

John Saleeby, VP Corporate Business Development – North America
for Dennis McKinley, ABB North America Wind Power

September 2013


ABB in the Wind Power Industry Supply Chain in the Coastal Southeast

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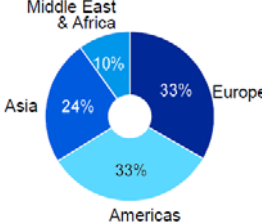
Power and productivity™
for a better world™ **ABB**

Introduction to ABB

A global leader in power & automation



- Headquarters: Zurich, Switzerland
- More than 145,000 employees in about 100 countries
- Revenues ~ \$40 billion
- Listed on Stockholm, Swiss and New York exchanges



Region	Percentage
Europe	33%
Americas	33%
Asia	24%
Middle East & Africa	10%

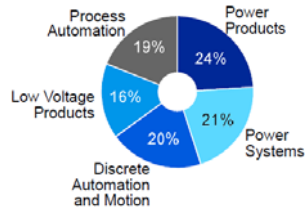
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ABB

Introduction to ABB Five divisions – all serving the Wind Power industry



Power Products Transformers, high- and medium-voltage switchgear, breakers, automation relays	Power Systems Substations, FACTS, HVDC, HVDC Light, power plant and network automation	Low Voltage Products Low-voltage power distribution products and systems, control components	Discrete Motion Industrial drives, motors, robots, PLCs, and advanced power electronics. Integrated factory automation.	Process Automation Control systems and application-specific automation solutions for process industries
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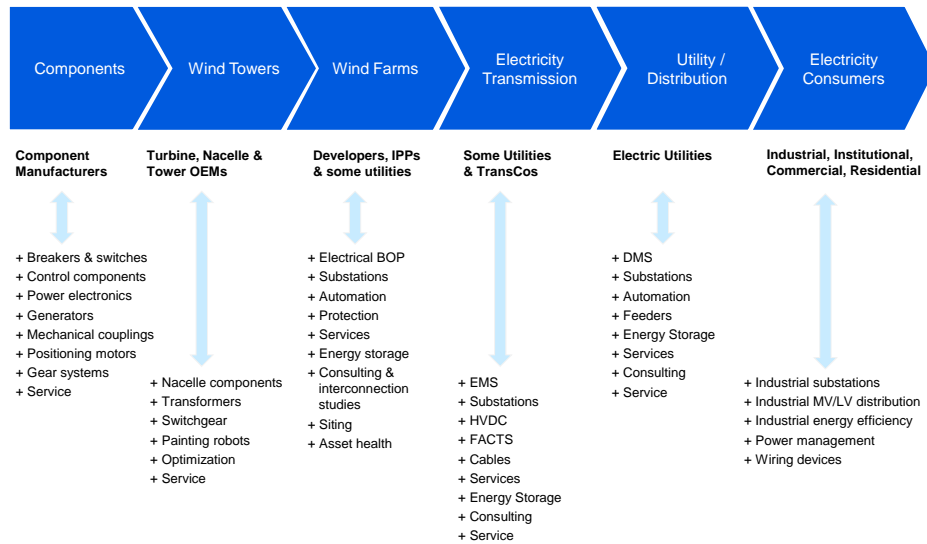


- In North America, a 10 BUSD company with an exceptional suite of products, systems & solutions for the Wind Power industry
- Recent acquisitions have further strengthened our portfolio:
 - Ventyx
 - Baldor
 - Thomas & Betts
 - Power One

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Wind Industry Value Chain ABB Content Areas



