

About BHEL

BHEL is India's largest engineering and manufacturing enterprise in the energy and infrastructure sectors. Established in 1964, we are a leading power equipment manufacturer globally and one of the earliest and leading contributors towards building an Aatmanirbhar Bharat. We serve our customers with a comprehensive portfolio of products, systems and services to its customers in the areas of power-thermal, hydro, gas, nuclear & solar PV, transmission, transportation, defence & aerospace, oil & gas, and water.

Right from developing country's power generation capacity to creating multiple capabilities in country's core industrial & strategic sectors, BHEL is deeply aligned to the vision of a self-reliant India. Consistent expenditure of more than 2.5% of its revenue on R&D and innovation; establishment of world-class assets, development and absorption of new technologies; and creating sustainable business solutions and contribution to the society at large through initiatives in skilling youth, health & hygiene, education, cleanliness and environment protection, stand a testimony to our commitment.

A resilient workforce, more than 32,000 strong is the driving force behind our journey over the years.



Solar module manufacturing facility at EDN, Bengaluru



Aerial view of HEEP, Haridwar

Power Sector

BHEL is one of the few companies in the world having the capability to manufacture the entire range of power plant equipment, with proven capabilities for executing thermal, gas, hydro and nuclear power projects. Offerings include:

- Steam turbines, generators, boilers and matching auxiliaries for fossil-fuel applications upto 1000 MW unit size
- Emission control equipment including Flue Gas Desulphurisation systems for SO_x emission control, high efficiency Electrostatic Precipitators for particulate emission control, and Boiler modification and Selective Catalytic Reduction systems for NO_x emission control
- Gas turbines and generators upto 299 MW unit size
- Hydro turbines and generators up to 400 MW unit size
- 220/235/540/700MWe nuclear turbine generator sets
- Plant performance improvement through renovation, modernization, uprating, residual life assessment, health diagnostics and life extension of plants

Company's pan-India presence includes a network of 16 manufacturing facilities, 2 repair units, 4 regional offices, 8 service centres, 1 subsidiary, 3 active joint ventures, 15 regional marketing centres, 3 overseas offices and current project execution at more than 150 project sites across India and abroad.

BHEL manufactures a wide range of high quality & reliable products adhering to national and international standards.


The worldwide installed base of power generating equipment supplied by BHEL exceeds 193 GW, making it the undisputed

leader amongst Indian power plant equipment manufacturers. Having installed more than 1000 thermal, hydro, nuclear, gas and solar PV based power generating sets in the country, company is now building strong foundations for cleaner and greener energy usage in future with development of critical technologies such as AUSC and coal to methanol.

BHEL is also a name to reckon with in various sectors of the industry. This is evident from supply of more than half of the traction equipment in locomotives & EMUs of Indian Railways; commissioning of 200+ electric substations and 5 major HVDC projects in the country; being the largest manufacturer and supplier of power transformers and electrical AC machines in the country, and 1.2GW+ solar portfolio spread across the country including ground mounted, rooftop, canal top and floating PV plants, among others.

BHEL plays a crucial role in the strategic sectors of the nation, being the sole Indian supplier for many technology intensive products and systems. BHEL is the only manufacturer of nuclear steam turbines in the country; the only company associated with all three stages of India's Nuclear Power programme; a major supplier of critical equipment and services in defence & aerospace sector for over three decades; and a trusted supplier of naval guns to Indian navy for their warships.

BHEL has a widespread footprint in all the inhabited continents of the world with references in 86 countries including the neighbouring countries of Bangladesh, Afghanistan, Bhutan, and Nepal, Indonesia, Oman, Iraq, Sudan, Afghanistan, United States and New Zealand. Till date, around 11 GW power generating capacity has been installed in overseas markets. An additional 6 GW is under execution, including the 2x660 MW Maitree Super thermal power project in Bangladesh and 4x225 MW Arun-3 Hydroelectric project in Nepal.



