



Sustainability *Report* 2016-17





VISION

A global engineering enterprise providing solutions for a better tomorrow

MISSION

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



VALUES

- GOVERNANCE** : We are stewards of our shareholders' Investments and we take that responsibility very seriously. We are accountable and responsible for delivering superior results that make a difference in the lives of the people we touch.
- RESPECT** : We value the unique contribution of each individual. We believe in respect for human dignity and we respect the need to preserve the environment around us.
- EXCELLENCE** : We are committed to deliver and demonstrate excellence in whatever we do.
- LOYALTY** : We are loyal to our customers, to our company and to each other.
- INTEGRITY** : We work with highest ethical standards and demonstrate a behaviour that is honest, decent and fair. We are dedicated to the highest levels of personal and institutional integrity.
- COMMITMENT** : We set high performance standards for ourselves as individuals and our teams. We honour our commitments in a timely manner.
- INNOVATION** : We constantly support development of newer technologies, products, improved processes, better services and management practices.
- TEAMWORK** : We work together as a team to provide best solutions & services to our customers. Through quality relationships with all stakeholders we deliver value to our customers.



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Chairman & Managing Director's Message

Dear Stakeholders,

It is with great pride that I present before you BHEL's Annual Sustainability Report which covers the company's Sustainability performance for the reporting period 2016-17. As a global enterprise, with footprints in 82 nations, our mission is to strive constantly to deliver sustainable solutions for all the stakeholders. Sustainability is imbibed in the values of BHEL and we strongly believe in judicious use of resources to preserve the environment. This report highlights the journey of BHEL on the path of Sustainability in sync with the "New India" vision given by our Hon'ble Prime Minister.

Forces of change such as climate change, technology disruptions, fragile geopolitics, newer regulations, urbanization and changing energy-mix are leading to emergence of newer challenges. The world is changing its priorities by focusing on preservation of environment and our organisation is geared up to this challenge and is developing & assimilating greener technologies including renewables. The company's total solar portfolio exceeds 370 MW after winning orders of 131 MW during the year.

Approx. 14.82 million units of energy were generated through in-house solar power installations & carbon footprint avoidance was 14,378 MT CO₂-e during 2016-17. The company has invested 2.75% of its turnover (Rs. 793.62 Cr.) on R&D during 2016-17 and the total intellectual capital of the company has enhanced to 3915 patents and copyrights. A total of Rs. 6025 Crore of the company's total turnover has been achieved from its in house developed products. Some of the key initiatives that has been undertaken to create a sustainable BHEL of tomorrow is summarised as:

- Developing Advanced Ultra Super Critical (AUSC) technology for higher efficiency thermal power plants, jointly with NTPC and IGCAR under the aegis of Government of India.



- Expanded the manufacturing capacity of solar cells to 105 MW and that of solar modules to 226 MW per annum.
- Developing new products and services such as emission control equipments, lift irrigation systems, enhanced offerings for nuclear power, water treatment solutions, waste water treatment systems, energy storage solutions, e-mobility solutions and expanding spares and services business.

The organisation is moving ahead relentlessly in its journey for 'Creating BHEL of tomorrow', a BHEL that is 'Responsive, Robust and Rising' to the needs of its stakeholders. Going forward, we will continue to serve the community through various socio-economic and community development programmes to promote skill development, education, improvement of living conditions and hygiene in villages and communities located in the vicinity of our manufacturing plants and project sites spread across the country and to develop & assimilate greener technologies for preserving the environment for the future generations.

Sobti

(Atul Sobti)





*Message
From
Director (HR)*

Dear Stakeholders,

For BHEL, Sustainability is about creating wealth for its stakeholders through growth which is sustainable, as well as attained in a socially acceptable manner while remaining within assimilative capacity of our ecological environment.

The triple bottom line approach for Sustainable Development is ingrained in all our Business processes. Thus, while striving for higher growth in the organization we have always been conscious and committed towards conservation of environment and sharing this created value with the society in more inclusive manner. Our R&D efforts too are focussed towards development and diffusion of technologies that reduces environmental footprints.

BHEL continued to tread the path of Sustainable Development during 2016-17 as well and has taken many initiatives which includes installation of a new Sewage Treatment Plant (STP) of 2 x 4 Million Litre Per Day (MLD) capacity at its HPEP Hyderabad unit. The treated discharge from this STP is being used for horticulture purpose in the factory premises thus making our HPEP Unit another Zero Liquid Discharge (ZLD) unit. Further, 40 kW rating Bio-Gasifier plant has been installed in TP, Jhansi unit for gasification of biodegradable solid wastes. The gas so produced is being used in the unit's canteen for cooking purpose. During the year, a 5MW_p solar power plant has been installed in Trichy unit which will further boost our efforts in moving towards sustainable energy mix in our operations. Our BAP-Ranipet and HPEP-Hyderabad units are already having Mega Watt (MW) scale solar power plants. Similar Solar power plants are being planned by some of the other units too. In addition to the above, our Units and Divisions continued incremental developments activities in areas like creating water harvesting facilities, plantation, recycling & reuse of solid wastes and waste water, recycling of lubricants and cutting oils to reduce use of fresh oil, energy conservation activities, and steps to reduce/control pollution in our manufacturing activities and services.



Thrust on CSR initiatives continued in the areas of education, skill development, promotion of health, livelihood promotion, women empowerment, promotion of renewable energy, sanitation and safe drinking water with an objective of promoting inclusive growth in communities in vicinity of our manufacturing plants in specific and across the country in general.

The present report has captured the specific efforts made towards addressing the tenets of Sustainable Development especially during 2016-17. Your feedbacks are welcome for making our future Sustainability Report more robust.

(D Bandyopadhyay)



REPORT PROFILE

The present report covers the snapshot of the journey of Bharat Heavy Electricals Limited (BHEL) which the organisation has covered treading the path of sustainability during 2016-17 and contributed towards nation building through supply and usage of cleaner technologies as well as promoting inclusive growth through its CSR initiatives.

The report is BHEL's 6th Annual Sustainability Report and has been prepared as per the framework of GRI-G4 for sustainability reporting. The data has been provided for multiple years wherever available for showing our performance over a time period. The data for this report has been given by the units for compilation at Corporate office.

All calculations have been done as per the standard calculation methodology followed in United Nations Framework Convention on Climate Change (UNFCCC) protocol, Calculation tool for Direct Emissions from Stationary Combustion – World Resource Institute (WRI) / World Business Council on Sustainable Development



3x660 MW Lalitpur Supercritical TPP commissioned by BHEL in Uttar Pradesh

(WBCSD), Green House Gas (GHG) Protocol, Central Electricity Authority (CEA) data for grid emission factor etc. The contents of the report have been developed on the principles of materiality, stakeholder inclusivity and responsiveness as applicable to BHEL's present sustainability context and stipulated in GRI framework.



Indian light combat aircraft, 'Tejas' equipped with compact and light-weight heat exchangers developed by BHEL



INS Kolkata, the lead ship of the Kolkata-class guided-missile destroyers of the Indian Navy, equipped with BHEL make 76 mm Super Rapid Gun Mount (SRGM) naval gun

We strongly believe that your feedback on our report will prove invaluable in improving the quality of our future reports. We shall be highly thankful to you for providing your valuable feedback on this report. Feedback can be e-mailed at ajitshar@bhel.in



OPPORTUNITIES, THREATS & WAY FORWARD**Key Opportunities & Threats**

Domestic economy is experiencing a turnaround but is still affected by the uncertainties. Economy has grown at 7.1% in 2016-17. Gross domestic product (GDP) growth slowed to 6.1% in the fiscal fourth quarter from 7% in the third. RBI has projected Gross Value Added (GVA) growth of 7.3 % in 2017-18 as compared to 6.6% in 2016-17. Important economic reforms and government initiatives are expected to stimulate capital expenditure, rural demand, and social and physical infrastructure invigorating economic activity. Over the medium run, the roll out of the Goods and Services Tax (GST), follow-up to demonetization, and enacting other structural reforms should push the economy towards a higher growth path.

Many initiatives taken by the Government in the form of Make-in-India, Start Up India and e-biz Mission Mode Project under the national e-governance plan, the Insolvency and Bankruptcy Code, and the abolition of the Foreign Investment Promotion Board are facilitating investment and ease of doing business in the country. "Make in India" platform presents a plethora of opportunities with major initiatives taken in various sectors like Defence, Transportation, Transmission, Renewables etc. Sectoral push for Solar, Urban transportation, Dedicated Freight Corridor, e-mobility & Green energy corridor will open new avenues for long term sustainable growth. The opportunities have been detailed in the respective chapters on Business sectors under Annexure-I of BHEL's Annual Report [AR] 2016-17 from page 30 to page 50.

Today, Climate Change is a critical concern which presents both enormous challenges as well as opportunities. Significant cuts in Green House Gas (GHG) emissions from energy need to be achieved either through reducing emission generation by replacing old power plants with one having more efficient technology or by employing energy efficiency measures. The government is adequately focusing on meeting the energy needs through a balanced mix of sources consisting of renewables, clean coal, Nuclear & Hydro. This focus in the recent past has led to continued cost reductions and acceleration in installation of clean energy sources in the country. Development of grid-based power storage is also being focused upon. But one of the biggest concerns for the country today is the investment slowdown which has taken hold of the economy for quite some time and is deeply rooted in the structural debt overhang problem of a number of country's industrial sectors, power sector being the prominent one. This excessive debt is saddled on the bank balance sheets which is further hindering credit growth and a revival of investment cycle in the country. This twin balance sheet problem - over-leveraged corporate sector and stressed banking sector - may delay the revival in private investment demand.

The global economy continued to recover during 2016, albeit at a slow pace amidst increasing uncertainty. World growth is expected to rise from 3.1 percent in 2016 to 3.5 percent in 2017.

But these positive developments do not take away the impediments to a stronger recovery. The growth rate in China was a bit stronger than expected, supported by continued policy stimulus. Geopolitical tensions in Iraq, Libya, Yemen, the Syrian Arab Republic and Ukraine have already had economic impacts at the national and sub-regional levels and the outlook over the medium term is not clear. Major economies of the world are engaged in simmering issues with other economies and inward-looking policies threaten global economic



integration and the cooperative global economic order, which have served the world economy, especially emerging market and developing economies, well.

Positioning for the Future

Today, India is on the cusp of a higher economic growth. The new era will present new growth opportunities. BHEL has embarked upon a transformation journey with a vision of 'Creating BHEL of Tomorrow' – creating an organisation which will be Rising, Robust and Responsive to the needs of customer, employees, shareholders and society. Leveraging BHEL's capabilities, glorious past and contribution in the nation's building, the company is putting a series of efforts focussed on sustaining growth and profit; asserting leadership in core business and developing people & digital capabilities; and finally, building capabilities in new businesses and technology for sustained growth.



Execution, Consolidation & Simplification (ECS)

Creating momentum for growth and making operations profitable in the shortest possible time has been the immediate priority of the company in recent times. To attain this, the company has been focussing on Execution, Consolidation & Simplification as the major enablers.

i. Execution: The immediate focus is on bringing speed in Execution and improving system capabilities. Major initiatives taken include conversion of non-executable orders into executable ones; focus on quarterly business performance in addition to annual results and; formation of 'Project Closure Synergy Group' (PCSG) for swift resolution of outstanding issues of identified projects to expeditiously realise balance payments & close projects.





ii. Consolidation: To improve operational efficiency and reduce operations cost, structural layers of duplication in the organisation are being removed through consolidation of various structures and establishments. Corporate Functions have been reorganised to give more focus to execution of strategies and, enhance their responsiveness towards customers, internal and external both. Consolidation of consistently non-performing products and assets is also being examined.

iii. Simplification: The company is making an endeavour to simplify systems, procedures and policies to eliminate waste, low-value activities and multiplicity of works.

Business Strategy: Power Sector

Energy sector is under transition; so is the power sector business of BHEL. The organisation needs to be assertive in protecting leadership in the core business and towards this, the Company is developing solutions to enhance value propositions in the existing portfolio. Organization has been restructured and new business groups for Hydro & Nuclear business have been formed to enhance responsiveness towards customers. Company is also making effort to expand core business area by offering new products and services such as emission control equipments, Lift Irrigation Systems, AUSC technology, primary side capabilities for nuclear and, expanding spares & services business.

Business Strategy: Diversification

Engineering and manufacturing are the core strengths of BHEL. Leveraging these strengths, the company is swiftly moving to capitalize emerging opportunities in solar power, transportation, defence and water business



"160 kW rooftop Solar PV plant commissioned by BHEL at Hyderabad, Telangana"



with the objective of increasing share of business from 'non-coal' areas. Accordingly, new business groups for Defence & Aerospace Business Group (DABG), Transportation Business & Systems Group (TBSG) and, Energy Storage Solutions (ESS) have been formed to harness emerging opportunities and consolidate the existing capabilities.

Leveraging three decades of experience in **Solar PV** and with focus on capacity & capability enhancement, BHEL's share of business in Solar is gradually increasing. BHEL has expanded manufacturing capacity of Solar PV cells from 8 MW to 105 MW and modules from 26 MW to 226 MW, at its manufacturing units at Bengaluru. The company has expanded its offerings in EPC solutions for both Grid Interactive and Off-Grid Solar PV power plants of utility scale and rooftop applications.

Capability building and establishing a strong technology base are the focus areas to strengthen the existing and developing the new businesses in urban transportation, defence and aerospace business.

With the revival of demand from Indian Railways and emerging opportunities in urban metro **transportation** as well as semi and high-speed trains, BHEL is focusing on business opportunities in these areas. BHEL is working with Indian Railways for IGBT based Propulsion Equipment required in air-conditioned ACEMU and Traction Converter for DE locomotives. BHEL is also engaged in development of Electric Power Train for electric vehicles/buses with an automobile partner. In parallel, BHEL has developed prototype Hybrid (Grid and/or Solar PV based) Wayside Charging Stations.

Defence provides new opportunities and the company is working on expansion of this portfolio. Towards this, BHEL has been nominated as the production agency for major Gun Systems for Indian Navy. The company is also being considered for production of Marine Gas Turbine for naval applications.

Strengthening EPC capabilities and technological advancements are central to growth in the business of transmission products and systems. BHEL has strengthened its higher voltage **transmission** portfolio with indigenously developed 1200 kV class Transformer and 765 kV Transformers and Reactors. The company is gearing up to address Extra High Voltage Gas Insulated Switchgear (EHV GIS) business with its in-house developed products as well as strengthening EPC capabilities in 765 kV segment.

To harness growth opportunities in **water** business, the company is strengthening existing business and adopting new business models. BHEL offers turnkey solutions from concept to commissioning for various feed water characteristics. The company is also gearing up to address Sewage Treatment Plant (STP) business and Large Scale Desalination with O&M.

Business Strategy: Global

BHEL has been continuously striving to align its export strategies in line with global dynamics. Currently, the company is focusing on deepening its global presence through market expansion and market penetration. With maiden orders from Chile and Estonia, the company has expanded its global footprint to 82 countries.

Digital Strategy



For harnessing digital technologies, to create new growth opportunities and to enhance operational excellence, a digital transformation strategy has been developed and 'Corporate Digital Transformation' group has been formed to execute it. Diagnostics & predictive maintenance services, digitalization of all employee-facing services and, developing digital platforms for enhancing employee engagement are the priority initiatives.

People Development

Developing people and orienting them towards organisation transformation strategy is a key imperative. In the current situation, both the demography of the employees and the business-mix are under transition. 'Corporate Learning and Development' (CLD) group has been formed and assigned the responsibility to improve alignment of training and development with business strategy. Further, technology interface is being enhanced with the objective of 'Ease of learning, Ease of sharing, Ease of access to support learning endeavours of the employees.

Innovation

Ability of the company to indigenise technology as per Indian operating conditions and upgrade existing products to contemporary levels through in-house efforts is BHEL's key competitive advantage. This has been possible due to consistent focus of the company on R&D and Innovation. Prevailing challenges in the environment viz. urbanization, climate change and the associated regulations are also creating demand for new products. Therefore, BHEL is further strengthening Engineering and Technology base through outcome based approach. '**Corporate Technology Management**' (CTM) group has been formed to strengthen Engineering and R&D capabilities in an integrated & focused manner.



ORGANIZATIONAL PROFILE

About the organisation

BHEL is one of the largest engineering and manufacturing companies of its kind in India. The company is engaged in design, engineering, manufacture, construction, testing, commissioning and servicing of a wide range of products and services for the core sectors of the economy, viz. Power, Transmission, Industry, Transportation, Renewable Energy, Oil & Gas and Defence with over 180 product offerings to meet the needs of these sectors. Since its inception in 1964, BHEL has been the solid bedrock of evolution of India's Heavy Electrical Equipment industry.



New turbine blade shop facility at BHEL, Haridwar

BHEL has a mammoth 20,000 MW per annum capability for manufacturing of power generation equipment. A widespread network of 17 manufacturing units, 2 repair units, 4 regional offices, 8 service centres, 1 subsidiary, 4 overseas offices, 6 joint ventures, 15 regional marketing centres and current project execution



Transformer Shop at BHEL Jhansi

at more than 150 project sites across India and abroad corroborates the humongous scale and size of its operations. With key focus on project execution, the worldwide installed base of power generating equipment supplied by BHEL has exceeded 178 GW. BHEL's 54% share in India's total installed capacity and 58% share in the country's total generation from thermal utility sets (coal based) as of 31st March, 2017 stand a testimony to its valuable contribution towards nation building.



BHEL's global competitiveness has established its footprint in all the inhabited continents with references in 82 countries including Malaysia, Oman, Iraq, Syria Sudan, Libya, Cyprus, Malta, Afghanistan, Bangladesh, Bhutan,



Stator Manufacturing under progress at BHEL, Haridwar

New Zealand etc. with cumulative overseas installed capacity of BHEL manufactured power plants nearing 10,000 MW. The high level of quality & reliability of BHEL products is a testimony to its adherence to international standards by acquiring and adapting some of the best technologies from leading companies in the world including General Electric, Siemens AG, Mitsubishi Heavy Industries Ltd. etc., together with technologies developed in its own R&D centres. While all the manufacturing units and other entities of the company have been accredited to Quality Management Systems (ISO 9001:2008), major manufacturing units have also been accredited to Environmental Management Systems (ISO 14001:2004) and Occupational Health & Safety Management Systems (OHSAS 18001:2007).

BHEL has been adept at transforming itself in line with the market requirements throughout its illustrious journey. Right from its incorporation in a protected market to facing the pressures of a liberalized economy and the time to time slowdown in the economic environment, BHEL has evolved by transforming its strategies from product manufacturing to market orientation, business excellence through portfolio restructuring and the current focus on sustaining growth through diversification.



World's first ± 800 kV pre-engineered Indoor DC hall at NE-Agra HVDC terminal

Diversification in transportation, transmission, defence, water & renewables is the strategy adopted to maintain a balanced portfolio of offerings. This strategy of diversifying and capitalizing new business opportunities stems from the commitment to innovation led growth which is an indispensable part of BHEL's business model. R&D focus of the organization is quite diverse ranging from Advance Ultra Supercritical thermal power plants to superconducting applications for electrical equipment. BHEL is one of the highest spenders on R&D in the Indian engineering field and has been consistently spending more than 2.5% of its turnover on R&D and innovation.



BHEL's greatest strength is its highly skilled and committed workforce of approx. 40,000 employees who have been the cornerstones of BHEL's journey of excellence. Further, the concept of sustainable development is inculcated in the DNA of BHEL which is evident from its mission statement- "providing sustainable business solutions in the fields of energy, industry and infrastructure". BHEL is also engaging with the society with its



Terminal 4x200 MW Koldam HEP commissioned by BHEL

social initiatives aimed at Community Development, Health & Hygiene, Education, Environment Protection, Disaster Management, Talent upgradation/ Skill development etc. The company is transforming in line with the market realities and embracing change to capitalize on the upcoming opportunities. Sustaining its leadership



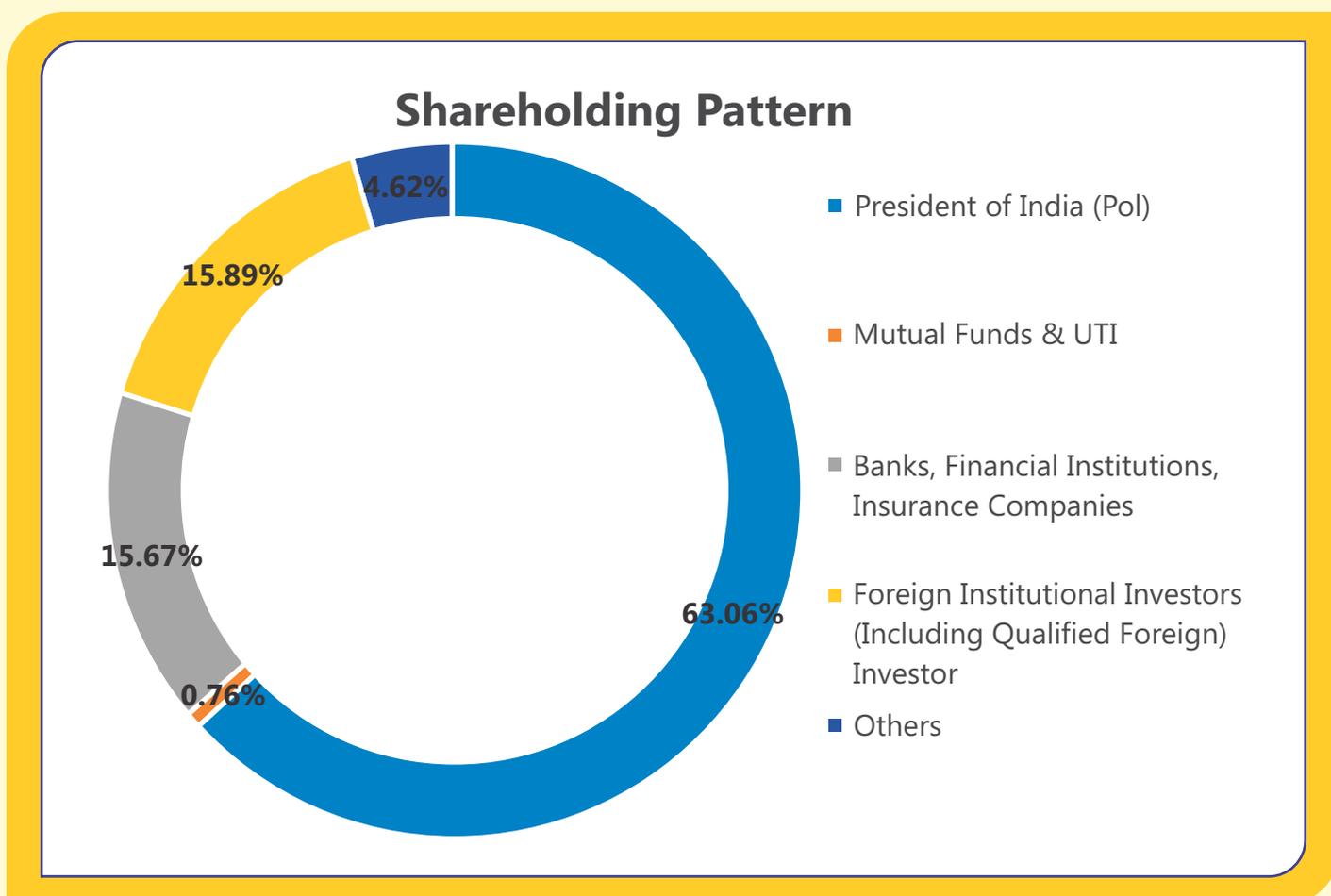
10 MW grid connected solar power plant at NLC township, Neyveli commissioned by BHEL

in existing businesses, building new capabilities, creating new sources of growth and responsible utilization of infrastructure will be the key to future growth and stakeholders' wealth enhancement. For BHEL's product profile, the reader may please refer to page 315-323 of our Annual report for FY 2016-17 available on www.bhel.com.



Nature of ownership and legal form

BHEL is a Maharatna Public Sector Undertaking (PSU) with 63.06% stake held by Government of India. It was established in 1964 under The Companies Act, 1956. The shareholding pattern of the company as on 31st March 2017 is shown in the figure below. There has been no change in the shareholding of the Government of India



during the reporting period (2016-17) as compared to the previous year. For detailed breakup of shareholding pattern, the reader may please refer to page 111-112 of BHEL's Annual Report (AR) 2016-17.

Recognition of Excellence

Continuing its tradition of bagging prestigious national/international awards, the organisation and employees won several awards during the year 2016-17 details of which have been provided in page 20-21 of BHEL's AR 2016-17. Some of the major awards & recognition are:

1. Prime Minister's Shram Awards (7 Nos) to 12 BHEL employees.
2. Vishwakarma Rashtriya Puraskars (8 numbers) to 36 BHEL employees.
3. Top PSU Award 2016 under 'Heavy Engineering Sector' from Dun & Bradstreet.



4. National Safety Awards (5 Nos) for longest accident free and lowest accident frequency rate by Ministry of Labour, GoI.
5. 'ICAI National Award for Excellence in Cost Management 2016'.
6. Top 25 Best Companies to Work for in India by Business Today magazine in partnership with PeopleStrong.
7. For the 26th year in succession, BHEL has been recognized by EEPIC for excellence in exports and has been conferred the 'Star Performer in 2014-15' in the category of Large Enterprise.
8. CBIP Award 2016 for Best Power Equipment Manufacturing Organization for Outstanding contribution in manufacturing wide range of equipment for the core sectors of economy, including Power Generation, transmission and renewable energy for the development of power sector.





Vision

A global engineering enterprise providing solutions for a better tomorrow



Mission

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



Global Footprints

Reference in 82 countries in all six inhabited continents

Contracted power plant equipment of around 17,000 MW

First overseas turnkey project commissioned by an Indian company - executed by BHEL at Tripoli, Libya in 1980

Secured the largest ever export order for 2X660 MW Maitree TPP from Bangladesh, BHEL's first highest rating power plant outside India



National Champion

One of the largest engineering & manufacturing companies in India serving core sectors of economy viz.

- ❖ Power Generation & transmission
- ❖ Transmission/Renewables/Defence/ Water management/Oil & Gas/ Industrial Products - Elec. & Mech.

17 Manufacturing Units, 1 Subsidiary, 6 Joint Ventures, 8 service centres & Infrastructure to deal with 150 + Projects sites

Built India's capability in heavy electrical equipment manufacturing with world class environment - friendly technology

WORLD of BHEL

Sustainable Performance

Zero debt company

Consistent dividend paying company since 1976-77

First listed its equity shares on stock exchanges in 1992

Did you Know?

BHEL is the Single largest contributor to the country's total installed electric utilities

All Indian satellites launched by ISRO are equipped with BHEL supplied solar panels since 2002 & batteries since 2005

World's largest ±800 kV, 6000 MW multi terminal HVDC NE-Agra transmission project under execution by BHEL

All the three ships of the Kolkata-class stealth guided missile destroyers equipped with BHEL's 76/62 mm Super Rapid Gun Mount (SRGM) and Auxiliary Control System.

