SMALL WIND
FACTSHEETS

How Much Noise Do Small Wind Systems Make?

Few moving parts

Most residential-sized wind generators are direct-drive devices with few moving parts. Unlike the utility-scale turbines used in wind farms, they do not have high-speed transmissions. Thus, most of the sound that comes from a residential sized wind turbine is aerodynamic noise caused by the blades passing through the air. The noise level of most modern residential turbines measures close to the ambient noise levels under average wind conditions. It is audible, if you are out of doors and listening for it, but no noisier than your average refrigerator.

Most residential turbines do not begin turning until a certain threshold, or "cut-in" wind-speed is reached - typically about 7 m.p.h. So, on a calm, windless day (or night), the turbine is still and silent.

Background noise masks aerodynamic sounds

Just how audible depends on the distance of the listener from the turbine - and also on the level of existing background noise, including traffic, farm machinery, barking dogs, children playing, lawn mowers, and even the environment itself. Residential-sized wind turbines are variable speed devices, turning faster and thus creating more sound as wind speed increases. At the same time, the wind itself creates sound, rustling through trees, shrubs, and fields, and even rattling buildings. These natural back-ground sounds also increase with wind speed, thereby effectively masking much of a small turbine's aerodynamic sound. The sound of a wind turbine may be distinguishable from ambient (background) noise even though it is not louder. However, the same can be said for all of the other components of ambient noise, including things like barking dogs, traffic, kids playing, tractors, and even trees.

Sound levels fall with distance

Sound levels fall off significantly with distance. In one sound test carried out on a Bergey Windpower 10 kW BWC Excel wind system at a distance of 300 feet and in 25 mph winds, the BWC Excel generated sound with a 54 dB(A) to 55 dB(A) rating, making the wind generator barely audible over the 52.5 dB(A) rating of the surrounding environment's background noise. At about 500 feet, the BWC Excel sound rating was 53 dB(A), making it just another part of the background sound.

In another instance, sounds from a 10-kW Jacobs wind system were measured by a representative of the Clinton (Iowa) Detective Bureau. "In wind speeds between 16 mph and 36 mph and at a position only 50 feet from the wind generator, the decibel meter registered the

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sound of the wind generator between 55 dB(A) and 59 dB(A). The detective noted that, 'at this location, the sound output from the generator was observed to be partially masked by the sounds from the rustling of leaves in the trees.' When the decibel meter was pointed at the trees (which were 300 feet away), the meter registered the tree sounds at 60 dB(A) to 62 dB(A).'" The conclusion: "the wind generator sounds were 'inconsequential in total noise emission.'"

References

Mick Sagrillo, Windletter Feb/Mar 1997

Other Fact Sheets Available on Small Wind Energy:

What is Small Wind?
Do Small Wind Systems Kill Birds?
What About Visual Impact?
Small Wind Systems and Public Safety
How Do Small Wind Systems
Affect Property Values?