



# Power and productivity for a better world ABB in Vietnam

## ABB Ltd.

<b>General Director</b>	Axel Kalt
<b>Employees</b>	878
<b>Established</b>	1993
<b>100% FDI</b>	Ownership transferred in 2002

**Investment Certificate:** No. 0110°3000°83 by Hanoi People's Committee

**ISO 9001:2008** certificate for designing and manufacturing of power transformer and distribution transformer

**ISO 14001:2004** certificate for designing and manufacturing of power transformer and distribution transformer

**BS OHSAS 18001:2007** certificate for designing and manufacturing of power transformer and distribution transformer

**ISO 900:2008** certificate for manufacturing of high voltage switchgear components, medium voltage switchgear and substations

**ISO 14001:2004** certificate for manufacturing of high voltage switchgear components, medium voltage switchgear and substations

P.O. Box 81B1 CH 8050 Zurich, Switzerland

URL Address: [www.abb.com](http://www.abb.com)

Revenue: US 36 billion (as of 2015)

Employees: 135,000 in 100 countries

**1993** Opened main office in Hanoi

**1994** Opened regional office in Ho Chi Minh City Established ABB Joint Venture for manufacturing of distribution transformers

**1996** Opened regional office in Da Nang City

**1997** Extended ABB JV license to include power transformers

**2002** Converted JV into 100% of ABB capital, named ABB Ltd.

**2005** Started strategic drive for export from Hanoi plant

**2006** Transition to local business for Discrete Automation & Motion, Low Voltage Products

**2008** Transition to local business for Medium Voltage, High Voltage and Process Automation

**2010** Opened a new branch in Bac Ninh with High Voltage and Medium Voltage factories

**2011** Opened Engineering Center to provide a high quality engineering package to customers and develop local competence

**2014** Welcomed the 1000th Power Transformer produced at ABB in Vietnam

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## Introduction of ABB in Vietnam

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### Power Grids Division

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- High voltage products manufacturing
  - Transformers manufacturing
  - Grid systems
  - Network management
  - Power generation
  - Substations
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### Electrification Products Division

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- Breakers and switches
  - Enclosures and DIN rails
  - Low voltage systems
  - Control Products
  - Intelligent building control and wiring accessories
  - Medium voltage products manufacturing
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### Process Automation Division

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- Process automation for the chemical, marine, metal, minerals, paper, oil and gas, petrochemical, pharmaceutical and semiconductor sectors
  - Measurement products and system
  - Turbochargers for marine, power and traction
  - Lifecycle services and support for automation equipment
  - Industrial maintenance management services
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### Discrete Automation and Motion Division

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- Drives and controls
  - Motors and generators
  - Robotics
  - Power conversions
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### Country Service & Engineering Center

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## Welcome to ABB in Vietnam



**ABB Ltd. ([www.abb.com.vn](http://www.abb.com.vn)) is part of ABB Group ([www.abb.com](http://www.abb.com)), a leading global technology company in power and automation that enables utility, industry, and transport and infrastructure customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in roughly 100 countries and employs about 135,000 people.**

Established in Vietnam in 1993, ABB recently has nearly 900 employees working in three regions across the country to ensure the nationwide presence of the ABB brand. The Head Office and Transformer Factories are located in Hanoi, a High Voltage and Medium Voltage power products factory is in Bac Ninh province, branch offices are in Ho Chi Minh City and Da Nang City.

ABB globally as well as in Vietnam is organised into four divisions: Power Grids, Electrification Products, Discrete Automation and Motion and Process Automation in order to serve customers in the most efficient way. Supporting four business divisions, we provide a full range of lifecycle services from spare

parts and equipment repair, training, migration to remote monitoring and technical support.

In each market and industry, we offer our customers a dedicated and competent team of sales, professional services and engineering expertise in support of the Group's extensive ranges of systems and products.

Our power and distribution transformers factories are among the 45 transformer factories worldwide. We manufacture a wide range of transformers with capacity to 63MVA and voltage to 171kV.

Being the market leader in both technology and quality, we are the largest transformers manufacturer by far in Vietnam. We are also expanding well in the export markets and local market. Our transformers are exported throughout the Asia Pacific region, serving clients from Australia and New Zealand in the south to Japan and Korea in the north. Approximately 50% of our transformer production is sold at the domestic market.



Through the years, ABB has established itself as a reliable and competent technology partner to government, private and domestic sectors and became one of the most prestigious names in power and automation technology in Vietnam.

We are committed to helping our customers to use power effectively and increase productivity in order to create a better world. We are committed to a long-term development in Vietnam, to grow along with the development of all utilities and industries in the country.

## Power Grids

Power products and services are delivered to Vietnam's utilities as well as industrial customers to help develop the country's infrastructure and improve its grid reliability.



