TVSC Wind Power Project

Frequently Asked Questions (FAQ's)

Turbine Specifications

Maximum Power Output	900 kW. This means at full capacity 900 kWh can be generated each hour
Cut-in Wind Speed	3 meters/second (6.7 mph). This is when the blades begin to turn and produce electricity.
Cut-out Wind Speed	25 meters/second (56 mph). This is when the turbine feathers completely out of the wind and locks itself down to prevent damage to the turbine.
Tower Height	71 meters (233 feet)
Blade Length	27.1 meters (88.9 feet)
Total Height	325 feet from base of tower to blade straight up.
Rotor Speed	6-28 rpm
Operational Temperature Range	-20 to 45 Celsius (-4 to 113 Fahrenheit)
Tower Material	Steel
Nacelle (Hub) Material	Glass fiber reinforced plastic
Rotor Material	Glass fiber reinforced plastic
Control System	PowerWind SCADA System

Due Diligence

Was a wind study completed for Tippecanoe Valley School Corporation?	Yes, a 13 year data set was purchased specifically for our site. It provides hourly data on wind speed, temperature and air density. Performance Services, our design builder, then used the professional wind energy software, called WindPro, to determine expected annual output.
What is the average annual wind speed at TVSC?	6.50 meters/second (14.5 mph)
How much energy will the turbine produce annually?	Based upon the wind resource TVSC expects to produce more than 2.2 million kWh's annually. This is almost 70% of energy required to power our High School and Middle School.
How does the wind turbine impact birds, bats or wildlife	According to the environmental study completed the turbine poses no threat to animals or wildlife.
Is the turbine noisy?	No, a sound study completed determined decibels are at or below 45 dBa; this is slightly louder than a refrigerator.

Does the turbine create shadows when the sun shines through the blades?	Yes, but a shadow-flicker study was conducted to ensure that any possible shadows would not impact surrounding homeowners or students at school.
Is the turbine safe to be around?	Yes, in most conditions. However, the turbine has been installed in an agricultural field to protect people from ice that may build up and fall off the blades. Tours of the turbine will not be conducted when it is snowing or after an icing event.
Were there any height restrictions?	No, an application was submitted to the Federal Aviation Administration (FAA) and approval was received.

Installation

Where is the turbine manufactured?	All components (tower, blades and nacelle) are made in Germany.
What size crane is needed for installation?	Typically two cranes are needed: a 100 ton helper crane and a 300 ton main assembly crane.
How long does the installation take?	2-3 days for vertical installation.
How big is the foundation?	The foundation octagonal and is 50 feet in diameter. The foundation is about 8 feet deep.
How much concrete is in the foundation?	300 cubic yards. This requires 30 cement trucks.
How much steel is in the foundation?	25 tons
How much does the tower weigh?	102 tons
How much does the nacelle weigh?	31 tons
How much does the hub and blades weigh?	19 tons
How do you reach the nacelle on top of the tower?	There is a ladder on the inside of the tower. Only personnel who has been trained and wearing approved climbing apparatus can climb.
How much concrete is in the foundation?	300 cubic yards. This required 30 cement trucks

Operations and Maintenance

Is there a warranty on the turbine?	Yes, a two year warranty for parts and labor is in place. PowerWind, the manufacturer, will resolve any issues during this time period at no cost to the TVSC.
How often does the turbine need service?	Preventative maintenance is performed twice a year.
Does TVSC need to employ a TVSC employee	No, a service contract will be in place and this cost is

to service the turbine?	already included in the financial model the school board reviewed.
How are unexpected costs addressed?	There are several means to address this concern. First is the two year warranty, second is mechanical failure insurance and third is a repair reserve fund set up by TVSC.

General Questions

How is the electricity produced by the TVSC wind turbine used?	The wind turbine is directly connected to both the High School and Middle School. As electricity is produced it is sent to each building and reduces the amount of electricity that would have been purchased from the utility company. If the turbine produces more than the High School or Middle School can use at a given time it is sold back on the grid and the school receives a check for that generation. If the turbine is not operational (no wind) the school purchases electricity from the utility company as usual. There is never a time period the school will be without power.
What is the life expectancy of a turbine?	25-30 years with proper maintenance.
What type of weather conditions can shut down a turbine?	When weather conditions occur outside of normal operational conditions the turbine will shut down to protect itself. Several examples of why the turbine might shut down would be: High gusts of wind or wildly changing wind directions, wind speeds over 56 mph, icing conditions, temperatures above 113 or below -4 Fahrenheit.
What is the "tip speed" of the blade at full production?	81.5 meters/second (182 mph)
How is production data tracked?	Two ways. First, the turbine control system tracks all production. Second, meters from the utility company are installed to track delivered energy. These two sources are reconciled to ensure accurate tracking.
How can I view current and historical production information?	TVSC has access to a "Wind Dashboard" that all community members are welcome to view. Please stop by the administration office for more information.
Can the wind turbine be used for educational use?	Absolutely, TVSC has access to k-12 renewable energy curriculum. This was provided as part of the project. Teachers have access to pre-approved lesson plans that will utilize data/information from the TVSC turbine.