Micrositing

Choosing the type of wind turbine (WTG) and its exact position are very important parts of the planning work of a wind park. This process is called *micrositing.*

During micrositing many aspects have to be regarded:

- wind conditions (statistic data concerning wind speed and wind direction)
- building requirements (e.g. distances to residences)
- ownership structure of the area
- accessibility (existing roads)
- influence of the WTG on the environment (e.g. shadow flickering, noise emission)
- distances between the individual turbines in a park

The knowledge of the wind conditions is very important for the decision about the development of a wind park. It is always the best to have measured data of the planned site for a period of at least two years. But this is not always possible. In case of a shorter measurement period wind consultants can find out the conditions by an interpolation of long-term measurements of near-by weather-stations.

Based on the information about the wind conditions it is possible to choose the type of turbine and the park layout which provides the highest energy production while keeping the external requirements. Based on a realistic forecast of the energy production it is possible to decide whether to invest in wind energy or not.

It is important to keep a distance to the next residences in order to not disturb the inhabitants by *noise emission* and *shadow flickering* of the turbine. Normally there have to be at least 500 m between the WTG and the next residence.

But it is also very important to keep the distance between the turbines in the park. A layout of a wind farm where the turbines are placed too close to each other could endanger the material and reduce the operating life of the turbines. A rotor of a WTG causes high turbulences that reduce the energy output of the next turbine. Compared with a single stand-alone turbine there are also higher loads on the following turbine because of increased turbulences in the wind park. Therefore the minimum distance between two turbines depends on the wind conditions and may be e.g. 6 rotor diameters (D) in the main wind direction and 4 diameters in other directions. As a matter of principle the turbulence intensities at the WTG should not exceed the certificated turbulence intensities.

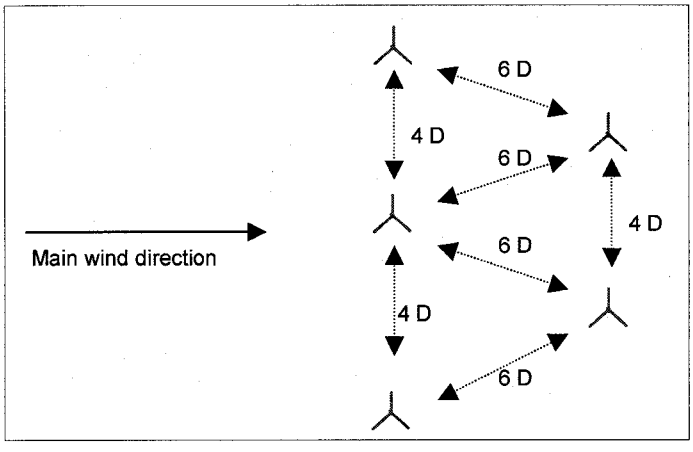

Figure 1: Distances between the turbines in a wind park

The distances between the turbines also have a strong effect on the energy output of the wind park. This effect is described by the park efficiency, the relation between the output of the park and the output of the same number of stand-alone turbines. Therefore the layout has to be planned carefully.

Exhibit

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