ABB Transformers at Nghe An Sugar Cogeneration Project



ABB at Nhon Trach 110kV substation

### High voltage products

ABB offers its customers a complete range of the most competitive and innovative high voltage products (42-800kV) in the market. Packages of equipment are supplied to power stations, utilities and contractors, either directly to the end user or through a channel partner.

Our ability to supply a full range of products or 'one stop shop', where you can purchase everything you need on one contract, ensure ease of operation as well as full compatibility amongst products.

Through the local manufacturing facility in Bac Ninh, we are able to provide core components for high voltage circuit breakers. These products are delivered to ABB factories worldwide.

### Transformers

ABB is the world's largest manufacturer of transformers with over 16,000 employees working in more than 45 production facilities around the world. ABB offers a complete range of power and distribution transformers designed to grant the reliability, durability, and efficiency required in utility, industrial, and commercial applications. Our portfolio allows utilities and industrials to maximize the return on transformer assets by ensuring a high reliability, reducing life cycle costs and ensuring optimized performance while lowering environmental impact.

ABB Transformer factories in Vietnam are among the key focused factories of ABB Global transformers operating on an area of 25,000 m<sup>2</sup> and employing the latest equipment and production technology.

ABB in Vietnam's factories manufacture world-class quality distribution transformers with capacity up to 10 MVA, voltage up to 36 kV and small power transformers with capacity from 10 to 63 MVA, voltage up to 171kV. ABB in Vietnam's liquid filled transformers are manufactured in accordance with the most demanding industry and international standards serving satisfied customers from South East Asia, Pacific countries in the East to Middle East and sub-Sahara countries in the West.

## Power Grids

ABB in Vietnam provides the electric, gas and water utilities as well as industrial and commercial customers with a wide range of products, systems solutions for power transmission and distribution, integrated solutions for power generation plants, utility automation and bulk power transmission, helping customers optimize resources, operate the electric systems reliably with the maximum economic benefit.

### Power generation

ABB's Power Generation business unit offers a wide range of solutions and services for the power generation industry. Our solutions have been used in more than 4,000 power plants all over the world, ranging from small hydro plants to large fossil-fired plants.

The power plant automation systems are based on ABB's field-proven control platforms to serve power generation specific needs and requirements for plant control and optimization. ABB delivers complete systems for the electrical balance of plant (eBoP) that use a broad portfolio of products from "high to low voltage" levels. We engineer and deliver integrated eBoP projects, tailoring the systems to the specific needs of different types of power plants such as combined cycle, fossil and hydro power plants.

### Substations

We provide optimized economical and technical turnkey solutions for all substation requirements. With direct

access to ABB's technology leading range of high voltage and medium voltage equipment and transformers, we are able to provide market leading technological solutions to the conflicting demands of reliability, performance, cost and environmental impact.

We can provide substation automation solutions for efficient control, protection, automation and monitoring of new and existing substations of any type, size and topology.

### Grid systems

ABB's patented HVDC (High voltage direct current) technology is used to transmit electricity over long distances by overhead transmission lines or submarine cables. It is also used to interconnect separate power systems, where traditional alternating current (AC) connections cannot be used.

systems. FACTS solutions enable grid owners to increase the capacity of existing transmission networks, while maintaining or improving the operating margins necessary for grid stability.

### Network management

We provide centralized market and asset management systems for electrical networks, district heating networks, gas networks and energy markets. It is a system integrator that offers total telecommunication solutions for the operational needs of utility industry customers, supporting them to grow on WAN applications. We also deliver worldwide communication solutions for the utility industry, from system integrator services to turnkey projects.



ABB Transformer at Hiep Phuoc Power Plant since 1999



ABB PASS 145kV at Giam Substation

# Discrete Automation and Motion



ABB robots at Le Group plant



ABB drives at Saigon Paper

## Robotics

ABB offers world-class manufacturing automation and robotics solutions for the automotive, metal fabrication, machine tools, foundry, and consumer and plastics industries. ABB robots, from small to large, are the product of innovative process engineering and world leading robotics experience and expertise.

As Vietnam's only direct robot supplier, ABB has the best robotics combination on offer in the country: reliable products, complete turnkey solutions, and a dedicated service team.

## Low Voltage Drives

ABB is globally the number one supplier of drives, with the widest product range available, delivering solutions that closely fit customers' business needs. ABB manufactures the most

**ABB helps customers in discrete manufacturing sectors such as automotive, water, cement, solar and wind, as well as the rail segment to increase the productivity, quality, safety and energy efficiency level with the cutting-edge automation technologies, solutions and products like power electronic systems, motors and generators, drives, programmable logic controllers (PLCs), and robots.**

technologically advanced range of standard and industrial drives on the market, used in industrial, commercial and residential applications and across a wide range of industry sectors. With new technology and product enhancements, ABB continues to offer customers the most comprehensive drives and drive service portfolio. This focus on products, tools and services brings not only reducing energy costs to its owners but also improving process control, increasing production capacity, reducing maintenance costs and less reactive power.

