



OptimaFlex

Optimization through flexibility



Increasing
profitability

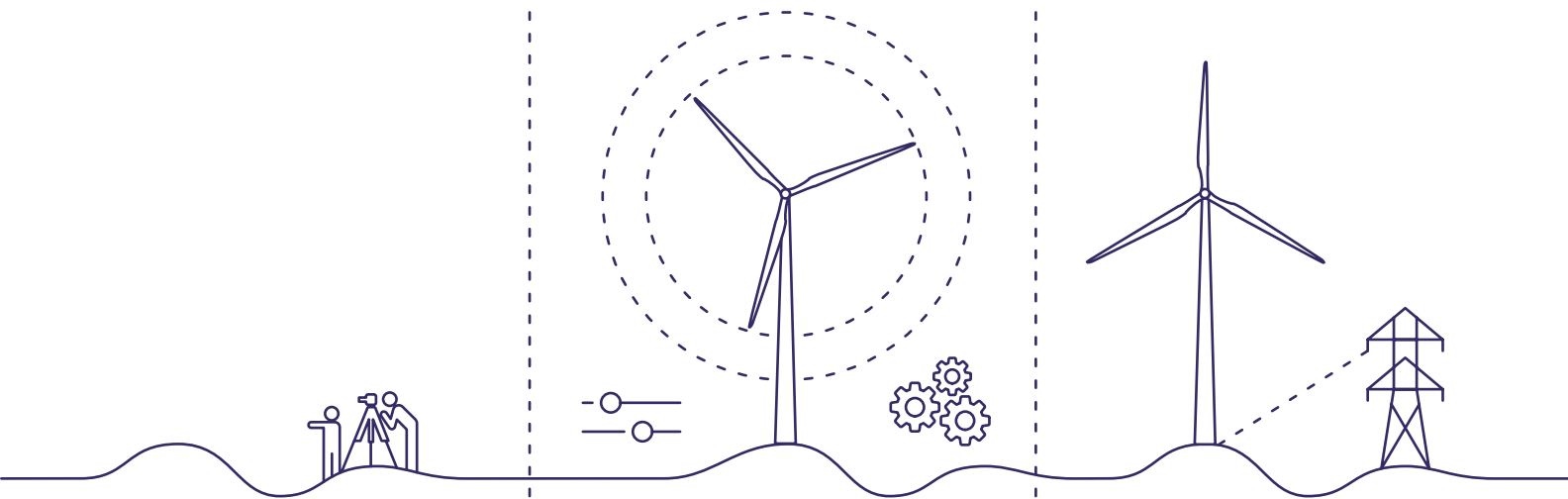


Siemens Gamesa turbines can be configured to adapt perfectly to site conditions, offering our customers the suitable product for their projects

Beyond the traditional off-the-shelf approach, which results in products that more or less fit all the sites, but are sub-optimal for many, the Siemens Gamesa OptimaFlex technology delivers a uniquely tailored solution that is perfect for our customers' specific needs.

Optimized site design combined with a customizable product, based on flexible power rating, site specific towers and optimized BoP solutions, allow Siemens Gamesa to deliver reduced LCoE by increasing AEP while optimizing cost.

Flexibility at every stage of the project's life cycle



Customer collaboration

We engage with our customers from the very early stage of the project development and assess with them every single detail to ensure the minimum LCoE.

- Detailed study of the business case combined with comprehensive site analysis.
- Expert technical input at the outset of the planning process.
- Enhanced site design tools.

Only such an in-depth collaboration allows us to deliver profitability and returns over the project's lifetime.

A flexible product

In life, change is the only constant. In wind power, that means changing environmental conditions as well as the fluctuating economic barometer that has an impact on our customers' business case.

Thanks to the Siemens Gamesa OptimaFlex technology, turbines can be precisely configured to suit site conditions:

- Customization of product offer to optimize performance.
- Site specific tower portfolio to offer the most suitable hub height and full adaptability to site loads.