95% of hydroelectric generating capacity in Bhutan Installed by BHEL

BHEL's first power generating set was the 30MW thermal power station installed at Basin bridge in Tamil Nadu, way back in 1969

All the states & six union territories of the country have power generating equipment installed by BHEL





Technology to mitigate climate change

Developing Advanced Ultra Supercritical (AUGC) technology for coal based power plants with NTPC and IGCAR

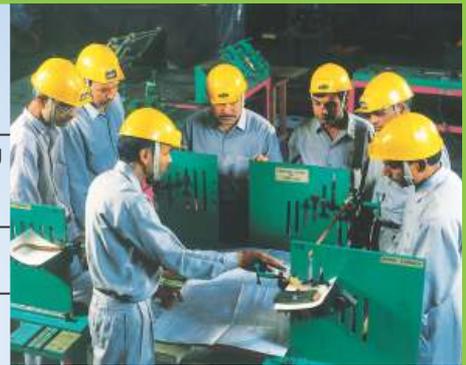
Indigenized Supercritical technology resulting in ~11% reduction in CO₂ emissions, higher efficiency & lower cost to customers

Offering emission control solutions for power plants

Highest number of eco-friendly supercritical sets commissioned in the country till date

Developed more efficient EHV Transmission systems and products (including ±800kV HVDC)

Achieved carbon footprint avoidance of 14,378 MT CO₂-e during 2016-17 by generating 14.82 MU energy through in-house solar power installations



Valuing People

Only PSU in Business Today's Top 25 Companies to work for in India (2016-17)

Third largest employer among non-financial CPSEs in Capital Goods sector

Participative management culture through Joint Council, Plant Council, Shop Council since 1973

~80% engineers amongst executives

2200 + female employees

Less than 1% attrition rate

Innovation

R&D Expenditure > 2.5% of Turnover highest in Indian engineering field

Five research institutes

14 Centres of Excellence

Total intellectual capital-3915

In-house R&D Centres of 12 Manufacturing units/Divisions recognized by DSIR



Social onus

Committed to Principles of UN Global Compact

Signatory to Integrity Pact of Transparency International

Supporting construction of 25 Clusters of Bio-Digester toilets in Haridwar and Rishikesh under Namami Gange & Swachh Bharat Abhiyan

Bio diversity

In-house green coverage of 4.7 million square meters

Plantation of more than 3 million trees

Supporting more than 10 Mobile Medical Units (MMUs) benefiting more than one lakh patients during the year



Unparalleled industrial experience

570,000 + MVA transmission equipment supplied

31,000 + AC machines supplied, largest Indian manufacturer

>50% of Indian Railways rolling stock equipped with BHEL's traction equipment

360 electric locos supplied to Indian Railways & other industries

385 + Compressors & 90 oil drilling rigs-supplied

42 + oil rigs refurbishment & upgradation completed

36+ SRGMs supplied



Energizing India

Major integrated power plant equipment manufacturer in the world with 20,000 MW p.a. manufacturing capacity

178 + CW power generating equipment installed till date

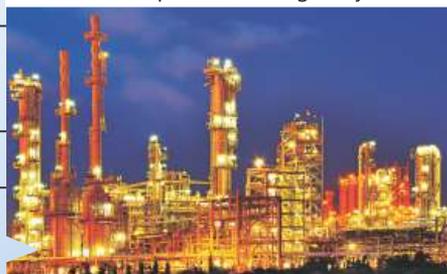
55% of india's nuclear power generating capacity (conventional island) installed by BHEL

Commissioned country's first 660 MW indigenously manufactured supercritical set at NTPC Barh-5 in 2013

Forayed into electricity generation with commencement of commercial operation at 800 MW Yeramarus TPS

16,500 + MW Captive Power Plant installed

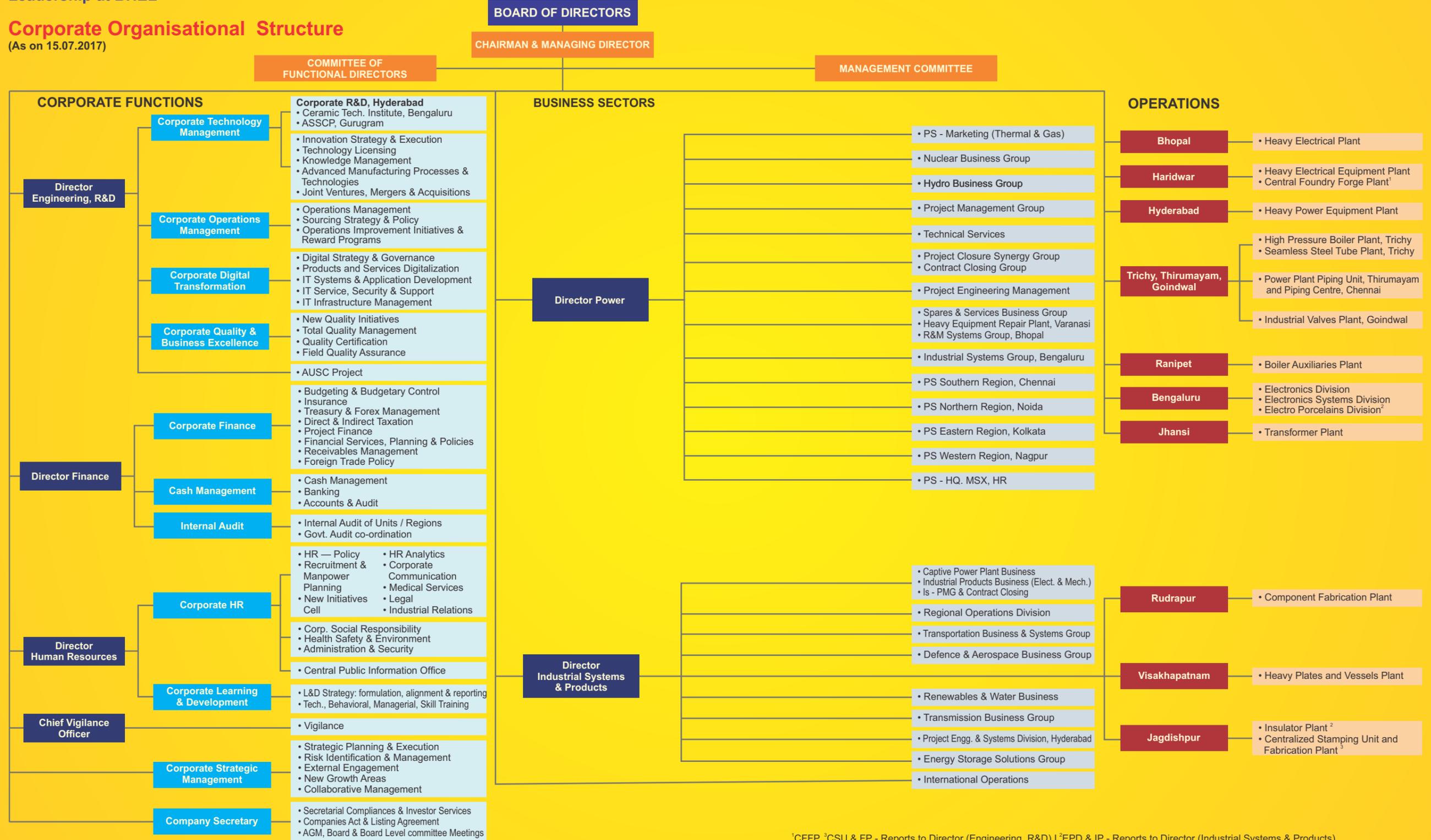
350 + MW- cumulative shipments of PV cells, modules, and systems



Leadership at BHEL

Corporate Organisational Structure

(As on 15.07.2017)

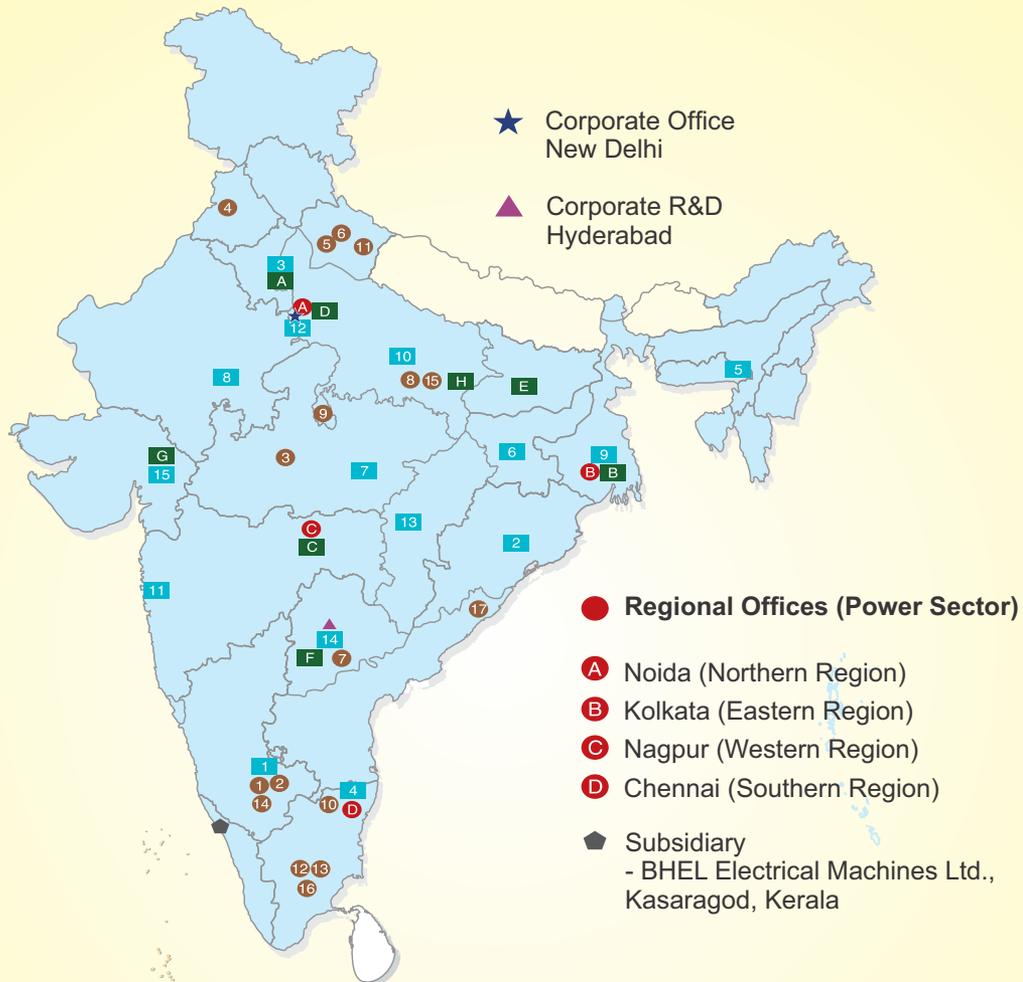


BUSINESS SECTORS

¹CFFP, ²CSU & FP - Reports to Director (Engineering, R&D) | ²EPD & IP - Reports to Director (Industrial Systems & Products)



BHEL in India



This graphical representation does not purport to be the political map of India

Business Offices

- | | |
|---------------|-----------------|
| 1 Bengaluru | 10 Lucknow |
| 2 Bhubaneswar | 11 Mumbai |
| 3 Chandigarh | 12 New Delhi |
| 4 Chennai | 13 Raipur |
| 5 Guwahati | 14 Secunderabad |
| 6 Ranchi | 15 Vadodara |
| 7 Jabalpur | |
| 8 Jaipur | |
| 9 Kolkata | |

Manufacturing Units

- 14 1 2 Bengaluru
- 3 Bhopal
- 4 Goindwal
- 5 6 Haridwar
- 7 Hyderabad
- 15 8 Jagdishpur
- 9 Jhansi
- 10 Ranipet
- 11 Rudrapur
- 12 13 Tiruchirappalli
- 16 Thirumayam
- 17 Visakhapatnam

Service Centres

- A Chandigarh
- B Kolkata
- C Nagpur
- D Noida
- E Patna
- F Secunderabad
- G Vadodara
- H Varanasi



MAKING IN INDIA FOR THE WORLD Established Presence in 82 Countries



AFRICA

ALGERIA
BENIN
COMOROS
DR CONGO
EGYPT
ETHIOPIA
GHANA
KENYA
LIBYA
MALAWI
MAURITIUS
MOZAMBIQUE
NIGERIA
RWANDA
SENEGAL
SOUTH AFRICA
SUDAN
SWAZILAND

TANZANIA
TAGO
UGANDA
ZAMBIA
ZIMBABWE

ASIA

AFGHANISTAN
AZERBAIJAN
BANGLADESH
BHUTAN
CHINA
HONG KONG
INDONESIA
IRAN
IRAQ
JAPAN
JORDAN
KAZAKHSTAN

KUWAIT
LAOS
MALAYSIA
MYANMAR
NEPAL
OMAN
PHILIPPINES
SAUDI ARABIA
SINGAPORE
SRI LANKA
SYRIA
TAIWAN
TAJIKISTAN
THAILAND
UNITED ARAB EMIRATES
VIETNAM
YEMEN

EUROPE

BELARUS
BELGIUM
BULGARIA
CYPRUS
ESTONIA
FINLAND
FRANCE
GEORGIA
GERMANY
GREECE
IRELAND
ITALY
MALTA
POLAND
ROMANIA
RUSSIA
SWEDEN
SWITZERLAND

TURKEY
UKRAINE
UNITED KINGDOM

NORTH AMERICA

CANADA
TRINIDAD AND TOBAGO
UNITED STATES OF AMERICA

OCEANIA

AUSTRALIA
NEW CALEDONIA
NEW ZEALAND
SAMOA

SOUTH AMERICA

CHILE
SURINAME



CORPORATE GOVERNANCE

Management Approach

BHEL functions within a sound framework of Corporate Governance which underlines commitment to quality of governance, transparency disclosures, consistent stakeholders' value enhancement and corporate social responsibility. BHEL endeavours to transcend much beyond the regulatory framework and basic requirements of Corporate Governance, focusing consistently towards building confidence of its various stakeholders including shareholders, customers, employees, suppliers and the society at large. The company has developed a framework for ensuring transparency, disclosure and fairness to all, especially minority shareholders.

The Corporate Governance framework of BHEL rests upon the four pillars of transparency, full disclosure,



4x125MW Kosti TPS, Sudan commissioned by BHEL on EPC basis

independent monitoring and fairness to all. To strengthen this, BHEL has signed an MoU with Transparency International to adopt 'Integrity Pact'. The corporate structure, business procedures and disclosure practices have attained a sound equilibrium resulting in achievement of goals as well as high level of business ethics. The following principles strengthen Corporate Governance in BHEL:

- I. Independence and versatility of the Board



- II. Integrity and ethical behaviour of all personnel
- III. Recognition of obligations towards all stakeholders – shareholders, customers, employees, suppliers and the society
- IV. High degree of disclosure and transparency levels
- V. Total compliance with laws in all areas in which the company operates
- VI. Achievement of above goals with compassion for people and environment

The company believes that conducting business in a manner that complies with the Corporate Governance procedures and Code of Conduct, exemplifies each of the core values and positions BHEL to deliver long-term returns to the shareholders, favourable outcomes to the customers, attractive opportunities to the employees and making the suppliers the company's partners in progress & enrichment of society.

In line with Articles of Association of the Company, The Companies Act, 2013 and SEBI (Listing Obligations & Disclosure Requirements) Regulations, 2015, certain key decisions (viz. appointment of Directors, adoption of annual accounts etc.) are taken by shareholders in the Annual General Meeting. All members of the Board (Functional Directors, Government Nominee Directors and Independent Directors) are appointed by the shareholders in the Annual General Meeting of the Company. Shareholders can also raise queries, interact with Board members and provide suggestions at the General Meeting(s) of the Company. The shareholders can provide recommendations and suggestions to any Director on the Board of BHEL. Their contact details are available on the website of the Company (www.bhel.com). Further, shareholders have a dedicated email-id viz. shareholderquery@bhel.in to communicate with the Company.

Governance structure at BHEL

The composition of the Board of Directors as on 31.03.2017 is as follows:

Particulars	Board Structure	Actual Strength as on 31.03.2017
Chairman & Managing Director	1	1
Whole-time Executive (Functional) Directors	5	5
Part-time Official Directors (Government Nominees) representing the Ministry of Heavy Industries & Public Enterprises, Government of India	2	2
Part-time Non-official (Independent) Directors	8	6
TOTAL	16	14

BHEL has a unitary board structure. Directors other than Functional (Whole-time) Directors are Non-Executive Directors. Non-Executive Directors comprises Part-time Official Directors & Independent Directors. Non-Executive Directors attend only meetings of the Board and are not involved in the day to day management of the Company. BHEL defines "Independent Director" as per Section 149(6) of the Companies Act, 2013, Regulation 16(1)(b) of the Listing Regulations and DPE Guidelines on Corporate Governance.



As on 31st March, 2017, there existed two vacancies of Part-time Non-official (Independent) Directors on the Board of BHEL. The matter of filling up of these vacancies is under consideration of Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, Government of India. As on 31.03.2017, there were 2 women independent (non-executive) Directors on the Board of BHEL. All Directors are eminent personalities having wide experience in the field of Management, Finance, Engineering, Administration and Industry. The Chairman of the Board is also Managing Director of the Company which is an Executive position.

Board Level Committees

There are eight Board Level Committees in BHEL. For the details of the Committees of the Board with regard to their composition and respective Terms of Reference (responsibilities/ mandate) as on 31.03.2017, the reader may please refer to BHEL's AR 2016-17 page 99-107.

Addressing Conflict of Interest (CoI)

All directors at the time of joining the Board give a certificate stating that neither they nor their relatives have any conflict of interest with the company's business. Directors also disclose their interest in other companies, corporates bodies and other entities to the Board at the time of joining and also whenever there is any change in the interest. Directors abstain from any discussions / approval of the Board pertaining to contracts or transactions with such interested parties. Further, all Directors and Senior Management Personnel sign an affirmation to abide by the Code of Business Conduct and Ethics of BHEL and ensure high standard of conduct.

Further, Senior Management personnel of the company make disclosure to the Board relating to all material, financial and commercial transactions where they have personal interest that may have potential conflict with the interest of the company (e.g. dealing in company's shares, commercial dealings with bodies, which have shareholding of management and their relatives, etc).

Constitution of Highest Governing Body

As per Articles of Association of BHEL, the President of India through Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, appoints the Chairman & Managing Director and Functional Directors on the Board of BHEL and also appoints Part-time Non-official (Independent) Directors on the Board of BHEL. Two Part-time Official Directors viz. Additional Secretary/ Joint Secretary, Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises and Additional Secretary & Financial Adviser, Ministry of Commerce and Industry are nominated by the Government of India on the Board of BHEL.

The Independent Directors are selected by the Department of Heavy Industry in consultation with the Search Committee of the Department of Public Enterprises which maintains a panel of eminent personalities having wide experience in the field of Management, Finance, Engineering, Administration and Industry. They play an important role in deliberations at the Board and Committee meetings and bring to the Company their expertise in the fields of engineering, finance, management, law and public policy.

The Independent Directors are part of important Committees constituted by the Board such as the Audit Committee, Nomination & Remuneration Committee, Stakeholders Relationship Committee and CSR Committee. In terms of Companies Act, 2013 and Listing Regulations, the Audit Committee and the Nomination & Remuneration Committee are chaired by an Independent Director and functions within their respective defined terms of references.





Sitting from right to left

Ms. Surama Padhy
Independent Director

Shri Rajesh Kishore
Independent Director

Shri Atul Sobti
Chairman & Managing Director

Dr. Subhash Chandra Pandey
AS & FA, DIPP. Part-Time Official Director

Shri A.N. Roy
Independent Director

Leadership at BHEL – Board of Directors' as on 15.07.2017

Standing from right to left

Shri S. Biswas
Director (Engineering, R&D)

Shri T. Chockalingam
Director (finance)

Shri Bhaskar Jyoti Mahanta
Joint Secretary, DHI : Part-Time Official Director

Shri Akhil Joshi
Director (Power)

Shri D. Bandyopadhyay
Director (Human Resources)

Shri Keshav N. Desiraju
Independent Director

Shri R. Swaminathan
Independent Director

Shri Amitabh Mathur
Director (Industrial Systems & Products)

Shri I.P. Singh
Company Secretary

Working of the Board

The Board's mandate is to oversee the Company's strategic direction, review and monitor corporate performance, ensure regulatory compliance and safeguard the interests of the shareholders. Such oversight and monitoring is ensured through regular meetings of the Board of Directors which are scheduled well in advance. This also ensures that important decisions are taken and implemented in time. In Financial year 2016-17, Board met 8 times.

The Company Secretary, in consultation with the Chairman & Managing Director, sends a written notice of each Board meeting to each Director. The Board agenda is circulated to the Directors in advance. The members of the Board have access to all information of the Company and are free to recommend inclusion of any matter in agenda for discussion. In case of need, the senior management is invited to attend the Board Meetings to provide additional inputs relating to the items being discussed and/ or to give presentation to the Board. The Board meets at least once in a quarter to review the quarterly results and other items on the agenda. Additional meetings are held, when necessary.



The information under the following heads are usually presented to the Board of Directors of BHEL either as part of the agenda papers or are tabled/ presented during the course of Board meeting:

- Annual operating plans and budgets and any updates.
- Capital budgets and any updates.
- Quarterly results for the company and its operating divisions or business segments.
- Minutes of meetings of Audit Committee and other Committees of the Board.
- Minutes of Board Meetings of unlisted subsidiary companies.
- Statement of all significant transactions and arrangements entered into by unlisted subsidiary companies.
- The information on recruitment of senior officers just below the Board level.
- Details of any Joint Venture or R&D project or technical collaboration agreement requiring approval of Board of Directors
- Significant labour problems and their proposed solutions. Any significant development in Human Resources/ Industrial Relations front like signing of wage agreement, implementation of Voluntary Retirement Scheme etc.
- Sale of investments, subsidiaries, assets, which are material in nature and not in normal course of business.
- Quarterly details of foreign exchange exposures and the steps taken by management to limit the issues of adverse exchange rate movement, if material.
- Action Taken Report on matters desired by the Board.
- Disclosure of Interest by Directors about directorships and Committee positions occupied by them in other companies.



- Quarterly report on compliance of various laws.
- Information relating to major legal disputes.
- Status of Arbitration cases.
- Short term investment of surplus funds.
- Any contract(s) in which Director(s) are deemed to be interested.
- Status of shareholders' grievances on quarterly basis.
- Significant Capital Investment proposals.
- Changes in significant accounting policies & practices and reasons for the same.
- Performance of various units/ functions.
- Any other information as required under Listing Regulations, DPE guidelines and SS-1 etc., to be presented to the Board either for information or approval.

In addition to the above, the Board of Directors has also constituted various statutory and technical committees such as the Board Level Audit Committee, Stakeholders Relationship Committee, Share Transfer Committee, HR Committee, Board level Committee for CSR, Committee of Independent Directors, Nomination & Remuneration Committee, Board Level Risk Management Committee, Committee on Arbitration & Major Legal Disputes and Board Level Committee on Mergers & Acquisitions to ensure in-depth analysis & review as well as to provide requisite guidance, advice and recommendations on important matters. The procedures for conducting meetings of these Committees are also similar to that followed for meetings of the Board of Directors.

BHEL being a Public Sector Undertaking, the appointment and remuneration of CMD/ Functional Directors are decided by the Govt. of India. The terms of appointment of CMD/ Directors, as approved by the President of India, provide for fixation of certain perks and benefits such as leased accommodation, payment of HRA, furnished accommodation, productivity linked incentive etc., as per rules of BHEL. The part-time non-executive directors are not paid any remuneration except sitting fees to Independent Directors for attending meetings of the Board or Committee thereof.

Performance evaluation of the highest governance body

The MoU signed between the company and the Govt. of India details out the parameters and initiatives that the company is required to undertake during that financial year. This MoU is evaluated at the end of the financial year by the Govt. and a performance rating is assigned to BHEL based on its performance on the spelt out parameters. The terms of reference of Board Level Committees are approved by the Board. The minutes of Board Level Committees are placed before the Board for its perusal. Further, there is a well laid down procedure for performance evaluation of CMD and Functional Directors. Department of Public Enterprises (DPE) has designed a format and laid down a procedure for filling up and evaluation of the Director's performance. Once the concerned Director does self-assessment, his evaluation is done by CMD, then by Secretary, Heavy Industries and closed by the Minister-in-Charge. The tenure of Functional Directors as spelt out in their Terms and Conditions of Appointment is five years or the date of their superannuation or order from Ministry of Heavy industry (MHI), whichever is earlier.



CMD, BHEL addressing a cross section of employees at BHEL, Haridwar

As per Schedule IV of the Companies Act, 2013, on the basis of performance evaluation of Independent Directors, it shall be determined whether to extend or continue their term of appointment. Since appointment of Independent Directors is decided by the Government of India and as the tenure of Independent Directors is normally for a period of three years, also as decided by the Govt. of India, the Board is not in a position to decide their continuance or otherwise on the basis of performance evaluation.

Ministry of Corporate Affairs has vide its notification dated 5th June, 2015 notified the exemptions to Government Companies from the provisions of the Companies Act, 2013 which inter-alia provides that Sec. 134(3)(p) regarding statement on formal annual evaluation shall not apply to Government Companies in case the directors are evaluated by the Ministry which is administratively in-charge of the company as per its own evaluation methodology. Further, in line with above exemptions, Sub-Sections (2), (3) & (4) of Sec. 178 regarding appointment, performance evaluation and remuneration shall not apply to Directors of Government Companies.

Shareholders provide recommendation or directions during Annual General Meeting or Extraordinary General Meetings. Also, they communicate with BHEL management or their representatives during financial result audio conference calls and one-to-one meetings during investor conferences or at BHEL premises. They also raise their concerns by posting emails to **shareholderquery@bhel.in** provided at 'investor relations' page of **www.bhel.com**.



Mechanisms to analyse corruption and fraudulent practice risks

As a part of BHEL's persistent endeavour to set a high standard of conduct for its employees (other than those governed by standing orders), the 'BHEL Conduct, Discipline and Appeal Rules, 1975' are in place. The Company is subject to RTI Act, 2005 and audit by Statutory Auditors (under chapter X of the Companies Act, 2013), CAG audit under section 143 of the Companies Act, 2013. Moreover, BHEL is a front-runner in implementing the Right to Information Act, 2005 and has embraced the Act in true letter and spirit. The organization has adequate system of internal financial control in terms of well documented policies and procedures that cover critical as well as important



CMD, BHEL administering the pledge to employees during the 'Vigilance Awareness Week' observed in BHEL

activities of financial and other operating functions. The details of internal financial control & RTI can be referred from BHEL's annual report 2016-17 on page 64.

Preventive vigilance is integral to BHEL functioning and details about the vigilance mechanism in BHEL is provided in page 26-27 of BHEL's annual report 2016-17. During the reporting period 25.17% of management employees have received anti-corruption training and the percentage of total non-management employees receiving such training stood at 2.95%.

Thus the management is striving to make all out efforts to arrange training programmes to sensitize the employees about these acts and rules and their roles and responsibilities therein. For further details about corporate governance, the reader may please refer to Annexure-VI of BHEL's AR 2016-17 page 95-114.

Ethics, Transparency and Integrity

The company has a Board approved 'Code for Business Conduct & Ethics' for all Board Members and Senior Management personnel in compliance with the requirements of DPE Guidelines on Corporate Governance for CPSEs & the SEBI's Listing Regulations as given in the web link:

http://www.bhel.com/investor_relations/pdf/Code_of_Business_Conduct_and_Ethics.pdf

The Board has laid down a Charter of the Board of Directors which clearly defines the roles and responsibilities of the Board and individual Directors. Further, the company endeavours to preserve the confidentiality of unpublished price sensitive information and prevent misuse of such information. Towards this a Board



approved policy 'Code of Conduct for Regulating & Reporting Trading by Insiders and for Fair Disclosure - 2015' in line with SEBI (Prohibition of Insider Trading) Regulations - 2015 and Listing Regulations governs Board members and other designated employees of the Company. The Code also provides for practices and procedures for fair disclosure of unpublished price sensitive information and the same can be accessed through the web link http://www.bhel.com/investor_relations/pdf/BHEL-Insider-Trading-Code-2015.pdf

In line with the requirements of DPE Guidelines on Corporate Governance and the Listing Regulations, BHEL provides progress reports on quarterly basis to DHI and stock exchanges. Further, with a view to ensure effective implementation of the Insider Trading Code, the Company has also in place Internal Operating Guidelines wherein the concerned Head of Departments (HoDs) of Corporate Functions/ Manufacturing units are required to ensure timely dissemination of information with regard to the Code to Connected Persons pertaining to their area. In line with the Listing Regulations, all Board members and Senior Management personnel affirm annually that they have fully complied with the provisions of the Code of Business Conduct and Ethics during the relevant financial year and an affirmation to this effect is given by the Chairman & Managing Director in the Annual Report of the Company.



Super Rapid Gun Mount (SRGM) for Indian Naval Ships under assembly at BHEL, Haridwar

For the purpose of the 'Code of Conduct for Regulating & Reporting Trading by Insiders and for Fair Disclosure, 2015', Director (Finance) is the compliance officer of the Company. In addition, as a part of BHEL's persisting endeavour to set a high standard of conduct for its employees (other than those governed by standing orders), the 'BHEL Conduct, Discipline and Appeal Rules, 1975' is in place. This is augmented by Fraud Prevention Policy and Whistle Blower Policy which not only arm one against unacceptable practices but also act as a deterrent. The Company is subject to RTI Act 2005 and audit by Statutory Auditors and CAG audit under section 139 of the Companies Act, 2013. These policies can be seen at the following web links:

<http://www.bhel.com/pdf/BHEL%20Fraud%20Prevention%20Policy.pdf>

<http://www.bhel.com/pdf/Whistle%20Blower%20Policy.pdf>

<http://www.bhel.com/pdf/Contact%20details%20of%20authorities%20under%20Whistle%20Blower%20Policy.pdf>



BHEL has signed MoU with Transparency International India (TII) to adopt 'Integrity Pact' to make procurement and contracting more transparent by binding both the parties to ethical conduct. A panel of three Independent External Monitors (IEM) have been appointed to oversee implementation of Integrity Pact in BHEL with due



State-of the art 105 MW Solar Photo-voltaic manufacturing line at BHEL, bengaluru

approval of Central Vigilance Commission. Within BHEL, accountability is well defined through 'Delegation of Powers' for various functionaries. Works Policy, Purchase Policy and other policy documents facilitate transparency in BHEL's working and commitment to the highest order of integrity. Six representations from suppliers were received during the year under Integrity Pact out of which five have been resolved by the IEMs. One complaint is under processing. The Company has a Stakeholders Relationship Committee specifically to look into matters related to redressal of shareholders and investors complaints. As reported by M/s Karvy Computershare Private Limited (RTA), 488 complaints were received from the shareholders during the year under review and all the complaints were redressed up to 31st March, 2017.