## Medium Voltage Drives

Medium voltage AC drives from ABB are used to control the speed and torque of induction and synchronous machines where high powers are needed. By delivering precise process control through ABB's patented Direct Torque Control (DTC), our Medium voltage drives made by ABB adapt the machine speed to the actual need, thus optimizing energy consumption. Medium voltage drives ensure the highest control accuracy without the use of an encoder, despite input power variations or sudden load changes.

## Programmable Logic Controller

ABB's automation devices deliver solutions with high performance and flexibility to be effectively deployed within diverse industries and applications including water building infrastructure, data centers, renewable energy, machinery automation, material handling, marine and more.

## Power converters and inverters

ABB power converters and inverters help customers to generate and use energy efficiently. They are designed for reliable operation even under the most

demanding conditions, and for low life cycle costs.

## UPS and power conditioning

ABB's power protection portfolio is a unique line up of UPS, power conditioning and power switching products, designed to solve power quality issues for commercial and industrial applications.

Covering applications from computer rooms through to large data centers and complete industrial plant protection, ABB has the UPS or voltage conditioning technology for every need from a few kW to applications of many MW and a wide range of supply voltages.

## Power Electronics

Being a successful player in the global marketplace calls for continuous improvement in productivity, energy efficiency and profitability. We help our customers to maintain their competitive edge with latest technologies and optimized process concepts.

## Motors and generators

ABB offers a comprehensive range of motors and generators. Our products are second to none for quality, reliability and performance. ABB supplies motors and generators for every application, making you more competitive.

ABB continues to develop and invest in a better product with even higher levels of performance. ABB's 'Process Performance' motors are particularly suited to demanding 24/7 operations, where end users cannot afford the loss of production through breakdowns.

# Electrification Products



Artu switchboards, breaker & switches, DIN-RAIL products, control products at JW Marriott Hanoi Hotel



Breaker & switches, DIN-RAIL products, control products at Times City

**ABB Electrification Products are widely used to help deliver major power savings in Vietnam infrastructure like building, construction, transportation, industry and telecommunications**

## Medium voltage products

In Vietnam, we have the capability to develop, produce and deliver a full range of medium voltage ( 1-36kV ) products used in utilities, manufacturing and processing industries, infrastructure and residential, and commercial buildings.

Whilst ABB's medium voltage manufacturing facility in Bac Ninh produces Primary switchgear and Compact station solutions. Supported by a strong local engineering team, we provide customers with the benefits of a complete manufacturing facility: design, engineering, project management, manufacturing and service support.

## Breakers and switches



- Breakers
- Switches and Fusegear

ABB provides breakers and low voltage switchgear to oil and gas, mineral processing, power, water, chemical and other industries in Vietnam. ABB offers the best solution for restoring the service condition rapidly in case of fault, providing at the same time optimum protection of the electrical installation. From the miniature circuit breakers to the molded-case and air circuit breakers of the standard and high breaking capacity type, with the ABB range, every technical problems will be solved thanks to the interaction of electronics in the control and operation stages of electrical installation.

The comprehensive ABB range of Low Voltage Switches and Fusegear products including switch dis connectors, cam switches, switch fuses, fuse switch dis connectors, fuse bases, fuse links, fuse monitors, enclosed switches and cable distribution cabinets meet the requirements in industry and buildings as well as the distribution needs of utilities. They are suitable for diverse applications, in motor control centers, in switchboards and as main switches in various equipment and machines, from single to eight poles and combination switches for change over, bypass, reversing etc.

## Control products



- Control and Protection
- Electronic Products and Relays
- Connection

Quality and reliability are built into every device to ensure total performance satisfaction, even in the most demanding applications.

ABB offers a very modern and competitive range of contactors, soft-starters, starters, proximity sensors, limit switches, manual motor-starters, a wide range of electronic relays and overload relays, together with an extended program of pilot devices and PLCs.

## Enclosures and DIN rail



- Modular DIN Rail Products
- Intelligent Building Control KNX
- Enclosures and Cable Systems

From single family houses, multiple dwellings, industrial construction such as office and administration buildings, airports to special products, efficient enclosures and cable systems from ABB are used wherever power is metered and distributed.

Modular DIN Rail Products offer a wide range of different functions, which can be integrated into the operations of an installation, with significant benefits to the user. These units have been designed to offer high-level performance and make your work safer and faster.

## Low voltage systems



- MNS Conventional Switchgear
- MNS Intelligent Switchgear

Worldwide, standardised, common line product engineering ensures best in class delivery of low voltage power distribution and motor control systems.

The low voltage systems business unit offers LV switchgear, LV switchboard and LV network quality products and services.