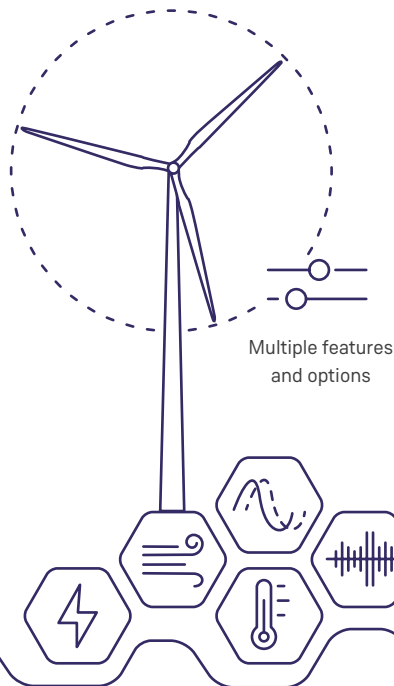
Ongoing optimization

OptimaFlex is ready for your projects, meaning our turbines will be able to react to contingencies over the lifetime of the project:

- Changing site and business case conditions.
- Grid connectivity requirements.

Constant monitoring of environmental, grid and turbine physical conditions allows for real-time power optimization. Longer term changes can be responded to through re-calibration of the turbine.

Increasing profitability



Flexible rating

The availability of a flexible power rating enables turbines to be configured for enhanced performance in each individual project and to achieve maximum returns. Every product is available with a number of Application Modes fully configurable via control software and supported by technical documentation, type certificate and the required contractual warranties.

This way, Siemens Gamesa delivers the suitable product configuration, depending on the project requirements and the actual environmental conditions of the site, with the perfect mix of the following parameters:

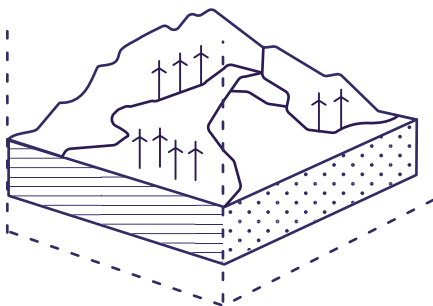
- Active power.
- Wind conditions.
- Ambient temperature.
- Reactive power capabilities.
- Aerodynamic noise.

Advanced site optimization

Thanks to advanced siting and design tools, we deliver the optimum site design that maximizes production and reduces loads.

We analyze the following met mast and wind farm data to define the optimal layout:

- Wind data (V_{avg} , V_{ref} , TI , Weibull k , wind shear, etc.).
- Noise limitations.
- Tip height restrictions.
- Flickering requirements.
- Site orography / complex terrain.
- Distance requirements from houses and roads nearby.

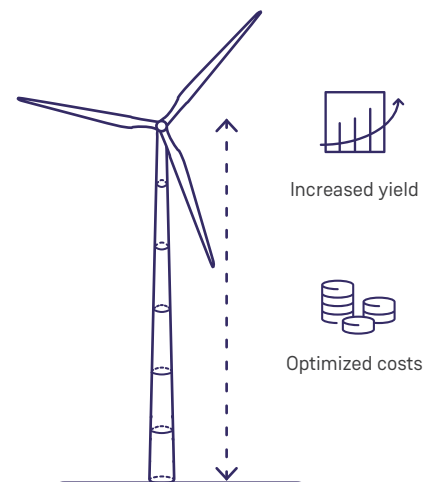


Site specific tower portfolio

Siemens Gamesa advanced tower portfolio enables cost savings and higher energy production from the very early stage of the bidding process. Also, site and market specific designs maximize competitiveness.

With our innovative flexible design approach, we deliver towers fully adapted to the specific needs of each project. The result is a tower design that can be customized per project and engineered to order:

- Multiple tower heights available to comply with the specific tip height restrictions of the project and maximize production.
- For each height, several structural designs are available to meet project and market constraints and site loads.
- Multiple tower technologies available, with different materials (steel, concrete and hybrid).
- The adoption of pedestals solutions (high-foundation) allows us to offer those heights otherwise not technically feasible for dynamic reasons.



BoP optimization

ONE methodology:

Thanks to the Siemens Gamesa ONE methodology, we offer an optimized cost-efficient BoP solution for the project, resulting from a thorough analysis of the logistics, construction and other BoP data and requirements in the site.

