ONE ENERGY
WIND FOR INDUSTRY

WIND MYTHS

Wind is a relatively new technology. As such, a variety of wind myths and misinformation currently exist. The following information is presented to help readers understand the true impacts of today's wind turbine technology. All reports and studies referenced in this document can be found on the One Energy website at www.oneenergywind.com/wind-education/wind-myths.

MYTH: RESIDENCES NEAR WIND TURBINES WILL BE AFFECTED BY SHADOW FLICKER.

Fact: Shadow flicker is the term used to describe what happens when rotating blades of a wind turbine come between the viewer and the sun, causing a moving shadow. For those who have homes close to wind turbines, shadow flicker can occur under certain circumstances. It can be annoying when trying to read or watch television, however, shadow flicker can be easily predicted. The effects can be precisely calculated to determine whether a flickering shadow will fall on a given location near a turbine. Potential problems can be easily identified and avoided, with solutions ranging from providing an appropriate setback from the turbine to planting trees to disrupt the effect.

"Wind Turbine Health Impact Study: Report of Independent Expert Panel" includes findings related to shadow flicker. The report was published by the Massachusetts Departments of Environmental Protection and Public Health in January 2012.

MYTH: WIND TURBINES ARE DANGEROUS BECAUSE ICE IS FREQUENTLY THROWN FROM THE BLADES IN THE WINTER.

Fact: A few times per year, under certain weather conditions, ice may form on the surface of wind turbine blades. If ice buildup occurs while the turbine is stopped, ice can fall from the blades, much like ice buildup on cell phone towers or power lines. If ice buildup occurs while the turbine is running, most turbines have vibration sensors that will automatically shut the turbine down, in order to prevent significant ice from being thrown from a moving blade. At all sites that One Energy works on, even under a worst case scenario, the closest residence to the turbines will have zero risk of being impacted by ice throw from the turbines.

"Wind Turbine Health Impact Study: Report of Independent Expert Panel" includes findings related to ice throw. The report was published by the Massachusetts Departments of Environmental Protection and Public Health in January 2012.

MYTH: WIND TURBINES ARE BUILT USING FEDERALLY SUBSIDIZED MONEY.

Fact: Private retail wind projects do not receive a single dollar from any governmental body. Businesses interested in investing in private wind projects are eligible for a federal Investment Tax Credit (ITC). This means that the business can reduce their taxes by 30% of the total project value. In exchange for investing in a wind project, their taxes on that investment are reduced by 30%. This is no different than other investment tax credits such as the First Time Homebuyer Credit, Qualified Tuition Tax Credit, Credit for Businesses Increasing Research Expenses and the Work Opportunity Tax Credit.

More information and resources regarding the Business Energy Investment Tax Credit (ITC) is available on the One Energy website at www.oneenergywind.com/wind-education/wind-references.

MYTH: WIND TURBINES ARE INEFFICIENT.

Fact: Wind turbines are highly efficient, not only from a return on investment standpoint, but from a larger environmental view. A simple method to measure overall efficiency is to examine the "energy payback," which is the amount of time it takes to produce a certain amount of energy. The energy payback time for wind is better than that of conventional plants; wind turbines produce between 17 and 39 times as much energy as they consume, compared to generation of 16 times for nuclear plants and 11 times for coal plants. In another comparison, car engines have a total thermal efficiency of 20-35%, gas turbines are up to 40%, and wind turbines have reached up to 55% thermal efficiency. Wind turbines also generate electricity from a natural resource, without hidden environmental costs and no need to mine, transport, store, dispose or treat. Wind energy is the most cost effective renewable energy technology available, generating clean electricity and helping combat climate change as well.

Additional information is available in a report published by the Fusion Technology Institute at the University of Wisconsin: "Net Energy Payback and CO2 Emissions from Wind Generated Electricity in the Midwest."

MYTH: WIND TURBINES CAUSE HEALTH ISSUES INCLUDING VERTIGO, MIGRAINES AND DECREASED IMMUNE FUNCTION.

Fact: Many of the medical claims related to wind energy come from documents published by Dr. Nina Pierpoint, who coined the term "Wind Turbine Syndrome." Wind Turbine Syndrome is not a recognized medical diagnosis. Dr. Pierpont's study was based upon phone interviews and symptom self-analysis of 38 people. An independent expert panel review found that the symptoms Dr. Pierpont attributed to Wind Turbine Syndrome are common in the public at large, and in her study no control group was created for comparison. Dr. Pierpont's findings have since been widely discredited.