In addition, a total of 269 public grievance complaints were received from the general public under the Centralized Public Grievance Redressal and Monitoring Scheme during the 2016-17. All the grievances were disposed within the prescribed time of 60 days.



MATERIALITY AND STAKEHOLDER ENGAGEMENT

BHEL's financial statement details have been provided on page 51-56 of BHEL's Annual Report for FY 2016-17. It includes standalone annual accounts as well as the consolidated financial statement. The consolidated financial statement includes its subsidiary and joint venture as well. The list of such entities is given in the table.

However, for the purpose of preparation of sustainability report of BHEL, the data pertaining to only BHEL has

been reported and subsidiaries and joint ventures are not being considered.

Subsidiary:

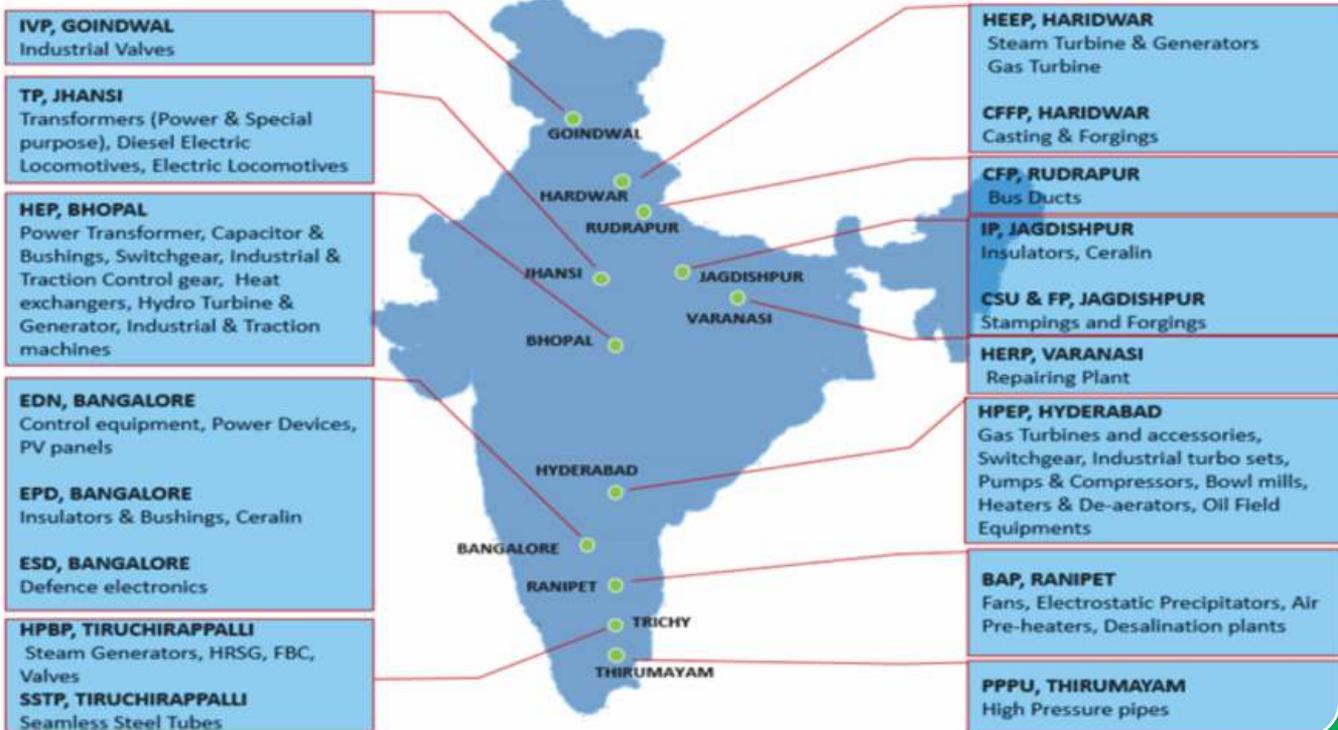
BHEL Electrical Machines Limited (BHEL EML)

Joint Venture:

1. BHEL- GE Gas Turbine Services Limited (BGGTS)
2. Dada Dhuniwale Khandwa Power Ltd. (DDKPL)
3. Raichur Power Corporation Ltd. (RPCL)
4. NTPC-BHEL Power Projects Pvt. Limited (NBPPL)
5. Latur Power Company Limited (LPCL)
6. Power Plant Performance Improvement Limited (PPPL)

Major activities of BHEL which have environmental impacts are being carried out in our manufacturing units and in these units, robust systems have been developed over a period of time for data capturing and reporting.

Reporting boundary for Environmental Indicators



The data on environmental aspect **EN1: Materials** includes material use at the project sites also. However, for all other aspects, the report is limited to the manufacturing units as shown in the figure captioned "Reporting Boundary for Environmental Indicators". At project sites, our projects are under various stages of execution and as of now except data capturing for material, other environmental aspects are not being monitored. The data for the aspects other than Environment includes the data for entire BHEL setup (excluding JVs and subsidiaries) unless stated otherwise.

Stakeholder Identification & Engagement

BHEL has identified 'Customers', 'Employees', 'Shareholders', 'Vendors' and 'Society' as its stakeholders. Processes are in place to ensure inclusion of stakeholder concerns and their expectations. Key issues are identified through ongoing stakeholder engagement and addressed by programmes or action plans with clear and measurable targets. BHEL units regularly organize vendor meets specifically for MSEs (including local suppliers) towards capacity and capability building, which also provides opportunities for open two-way communication, discussions on ideas of mutual benefits and support. Customers are engaged through several modes like customer meets. Investor community is engaged through meetings, conferences etc. and are provided with relevant information pertaining to their investment decisions. Society is engaged through CSR activities.



There are no changes in our approach towards stakeholder identification & engagement, process for defining report content and aspect boundary, and identified key materials issues. So for the sake of brevity of the report, the description of the same has been omitted. However, the reader may please refer to our Sustainability report for 2015-16 on www.bhel.com for the details of the same.



ECONOMIC PERFORMANCE

Management Approach

BHEL believes in conducting business in a manner that complies with the philosophy of Corporate Governance, exemplifies each of our core values and positions us to deliver consistent stakeholders' value enhancement, favourable outcomes to our customers, opportunities to our employees, making the suppliers our partners in progress and enriching the society.

Preparing for growth

BHEL has already established itself as a market leader in the field of supercritical technology. BHEL has developed the capabilities to indigenously manufacture supercritical sets, in-line with Government's initiative of 'Make in India'. The company is geared up to address new opportunities arising from the revised emission norms, by offering customized emission control solutions. Besides providing the equipment for upcoming projects, BHEL has the capability to provide emission control solutions for various sets already in operation.



50 MW Solar Power Plant commissioned by BHEL at Kadiri (Ananthapur), Andhra Pradesh

Company is also enlarging its scope of offer with inclusion of new products viz. Water Management system, Air Cooled Condenser, BoP system, emission control equipment like Flue Gas Desulphurization (FGD), Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR), etc. in its power sector portfolio. With the increased focus on power from the Renewable Energy Sources, especially given the fact that Energy Storage technology is in the nascent stage of development, it is expected that there will be increased impetus on flexible operation of thermal power plants, so as to maintain grid stability. The organization is geared up to address the forthcoming opportunities of providing flexible operation for thermal plants. The company is continuously focusing on achieving higher efficiencies through technological enhancements. Under a (recently approved)



development project with grant from the Govt. of India, the company is working for indigenous development of nation's first Advanced Ultra Supercritical Technology based plant, which is a pioneer R&D project undertaken jointly with NTPC and Indra Gandhi Centre for Atomic Research (IGCAR). Development of this technology shall not only help in achieving higher efficiencies but also reduce the coal consumption as well as CO₂ emission levels. In hydropower segment, the organization has enhanced its capabilities to manufacture up to 400 MW hydro sets. Development of efficient runner profiles and reduction of hydro turbine weights have been instrumental in BHEL's recent successes in the segment. BHEL has also emerged as a leading player in large size Pump-Motors required in Lift Irrigation Scheme projects being implemented by state governments. BHEL is also targeting emerging opportunities for R&M and spares business in hydropower plants.



5X30 MW Mahatma Gandhi Kalwakurthy Lift Irrigation Project, Telangana, set up by BHEL

To harness emerging opportunities in Nuclear power, the company is working towards increasing its offerings in nuclear plants with focus on indigenization and taking up the complete 'TG Island' on 'EPC basis'. With its strong manufacturing prowess, BHEL is well positioned to enhance its contribution in the Nuclear projects which are likely to come up, both, with foreign collaboration and as a part of the indigenous Nuclear Power programme.

For detailed standalone as well as consolidated financial statements of BHEL, the reader may please refer to page 148-306 of BHEL's AR 2016-17. The consolidated financial statement includes its subsidiary and joint venture as well. Highlights of the economic performance have been shown in the figures above.



Value addition statement

The value addition statement is provided in the table below.

₹ in Crore

	IND AS		IGAAP			
	2016-17	2015-16*	2015-16	2014-15	2013-14	2012-13
A. Generation of Value Addition						
Value of Production (Net of Excise Duty)	26631	24718	24765	29755	37077	47219
Less-Direct Material, Power & Fuel and payment to sub-contractors	16520	16362	16383	17772	22031	27759
Value Added	10111	8356	8382	11983	15046	19460
Less- Other Operating Expenses	2913	2922	3355	3224	2982	3196
Net Value Addition	7198	5434	5027	8759	12064	16264
% to value of production	27.03%	21.99%	20.30%	29.44%	32.54%	34.44%
B. Application of Value Addition						
Employees payments	5400	5380	5541	5450	5934	5753
% to net value addition	75.02%	98.99%	110.23%	62.22%	49.19%	35.37%
Depreciation	849	936	936	1077	983	953
% to net value addition	11.79%	17.22%	18.61%	12.30%	8.15%	5.86%
Finance Cost :	351	359	27	92	133	125
% to net value addition	4.87%	6.61%	0.53%	1.05%	1.10%	0.77%
Tax Provision	132	(455)	(563)	721	1554	2818
(Income Tax including Deferred tax)						
% to net value addition	1.83%	(8.36%)	(11.21%)	8.23%	12.88%	17.32%
Dividend (incl. dividend tax)^	354	183	118	341	810	1544
% to net value addition	4.92%	3.37%	2.34%	3.90%	6.71%	9.49%
Retained Profit	113	(969)	(1031)	1078	2651	5071
% to net value addition	1.57%	(17.83%)	(20.51%)	12.31%	21.97%	31.18%

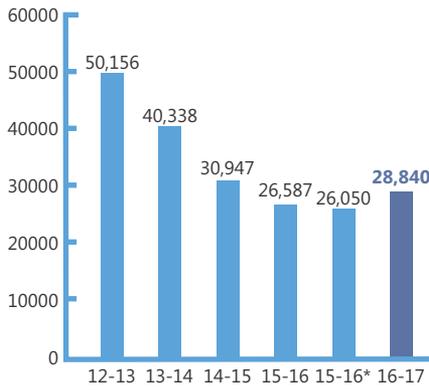
* Figures are restated as per Ind AS

^ As per Ind AS for 2015-16 and 2016-17, Dividend includes Interim Dividend for the Current Year and Final Dividend for the Previous Year

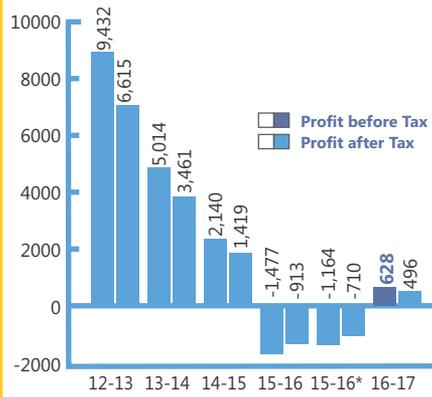


Financial Performance Highlights

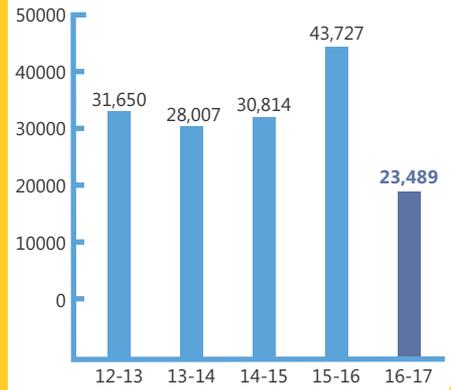
Turnover
₹ in Crore



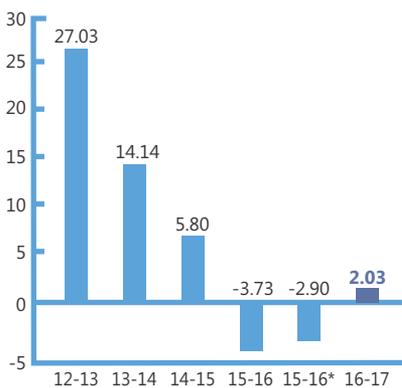
Profit before tax / Profit after tax
₹ in Crore



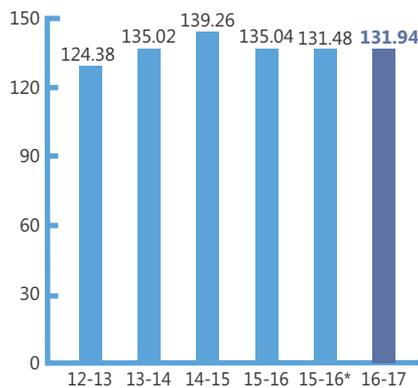
Orders Received
₹ in Crore



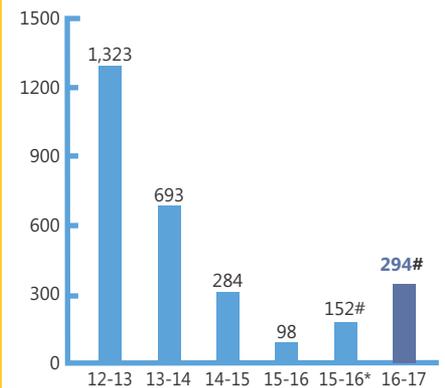
Earnings Per Share
in ₹



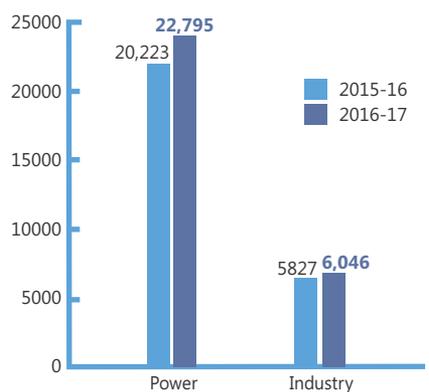
Net Worth Per Share
in ₹



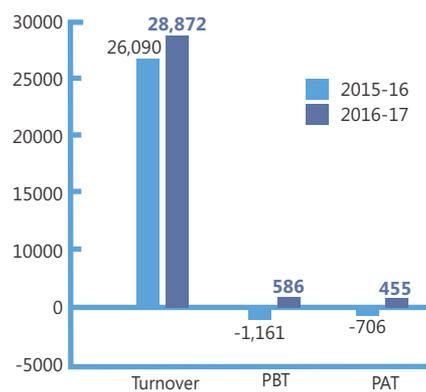
Dividend Distribution
₹ in Crore



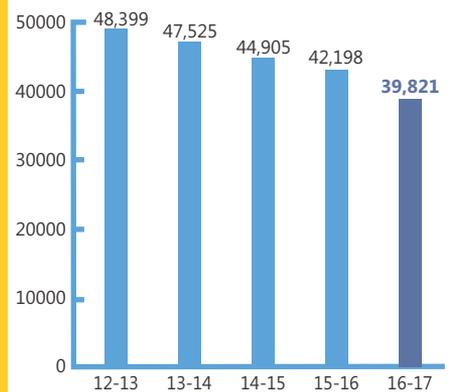
Segment Wise Revenue
₹ in Crore



Consolidated Financial Results
₹ in Crore



Manpower
in Numbers



*Figures are restated as per Ind AS

Dividend for 2015-16* and 2016-17, includes Interim Dividend for the Current Year and Final Dividend for the Previous Year as per Ind AS



8,570 MW
of power project
commissioned/
synchronized



45,274 MW
projects commissioned during
12th Five Year Plan, 2012-17;
9% more than Gol target

178 GW+
Power Generating Equipment
installed till date



Orders in Hand
₹1,05,200 Cr.

14.82 Million Units
of power generated
through in-house
solar power installations



₹10,047 Cr.
Largest ever export order
from **2x660 MW**
Maitree STPP, Bangladesh

508
Patents and copyrights filed;
Total intellectual capital: 3915;
₹ 794 Cr. Invested in
R&D and innovation



370 MW
solar PV portfolio;
mfg. capacity enhanced to
226 MW solar modules
105 MW solar cells

18,282
vocational trainees &
4,728
act-apprentices trained



3.9
Training Man-days
per employee

₹294 Cr.
invested in company's assets
for capability building/productivity
enhancement/indigenization



39,821
no. of human capital base;
8 Vishwakarma &
7 Shram awardees



Indirect Economic Impact on Society

As a responsible corporate citizen, BHEL has been undertaking since inception and continues to serve the community through various socio-economic and community development programmes to promote skill development, education, improvement of living conditions and hygiene in villages and communities located in the vicinity of our manufacturing plants and project sites spread across the country

BHEL has well-structured organizational set-up, policy & procedures through which various CSR programmes are implemented, which include CSR initiatives on inclusive growth and equitable development. This CSR programme addresses the requirement of stakeholders in the vicinity of our premises are identified and suitably addressed. It has led to the creation of a lot of public infrastructure which have helped in improving the quality of life of these stakeholders in meaningful ways. Towards various CSR initiatives, a total amount of Rs. 26.78 Crore has been spent in 2016-17. Details of these activities have been provided in the chapter - "Our societal performance" in this report.

The company take affirmative action in recruitments and promotion for representation of employees from socio-economically backward section of society as well representation of minorities and women, as mandated by the Govt. of India. The company is an equal opportunity employer and does not discriminate on the basis of gender, race, caste, religion, language, region etc. in recruitment, and employment relationship.

Inclusive Sourcing

Micro and Small Enterprises (MSEs) and local suppliers in and around the manufacturing units are part of BHEL's supply chain and the company has been supporting them from various fronts. As mandated in the Public Procurement Policy-2012 for MSEs (issued by Ministry of MSME-GOI), BHEL has achieved the target of 20% of its total procurement from MSEs during 2016-17. Regular Vendor Meets and Supplier development programs are being organized by BHEL units, specifically for MSEs (including local suppliers) as well as specific to SC/STs, which serve as platform for identification of needs and formulation of action plan for mutual benefits.



OUR ENVIRONMENTAL PERFORMANCE

Management Approach - Sustainability

BHEL's strong belief in Sustainable Development resonates in its mission statement – "Providing Sustainable Business Solutions in the fields of Energy, Industry & Infrastructure". The tenets of Sustainable Development have taken deep roots in our business processes and is embedded in our systems. Our concern for environment protection is manifested in our efforts towards development of products having a lesser environmental footprint, use of renewable energy & cleaner fuels having lesser carbon footprint in our operations, recycling of natural resources like raw materials & water to the extent feasible, and responsible waste management. Major thrust areas include efficient energy management, use of cleaner technologies, addressing the issue of social development and inclusive growth through focus on capacity building, development of backward regions and up-liftment of the marginalised & under-privileged sections of the society.

Like earlier, this year too, the thrust continued on initiatives & projects in the area of generation of renewable power through solar power plants, energy conservation, energy efficiency, water conservation, conservation of various natural resources used in our operations, tree plantation, rainwater harvesting, development of green areas, waste management based on the concept of Reduce-Recycle-Reuse (3R) all aimed towards reduction of our environmental footprint.

Material and natural resource management

Our thrust on conservation and efficient utilization of various natural resources in manufacturing activities and at project sites continued this year as well. Company's manufacturing processes generate fair amount of metal

scraps. These scraps subsequently undergo recycling within the company and are reused appropriately. The company has a well-established mechanism to recycle the products and wastes generated to the extent feasible. For example, many of our manufacturing units have their own foundry shop wherein mild steel scraps/off-cuts are melted in electric arc and induction furnace to produce steel castings. Similarly, Copper scrap is melted



in induction furnace to produce Copper & copper alloy castings. These steps help us in reducing the use of virgin raw material and save precious natural resources and consequently reducing the environmental footprint

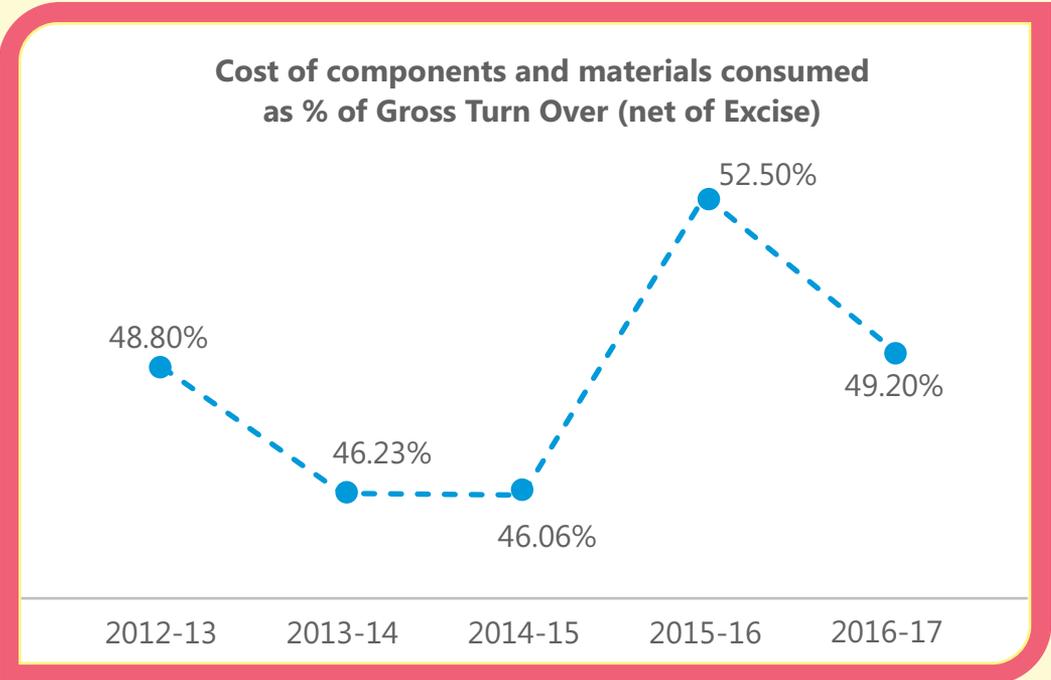


of BHEL. One of our units, Central Foundry Forge Plant (CFFP) - Haridwar manufactures Steel Forgings and Castings for which the molten steel required is produced in the Steel Melting Shop using steel scrap as a major raw material. BHEL recycled/reused nearly 3-5% of its materials as recycled input materials, thereby reducing impact on natural resources. Moreover, for packing and other activities reusable materials are also being used.

Statement for raw materials and components consumed (Rs. Crore)					
	2012-13	2013-14	2014-15	2015-16	2016-17
Group of materials					
Ferrous materials	4517.67	2522.14	2415.5	2311.13	2021.85
Non-ferrous materials	597.11	425.72	381.37	296.6	277.64
Insulating materials	305.72	277.08	219.83	159.08	142.81
Insulated cables and Magnet wires	45.62	87.27	78.97	33.14	57.33
Components	12635.2	8967.26	6040.61	5547.26	5955.69
Others	4942.52	4859.04	4567.71	4654.65	4647.49
Total	23043.8	17137.5	13704	13001.9	13102.8
Gross Turnover net of Excise	47219	37073	29755	24765*	26631*

*As per INDAS

A significant improvement has been registered in material consumption during 2016-17 as compared to 2015-16 where in terms of percentage to Gross Turnover (net of Excise), it declined from 52.5% to 49.2% in 2016-17. This was possible due to better inventory management and cost efficiency drive undertaken by the company. The average figure for the last 5 years stood at 48.56% for the value of material & components consumed as percentage of Gross Turnover (net of Excise).



Due to large variation in product mix and services from year to year and consequently varied input materials across the organisation, measurement of material consumption in terms of weight or volume of raw materials consumed in physical terms as per GRI G4 guidelines is not possible and consequently the actual trend of material consumption is difficult to establish at present in absolute physical terms. Further, our project sites have a cycle time of 3-5 years and the relationship between turnover and material consumption may not be correlated in a simple way. This present a limitation to our data reporting as per the GRI G4 guidelines.



BHEL being a major manufacturing company and our processes are material intensive which is also reflected in the cost of material & components consumed as a percentage of turnover. Therefore, abundant opportunities exist to reduce material consumption through design optimisation, better procurement practice for cost optimisation and recycling of reusable materials in house. To enhance the competitiveness of our products & services, various initiatives such as design optimisation; enhancing performance parameters; de-packaging of bought-out-items & civil works; and indigenization of supercritical technology have been taken up.