Our engineering expertise will help you to cost effectively design or retrofit systems tailored to your demands. We pay particular attention to quality, reliability and personnel safety. With manufacturing units in 80 countries, ABB is your global partner acting locally in Vietnam. We provide you with reliable and quality switchgear for all your power distribution and motor control needs.

## Wiring accessories



- Wiring Accessories
- Industrial Plugs and Sockets
- Door Entry Systems

ABB is one of the leading wiring accessories manufacturers in the world. The times when a switch was solely restricted to its specific function are gone. Meanwhile it has developed into a decorative "design object" and set clear accents in interior design. The Busch Jaeger wiring accessories product range complies fully with the high standard of quality set forth in DIN EN ISO 9001:2008 + 14001: 2004 and BS OHSAS 18001:2007.

## Connection and Wire mangement



From the earliest days of electrical history over 100 years ago, ABB has been a leader in providing connected and wiring products for commercial and industrial construction, industrial plant maintenance, repair and operation, electrical utility distribution, and original equipment manufacturing. We offer one of the broadest product lines in the electrical industry, supplying over 70 percent of the items used in a typical electrical application.

## Process Automation

Many of ABB Process Automation integrated solutions are used to improve productivity for industrial plants such as metals, refineries, cement mills, pulp & paper plants, oil and gas production and processing and mineral processes.



Hoan Vu project

ABB delivers integrated solutions for control, plant optimization, and industry specific application knowledge and services to help process industry customers meet their critical business needs in the areas of operational profitability, capital productivity and risk management.

Through integrated process control and management information systems, industry specific know how and the ability to integrate automation and power products, ABB helps customers improve the efficiency and reliability of their manufacturing operations. These improvements in efficiency reduce industries' impact on the environment.

ABB helps customers design and implement an effective system architecture to ensure that the right information reaches people when they need it to make decisions, which directly affect business profitability and regulatory compliance.

Specifically, ABB designs and provides manufacturing execution systems, distributed control and safety systems, process analytical systems, paper quality control systems, sectional drives, force measurement, mine winders, metallurgical analyzers, electro-magnetic stirrers, brakes and stabilizers, FMS instruments for atmospheric chemistry & weather satellites, Azipod marine propulsion, marine, crane and turbochargers.

### Measurement products and system

ABB is a global leader in measurement products and systems with solutions certified to international standards, and a worldwide network of manufacturing plants, after sales service centers and calibration facilities, strategically located around the world. ABB has proven expertise in providing leading edge measurement products and system across industries such as power, water and waste water, chemical, oil and gas, pharmaceutical, pulp and paper, mining, food and other process industries. When you choose ABB, you receive the extra assurance that comes from knowing high quality products are supported by local and worldwide teams of ABB factory trained engineers.

### Turbochargers

More than 50 percent of the world's tankers, container ships, diesel and gas power stations and mining vehicles are fitted with ABB turbochargers to help them increase the power output of their engines.

Our turbochargers are backed by a global service network that operates 24 hours a day 365 days a year, to keep them in prime condition wherever they may be in the world. That network includes instant online access to the sales and service history of every single ABB turbocharger in use in the world, a vast inventory of spare parts, and global, uniform standards, solutions and processes.

When you buy or service your turbocharger with ABB, you receive our guarantee of the highest quality, genuine parts and service. Wherever ABB replaces or refurbishes your turbocharger you can be sure of the same high level of service, expertise and rapid turnaround that is found wherever ABB operates.



Song Gianh project





**We are a local leading provider of project management and engineering solutions to both utilities and process industries. We offer a full range of resources & infrastructure on engineering delivery including engineering specialists, professional project managers and experienced logistic staff that enable us to deliver all- rounded engineering solutions from individual engineering support to total engineering package of the whole project lifecycle.**

Through ABB standard project management procedures, engineering process and quality control, we are able to complete our engineering delivery in a safe, reliable, timely and cost effective manner.

With our Engineering Center and a strong track record of successful project delivery, ABB in Vietnam has become a strong local supplier of complete electrification system.

The products and systems we have covered include: Power transformers, High voltage switchgears, Outdoor/indoor medium voltage switchgears, Low voltage switchgears, Variable speed drive, PLC, Complete transmission/distribution substation system, Power plant control system, Substation automation system, SCADA system, etc.

The processing industry we are covered: Process automation system 800xA, Freelance in mining, pulp and paper and metals, oil and gas, and water treatment application projects.

The substations we are covered: Protection & control panels, Relays protection design and configuration, microSCADA system, COM600 and RTU application system.

