



ABB smart grid
Intelligent business

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Smart grid investment for improved operational effectiveness

ABB smart grid solutions help control costs and meet consumer demand with fewer resources

Distribution grid management

Increase reliability and efficiency while reducing operations costs through better communications and control

Utility analytics

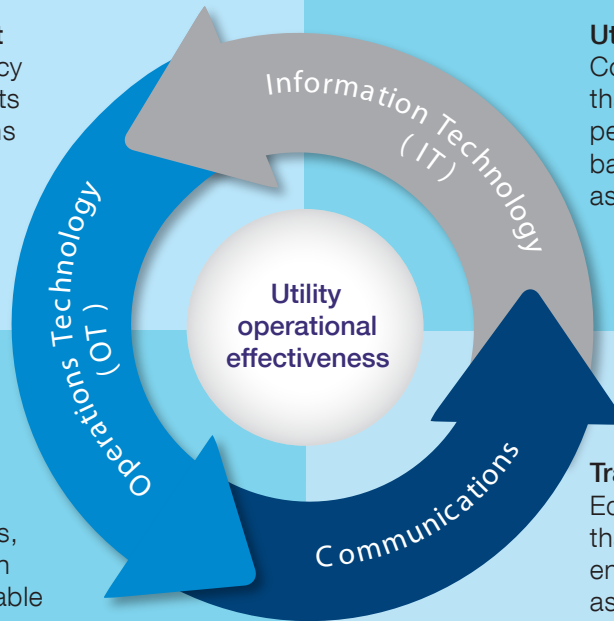
Consumer and grid analytics that improve operational performance and condition-based maintenance to improve asset life-cycle management

Distributed energy resources

Enable groundbreaking operational flexibility for utilities, providing utility customers with lower costs and more sustainable electricity-consumption options

Transmission grid management

Equipment, process and tools that interconnect renewable energy sources to legacy grid assets from transmission through distribution



The convergence of operations technology (OT) and information technology (IT) integrates enterprise-level IT applications with grid systems and equipment, elevating overall system performance.

Drive investment returns

Future energy demands require a smarter grid – one that is more efficient, reliable, and capable of carrying more high-quality energy to more consumers than ever before. No other smart grid solution partner in the world offers the breadth of systems expertise, equipment, software, and communications technologies provided by ABB.

ABB smart grid solutions drive investment returns by integrating operational technologies (OT), such as the equipment and systems controlling the grid, with communications and the information technologies (IT) used by utilities for enterprise level applications.

ABB smart grid solutions: Interconnecting four critical utility business areas

- Distribution grid management
- Utility analytics
- Transmission grid management
- Distributed energy resources

Benefits

- Increased grid efficiency
- Improved reliability
- Achieve sustainability objectives
- Better operational performance
- Deliver expected shareholder returns

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Distribution grid management

Deliver operational excellence

ABB offers the broadest portfolio of industry solutions offered by any single company worldwide. By providing the software, communications technologies and expertise to manage every facet of the smart distribution grid, ABB virtually eliminates the interoperability issues and project overruns that plague solutions cobbled together from multiple vendors.

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ABB smart grid center of excellence (COE) Minimize distribution grid management investment risk

The COE provides utilities a single-point of contact to leverage ABB's proven expertise as a worldwide T&D operations and information technology systems provider in two crucial ways:

- Demonstration: Before finalizing system project specifications, experience the functionality of new interconnected technologies performing multiple "what-if" scenarios in the COE's Distribution Automation Demonstration Center.
- Verification: Pre-test the functionality, interoperability, and operational expectations for new grid management systems, including non-ABB components, in the COE's unique Distribution Automation Verification Center.

ABB complete distribution grid management solutions

- Distribution Management Systems (DMS) with advanced applications
- Distribution SCADA integrated into DMS
- Outage Management Systems (OMS) with integrated workforce management
- Distribution Automation (DA) with wide area communications and distribution feeder equipment
- Substation Automation (SA) including protection and control
- Distributed Energy Resources (DERs) control and aggregation into virtual power plants
- Business Intelligence (BI) for situational awareness

Benefits

- Increase reliability
- Improve efficiency
- Expand capacity
- Lower investment risk



ABB smart grid

Distribution grid management

Improve grid reliability and efficiency

No company has invested more research and development capital than ABB to integrate equipment, software, and communications into proven, smart grid applications.

ABB smart grid applications

- Fault detection, isolation, and restoration (FDIR) helps ABB customers decrease restoration time by as much as 33% - essential after a storm when downtime risks lives.
- Volt/VAr control has reduced generation load by as much as 4-6%, helping many ABB customers reduce peak demand.

