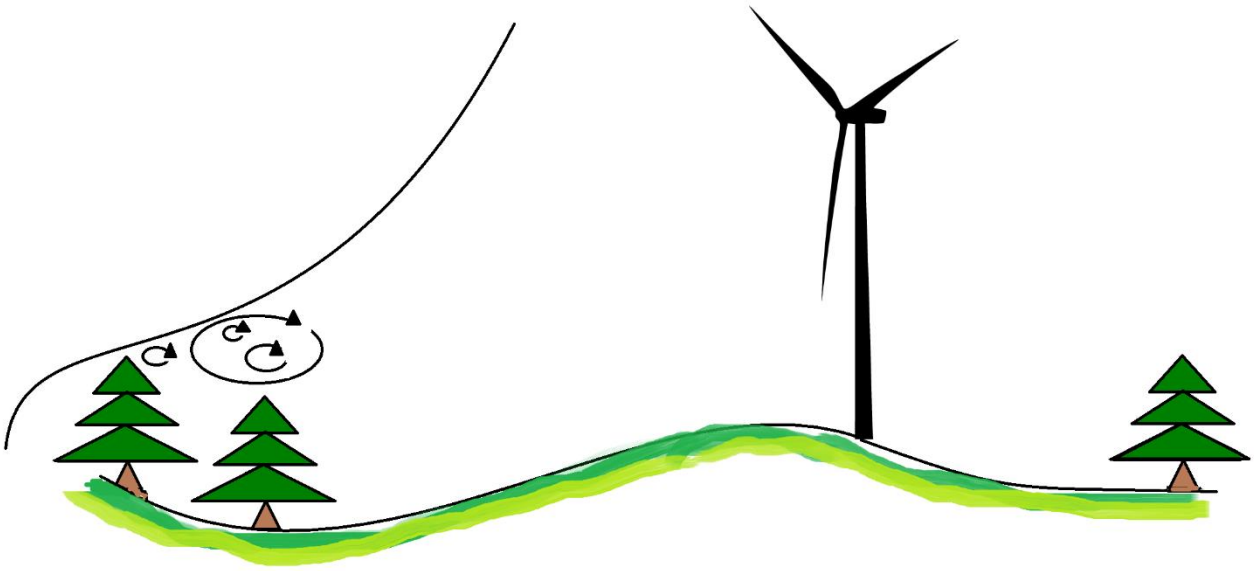
Strategic forest clearing helps you make the most of your wind farm

Meventus' strategic forest clearing around your wind turbines prolongs turbine lifetime and increases production

Is your wind farm located in forested terrain? By taking a strategic approach in the forest clearing around your turbines, you can increase both the lifetime and production of your wind farm.

The wind flow over forested terrain is characterized by a slow down in wind speeds, higher wind shear and increased turbulence. High wind shear and turbulence are factors that increase fatigue loads on turbines, and most turbines today are not designed for these loads. This leads to higher maintenance costs and a decrease in overall lifetime.