The scope of our engineering support and delivery includes:

### **Basic Engineering**

- System HW engineering: Schematics, layouts
- Cable engineering: Schedules, cabling, wiring tables
- Cabinet engineering
- Dimension Engineering
  - DCS
  - Electrification
  - VSD Systems

### **Automation Engineering**

- System configuration & I/O Eng
- Software generation
- Process Graphics

### **Electrification System Engineering**

- Protection and control panel design:
  - MV, LV Switchgears
  - HV protection and controls
- Secondary Design



- MicroSCADA: Solution, Design, Configuration and Application
- Protection Calculation
- Harmonic Calculation

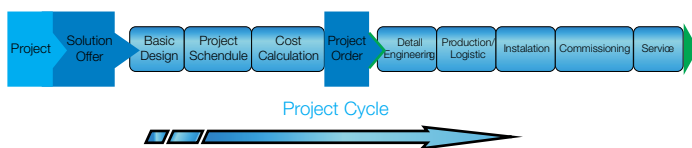
#### Site service

- Site management
- Installation supervision
- Testing and commissioning

#### Project Management

- Project Sourcing
- Documents Controls
- Logistic support

Our capability in project lifecycle support:



#### a) Power generation and industrial electrification:

- eBoP of power plant and water systems
- Plant electrification
- Automation of power plant and water systems

#### b) Substations:

- Full scope engineering of substations for utility and industrial applications up to 500kV
- Network management
- Substation automation systems involving control, protection and SCADA

#### c) Process automation systems:

- System configuration & I/O Eng.
- Advanced process control
- Safety system, Safeguard, Plantguard

Our reference projects:

#### 1. Nui Phao Mining project

Comprehensive electrical and automation packages from 10kV substation to instruments of field device which included hardware design, software configuration, project management, logistic handling, installation, commissioning and operation services.

The details are as follows:

##### • Complete 110kV substation

- Transformers: 02x110/22kV 40MVA,
- Outdoor 110kV circuit breakers dis connectors.
- Indoor switchgear: 22kV switchgears.
- 110kV HV Current transformers.
- 110kV HV Voltage transformers.

##### • 22kV and 6kV switchgear

- 6 incoming and more than 20 outgoing feeders,
- Coordination EVN testing and approval for power on.

##### • Low voltage MNS switchgear

Supply for 762 loads, total power is higher 23MW, consists of:

- Motor control center MCC,
- Soft starter Protection relay,
- Local transportation.

##### • Project management/logistic

- More than 2B various P.O. (purchase orders).

##### • Variable speed driver and soft starters

- Power range 3 640KVA,
- Power system harmonic analysis.

##### • Process control system

- PCS system size 3,000 I/O, 500 motors, 150 VSDs, and 09 controllers.

##### • Modular switch-room (E-house)

- 12 EHouses, maximum size L\*W\*H: 22m\*6.6m\*3.3m,
- Weight can be 40 tons in empty load and up to 60 tons with full installation.

##### • Document control

- 1,300 document transactions.

##### • Safety management

- Absolute performance of safety policy and training Safe project organization and safe plan,
- JHA / Risk assessment service job.



VBL Da Nang Project



CBL Cambodia Brewery Project in 2015

## 2. Heineken projects

### 2.1 VBL Da Nang Project.

- VBL Da Nang Project phase 3.1.
- VBL Da Nang Project phase 4.1.

Turnkey project consists of MV switchgear, transformers, MCC, engineering package and installation, commissioning.

- **EVN connection point design**
  - Document submitted and approved by EVN,
  - Pole mounted substation and EVN energy measurement.
- **Dry transformers**
  - For 08 substation 22/0.4 kV and 22/6.8kV range 400-2,500kVA
- **22kV switchgear**
  - More than 30 outgoing feeders.
- **22kV compact substations**
  - 03 CSS Includes transformers, Ring main unit and Low voltage switchgears.
- **Low voltage switchgears**
- **Project/logistic and site management**
- **Safety management**

### 2.2 CBL Cambodia Brewery Project

Turnkey project consists of MV switchgear, transformers, MCC, engineering package and installation, commissioning.

- **EDC connection point design.**
  - Document submitted and approved by EDC
  - CBL energy measurement
- **Dry transformers**
  - For 06 substations 22/0.4 kV and 22/6. 3kV range 800 2000kVA
- **22kV switchgears**
  - 20 outgoing feeders
- **22kV compact substations**
  - 02 CSS Includes transformers, Ring main unit and Low volt-age switchgears
- **Low voltage switchgears**
- **Project/logistic and site management**
- **Safety management**

## Services

ABB service engineers provide commissioning, on-site maintenance and repair services to the growing installed base of ABB products & solutions being used throughout Vietnam and overseas. ABB in Vietnam utilizes ABB global high-tech tools and computerized equipment to diagnose the problems quickly, which helps increase the product availability and productivity



After sales service for ABB products includes installation and commissioning services; preventative and corrective maintenance services, asset assessment and diagnostics, retrofitting, repairs, rewinds; mid-life refurbishments; and spare parts.