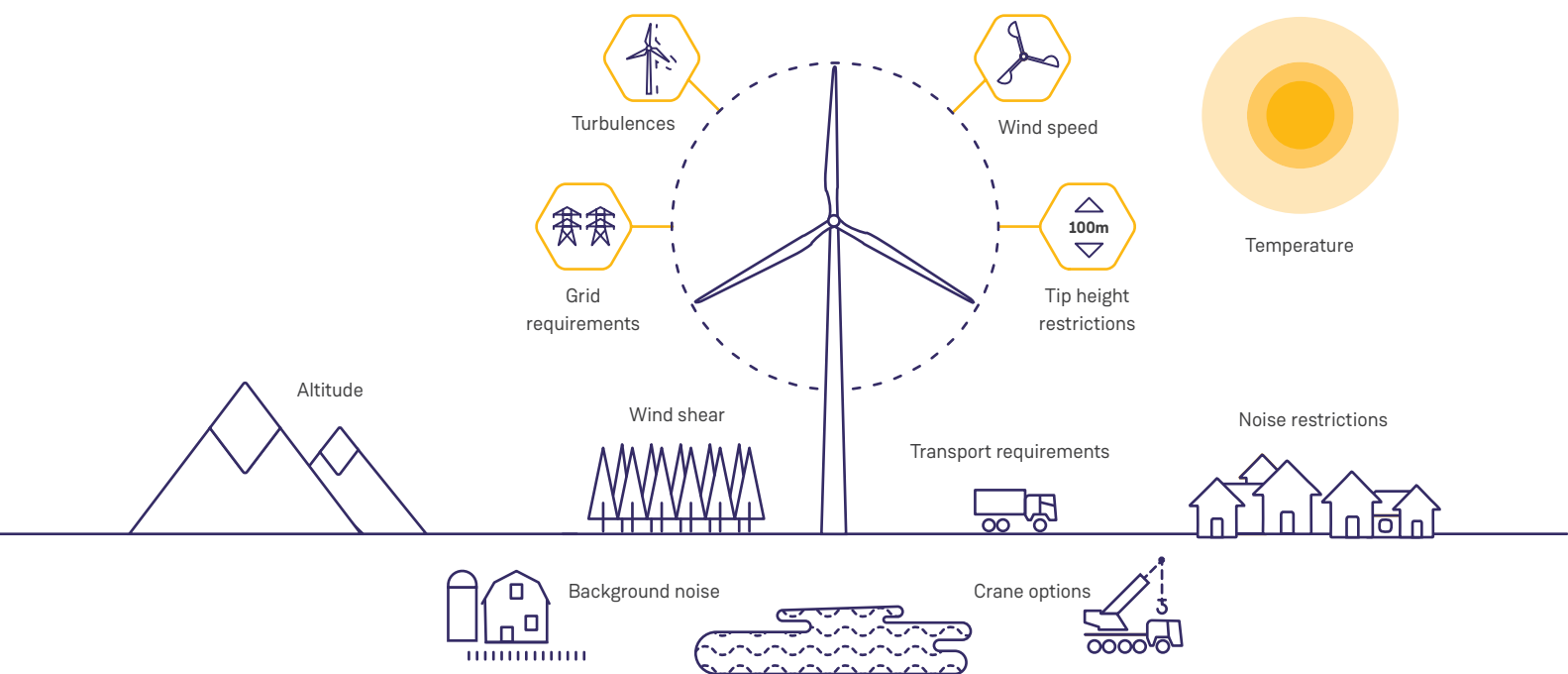
Even when the BoP is not in the scope of supply of Siemens Gamesa, customers are provided with engineering support to reduce the overall expenditures in their wind energy project by optimizing the BoP costs, which normally accounts for 25-30% of the total costs, thus affecting significantly the business case.

Foundation design:

Siemens Gamesa's engineering teams provide extensive expertise in foundation design. The wind turbine foundation accounts for 7-9% of the total costs and can be optimized on a project-by-project basis to reduce LCoE.



OptimaFlex implementation in Siemens Gamesa products



Siemens Gamesa flexible product

Our product portfolio represents a fresh approach to wind power. Conventionally, turbines are designed to meet the demands of the most challenging conditions: the most remote sites, severe legal restrictions, extreme ambient temperatures and so on.

Siemens Gamesa OptimaFlex technology is a radical departure from this off-the-shelf philosophy. The deep insights we gain through collaboration with our customers are transformed into bespoke solutions that fit our customers' needs precisely:

- Turbines are designed and certified to cover a wide range of project requirements and environmental conditions.

- Every turbine is configured via control software to guarantee the lowest LCoE for the project.
- A unique nacelle, hub, blade hardware for every turbine model optimizes the supply chain and improves internal costs of complexity.
- Real-time configuration of operational parameters ensures continuous optimal performance.

Moving from off-the-shelf to
tailor-made solutions

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