Power Grids division
A brief introduction
ABB in simple terms

What (Offering)
- Power & Automation
  - Power ~ 40% of revenue
  - Automation ~ 60% of revenue

For whom (Customers)
- Utilities
  - ~35% of revenue
- Industry
  - ~45% of revenue
- Transport & Infrastructure
  - ~20% of revenue

Where (Geographies)
- Asia, Middle East, Africa 37%
- Americas 29%
- Europe 34%

- ~$40 bn revenue
- ~100 countries
- ~140,000 employees
- Single “A” credit rating
- HQ Zurich
Well positioned in attractive markets
Better fit with customer patterns

Power & Automation

Utilities

Power Grids
#1 T&D offering
Market and technology leader
Global reach
Largest installed base

Electrification Products
A leading player for LV and MV electrification

Discrete Automation and Motion
#1 in industrial motion, a leading robotics player

Process Automation
#1 in DCS, leading in process industries, marine

Industry

Power & Automation “for the grid”

Transport & Infrastructure

Power & Automation “for the site”
Power Grids division
Power and automation solutions for a changing grid

Products & components
- Traction transformer
- Power transformer
- HV\(^1\) Gas Insulated Switchgear
- HV\(^1\) Air Insulated Switchgear

Systems & integration
- HVDC\(^2\)
- Substation and Substation Automation

Services & software
- Consulting and service
- IT/OT integration and asset management

Broolest offering: Power & Automation for the grid
Power Grids division
Delivering differentiated customer value

Leveraging portfolio and expertise to maximize customer value

- Power and automation products, systems & service solutions across the power value chain
- Global footprint ensures competitiveness and proximity to customers
- Proven track record and unmatched worldwide installed base
- Lifecycle support services
- Unparalleled domain expertise backed by skilled and experienced workforce

Offering solutions through five business units

- Transformers
- High Voltage
- Grid Systems
- Grid Integration
- Grid Automation
Solutions for a changing grid – pioneering innovations

Key technology drivers

- Lowering environmental impact
- Smaller product footprint
- Cost optimization
- Intelligent products
- Higher voltages

Recent examples:

- Eco-efficient gas-insulated switchgear (GIS)
- 525 kV extruded HVDC cable
- Grid automation (digital substation)
- Ultra High Voltage
  1,200 kV AC
  1,100 kV DC
Power Grids: Business Unit - High Voltage
Offering overview

Up to 1200 kV AC and 1100 kV DC

- Gas-insulated switchgear
- Air-insulated switchgear
- Multifunction modules / hybrid switchgear
- Generator circuit breakers
- Instrument transformers
- Disconnectors
- Surge arresters
- Capacitors and filters
- Power quality solutions
- Cooling systems
- Cable accessories
- Service across the value chain

GIS & GCB

Breakers & Modules

HV Components

Service
Power Grids: Business Unit - Transformers
Offering overview

Power transformers
- Generator step-up (GSU transformers)
- HVDC converter transformers
- Specialty transformers

Distribution transformers
- Single-phase distribution transformers
- Large/ Medium/ Small distribution transformers

Dry- type transformers
- Medium voltage dry-type transformers
- Low voltage transformers
- HiDry dry-type transformers
- Line voltage regulators

Insulation & Components
- Bushings
- On-load tap changers
- Insulation and fluids
- Fuses and fuse holders

Services
Power Grids: Business Unit - Grid Systems
Offering overview

HVDC and HVDC Light
- Long-distance overhead, sub-sea & underground bulk power transmission with minimum losses
- Integrating renewables (hydro, wind, solar)
- Asynchronous connections
- Power to and from shore
- Interconnections
- City infeeds

High-voltage cables
- Submarine and underground alternating current (AC) and direct current (DC) cable systems

Power semiconductors
- T&D, industrial drives and traction applications

Consulting and service
- System consulting
- Upgrades
- Lifecycle services
### Power Grids: Business Unit - Grid Integration

#### Offering overview

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- Transmission and distribution substations
  - Air-, gas-insulated & hybrid substations up to 1,100 kV
  - Mobile, prefabricated, and containerized substations
  - Battery energy storage systems
- T&D infrastructure & grid integration solutions
  - Distribution substations for industries, railways, data centers etc.
  - Grid access for renewables / distributed generation
  - Indoor and underground substations
  - Shore-to-ship power solutions
- Flexible AC Transmission Systems (FACTS)
  - Static Var Compensation
  - Series and Thyristor-Controlled Series Compensation
- Lifecycle services
  - Consulting, Maintenance, Upgrades, Retrofits
Power Grids: Business Unit - Grid Automation
Offering overview

Enterprise Software
- Asset Performance Management
- Enterprise Asset Management & Workforce Management
- Advanced real-time control and SCADA.
- Operations and Energy Portfolio Management

Grid automation products, systems & service
- Intelligent devices for communication, protection & control of electricity networks
- Design, commissioning and service for:
  - Substation automation
  - Wired and wireless communication networks

Microgrids & Distributed Generation
- Stabilization, automation and control solutions for renewable energy generation in remote or isolated grids
- Grid connected, Hybrid, islanded solutions
Solutions for a changing grid – lifecycle support
Consulting, Service and Software for asset health management

ABB offers a range of consulting and service solutions:
- Deep domain expertise across the power value chain
- Vast global installed base
- End-to-end offering portfolio
- Cutting-edge technology and innovation
- Lifecycle management approach

Examples of service offering:
- Power plant optimization and energy efficiency
- HVDC upgrades / modernization and power quality
- Sensor based technologies
- Asset Health Management

ABB is a leader in asset management software solutions

Leveraging installed base, domain expertise & technology to deliver customer value through consulting, service, and software
Solutions for a changing grid
Opportunities to deliver value to our customers

- Integration of renewables
- Bulk transmission
- Asset management
- Microgrids
- Power transmission
- Energy storage
- Smarter grids and cities
- Power transformers and HV equipment
- T&D substations
- Power grid automation
- Grid reliability and power quality

Market drivers
- Renewables and distributed generation
- Longer transmission distances
- Power quality
- Power grid automation
- New grids: emerging markets
- Aging grids: developed markets
- Service and asset health management
Power and productivity for a better world™