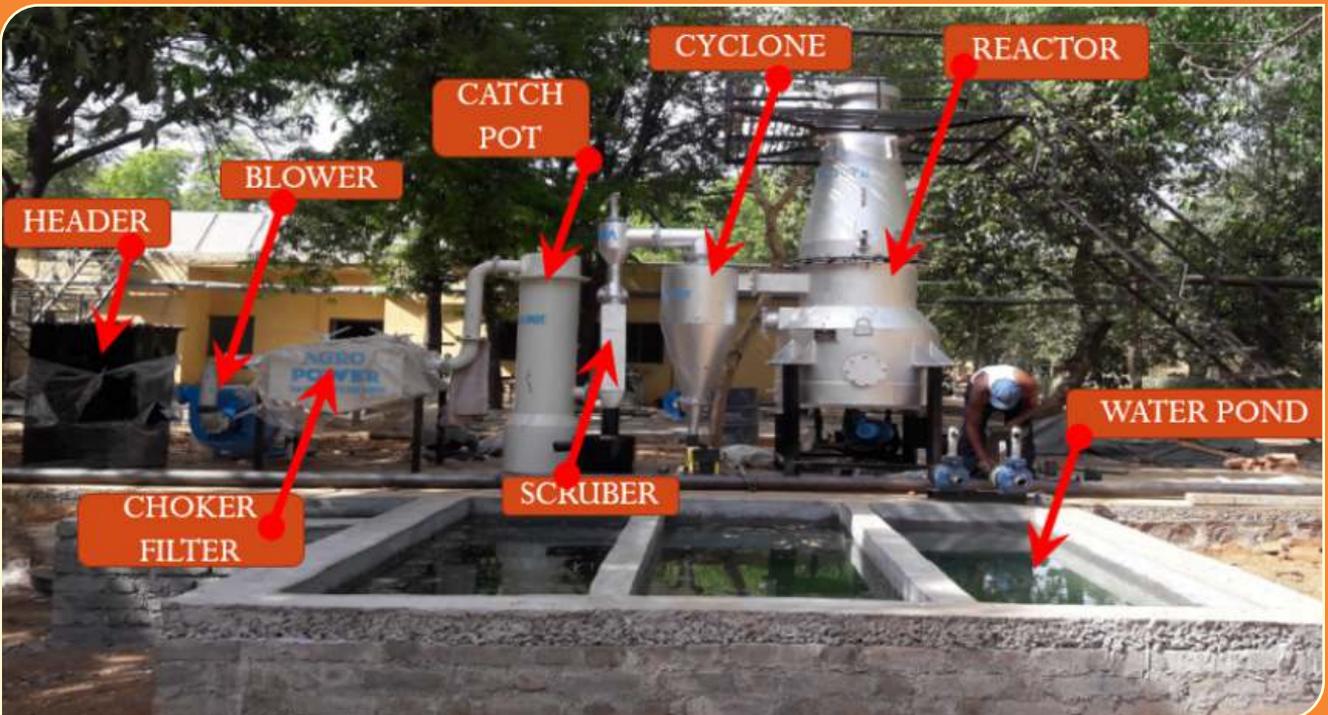
Various initiatives have been taken across BHEL to reduce the material consumption, reusing/recycling of waste produced etc. to reduce our environmental footprint. Some of the examples of such initiatives taken during the reporting period is indicted in the table below:

Unit	Initiative (s)
HEP Bhopal	<ul style="list-style-type: none"> 1539 M³ of wood has been reused to manufacture wooden box for packaging 1400 MT of mild steel scrap/offcuts have been reused through steel melting in electric arc & induction furnace to produce steel castings 50 MT of Copper Scrap has been reused through melting in induction furnace to produce copper and copper alloy castings Approx. 550 MT of Furnace oil was saved through condensate recovery & various improvement steps taken in the steam distribution system. About 139 MT of LPG was saved through renovation of Stress relieving (SR) furnace & controlling heat loss from various furnaces.
EDN Bengaluru	<ul style="list-style-type: none"> 14 MT of steel scrap was used to fabricate new storage racks at component stores. 96 scrap solar PV modules have been installed on 6th floor of NEB Building and 96 SPV modules at HR & IT Block and are generating 20 KW_p power at each location.
HPVP Vizag	Sent 668 MT of Heavy Melting CS Scrap to CFFP Haridwar for recycling
IP Jagdishpur	Introduction of Non-destructive testing at finishing stage using ultrasonic thickness gauge for resource conservation as in destructive testing of insulators number of articles used to get destroyed during testing.
PPPU Thirumayam	2000 MT of Steel Scrap was used for fabrication of fabricating shipping box and in-house facilities.
HPBP Trichy	5 MT of waste cut bits generated was recycled in-house
TP Jhansi	A gasifier equipment of 40 kW rating has been installed which burns wooden waste including dry twigs, leaves, saw dust etc., and produces Producer Gas which is used as fuel in canteen.
BAP Ranipet	Only treated wastewater from Sewage Treatment Plant was used for watering of the plantation inside the factory and thereby saving freshwater.
HPEP Hyderabad	





New STP of 2X4 MLD installed at HPEP Hyderabad

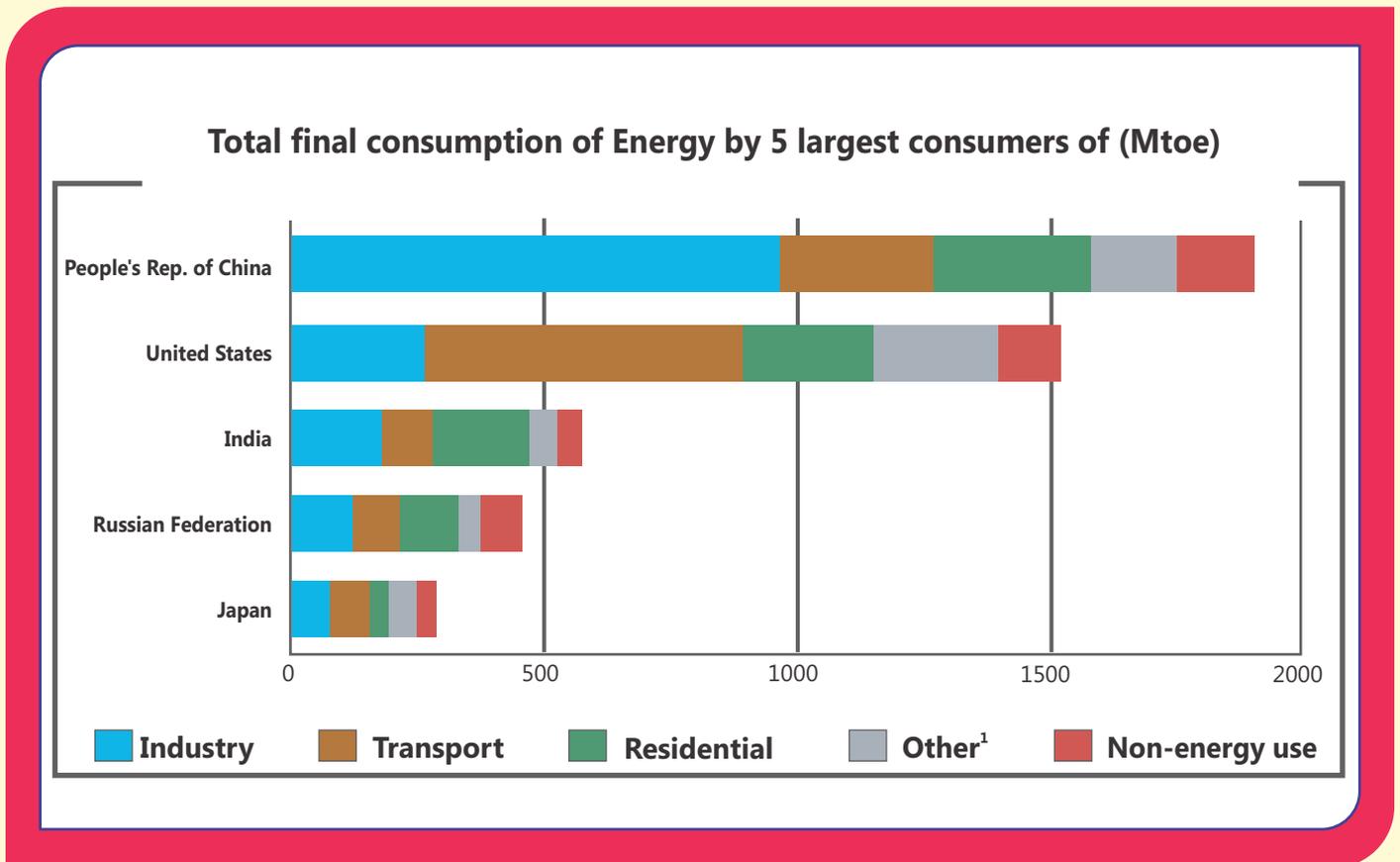


Biomass Gasifier at TP Jhansi unit



Energy

India is the third largest consumer of primary energy after USA and China and the total consumption for 2016 stood at 723.9 Million Tonnes oil Equivalent (source: BP Statistical review of World Energy 2017). Further the data



for total final consumption (Mtoe) as per Key World Energy Statistics 2017 by International Energy Agency for five largest consumers of energy is shown in the figure below. A large portion of this energy demand is met through imports which entails spending our foreign reserve, being dependent on other countries for imports which in turn impairs our energy security. In this backdrop, it is imperative for the industry to use the energy more prudently in its own interest as well as in the overall interest of our country.

BHEL, clearly understands its responsibilities towards efficient use of energy resources as it not only helps its financial bottom line but environmental bottom line as well. The company is conscious of energy mix in its operations and at the same time being a major player in power and infrastructure sector, it is contributing towards conservation of resources through development of cleaner technologies having more efficiency and lesser carbon footprint.

The data for total energy consumption across all the units of BHEL for the last 5 years is shown in the figure. A variety of fuels is being used across BHEL which include Diesel, Super Kerosene Oil (SKO), Coal, Liquefied Petroleum Gas (LPG), Regasified Liquefied Natural Gas (RLNG), Dissolved Acetylene (DA), Furnace Oil (FO) etc. BHEL is using cleaner fuels now as compared to past like Regasified Liquefied Natural Gas (RLNG) being used in many units like HEEP Haridwar, CFFP Haridwar, IP Jagdishpur, and EPD Bengaluru, and LPG which is being used at HPEP Hyderabad and Trichy unit.



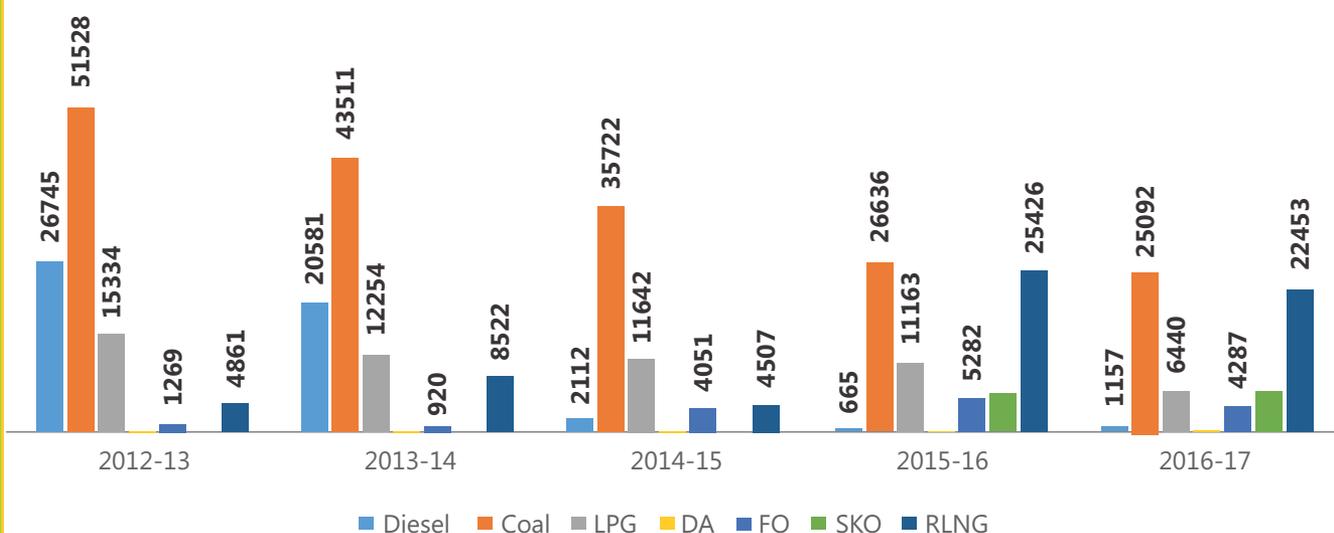
Total Direct & Indirect energy consumption in BHEL units in TJ

Description	Energy Consumed in TJ (2012-13)	Energy Consumed in TJ (2013-14)	Energy Consumed in TJ (2014-15)	Energy Consumed in TJ (2015-16)	Energy Consumed in TJ (2016-17)
Direct Energy					
Primary Energy (Fuels Consumed like Diesel, Coal, LPG, Kerosene etc.)	3226.86	2839.92	2845.89	2993.3	2222.27
Primary Energy Produced (Through Solar Energy generation)	0.29	3.9	25.34	29.26	53.35
Indirect Energy					
Electricity Consumed	1330.8	1116.76	1093	1154.34	1160.36
Total Energy consumed (TJ)	4558	3961	3964	4177	3436
Gross Turnover net of Excise (Rs. Crore)	47219	37073	29755	24765	26631*
Energy Intensity (GJ /Lakh Rs. of GTO net of Excise)	0.97	1.07	1.33	1.69	1.29
Energy Productivity (Lakh Rs. Of GTO net of Excise achieved / GJ)	1.03	0.93	0.75	0.59	0.77

*As per IND AS 1 Tera Joules (TJ) = 1000 Giga Joules (GJ) = 10⁶ Mega Joules = 10⁹ Kilo Joules (KJ) = 10¹² joules

The following figures show 5 years' energy consumption data in different forms. As can be seen from the figure, during 2012-13, the weight of coal in the fuel mix was the maximum. However, the coal usages are on a declining trend.

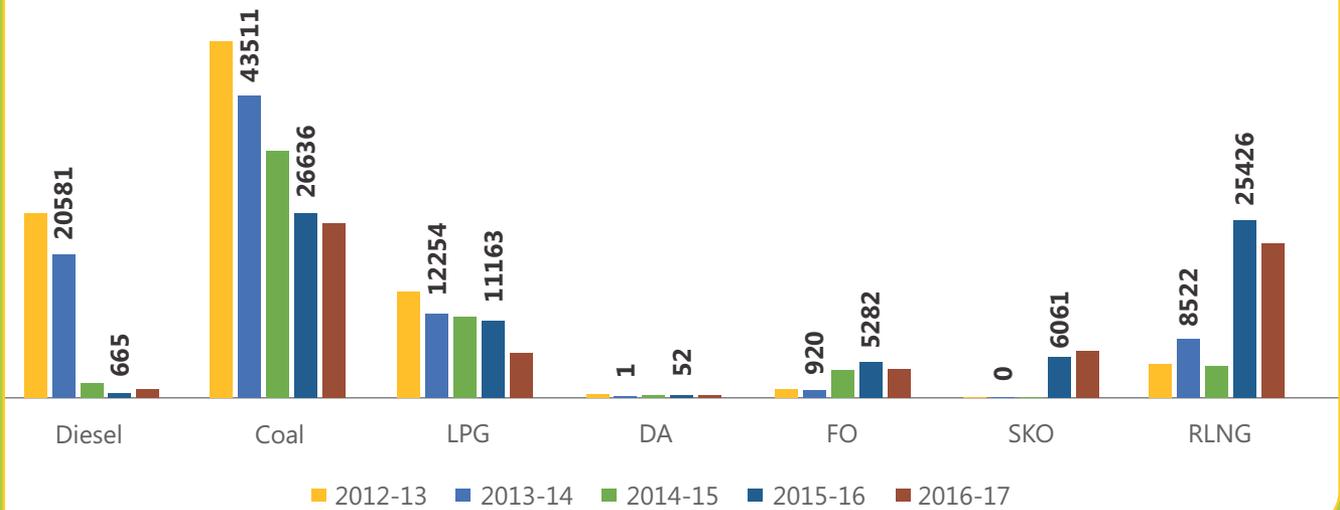
Contribution of different energy sources in total annual energy mix (MT)





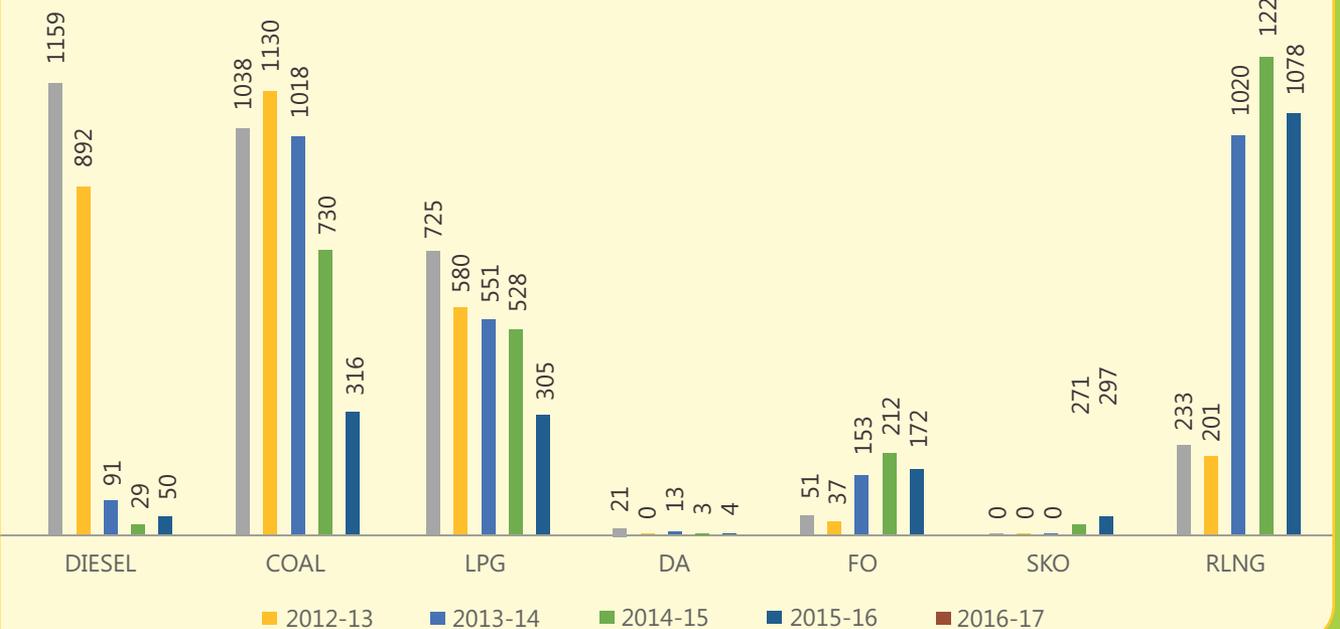
Similarly, in our annual energy mix during 2012-13, maximum energy was derived out of diesel followed by coal. However, the latest trend shows that the contribution of RLNG in our fuel mix is maximum now.

Annual variation in quantity of fuel used by weight (MT)

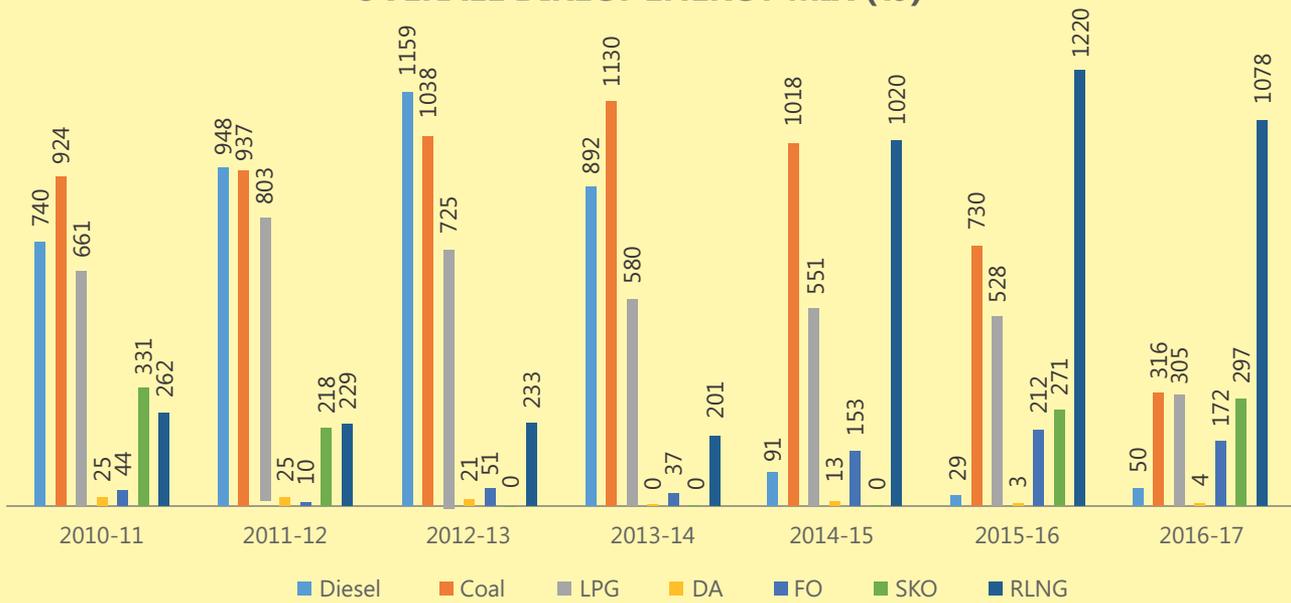


Also from the table it can be seen that overall energy use in our processes is having declining trend. Five of our units namely HEEP Haridwar, CFFP Haridwar, CSU & FP Jagdishpur, IP Jagdishpur and EPD Bengaluru are using RLNG as primary fuel. As RLNG does not require physical carriage through containers, and consequently the indirect fuel consumption incurred earlier for transportation of primary energy sources have been eliminated now.

ANNUAL VARIATION IN ENERGY DERIVED BY DIFFERENT FUELS (TJ)



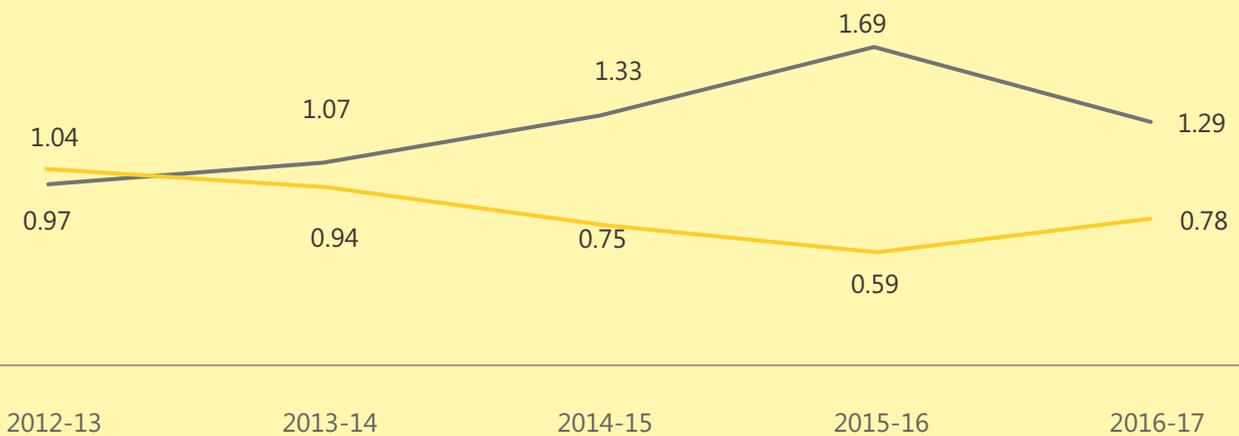
TYPES OF FUELS USED AND THEIR CONTRIBUTION IN OVERALL DIRECT ENERGY MIX (TJ)



The **average** Energy Intensity (defined as Total Energy Consumed in Giga Joules per Lakh Rs. of Gross Turnover net of Excise achieved) figure stood at 1.27 and for the last 5 years varied from 0.97 to 1.69 as shown in the figure labelled energy intensity / productivity data.

ENERGY INTENSITY/PRODUCTIVITY DATA

- Energy Intensity (GJ /Lakh Rs. of GTO net of Excise)
- Energy Productivity (Lakh Rs. of GTO net of Excise achieved / GJ)





Similarly, the figure for Energy Productivity (Defined as GTO net of Excise achieved in Lakh of Rs. per Giga Joules of total energy consumed) stood at an average of 0.82 for the last 5 years and varied from 0.59 to 1.04. However, it may be noted that the data for GTO net of Excise encompasses entire BHEL whereas the energy usage data is restricted to reporting boundary for environmental parameter only. It clearly established the fact that the energy productivity was at its peak when the GTO net of Excise achieved was maximum in the history of BHEL. Similarly, the energy intensity was at its lowest for 2012-13 when the GTO net of Excise was at its peak. During 2015-16, when the turnover of the organisation was at its lowest in the last 5 years, the figure for energy productivity is at its ebb.

Efforts in conservation of energy & energy efficiency

In BHEL, Energy Conservation (ENCON) is an important thrust area and efforts in this direction continued in the reporting period as well. Some of the initiatives taken during the reporting period are given below:

- Implementation of Energy Management System (ISO 50001: 2011) enables the organization to establish systems & processes necessary to improve energy performance, including energy efficiency, use and consumption. Five manufacturing units (HEP-Bhopal, HEEP-Haridwar, HPBP-Trichy Unit#1, HPEP-Hyderabad, and EPD-Bengaluru) have obtained ISO 50001:2011 certification for their Energy Management System.

- Energy Audit of manufacturing units is conducted periodically in a phased manner to identify the Opportunities for

Improvements (OFIs). Energy Audit was conducted at HEEP-Haridwar and PPPU Thirumayam units in FY 2016-17. 64 ENCON projects were implemented across the company. These projects were related to installation of Automatic Power Factor Correction to improve Power Factor, door latching



Light pipe installed in canteen area of HPEP Hyderabad

system in Furnaces, FRP/ Polycarbonate sheets on rooftop to harness sun light for lighting inside factory sheds, replacement of old inefficient Air conditioners with energy efficient star rated ACs etc. ENCON projects are undertaken based on the recommendations of Energy Audit.

- A target of 4% reduction in specific energy consumption (Energy consumed/ MT of product) over previous year value was undertaken for Trichy and CFFP-Haridwar units. Actual achievements for the two units were 4.28% and 5.14% respectively.



- To bring the competitive spirit amongst manufacturing units, a Trophy for Energy Efficient Unit was instituted and BAP-Ranipet Unit was declared winner for the second consecutive year.