ABB has the edge in maintenance with over 25,000 service professionals in over 100 countries worldwide helping customers meet productivity performance challenges, improve their overall plant equipment efficiency and lower maintenance costs.

ABB's performance based contracts are designed to produce quantified, measurable results for the customers' bottom line, reducing maintenance costs and improving productivity. The focus is on creating value, assisting customers with transformational change and driving a maintenance culture centered on continuous improvement and business excellence.

From installation and commissioning, to maintenance and training, ABB provides the very best in customer care as part of an overall package.

With the intention to satisfy our customers' increasing needs for technical support and service, and access to ABB Service, the ABB Customer Support Center provides 24/7 service and technical support, including service related business inquiries, service inquiries and spare parts. All customers can reach ABB support through call center or email at any time.

The ABB Customer Support Center consolidates the company's service resources. The establishment of the center will enable customers to reach our service team easily, as well as save time and cost for technical services



Safety principle: Deliver safely, on budget, on time, in full and to the right quality.



The Health and Safety of our employees, contractors, customers and others affected by our activities is the key priority for ABB.

Our high commitment to HSE (Health, Safety and Environment) excellence and Country OHS Strategic Objectives are:

- Zero fatal or serious injury,
- Compliance with ABB OHS requirements & Vietnam Labor,
- Law Entrance Positive Safety Culture in the Company.

To achieve this, we strive to fully integrate health and safety into our operations by encouraging safety leadership at every level; recognizing that behavior is the key and that all incidents are preventable; and ensuring appropriate resources to achieve world class performance.

All ABBVN employees will participate in the “Don’t Look The Other Way” campaign. By reporting and investigating near misses and hazards (unsafe situation / unsafe conditions), we are able to better address the risks in our business and related root causes, reduce the chance of incidents and make ABB a safer place to work.

