Sustainability Report 2015-16

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Chairman & Managing Director's Message

Dear Stakeholders,

It is my honour to present before you BHEL's annual sustainability report which covers the company's performance for the reporting period 2015-16. The report encompasses glimpses of milestones in the path followed by the organisation on its journey to sustainable growth. In this journey of 'Creating BHEL of Tomorrow', it is our passionate endeavour to transform BHEL into an organisation which is 'Responsive, Robust and Rising' to the expectations of its stakeholders.

At BHEL over the last five decades, sustainability has been a way of life and the company has endeavoured to work with the best efficiency and efficacy to be more productive and deliver the desired results to its stakeholders. The same is evident in the company's mission statement. The company strongly believes in the preservation of natural environment so that the benefits of today's development are fruitfully enjoyed by future generations. BHEL is also engaging with the society through its social initiatives under CSR aimed at community development, health & hygiene, education, environment protection, disaster management, and talent up-gradation/skill development.

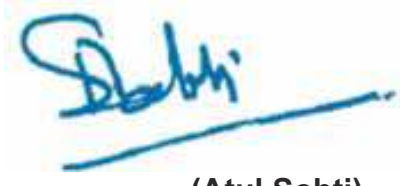
The company is geared up to diversify into new business areas and strengthen the capabilities in renewable technologies. We firmly believe that in the coming decades as the world focus shifts more and more towards making the environment better, developing advanced technologies in renewable sector and greener technology shall be the bedrock for our organisation. The 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.

BHEL is a major supplier of Solar Photo Voltaic systems and having supplied more than 190+ MW_P cumulative shipments of PV cells, modules and systems, and helping our customers to generate clean energy. Going beyond just being a supplier of solar systems, we have commissioned a 5 MW_P

grid interactive Solar power plant at our Ranipet unit and 1.5 MW_P Solar Power Plant at our Hyderabad unit for in-house consumption and to move towards sustainable energy mix in our operations. Further, a 5 MW_P solar plant has been installed recently at our Tiruchirappalli unit. These MW_P scale solar power plants and other solar installations have generated around 15 million units of energy in the last two years, resulting in carbon footprint avoidance of 14000 MT CO_2-e during the same period. An in-house green coverage of about 4.7 million sq. metres and plantation of more than 3 million trees till date is a testimony of the company's commitment towards a greener environment.

The company has invested 3.36% of its turnover on R&D during 2015-16, which is the highest in the Indian engineering field. A large part of this investment is towards developing or improving products or technologies aimed at sustainable growth. Some of them are establishing capability for 800 MW Advanced Ultra- Supercritical Power plants, developing in-house capability to establish grid connected solar power plant, developing efficient 3-phase propulsion systems for railways, developing applications in the area of emerging technologies like High-Temperature Superconducting (HTSC) Motor, Fuel cell up to 2 kW rating, efficiency improvement of crystalline silicon solar cells etc.

Going forward, BHEL will continue to tread the path of sustainability and contribute towards nation building through supply and usages of cleaner technologies as well as promoting inclusive growth through CSR programme.



(Atul Sobti)

Message from Director (HR)

Dear Stakeholders,

For BHEL, Sustainability is about preserving our natural environment which is the source of our survival & well being while creating value for the stakeholders in a socially acceptable manner. In other words, as a responsible corporate citizen, we are committed to putting our all-out effort for the preservation of environment while achieving higher growth in the organisation and sharing this created value with the society in more inclusive manner. At BHEL, we believe in doing business in a sustainable manner and this ethos extends across the spheres of our Business strategies, environmental actions, social initiatives and corporate governance.

BHEL has ingrained the triple bottom line approach for Sustainable Development in its Business processes. It has been creating value for its stakeholders since inception. Its R&D efforts have always been directed towards development and diffusion of technologies that reduces environmental footprints. BHEL has laid down an elaborate enabling framework for putting concerted efforts towards strategic as well as ground level day to day work. 'Sustainable Development Policy' is the guiding force for all our CSR & Sustainability activities and execution at the unit level is steered by the Nodal officer for Sustainability.

BHEL continued to tread the path of Sustainable Development during 2015-16 as well and has taken many initiatives which include setting up of a 1.5 MW_p solar power plant at its HPEP Hyderabad unit. Further, a 5 MW_p Solar Power plant is under installation at Trichy unit which will further boost our efforts in moving towards sustainable energy mix in our operations. Towards achieving its objective of promoting inclusive growth, the thrust on CSR initiatives continued which resulted in creating social infrastructure for the benefit of the community by and large. During 2015-16, an amount of ₹110.10 Crores was spent on CSR initiatives by BHEL.

The specific efforts made towards addressing the tenets of Sustainable Development particularly during 2015-16 is captured and elaborated in this Sustainability Report. This report is the result of many concerted and dedicated efforts of Corporate HSE team & Unit level Nodal Officers for Sustainability. I invite your feedback for making our future Sustainability Report more robust.

(**D Bandyopadhyay**)

OVERVIEW OF THE REPORT

Key Opportunities & Threats

The domestic economy is experiencing a turnaround. The economy is expected to grow at 7.6% in 2016-17. Important economic reforms including enhancing financial inclusion, rationalisation of subsidies and relaxing FDI limits in several key sectors have buoyed the investment sentiment.

'Make in India' platform presents a plethora of opportunities with major initiatives taken in various sectors like defence, transportation, transmission, renewables etc. Defence sector presents a major opportunity for indigenization and leveraging on domestic strength in manufacturing. In the same line sectoral push for solar, urban transportation, dedicated freight corridor, e- mobility and green energy corridor will open new avenues for long-term sustainable growth. The positive steps taken by the government are likely to translate into more business opportunities for the company. The opportunities have been discussed in detail in BHEL's Annual report 2015-16 in the respective chapters on business sectors under Annexure-1 of Management Discussion and Analysis.

Climate change is the most potent problem the world is facing today. Significant cuts in the emission of Green House Gases (GHG) during energy generation need to be achieved through either substituting 'higher emission' generation technology with 'lower emission' technology or by employing energy efficiency measures. It presents a lot of opportunities for companies like BHEL and at the same time, presents many challenges, particularly related to the development of 'green technologies'. With emissions norms getting more stringent, there is an opportunity for supplying emission control equipments for new coal-based plants.

BHEL has successfully developed and demonstrated 50kWp SPV systems using sun trackers based on liquid balancing system

Global recovery continues at a slow pace. Delayed recovery in Organisation for Economic Co-operation and Development (OECD) economies and slowdown of China's growth are adding stress to global economic recovery. China's economy is slowing as it transitions from investment and manufacturing to consumption and services. A sharper slowdown in China than currently projected could have strong international spill overs through trade, commodity prices and confidence and lead to a more generalised slowdown in the global economy. As per World

Economic Outlook released by IMF in April 2016, China's growth is projected to slow to 6.5% this year and 6.2% in 2017. A further weakening is expected in the industrial sector, as excess capacity continues to unwind, especially in real estate as well as in manufacturing.

Geopolitical tensions in Iraq, Libya, Yemen, the Syrian Arab Republic and Ukraine have already made economic impacts at the national and sub-regional levels. Most of the world's major oil-producing countries are still grappling with investment decisions, and subdued output, despite modest rebound in international crude oil prices. The oil price outlook is uncertain and is likely to be so in the near and medium term.

Positioning for the Future

Amidst the difficult external economic and business environment, BHEL continues to face challenges in the current year also. Nevertheless, the company has developed considerable resilience to leverage its engineering strength and manufacturing prowess to regain growth momentum in the next phase of Indian economic growth. The overall business scenario is improving and the 'Make in India' initiative of Govt. of India is poised to drive the manufacturing sector into a new phase of growth.

- **Power Sector:** BHEL has taken initiatives to sustain leadership in Indian power sector. Major ones include enlarging the scope of the offer, expanding business and enhancing competitiveness. The share of EPC orders in the company's power sector order mix is gradually increasing – from 36% in XI Five Year Plan (FYP) to 45% in XII FYP. The company has added Flue-Gas Desulfurization (FGD) system, air cooled condenser and water management system as a strategy to enlarge scope of offer. Further steps have been taken for indigenization of supercritical technology. Going forward, the company is gearing itself to capitalise on opportunities emerging from new environmental norms issued by Ministry of Environment, Forest & Climate Change.
- **Make in India:** BHEL considers 'Make in India' as an inflexion point to significantly scale up and diversify its business mix. New opportunities are emerging in defence, railways, solar and also in conventional power sector – most importantly with a focus on enhancing technology depth. The company is building new capabilities and exploring new business models to take advantage of emerging opportunities and is confident of regaining growth momentum in near future. Some of them are:

800 MW IP Turbine under assembly at BHEL works for NTPC

- **Solar PV:** With focus on the growing demand in the solar PV market, BHEL is in the process of augmenting its manufacturing capacity for SPV cell to 105 MW and for modules to 226 MW. Further, EPC capability is being enhanced to 600 MW including long-term comprehensive O&M for large projects.
- **Transmission:** BHEL has strengthened its higher voltage transmission portfolio with indigenously developed 1200 kV class Transformer & 765 kV Transformers & Reactors. The company is gearing up to address EHV GIS business with own-make GIS upon successful field trials. Initiatives are being taken for exploring tie up with OEMs for SCADA DMS and subsequent implementation of a demonstration project for Smart Grids.
- **Transportation:** With the revival of demand from Railways and emerging opportunities from Dedicated Freight Corridor (DFC) and urban metro transportation, the company is focusing on business opportunities in Metro coaches, high-speed trains and equipment for higher HP locomotives. For development of prototype for electric buses, in-house development of power electronics, motors and PV based wayside charging equipment has been taken up.
- **Defence:** Tie-ups are being pursued with global technology leaders in defence sector by leveraging BHEL's strength in manufacturing.

Super Rapid Gun Mount (SRGM) for Indian Naval Ships under construction at HEEP, Haridwar

- **Water:** The company is gearing up to address Sewage Treatment Plant (STP) Business and large scale desalination with O&M.
- **Global Footprints:** The company is making efforts to expand its global footprints and creating more market references. Currently, BHEL is executing 22 projects in 14 Countries.

- **Cost Competitiveness:** To enhance cost competitiveness of our products, various initiatives such as design optimization; enhancing performance parameters; de-packaging of bought-out-items & civil works; and indigenization of supercritical technology have been taken up.

Indigenous development of nation's first Advance Ultra supercrticial Technology (AUSC) based plant undertaken jointly with NTPC and IGCAR

- **R&D and Innovation:** BHEL's products and systems are technology intensive and thus, the company has adopted R&D and technology development as one of the central drivers for implementing its strategy. The company has maintained R&D expenditure at plus 2.5% of the turnover for more than 5 years. Recent in-house developments include 765 & 1200 KV UHVAC transformer & reactor, IGBT propulsion technology for loco & ACEMU, STATCOM for industrial & grid applications, Phase Shifting Transformer (PST) and 500 kW PCU for solar PV generation. The company is also working with NTPC and IGCAR for development of Advanced Ultra Supercritical (AUSC) technology for coal-based power plants.
- **People Development:** In line with the growing aspirations of the millennial generation of the company, the people development strategy of BHEL is focusing on developing employee competencies in alignment with the business plans through implementation of initiatives like e- learning modules and focus on technical & behavioural training.
- **Creating BHEL of tomorrow:** To harness emerging opportunities and regain growth momentum, a strong resolve has been made towards transformation of BHEL into an organisation which is "Responsive, Robust and Rising" to the needs of our customers, employees and shareholders. Focus on Execution, Consolidation and Simplification (ECS) is one of the first steps to initiate this transformation process. There is a focus on bringing systemic changes and speed in Execution (expeditiously translating an idea or strategy into action); eliminating structural layers of duplication through *Consolidation;* and working on *Simplification* of processes.

Report Profile

This report is the 5th Annual Sustainability report of Bharat Heavy Electricals Limited (BHEL) and has been prepared in line with the latest version of Global Reporting Initiative (GRI) framework i.e. GRI G4 covering the activities conducted in 2015-16. Previous year report for 2014-15 was also prepared in line with GRI-G4 guidelines.