List of major ENCON projects taken by our manufacturing units during the reporting period is shown in the table below:

Major ENCON Projects undertaken in BHEL during 2016-17			
SI No	Name of the unit/ division	Project Title	Envisaged Energy saving (kW-hr/Yr.)
1	BAP Ranipet	Inhouse retrofitting of existing 47KW DC motor and drive in SK12 machine with AC motor and drive.	24000
2		Installation of 18 W LED in place of 72 W (2X36) conventional flourescent tube fittings. = Qty. 500 Nos.	25500
3		Arresting leakages & wastage in compressed air lines inside manufacturing sheds and optimum utilisation of Air compressors by utilising smaller compressors depending upon requirements	60000
4	CFP Rudrapur	Installation of Astro timer switch system for street lights, Boundary Lights & High Mast lighting system.	6753
5		Replacement of 105 Nos. 2X18 W CFL panels with 70 nos. 36 W surface mounted LED Panels in New Admn. bldg.	2592
6	CFFP Haridwar	Replacement of old hot water pump motor by Energy efficient motor with soft starter.	51300
7		Installation of latching system in 10 Nos. of furnaces.	9205426
8		Replacement of hot water pump 1 Nos. in new water pump house.	24000
9	IP Jagdishpur	Replacement of 40 Watt Tube Lights With 20 Watt LED(100 Nos)	10500
10		Replacement of 70 Watt SV Street Light With 45 Watt LED (50 Nos)	8760
11	IVP Goindwal	Replacement of existing 24 nos. ceiling fans (110 watt) with Energy Efficient ceiling fans (72 watt).	3283
12	PPPU	Installation of 50 Nos of LED Solar Street Lights.	27375
13	Thirumayam	Installation of Energy Savers	30000
14		Replacement of 400 W metal hallide lamps with 200 W LED lamps - 12 Nos.	7200



15	HPBP Trichy	Optimum Operation of Producer gas Generators (Coal Saving).	Coal saving = 3132 MT
16		Efficient energy optimisation & loading in LPG furnaces.Bldg-50 & Bldg-1.	LPG saving = 466.20 MT
17		Optimised operation of Air compressors based on production requirement.	1287000
18		Replacement of 100 Nos. 250 W HPSV lamps with 4X24 W T5 Fluorescent fittings external lightings in Building-1	18792
19		Optimization of Lighting load usage in roof lights at PG plant, Coal handling Area, compressor house, oxygen Plant	12900
20		Energy saving project in cooling water system using available spares	18200
21		Optimization of Lighting load in Building-50 by introducing automation in its ON / OFF operation	301125
22		Implementation of auto tripping mechanism of Man coolers during rest/ break hours and several other automation in lighting, air-conditioning etc	125537
23	HEEP Haridwar	Replacing 400 W metal halide street light system with 120 W LED Lamps	83166
24		Installation of Energy efficient LED Bulbs 300 Nos (9 W 200 Nos & 12 W 100 Nos) replacing Metal Halide High Bay Lighting in Block-3.	11500
25		Replacing 50 Nos. of 2 X 36 Watt CFL False Ceiling Panels with 36 W LED Panels & 15 W LED Down lighter ED office and GM Offices.	20000
26		Installation of Energy efficient LED Lightings 50 Nos (400 W to 120 W) for Metal Halide High Bay Lighting in Block-3.	84666
27		Installation of Energy efficient LED Lightings 100 Nos (70 W by 45 W) replacing 50 Nos (150 W to 60 W) replacing HPSV Lamps in Street Lighting System	32833
28		Installation of Energy Efficient 18 W LED in place of 85 Watt CFL and 40 Watt tube lights Qty.: 500 Nos (in new CNC Taping Hall 3-470 and old CNC Taping Hall 3-461) & offices	48166

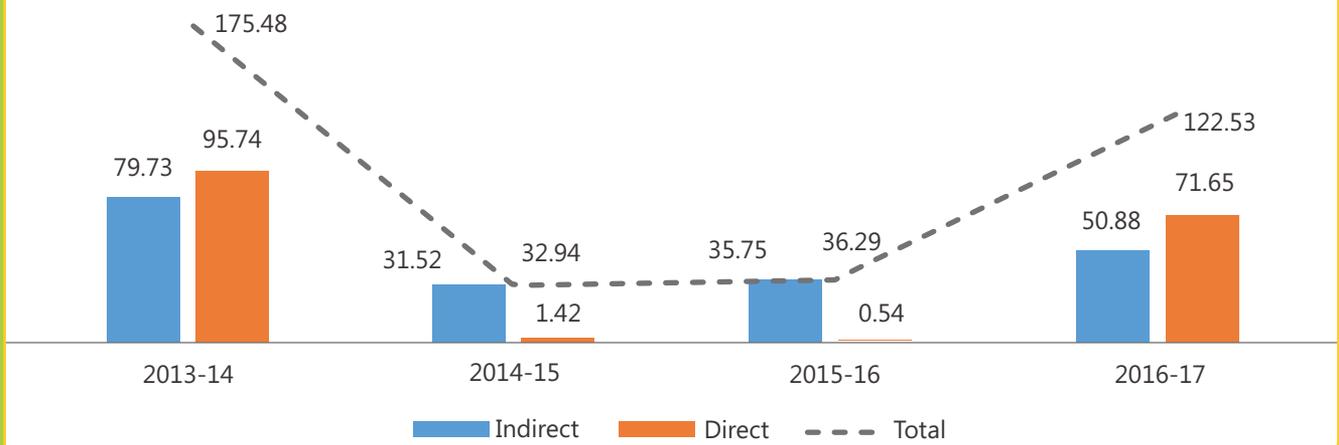
29		Installation of 25KW _p Solar PV Plant for Main ADM Building	42500
30	HEP Bhopal	Replacement of existing T5 street light fitting with Energy efficiency LED street light fitting (150)	47961
31		Installation of LT APFC panel in Block substation to improve P.F	80000
32		Replacement of 100 watt incandescent lamp fitting with 10 watt LED lamp in IFX conference hall (200 Nos.)	36000
33		Installation of transparent sheet in roofing of rooftop of manufacturing blocks	416160
34		Installation of High Bay LED light fitting (250 Nos.)	90000
35		Putting thermal insulation over exposed steam and condensate pipelines outside the block	6983
36		Improvement in Energy performance in 1500kw Arc Furnace by reducing single heat per day in a year by and further 50% in year 2017-18.	45000
37		Improvement in Energy performance in 1500 KVA Melting Induction Furnace by reducing single heat per day in a year by 50% in yr. 2016-17	40000
38		Replacement of thermal insulation material and deformed lid of 144kw Carburizing Furnace in TGM.	20000
39		Replacement of thermal insulation of 75kw Electric Oven in CIM.	12000
40		Switching off of exhaust fans /Man coolers by a Master switch in a gang way in TGM & PRM.	3000
41		Installation of LED light fittings inside shops running in 2 and 3 shifts in PRM, TGM & FYM (Total- 50 Nos.).	4500
42		2 Storied pallet for heating electrical coils in 2 Ovens in CIM.	20000
43		Electrical contractor arrangement for switching off 90% overhead lights (35 nos.) above material store in Bay-3 PRM.	4000
44		Automatic switching off system for cooling system of 1.5 megawatt Induction Furnace to prevent its running over night	10000
45		Replacement of overhead Emergency lights (85 watts) in 4 blocks of Feeders by 42 watts LED lights. Total 40 nos.)	6192
46		Improving Energy efficiency of Electric Oven (4/B/2077) of EM Process by 20 % by installing Thyristor controller	76800
47		Improving Energy efficiency of Electric Oven (26/B/2062) of TAM Process by 20 % by installing Thyristor Controller	76800
48		Thermal insulation of steam heated ovens to reduce radiation loss	55866



49		Auto temperature control of steam heated ovens (6/B/33, 6/B36, 6/B/2006).	67069
50		Installation of Vapour condensers in Vacuum Plants to improve heat exchange efficiency (6/B/36)	48883
51		Recovery of steam return condensate and optimization of use of steam by reducing the fuel consumption for steam generation (TRM)	520 MT of furnace oil
52	TP Jhansi	Installation of Biomass Gasifier to reduce LPG consumption in canteen	14000
53	HPEP Hyderabad	Replacement of Metal halide light fittings with LED lights in 02 & 06 Blocks - 160 Nos	161280
54		Replacement of Fluorescent tubes with LED tubes in 01 Annexe - 500 Nos.	33000
55		Closing of Precision Controls Furnace door during the resin curing period	30000
56		Reducing holding time in furnaces in 04 Block	65192
57		Closing of lids of furnaces in 04 Block	234618
58		Installation of 20 KWp Solar rooftop system on GT main Annexe	36500
59		Installation of 50 Nos of LED street light	28800
60	EDN Bengaluru	Increasing the number of un-diffused silicon wafers by 20% (from 245 to 295) per batch for diffusion (of power semiconductor devices product)	900
61		Installation of 150 TR Screw chiller for 105 MW PV Cell line manufacturing A/c for Airconditioning	206010
62		Installation of 125x2 TR Screw chiller for 105 MW PV Cell line manufacturing A/c for process chilled water	343350
63		Replacement of 66 TR Reciprocating chiller with Screw Chiller for DOE AC Plant	30503
64	EPD Bengaluru	Energy Efficient Lighting (LED, T5 fittings and Metal Halide) for office and shop floor	78000
65		Energy saving system utilizing efficient technologies (VFD's for Kilns)	121000
66		Street light Power source changed to Solar	9198

From the above table it can be seen that due to ENCON projects completed during 2016-17, there will be an annual energy saving of 14.13 Million units across BHEL. Further due to significant avoidance in coal, LPG and FO consumption, as listed in the table above, about 71.65 Tera joules (TJ) of direct energy usage per annum would be avoided.

Energy usages avoided (in TJ) across BHEL units in last 4 years due to Energy Efficiency/conservation efforts



It may be noted that recurring savings has not been included in the data and only fresh projects undertaken during the reporting period have been considered for calculation of annual projected energy saving. As can be seen from the figure the energy savings activities have gone up significantly which may partly be attributed to implementation of ISO 50001 in many of our major energy intensive units.

Green Energy Generation

During the last 3 years' many new renewable energy based systems were installed across BHEL augmenting the renewable energy generation capacity substantially. A 5 MW_p Solar Power Plant was installed in Trichy unit during the year taking the cumulative installed capacity for MW-scale solar power plants to 11.5 MW_p as on March-2017 across BHEL. In addition, many rooftop and ground based kW scale systems have been



20 kW_p rooftop solar system at EDN Bengaluru



installed in different units of BHEL. The total electricity generated from various solar systems stood at 14.82 Million units for the reporting period.

The list of major solar installations across BHEL is given in the following table:

List of major solar installations across BHEL premise			
Sl No	Unit	Capacity	Description
1	R&D Hyderabad	250 kW _p	Ground based SPV system
2	R&D Hyderabad	13.5 kW _p + 13.7 kW _p	Rooftop Solar system
3	HEP Bhopal	250 kW _p	Ground based SPV system
4	ESD & EDN Bengaluru	87 kW _p	Rooftop Solar systems
5	HPEP Hyderabad	1.5 MW _p	Mega Watt scale SPV system
6	HPBP & SSTP Trichy	20 kW _p + 50 kW _p + 50 kW _p	Rooftop solar plant
7	HPBP & SSTP Trichy		Miscellaneous solar systems like 4000 LPD & 3000 LPD Solar Water Heating (SWH) system, LED Street Lights etc.
8	HPBP & SSTP Trichy	5 MW _p	Mega Watt scale SPV system
9	BAP Ranipet	5 MW _p	Grid interaction SPV plant of Mega Watt Scale
10	HEEP Haridwar	25kW _p	Rooftop solar plant



8 kW_p Wind Solar Hybrid system at EDN Bengaluru



70 kW_p Solar system at PPPU Thirumayam





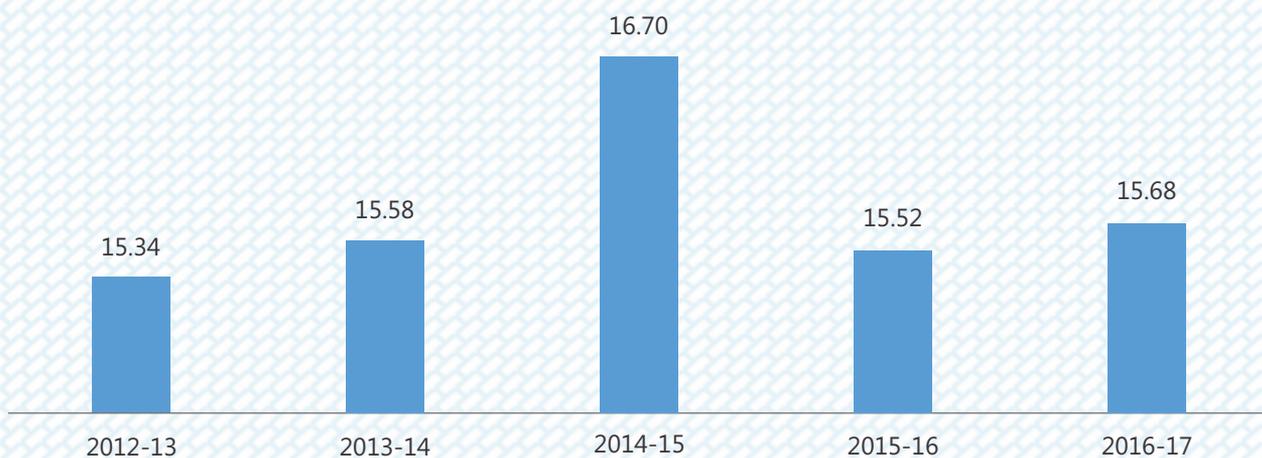
5 MW_p Grid Interactive Solar Photo Voltaic System installed at Trichy unit



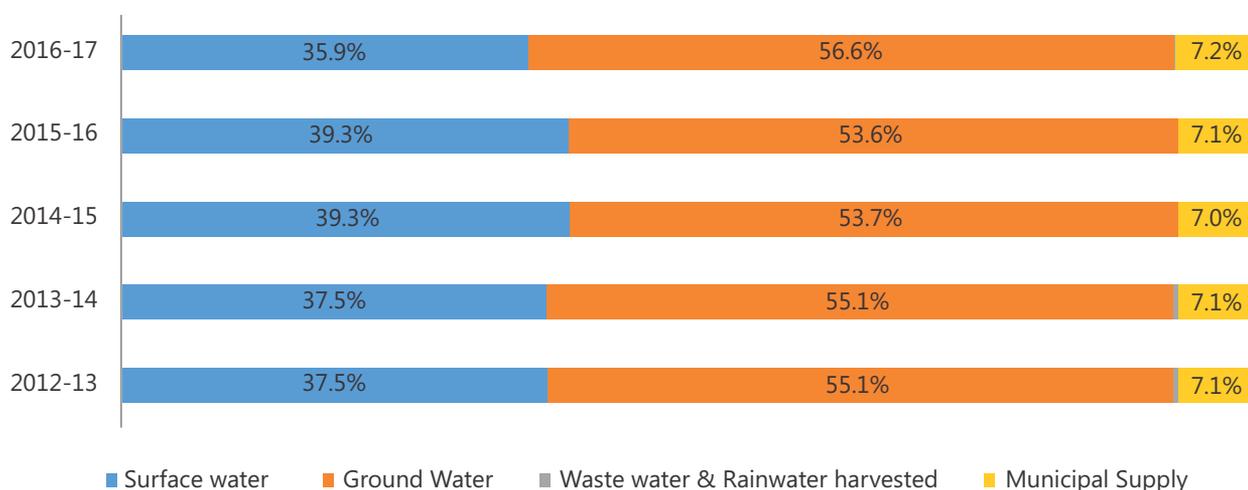
Water usages & its conservation in our premises

We at BHEL believe that since water is a common good, it is imperative that being a responsible corporate citizen we should use water in our operations most judiciously. Efficient use of water inside the organisation is a value proposition as it helps in reduction of water and energy related expenditure as well. Keeping the broader objectives of our country's National Water policy 2012 which lays emphasis on water reuse / recycle and making our industrial units as Zero Liquid Discharge (ZLD) units, many of our units have already achieved the status of ZLD plant and remaining units are working towards achieving this objective.

Total water intake in Million Cubic Mtr across BHEL during last 5 years



Contribution of different sources of water

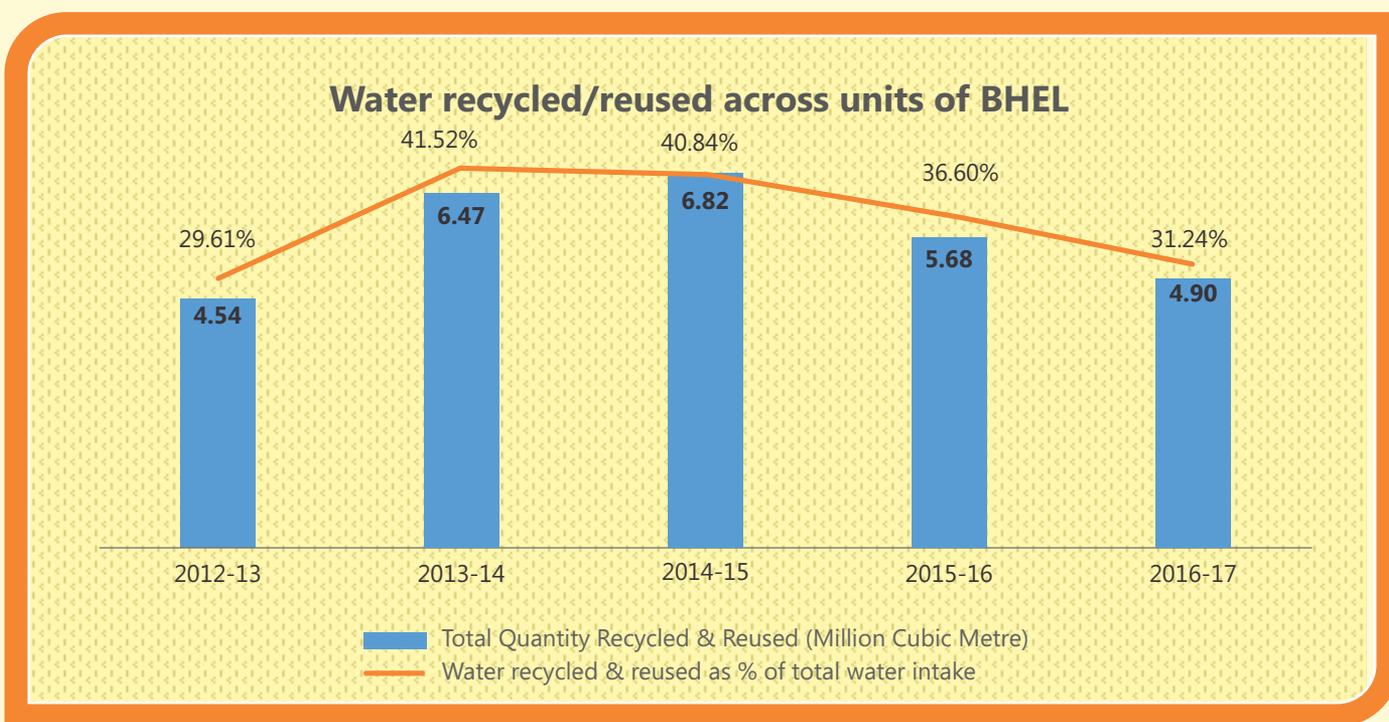


As can be seen from the figure, the average quantity of water drawn from different sources at our manufacturing units during the last 5 years stood at 15.76 Million Cubic Metre. Further, the contribution of different water



sources is also shown in the figure. As evident from the figure, groundwater is the major source of water in our units followed by surface water and municipal supply. Further, it may also be noted that at our EPD Bangalore unit, rainwater is collected and used inside the premise. IVP Goindwal unit is reusing the wastewater in its process. At our BAP Ranipet unit, Township resident water timing has been reduced and awareness through periodical communication on the optimum use of water is being given to the residents. Further 7 RO plants have been installed in BAP Ranipet unit for drinking water purpose.

During the reporting period, a total volume of 3.35 Million M³ of effluent was discharged from various manufacturing units of BHEL which is nearly 21.37% of water drawn for 2016-17. All the waste water quality related parameters were within the prescribed limit for discharge of waste water as specified by the respective state pollution control boards.



Further, water recycling/reuse is a normal practice in our manufacturing units. The used water is mostly treated locally and reused for horticulture purposes. During last 5 years, a total quantity of 28.41 Million M³ of water has been reused/recycled in our premises which amount to an average of 5.68 Million M³ of water recycled/reused per annum during the last 5 years.

The water balance figure is shown in the picture labelled as water Balance across BHEL premises. In this figure, other usages include the use of water in various process, water losses etc. BHEL is not a water-intensive manufacturing industry and as such, there is no water source which is significantly affected by the withdrawal of water by BHEL units.

अपील

जल संरक्षण- आज की आवश्यकता

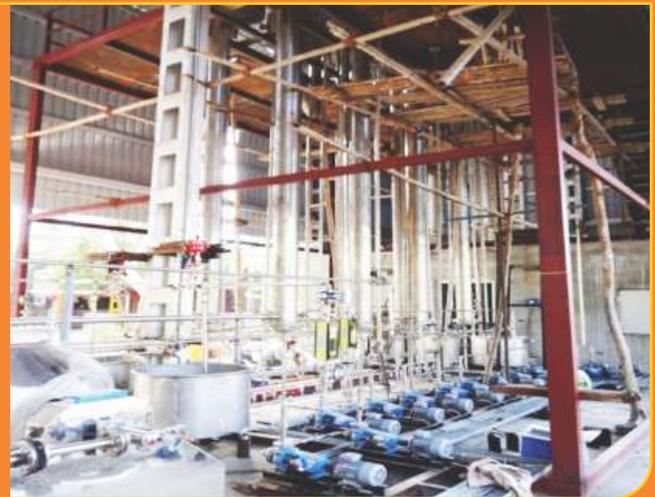
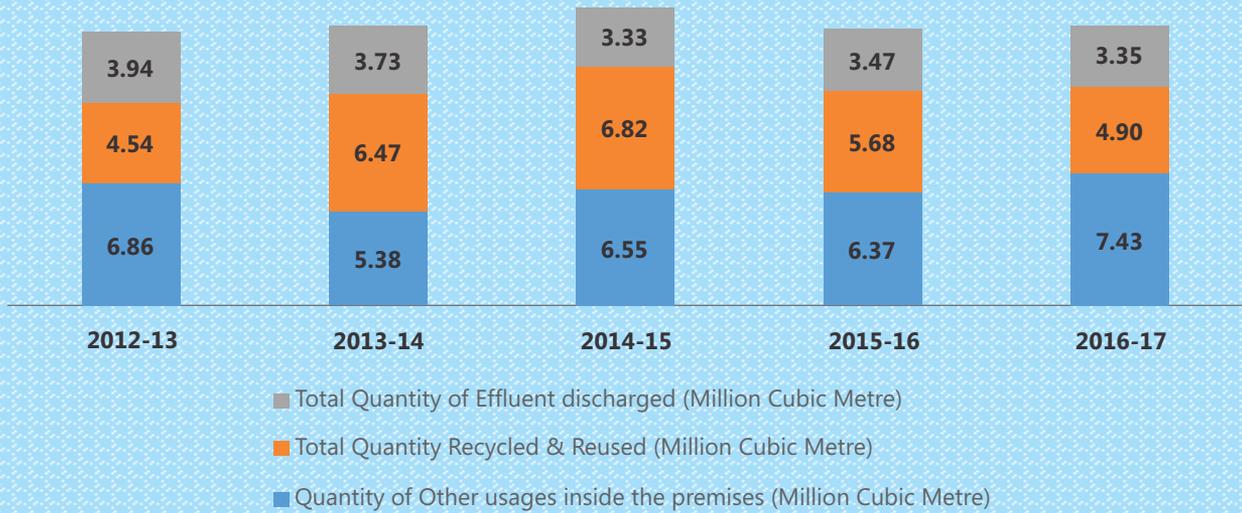
जल अतिमहत्वपूर्ण प्राकृतिक संसाधन है। पृथ्वी के लगभग 70% भाग में जल मौजूद होने के बावजूद हमारे लिये उपयोगी जल (ताजा जल) उपलब्ध जल का केवल लगभग 1% हिस्सा है। शेष जल खारे पानी के रूप में समुद्रों में तथा हिम के रूप में ग्लेशियर में है।

मौसम के बदलाव के कारण मानसून से होने वाली बारिश में सदैव अनिश्चिता बनी रहती है। गर्मी के शुरू होने से जल की मांग में वृद्धि हो रही है। हमें आने वाले समय के लिये तैयार रहना है। मानसून में देरी होने पर जल उपलब्धता में कमी आयेगी। हम अपनी आदतों में बदलाव कर काफी मात्रा में जल बचा सकते हैं। अतः हम आज से ही जल संरक्षण पर विशेष ध्यान देना शुरू करें तथा इस बहुमूल्य प्राकृतिक संसाधन को संरक्षित करें।

निवेदक : पर्यावरण प्रबंधन प्रकोष्ठ (एएफ.एम.एस.)
आरजे डी प्रोडिक्ट्स लिमिटेड, भोपाल



Water Balance across BHEL premises



Multi Effect Evaporation system for tertiary treatment of the effluent generated from electroplating process (Block 4 Switchgear Manufacturing) at HEP Bhopal



Biodiversity conservation within our premises

None of our unit is surrounded by any biodiversity reserve or protected area. Lot of efforts have been taken by our units to maintain the greenery around our physical footprint. Towards this, every year mass tree plantation programme is undertaken by our units on world environment day. Further it is now a standard practice in some of our units like Trichy, BAP Ranipet, HPEP Hyderabad etc. that superannuating employees plant a sapling on their last day at work.



Greenery in factory premise of PPPU Thirumayam



भारत हेवी इलेक्ट्रिकल्स लिमिटेड, भोपाल



पर्यावरण जागरूकता कार्यक्रम

वृक्ष, पानी और शुद्ध हवा,
जीवन जीने की अनमोल दवा ॥



Under a noble initiative Harit-Haram, total 12000 saplings were planted at HPEP Hyderabad unit during 2016-17.



12000 saplings were planted under the initiative Harit Haram at HPEP Hyderabad



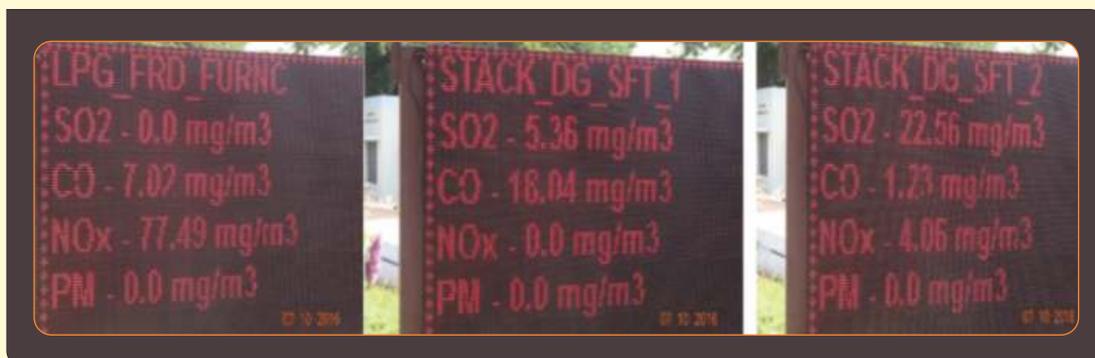
A snapshot of some of the water and biodiversity conservation and related activities carried out during 2016-17 is provided in the following table:

Water and Biodiversity Management

1. **EDN Bengaluru unit:** Approx. 150 KLD of sewage is being treated in STP and then being used for horticulture.
2. **HEEP Haridwar unit:** 500 saplings were planted during the year. A new park named "Gandhi Park" has been developed in the township.
3. **BHEL Trichy:** Water consumption was reduced by nearly 6.5 % with respect to the consumption in the year 2015-16.
4. **BAP Ranipet unit:** To reduce the water consumption in the township, water supply duration has been reduced periodic campaign is carried out to educate residents about optimum use of water.
5. **BAP-Ranipet unit:** About 3500 saplings were planted during the year.
6. **EDN-Bengaluru unit:** About 1000 saplings of various varieties were planted inside the factory premises & township during World Environment Day-2016 celebration. Further, thousands of saplings of various varieties were planted on the road median below Metro line from Nayandahalli station to Attiguppe station.
7. **HPEP Hyderabad unit:** 12000 Saplings were planted under the initiative Harit-Haram during world environment day – 2016 celebrations.

Managing emissions and Carbon footprint

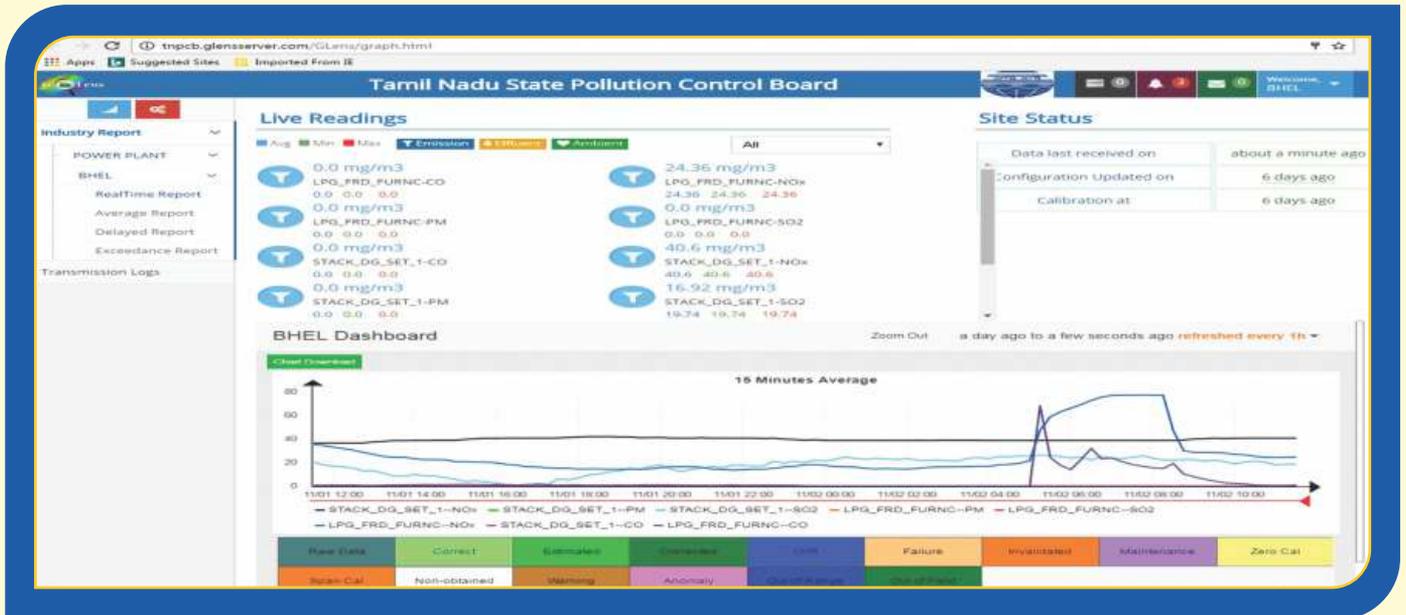
In our factory premises, all emissions are being monitored by respective units as per the requirements of applicable environment related Acts and Rules. Records are being maintained and the same is being reported to concerned statutory authorities from time to time as per the statutory requirements. Monitoring and control of emissions from boiler & gas plant furnaces are undertaken regularly to maintain emissions levels below the permissible limits. The quality of all emissions into air are monitored and maintained within the permissible



Real time digital display of Air Emission from stacks at PPPU Thirumayam unit

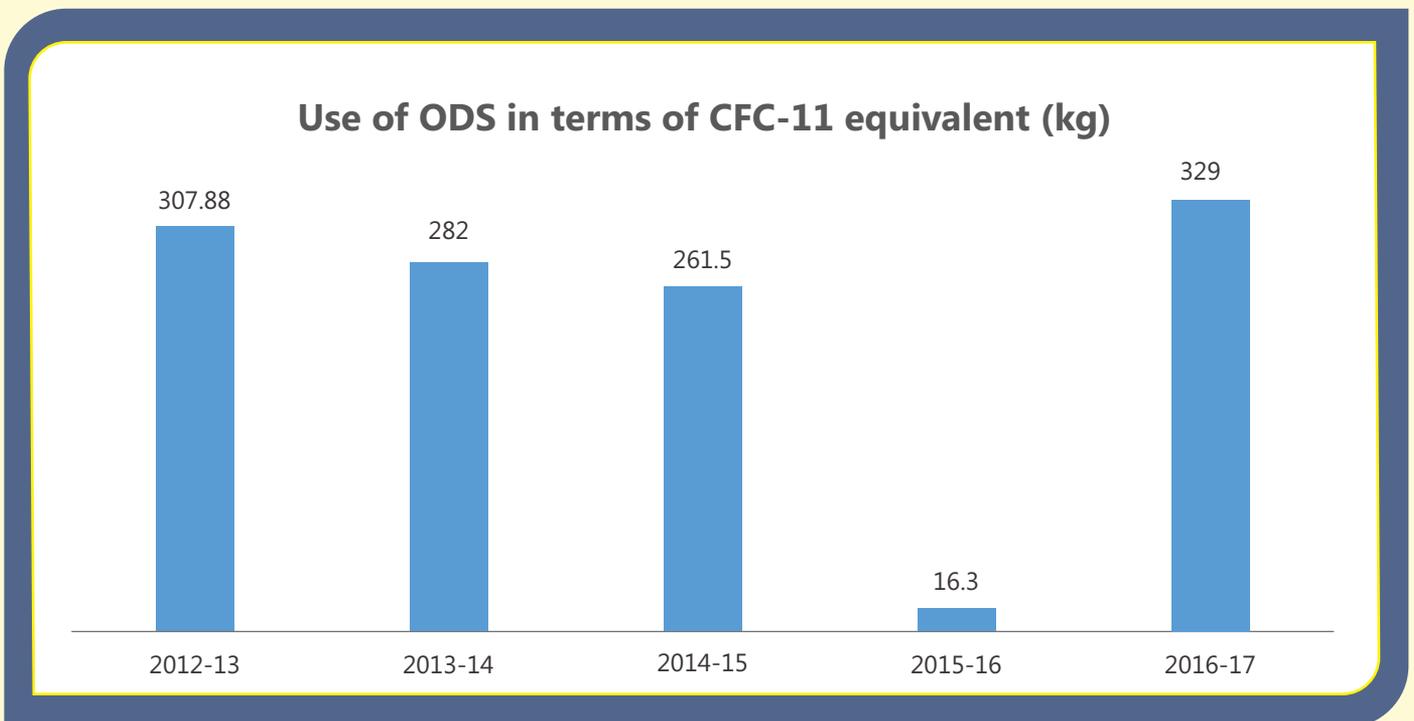


limits prescribed by respective state pollution control boards (SPCB) and central pollution control boards (CPCB). However, as far as GRI G4 requirements for capturing the weight of pollutants being let out from the organisation is concerned, we are yet to develop a system to quantify the emissions of all the major pollutants like NO_x , SO_x , $PM_{2.5}$, PM_{10} etc.