3x660 MW North Karanpura Thermal Power Station under commissioning by BHEL in Jharkhand


Industry Sector

BHEL's major offerings for Energy, Industry and Infrastructure sectors include:

- **Transportation:** IGBT based propulsion equipment (traction converter/auxiliary converter/Vehicle Control Unit), traction transformers for electric Locos and ACEMUs/ MEMUs, EMU coaches, electric locomotives upto 9000 HP and diesel electric locos upto 3000 HP
- **Renewables:** EPC solutions from concept to commissioning for grid connected and standalone solar PV applications
- **Defence & Aerospace:** Strategic equipment for Indian defence forces including Super Rapid Gun Mount & Integrated Platform Management System for naval ships, compact heat exchangers, space grade Lithium ion cells, space grade solar panels and space grade batteries, Hot forming of spacecraft propellant tank, Forming of Titanium Shell/Domes, welding & machining of Titanium sheet and tubes
- **Energy storage solutions & other business areas:** EPC solutions for Electric vehicle charging station including Solar Based EV Charging stations, battery energy storage systems; EPC solutions for railway track electrification; complete water management solutions for power plants, industries and municipal applications; medical oxygen plants
- **Captive Power & process plants:** standalone STGs, BTG package, GTG, Refinery CPP on EPC basis, UB package, Downstream oil and Gas packages.
- **Transmission:** EHV substations ranging upto 765 KV, UHV substations and HVDC converter stations up to ± 800 KV, power transformers, shunt reactors, vacuum switchgear, gas insulated switchgears, ceramic insulators, Flexible AC Transmission system devices etc.
- **Industrial products:** Oil rigs, wellheads & Xmas tree valves, mechanical packages, fabricated equipment & boiler feed pumps, compressors & AC machines

BHEL is leveraging on its technology capabilities and committed workforce to transform itself. Asserting leadership in core business, diversifying the business mix, cost optimisation, efficiency optimisation & innovative technological solutions are the major

enablers driving company's competitiveness in its businesses. BHEL is reimagining its future with focus on turning around the immediate challenges and building a strong base for sustainable growth in the near future.



Utility boiler and STGs commissioned by BHEL at IOCL Paradip, Odisha

BHEL has been a long standing and reliable partner of Indian Railways offering a wide range of products and propulsion systems for all types of rolling stock.

Indian Railway's first 9000 HP freight locomotive equipped with propulsion system indigenously developed and supplied by BHEL including Traction Converter, Vehicle Control Unit (VCU) and high power Traction Motors has been commissioned during the year. This loco will be used in Western and Eastern Dedicated Freight Corridors, substantially improving the efficiency of Indian Railway's freight operations.

Rapid Strides in MODERN *Transportation !*

BHEL also supplied and commissioned 6000HP WAG9H locomotives to Indian Railways during the year, ahead of the schedule.

With its engineering and product development capabilities, BHEL is fully geared-up to provide innovative solutions to address the upcoming requirements of rail transportation.





PAN INDIA PRESENCE



Manufacturing Plants/ Unit Locations

BHEL Manufacturing Units

BHEL Manufacturing Units	Bengaluru	1. Electronics Division (EDN)
		2. Electronics Systems Division (ESD)
		3. Solar Business Division (SBD)
	Bhopal	4. Heavy Electrical Plant (HEP)
	Goindwal	5. Industrial Values Plant (IVP)
	Haridwar	6. Heavy Electrical Equipment Plant (HEEP)
		7. Central Foundry Forge Plant (CFFP)
	Hyderabad	8. Heavy Power Equipment Plant (HPEP)
	Jagdishpur	9. Fabrication Stamping & Insulator Plant (FSIP)
	Jhansi	10. Transformer Plant (TP)
	Rudrapur	11. Component Fabrication Plant (CFP)
	Ranipet	12. Boiler Auxliaries Plant (BAP)
	Tiruchirappalli	13. High Pressure Boiler Plant (HPBP)
		14. Seamless Steel Tube Plant (SSTP)
	Thirumayam	15. Power Plant Piping Unit (PPPU)
	Visakhapatnam	16. Heavy Plates & Vessels Plant (HPVP)

