

## Power Systems Consulting: Wind solutions

Identify and optimize wind power solutions through technical and economic consulting capabilities

With 30 years of experience, in-depth know-how, global manufacturing footprint and thorough understanding of both wind turbine applications and power systems, ABB serves wind power customers at every stage of the process.

As the renewable industry has matured, there are a few options and concerns that developers and owner/operators of wind power should consider. ABB's consulting team can help by providing the expertise to optimize output and efficiency all while mitigating risks.

### Technical Consulting Solutions

- ❑ **Expertise in grid integration analysis** – Ensure that system reliability and performance are not compromised while getting an understanding of system costs from experts that have performed hundreds of system integrations.
- ❑ **Grid interconnection planning** – Maximize power into the transmission grid at various sites without the need for additional system upgrades. Understanding up front what issues could occur downstream will be better for the lifecycle of your project.
- ❑ **Grid code compliance** – Be assured that renewable projects will not negatively impact the reliability performance of the power system. Don't miss project milestones or get penalized for passing off compliance requirements.
- ❑ **System impact studies** – Consider a range of system operating scenarios, as well as dynamic simulations on the network. Identification and prioritization of issues can be leveraged when investing in upgrades or unexpected system impacts. Identify any transient overvoltages that can cause system failures which are traditionally not covered by the developers and/or OEMs.
- ❑ **Balance of plant** - Gain detailed designs of substations and collector systems for windfarms from a leading OEM. Let our experts share the optimal configurations based on your priorities.
- ❑ **Due diligence on wind turbine manufacturers** – Receive unbiased analysis and recommendations. While ABB does not sell or service wind turbines, we do sell components to almost all wind manufacturers. Therefore, we can draw on information from each suppliers' expertise.
- ❑ **Offshore advisory services** – Consider the offshore market by identifying potential problems of transmitting power and leveraging solutions like HVDC cables. Understand project costs and system impacts early on and learn what options are available from the industry leaders.
- ❑ **Battery application solutions** – Optimize output through application selection and system impact analysis. Take advantage of excess output and know how much more power you can leverage.
- ❑ **Performance optimization (technical loss reduction)** Know what options are available to optimize production that can then be used to generate revenue or increase cost savings. Maximize current assets instead of purchasing more generation.
- ❑ **Transmission and distribution root cause analysis** – Get to the bottom of issues and ensure that they don't come back again. Better understand the interactions between HVDC and FACTS, (STATCOM, SVC, Series Cap.) devices that may not have been addressed during the development of projects if the focus was on minimizing costs rather than increasing reliability. Know what to do about harmonic issues that may occur due to currents flowing through step-up transformers from the converters to the collection system.



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## Economic Consulting Solutions

- ❑ **Asset risk management** – Reduce the risk of equipment failure, extend the life of your equipment, and minimize the risk of unplanned outages. Monitor and control your risks effectively for the lifetime of your projects through sensors and software created by a leading OEM.
- ❑ **Emission displacement calculations** – Qualify and quantify environmental impact. As wind generation displaces fossil-fuel based generation, know how much CO<sub>2</sub> was eliminated then leverage your remaining allowances.
- ❑ **Production cost models (investment analysis)** – Estimate production through simulations that calculate additional revenue for additional services and when buying a plant. Feel confident that sub-hourly calculations are qualified by the industry's leading production simulation software experts.
- ❑ **Congestion identification** – Locate where/when congestion exists, (dispatches, outages,...), and have alternative solutions proposed. Both plant and system operators can benefit from data analysis performed by experts that have a wide range of experience from similar networks/systems.
- ❑ **Understand requirement and reserve margins** – Qualify and quantify what limitations exist. Know your margin limitations and take advantage of them to provide additional benefits.
- ❑ **Asset portfolio analysis** – As owners acquire additional plants, know how to best centralize, monitor and control all of your asset data while prioritizing maintenance/investment decisions. Portfolio cost savings can be recognized and qualified through detailed analysis.

## About ABB Power Systems Consulting

The Power Systems Consulting team at ABB provides novel approaches and solutions to developers, EPCs, electric utilities, system operators, independent power producers, and industrial electric users worldwide.

We offer a wide range of consulting services in the areas of transmission systems, system controls, energy efficiency, power market analysis, asset evaluation, industrial systems, and equipment selection. Combined with years of experience and state-of-the art technology, ABB's internationally recognized team of consultants will help you to develop and optimize your electric system to reach your desired level of performance.

## ABB Inc.

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