

Indian Engineering.
Global Enterprise.

ENGINEERING SUSTAINABLE SOLUTIONS



BHEL An Overview

Established in 1964, Bharat Heavy Electricals Limited (BHEL) is the largest engineering and manufacturing enterprise in India in the energy and infrastructure sector with the capability to manufacture the entire range of power plant equipment.

BHEL caters to the core sectors like Power Generation, Transmission, Industry, Transportation, Renewable Energy, Oil & Gas, Water, Defence & Aerospace, and e-Mobility & Energy Storage Solutions, and has references in 82 countries across the globe. BHEL's mammoth size of operations is evident from its widespread network of 17 Manufacturing Units, 2 Repair Units, 4 Regional Offices, 8 Service Centres, 1 Subsidiary, 3 Overseas Offices, 5 Joint Ventures, 15 Regional Marketing Centres and more than 150 project sites across India and abroad.

Through its strategic partnerships with global technology leaders, BHEL has been acquiring technologies for the past five decades, which are adopted and indigenised at its in-house Corporate R&D Division and Research and Product Development (RPD) centres at manufacturing units that work together to evolve optimal solutions to suit customer-specific needs. While all the manufacturing units and other entities of the company have been accredited to Quality Management Systems (ISO9001), major manufacturing units have also been accredited to Environmental Management Systems (ISO 14001) and Occupational Health & Safety Management Systems (OHSAS 18001).





Power

The power generation segment comprises thermal, gas, hydro and nuclear power plant businesses. BHEL has been in this business for almost five decades, having commissioned its first coal-based set in 1969. The company has proven turnkey capabilities for executing power projects from concept to commissioning. BHEL offers a wide variety of coal-based sets of up to 1,000 MW rating, including 660/700/800 MW rating sets based on supercritical technology and sub-critical sets of up to 600 MW unit rating. The company also offers state-of-the-art emission control equipment for coal-based plants for lower carbon footprint and compliance with the revised emission norms notified by the Government of India. BHEL sets are customised for Indian conditions and fully comply with the technical standards notified by the Central Electricity Authority (CEA).

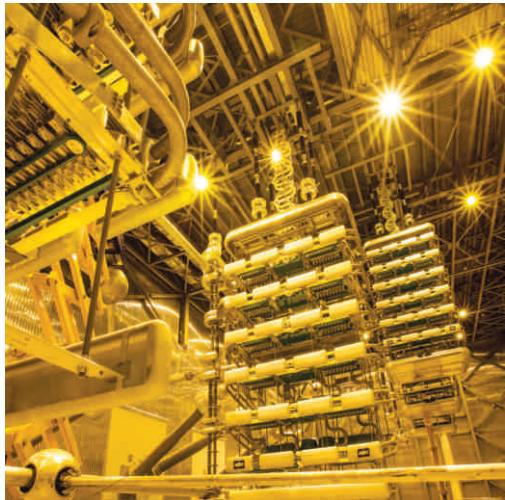
Additionally, the company supplies co-generation and combined cycle plants with higher plant efficiencies. BHEL also manufactures Circulating Fluidized Bed Combustion (CFBC) boilers that efficiently utilise the low calorific lignite available in India and has commissioned power projects based on CFBC technology up to 250 MW rating.

The company manufactures a wide range of products for nuclear reactors viz. steam generators, reactor headers & end shields, besides nuclear turbine-generator sets ranging from 220 MWe to 700 MWe ratings. Customised hydro sets from 5 MW to 300 MW of Francis, Pelton and Kaplan types for different head-discharge combinations, are also engineered and manufactured by BHEL. The company manufactures advanced-class large size gas turbines and matching generators.

BHEL has proven expertise in plant performance improvement through renovation, modernisation and uprating of a variety of power plant equipment.



Transmission



BHEL is a leader in the field of power transmission in India with a wide range of transmission systems and products and a proven track record across the globe. BHEL undertakes turnkey transmission projects from concept to commissioning on EPC basis which includes execution of EHV & UHV substations/switchyards, both AIS and GIS types ranging from 33 kV to 765 kV, HVDC converter stations (up to ± 800 kV), and reactive power compensation schemes.