Online Stack Emission Monitoring Systems installed in 1000kVA, 2000kVA & 70T furnace at PPPU- Thirumayam connected with TNPCB portal

In line with the commitment of Govt. of India, use of Ozone Depleting Substances (ODS) in refrigerators and chillers has been phased out at most of our units and at the places where it is still being used, the process of its



gradual phase-out is underway. During 2016-17, the quantity of ODS used stood at 329 KG CFC-11 equivalent for the reporting period. The new machines procured in our units are using refrigerants like R-134a, R-410a etc.

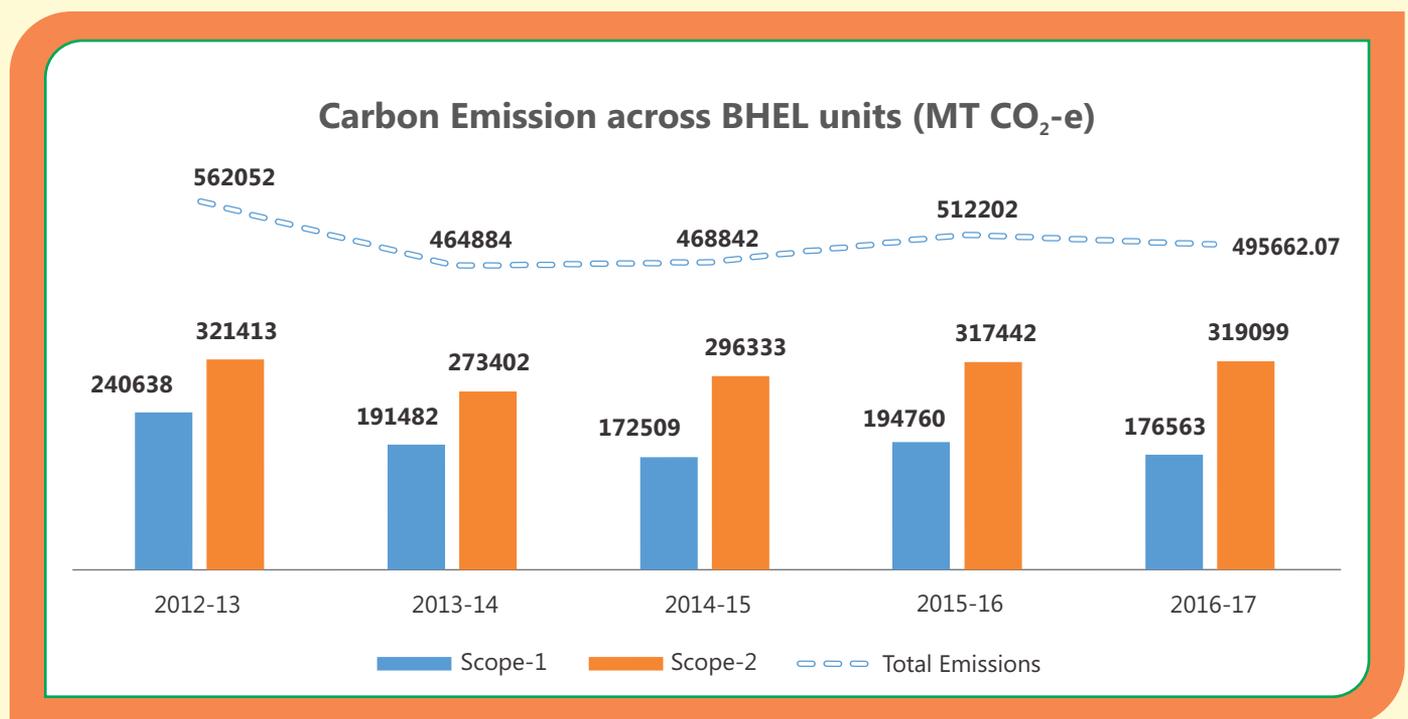


which are more environment-friendly and having fewer Ozone Depleting Potential (ODP) values.

All our units are capturing their carbon footprint and calculating Scope-1 and Scope-2 emissions. The inventory of GHG emissions is being maintained at unit level and consolidated carbon footprint figure for the organisation is being arrived at. However, Scope-3 emission is not being captured at present in our organisation.

Scope-1 emission is being calculated through application of proper emission factor for stationary combustion to different category of fuel used using appropriate UNFCCC protocol. For calculation of Scope-2 emission the data from CEA is used and applying appropriate CDM methodologies for calculation.

(Ref: http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver12.pdf)

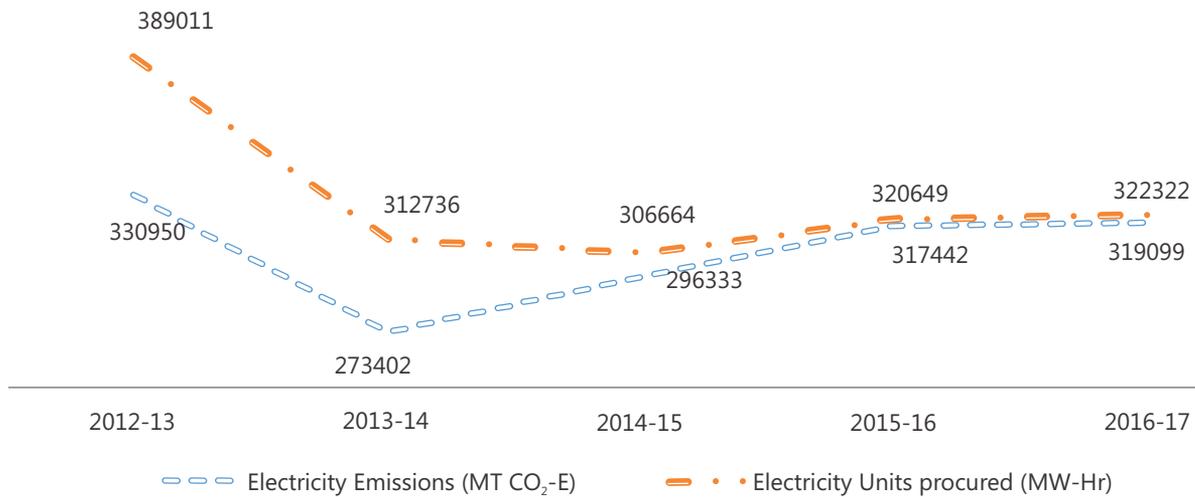


However, it is important to note that the major impact of our products is beyond our premise and is at the customer's end during the usages of the equipment. Therefore, it is always our endeavour to develop and assimilate greener technologies so as to enable our customers to reduce their carbon footprint and help fighting climate change due to global warming.

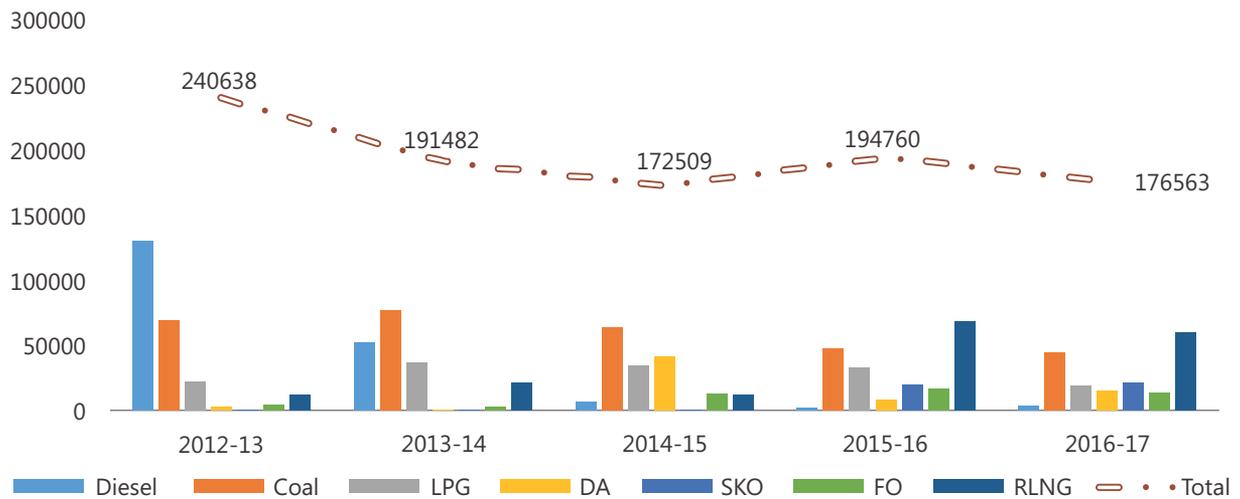
The figures shown here indicate the Scope-1 emissions due to primary energy consumption, Scope-2 emissions due to electricity procured and total such emissions. Also contribution of different fuels in our emissions over the last 5 years is also shown.



Scope -2 emission: Due to use of electricity procured from utilities (MT CO₂-e)



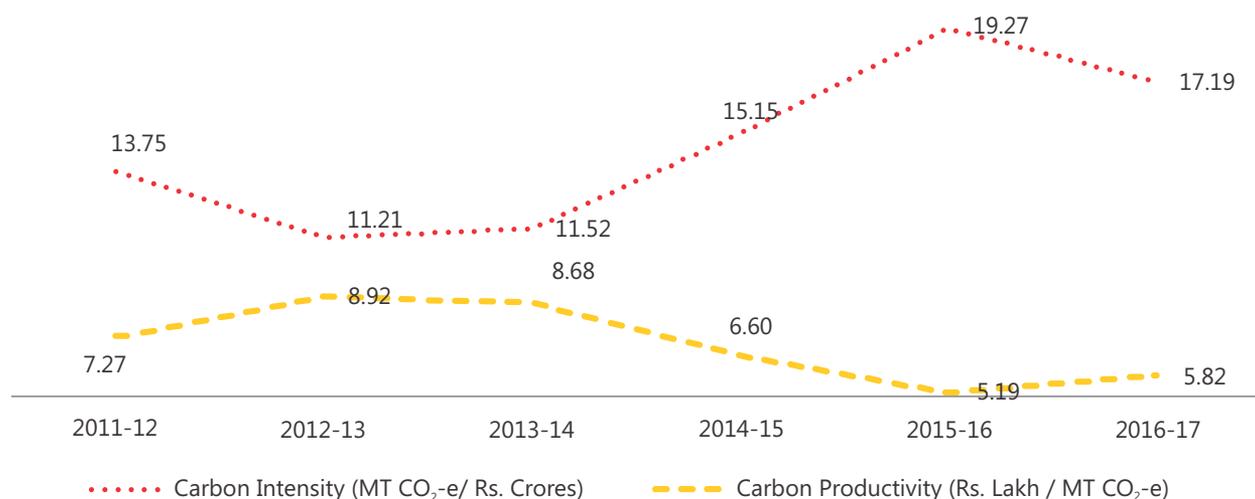
Scope-1 emission: Contribution of major fuels used (MT CO₂-e)



The carbon productivity (Gross Turnover achieved in Lakh Rs. per unit of Carbon Footprint in MT CO₂-e) and carbon intensity (Carbon Footprint in MT CO₂-e per Crore Rs. of Gross Turnover) data is also shown in the figure captioned Carbon Intensity / Productivity data. The average value of carbon intensity stood at 14.16 MT CO₂-e / Rs. Crore meaning for every Rs. 1 Crore of Gross Turnover achieved during the last 5 years on an average 14.16 MT of CO₂-equivalent was released in atmosphere. Similarly, the average figure for the last 5 years of Carbon Productivity stood at Rs. 7.06 Lakh per MT CO₂-e, indicating that for each MT CO₂-e emission a corresponding GTO of Rs. 7.06 Lakh was achieved.



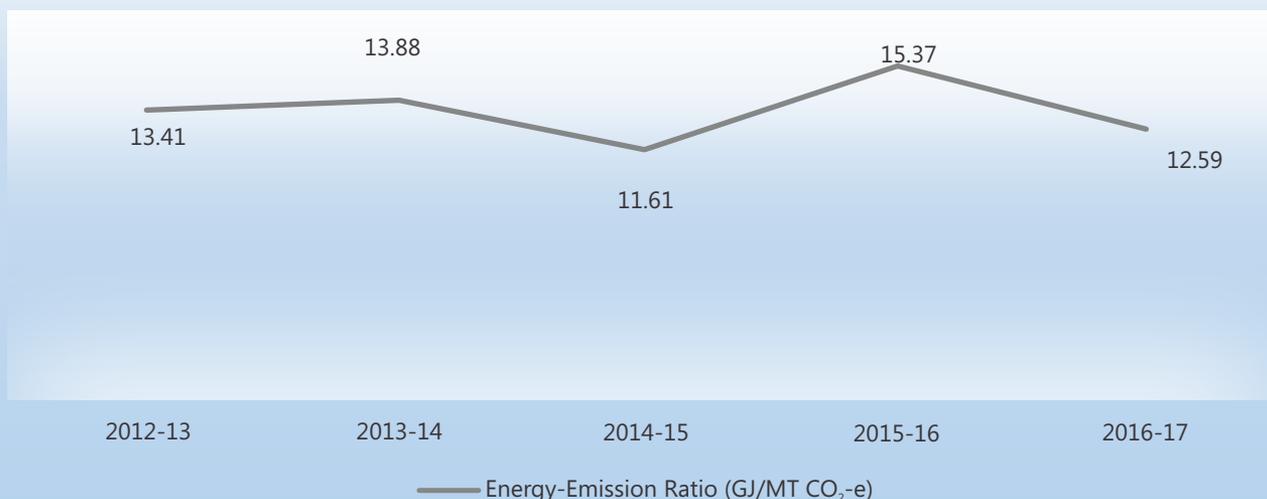
Carbon Intensity / Productivity data



However, it may be noted that the GTO has been taken for entire BHEL whereas the emissions have been considered only for the manufacturing units as indicated under the reporting boundary. The figure is being presented here only for comparison purpose as the reporting boundary has been same for the data presented here. The analysis of this trend is not done thus far due to a complex interplay of our product line, turnover, outsourcing and other miscellaneous factors which contribute towards carbon intensity/productivity.

Further the figure for energy emission ratio for the last 5 years has been shown in the figure below. It indicates that for 1 TJ of primary energy being consumed, how much is the amount of Scope-1 emissions.

Energy-Emission Ratio (EER)



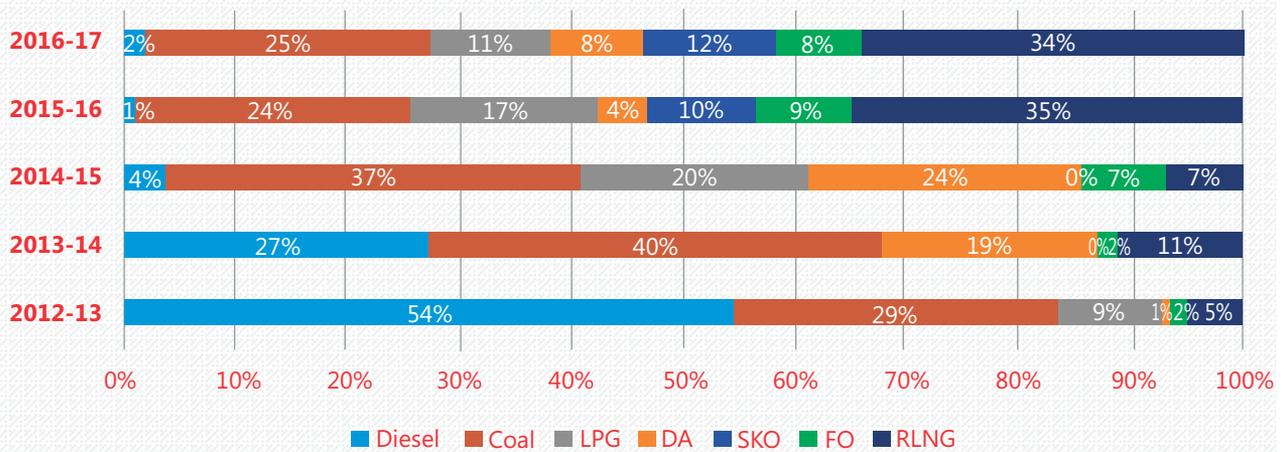


Contribution of major fuels used in units in Scope-1 emission (MT CO₂-e)

Sl. No	Fuel	2012-13	2013-14	2014-15	2015-16	2016-17
1	Diesel	130821	52008	6661	2097	3651
2	Coal	69739	77448	63584	47411	44663
3	LPG	22664	37170	35302	33151	19123
4	DA	1378	2	42108	8420	14757
5	SKO	0	0	0	18896	20686
6	FO	4004	2902	12780	16662	13524
7	RLNG	12033	21953	12075	68124	60159
	Total	240638	191482	172509	194760	176563

Although, the data for Scope-3 emission is not being captured yet but reduction in Scope-3 emissions is evident due to increasing usage of RLNG which is supplied through pipelines and does not require physical carriage through conventional means of transportation like tanker etc.

Contribution of different fuel sources used in direct emission (%)



Reduction in energy consumption was achieved in our premises through continued emphasis on better upkeep of energy intensive systems, installation of turbo ventilator based on natural air flow, installation of LED lights replacing conventional lights, installation of rooftop solar plants, installation of energy efficient Air Conditioning and Ventilation Systems (ACVS), providing translucent acrylic sheets on roofs and side walls of factory sheds for use of natural lights during daytime etc. Due to sustained focus on energy efficiency / conservation activities avoidance of carbon footprint to the tune of 22591 MT CO₂-e could be achieved during the reporting period. As seen from the figure, the thrust on saving of fuel/electricity and thereby carbon emission avoidance has gone up in the reporting period. This may be attributed to more concerted efforts in energy efficiency / conservation projects due to introduction of ISO 50001 – ENMAS.

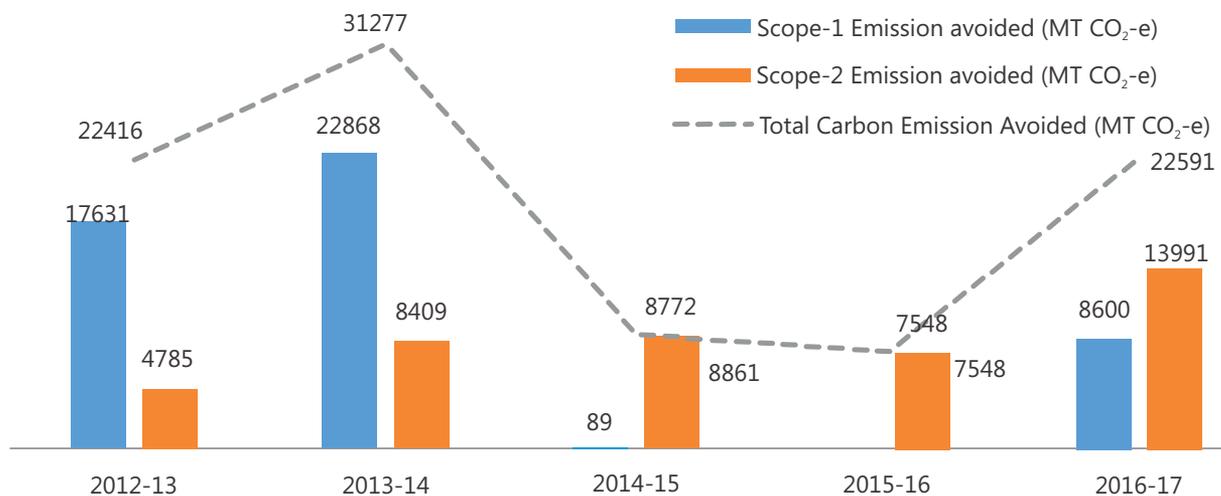


It may further be noted that the carbon emission avoidance calculation has been done for projects undertaken in the reporting period and not the savings accrued over the years.



2 X 50 kW_p Rooftop Solar System installed at Trichy unit

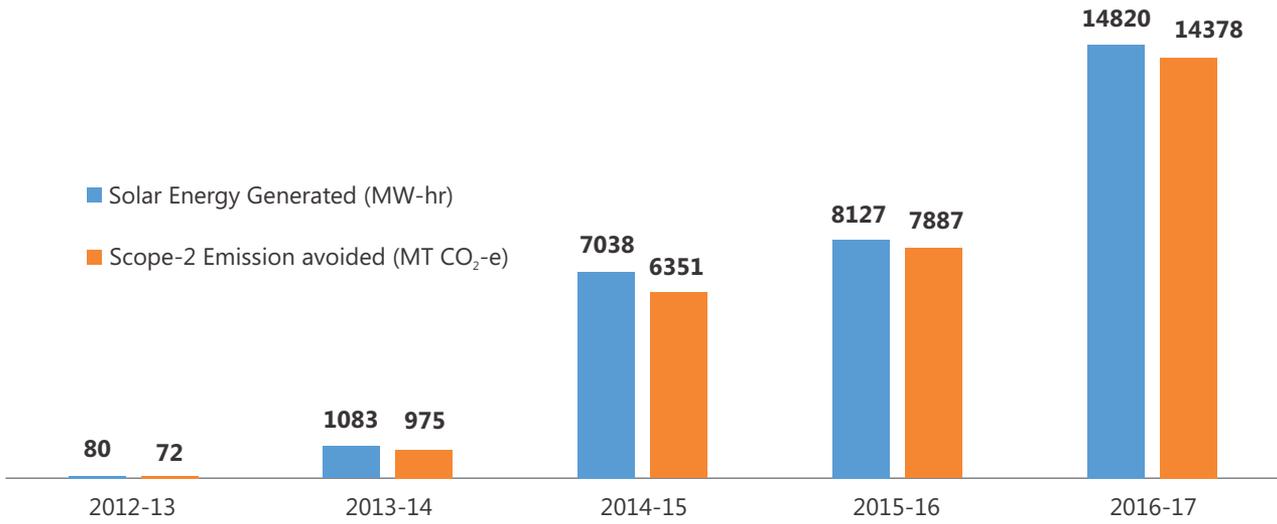
Carbon Emission Avoidance due to Energy Efficiency / Conservation activities



During the reporting period a 5 MW_p SPV plant at Trichy unit got commissioned which bolstered our efforts towards generation of renewable energy and thereby avoidance of carbon footprint to that extent. Now we have 3 plants of Mega Watt scale – 5 MW_p at BAP Ranipet unit, 5 MW_p at Trichy unit and 1.5 MW_p at HPEP Hyderabad unit in addition to number of rooftop based solar systems of kW_p scale.



Carbon Emission Avoidance on account of Renewable Energy Generation (MT CO₂-e)



Further, as mentioned in the previous section we have reduced the consumption of diesel and other conventional fuels which require carriage by road and thereby reducing the Scope-3 emission which would have occurred on account of carriage of these fuels by road or rail. However, the savings thus accrued is not quantified till date.



60 kW, Rooftop Solar System installed at EDN Bengaluru made out of rejected solar panels



Responsible waste management

Waste management is an important thrust area in our sustainability management system. Reduction of waste generation at sources and recycling & reuse of generated waste is an area where lot of emphasis is there. In addition to regular activities in waste management, some of the examples of specific activities taken up during the reporting period in this area is given in the table below:

Waste Management

- HEP- Bhopal unit:** A Multi Effect Evaporation system was commissioned for recycling of all the effluent generated in the electroplating process for total recycling of all the effluent generated in the electroplating process.
- HEEP-Haridwar unit:** To ensure proper collection and segregation of wastes at source the existing waste bins for different types of wastes were renovated and wherever bins were not there, new bins were provided.
- HEEP-Haridwar unit:** Safe storage facilities were created for storage of hazardous wastes.
- BHEL Trichy -** Organic wastes are composted into manure and used for horticulture. 2 MT of food-waste is used as fodder for piggeries and generates revenue as well. 24 KLD of reject water from RO plant being used for washing utensils thereby reducing the consumption of freshwater.
- EDN-Bengaluru unit:** Sludge from ETP is being used as manure for plantations inside the BHEL premises and excess manure is distributed to the farming community.

Across BHEL, solid wastes/scraps having resale value were collected, stored safely and then sold to authorised agencies/recyclers. Similarly, Hazardous Wastes and e-wastes were disposed of following procedure/methodology prescribed in the relevant statutes.

The data for waste generated during last 5 years is shown in the table below.

Hazardous and Non-Hazardous Wastes generated at units

Type of wastes	Unit	Quantity (2012-13)	Quantity (2013-14)	Quantity (2014-15)	Quantity (2015-16)	Quantity (2016-17)	Disposal method
Non -Hazardous	MT	69661.7	100902.7	57385.1	33933	36945	Sold to the authorised users/ disposal facility
Hazardous	MT	8286.9	6877.1	6185.0	5309.8	4724	

The waste generated at our premises are either recycled/reused in-house or given to authorised recycler for recycling/reuse outside BHEL. The following table shows the details of waste recycled/reused data for the last 5 years.



Waste Reused / recycled at units

Type of wastes	Unit	Quantity (2012-13)	Quantity (2013-14)	Quantity (2014-15)	Quantity (2015-16)	Quantity (2016-17)	Remarks
Non -Hazardous	MT	3671.48	6415.28	9708	33591	36028	Includes ferrous as well as non-ferrous materials
Hazardous	MT	411	3.62	92	1059	2601	Used oil and other materials reused inside or sold to authorised recyclers



Segregated PV Module Scrap and Electrical scrap properly stored in storage yard at EDN Bengaluru



Compost yard for making manure from shredded leaves, tree cuttings etc. at Trichy unit

Initiatives taken to reduce environmental footprint of our products and services

As the products developed by BHEL is having the effect of its environmental footprint mainly in use phase, it is imperative that we develop and assimilate greener technologies having lesser environmental footprint across its life cycle. BHEL is contributing to the global effort for sustainable development by encouraging application of inclusive and environment friendly business practices across the value chain.



