

Wake Adapt®

## Reducing wake losses

Wake Adapt® is a controller feature that reduces the wake losses of a wind power plant. The losses are reduced by what are known as wake control techniques. These techniques adapt the operation of the upstream turbines to increase the kinetic energy in the wind inflow to downstream turbines.

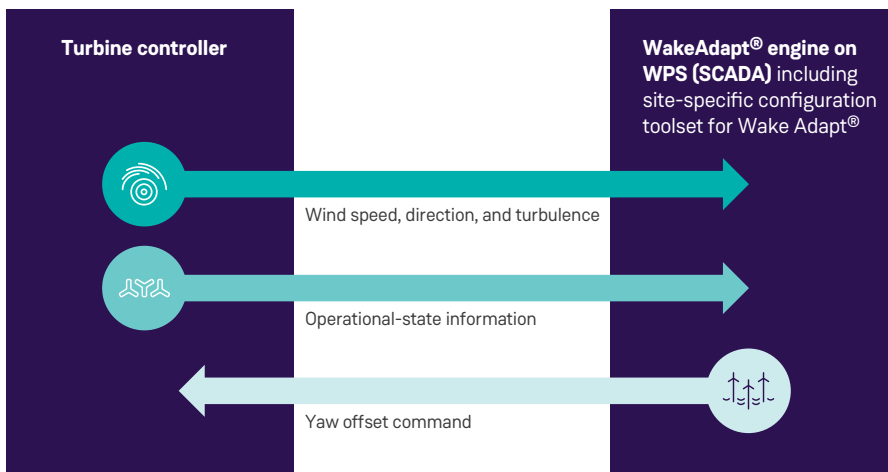
Wake Adapt® collectively adjusts the operation of each turbine in a wind power plant through the park-level control and hence improves the annual energy production of the whole wind farm.

## How does Wake Adapt® work?

When turbines are aligned in the wind direction and the wake of upstream turbines affects the downstream turbines, WakeAdapt® is activated. The activation occurs at below-rated wind speeds and at low turbulence intensity as this is when wake effects are the most important and when the yaw offsets have only limited effects on the wind turbine structural loads.

WakeAdapt® strategically commands offsets of the yaw position of turbines relative to the inflow wind direction. It also adjusts the wake control strategy to special situations, for example when a downstream turbine is stopped for service. The wind turbine controller is equipped with monitoring and control software that keeps the yaw offsets within a safe envelope. The solution relies on existing hardware and sensors.

**Fig. 1: Wake Adapt® command between the turbine and SCADA**



## Key benefits of Wake Adapt®

- The park-level software solution is remotely operable and customized to the site conditions of each wind power plant.
- Reduces wake loss by up to 10%, resulting in an increase of the annual energy production of the entire wind power plant by up to 1.0%, depending on site-specific conditions.
- Immediate payback due to revenue sharing model.



- Methodology for application and benefits determination of the Wake Adapt® feature has been validated by an independent third party
- Applicability : G4, D6, D7, and D8 offshore platforms

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