enthusiastic about collaborating on this educational project. The City of Berea welcomed the project.