BHEL started its journey of compilation and publication of its sustainability performance in the form of Annual Sustainability Report in 2011-12. Current report covers the sustainability performance of the company for the period 1st April 2015 to 31st March 2016 and is an attempt to give its readers a holistic view of our sustainability performance for the reporting period and the areas in which further improvement is desired. Data has been provided for multiple years wherever available for comparison purpose.

As committed in the previous year's sustainability report, we have included the data for our newly established unit Power Plant Piping Unit (PPPU), Thirumayam in this year's report and consequently, an adjustment has been made in the corresponding data for the last two years to uphold the principle of comparability.

For the reporting purpose, data has been captured through SAP system wherever available. Data not available through SAP system at units have been taken from reliable sources at units, compiled in a given format at the unit level and sent to the corporate office for preparation of this report. Wherever the data is not based on measurement, the same has been arrived at using appropriate estimation methodology.

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 (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.

There has been no significant change from the previous reporting period. 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

At present, the report is not being externally assured. The reporting principles and methodology are in accordance with the "Comprehensive" option of GRI-G4 reporting framework.

ORGANISATIONAL PROFILE

About the Organisation

Bharat Heavy Electricals Limited (BHEL) is the largest engineering and manufacturing company of its kind in the country engaged in the design, engineering, manufacture, construction, testing, commissioning and servicing of a wide range of power equipment. BHEL caters to the needs of core sectors of the Indian Economy viz. Power Generation and Transmission, Industry, Transportation, Renewable Energy, Defence, etc. The company offers 180 products in 30 major product groups and specialised long-term services to the customers. The main line of business includes design, engineering, manufacture, supply, erection and commissioning of power projects. The company has the capability to deliver 20,000 MW per annum of main power plant equipments. BHEL is also engaged in the engineering, manufacture, supply and erection & commissioning of major capital equipment/products to a number of industries other than power utilities like metallurgical, mining, cement, paper, fertilisers, refineries, petrochemicals etc., and provides specialised After-Market-Services. BHEL has proven turnkey capabilities for executing power projects from concept to commissioning.

BHEL's first 700 MW supercritical thermal set commissioned at KPCL Bellary

The company has over the years established its references in around 78 countries across the world. All products of BHEL face stiff competition from both domestic as well as international companies. BHEL's products and systems are highly technology-intensive in nature and the Company has been updating technology through collaborative tie-ups with world leaders as well as through in-house R&D efforts.

BHEL is embracing the next phase of its growth on the strength of a sturdy foundation of more than 50 years of its journey of engineering excellence. BHEL has been the solid bedrock of India's Heavy Electrical Equipment industry since its inception in 1964.

BHEL's growth has been synchronous with achieving self-sufficiency in the indigenous manufacturing of heavy electrical equipments. In the country, BHEL alone constitutes a mammoth 20000 MW per annum capacity for manufacturing of power generation equipment. A widespread network of 17 manufacturing units, 2 repair units, 4 regional offices, 8 service centres, 1 subsidiary, 6 overseas offices, 6 joint ventures, 15 regional marketing centres and current project execution at more than 150 project sites across India and abroad corroborates the humungous scale and size of its operations. With the key focus on project execution, the worldwide installed base of power generating equipment supplied by BHEL has exceeded 170 GW. BHEL has 55% share in India's total installed capacity and 58% share in the country's total generation from thermal utility sets (coal based) as of March 31, 2016, this stands a testimony to its valuable contribution towards nation building.

Power Sector

BHEL is one of the few companies in the world having the capability to manufacture the entire range of power plant equipment and has proven turnkey capabilities for executing power projects from concept-to-commissioning. The power sector comprises thermal, gas, hydro and nuclear power plants. BHEL:

- Supplies steam turbines, generators, boilers and its auxiliaries upto 1000 MW. Currently executing projects on EPC basis including supercritical sets of 660/700/800 MW ratings
- Supplies hydro turbines and generators of up to 250MW rating
- Manufactures 220/235/540/550/ 700MWe nuclear turbine generator sets
- Has proven expertise in plant performance improvement through renovation, modernization and uprating of a variety of power plant equipments
- Has special know-how of residual life assessment, health diagnostics and life extension of plants
- Has supplied thermal sets that have consistently exceeded national average efficiency parameters.

Industry Sector

BHEL is a leading manufacturer of a variety of Industrial Systems & Products and meets the growing demand for major industries like oil and gas, metallurgical & mining, fertilisers, sugar, refineries, paper & petrochemicals etc. Besides this, Industry Sector operations also provide complete solutions for captive power generation, transmission, transportation, renewable energy, water management, defence and other industrial products. Major areas of operation include:

- Captive Power projects: Supplies Steam Turbine and Gas Turbine based Captive Power Plants
- Transmission: Execution of EHV & UHV substations ranging from 33 KV to 765 KV & HVDC converter stations up to ±800KV, power transformers, shunt reactors, vacuum & SF6 switchgear, gas insulated switchgear, ceramic insulators, etc.
- Transportation: Manufactures IGBT based propulsion equipment (traction converter/auxiliary converter/VCU), 25KV AC locos, EMU coaches and diesel-electric locomotives upto 5000HP
- Renewables: EPC solutions from concept to commissioning for grid connected and standalone PV applications ranging from kW to MW sized plants, space grade solar panels and space grade batteries.
- Water: Turnkey solutions for water treatment systems including Pre-Treatment plants (PT), Seawater Reverse Osmosis (SWRO) plants, Demineralization (DM) plants, RO plants for industrial applications, Waste Water/ Effluent Treatment plants (WWTP)/ (ETP), Sewage Treatment plants (STP) and Zero Liquid Discharge (ZLD) systems.
- Industrial products (Electrical & Mechanical): Range of industrial products including oil rigs, wellheads & Xmas trees, fabricated equipments & boiler feed pumps, compressors & AC machines
- Defence: Supplier of strategic equipment to Indian defence forces including Super Rapid Gun Mount & Integrated Platform Management System for naval Ships, Thermo pressed components, Heat exchangers for LCA, Turret castings for T72 tanks, castings for ships and simulators etc.

Locomotive under testing at Centre for Electric Transportation.

Condenser for TEJAS Aircraft

BHEL also has a widespread overseas footprint in 78 countries including Malaysia, Oman, Iraq, the UAE, Bhutan, Egypt and New Zealand, 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 and Mitsubishi Heavy Industries Ltd. etc., together with technologies developed in its own R&D centres. Most of the company's manufacturing units and other entities have been accredited to Quality Management Systems (ISO 9001:2008), 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 pressure of a liberalised economy and the current 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.

HYD.OIL-IDG OIL-FUEL COOLER (HE-1) FOR TEJAS AIRCRAFT

Diversification in transportation, transmission, defence, water & renewables is the strategy adopted to maintain a balanced portfolio of offerings. This strategy of diversifying and capitalising 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 organisation is quite diverse ranging from advance ultra-supercritical thermal power plants to grid-connected renewable energy systems.

Primary Heat Exchanger for TEJAS Aircraft

Precooler for TEJAS Aircraft

Reheater for TEJAS Aircraft

Secondary Heat Exchanger for TEJAS Aircraft

BHEL's greatest strength is its highly skilled and committed workforce of about 42,000 employees who have been the torchbearers of BHEL's journey of excellence.

Further, the concept of sustainable development is ingrained 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 social initiatives aimed at Community Development, Health & Hygiene, Education, Environment Protection, Disaster Management, and Talent up gradation/Skill development.

The future is filled with both exciting opportunities & gruelling challenges. Creating new sources of growth, responsible utilisation of infrastructure, building new capabilities and transforming in line with the market realities will be the key to future growth and stakeholders' wealth enhancement.

For further details about business profile and performance of different business segments, readers may please refer to page 32-54 of BHEL's Annual Report for FY 2015-16.

Primary Products and Services

For details about primary products and services, kindly refer to page 243-251 of BHEL's Annual report for FY 2015-16 available on www.bhel.com.

Vision

A global engineering enterprise providing solutions for a better tomorrow

Mission

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

Sustainable Performance

Zero debt company

Consistent dividend paying company since 1976-77

First listed its equity shares on stock exchanges in 1992

WORLD of BHEL

A National Champion

An Indian Maharatna CPSE

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

- Power
- Industry

Transmission/Transportation/ Renewables/Defence/Water/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

Global Footprints

References in 78 countries

Offices in 6 countries

Contracted power plant equipment around 17,000 MW

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

Sudan's largest 500 MW Kosti TPS and two 220kV substations in Afghanistan successfully commissioned in 2015-16

Did you Know?

3 out of 5 houses in India are supplied power generated from BHEL sets

BHEL commissioned/synchronized an all time high of 15,059 MW power projects in a single year in 2015-16

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

BHEL is energizing India's north east with commissioning of 1st unit of highest rating (3x250 MW) coal based power plant in Bongaigaon, Assam

Indian Navy's INS Kochi, Kolkata class missile destroyer ship is equipped with BHEL's Super Rapid Gun Mount and Auxiliary Control systems

Worlds largest ±800 kV, 6000 MW multi terminal HVDC NE Agra transmission project under execution by BHEL

95% of hydroelectric generating capacity in Bhutan Installed by BHEL

BHEL's first power generating set was the 30 MW thermal power station installed at Basin bridge in Tamil Nadu, way back in 1959

All the 29 states of the country have power generating equipment installed by BHEL.

Innovation

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

Five research institutes

14 Centres of Excellence

More than 1 patent/copyright filed per day

Total intellectual capital-3441

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

Heralding the change towards climate

Supercritical technology resulting in 11% reduction in CO_2 emissions, less fuel consumption & lower cost to customers

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

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

Developed more efficient EHV Transmission systems and products (765 kV AC, 800 kV DC & 1200 kV AC)

Generated 8.08 MU energy & carbon footprint avoidance of 7800 MT CO_2-e during 2015-16 through in house solar power installations

Low lifecycle cost of equipment facilaiting affordable and environmentally sustainable energy systems

Valuing People

Participative management culture through JCM, Plant Council., Shop Council since 1973

77% engineers amongst executives

2,300 + female employees

Less than 1% attrition rate

4 + days of training per employee per year

Social Onus

Committed to Principles of UN Global Compact

Signatory to Integrity Pact of Transparency International

Undertaken 60 projects on "Swachh Bharat"

Bio diversity

- In house green coverage of 4.7 million Square meters
- Plantation of more than 3 million trees

BHEL's mobile science vans benefitting school children in vicinity of three units of BHEL vis. Haridwar, Jhansi and Trichy

Supporting 11 mobile medical units for benefits to the needy patients

Energizing India

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

170+ GW 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

Commissioned country's first indigenously manufactured 800 MW boiler at APPDCL Krishnapatnam 2, in 2014