We supply numerous products addressing contemporary environmental concerns like supply of Thermal Technologies; Flue-gas desulfurization (FGD) system; Solar Photovoltaic; Electrostatic Precipitator (ESP) etc. which leads to lower auxiliary power consumption, higher plant efficiency, lower design heat rate & better PLF resulting in lower life cycle cost and less fuel consumption.

During the year, there have been significant developments/ improvements in engineering, processes and products covering various business verticals like Power, Industry, Transportation and Renewables. Some notable achievements to provide energy efficient or renewable energy based products and services and reduction in energy requirements are:

- Indigenous design and manufacturing of 420 kV, 40 kA GIS bay.
- Developed 2 x 500 kVA Hotel Load Converter (HLC) to replace polluting DG sets for Indian railways. The first 2x500 kVA HLC has been commissioned by Indian Railways.
- Developed Polar Axis Solar Passive Tracker which will generate more energy for the same MW_p rating.
- Designed and Commissioned India's first 1 MW Seasonal Tilttable Canal Top Solar PV Plant.
- Designed, commissioned and demonstrated 25 kW_p floating solar plant at Narsapur Lake (near Hyderabad), Telangana. Besides generating power at higher efficiency, the floating solar farm conserves precious irrigation and drinking water by reducing evaporation.
- With the increasing trend of higher MW level of solar power plants, BHEL has successfully developed state-of-the-art 1.25 MW Grid Connected Power Conditioning Unit (GCPCU) for Solar Power Plant.
- Developed two cylinder reheat steam turbine with new back pressure HP module for 70 MW rating industrial sets. This turbine incorporates advanced blading and brush seals resulting in improved heat rate.
- Developed an efficient variant 5075 kW, 11 kV, 10 Pole ID fan motor with modified slot combination and slot size achieving low noise & low starting current for supply to Supercritical Power Plants.
- Development of Advanced Ultra Super Critical (AUSC) Technology project in progress, which will lead to 46% plant efficiency and 11% reduction in coal consumption and emissions as compared to supercritical technology. As part of this development a High Temperature wear resistant coating by HVOF process and stellite coating by laser cladding on Ni-Based super alloy material (IN617 CCA) for Steam Turbine control valve components has been developed.



Prototype Solar cell under development at ASSCP Gurgaon

Some of the Products/ technologies developed/ adopted which are having lesser environment footprint are:

✓ **Development of Advanced Ultra-Supercritical Technology:**



GOI has approved a proposal of R&D project for development of Advanced Ultra Supercritical (AUSC) technology for thermal power plant involving an estimated expenditure of Rs. 1554 Crore, with a contribution of Rs. 270 Crore from BHEL, Rs. 50 crore from NTPC, Rs. 234 Crore from IGCAR, Rs. 100 Crore from Department of Science & Technology (DST). Balance amount Rs. 900 Crore will be provided by DHI to BHEL as plan Gross Budgetary Support for Implementation of the R&D project, spread over a period of three years, commencing from 2017-18.

After successful development of AUSC technology the plant efficiency will go up-to 46% leading to reduction in coal consumption by 11% as compared to Super Critical technology based power plant and consequently reduction in CO₂ emission by 11% as compared to Super Critical power plant. This will significantly improve the sustainability of our scarce resources like coal and save environmental degradation.

✓ **Development of NO_x Emission control technology:**

In order to address the new stringent emission norms for various oxides of Nitrogen (NO_x) less than 100 mg/Nm³. BHEL has developed Selective Catalytic Reduction (SCR) catalyst (Honeycomb) for NO_x emission control technology in thermal power plants. BHEL will be setting up a pilot demonstration plant at NTPC Simhadri. After successful development of this product, BHEL will meet new emission norms for NO_x and drastically reduce the pollutions from thermal power plants.

✓ **Development of Solar Power based grid connected EV charging station**

Demonstration project for development and installation of 3 nos. of wayside solar powered grid connected Electric Vehicles Charging Station having SPV plant capacity of 3 kWp, 5.4kWp and 10.8 kWp. The developed Charging Station will undergo field trial at a site identified by Department of Heavy Industry, Government of India (DHI) in Delhi NCR.

✓ **Development of SO_x Emission control technology:**

Flue-gas desulfurization (FGD) is a set of technologies used to remove Sulphur-dioxide (SO₂) from exhaust flue gases of fossil-fuel power plants.

✓ **Solar cell efficiency improvement:**

Efficiency improvement of crystalline silicon solar cells from 16% to 25 %, etc. Further, in-house R&D efforts are focused on meeting customers' specific needs for any derivative/modified products, diversification, site support and product lifecycle improvement. For details about R&D in BHEL, the reader may please refer to page 89-94 of BHEL's Annual Report 2016-17.

Environmental Protection Expenditure

BHEL has been taking a plethora of initiatives for improvement of the environment and reducing its environmental footprint especially in and around its physical presence under sustainability incurring expenditure for the same. These include statutory requirements as well as voluntary activities and involves expenditure like expenditure on monitoring of stack emissions & ambient air quality, expenses on obtaining consents/authorisations under various environmental legislations, expenses on certifications of ISO 14001 & OHSAS 18001, expenses on installation of new environment friendly technologies, expenses on insurance for environmental liabilities, and expenses on projects taken for environment improvement. The expenditure



incurred on such activities during last 5 years is shown in the figure below. It indicates that a total amount of Rs. 4997 Lakh has been spent in the last 5 years on environment protection activities from the revenue budget. This data does not include the salary of officials engaged in Environmental Management Activities. Although, lot of assets are created at our various premises related to environmental improvement activities, however such capital expenditure is over and above the expenditure shown in the figure.

Expenditure on Environment Protection (Rs. Lakhs)



Management of Significant Spills

No significant spills were reported in any of the manufacturing units during the reporting period. Further, there are no water body and related habitats which are significantly affected by our discharge of water and runoff.

Compliance

All major units and divisions of BHEL have well established Environment Management Systems (EMS) conforming to the requirements of ISO-14001: 2004 and Occupational Health and Safety Management Systems (OHSMS) conforming to the requirements of OHSAS 18001: 2007 and certified for the same. These management systems provide a framework for proactively identifying and ensuring compliance with applicable environmental, occupation health and safety related rules and regulations. Periodic internal as well as external audits by certifying agencies are carried out to ensure effective implementation of the established systems, including legal compliance.

All applicable environmental consents, authorisation & licenses are maintained and their terms & conditions are complied with. Further none of the units has been imposed with any monetary fines and non-monetary sanctions for non-compliance with environmental laws and regulations during the reporting period.

Management Approach – Human Rights, Anti-corruption, Labour Practices & Decent Work

BHEL policies are in line with the principles of Human Rights, the Constitution of India, various Labour Laws, etc. Special provisions have been made in BHEL to safeguard women employees at the workplace. Internal Complaints Committee (ICC) has been formed to look into the cases of Sexual Harassment of female employees at workplace. The principles of Natural Justice are scrupulously followed in “The BHEL Conduct, Discipline and Appeal Rules” applicable to all its employees except workers who are governed by the Standing Orders.

BHEL believes in the highest levels of personal and institutional integrity. The Value Statement of the Company calls for the highest ethical standards to be observed in decision making and demonstration of the same in an honest, decent and fair manner. The Company has zero tolerance approach towards all forms of corruption. BHEL is committed to enhance transparency in all its business dealings for which it has a Vigilance set-up in place to prevent irregularities.

The Company neither subscribes to nor indulges in forced / compulsory labour practices. Towards this, it never asks its employees to deposit their original documents pertaining to educational qualifications or Date of Birth. As per BHEL’s Recruitment Policy, the minimum age for employment in the Company is 18 years. It is not permissible to employ any person below this age in BHEL.

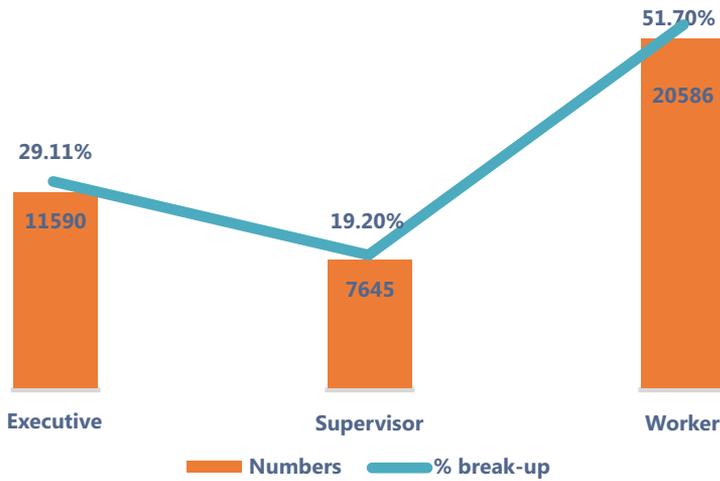
BHEL has been a frontrunner in the area of human resource management. The guiding principle for company’s HRM policy is to ensure availability of competent, motivated and effectively contributing Human resources and to facilitate achievement of their full potential at all times to realize organizational mission. Company has documented the HRM policies and rules in the form of a ‘Personnel Manual’ to ensure transparency and uniformity in implementation for regulating employment relationship, career growth/ development, employees’ emoluments/benefits, healthcare and well-being, which apply equally to all employees, irrespective of factors such as sex, caste, religion, race, etc. All recruitments are conducted in a transparent and impartial manner, thereby giving equal opportunity to all eligible candidates, without any discrimination whatsoever.

Under our HR policy, a new initiative was taken with the creation of “BHEL Retired Employee Medical Benefit Trust”. The other notable policy directions initiated during the year are Revision of BHEL Employees Pension Scheme, Retired Employees Contributory Health (RECH) Scheme for retired employees, administration of Medical benefits to serving/retired employees through a centralized online Portal/System which lays emphasis on sound HR practices in BHEL.

Profile of the employee base

The manpower strength of the company as on 31.03.2017 stood at 39,821. Number of permanent employees with disabilities was 929 as on 31st March-2017.

Cadre-wise distribution of permanent employees



Region-wise/ Gender-wise distribution of workforce

Region	Female	Male	Total
East	39	751	790
North	910	16227	17137
South	1277	19922	21199
West	25	670	695
Total	2251	37570	39821

BHEL engages contractors for certain works and services as per organisational needs. The number of contractors working for BHEL and number of people engaged by the contractor varies from time to time as per the requirements.

Employee Turnover

Total number of Employees hired during the reporting period was 65, whereas the total number of employee turnover during the same period was 2450. Majority of the turnover was due to superannuation.

Region Group-wise Employee Turnover

Region	Total
North	954
East	34
South	1435
West	27
Total	2450

Gender-wise Employee Turnover

Gender	Total	%age
Male	2334	95.27
Female	116	4.73
Total	2450	100

Age Group-wise Employee Turnover

Age Group	Total
21-30	105
31-40	82
41-50	24
51-60	2239
Total	2450

100% of male employees who availed paternity leave returned to work. Also 100% of women employees who availed maternity leave joined work after

completion of their leaves. Significantly all women employees who avail up-to 2 years of child care leave also returned to work after completion of leave. All employees who avail sabbatical or extra ordinary leave for taking care of medical/ sickness in family also return to work.



The company elicits partnerships with smaller organizations, self- working professionals, self-help groups, cooperatives etc. The broad base initiatives provide economic and social growth avenues to these organizations and create opportunities for wealth creations and sharing the gains of economic activity.

Part-time employment and tenure based temporary opportunities for rendering services are provided in areas of healthcare and medical services. Self-employed professionals are provided remuneration comparable to industry benchmark. However, they are not offered pay scales and attendant benefits like perks and allowances. Being self-employed professionals they are not employees of the company and as such their emoluments cannot be compared to regular employees of the company.



Temporary employees are engaged in workmen cadre against regular vacancies for a period of one year. Post completion of one-year service, the temporary employees are absorbed in the regular establishment of the Company. While the temporary employees (recruited against regular vacancies) are paid uniform consolidated amount during their one-year temporary service period, upon absorption they are entitled to regular pay scale plus perks and allowances attached thereto. As such, the essential difference in the matter of benefits admissible to full time employees vis-à-vis temporary employees as stated above lies in grant of pay scale and associated perks & allowance to the former.

Performance and career development

The in-house Performance Management System e-MAP was reviewed and some new modules were introduced in the process workflow. These are Quarterly Feedback Module, Pen Picture module, number of KRAs (Key Responsibility Areas) per plan, Mandatory KRAs and Revised KRA Masters.

An employee engagement survey was conducted for Executives in BHEL, in which 4,390 executives participated. BHEL's overall score in the survey was 5.5 on a scale of 7. The responses were captured on an online platform and relevant reports were generated. Focused group discussions were conducted across the organization to identify employees' causes of concerns. Action plans have been initiated in these areas to address organization and unit level issues.



Employee recognition initiatives like 'Best Employee of the Quarter' and 'High Potential (HiPo) Employees Scheme' were initiated in the previous year and continued in 2016-17. Under the HiPo scheme, 415 HiPos have been identified amongst the mid-level executives so far. The grooming process for such executives, as envisaged in the HiPo scheme has been initiated in their respective units/divisions. The grooming process includes: Stretched Assignments, On the Job experience, Job Rotation, Cross Functional Team exposure, Specific Training programmes and Appointment of Coach.

In 'Best Employee of the Quarter' scheme, 1,400 applications were received during the year and 340 awards were given in different categories.

Labour / Management relations

In BHEL there are three distinct cadre of employees namely Workmen, Supervisors and Executives. Out of these,



only the workmen cadre, which constitutes approximately 52% of total manpower strength, are covered by agreements on issues like wages, perks & allowances, incentives, etc., arrived at through the process of collective bargaining in the Joint Committee for BHEL which is an Apex Level Bipartite forum constituted for discussing



workers and company interest related issues with the workmen representatives, based on the principle of participative management. This committee has been in existence since 1973. The Joint Committee at the Apex Level and Plant and Shop Councils at the unit have a very important role to play in maintaining growth of the company and also to make all employees aware of the overall business environment in which the company is operating. Issues like production, productivity, quality, on time delivery, cost reduction, encouraging suggestions and such other work related issues are discussed and information is disseminated to the lowest level in order to familiarize the employees to the challenges ahead and the need for putting in their best so that the company is not only able to meet such challenges but emerge out stronger.

In respect of executives and supervisors, the Govt. of India issues instructions for their salary and other related benefits. However, the executives and supervisors have formed their associations and regular meetings are held with them wherein their views and suggestions are duly considered. The Industrial Relations' scenario in the various manufacturing units and other divisions of the company remained harmonious and peaceful during the year 2016-17. No man-days were lost during the year on this account. For details about industrial relations in BHEL the reader may refer to page 60 of BHEL's Annual report 2016-17.

Occupational Health & Safety

BHEL is fully committed to providing a safe and healthy work environment in all its manufacturing units and project sites. It is our firm belief that safe and healthy workplace not only boosts people's morale but is also a precondition for greater productivity at workplace. It has always been our endeavour to consolidate good safety practices and make them a part of our work culture. Due to various initiatives taken to improve safety performance at project sites, the number of fatal accidents and man-days lost due to reportable accidents have decreased.

In manufacturing units too, the number of reportable accidents has reduced with respect to 2015-16.



बड़ी दुर्घटनाओं के छोटे कारण

**3 कारण-
दुर्घटनाओं के**

सुरक्षित प्रणाली अपनाएं

**बाल बाल बचें!
ऐसी घटनाएँ
चेतावनीयों हैं।**

नियमों का पालन करें

सुरक्षा उपकरण पहनें

**स्वास्थ्य, सुरक्षा एवं पर्यावरण अभियांत्रिकी विभाग
भारत हेवी इलेक्ट्रिकल्स लिमिटेड, भोपाल**

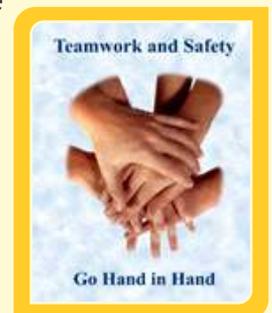
Occupational Health Services (OHS) centres are being run in the factory premises providing preventive as well as curative occupational health services to employees. Health monitoring of employees is carried out at these centres as a preventive health management measure. Some of the initiatives taken in our units/divisions to build and maintain safety and health culture at workplace during 2016-17 included:



- ✓ Awareness training on Material Safety Data Sheet (MSDS) and Safe Operating Procedures (SOP) to ensure safety in handling and use of hazardous chemicals.
- ✓ Health & Safety related training sessions for Regular Employees, Contract Workers & Trade Apprentices.
- ✓ Training at workplace for Crane Operators, Riggers, and Helpers for ensuring safety in Material Handling.
- ✓ Demonstration of Rescue operation in the event of fall from height and awareness creation on appropriate use of appropriate Personal Protective Equipment (PPEs) at project sites.
- ✓ Providing sponsorship to company officials/supervisors for 1-year Advanced Diploma Course in Industrial Safety conducted by Central Labour Institute at Mumbai, and Regional Labour Institute at Kanpur, Kolkata, Chennai and Faridabad.
- ✓ Hazard Identification and Risk Assessment exercise for all new activities/process modification/equipment installation.
- ✓ Tool box talk/pep talks at workplace covering area specific safety issues.
- ✓ Conducting periodic maintenance & testing of material handling equipments (cranes, lifting tackles, hoists, forklifts, pallets etc.), pressure vessels/air receivers, power presses etc.
- ✓ Celebration of Road Safety Week to create awareness amongst employees and drivers associated with transportation of our products.
- ✓ Celebration of National Safety Day/week to create awareness about safety topics amongst the employees, contract workers and other stakeholders in our society. The theme of the Safety Day-2017 was "Leadership in Safety and Health Enhances Business Sustainability". Employees took safety pledge and several competitions were organised to promote safety.
- ✓ Sharing of good practices through publication of in-house magazines and handbooks on various safety related topics.



Safety awareness campaign under progress at PPPU Thirumayam



The safety statistics of our manufacturing units for the last 7 years is given in the table captioned Safety Statistics for BHEL units.

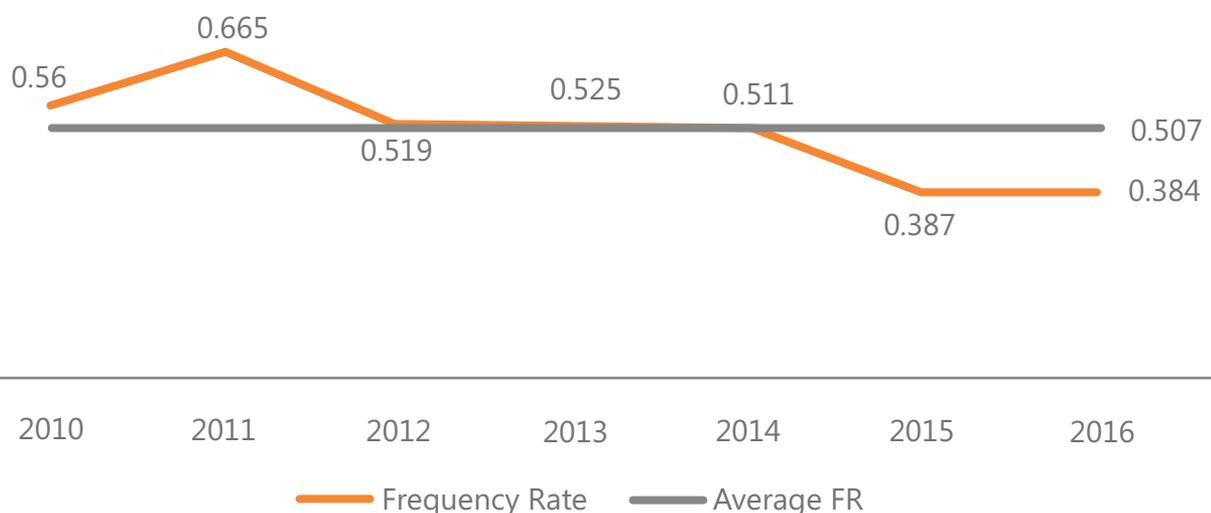


Safety Statistics for BHEL units

Calendar Year	Total Reportable accidents	Total Man days lost	Man Hours worked (in Million Hours)	Frequency Rate	Severity Rate
2010	82	8433	146.338	0.560	57.627
2011	97	33711	145.961	0.665	230.959
2012	77	50582	148.42	0.519	340.803
2013	88	9029	167.366	0.525	53.947
2014	82	19848	160.624	0.511	123.568
2015	59	1246	152.275	0.387	8.184
2016	55	7163	143.168	0.384	50.032

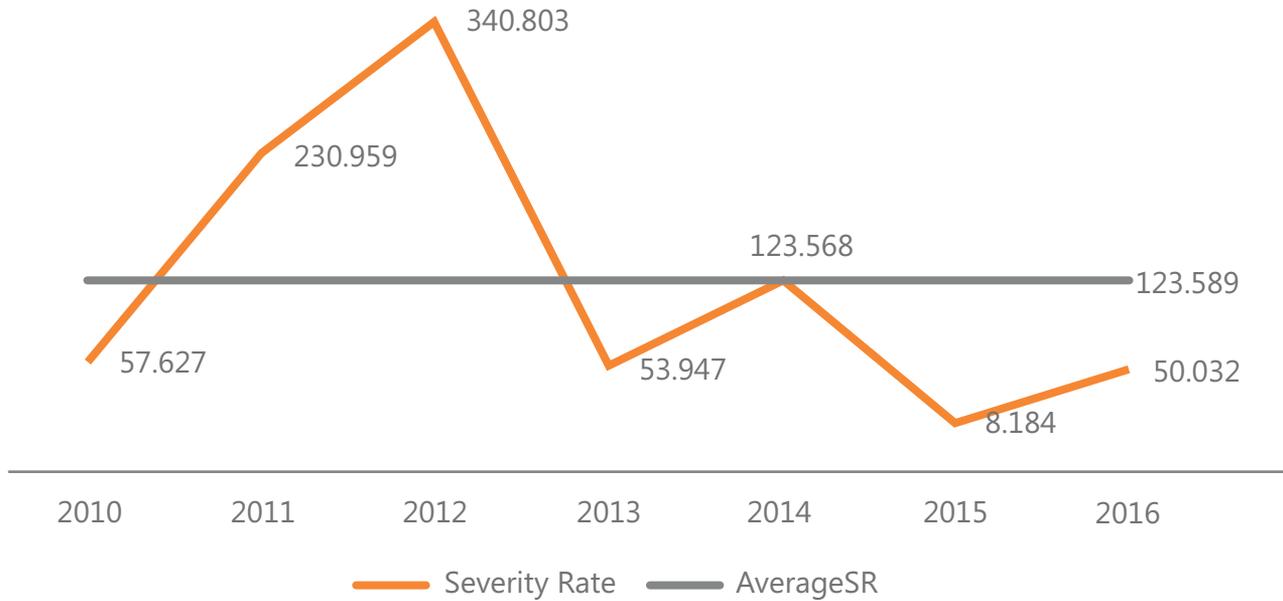
The same data is further shown in different forms in the figures labelled as Frequency Rate and Severity Rate. Frequency rate is the number of reportable accidents which happened during this period per million man hours worked. The man-hours worked include the man-hours contributed by all regular as well as contractual employees and considers the overtime as well. Similarly, severity rate is defined as number of man-days lost due to these reportable accidents per million man-hours worked. Frequency rate is indicative of number of accidents whereas the severity rate is indicative of effect of such incidents/accidents at workplace.

Frequency Rate data for manufacturing units





Severity Rate data for manufacturing units



Safety is a Journey and not a Destination.

Learning and Development

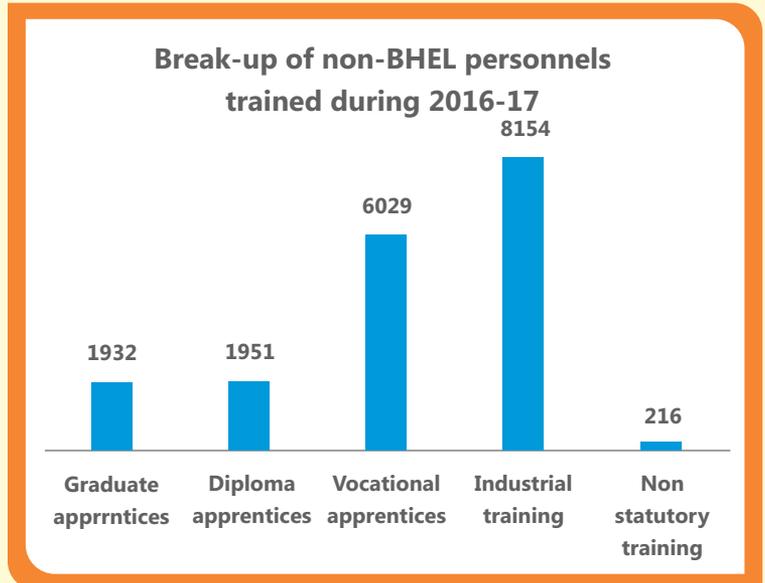
Our Corporate Learning and Development (CLD) Group as the nodal learning agency is focusing on providing a platform for technical training and leadership development opportunities thereby enhancing technical as well as managerial competency of the employees through class room training, digital learning, blended learning, outbound training, certification courses, sponsored courses etc. For details of the same, the reader may please refer to page 58-59 of BHEL's AR 2016-17.



Training man days per employee	3.90
% of employees trained in safety & Skill related programme	35.04%
% of permanent women employees trained in safety & skill related programme	46.06%
Skill development opportunities provided to non-employees	18282
Number of customers trained	800
Number of employee trained on skill upgradation	10085



Various subjects covered in these programmes are Technical skill upgradation in Supercritical, MS office, GST, Emotional intelligence, Achievement motivation certification as trainers, Resilient leadership, General Management Programme (GMP), Strategic Management Programme (SMP), Young Management Programme (YMP). Skill upgradation on solar technology, ISO trainings, Knowledge Transfer Workshop on Super-Critical Boilers, Improvement in Specific Energy Consumption, Understanding Power Stations (Thermal, Nuclear, Hydro, Gas and CCPP) IGBT based Propulsion Systems, Water Treatment Business, Wind and Biomass - Renewable Power Business, Workshop for Turbine Service Engineers, Workshop on Solar Energy Technology etc. Programmes like INSPIRE and HORIZON are held for employees who get promoted into higher cadre. Programmes on counselling skills, communication skills, presentation skills and negotiation skills are organised at units. These programmes are aimed at imparting skills management and learnings that even support the continued employability of employees approaching superannuation and assist them in managing career endings.



The General management programme organised by BHEL are Engineer/Executive trainee induction programme, GMP, SMP, YMP have sessions on emerging technologies, sustainability etc.

A glimpse of programmes held in BHEL on emerging technology and climate change issues are enumerated below:

- ✦ Renewable Energy Business
- ✦ Knowledge transfer workshop on Supercritical Turbine & Auxiliaries
- ✦ E-Learning- Adobe Captivate
- ✦ De-NOx Systems for Indian coal fired power plants
- ✦ Workshop on Solar Energy Technology
- ✦ Water Chemistry for Thermal Power Plants
- ✦ Advanced Ultra Super Critical Technology
- ✦ Data Analytics & Business Intelligence
- ✦ Video Conferencing Lecture on Energy Summit & Climate Changed



- ✦ Mechatronics
- ✦ Nuclear Power Business
- ✦ Workshop on Roof Top Solar PV System
- ✦ Workshop on IND - AS
- ✦ Accident Prevention at Workplace
- ✦ Adobe Captivate Workshop
- ✦ Winning Together Workshop
- ✦ Strategic Financial Analysis Business Repositioning for leaders
- ✦ L&D Policy Workshop
- ✦ Workshop for Turbine Service Engineers
- ✦ Improvement in Specific Energy Consumption
- ✦ Operations Management
- ✦ IGBT based Propulsion Systems
- ✦ Water Treatment Business
- ✦ Wind and Biomass - Renewable Power Business

Further, about **4,728** ITI apprentices of different trades, have also been trained for which BHEL was appreciated under NAPS by Honourable Prime Minister of India. BHEL is member of Governing body of Capital Goods sector skill council and Power sector skill council and is actively involved in developing National Occupational standards for these sectors. BHEL is actively involved in syllabus upgradation of ITI trades with DGT under ministry of skill dev & entrepreneurship. Welding Research Institute (WRI), Tiruchirappalli has been conducting Skill development programme for ITI-Welder passed candidates as well as School drop-outs.

During the reporting period, 25.17% of management employees and 2.95% of non-management employees received training in BHEL's anti-corruption policies and procedures.