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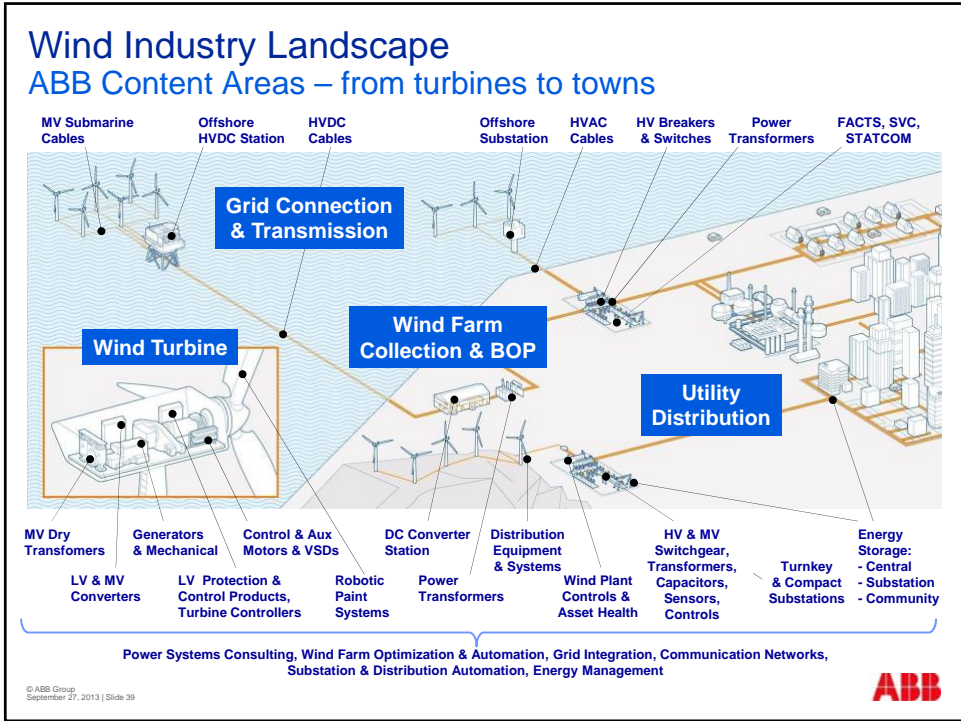


ABB Supply Chain for Wind Southeast Coastal Footprint



~ 430 employees

- Lake Mary, FL
 - Switchgear and utility distribution products & system solutions
- Coral Springs, FL
 - Circuit protection & control



~ 830 employees

- Bland, VA
 - Dry & distribution transformers
- South Boston, VA
 - Small & medium power transformers



~ 1,100 employees

- Atlanta, GA
 - Ventyx software products & solutions for energy & utility markets
- Athens, GA
 - Baldor electric motors
- Gainesville, GA
 - Baldor electric motors to 5,000 HP



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Offshore Wind Connections AC System Experience



140 MVA, 145 kV offshore substation
in the Netherlands

Installation of AC Cable Systems for Offshore Wind



Infield cables
on drums

Export cable
on turn table

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Offshore Wind Connections DC System Arrangement

Large offshore wind site with one or several AC substation platforms

Offshore HVDC voltage source converter station

HVDC export cable system and onshore HVDC voltage source converter station



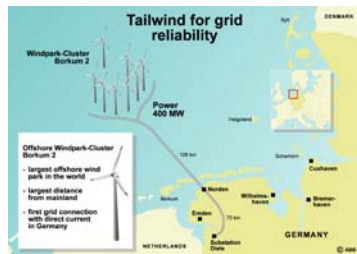
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Offshore Wind Connections DC System Experience

BorWin 1: First HVDC System for Offshore Wind Interconnection (to German grid)

DoIWin 1: World's Largest HV Offshore Converter (North Sea to German grid)



Applications

Efficient interconnection of large offshore wind generation facilities to German transmission grid.

Solutions

- BorWin: 127 miles long HVDC system, 300 kV (± 150 kV), 400 MW, submarine & underground cables
- DoIWin: engineering, design, supply & installation of 320 kV, 800 MW converter to connect 3 offshore wind farms to grid



BorWin Alpha offshore converter station

400 kV AC Diele substation & converter



800 MW DoIWin Converter Station



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ABB in Wind Power

A global leader in wind, with a focus on offshore



Installation of Offshore HVDC Converter Station

ABB Continues to invest in innovative technologies for the Wind Industry

Pentalum's Innovation

A **low cost, Accurate & low power** laser based system that remotely measures wind and substantially improves Wind Farms and Wind Turbines performance

- Developed by professionals.
- Unique "Direct Detection" architecture enables the use of common, reliable, low cost components with no moving parts.
- Affordable to enable deployment of multiple units.



PENTALUM

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- ABB equipment installed in **over 100,000 turbines** around the world generating 35 GW
- Dozens of **off-shore converter stations & substations**
- Thousands of miles of **HVDC lines**
- Thousands of wind farm **technical & economic studies**
- Over 35,000 wind **generators** installed
- Market leader for key **turbine electrical drivetrain** components – expertise in all turbine drive concepts
- Tens of thousands of **transformers** on wind applications
- Hundreds of **onshore substations**
- Customers on all continents – OEMs, IPPs, Developers, Utilities and Transmission Companies

ABB has more electrical equipment installed on wind farms than any other company, and a large part of our capability is located in the Southeast US



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