



ABB Wind Care Service Offering

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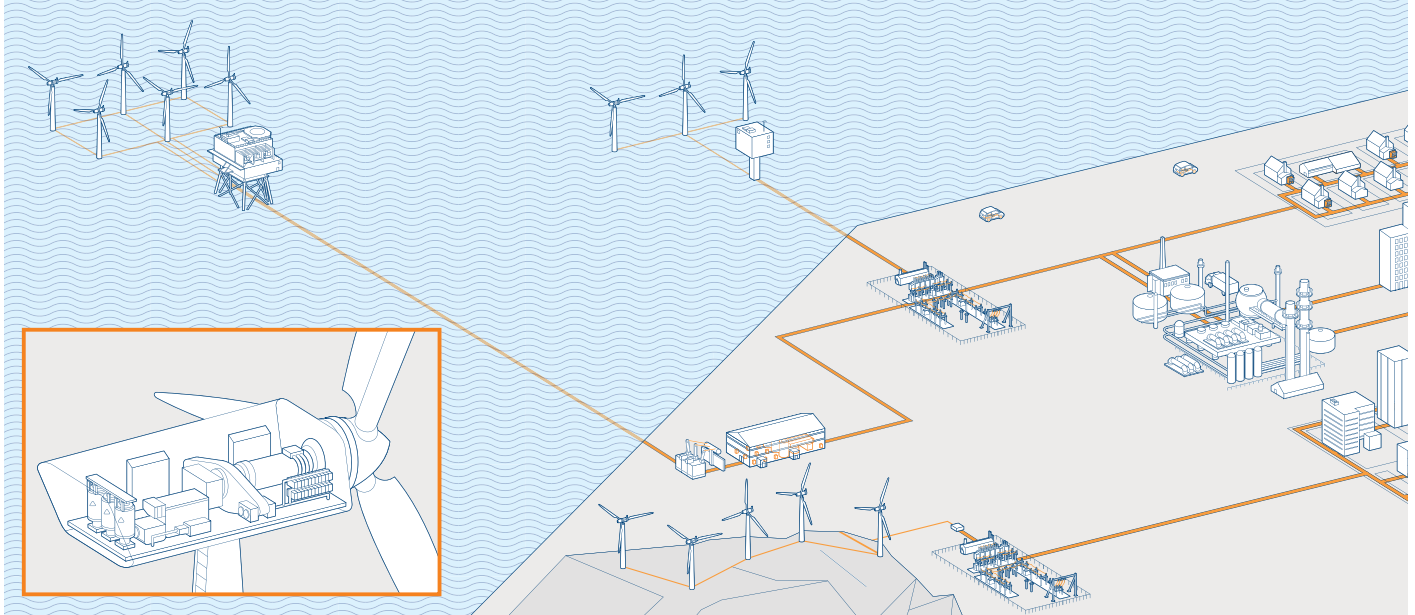


ABB is the largest supplier of electrical components, systems, and services to the wind power industry. With continued investment and expansion of service offering, ABB is uniquely positioned to support and optimize your turbine and wind farm through the entire lifecycle

With the changing environment of wind power approaching grid parity and various governments revising their support mechanism and policies, it is critical to run wind assets at the highest efficiency and with an optimized control and maintenance strategy. ABB can help.

You can count on ABB Wind Care for an optimized Wind Economy. With our local presence, global footprint, fast delivery and responsiveness, our wind service offering include efficiency improvement and production increase, while improving reliability and reducing levelized cost of energy (LCOE) over the lifetime of your turbine and wind farm.

ABB offers full spectrum of comprehensive life cycle services for wind farm electrical systems, including installation and commissioning, spare parts management, technical support, online and classroom training, preventive maintenance, retrofit

