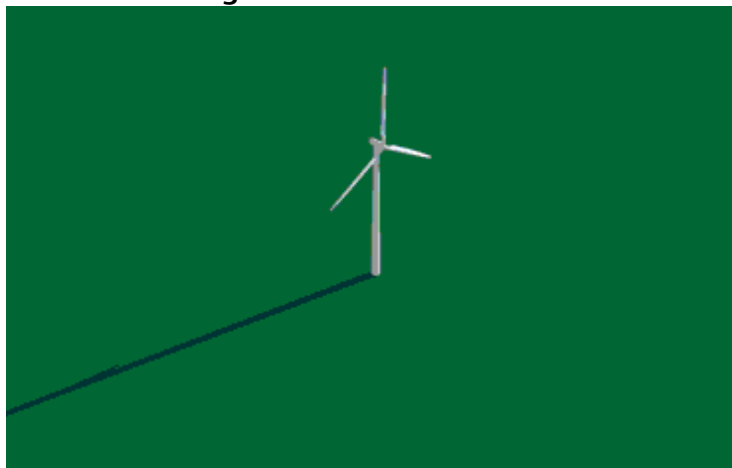


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Shadow Casting from Wind Turbines



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Wind turbines, like other tall structures will cast a shadow on the neighbouring area when the sun is visible. If you live very close to the wind turbine, it may be annoying if the rotor blades chop the sunlight, causing a flickering (blinking) effect while the rotor is in motion.

A bit of careful planning, and the use of good software to plan your wind turbine site can help you resolve this problem, however. If you know where the potential flicker effect is of a certain size, you may be able to place the turbines to avoid any major inconvenience for the neighbours.

Few Rules

Shadow casting is generally not regulated explicitly by planning authorities. In Germany, however, there has been a court case in which the judge tolerated 30 hours of actual shadow flicker per year at a certain neighbour's property. In the 30 hours, it appears, one should only include flicker which occur during the hours where the property is actually used by people (who are awake).

Predicting Shadow Flicker

Fortunately, we are able to predict quite accurately the probability of when and for how long there may be a flicker effect. We may not know in advance whether there is wind, or what the wind direction is, but using astronomy and trigonometry we can compute either a likely, or a "worst case" scenario, i.e. a situation where there is always sunshine, when the wind is blowing all the time, and when the wind and the turbine rotor keep tracking the sun by yawing the turbine exactly as the sun moves.

Figuring out the exact shape, place, and time of the shadow from a wind turbine requires a lot of computation, but at least one professional wind software programme can do this very accurately, even in hilly terrain, and with house windows of any size, shape,

location and inclination facing in any direction. (See the [Links](#) page for the address of wind software companies).

Do it Yourself

On one of the following pages we have included another shadow calculator, which will give you a possibility of computing a shadow map of your particular area in flat terrain. The calculator gives you a lot of options to produce realistic estimates of actual shadow casting. Fortunately, you will discover that shadow casting problems are generally restricted to a few areas close to the turbine.

Since the calculation of shadow casting requires lots of computer power, we have included a number of important general results on the following pages.

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<http://www.windpower.org/en/tour/env/shadow/index.htm>

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