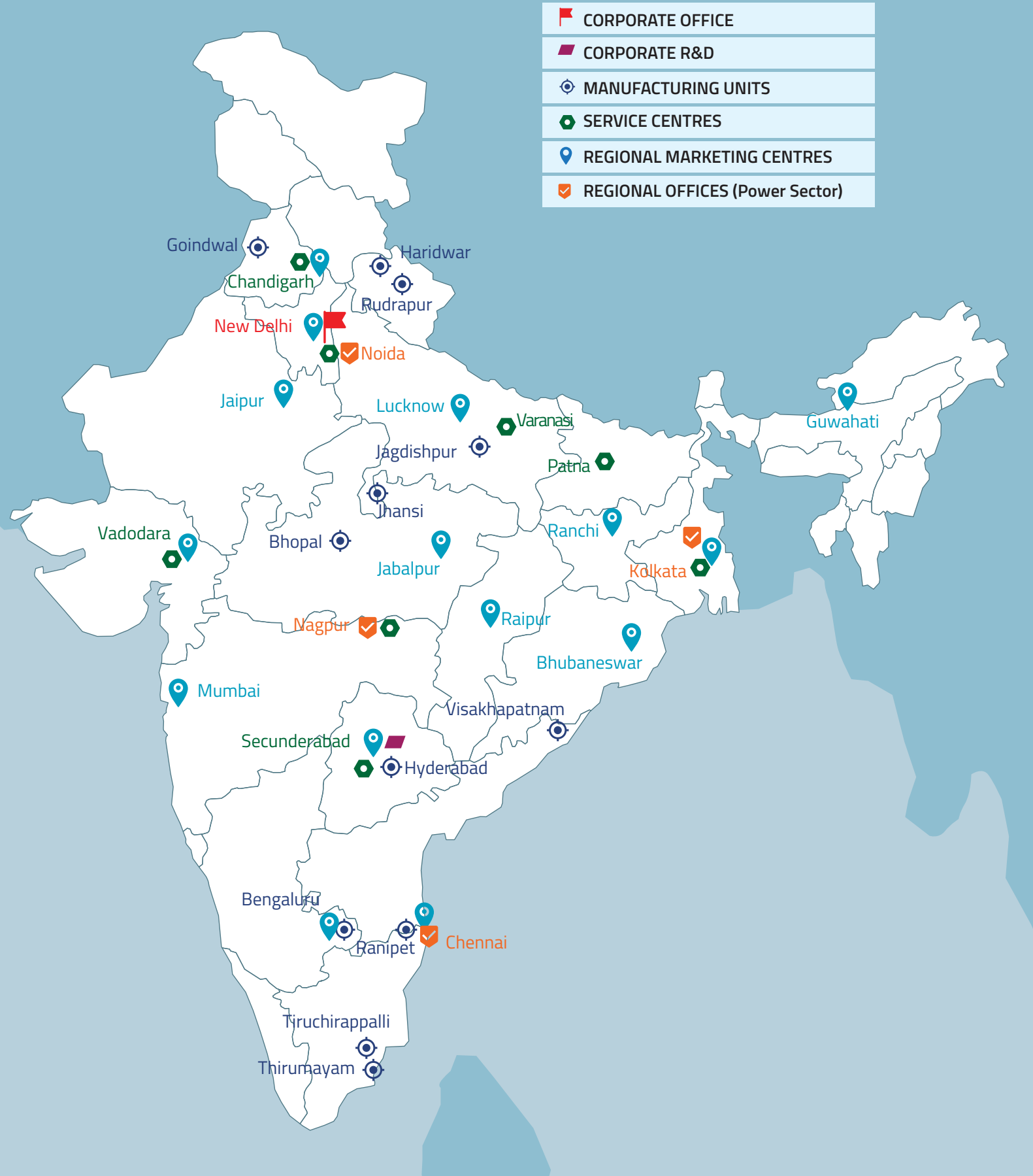
BHEL Repair Units

Mumbai	1. Electrical Machine Repair Plant (EMRP)
Varanasi	2. Heavy Equipment Repair Plant (HERP)

