Where the Wind Blows – Determining Turbine Locations

by Gord Potts

Ideal location characteristics
How are a wind farm’s turbine locations selected? What are the key location features? What factors affect turbine height and distance decisions? This week’s column will aim to answer your questions about how the Grand Bend Wind Farm turbines will look and where they will be placed in advance of the construction phase.

Turbine location is determined through extensive scientific research. To determine the best possible location for a wind power system, one must first assess the prevailing wind patterns and wind speeds. The large, flat agricultural land east of Highway 21 provides a near-perfect location for a wind power generation project. The close proximity of the Grand Bend Wind Farm to the shoreline of Lake Huron exposes the area to an above average wind resource. Extensive data collection and wind studies have confirmed the potential of this site.

Other important factors
An ideal turbine location is also easily accessible to facilitate construction and operation, does not encroach on any environmentally sensitive areas, and is a reasonable distance from large natural or man-made obstructions and residences. In addition, the Green Energy Act requires that turbines be located a minimum of 550 meters from any defined ‘receptor’ (or residence).

Individual turbine locations are determined by a computer program designed to meet all of the above-stated criteria while ensuring that the turbines don’t shadow each other from the prevailing wind.

Turbine Models
Turbines are then selected, based on the aerodynamic characteristics of the blade, generator output versus blade length, and tower height. Every turbine is slightly different. Matching the turbine to the site’s conditions is key to ensuring that power output is optimized, sound level limits are respected, and community impact is minimized. The Grand Bend Wind Farm will use 45 to 48 Siemens 2.3 MW wind turbines. These machines have a rotor diameter of 113 meters and the center of the turbine is approximately 100 m above the ground. They were chosen to minimize the number of turbines required while maintaining a high level of energy production.

Grand Bend’s geographical location, large flat agricultural land base and wind resources make it an ideal spot to generate, clean, renewable wind energy that will be used locally and across the province. The turbine location map is available on our website for your review. I encourage you to have a look and contact me at grandbend@northlandpower.ca with any questions about the proposed layout.

Intelligent energy for a greener planet

Northland Power is an Ontario-based company with over 25 years experience developing, owning and operating facilities that produce and sell clean and green energy.