The company has executed a number of High Voltage Direct Current (HVDC) projects in India, notably the world's largest ± 800 kV, 6000 MW Ultra High-Voltage Multi-terminal DC transmission link between North Eastern part of India and Agra (Uttar Pradesh). BHEL is also currently executing +800 kV, 6000 MW, Raigarh-Pugalur HVDC project, which is another milestone project in HVDC segment.

The products manufactured by BHEL include power transformers up to 1200 kV, HVDC converter transformers up to 800 kV, current transformers up to 400 kV, capacitive voltage transformers up to 1200 kV, dry type transformers, shunt reactors up to 765 kV, power capacitors, vacuum and SF₆ switchgears, gas insulated switchgear up to 400 kV, control and relay panels, SCADA, IEC 61850 based Substation Automation System, thyristor valves and controls for HVDC application, ceramic and composite insulators, FACTs devices (FSC, SVC, Thyristor Controlled Shunt Reactor (CSR)) for dynamic reactive power management of long transmission lines.

BHEL has indigenously developed India's first 400 kV Phase Shifting Transformer (PST) and commissioned it at Kothagudem power plant in Telangana. The PST contributes towards improving the transmission efficiency and also averts grid collapse in case of system instability.





Industry

BHEL supplies major equipment for a number of industries including oil and gas exploration, metallurgy and mining, pipelines, petrochemicals, chemicals, automobiles, steel, aluminium, refinery, cement, fertilizer, sugar, paper, textiles, etc. The range of products offered includes AC machines, alternators, centrifugal compressors, heat exchangers, pressure vessels, columns, fired heaters, cryogenic air separation plants, gas turbine based co-generation and combined cycle power plants, steam turbine based captive and co-generation power plants to suit requirement of different industries, turbo-generators, complete range of steam generators for process industries capable of burning a wide variety of fuels, diesel engine based power plants, electrostatic precipitators, fabric filters, etc.

Transportation

BHEL is a leading supplier of electrical propulsion systems and traction equipment for all types of rolling stock to Indian Railways, which operates one of the world's largest railway networks. India's first fully air-conditioned AC EMU is equipped with BHEL-supplied IGBT based propulsion equipment. The company also manufactures complete electric locomotives (up to 6000 HP) & EMU coaches for Indian Railways. BHEL manufactures diesel electric locomotives (up to 3000 HP) catering to the shunting requirements of various industries and power utilities.

BHEL has also diversified into the area of track maintenance machines and coach manufacturing for Metros & Indian Railways.





Oil & Gas

BHEL supplies complete onshore drilling rigs capable of drilling up to 9,000 M, with AC-SCR system or AC drives incorporating the latest state-of-the-art technology, mobile rigs, work-over rigs and sub-sea wellheads. BHEL also supplies onshore drilling rig equipment like draw works, rotary-table, travelling block, swivel, mast and substructure, mud systems and rig electrics to leading oil and natural gas exploration companies of India.

Wellheads and X-Mas tree valves up to 10,000 Psi rating onshore as well as offshore applications are also provided by BHEL to drilling companies. The company has also supplied casing support systems, mudline suspension systems and block valves for offshore application.