Unparalleled Experience

530,000+ MVA transmission equipment supplied

30,000+ AC machines supplied, largest Indian manufacturer

15,000 + MW Captive Power Plant installed

190+ MW cumulative shipments of PV cells, modules and systems

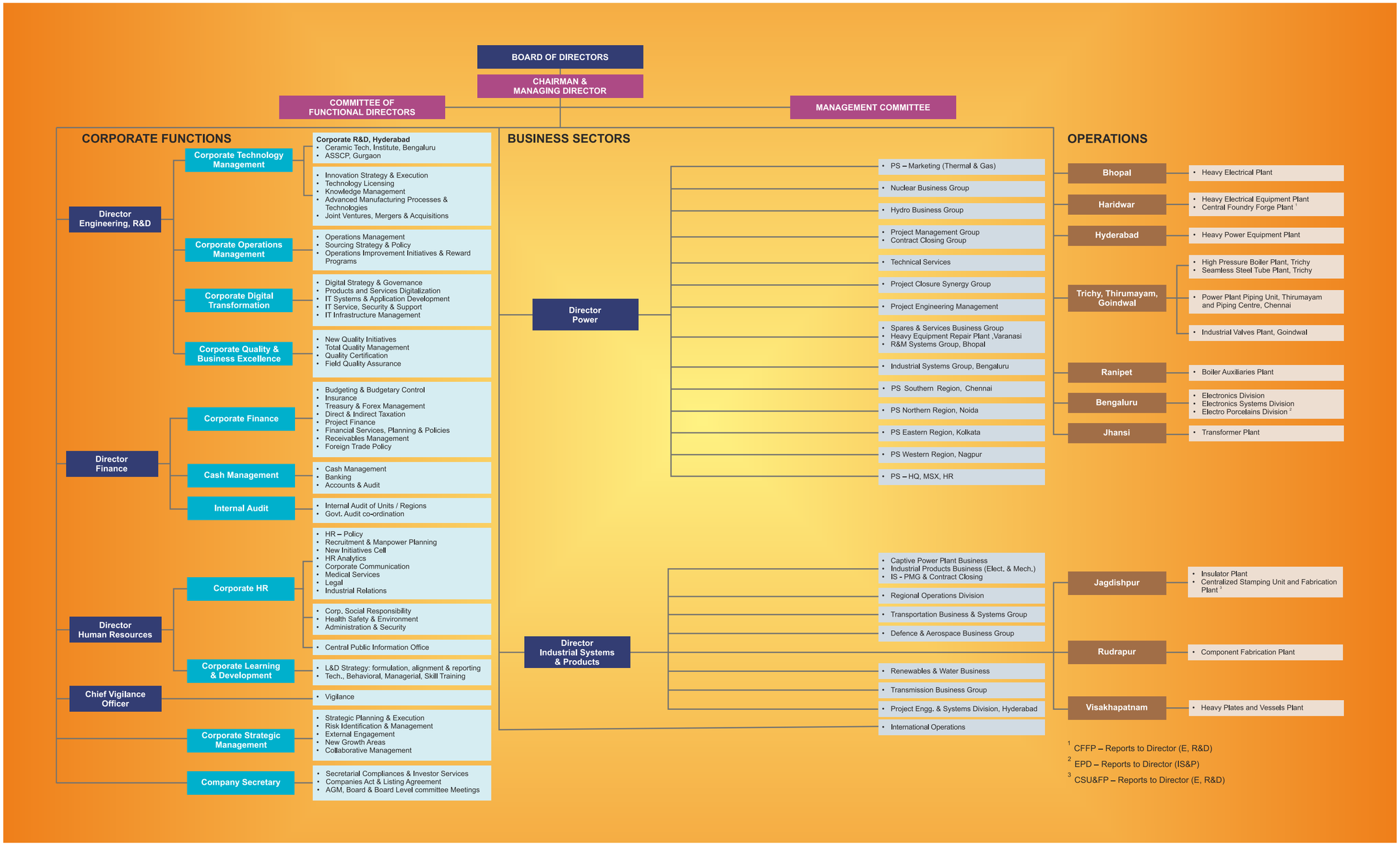
360 electric locos supplied to Indian Railways & other industries

380 + Compressors & 90 oil drilling rigs supplied

42+ oil rigs refurbishment & upgradation completed

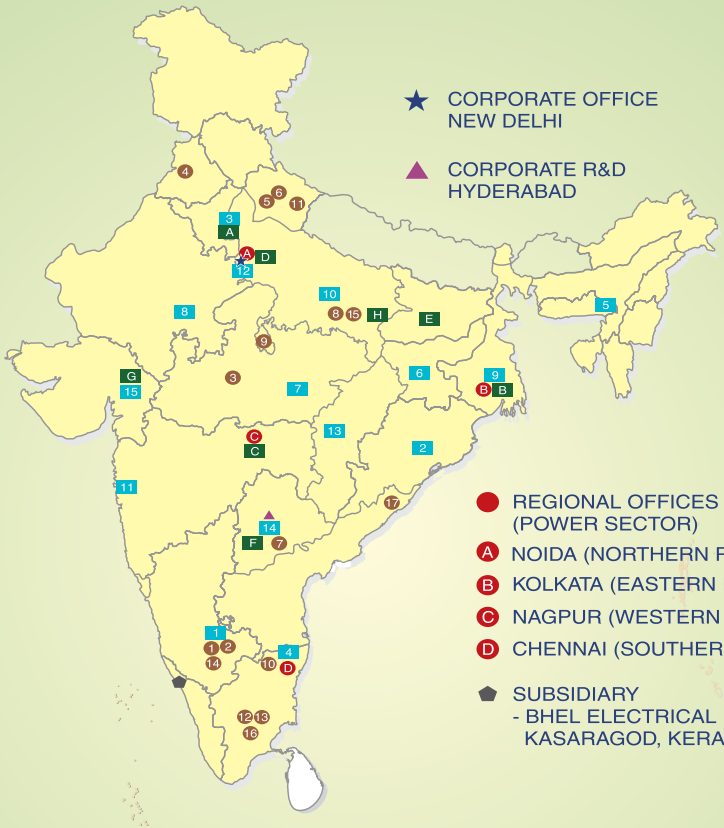
34 SRGMs supplied

Sustainability Report 2015-16



Creating BHEL of tomorrow
RESPONSIVE. ROBUST. RISING

BHEL in India



BUSINESS OFFICES

1 BENGALURU
2 BHUBANESWAR
3 CHANDIGARH
4 CHENNAI
5 GUWAHATI
6 RANCHI
7 JABALPUR
8 JAIPUR
9 KOLKATA
10 LUCKNOW
11 MUMBAI
12 NEW DELHI
13 RAIPUR
14 SECUNDERABAD
15 VADODARA

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

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

Global Footprints of BHEL

Presence in 78 countries around the world

AFRICA
ALGERIA
COMOROS
DR CONGO
EGYPT
ETHIOPIA
GHANA
KENYA
LIBYA
MALAWI
MAURITIUS
NIGERIA
RWANDA
SENEGAL
SOUTH AFRICA
SUDAN
SWAZILAND
TANZANIA
UGANDA
ZAMBIA
ZIMBABWE

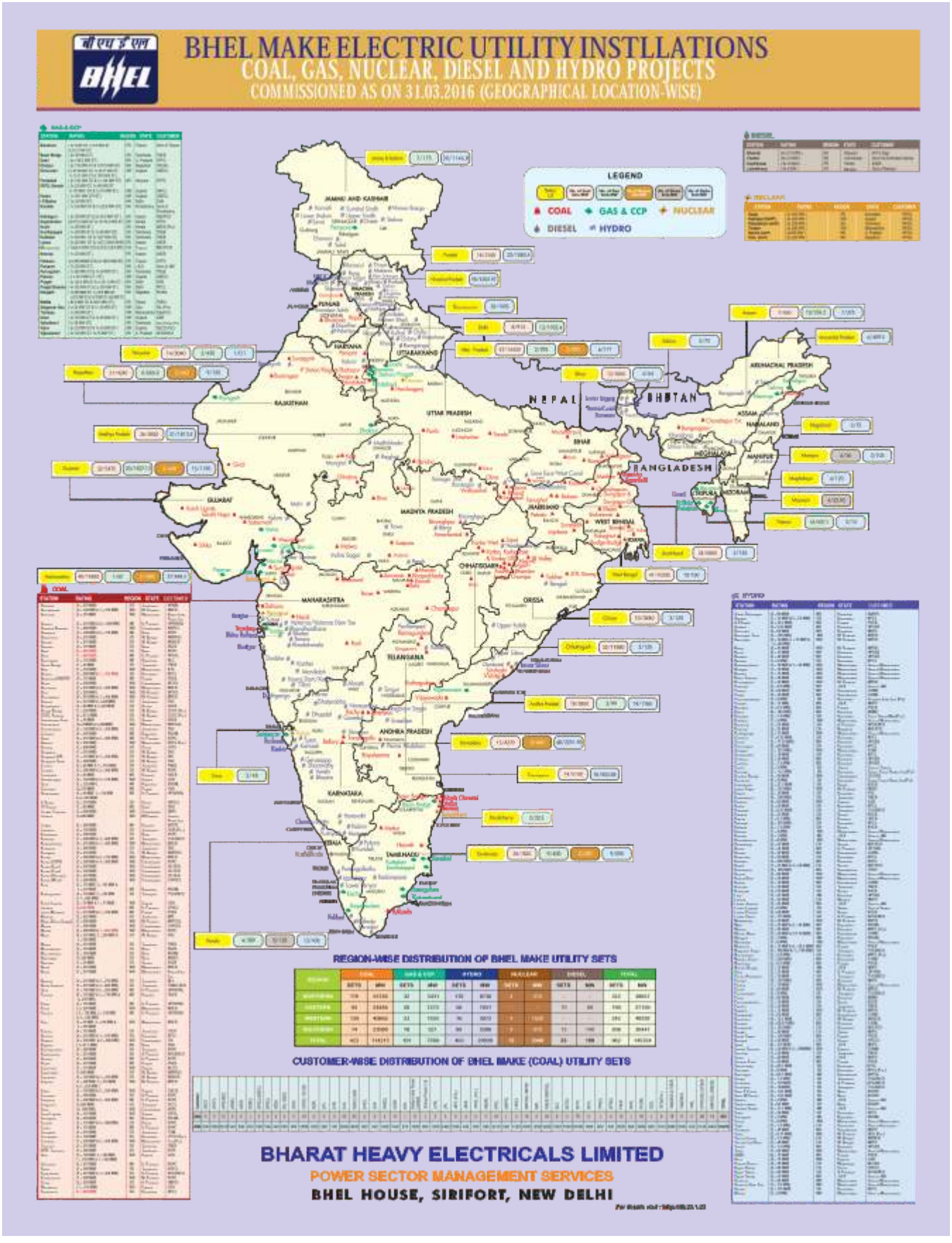
ASIA
AFGHANISTAN
AZERBAIJAN
BANGLADESH
BHUTAN
CHINA
HONG KONG
INDONESIA
IRAN
IRAQ
JAPAN
JORDAN
KAZAKHSTAN
KUWAIT
LAOS
MALAYSIA
MYANMAR
NEPAL
OMAN
PHILIPPINES
SAUDI ARABIA
SINGAPORE
SRI LANKA
SYRIA
TAIWAN
TAJIKISTAN
THAILAND
UAE
VIETNAM
YEMEN

EUROPE
BELARUS
BELGIUM
BULGARIA
CYPRUS
FINLAND
FRANCE
GEORGIA
GERMANY
GREECE
IRELAND
ITALY
MALTA
POLAND
ROMANIA
RUSSIA
SWEDEN
SWITZERLAND
TURKEY
UKRAINE
UK