Benefits

- Faster storm response
- Decreased restoration time
- Improved capacity
- Reduced peak demand
- Higher customer satisfaction
- Better public relations

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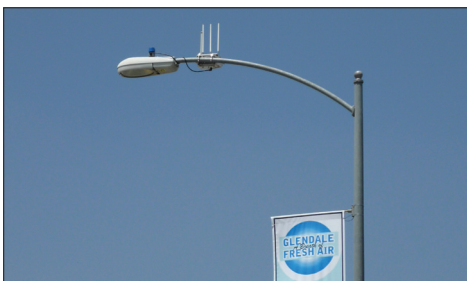
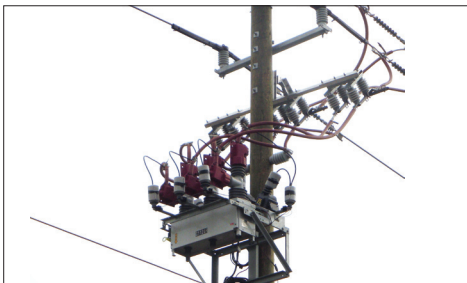


ABB smart grid Utility analytics



Optimize the grid with situational awareness

ABB utility analytics deliver the situational awareness needed for grid optimization and better health management of T&D equipment. Embedded operational intelligence in sensors, monitors, communications, software, and business intelligence enables utilities to deploy the right resources to the right problem at the right time.

ABB end-to-end utility analytics solutions

ABB smart grid analytics solutions give utilities a 360° view of what's happening on their grid and provide unparalleled decision support.

- Industry-leading grid control and performance
- Fully-integrated, enterprise-wide asset health management
- Intelligence for the integration of distributed energy resources

ABB's Asset Health Center: comprehensive asset health management

ABB's Asset Health Center is the only enterprise-wide, end-to-end solution that enables utilities to leverage the extensive domain knowledge of a major transmission and distribution manufacturer, top operations technology and information technology systems provider, and experienced global service organization into one comprehensive asset management solution.

Benefits

- Reduce downtime
- Lower operational costs
- Improve capital investment planning
- Avoid regulatory penalties and fines
- Maximize a smaller workforce
- Upgrade worker safety

ABB utility analytics deliver situational awareness for grid optimization and better asset health management of T&D equipment.

ABB smart grid

Distributed energy resources

Integrate edge of grid technologies

Distributed energy resources are changing the landscape of the energy industry by providing edge of grid technology that helps the utility improve energy efficiency and reliability. ABB's demand response solution portfolio includes the hardware, software, and decision support that enables utilities to model, control, forecast and aggregate demand.

Combining operational system and business intelligence with distributed energy resource (DER) applications creates a more dynamic, sustainable power grid.

ABB distributed energy resource solutions

ABB combines operational systems and business intelligence into a wide variety of DER applications:

- Demand response – industrial, commercial, and residential
- Distributed generation
- Electric vehicle charging infrastructure
- Energy storage and stabilization
- Microgrids
- Virtual power plants

Benefits

- Increase renewable penetration
- Achieve sustainability objectives
- Improve grid stability
- Optimize demand and supply
- Improve reliability
- Increase capacity
- Enable participation in energy markets
- Create vertically integrated energy portfolios

ABB's demand response solution portfolio includes the hardware, software, and distributed systems plus the decision support that enables utilities to model, control, forecast and aggregate demand.



Increase transmission capacity and resiliency



Energy is not always located in the most convenient locations. ABB leads the industry in providing transmission grid management solutions that limit losses and enable a secure, reliable transmission grid.

ABB has pioneered FACTS technology and delivered more than 700 systems worldwide, more than any other supplier. In addition, ABB has developed breakthrough technologies and supplied more than half of the world's HVDC projects – a unique achievement that gives ABB an unrivalled base of experience.

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ABB transmission grid management solutions

ABB offers an industry-leading transmission grid management solution portfolio.

- Energy management systems (EMS/SCADA)
- Wide area monitoring and control systems (WAMS)
- Flexible AC transmission (FACTS)
- High-voltage DC (HVDC)
- Utility scale energy storage
- Substation automation
- High-voltage sensors

Benefits

- Increased transmission capacity over existing AC lines
- Fast voltage regulation, active power control, and load flow control in meshed power systems
- Manage and eliminate bottlenecks in existing transmission systems
- Better use of capital budgets by providing an alternatives to building new power lines or power generation facilities
- Reduced loss by as much as 3% when transmitting power over long distances, such as from offshore or remotely-located renewable generation

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