## Typical References

	Project names/Segment	Location	Scope of Supply	Delivery/ Commissioning year
Power Grids	Pass tunnel project	Central Vietnam	Turn-Key 110/22kV GIS, including SCADA	2005
	Tan Dinh Project	Southern Vietnam	150MVA Transformers for 500kV Substation and all primary equipment	2005
	220kV Substation Project	Vietnam	Complete substation equipment of Transformer, primary, secondary, Telecom & Scada	Since 2006
	Network management system	Central and Highland Vietnam	Substation rehabilitation & Mini SCADA in 4 cities Danang, Hue, Quy Nhon, Buon Me Thuot	2006
	Various Oil & Gas Projects	Malaysia	More than 190 units of Transformer from 0.16MVA to 60MVA	Since 2006
	Substation projects throughout Vietnam	Vietnam	More than 240 units of power transformer and 500 units of distribution transformer, High voltage and medium voltage Switchgear	Since 2006
	Various mining projects	Australia	More than 250 units of transformer from 1MVA to 50MVA	Since 2006
	Various Substation and Power Plant Projects	Australia	More than 150 units of transformer from 10MVA to 63MVA	Since 2006
	Various Substation and Power Plant Projects	New Zealand	More than 70 units of transformer from 2.5MVA to 40MVA	Since 2006
	Various substations	Kenya	More than 20 units of transformer from 0.1MVA to 23MVA	Since 2008
	Oil refinery plant	Central Vietnam	26 Transformers from 3,15MVA to 34MVA More than 100 Switchgear panel type Unigear ZS1	2007
	Cement plant	Northern Vietnam	Complete 110kV substation equipment to feed the entire plant	2007
	Thermal power plant	Northern Vietnam	DCS (Distributed Control Systems); Grid Connection; Generator and unit/station Transformers; MV & LV systems and cabling; DC/UPS systems	2007
	Various Substation and Power Plant Projects	Indonesia	More than 60 units of transformer from 1MVA to 60MVA	Since 2008
	Hydro power plant	Southern Vietnam	6.6kV Gas Insulated Switchgear (GIS) for auxiliary system	2008
	Various Substation and Power Plant Projects	Philippines	More than 90 units of Transformers from 2MVA to 33MVA	Since 2006
	Mining projects	Papua New Guinea	More than 30 units of transformer from 20MVA to 75MVA	Since 2009
	Substation projects	Congo DR	More than 10 units of transformer from 5MVA to 15MVA	Since 2011
	Mining project	Northern Vietnam	More than 20 units of transformer 0.2MVA to 40MVA, ABBACUS capacitor of AUABB	Since 2012
	Steel Complex project	Central Vietnam	More than 60 units of Transformers from 0.5MVA to 37.5MVA	Since 2012
	Continuous Casting Machine Steel Mill	Indonesia	More than 20 units of Transformers from 0.16MVA to 40MVA	2013
	Steel Mill project	Vietnam	110kV GIS Switchgear, 40.5kV & 24kV Switchgears	2013
	Refinery - Temporary Power Supplies	Vietnam	Compact Secondary Substations	2013
	Industrial Zone	Vietnam	24kV Ring Main Units	2013
	220kV Hydro Power Plant	Vietnam	220kV Circuit Breakers, 220kV Disconnectors and spare parts	2013
	Industrial zone Extension	Vietnam	110/22kV 63MVA Transformers, 110kV & 24kV Switchgears	2013
	Power plant	Central Vietnam	Complete 220kV Switchyard for 1200MW Vung Ang 1 power plant	2013
	Various substations	Zambia	14 units of transformers from 5MVA to 31.5MVA	Since 2013
	LNG project in Western Australia	Australia	More than 20 units of Transformers from 10MVA to 30MVA	2014
	Station for 110kV Sub-marine cable Project	Southern Vietnam	110kV 40MVA Transformer, 110kV 42MVA Shunt Reactor, Distribution transformer, Preliminary & secondary equipment, Control and protection equipment	2014
500kV Substation	Vietnam	500kV, 220kV, and 110kV Circuit Breaker & related services	2014	
110kV GIS Substation	Vietnam	110kV GIS Switchgear, 24kV Capacitor, 24kV MV switchgear	2014	
Various substations upgrade	Uganda	7 units of transformer from 10MVA to 20MVA	2015	
Electrification Products	Fastening elements factory	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2005
	Various buildings	Vietnam	ATS, Breaker & switches, DIN-RAIL products, control products, EIB, Artu switchboards	Since 2005
	Various Power companies	Vietnam	Breaker & switches, DIN-RAIL products	Since 2006
	Pharmaceutical factory	Southern Vietnam	ATS, breaker & switches, DIN-RAIL products, control products	2007
	Oil and fat factory	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2007
	BTS	Northern provinces	DIN-RAIL products, control products	2008
	Gas company	Southern Vietnam	Artu switchboards, breaker & switches, DIN-RAIL products, control products	2008
	Steel factory	Northern Vietnam	Breaker & switches, DIN-RAIL products, control products	2009
	Terminal port	Southern Vietnam	Artu switchboards, ATS, breaker & switches, DIN-RAIL products, control products	2009
	Paper plant	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2011
	Luxury Hotel	Northern Vietnam	Artu switchboards, breaker & switches, DIN-RAIL products, control products	2011
	Mining project	Northern Vietnam	MNS switchgears	2012
	Various high quality residential areas	Vietnam	Breaker & switches, DIN-RAIL products, control products	Since 2012
	Plastic Factory	Southern Vietnam	MNS switchgears	2013
	Brotex Factory	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2013
	Military Airport	Northern Vietnam	Breaker & switches, DIN-RAIL products, control products, EIB, EWA	2014
	Thermo plant	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2014
	Tourist area	Central Vietnam	Breaker & switches, control products	2014
	Computer factory	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2014
	Seafood factory	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2014
	Hospital	Northern Vietnam	Breaker & switches, DIN-RAIL products, control products	2015
	Platform	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2015
	Beer factory	Central Vietnam	Breaker & switches, DIN-RAIL products, control products	2015
	FMCG factory	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2015
	Port	Southern Vietnam	Breaker & switches, DIN-RAIL products, control products	2015
	Sugar factory	Central Vietnam	Breaker & switches, control products	2016
	06 Cement Plants	Vietnam	Engineering & Technical; Process control system; Expert software; AC drive; 110 kV substation, MCC, LVSW, MVSG; Distribution transformers; Gas analyzer; MV & LM motor; Instrumentation; Electrical cables	2007 & 2008