NORTH AMERICA
CANADA
TRINIDAD AND TOBAGO
USA

OCEANIA
AUSTRALIA
NEW CALEDONIA
NEW ZEALAND
SAMOA

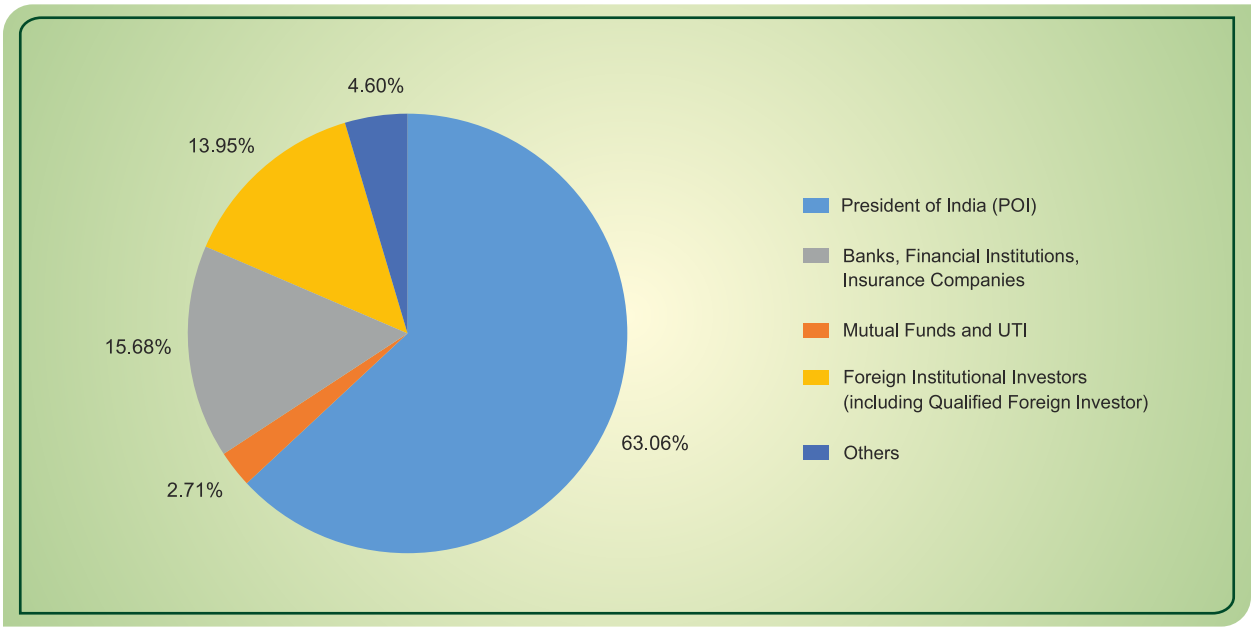
SOUTH AMERICA
SURINAME


BHEL MAKE ELECTRIC UTILITY INSTLLATIONS
COAL, GAS, NUCLEAR, DIESEL AND HYDRO PROJECTS
COMMISSIONED AS ON 31.03.2016 (GEOGRAPHICAL LOCATION-WISE)
LEGEND
COAL
GAS & CCP
NUCLEAR
DIESEL
HYDRO
NEPAL
BHUTAN
BANGLADESH
REGION-WISE DISTRIBUTION OF BHEL MAKE UTILITY SETS
CUSTOMER-WISE DISTRIBUTION OF BHEL MAKE (COAL) UTILITY SETS
BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR MANAGEMENT SERVICES
BHEL HOUSE, SIRIFORT, NEW DELHI

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 2016 is shown in the adjacent figure.

There has been no change in the shareholding of the Government of India during the reporting period (2015-16) as compared to the previous year.



Recognition of Excellence

Continuing its tradition of bagging prestigious national/international awards, the organisation and employees won several awards during the year 2015-16. For details of these awards kindly refer to page 20-22 of BHEL's Annual report 2015-16.

CORPORATE GOVERNANCE

Management Approach

BHEL has established a sound framework of Corporate Governance which underlines commitment to quality of governance, transparency in 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 the 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 Policy of BHEL rests upon the four pillars of Transparency, Full Disclosure, Independent Monitoring and Fairness to All. To strengthen this, BHEL has signed a MoU with Transparency International to adopt 'Integrity Pact'. Our corporate structure, business procedures and disclosure practices have attained a sound equilibrium with our Corporate Governance policy resulting in achievement of goals as well as high level of business ethics.

Governance structure at BHEL

The composition of the Board of Directors as on 31.03.2016 is as under:

Particulars	Board Structure	Actual Strength as on 31.03.2016
Chairman & Managing Director	1	1
Whole-time Executive (Functional) Directors	5	4
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	5
Total	16	12

As on 31st March, 2016, there existed one vacancy of Director (Power) and three 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.

Board Level Committees

There are eight Board Level Committees in BHEL. The details of the Committees of the Board with regard to their composition and respective Terms of Reference (responsibilities/ mandate) as on 31.03.2016 can be seen in BHEL's Annual Report 2015-16 page 98-105.

As on 31.03.2016, the Board comprised of persons within the age group of 45-65 years. There was one Woman Independent (non-executive) Director on the Board of BHEL with age of 63 years. Only one-woman Director belonged to a minority group. All Directors are eminent personalities having wide experience in the field of Management, Finance, Engineering, Administration and Industry. The Chair of Highest Governing body is also an executive officer (Chairman & Managing Director).

BHEL has a unitary board structure. Directors other than Functional (Whole-time) Directors are Non-Executive Directors. Non-Executive Directors comprise of 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.

In line with Articles of Association of the Company, Companies Act and SEBI (Listing Obligations & Disclosure Requirements) Regulations, 2015, certain important key decisions (viz. appointment of Directors, adoption of annual accounts etc.) are taken by shareholders in the Annual General Meeting. 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. Contact details are available on the website of the Company (www.bhel.com). Further, shareholders have a dedicated email-id:shareholderquery@bhel.in to communicate with the company.

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, body corporates 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 in/ 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 a high standard of conduct.

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, Functional Directors and Part-time Official Directors on the Board of BHEL and also nominates Part-time Non-official (Independent) Directors on the Board of BHEL.

The appointment of Chairman & Managing Director and Functional Directors is on such terms and conditions, remuneration and tenure as the President of India may from time to time determine.

Two Part-time Official Directors viz. Additional Secretary/ Joint Secretary, Department of Heavy Industry-Ministry of Heavy Industries & Public Enterprises and Additional Secretary & Financial Advisor, Ministry of Commerce and Industry are nominated by the Government of India on the Board of BHEL. They continue to be on the Board of BHEL at the discretion of the Government of India.

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.

BOARD OF DIRECTORS

(as on 10.08.2016)

Sitting from right to left:

Shri Keshav N. Desiraju, Part-time Non-official Director

Shri Rajesh Kumar Singh, Joint Secretary, DHI

Shri Atul Sobti, Chairman & Managing Director

Dr. Subhash Chandra Pandey, Additional Secretary & Financial Adviser, DIPP

Shri A.N. Roy, Part-time Non-official Director

Standing from right to left:

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

Ms. Harinder Hira, Part-time Non-Official Director

Shri T. Chockalingam, Director (Finance)

Shri R. Swaminathan, Part-time Non-Official Director

Shri Rajesh Kishore, Part-time Non-Official Director

Shri D. Bandyopadhyay, Director (Human Resources)

Shri Akhil Joshi, Director (Power)

Shri Amitabh Mathur, Director (Industrial Systems & Products)

Shri I.P. Singh, Company Secretary

Code of Business Conduct

As part of BHEL's persisting endeavor to set a high standard of conduct for its employees, a 'Code of Business Conduct and Ethics' was laid down for all Board Members and Senior Management Personnel and the same was revised in line with changes in the regulatory framework & changing business dynamics and to incorporate other relevant provisions to strengthen the Code. Pursuant to erstwhile Listing Agreement with the Stock Exchanges, the Board of Directors of BHEL in its 465th meeting held on 14th November, 2014 revised and approved the "Code of Business Conduct & Ethics for Board Members and Senior Management Personnel" of the Company. The Code is also in compliance with the current Listing Regulations. The Code encompasses:

- General Moral Imperatives;
- Specific Professional Responsibilities; and
- Specific Additional Provisions for Board Members and Senior Management Personnel.

A copy of the said revised Code has been placed on the Company's website 'www.bhel.com'. All Board members and Senior Management Personnel affirm compliance with BHEL's "Code of Business Conduct and Ethics" at the end of every financial year. A declaration to this effect is signed by the Chairman & Managing Director and given in the Annual Report of the Company.

All Board members and Senior Management personnel have affirmed compliance with BHEL's "Code of Business Conduct and Ethics" for the financial year 2015-16.

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 are 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 the financial year 2015-16, Board met 10 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 the 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 a 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 of 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 the signing of wage agreement, implementation of Voluntary Retirement Scheme etc.
- Sale of material, nature of investments, subsidiaries, assets, which is 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 with 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 the quarterly basis.
- Significant Capital Investment proposals.
- Changes in significant accounting policies & practices and reasons for the same.
- The performance of various units/ functions.
- Any other information required 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 and Committee on Arbitration & Major Legal Disputes 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 the Board of Directors.

Ethics, Transparency & Integrity

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

BHEL's Governance framework endeavours to transcend much beyond the regulatory and basic requirements of Corporate Governance, focusing consistently towards building the confidence of

its various stakeholders including shareholders, customers, employees, suppliers and the society at large. The framework underlines commitment to quality of governance, transparency in disclosures, consistent stakeholders' value enhancement and corporate social responsibility. Our corporate structure, business procedures and disclosure practices have attained a sound equilibrium with our Corporate Governance Policy resulting in achievement of goals as well as high level of business ethics. BHEL's Corporate Governance policy is based on the following principles:

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 is complying with the provisions of Companies Act, Listing Regulations (erstwhile Listing Agreement) and DPE Guidelines.

A MoU has been signed with Transparency International India (TII) to adopt 'Integrity Pact', to make public procurement and contracting more transparent by binding both the parties to ethical conduct. A panel of three Independent External Monitors (IEMs) have been appointed with the due approval of Central Vigilance Commission to oversee implementation of Integrity Pact in BHEL. Works Policy, Purchase Policy and other policy documents facilitate transparency in BHEL working and commitment of highest order of integrity. Under 'Delegation of Power' of various functionaries, accountability is well defined.

The performance of the Board is judged against benchmarks set within the company as well as the Memorandum of Understanding signed with the Department of Heavy Industry. The effectiveness of the Board is seen with respect to the overall value addition by the decisions taken at the Board Meetings.

Mechanisms to analyse corruption and fraudulent practice risks

The company has a Board approved 'Code for Business Conduct & Ethics' for all Board Members and Senior Management personnel which can be viewed through the following link:

http://www.bhel.com/investor_relations/pdf/Code%20of%20Business%20Conduct%20and%20Ethics.pdf

In addition, as 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' 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.

BHEL is a front-runner in implementing the Right to Information Act, 2005 and has embraced the

Act in true letter and spirit.

- A Central Public Information Officer (CPIO) and a Central Assistant Public Information Officer (CAPIO) aided by a Dy. Manager (Law) at the company level and 21 CPIOs at each of the major administrative units are functioning as part of the Right to Information Group.
- 21 Appellate Authorities are functioning at the company level to dispose of first appeals filed under the Act.
- To assist and facilitate the citizens in obtaining information, detailed guidelines have been placed on BHEL's website, spelling out the procedure for securing access to information and filing of first appeals under the Act.
- Instructions have been issued to administrative units to ensure compliance with the mandatory requirements of the Act.
- Proactive disclosures have been made on BHEL's website in line with Section 4 (1) (b) of the Act, disseminating various categories of information so that citizens have the minimum need to resort to the Act for the purpose of obtaining information.
- BHEL is an active member of Steering Committee on RTI constituted by Standing Conference of Public Enterprise (SCOPE).
- BHEL has adopted the RTI online web portal of Department of Personnel & Training, Govt. of India. The RTI Applications/Appeals filed on this web portal are received electronically in BHEL.
- The CPIOs and the other stakeholders involved are sensitised regularly about their obligations under the Act through various training and workshops.

BHEL organised its annual workshop on the Act on 11.3.2016 for the benefit of all the CPIOs and First Appellate Authorities. The keynote address was delivered by Prof (Dr.) M M Ansari, Former Central Information Commissioner.

Monitoring mechanisms in place to avoid incidences of corruption

BHEL has adequate systems of internal financial controls in place, in the form of well-documented policies & procedures that cover critical as well as important activities of financial and other operating functions.

The procedures are in the form of manuals, guidelines, the delegation of powers and IT systems & controls which are effected through people operating in various departments within the company at different levels. These are designed to ensure compliance to the Internal Financial Controls as detailed in the Companies Act - 2013. The senior management reviews and certifies the effectiveness of the internal control mechanism over financial reporting, adherence to the code of conduct and company's policies.

BHEL has an in-house Internal Audit Department commensurate with its size of operations. It has Internal Audit Cells located at major manufacturing units, regional offices and at the corporate office of the company which carry out audits as per annual audit programme approved and reviewed by Board Level Audit Committee. The Internal Audit Department checks the adequacy and effectiveness of internal financial control system through regular audits, system reviews and provides assurance on compliance with the legal, regulatory and internal policies and procedures of the company.