BHEL Subsidiary

Kasaragod	1. BHEL Electrical Machines Ltd. (BHEL-EML)
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	CORPORATE OFFICE
	CORPORATE R&D
	MANUFACTURING UNITS
	SERVICE CENTRES
	REGIONAL MARKETING CENTRES
	REGIONAL OFFICES (Power Sector)



World of BHEL

A National Institution

- One of the largest engineering & manufacturing companies in India serving core sectors of the economy
- Pan India presence with 16 Manufacturing Units and 150+ project sites globally

Vision



A global engineering enterprise providing solutions for a better tomorrow

Mission



Providing sustainable business solutions in the fields of Energy, Industry & Infrastructure



Energizing India

- 193+ GW power generating equipment installed in India and abroad
- 18,250+ MW Captive Power Plants commissioned
- 1.2+ GW total solar portfolio
- BHEL manufactured equipment constitutes 55% of thermal power generation capacity, 47% of nuclear power generation capacity (secondary side) and 45% of hydro power generation capacity in the country

Unparalleled contribution in core sectors

- 6,90,000+ MVA transmission equipment supplied
- 32,550+ AC machines supplied
- 760+ Locos supplied to Indian Railways and Industries
- 410+ Compressors supplied and 90 Oil drilling Rigs-Supplied
- 13000+ Well Heads & Christmas Tree valves supplied
- 40+ Super Rapid Gun Mount supplied for Indian Navy ships

Global Footprints

- Footprints in 86 countries
- 11 GW power generation capacity built outside India; 6 GW under execution
- Two overseas Solar PV projects contracted

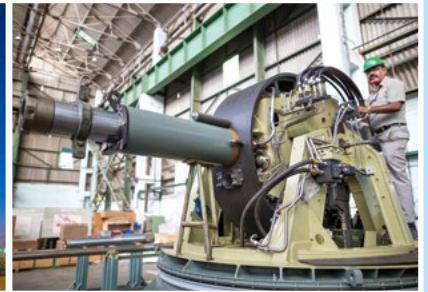
Valuing people

- Committed workforce, more than 32,000 strong
- ~1900 Female employees
- 9000+ Engineers
- Participative management culture since 1973



Did you know?

- BHEL developed HP Turbine with composite welded Inner casing of two dissimilar metals for AUSC application for the first time in the country.
- BHEL has indigenously developed Passivated Emitter and Rear Cell (PERC) technology for high efficiency c-Si solar cells
- BHEL commissioned first-of-its-kind 1.7 MW SPV plant supplying power directly to traction grid of Indian Railways at Bina, Madhya Pradesh
- BHEL supplied the first indigenously developed 500 kW Main Motor Generator for strategic application of Indian Defence forces
- BHEL has successfully developed and supplied 3-phase AC Induction Motors and Traction Alternators for 3000 HP cape gauge locomotive applications for Mozambique Railways



Technology for a sustainable future

- In house development of Advanced Ultra Supercritical (AUSC) and Coal to Methanol technologies progressing
- Spearheading the development, installation and indigenisation of emission control equipment for coal based power plants in India
- Carbon footprint avoidance of nearly 26,118 MT MT of CO₂-equivalent through in-house 28MWp solar power installations
- Developed efficient EHV Transmission systems and products (including ± 800 KV HVDC)
- 12 townships of BHEL units declared as 'Single Use Plastic Free'

Growing with society

- Supplied over 5,75,000 cubic meters of medical oxygen to the country during second COVID wave
- Committed to Principles of UN Global Compact
- Signatory to Integrity Pact of Transparency International
- 35,500+ saplings planted across BHEL during 2020-21 to enhance green cover
- BHEL Trichy is creating one-of-its-kind BHEL Vann, to preserve native trees and planting half a million trees by 2022

Innovation

- R&D Expenditure consistently >2.5% of revenue
- Collaborative R&D with leading academic institutions & research organizations
- Five research institutes; 14 Centres of Excellence
- In-house R&D Centres of 12 Manufacturing units & Divisions recognized by DSIR

Recognition of Excellence

Continuing the tradition of securing prestigious national and international recognitions, BHEL and its employees have won several awards during the year. Notable among these include:



Governance Now 8th PSU Award under **Maharatna Category** for: -

- » **HR Excellence** in demonstrating excellence in overall HR initiatives.
- » **Digital Transformation** in demonstrating excellence and innovation in securing its information and digital infrastructure.
- » **Research & Innovation**

Golden Peacock National Quality Award 2020 in Power Equipment Sector.