## Typical References

	Project names/Segment	Location	Scope of Supply	Delivery/ Commissioning year
Process Automation	Well-head platform	Southern Vietnam	Fully integrated Wellhead production platform automation	2008
	Paper plant	Southern Vietnam	800xA control system, quality control system; Power generation & distribution	2009
	Gas Terminal	Southern Vietnam	Control system and drives	2011
	Paper Plant	Northern Vietnam	Quality control system and paper machine drives system	2012
	Mining Plant	Northern Vietnam	Electrical system and Control system integratedly in e-house	2012
	Beer factory extending	Central Vietnam	Electrical system with dry transformer, MV & LV circuit breaker system, cable dynamics and bus conductor including designing, installation, engineering and commissioning.	2012 & 2013 & 2015 & 2016
	Beer factory extending	Cambodia	Electrical system with dry transformer, MV & LV circuit breaker system, cable dynamics and bus conductor including designing, installation, engineering and commissioning	2014
	Cement plant	Southern Vietnam	Supplying and Delivering material and equipment for Primary Diagram at 110kV sub-station of Binh Phuoc Cement Plant	2016
Paper Plant	Northern Vietnam	Supplying equipment and services for QCS system at Vinapaco Paper plant	2016	
Discrete Automation & Motion	Cement factory	Southern and Northern Vietnam	LV & MV drives and motors	2007- 2014
	Water plant	Southern Vietnam	LV motors, LV Drives, PLC & HMI	2009 & 2014
	Automobile factory	Northern Vietnam	19 robots in pressline, cutting, painting	2009 & 2010
	Building	Southern and Northern	HVAC LV drives, MV drives and LV drives	2009 - 2014
	Generator factory	Southern Vietnam	Robot in welding generator parts	2010
	Printing factory	Southern Vietnam	PLC, drive	2010
	Port	Southern Vietnam	Drives, PLC, HMI and Hazardous motors	2010
	Paper factory	Southern Vietnam	Drives	2010
	Printer factory	Northern Vietnam	2 robots for stamping machine tending	2011
	Motor bike part manufacturer	Southern Vietnam	3 robot system for welding motorbike parts	2011
	Paint manufacturer	Southern Vietnam	Palletizing robot system for paint pail	2011
	Beam fabrication workshop	Southern Vietnam	Beam profile cutting robotic system (by plasma and oxy-fuel) for offshore construction	2011
	Printer Factory	Northern Vietnam	4 robots for stamping machine tending	2011, 2012
	Softdrink Plant	Northern Vietnam	Palletizing robots for C2 carton boxes	2011, 2013
	Softdrink Plant	Southern Vietnam	3 palletizing robots system	2012/2013
	Refinery plant	Central Vietnam	MV & HV motors and Service for MV motors	2011 - 2014
	Oil & gas production enterprise	Southern Vietnam	LV motors and MV motors	2011 - 2014
	Fertilizer factory	Southern Vietnam	4 robots for fertilizer bags palletizing	2012 & 2015
	Beer factory	Central Vietnam	2 robots for palletizing, 1 robot for de-palletizing crates of glass beer bottles	2012
	Agricultural machine manufacturer	Southern Vietnam	Robot system for arc welding	2012
	Replacement and commissioning for fan	Southern Vietnam	LV drives	2012
	Motor river water pump	Southern Vietnam	LV drives	2012
	Paper factory	Northern Vietnam	LV drives	2012
	Excitation System Retrofit for Hydro Power Plant	Northern Vietnam	3 Excitation System Unitrol6080 for 3 x45MW units	2012
	Mining & Mineral	Northern Vietnam	LV & MV Drives and Motors	2012 - 2014
	Electronics company	Northern Vietnam	2 Static Frequency Converters with total 375 KVA; Low Harmonic Drive	2012 & 2014
	Electrical cabinet manufacturer	Southern Vietnam	Robot + positioner for welding electrical cabinet	2012
	Scaffold producing automation line	Northern Vietnam	Robot for welding scaffold	2013
	Fertilizer Plant	Northern Vietnam	Palletizing robot system for fertilizer bags	2013
	Cable ladder automatic production	Southern Vietnam	Robot for welding cable ladder	2013
	Beam & Tube Cutting System	Southern Vietnam	Beam & tube profile cutting robot system (by plasma and oxy-fuel) for offshore construction	2013
	Healthcare company	Northern Vietnam	UPS-i 1.25MVA with battery back up time 90 minutes	2013
	Plant	Northern Vietnam	UPS-i 1500 KVA with battery back up time 60 seconds	2013
	Sugar factory	Central Vietnam	MV motors	2014
	Animal feed production factory	Central Vietnam	High efficiency motor - IE2	2014
	Electrical group	Northern Vietnam	Complete arcwelding robot cell with turn table for welding electrical cabinet parts	2014
	Excitation System Retrofit for Hydro Power Plant	Southern Vietnam	2 Excitation Unitrol6080 for 2x75MW units	2014
	Excitation System Retrofit for Hydro Power Plant	Central Vietnam	4 Excitation Unitrol6800 for 4x180MW units	2014
	Mining	Northern Vietnam	MV Drives	2014
	Soya milk packaging	Northern Vietnam	Milk pouch case packing and palletizing	2014, 2015
Administrative Center	Southern Vietnam	LV Drives	2014	
Motobike parts manufacturing	Northern Vietnam	13 robots for 3 stamping lines and welding robot stations	2015	
Animal feed plant	Southern Vietnam	Palletizing robot system for animal feed bags	2015	
Electronic plant	Northern Vietnam	3 phase UPS	2015	
Excitation System Retrofit for Hydro Power Plant	Central Vietnam	2 Excitation Unitrol6800 for 2x150MW units	2015	
Hospital Medic	Southern Vietnam	3 phase UPS	2016	
Sutury Plant	Northern Vietnam	Single phase and 3 phase UPS	2016	
Government Building	Northern Vietnam	LV Drives	2016	
Pass Tunnel	Central Vietnam	LV Drives	2016	
Upgrading PM5, PM6 system for Factory	Southern Vietnam	LV Drives	2016	

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