Functioning of internal audit as well as internal financial control systems are periodically reviewed by the Board Level Audit Committee (BLAC) which is supported by Unit Level Audit Committees (ULAC). Necessary directions are issued by BLAC/ULAC/ Management wherever required to further strengthen the internal financial control system keeping in view the dynamic environment in which the company is operating. The company continues its efforts to align all its processes and controls with global best practices.

BHEL has a strong vigilance mechanism in place. The vigilance department of BHEL is headed by a Chief Vigilance Officer (CVO) appointed by Department of Heavy Industry (DHI), Ministry of Heavy Industries & Public Enterprises, Govt. of India. Major manufacturing units/regional offices of BHEL have vigilance set ups headed by senior vigilance executives reporting to the CVO. BHEL is laying more focus on preventive vigilance to tackle corruption. The approach to preventive vigilance includes a combination of measures like the review of rules & policies particularly concerning procurement and recruitment, awareness measures and focusing on specific functional areas.

Some of the preventive measures initiated in recent times are as under:

- Review and updating the policies/manuals in order to align them with the extant Govt. policies/guidelines, and to bring clarity in the provisions to avoid scope for different interpretations
- Expansion of vendor base to ensure competitiveness
- Demarcation of BHEL land and digitisation of land records
- Introduction of audit trail in computerised systems for tracking changes
- Installation of CCTVs to check material movements and to improve security environment in the premises of manufacturing units
- Issue of Fraud Prevention Policy and Complaint Handling Policy of the company
- Introduction of on-line complaint system to bring more transparency

A detailed Corruption Mitigation Action Plan in respect of potential areas of corruption in BHEL has been prepared and it has been taken up for implementation by all units/regions. Potential areas of corruption have been identified, and in each case, the detailed strategy has been identified in respect of causes of corruption, proposed action plan to mitigate the same and measurable targets and persons responsible for implementation in the respective units. Vigilance department is publishing a quarterly **e-Newsletter 'DISHA'** with a view to creating awareness about relevant policies, rules and procedures, to disseminate the instructions/ guidelines issued by CVC & Govt. of India from time to time and to share best practices and case studies. The Vigilance Awareness Week was observed from 26th – 31st October, 2015 in the corporate office, manufacturing units, regional offices, at project sites of BHEL with the Pledge of Integrity undertaken by the employees. During the week, a documentary film on BHEL **"Chalo Sath Chalein- Ek Anubhav BHEL ka"** by BHEL was telecast by Doordarshan in October 2015. Besides showcasing the good governance, transparency and best practices adopted by BHEL, the film highlights how the collective approach of BHEL's management and vigilance has brought benefits to the company.

Routine/surprise inspections were carried out by units / Corporate Vigilance and the learnings were shared with the senior executives of management. In addition, circulars were issued by Corporate Vigilance for systemic improvements in critical areas. Since BHEL has adopted Integrity Pact, structured meetings are held with the Independent External Monitors (IEMs) every quarter wherein the procurement related issues and complaints thereupon are discussed. The Integrity Pact has been made mandatory for all purchase orders/contracts of value more than ₹5 Crore.

Materiality and Stakeholder Engagement

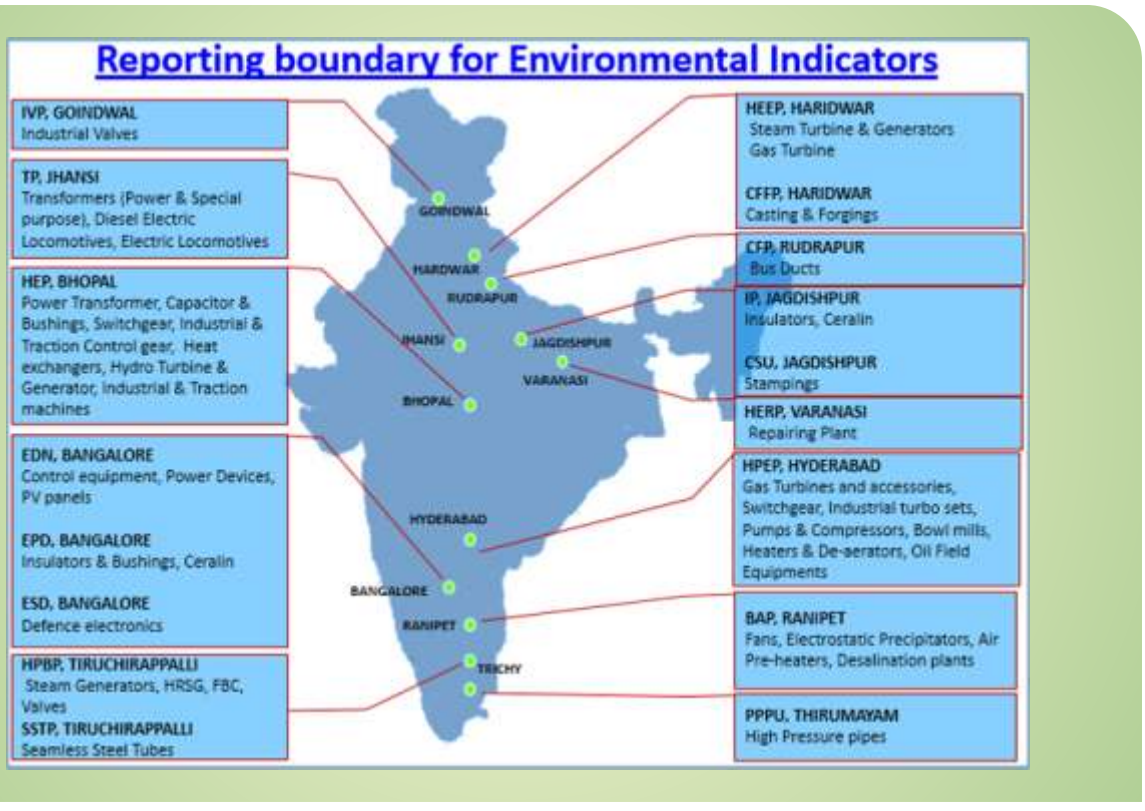
BHEL's financial statement details have been provided on page 148- 236 of BHEL's Annual Report for 2015-16. It includes standalone annual accounts as well as the consolidated financial statement. The consolidated financial statement includes its subsidiary and joint venture as well. The list of such 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 joints ventures are not being considered.

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.

Subsidiary:
BHEL Electrical Machines Limited (BHEL EML)
Joint Venture:
1. BHEL- GE Gas Turbine Services Limited
2. Dada Dhuniwale Khandwa Power Ltd.
3. Raichur Power Corporation Ltd.
4. NTPC-BHEL Power Projects Pvt. Limited
5. Latur Power Company Limited (LPCL)
6. Powerplant Performance Improvement Limited (PPPL)

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 and controlled in a robust manner.

The data for the aspects other than Environment includes the data for entire BHEL setup (excluding JVs and subsidiaries).

Stakeholder Identification & Engagement

BHEL's identified stakeholders broadly fall into six categories. They are – Government of India, Customers, Employees, Shareholders, Vendors and Society. BHEL has processes in place to ensure inclusion of stakeholder concerns and expectations.

These are the groups which either affect the business of BHEL or themselves get affected by our business. This relationship forms the basis on which these specific groups have been identified by the organisation as its stakeholders.

Key issues are identified through ongoing stakeholder engagement and addressed by programmes or action plans with clear and measurable targets. BHEL units regularly organise Vendor Meets specifically for MSEs (including local suppliers) towards capacity and capability building, which also provide opportunities for open communication for mutual benefit and support.

Based on the stakeholder expectations material issues are identified. These issues are viewed in the Sustainability Context of the organisation. Then finally the issues which are perceived as important to both the key stakeholders and to the company are prioritised and reported as key Sustainability issues for the organisation with regards to its sustainability performance.

BHEL has clearly identified the disadvantaged, vulnerable poor, needy & marginalized stakeholder in the vicinity of the BHEL manufacturing units/regional offices/divisions/sites/offices and their concerns are addressed as per BHEL's CSR Policy which is incompliance with section 135 & Schedule VII of the Companies Act, 2013 and rules made thereunder as well as DPE Guidelines on CSR & Sustainability for CPSEs released on 21.10.2014.

Some of the stakeholder engagement activities undertaken during 2015-16 are given in the table below.

Modes of Stakeholder Engagement & Activities

Stakeholder Group	Mode of Engagement/ Communication	Snapshot of activities conducted in 2015-16
Shareholders	Annual Report, Press Releases, Investor Relation	• Annual General Meeting • Conference calls/ one-to-one meeting with Investors and company's communication at investor conferences in India and abroad • Separate section on Corporate Governance annexed with Annual Report of the company wherein all disclosures are made as per the listing requirements

Stakeholder Group	Mode of Engagement/ Communication	Snapshot of activities conducted in 2015-16
Shareholders		• Disclosure of material information or event on the internet, filing of information with SEBI & Stock exchanges, News release and Press conferences
Customer	MoU, Reports	• Parliamentary Committee meetings • GoI has major shareholding in BHEL and hence company has several established mechanisms in place to communicate with Government authorities • MoU formulation task force and performance review by Department of Public Enterprises (DPE) • Interaction with Ministry of Heavy Industry & Public Enterprises at senior most level on company performance as well as Policy related issues • Adherence to values/ processes in line with guidelines given by Government institutions like Parliamentary committees, CVC, CAG, Ministry of Heavy Industry etc.
Suppliers	Customers' meet, surveys	✓ Customer Satisfaction Surveys ✓ Continuous interaction and feedback by CMD, Functional Directors and Marketing Groups at Corporate level ✓ Assessment of present and future needs by Unit/Regional Heads and concerned General Manager once in 3 months for every customer and also need based ✓ Assessment of short/midterm needs once in two months for every customer by Head of Functions in manufacturing units ✓ Work Progress Review by Site-in-charge everyday ✓ Annual customer meet by Top & senior management

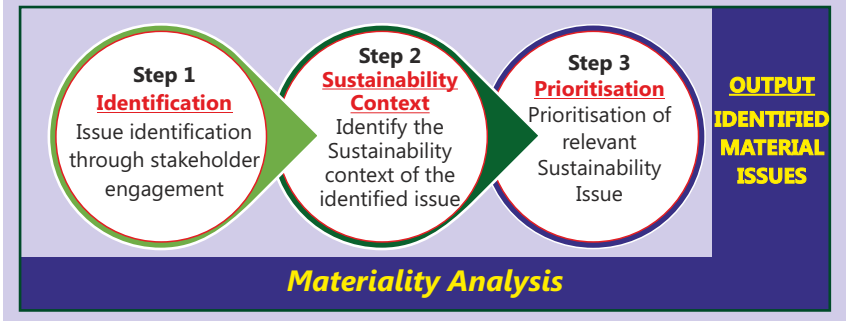
Stakeholder Group	Mode of Engagement/ Communication	Snapshot of activities conducted in 2015-16
Suppliers	Vendors Meet	√ Vendor Satisfaction Surveys by manufacturing units √ Daily Milestone review by Project Site In-charge √ Short & midterm need assessment by senior management √ Contract execution review by the head of functions as and when needed. √ Vendor meets at manufacturing unit level √ Partnership through MoUs/Rate Contracts
Employees	In-house magazine, Message from CMD, Employee engagement survey, Joint Committee, Plant Council, Shop Council	☞ Employees Satisfaction Surveys ☞ Top down communication through Management Committee meetings, Monthly Communication meetings, Top management meeting, Project review meetings ☞ IT-enabled communication e.g. Internet and e-mails, Intranet, e-Map etc. ☞ Display Boards, LED/Plasma TV display etc. ☞ Bottom-up communication through Joint Committee, Plant Council, Shop Council, General communication meeting etc. ☞ Horizontal communication through daily communication meeting at sites/shop floor, Video Conferencing, Audio Conferencing, IP phone etc.
Society at large	CSR Programme, Baseline Survey / need identification	❖ CSR Projects ❖ Interaction with people through site visits for CSR, Meeting with NGO's representatives ❖ Society Satisfaction Surveys by units ❖ Continuous interaction with Local administration/District authorities by senior management at manufacturing units/project sites ❖ Medical camps/ Blood donation camps at units/Sites/adopted villages etc. ❖ Creation of educational infrastructure for local people at manufacturing units ❖ Other social welfare initiatives

Some of the key topics and concerns which have been raised by the stakeholders during 2015-16 and the steps being taken by the organisation to address these concerns and risks are given in the table below.

