



DWEA Briefing Paper: **Tower Setback**

Summary

Excessive setback requirements for distributed wind turbines hinder the effective use of wind energy. Distributed wind turbine setbacks should be in line with setback requirements for other structures.

The Illusion of Prudence

“Setback” defines how close a wind turbine can be installed to existing property lines, roadways, power lines or other structures. The underlying logic is that the wind turbine structure might fall and it should do so safely and within the owner’s property. In reality, however, setback restrictions are overreactions to a nearly nonexistent risk and often stand in the way of smart wind turbine siting.

The Strongest Structures in the Area

Many zoning jurisdictions require structural analyses of wind turbine towers and foundations, just as they do for buildings and other constructed facilities. The most common structural design standard in the United States is the International Building Code (IBC). The IBC defines the rules for applying wind loads to structures and includes maps of extreme wind speeds for the United States. For every site in the country, the IBC defines the worst-case wind conditions expected in 50 years. These conditions are then used to estimate the loads imparted to a structure and form the basis of the structural design.

For example, a tower and foundation to be installed in coastal North Carolina would need to be designed for sustained 140 mph winds and 3-second gusts to 165 mph according to the latest version of the IBC, which is updated every three years. Recent updates reflect increased design requirements in response to losses from hurricanes and other severe storms. The result is that a distributed wind system installed today will be designed to survive winds that would severely damage existing homes, buildings, and power lines that were built to earlier, less stringent, design codes.

What if the Worst Happens

Man-made structures are not the only tall objects that carry a risk of failure; so do trees. The most likely time for such a failure is during severe weather when the winds are at their highest. According to Kent State Professor Tom Schmidlin, 407 people were killed by falling trees in the U.S. between 1995 and 2007; 76% of these deaths occurred during severe weather. Other than accidents to workers during installation, no record can be found of a person being injured, let alone killed, by a falling distributed wind turbine. If you think about it, the prospects are quite remote. First, the risk of a failure is minimal due to the high design standards of the tower. Second, people are not likely to be outdoors in the vicinity of a wind turbine during severe weather.

Alleged risks of ice-throw and blade-throw have never been substantiated. Ice build-up disrupts the aerodynamics of the blades, so wind turbines only turn at very slow speeds when iced up. Therefore,



when the ice sheds it falls straight down, just as it does from trees and power lines. And while it might be possible for a blade to become detached from a defective wind turbine, the likelihood is remote and the chances of causing an injury are almost nil.

Are Setbacks Really Justified?

Setbacks do limit the effective use of distributed wind systems. They can limit allowable tower height, they can keep towers from being placed optimally on a property where a turbine can take the best advantage of the wind, and they can eliminate the use of long and narrow properties. **DWEA recommends that setback requirements be set prudently and in line with actual risks. Our recommendation is for no setback restrictions beyond what is in place for other structures on the property, and we recommend any wind turbine specific setback be referenced to the nearest neighboring occupied dwelling rather than the property line.** No matter how many small wind turbines are installed they will never equal the magnitude of the risk posed by trees, and trees have no setback restrictions.