According to an independent panel commissioned by the Massachusetts Department of Environmental Protection and Massachusetts Department of Public Health, "there is no evidence for a set of health effects, from exposure to wind turbines that could be characterized as a 'Wind Turbine Syndrome.'"

MYTH: WIND TURBINE COMPONENTS ARE NOT MADE IN THE UNITED STATES.

Fact: During the initial wind turbine construction boom in the late 90's and early 2000's, the majority of turbine components did come from overseas. But now with close to 47,000MW of installed power across the United States, both U.S. and foreign manufactures have expanded their capacity in the United States to assemble and produce both wind turbines and components.

Nearly 400 U.S. manufacturing facilities produced components in 2010. Tens of thousands of U.S. workers are employed in the manufacturing of wind turbines, from Colorado to Ohio and from North Dakota to Texas. Although turbine manufacturers' supply chains are global, recent investments are estimated to have raised the share of parts manufactured in the United States to 50-60%. Of the top 10 global wind turbine manufactures in 2011, five (Vestas, Gamesa, GE, Suzlon and Siemens) have an American manufacturing presence.

More information is available within a report from the Congressional Research Service "U.S. Wind Turbine Manufacturing: Federal Support for an Emerging Industry."

MYTH: WIND TURBINES ARE LOUD AND NOISY.

Fact: Modern wind turbines are actually very quiet. Sound is measured in decibels. Wind turbine noise measured directly below the turbine ranges between 45 and 55 decibels. For comparison, the average home is measured at 50 decibels and a library at 40 decibels. An operating modern wind turbine at a distance of 750 feet is no noisier than a kitchen refrigerator or a moderately quiet room. Even in rural areas, where there is little additional sound to mask that of wind turbines, the sound of the blowing wind is often louder than that of a wind turbine. Early wind turbines from the 1970s did produce more noise than those that are being installed today. Converting the energy in the wind to audible sound or noise wastes energy. The blades used today are designed to be more efficient and thus generate very little noise.

Additional information is available in the white paper "Wind Turbine Acoustic Noise" published by the Renewable Energy Research Laboratory at University of Massachusetts at Amherst.

MYTH: WIND TURBINES PRODUCE DISEASE-CAUSING LOW FREQUENCY NOISE AND INFRASOUND.

Fact: Low frequency noise and infrasound are not unique to wind turbines. Infrasound is produced by many natural and man-made sources such as road vehicles, aircraft, industrial machinery, air-conditioning units and ocean waves. In fact, many animals communicate using infrasound. Measured infrasound levels near modern upwind wind turbines show at distances as close as 223 feet that the decibels are well below that required for non-auditory perception. While wind turbines may produce some amount of infrasound, it is minimal. A report published in *Environmental Health* has determined that "to date, no peer reviewed scientific journal articles demonstrate a causal link between people living in proximity to modern wind turbines, the noise (audible, low frequency, or infrasound) they emit and resulting physiological health effects."

MYTH: WIND TURBINES WILL DECREASE PROPERTY VALUES.

Fact: The U.S. Department of Energy funded a study published in the *Journal of Real Estate Research*. The study reviewed 7,500 home sales surrounding 24 wind farms in 9 states, over a period of 10 years. The study concluded that there is no long-term devaluation of property values. The study does note that the only depreciation in home values occurred in the period between announcement of the wind farm project and start of construction. Within two years, even the homes within 1,000 feet of the turbines had no reduction in value. Several additional studies show similar results in Illinois and New York.

See "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis" for more information.

MYTH: WIND TURBINES ONLY LAST 20 YEARS. AFTER THAT, TOWERS WILL BE ABANDONED.

Fact: Wind turbines are designed to last 20-30 years. After that, the 170 tons of steel and 4 tons of copper in each turbine can be recycled. At current scrap prices (about $200 per ton for steel and $4,700 per ton for copper) that's more than $100,000 for each turbine. Even if the scrap value does not increase in the next few decades, it will be still be far more profitable to remove and scrap the towers than abandon them. There are currently companies who pay for the right to take down turbines built in the 80's and 90's and sell them for scrap.