Material issues identified	Strategic goals set to resolve these issues
Order book reduction due to increasing competition, excess domestic manufacturing capacities and low business sentiments.	• Expanding the offerings, including focus on EPC business • Diversified Product Profile
High material cost to turnover ratio	Means are being explored to reduce the material content of our products so as to reduce their cost as well as environmental footprint over its life cycle
Safety performance at site	❖ Safety Performance review is being done more critically ❖ Safety organisation at project sites is being strengthened ❖ Heightened efforts to involve all the employees in improving safety performance
Expectations of stakeholders in the vicinity of our geographical footprint	More focused CSR initiatives are being taken to address the expectations of the stakeholders. Sustainability and scalability are the two important parameters identified for such projects

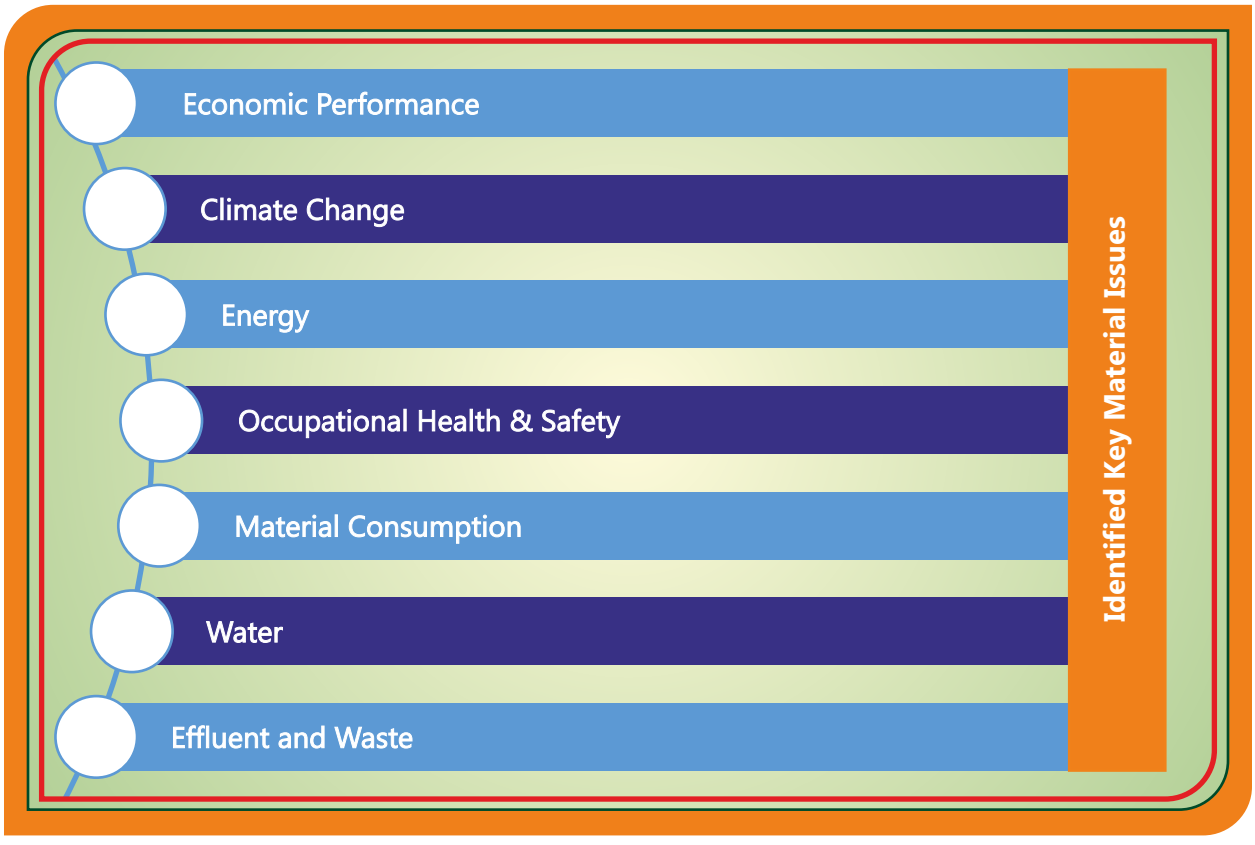
Process for defining report content and aspect boundaries

Our process of materiality analysis is a three stage process. In the first stage, plethora of issues which are significant for the stakeholders of the company and which may affect or have a potential to affect the sustainability of business of the organisation are identified. It is done through stakeholder engagement/feedback/ brainstorming. In the next stage, these identified issues are analysed in sustainability context to analyse the importance of the identified issue for the organisations' Economic, Environmental and Social Impact and how the issue is going to influence the stakeholders' decision and assessment of BHEL.



Then in the third & final stage, the relevant issues which are material to the company as well as the stakeholders are prioritised through a simple matrix.

For the reporting period 2015-16, like the previous year the following issues have been found to be key material issues for the company and the same are reported in this document in detail:



It may also be noted that major impact of our product and services lies outside our boundary during the life cycle of the power plant which is beyond the control of BHEL. To minimise the environmental impacts of our products and services, BHEL is continuously striving for more efficient power plant equipment and development of greener technologies. Also, emission during transportation of our products across our presence is there but we are unable to capture it at present.

There is no significant change in our operations or supply chain from previous reporting periods. However, due to incorporation of 3 years' data for our PPPU Thirumayam unit there has been a modification in the scope and aspect boundary of the identified material issues as compared to previous reports. The environmental indicator data for PPPU Thirumayam has been added this year and consequently, the same is incorporated in the data for 2013-14 & 2014-15 leading to minor adjustment in the data reported in our sustainability report for 2013-14 & 2014-15.

ECONOMIC PERFORMANCE

Management Approach

The company believes that conducting business in a manner that complies with the Corporate Governance procedures and Code of Conduct exemplifies each of our core values and position us to deliver long-term returns to our shareholders, favourable outcomes to our customers, attractive opportunities to our employees and making the suppliers our partners in progress & enriching the society. BHEL has exhibited sustainable growth throughout its journey so far despite various challenges being faced by the company.

Preparing for growth

Amidst the difficult external economic and business environment, BHEL continues to face challenges in the current year also. Nevertheless, the company has developed considerable resilience to leverage its engineering strength and manufacturing prowess to regain growth momentum in the next phase of Indian economic growth. The overall business scenario is improving and the 'Make in India' initiative of Govt. of India is poised to drive the manufacturing sector into a new phase of growth.

- **Power Sector:** BHEL has taken many initiatives to sustain a leadership position in Indian power sector. Major ones include enlarging the scope of offers, expanding business and enhancing competitiveness. The share of EPC orders in the company's power sector order mix is gradually increasing – from 36% in XI FYP to 45% in XII FYP. The company has added Flue-Gas Desulfurization (FGD) system, air cooled condenser and water management system as a strategy to enlarge the scope of offers. Further steps have been taken for indigenization of supercritical technology. Going forward, the company is gearing itself to capitalise opportunities emerging from new environmental norms issued by Ministry of Environment, Forest & Climate Change.
- **Make in India:** BHEL considers 'Make in India' as an inflexion point to significantly scale up and diversify its business mix. New opportunities are emerging in defence, railways, solar and also in the conventional power sector. The company is building new capabilities and exploring new business models to take advantage of emerging opportunities and is confident of regaining growth momentum in near future. Some of them are:
  - **Solar PV:** With the focus on the growing demand in the solar PV market, BHEL is in the process of augmenting its manufacturing capacity for SPV cell to 105 MW and for modules to 226 MW. Further, EPC capability is being enhanced to 600 MW including long-term comprehensive O&M for large projects.
  - **Transmission:** BHEL has strengthened its higher voltage transmission portfolio with indigenously developed 1200 kV class Transformer & 765 kV Transformers & Reactors. The company is gearing up to address EHV GIS business with own-make GIS upon successful field trials. Initiatives are being taken for exploring tie up with OEMs for SCADA DMS and subsequent implementation of a demonstration project for Smart Grids.

- **Transportation:** With the revival of demand from Railways and emerging opportunities from Dedicated Freight Corridor (DFC) and urban metro transportation, the company is focusing on business opportunities in Metro coaches, high-speed trains and equipment for high HP locomotives. For the development of the prototype for electric buses, in-house development of power electronics, motors and PV based wayside charging equipment has been taken up.
- **Defence:** Tie-ups are being pursued with global technology leaders in defence sector by leveraging BHEL's strength in manufacturing.
- **Water:** The company is gearing up to address business opportunities in the area of Sewage Treatment and large-scale desalination with O&M.

❖ **Global Footprints:** The company is making efforts to expand its global footprints and creating more market references. Currently, BHEL is executing 22 projects in 14 Countries.

❖ **Cost Competitiveness:** To enhance the competitiveness of our products and services, various measures like design optimisation; enhancing performance parameters; de-packaging of bought-out-items & civil works; and indigenization of supercritical technology etc. have been initiated.

❖ **R&D and Innovation:** BHEL's products and systems are technology intensive and thus, the company has adopted R&D and technology development as one of the central drivers for implementing its strategy. The company has maintained R&D expenditure at plus 2.5% of the turnover for more than 5 years. Recent in-house developments include 765 & 1200 kV UHVAC transformer & reactor, IGBT propulsion technology for loco & ACEMU, STATCOM for industrial & grid applications, Phase Shifting Transformer (PST) and 500 kW PCU for solar PV generation. The company is also working with NTPC and IGCAR for the development of Advanced Ultra Supercritical (AUSC) technology for coal-based power plants.

❖ **People Development:** In line with the growing aspirations of the millennial generation, the people development strategy of BHEL is focusing on developing employee's competencies in alignment with the business plans through the implementation of initiatives like e- learning modules and focus on technical & behavioural training.

❖ **Creating BHEL of tomorrow:** To harness emerging opportunities and regain growth momentum, a strong resolve has been made towards transforming BHEL into an organisation which is "Responsive, Robust and Rising" to the needs of our customers, employees and shareholders. Focus on Execution, Consolidation and Simplification (ECS) is one of the first steps to initiate this transformation process. There is a focus on bringing systemic changes and speed in Execution (expeditiously translating an idea or strategy into action); eliminating structural layers of duplication through Consolidation, and working on Simplification of processes.

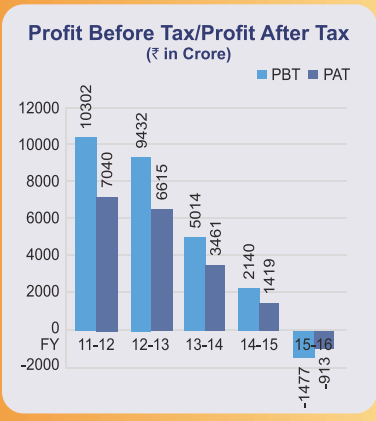
Financial statement details have been provided on page 148- 236 of BHEL's annual report for 2015-16. It comprises of standalone annual accounts as well as the consolidated financial statement. The consolidated financial statement includes its subsidiary and joint venture as well.

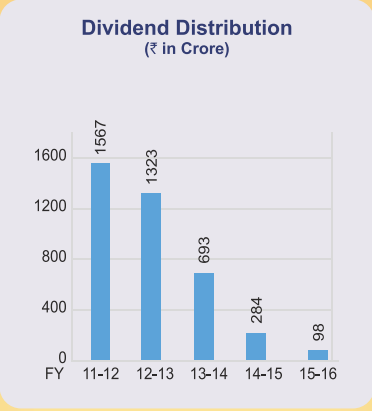
Value addition statement

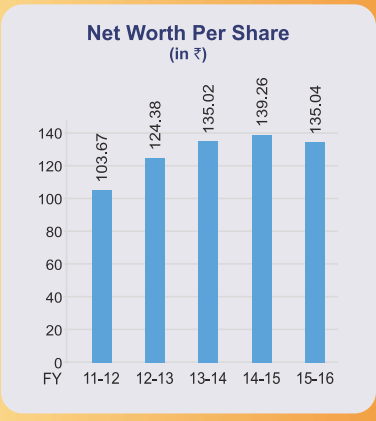
The value addition statement is provided in the table below.