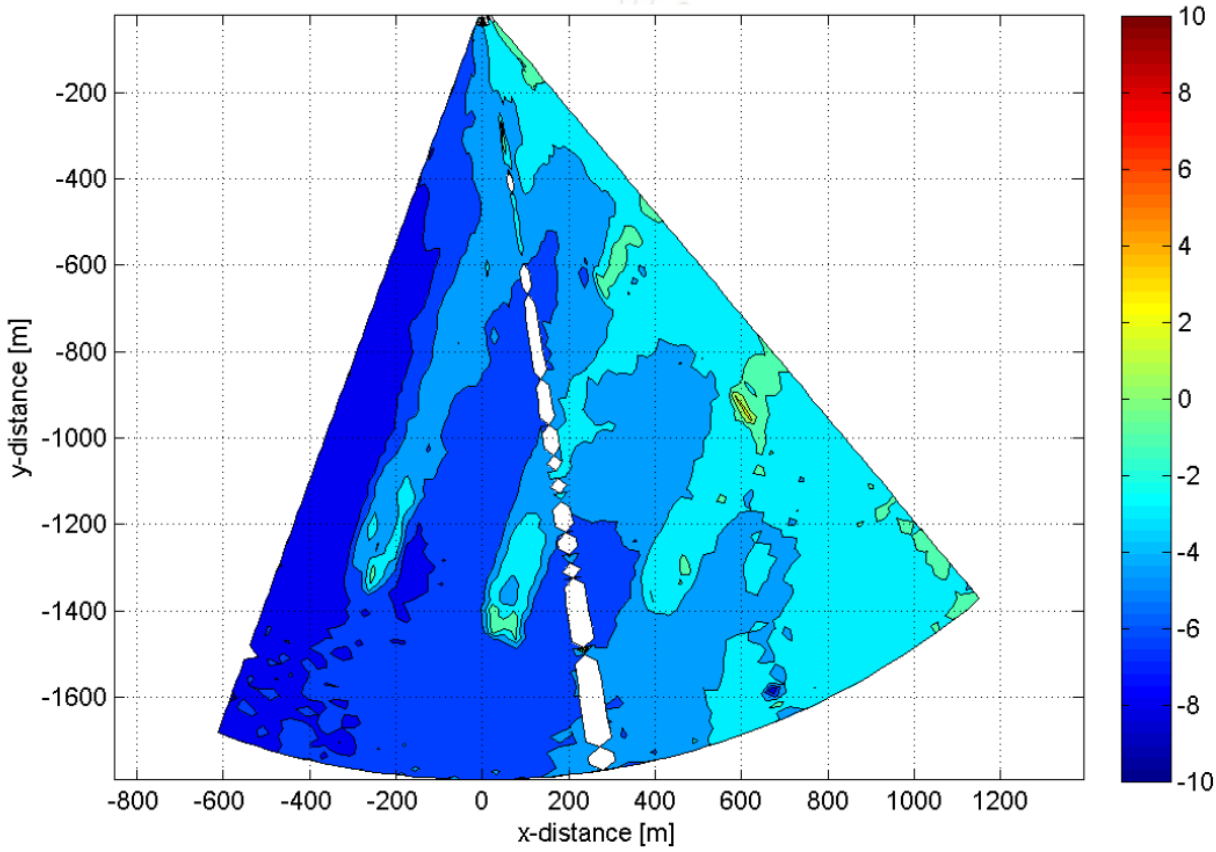


Depictive picture of the wind profile and turbulence over a forest surrounding a wind turbine

Meventus can evaluate how forest clearings improve the wind conditions in your wind farm, recommending key-hole cuts in the forest for existing or planned parks. This is achieved in three general phases: Flow model construction to understand/characterize the site conditions, model validation, and forest clearing improvement analysis.

The first step in the process is understanding the baseline conditions at the site. This is performed by a site visit to determine the forest characteristics (type, height, density, porosity, etc.) and construction of a high quality CFD flow model. This model is able to describe turbulence and large scale recirculation in complex terrain and have the spatial and temporal resolution required to estimate turbine loads.

As modelling forest conditions is challenging, it is important to validate that the model accurately represents the site to the required level of fidelity. With nearly 10 years of experience in modelling and measuring flow conditions in complex and forested terrain, Meventus has developed methods using a high-resolution scanning lidar (capable of measuring at 10Hz with spatial resolutions of 6-9 meters) to perform this validation, ensuring the turbulence and recirculation generated by the forest are properly represented.



Measurement performed by high resolution scanning lidar at 2 km distance

Once validated, the flow model can then be used to identify optimal shapes and sizes of forest clearings to minimize loads, as well as estimate the impact on expected production. This approach will help park owners minimize the amount of time and money spent cutting down unnecessary forest areas with little noticeable improvement, resulting in a better performing and more prosperous wind farm!

Please contact Meventus for more detailed information client references and how you could benefit from our expertise in wind power in forested areas.

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