Renewables

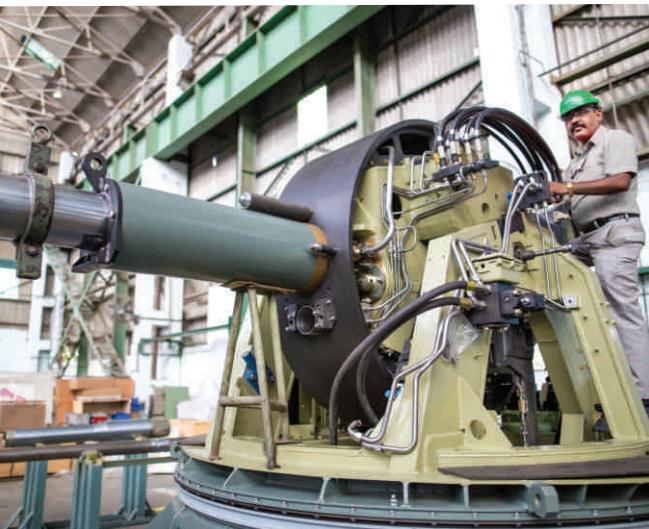
With a current portfolio of more than 465 MW in the field of photovoltaics, BHEL has generated expertise in critical parts of the silicon value chain, viz., processing of silicon wafer to cell, processing of cell to PV module and in design, supply, installation, commissioning and O&M of grid interactive utility, rooftop solar, canal top and floating solar PV power plants. Thus, offering turnkey solutions for solar PV plants. BHEL has a dedicated R&D group in the area of semiconductor materials, nano and thin film devices. ISRO has partnered with BHEL for space-grade solar panels and satellite batteries.



Water Business

BHEL offers complete Water Management Solutions including Desalination Plants, Water Treatment Plants (WTP), Effluent Treatment Plants (ETP), Sewage Treatment Plants (STP), Tertiary Treatment Plants (TTP) and Zero Liquid Discharge (ZLD) System for power plants, industries and municipal applications. The company set up its first Sea Water Reverse Osmosis (SWRO) plant in 1999.

Defence and Aerospace



BHEL has emerged as a reliable supplier of equipment and services to Indian defence forces for more than two decades with dedicated engineering and manufacturing facilities. Major products include super rapid gun mount, strategic naval equipment, integrated platform management systems, thermo-pressed components, turret castings for T72 tanks, simulators, castings and forgings, etc.

BHEL has been a reliable supplier to ISRO for solar panels and batteries for their satellites. BHEL is one of the few firms worldwide with capability to design and manufacture heat exchangers for military aircraft and is supplying heat exchangers for 'TEJAS'. BHEL is rapidly expanding its offering in the aerospace segment.

e-Mobility & Energy Storage Solutions

BHEL is committed to nation's e-Mobility mission in a significant way. BHEL had manufactured and supplied more than 300 Battery Powered Road Vehicles in the past. Presently it is geared up to provide end-to-end integrated e-mobility solutions for cities. BHEL is focusing on a diversified portfolio consisting of traction motors and controls, Lithium ion battery packs and charging infrastructure.

BHEL has a state-of-the-art facility for packaging and testing of Li-ion batteries for space applications. The company has assembled, tested and supplied more than 70 batteries of 45 Ah – 180 Ah to ISRO for use in its satellites during the last 15 years.

BHEL is also capable of delivering complete grid storage solutions with in-house developed Power Conditioning System and SCADA.

International Business



BHEL has established itself as a global player with footprints in 82 countries across the globe. Starting its journey with the first export order for Malaysia in the early seventies, the company has been expanding its references year by year. These references encompass complete power projects on EPC basis (thermal, hydro, gas), substation & rehabilitation projects, along with a wide gamut of products including turbines, generators, boilers, DG sets, control equipment, transformers, capacitors, bushings, insulators, switchgears, solar modules, motors, wellheads, castings, valves, locomotives, etc. The company has also been providing after-sales support to its overseas customers in the form of spares and services. The cumulative installed capacity of power plants overseas with BHEL-supplied equipment stands at close to 11 GW.



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BENIN
COMOROS
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EGYPT
ETHIOPIA
GHANA
KENYA
LIBYA
MALAWI
MAURITIUS
MOZAMBIQUE

NIGERIA

RWANDA
SENEGAL
SOUTH
AFRICA
SUDAN
SWAZILAND
TANZANIA
TOGO
UGANDA
ZAMBIA
ZIMBABWE

ASIA

AFGHANISTAN
AZERBAIJAN
BANGLADESH
BHUTAN
CHINA
HONG KONG
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Powering Progress...Brightening Lives. Touching Every Indian Home