Golden Peacock Environment Management Award 2020 in Power Equipment Sector.

Clarivate South and South East Asia Innovation Award 2020, putting BHEL among top 28 innovators in South East Asia based on Volume of patents, Grant success rate, Extent of globalization, Influence of innovation.

Largest Participating Corporate Trophy at Airtel Delhi Half Marathon 2020.





Institute of Chartered Accountants of India honoured BHEL with the prestigious Plaque for **Excellence in Financial Reporting 2019-20** in the category of Infrastructure and Construction Sector. This award was conferred by Shri Arjun Ram Meghwal, then Hon'ble Union Minister of State for Parliamentary Affairs and Heavy Industries & Public Enterprises in the presence of Dr. Anil Agrawal, Hon'ble Member of Parliament, CA Atul Kumar Gupta, President ICAI and other dignitaries in recognition of excellence in preparation and presentation of qualitative Financial Information.

Director (Finance) was conferred the honour of '**BEST CFO PSU**' in a virtual ceremony at the **CFO & Financial Strategy Summit & Awards 2021**, organised by BW CFO World in association with BW Businessworld.

Certificate of appreciation by Central Board of Indirect Taxes and Customs, Ministry of Finance (in respect of multiple states) for substantial contribution, prompt filing of return and timely payment of Goods and Services Tax to Government, thereby substantially contributing in building a strong and resilient nation.

Gold Award under **APEX India Occupational Health & Safety Award-2020** for outstanding achievement in Occupational Health & Safety (OH&S) Management in Engineering Sector.

Special Commendation for the **National Award for Innovative Training Practices** by Indian Society for Training & Development.

Ranked among top 10 in Times Ascent Dream Companies to Work For by World HRD Congress. Received the award in the category of Organization with Innovative HR Practices.

Times Ascent HR Super Achievers Award to **Sh. Anil Kapoor**, Director (HR) by World HRD Congress.

Platinum Award under **APEX India HR Excellence Award- 2020** for excellence in HR practices in Engineering Sector.

SKOCH Gold Award for Cyber Security resilience during Covid-19 pandemic.

Scope Meritorious Award for R&D 2016-17 for Technology Development and Innovation.

SKOCH Order of Merit Award for Inspirational or Transformational Performance during Covid for various projects.

SKOCH Order of Merit Award for Digitalisation of HRM Processes.

First prize of Kaushalacharya Award 2019-20, recognising the mentorship spirit of the organisation towards the Engagement of apprentices in its establishments.

Platinum recognition under **CII EXIM Bank award for Business Excellence 2020** as per EFQM 2020 model to HEEP Haridwar.



Unleashing *the* **Nuclear Power!**

BHEL has been leading from the front for over four decades in the development of Nation's Nuclear power segment, with it being the only Indian company to be associated with all the three stages of the Nuclear Power Programme.

BHEL is the only company in India having design and engineering capabilities in TG sets for nuclear applications. 12 Pressurised Heavy Water Reactors (PHWR) out of the total 18 PHWRs operating in the Nation, accounting for 74% of the Nuclear Power capacity are equipped with BHEL supplied Steam Turbine Generator sets (10 units of 220 MWe each and two units of 540 MWe), showcasing BHEL's contribution in helping attain maturity for the first stage of the Nation's indigenous Nuclear Power Programme.

BHEL is fully geared up to address the 700 MWe 'TG Island' business on 'EPC' basis for the upcoming PHWRs which are being procured by NPCIL under Fleet Mode. Emerging as the lowest bidder for the same, BHEL has reaffirmed its leadership in engineering & manufacturing of Nuclear Steam Turbines.