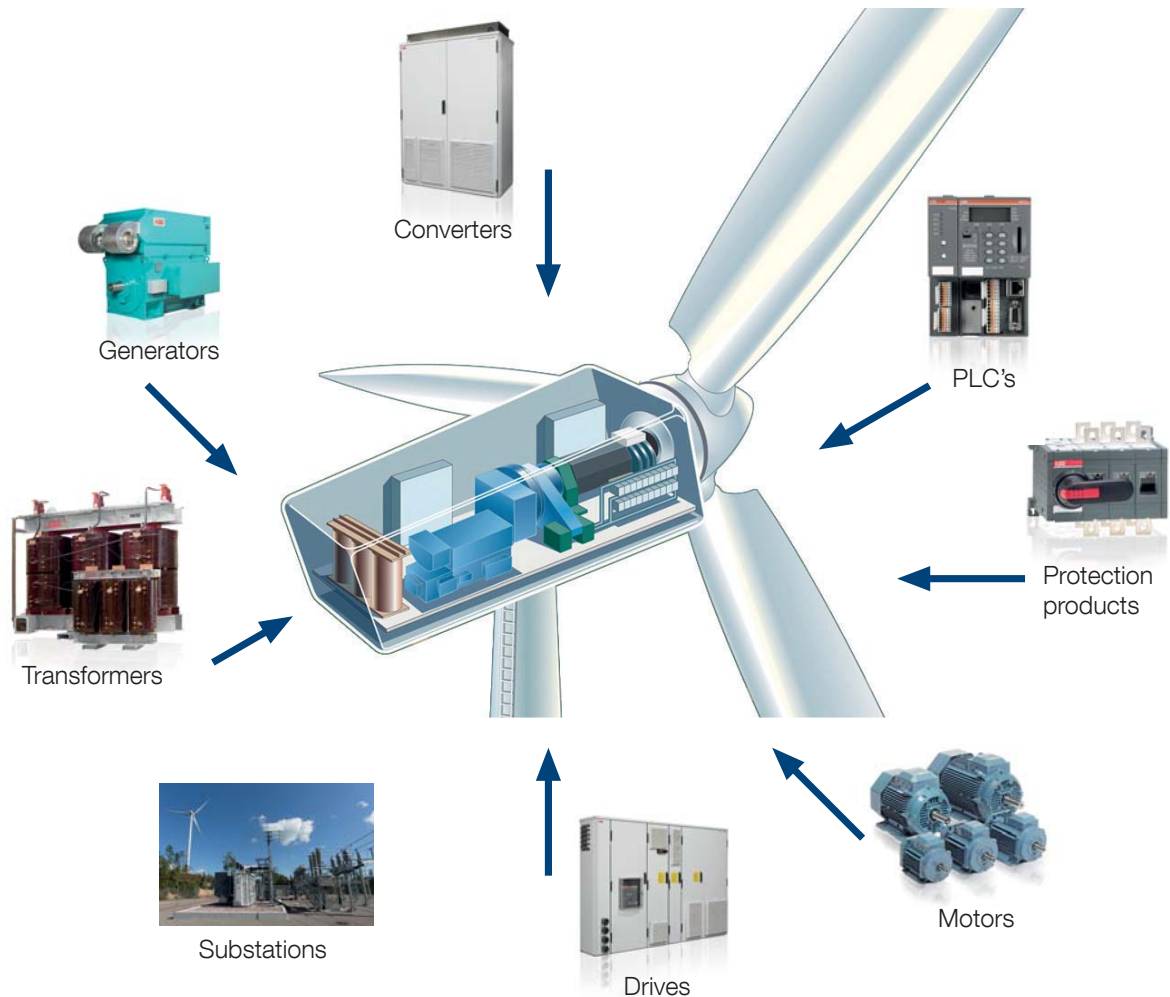
and refurbishment. ABB offers repair services and replacement components for non-ABB products as well.

ABB life cycle services help you increase kWh production by providing the foundation to keep products operating at optimum levels with minimal downtime.

ABB has comprehensive electrical system knowledge from the generator to the point of grid connection, offering optimized solutions and consultancy services for grid collection optimization and smooth integration.

Whether you are a turbine OEM, an ISP or an operator, ABB's global service network supports your unique needs with on-site support and lifecycle services. Wherever you are located in the world we can provide rapid response through our service hubs, backed by global R&D resources.

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Custom made service contracts

Each turbine manufacturer, service provider or wind farm operator has a unique need for services. ABB provides you with the right service contracts as you can bundle individual services into one contract made at any stage of product ownership, throughout the product life cycle. Contracts can be of a mix of services, including spare parts, preventive or corrective maintenance agreements, technical support, and training. Service contracts provide you with improved cost controls, increased operational efficiency, lower capital expenditures, reduced downtime and extended product life time

Engineering and technical support

As wind turbines require sophisticated design, ABB's engineers work with you during product specification phase to ensure all of technical questions and issues are addressed. Engineering and technical support is available by phone, email, or on-site visits.