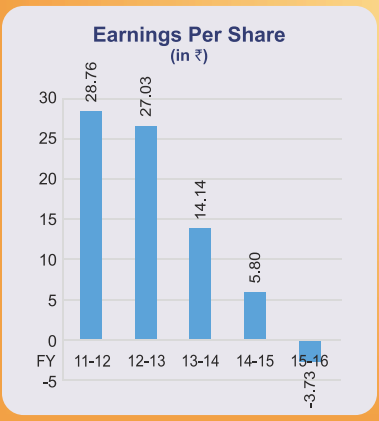
Description	2015-16	2014-15	2013-14	2012-13	2011-12
A. Generation of Value Addition					
Value of Production (less excise duty)	24765	29755	37077	47219	47815
Less -Direct Material, Power & Fuel and Payments to Contractors	16383	17772	22031	27759	28717
Value Added	8382	11983	15046	19460	19098
Less - Other Operating Exp (Net of Income)	3355	3224	2982	3196	2479
Net Value Addition	5027	8759	12064	16264	16619
% to value of Production	20.30%	29.44%	32.54%	34.44%	34.76%
B. Application of value Addition					
Employees payments	5541	5450	5934	5753	5466
% to net value addition	110.23%	62.22%	49.19%	35.37%	32.89%
Depreciation	936	1077	983	953	800
% to net value addition	18.61%	12.30%	8.15%	5.86%	4.81%
Financing charges :					
-Interest on borrowings	27	92	133	125	51
%to net value addition	0.53%	1.05%	1.10%	0.77%	0.31%
Tax Provision (Income Tax, Def. Tax & Prior Period)	-563	721	1554	2818	3262
% to net value addition	-11.21%	8.23%	12.88%	17.32%	19.63%
Dividend (incl. divident tax)	118	341	810	1544	1821
% to net value addition	2.34%	3.90%	6.71%	9.49%	10.95%
Retained Profit	-1031	1078	2651	5071	5219
% to net value addition	-20.51%	12.31%	21.97%	31.18%	31.41%

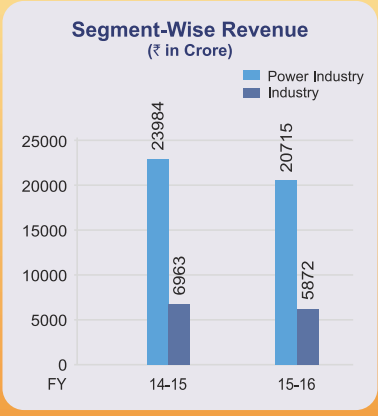
Financial Performance Highlights

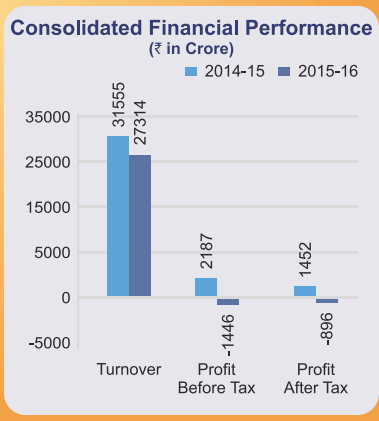






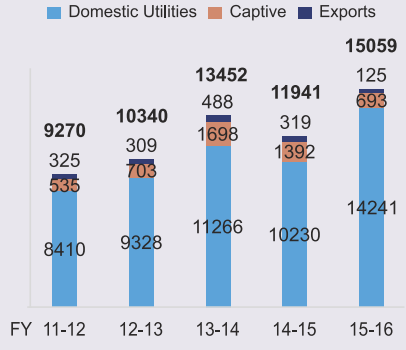




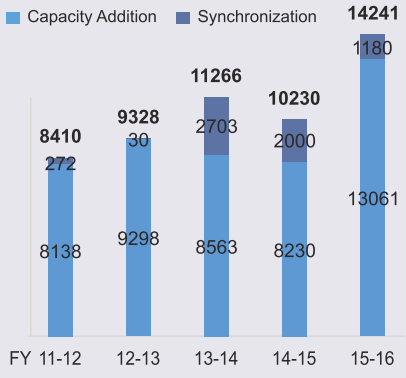


* Orders worth ₹ 7429 Crore have been excluded during the year from the order outstanding which are not likely to commence and this has no impact on revenue.

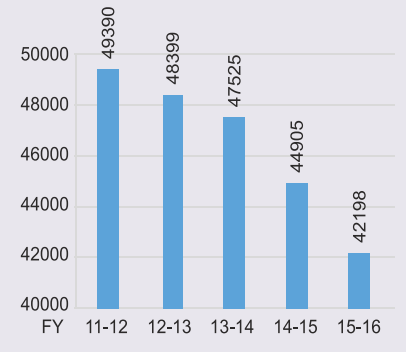
Power Plants Commissioned/Synchronized (in MW)



Contribution to India's Utility Power Generation Capacity (in MW)



Manpower (in Nos.)



10,000 MW+
Power projects commissioned/synchronized per annum for the fourth consecutive year

170 GW+
Power Generating Equipment installed till date

74% Market share in Indian Power Sector

Innovation **477** patents and copyrights filed

42,198 No of employees; **10** Vishwakarma & **7** Shram awards

4.18
Training Man-days per employee

Generated **8.08 Million units** energy through in-house solar power installations

11,026 Vocational trainees &
7,157 Act-apprentices trained

Orders in Hand
₹ 1,10,730 Crore

Hydropower projects commissioned in the country in 2015-16
100% by BHEL for the second year

For detailed standalone and consolidated financial statements of BHEL, the reader may please refer to page 149-196 of BHEL's Annual report for 2015-16. Some of the highlights of economic performance have been shown in the figures above. For coverage of organisation's defined benefit plan obligation, the readers may kindly refer to page 180-184 of BHEL's Annual report 2015-16.

As per our recruitment policy, generally, local hiring is not done in any cadre. Recruitment to induction level and to other levels, where approved by the Competent Authority, is normally from the source mentioned below:

- From open market through advertisement in the press. In addition, vacancies are notified to Employment Exchanges as per the provisions of the Employment Exchange (Compulsory Notification of Vacancies) Act, 1959, recognised associations and agencies who maintain rosters of suitable persons in different skills and specialities for promotion of the interests and welfare of Scheduled Castes/Scheduled Tribes, Ex-Servicemen and other similar special categories.
- By considering departmental candidates possessing the specified requirements.
- By absorption of deputationists from the Central/ State Governments and other Public Sector Undertakings.
- Recruitment of specialists working abroad with experience in cutting edge technologies of relevance to BHEL.
- Any other sources as approved by the Competent Authority in exceptional circumstances.

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, provides for fixation of certain perks and benefits like 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. The entry level wages are much higher than the minimum wages at all our locations of work and are uniform across the organisation.

During the reporting period, no significant financial assistance has been received from the Government of India.

Indirect Economic Impact on Society

As a responsible corporate citizen mindful of its social responsibilities, BHEL has been undertaking various socio-economic and community development programmes since its inception. The company has always endeavoured to bring about change in the lives of communities in the vicinity of its manufacturing unit/divisions/sites.The activities being carried out inside our premises requires many resources which we draw from the society. Ultimately this interaction leads to a multiplier effect as far as the indirect economic impact is concerned.

BHEL has a structured CSR programme in which 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 ₹ 110.10 Crore has been spent in 2015-16. Details of these activities have been provided in the chapter - "Our societal performance" in this report.

It is the policy of the company to help the Government in achieving its objectives of advancing the socio-economic status of those belonging to weaker sections of the society. The company adheres to and follows the Presidential/ Govt. Directives/Acts & Rules concerning reservation of vacancies and concessions allowed to candidates belonging to Scheduled Caste/Scheduled Tribes/Ex-Serviceman/Physically Challenged/Minority Communities etc. and help the vulnerable section of society in achieving inclusiveness in the society.

Supporting marginal supply chain partners

BHEL has been supporting Micro and Small Enterprises (MSEs) and local suppliers in and around its manufacturing units. Regular Vendor Meets and Supplier development programs are organised by BHEL units specifically for MSEs (including local suppliers). Also, as mandated in the Public Procurement Policy-2012 for MSEs (issued by Ministry of MSME- Govt. of India), BHEL has achieved the target of 20% of its total procurement from MSEs during 2015-16.

OUR ENVIRONMENTAL PERFORMANCE

Management Approach - Sustainability

With time global community realised that though rapid development is a must for enhancing the quality of life of the world populace, but at the same time our natural capital needs to be protected assiduously. That is where the concept of "Sustainable Development" (also known as Triple Bottom Line approach) fits in, which guides us through the path of development which is broad based (equitable) benefitting the society to the maximum extent possible and attained through operating within the confines of assimilative capacity of our natural environment. So for BHEL, sustainability is about enhancing stakeholder value while operating within the virtual boundary set by the assimilative capacity of the natural environment and distributing the fruits of this created value in an equitable manner.

Since its inception, BHEL has been leveraging technology and innovation for providing products, systems and services to its customers and enabling them to use resources with better efficiency and productivity which is evident from our Mission Statement – ***"Providing Sustainable Business solutions in the fields of energy, industry & infrastructure".*** To help achieve the ecological sustainability throughout our operations, we have been taking key projects & initiatives in the areas of renewable energy generation through solar systems, tree plantation, water conservation, energy efficiency, workplace environment improvement, resource conservation etc. Megawatt scale Solar Power Plant at BAP Ranipet (5 MW_P), HPEP Hyderabad (1.5 MW_P) and Trichy complex (5 MW_P) are the milestones in our journey towards ensuring environmental sustainability in our operations.

Governance for sustainability

BHEL believes that while governance for sustainability, stakeholder engagement and disclosure on sustainability issues forms the bedrock for embedding sustainability within the organisational DNA, the performance on Environmental and Social issues linked with its business is the ultimate measure of sustainability. To institutionalise the concept of sustainability, BHEL has enunciated its Sustainability Policy and ensures adherence to the guidelines on Corporate Social Responsibility (CSR) and Sustainability issued by Department of Public Enterprises under Ministry of Heavy Industries and Public Enterprises for Central Public Sector Enterprises. BHEL discloses its performance on sustainability issues through annual Sustainability Report.

Sustainability Framework

BHEL has formulated a 'Sustainable Development Policy' in line with the scale and nature of activities, products & services. This policy is the guiding force for us which inspires all our endeavours to venture into the realms of sustainable development. Focus areas have been identified in our Strategic Plan for ensuring our continued impetus on Sustainability through our products, service and internal operations across the organisation. Key projects & initiatives are undertaken in the areas of renewable energy generation through solar power plants, energy conservation through initiatives & projects, tree plantation, water conservation, energy efficiency, workplace environment improvement, emissions reduction, resource conservation, and utilisation of Non-Conventional Energy Sources.

Like previous year key material issues pertaining to environmental indicators as identified for 2015-16 are material usages, energy, water, effluents & waste management. The data pertaining to these identified material issues are provided in the following sections.

Responsible use of natural resources

Conservation and effective utilisation of natural resources have become a mainstay in our business process. The company has an institutionalised mechanism to recycle the products and wastes generated to the extent feasible. For example, the general practice adopted to minimise waste generation at source in use of steel plates are:

- Computerised nesting plan of each steel plate to adjust maximum number of jobs in a plate
- Preservation and reuse of off-cuts generated after nesting & using them for cutting out smaller jobs, like strong lifting lugs & tackles, etc.