Diversity and Equal Opportunity

The company takes affirmative action in recruitments and promotion for representation of employees from socio-economically backward section of society as well representation of minorities and women, as mandated by the Govt. of India. The company is an equal opportunity employer and does not discriminate on the basis of



gender, race, caste, religion, language, region etc. in recruitment, and employment relationship.

Supplier Assessment

BHEL signed the Integrity Pact with Transparency International on 16.12.2008 and the same was adopted in Feb. 2009. Structured meetings are held with the Independent External Monitors (IEMs) every quarter wherein the procurement related issues and complaints thereupon are discussed. BHEL has implemented e-procurement as business improvement and sustainable business practice. In this direction adding another milestone towards green initiative by leveraging technology, BHEL has implemented its in-house developed "Online Supplier Registration Portal" hosted on www.bhel.com and applicable for all its manufacturing units. The portal enables prospective suppliers to submit their registration forms for online processing thereof. Majority of procurement is done on tender basis wherein any supplier irrespective of its geographical location can participate in tender for fair and transparent procurement process.

Protecting human rights in Supply Chain

BHEL is a life time member of United Nations Global Compact (UNGC), India Network. The company reports its performance on 10 Principles of UNGC every year through Communication on Progress (CoP). This CoP is web-hosted on UNGC website and can be accessed through the webpage <https://www.unglobalcompact.org>.

Micro and Small Enterprises (MSEs) and local suppliers in and around the manufacturing units are part of BHEL's supply chain and the company has been supporting them from various fronts. As mandated in the Public Procurement Policy-2012 for MSEs (issued by Ministry of MSME-GOI), BHEL has achieved the target of 20% of its total procurement from MSEs during 2016-17. Regular Vendor Meets and Supplier development programs are being organized by BHEL units, specifically for MSEs (including local suppliers) as well as specific to SC/STs, which serve as platform for identification of needs and formulation of action plan for mutual benefits.

Human rights grievance mechanism

An Act has been legislated by Parliament of India to provide protection to women against sexual harassment at workplace and for the prevention and redressal of complaints of sexual harassment and for matters connected therewith or incidental thereto and is titled as "The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013". The Act has come into force on 9th December 2013 with notification of rules called "The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Rules, 2013".

The provisions of the Act and the Rules are being strictly complied with. In accordance with the Act, Internal Complaints Committee (ICC) has been constituted in all units of BHEL and their constitution and contact details have been hosted on respective unit's website. Posters highlighting the key provisions of the Act, Duties of the Employer, Complaints Redressal Mechanism, Action for Malicious Complaints & various misconceptions about Sexual Harassment have been displayed at conspicuous places in all units in Hindi, English and Regional languages. 5 workshops were conducted by Corporate Office for ICC members across units through Video



Conferencing. At unit level, 41 Workshops / awareness programmes were conducted on Gender Sensitization, self defense and awareness about the Act. In addition, women employees are nominated for programs conducted by outside agencies on Sexual Harassment. During the year 2016-17, 4 complaints of sexual harassment were reported. All 4 complaints were disposed-off satisfactorily.

BHEL has established a formal Complaint / Grievance handling procedure for all individuals except (i) Employees (ii) Shareholders (iii) Vendors & (iv) Customers for whom a formal Grievance Redressal System already exists in which any grievance can be registered online through our portal <http://www.bhel.com/grievance/grievance.php>.

A High-Powered Committee consisting of Head of Finance, Head of HR (Convenor) and Head of the Department to which the grievance is related decides on all the Grievances within 45 days of its receipt from the Personnel Grievance Officer (PGO) and thereafter informs the aggrieved person about the decision of the Committee within 7 days through the PGO. The decision given by the High-Powered Committee is final.

No grievance related to human rights was received under Centralised Public Grievance Redress & Monitoring System (CPGRAMS) during the reporting period.



PERFORMANCE ON SOCIETAL IMPACT

Management Approach – Contribution towards overall wellbeing of the society

For BHEL, the major focus of Corporate Social Responsibility (CSR) is inclusive growth through capacity building, empowerment of communities, environment protection, development of backward regions and upliftment of the marginalised & under-privileged sections of the society. The company has supported various social initiatives across the country by undertaking projects in diversified areas. BHEL undertakes CSR initiatives for implementation mostly through various NGOs/Trusts/Social Welfare Societies and other governmental & non-governmental agencies engaged in social activities throughout the country.

BHEL remained focused on its social responsibilities by undertaking or supporting various CSR initiatives in diversified areas in line with the Schedule-VII of The Companies Act-2013. The initiatives were spread across the country, mostly near BHEL establishments. During the year BHEL was awarded **with "Skoch Order-of-Merit"** Award for "Holistic approach in Health Care Services Sector for good health & wellbeing of society". BHEL also **received recognition from HelpAge India** for its exemplary services and commitment to provide quality medical healthcare services to the underprivileged people and in particular, the elderly people living in the remote/backward regions of the country. Following are glimpse of some of the major CSR activities (focus area-wise) undertaken by BHEL during the year:

Clean India



Inauguration of one of the Bio-Digester Toilet Cluster in Haridwar, Uttarakhand



Waste management equipment's provided by BHEL to Varanasi Nagar Nigam for Solid waste Management

- Financial support for construction of 25 Clusters of Bio-Digester toilets in Haridwar and Rishikesh. The project also includes provision for safe drinking water at each cluster and maintenance for a period of 2 years after commissioning.
- Provided financial support to Varanasi Nagar Nigam for the project "Automatized system for solid waste collection and transportation".
- Provided financial support for construction of a covered RCC drain along DSC road in sector-17, Noida and construction of public toilet facility near Rajnigandha Chowk, Noida.

Educated India

- BHEL is Providing support for running more than 30 schools located in BHEL manufacturing Units, benefitting more than 40,000 school children.
- Provided financial support for construction/renovation of toilets, electrical fixtures, installation of Solar



Mobile Science Lab- Running in the vicinity of BHEL Jhansi, Haridwar & Trichy Unit



Children of one of the Govt. Schools in Jhansi learning Science through hands on experience



Street Lights and providing tables & chairs in 108 Govt. Schools including 8 Kasturba Gandhi Residential Schools in Lucknow, Uttar Pradesh.



Desks & Benches provided to Schools near Lucknow, Uttar Pradesh



Distribution of Uniforms to Children of Rajkiya Prathmik Vidhyalaya, Hasanpur near Rudrapur

- Provided financial support for running Mobile Science Labs in vicinity of three manufacturing units (one at each Unit) of BHEL viz, Haridwar, Jhansi and Trichy”, benefitting more than 30,000 students during the year.
- BHEL is providing financial support to the project “Udayan Shalini” fellowships programme for supporting higher education of 100 Nos. of girl students coming from below-the-poverty line (BPL) families.
- Provided financial support for distribution of 5000 educational tablets to students of Govt. Schools in Maharashtra.
- Scholarship programme for students belonging to Below Poverty line (BPL) families through FAEA.



Quarterly workshop of Udayan Shalini fellowship programme at BHEL Haridwar



Educational Fellowship program for BPL students:

- ✓ Continued the financial support, through Foundation for Academic Excellence and Access (FAEA),
- ✓ Providing educational scholarship for mentoring students belonging to BPL category.
- ✓ Total duration of the project = 6 Years
- ✓ BHEL's Contribution = Rs 445.84 Lakh

Distribution of scholarship to meritorious students of underprivileged section of society

Healthy India

- Partnered with HelpAge India, PHDRDF and Wockhardt Foundation by providing financial support for running & operations of total 10 Mobile Medical Units (MMUs) in the vicinity of our project sites and manufacturing units, benefitting more than one lakh patients during 2016-17.
- Provided financial support for construction of Ganga Prem Hospice at Raiwala, Rishikesh, Uttarakhand. It is a 30 bedded facility for the palliative care of terminally ill cancer patients.
- Provided financial support for distribution of Anti Haemophilic Factor (AHF) to 1021 Haemophilic patients over a period of three years (2014-15 to 2016-17). During the year 2016-17, 20 camps were organised, covering 240 beneficiaries.



Inauguration Ceremony - Ganga Prem Hospice, Raiwala , Rishikesh





Cataract Eye Surgery Camp in Koppal District, Karnataka.



CSR Project Heal-A-Soul:

- ✓ Implemented in 2 phases over a period of 3 years through a network of 77 chapters of HFI spread all over India.
- ✓ NGO – Haemophilia Federation India (HFI)
- ✓ Anti Haemophilic Factor (AHF) distributed to

1021 Haemophilic patients starting from August, 12 to till date

- ✓ Carrier detection and prenatal diagnosis of 120 patients, 20 distribution chapters were organized and 240 beneficiaries were covered in 2016-17
- ✓ BHEL's contribution = Rs 320.1 Lakh

Mobile Medical Van running with partnership with PHDRDF

Green India

- BHEL undertook a green initiative project "Installation of 100 kW_p Grid Interactive Solar Power System in schools" at Bhopal.
- Provided financial support for installation of 75 kW_p capacity Solar PV Plant at Ramakrishna Mission Ashram, New Delhi
- Installed solar street lights and domestic lights in two villages in Medak district, Telangana.



Inauguration of 75 kW_p capacity Solar PV Plant installed by BHEL at Ramakrishna Mission Ashram, New Delhi



Inauguration ceremony: 50 kW_p Grid Interactive Solar Power Plant in Jnanakshi Vidyaniketan, Rajarajeshwari Nagar, Bengaluru.



A Solar LED lights in a village in Pilibhit, District U.P

Responsible & Inclusive India



CMD, Shri Atul Sobti, visited an overhead water tank constructed for poor & needy villagers at Trichy



- Provided financial support for construction of cement concrete roads in 3 villages of Davangere district, Karnataka.
- Continued financial support for upliftment and economic empowerment of marginalized farmers of Khargone district of Madhya Pradesh.
- Provided financial support for construction of a Multipurpose Hall in Kasturba Nursing College, Bhopal.
- Provided tailoring machines and training in tailoring to women at Sthree Shakthi Bhavan, Devanahalli, Bengaluru.



Skill Development Training for Women



Anganawadi Building constructed by BHEL-EPD, Bengaluru at Muthuru, Doddaballapur Taluk



Inauguration of Multipurpose Auditorium Hall at Kasturba College of Nursing on 13/01/2017

Disaster & Calamity

BHEL has constructed 96 Model Houses [Flats] at Vizag, Andhra Pradesh, for Hud-Hud cyclone affected People. These flats have been handed over to district administration for allotment to target beneficiaries.



Flats constructed by BHEL at Vizag for Hud-Hud cyclone affected people



Compliance

No substantiated complaint regarding breach of customer privacy and loss of customer data has been reported against BHEL for its activities. No fine/penalty for non-compliance with laws and regulations concerning the provision and use of products and services have been levied.

There is no case filed by any stakeholder against the company regarding unfair trade practices, irresponsible advertising and/or anti-competitive behaviour during the last five years and also no such case is pending as on end of financial year i.e., 31-03-2017. Further, there were no significant fines and non-monetary sanctions for non-compliance with laws and regulations levied on the company during the reporting period.

Product Responsibility

BHEL's R&D strategy, structure and infrastructure are aligned to meet the challenges of present & future business environment. The R&D expenditure of the company for 2016-17 is Rs. 793.62 Crore which is 2.75 % of the turnover. This includes the expenditure incurred on R&D efforts made at manufacturing units for major modifications/improvements in products/designs against customer requirements which are not covered in R&D projects. The company filed 508 patents and copyright applications during the year 2016-17, enhancing the company's intellectual property in terms of number of such rights to 3,915.

Detailed Product Labels/ Name Plates/ Test Certificates are provided to customers as per their requirement and terms of the contract with them. There has not been any incident of non-compliance with regulations and voluntary codes concerning product and service information and health & safety impacts of products and services.

Marketing Communication

BHEL being a multi-national organisation has its office and operations spread across the globe. Any marketing communication is thoroughly reviewed for adherence to applicable laws and statues before publication. While the company has a centralised department (Corporate Communications) which is the primary agency for all advertising communication and thus responsible for compliance, for BHEL's overseas contacts, associates and at times, the Embassy/ High Commission of India is also consulted before issuance of communication for overseas market.

Power Sector Marketing department deals with sponsorship of events for sales promotion. It follows company's set practice in this regard. No incidence of non-compliance with regulations and voluntary codes concerning marketing communications has taken place pertaining to Power Sector Marketing.



Customer orientation

For BHEL, customer focus is essential part of business and company is persistently working towards creating value for customer through products and services. It is an integral part of BHEL's culture which is also reflected in our Vision, Mission and Values statement - "In its quest to be Global Engineering Enterprise, BHEL pursues Continual Improvement in the Quality of its Products, Services and Performance leading to Customer Delight through Commitment, Innovation and Team work of all Employees"

The company provides detailed Product Labels/ Name Plates/ Test Certificates to customers as per their requirement and terms of the contracts with them, besides the mandatory requirements of the applicable laws.

Given the diverse and large scale operations of BHEL, customer complaints get registered through multiple modes. Two dedicated online complaint system, i.e., Customer Complaint Management System (CCMS) and Site Action request (SAR)/ Commissioning Action Report (CAR) System have been introduced and are in operation. Apart from complaints, customer feedback is taken regularly through customer satisfaction surveys, customers' meets and face-to-face interactions.

There is no case filed by any stakeholder against the company regarding unfair trade practices, irresponsible advertising and/or anti-competitive behaviour during the last five years and pending as on end of financial year i.e., 31-03-2017.

Road Ahead

The concept of Sustainability is imbibed in the DNA of BHEL as our mission statement itself says – "Providing Sustainable Business solutions in the fields of Energy, Industry & Infrastructure". As a responsible corporate citizen, we are committed for putting our all-out effort for preservation of environment while achieving higher growth in the organization and sharing this created value with the society in more inclusive manner. With its committed workforce and enabling framework in place, BHEL is poised to move ahead towards the journey of Sustainability with more vigour. We are committed to focus on newer areas to meet the challenges of a changing business scenario while continuing development in traditional areas of business and thus 'Creating the BHEL of tomorrow'.



GRI Content Index for 'In accordance' – Comprehensive

GENERAL STANDARD DISCLOSURES

Indicator	Description	Page No./ explanation	Omissions	External Assurance
STRATEGY AND ANALYSIS				
G4-1	Statement from the most senior decision – maker of the organisation about the relevance of sustainability to the organisation and the organisation’s strategy for addressing sustainability	3-4		
G4-2	Description of key impacts, risks, and opportunities	9-10		
ORGANISATIONAL PROFILE				
G4-3	Name of the organisation	7		
G4-4	Primary brands, products, and services	Page 315-323 of BHEL’s Annual Report (AR) 2016-17		
G4-5	Location of organisation’s Headquarters	24		
G4-6	Number of countries where the organisation operates	25		
G4-7	Nature of ownership and legal form	18		
G4-8	Markets served	11-12		
G4-9	Scale of the organisation			
G4-10	Details of workforce broken down by gender, employment contract, employment type etc.	78-79		
G4-11	Percentage of total employees covered by collective bargaining agreements	80-81		
G4-12	Description of the organisations supply chain	89-90		
G4-13	Significant changes during the reporting period regarding the organisation’s size, structure, ownership, or its supply chain	None		
G4-14	How the precautionary approach or principle is addressed by the organisation	27-28		
G4-15	Externally developed economic, environmental and social charters, principles, or other initiatives to which the organisation subscribe or which it endorses	Page 87 of BHEL’s AR 2016-17		
G4-16	Memberships of associations and national/ international advocacy organisations in which the organisation holds a position on the governance body and participates in projects or committees			



GENERAL STANDARD DISCLOSURES

Indicator	Description	Page No./ explanation	Omissions	External Assurance
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES				
G4-17	Entities included in the organisation's consolidated financial statements with indication of coverage in the report	36		
G4-18	Process for defining the report content and the Aspect Boundaries	Page 38-39 of BHEL's Sustainability Report (SR) 2015-16		
G4-19	Material Aspects identified in the process for defining report content			
G4-20	Description of Aspect Boundary within the organisation for each material aspect			
G4-21	Description of Aspect Boundary outside the organisation for each material aspect			
G4-22	Explanation of the effect of any re-statement of information provided in the earlier Report.	None		
G4-23	Significant changes from previous reporting periods in the Scope and Aspect Boundaries			
STAKEHOLDER ENGAGEMENT				
G4-24	List of stakeholder groups engaged by the organisation			
G4-25	Basis for identification and selection of stakeholders with whom to engage			
G4-26	Organisation's approach to stakeholder engagement			
G4-27	Key topics and concerns that have been raised through stakeholder engagement, and how the organisation has responded to those key topics and concerns	Page 33-39 of BHEL's SR 2015-16		
REPORT PROFILE				
G4-28	Reporting Period	7		
G4-29	Date of most recent previous Report			
G4-30	Reporting cycle			
G4-31	Contact point for questions regarding the report or its contents	8		
G4-32	GRI Content Index	98-112		
G4-33	Organisation's policy and current practice with regard to seeking external assurance for the report; relationship with the assurance providers; the highest governance body's involvement in seeking assurance for the organisation's Sustainability Report			Not reported



GENERAL STANDARD DISCLOSURES

Indicator	Description	Page No./ explanation	Omissions	External Assurance
GOVERNANCE				
G4-34	Governance structure of the organisation; committees responsible for decision-making on economic, environmental and social impacts	27		
G4-35	Process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees	27-28		
G4-36	Executive - level positions with responsibility for economic, environmental and social topics			
G4-37	Processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics			
G4-38	Composition of the highest governance body and its committees	Page 99-107 of BHEL's AR 2016-17		
G4-39	Function of the Chair of the highest governance body within the organisation's management and the reasons for his arrangement as an executive officer	26-28		
G4-40	Nomination and selection processes for the highest governance body and its committees; the criteria used for nominating and selecting highest governance body members	Page 101-102 of BHEL's AR 2016-17		
G4-41	Processes for the highest governance body to ensure conflicts of interest are avoided and managed; disclosure of conflicts of interest to stakeholders	Page 28		
G4-42	Highest governance body's and senior executives roles in development, approval, and updating of the organisation's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental and social impacts	Page 28-30		



GENERAL STANDARD DISCLOSURES

Indicator	Description	Page No./ explanation	Omissions	External Assurance
GOVERNANCE				
G4-43	Measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics	28-30		
G4-44	Processes for evaluation of the highest governance body's performance with respect to governance of economic environmental and social topics; actions taken in response to evaluation results	Page 102 of BHEL's AR 2016-17		
G4-45	Highest governance body's role in the identification and management of economic, environmental and social impacts, risks, and opportunities; use of stakeholder consultation for supporting the process			
G4-46	Highest governance body's role in reviewing the effectiveness of the organisation's risk management processes for economic, environmental and social topics			
G4-47	Frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities			
G4-48	Highest committee or position that formally reviews and approves the organisation's sustainability report and ensures that all material Aspects are covered			
G4-49	Process for communicating critical concerns to the highest governance body			
G4-50	Nature and total number of critical concerns that were communicated to the highest governance body and the mechanism(s) used to address and resolve them			
G4-51	Remuneration policies for the highest governance body and senior executives; how performance criteria in the remuneration policy relate to the highest governance body's and senior executives' economic, environmental and social objectives		Page 28 of AR 2016-17	



GENERAL STANDARD DISCLOSURES

Indicator	Description	Page No./ explanation	Omissions	External Assurance
GOVERNANCE				
G4-52	Process for determining remuneration	Page 28 of AR 2016-17		
G4-53	How stakeholders' views are sought and taken into account regarding remuneration			
G4-54	Ratio of the annual total compensation for the organisation's highest- paid individual to the median annual total compensation for all employees (excluding the highest – paid individual)			
G4-55	Ratio of percentage increase in annual total compensation for the organisation's highest – paid individual to the median percentage increase in annual total compensation for all employees (excluding the highest – paid individual)			
ETHICS AND INTEGRITY				
G4-56	Organisation's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics	33-35		
G4-57	Internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organisational integrity			
G4-58	Internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organisational integrity			



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
CATEGORY: ECONOMIC				
ECONOMIC PERFORMANCE				
G4-EC1	Direct economic value generated and distributed	40		
G4-EC2	Financial implications and other risks and opportunities for the organisation's activities due to climate change	38-39		
G4-EC3	Coverage of the organisation's defined benefit plan obligations	Page 158-159 of AR 2016-17		
G4-EC4	Financial assistance received from government			
MARKET PRESENCE				
G4-EC5	Ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation	43		
G4-EC6	Proportion of senior management hired from the local community at significant locations of operation			
INDIRECT ECONOMIC IMPACTS				
G4-EC7	Development and impact of infrastructure investments and services supported	Page 87-88 of AR 2016-17		
G4-EC8	Significant indirect economic impacts, including the extent of impacts			
PROCUREMENT PRACTICES				
G4-EC9	Proportion of spending on local suppliers at significant locations of operation	Page 45 of AR 2016-17		
CATEGORY: ENVIRONMENTAL				
MATERIALS				
G4-EN1	Materials used by weight or volume	45-48		
G4-EN2	Percentage of materials used that are recycled input materials			
ENERGY				
G4-EN3	Energy consumption within the organisation	49-52		



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
ENERGY				
G4-EN4	Energy consumption outside of the organisation		Not reported	
G4-EN5	Energy intensity	51		
G4-EN6	Reduction of energy consumption	52-57		
G4-EN7	Reductions in energy requirements of products and services			
WATER				
G4-EN8	Total water withdrawal by source	60-62		
G4-EN9	Water sources significantly affected by withdrawal of water	None		
G4-EN10	Percentage and total volume of water recycled and reused	61-62		
BIODIVERSITY				
G4 – DMA	Aspect specific DMA			
G4-EN11	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas		None of BHEL's operational sites are owned, leased, managed in, or are adjacent to, protected areas and areas of high biodiversity value, therefore, these standard disclosures are not applicable.	
G4-EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas			
G4-EN13	Habitats Protected or Restored			
G4-EN14	Total number of IUCN red list species and national conservation list species with habitats in areas affected by operations, by level of extinction risk			
EMISSIONS				
G4-EN15	Direct greenhouse gas (GHG) emissions (scope 1)	67-71		
G4-EN16	Energy indirect greenhouse gas (GHG) emissions (scope 2)			
G4-EN17	Other indirect greenhouse gas (GHG) emissions (scope 3)		Not applicable	



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
EMISSIONS				
G4-EN18	Greenhouse gas (GHG) emissions intensity	69		
G4-EN19	Reduction of greenhouse gas (GHG) emissions	70-72		
G4-EN20	Emissions of ozone-depleting substances (ODS)	66-67		
G4-EN21	NO _x , SO _x and other significant air emissions	65-66		
EFFLUENTS AND WASTE				
G4-EN22	Total water discharge by quality and destination	61-62		
G4-EN23	Total weight of waste by type and disposal method	73-74		
G4-EN24	Total number and volume of significant spills	None		
G4-EN25	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel convention, annex i, ii, iii, and viii, and percentage of transported waste shipped internationally		This standard disclosure is not applicable as there was no transport, import, export or treatment of waste deemed hazardous under the terms of Basel Convention Annex I, II, III & IV	
G4-EN26	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organisation's discharges of water and runoff		Not applicable	
PRODUCTS & SERVICES				
G4-EN27	Extent of impact mitigation of environmental impacts of products and services	74-76		
G4-EN28	Percentage of products sold and their packaging materials that are reclaimed by category			



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
COMPLIANCE				
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.	77		
TRANSPORT				
G4-EN30	Significant environmental impacts of transporting products and other goods and materials for the organisation's operations, and transporting members of the workforce		Not reported	
OVERALL				
G4-EN31	Total environmental protection expenditures and investments by type	76-77		
SUPPLIER ENVIRONMENTAL ASSESSMENT				
G4-EN32	Percentage of new suppliers that were screened using environmental criteria		Not reported	
G4-EN33	Significant actual and potential negative environmental impacts in the supply chain and actions taken	77		
ENVIRONMENTAL GRIEVANCE MECHANISM				
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	77		
CATEGORY: SOCIAL				
LABOR PRACTICES AND DECENT WORK				
EMPLOYMENT				
G4-LA1	Total number and rates of new employee hires and employee turnover by age group, gender and region	78-80		
G4-LA2	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	80		
G4-LA3	Return to work and retention rates after parental leave, by gender	78-80		



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
LABOR/MANAGEMENT RELATIONS				
G4-LA4	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements	80-81		
OCCUPATIONAL HEALTH AND SAFETY				
G4-LA5	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs	80-81		
G4-LA6	Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	81-84		
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation			
G4-LA8	Health and safety topics covered in formal agreements with trade unions			
TRAINING AND EDUCATION				
G4-LA9	Average hours of training per year per employee by gender, and by employee category	84-86		
G4-LA10	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings			
G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	80		
DIVERSITY AND EQUAL OPPORTUNITY				
G4-LA12	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity	80-81		



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
EQUAL REMUNERATION FOR WOMEN AND MEN				
G4-LA13	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation		Not applicable	
SUPPLIER ASSESSMENT FOR LABOR PRACTICES				
G4-LA14	Percentage of new suppliers that were screened using labor practices criteria	80-81		
G4-LA15	Significant actual and potential negative impacts for labor practices in the supply chain and actions taken			
LABOR PRACTICES GRIEVANCE MECHANISMS				
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved through formal grievance mechanisms	80-81		
HUMAN RIGHTS				
LABOR PRACTICES GRIEVANCE MECHANISMS				
G4-HR1	Total number and percentage of significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	80-81		
G4-HR2	Total hours of employee training on human rights policies or procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained			
G4-HR3	Total number of incidents of discrimination and corrective actions taken			
FREEDOM OF ASSOCIATION AND COLLECTIVE BARGAINING				
G4-HR4	Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and measures taken to support these rights	80-87		



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
CHILD LABOUR				
G4-HR5	Operations and suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor	87-88		
FORCED OR COMPULSORY LABOUR				
G4-HR6	Operations and suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor	87-88		
SECURITY				
G4-HR7	Percentage of security personnel trained in the organisation's human rights policies or procedures that are relevant to operations	87-88		
INDIGINEOUS RIGHTS				
G4-HR8	Total number of incidents of violations involving rights of indigenous peoples and actions taken		Not applicable	
ASSESSMENT				
G4-HR9	Total number and percentage of operations that have been subject to human rights reviews or impact assessments	87-88		
SUPPLIER HUMAN RIGHTS ASSESSMENT				
G4-HR10	Percentage of new suppliers that were screened using human rights criteria	87-88		
G4-HR11	Significant actual and potential negative human rights impacts in the supply chain and actions taken			
HUMAN RIGHTS GRIEVANCE MECHANISMS				
G4-HR12	Number of grievances about human rights impacts filed, addressed, and resolved through formal grievance mechanisms	87-88		



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
SOCIETY				
LOCAL COMMUNITIES				
G4-SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	87-88		
G4-SO2	Operations with significant actual and potential negative impacts on local communities			
ANTI CORRUPTION				
G4-SO3	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	Page 84-85 of BHEL's AR 2016-17		
G4-SO4	Communication and training on anti-corruption policies and procedures			
G4-SO5	Confirmed incidents of corruption and actions taken			
PUBLIC POLICY				
G4-SO6	Total value of political contributions by country and recipient/beneficiary		Not applicable	
ANTI COMPETITIVE BEHAVIOUR				
G4-SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	96		
COMPLIANCE				
G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	96		
SUPPLIER ASSESSMENT FOR IMPACTS ON SOCIETY				
G4-SO9	Percentage of new suppliers that were screened using criteria for impacts on society		Not reported	
G4-SO10	Significant actual and potential negative impacts on society in the supply chain and actions taken		Not reported	



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
GRIEVANCE MECHANISMS FOR IMPACTS ON SOCIETY				
G4-SO11	Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms	96		
PRODUCT RESPONSIBILITY				
CUSTOMER HEALTH & SAFETY				
G4-PR1	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	96-97		
G4-PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning the health and safety impacts of products and services during their life cycle, by type of outcomes			
PRODUCT & SERVICE LABELING				
G4-PR3	Type of product and service information required by the organisation's procedures for product and service information and labeling, and percentage of significant product and service categories subject to such information requirements	96-97		
G4-PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes			
G4-PR5	Results of surveys measuring customer satisfaction			



SPECIFIC STANDARD DISCLOSURES - Material Aspects

Indicator	Description	Page No./ explanation	Omissions	External Assurance
MARKETING COMMUNICATIONS				
G4-PR6	Sale of banned or disputed products		Not applicable	
G4-PR7	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship, by type of outcomes	96-97		
CUSTOMER PRIVACY				
G4-PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	96-97		
COMPLIANCE				
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	96-97		







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