Training improves performance

Given the wind turbine complexity, understanding how to efficiently integrate and operate various components provides the base for improved quality and reduced production costs. To mention a few, ABB training is available for low voltage breakers, contactors, converters and switchgears. You may attend training at ABB training centers, online classes, or at your own site. Training keeps your engineers up-to-date with latest information and product development.

Regional service hubs

ABB has positioned regional service hubs around the world to provide certified services for ABB and other products, and help you improve turbine production and reliability. The service hubs perform repair, refurbishment, and retrofit work.

Service offering



Installation and commissioning

ABB service engineers, with understanding of turbine and overall system, deliver expert on-site Installation and Commissioning services. Including self-maintenance support, consulting, full project management and complete outsourcing solutions.

Maintenance

Effective practices in predictive, preventive and corrective maintenance maximize the performance of your turbine and wind farm. ABB service personnel are trained in the latest diagnostic, repair and maintenance practices. To ensure the maximum value from your investment, we provide solutions for condition monitoring of generators, transformers, high voltage breakers, and other critical components

Spare Parts

ABB's global logistics network is strategically positioned to provide spare part deliveries throughout the world. For instance, this includes low voltage components and accessories, power transformer bushings, converters and generators. Our service organization delivers recommended spare parts, component exchange, and inventory and logistics management..

Extensions, Upgrades and Retrofits

The ABB lifecycle management model provides the framework used to develop and provide evolutionary services that maximize availability and performance throughout equipment lifetime. This model enables ABB to provide optimum support and a smooth transition to new software that controls your converter, low voltage components when a product reaches the end of its

lifecycle, or upgrade solution to enhance the performance of your power transformer. ABB offers retrofit solutions that improve turbine production, reduce mechanical stress on components, and provide reactive power compensation and grid code compliance. In line with this, ABB through its Technology Venture arm, invested in ROMO, which offers turbine performance improvement through a better yaw alignment system.

Repairs and replacement parts

ABB offers replacement parts and repair services for all electrical components in order to increase your turbine and overall system performance. Repairs can be done in our workshops or on site with Full load testing for converters to ensure service quality. With ABB Generator Replace and Recycle concept, we replace a damaged generator from stock, take the damaged generator for exchange, repair and refurbish it. Once repaired, we return it to storage, and if not feasible to repair, we manufacture a new one for the storage.



Service offering



Engineering and Consulting

ABB's engineers work with you starting with product specification phase, and offer consulting services to identify key potential for improvement. Our highly qualified experts have an in-depth knowledge of needs as well as best practices whether you have a single or a comprehensive technical or organizational issue. You can always count on ABB's comprehensive range of consultancy services for grid connection, system optimization, and to secure wind power evacuation. This covers Electrical Balance of Plant (eBoP) with medium voltage collection system and high voltage interconnection network, including substations for power transmission and distribution. As well as consulting for power quality, energy storage, and small micro grid system integration.

Extensions, Upgrades, and Retrofits

The ABB lifecycle management model provides the framework used to develop and provide evolutionary services that maximize availability and performance throughout the life of ABB equipment. This model enables ABB to provide optimum support to you and a smooth transition to new software and equipment when a product reaches the end of its lifecycle. Most ABB products provide useful service for twenty years or more. Throughout the product lifecycle, we work to provide solutions that expand the functionality and extend the lifecycle of your equipment, while maintaining your core investment.

Advanced Services

Analyzing and utilizing data effectively is paramount to decision-making and response time. ABB optimization services use continuous improvement methodology, advanced tools, and knowledge of turbine and overall system to identify improvement opportunities.

Whether it is through remote monitoring of specific components or remote supervision of complete wind farms using ABB SCADA systems, We can help you with predictive maintenance by continuously monitoring and analyzing key parameters related to equipment condition. This helps you reduce Operation and Maintenance costs and optimize wind farm performance through diagnostics, control, and intelligent maintenance; leading to asset life extension

End of Life Services

Services for proper management of equipment at the end of life cycle including removal, disposal, repurchase, and recycling



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