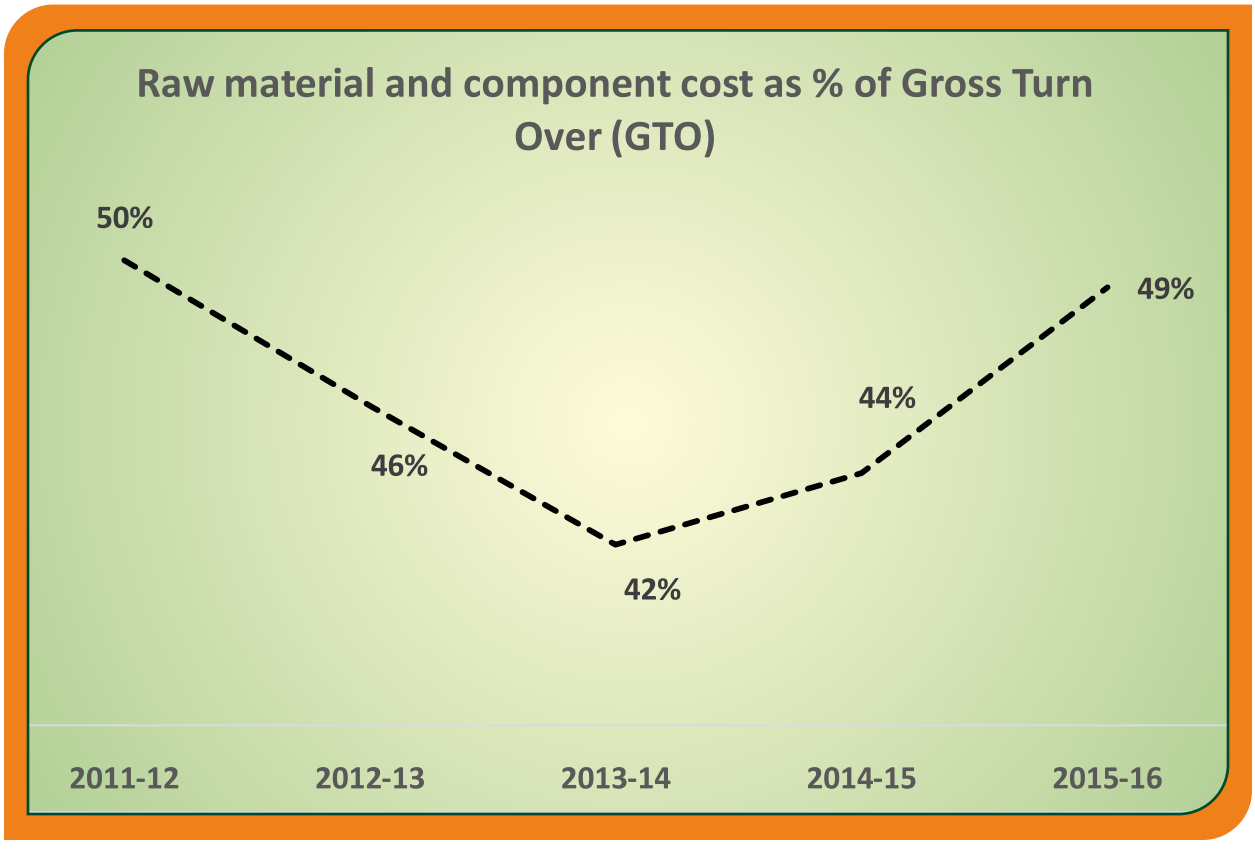
Many manufacturing units are having foundry shops wherein the recycling of local ferrous scrap happens. These small but significant steps help us in reducing the use of precious natural resources and consequently reducing the environmental footprint of BHEL. Further on an aggregate basis, approx. 3-5% of materials used at BHEL are recycled input material on account of the use of ferrous scraps for making castings and forgings, etc.

At our Central Foundry & Forge Plant (CFFP) located at Haridwar, for making castings and forgings molten steel is prepared using only ferrous scrap. The steel scrap used in the process is partly generated in CFFP itself and the rest is obtained from other manufacturing units and project sites, thus making the molten steel produced an almost 100% recycled product. E-procurement in BHEL is also being implementing in phased manner as a business improvement initiative and sustainable business practice.

Due to large variation in our products and services 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 guidelines could not be established and consequently the actual trend of material consumption could not be established at present in absolute physical terms. Further, our project sites have a cycle time of 3-5 years and the relationship between GTO 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.

However, the data about resource consumption by entire organisation in last 5 financial years is presented in the figure below along with Gross Turn Over (GTO) figures. As shown in the figure, this cost varied from 42% to 50% of our GTO figures during the last 5 years and average stood at almost 46%. It is a clear indication of underlying gamut of opportunities and challenges for optimal use of material resources and cost optimisation through better procurement practices. 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.



The concept of 3Rs – Reduce-Recycle-Reuse has been institutionalised by our units and projects have been undertaken across various units of BHEL for reduction/recycling/reuse of waste with an objective of reducing the use of virgin material and consequently reducing the environmental footprint of BHEL.

Statement of Consumption of Materials for 2011-16 (5 years)											(Value in Crore ₹)
	Year->	2015-16		2014-15		2013-14		2012-13		2011-12	
Group of Material	Units	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Ferrous material	MT	288490		233766		252360		359639		647585	
	Meters	4603520		4990653		5894301		12455008		16084481	
	Nos	1439651		1381094		2744341		4484045		5839126	
	Sq.M	17		4580		201723		16181		50035	
	Kg.	30713375		36771808		36344557		65601635		64246360	
	Others	184		110		680		461		143	
			2311.13		2415.50		2522.14		4517.67		5774.15
Non- ferrous material	Units	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	MT	30914		9994		13253		10757		6101	
	Meters	809565		1417133		1316512		2628311		3050477	
	Nos	93649		105614		195572		338013		211852	
	Sq.M	11		95		327		4285		96	
	Kg.	3361933		5674244		5749753		7896378		6967175	
	RL	18398		16397		14680		23838		26960	
	Others	36712		25040		29781		34565		444	
			296.60		381.37		425.72		597.11		554.30
Insulating Material	Units	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Meters	51285464		44533937		39478186		55491713		79130216	
	MT	23565		14508		14031		23715		33058	
	Nos	573489		188061		208777		898553		469400	
	Sq.M	1671740		3473306		3681993		2749575		2024396	
	Kg	470024		472804		674542		711885		1242793	
	LT	5095357		6037487		6729480		5410250		5268930	
	RL	106815		112677		80972		235629		135391	
	M2	120235		114513		163327		190245		171330	
	KL	0		0		6748		3493		7460	
	ST	8		461		112		237		509	
	Others	48538		24934		7660		112034		31596	
			159.08		219.83		277.08		305.72		280.41
Insulated cables and Magnet wires	Units	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Meters	2274206		6356213		6015498		2777834		3762371	
	Nos	3637		49260		129112		459681		153753	
	Kg	440542		445209		8163		12504		6149	
	Others	4014		5		4					
			33.14		78.97		86.27		45.62		60.09
	Units	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Components			5547.26		6040.61		8971.01		12635.20		10739.08
Others			4654.65		4567.71		4859.04		4942.52		7141.32
Total cost of consumption of raw materials & components (₹ Crore) [MC]			13001.86		13703.99		17141.26		23043.84		24549.35
Gross Turnover (₹ Crore) [GTO]			26587		30947		40338		50156		49510

Some of the specific activities related to optimal utilisation of natural resources undertaken during 2015-16 are indicated in the figure below:

Unit	Activity
HEEP Haridwar	• Utilisation of old packing boxes after repair /modification in Wood Working Shop. • Recovery of 155 drums (27.9 MT) of used /waste oil using Coolant Recovery System and with the help of Oil Skimmers.
HPEP Hyderabad	• Recycled 2107 MT of MS Scrap, which is equivalent to 11% of input Raw material.
HEP Bhopal	• Sand reclamation plant is under execution having capacity to convert 6 MT of sand lumps (used sand) into usable sand per hour which would be then mixed with 20% of fresh sand in an automatic mixer to produce up to 10 MT/Hr. of prepared sand for moulding.

Unit	Activity
HEP Bhopal	• At various shops, optimum utilisation of input raw material like Steel plates & CRGO is being ensured. Scrap steel, Offcuts etc. are utilized in Foundry and remaining scrap is sold to authorised agencies for recycling.
HERP Varanasi	• Dry leaves, canteen waste, waste paper etc. are used to make vermicompost, which is a bio-organic fertiliser, with the help of earthworm. The vermicompost produced is used as a manure in Horticulture.
HPVP Vizag	• Implementation of the concept of 5S across all sections of the factory resulted in improvement in productivity and better resource management.

Energy

Being an integrated power plant equipment manufacturer, BHEL is quite conscious of the fact that optimal utilisation of energy in our operations and services is not only a value proposition but also a responsibility for the organisation. With this view, the company has promoted the activities related to energy conservation, energy efficiency and usages of green energy in our premises. It helps us in reducing our conventional energy usages, encourage the use of green energy in our energy mix and drives us towards the path of sustainable energy usages.

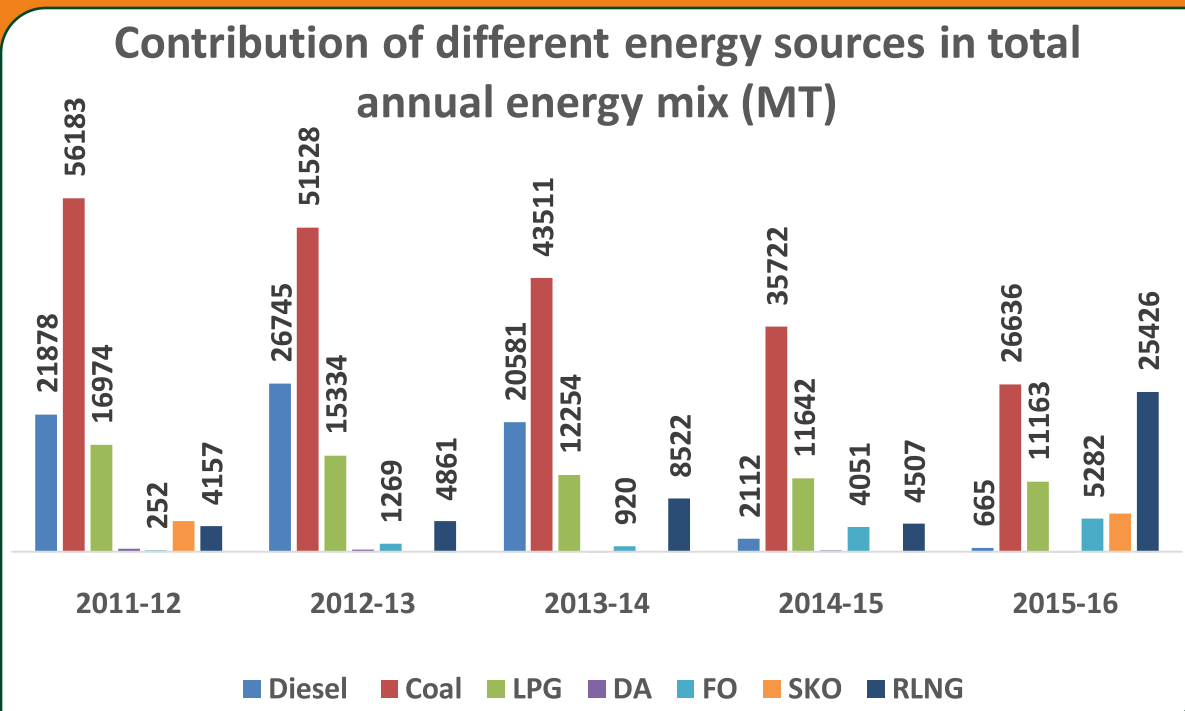
The total energy consumption across all the units of BHEL for the last 5 years is shown in the figure. A variety of fuels is being used across BHEL which include Diesel, Super Kerosene Oil (SKO), Coal, Liquefied Petroleum Gas (LPG), Regasified Liquefied Natural Gas (RLNG), Dissolved Acetylene (DA), Furnace Oil (FO) etc. BHEL is moving towards more and more use of cleaner fuels like Natural Gas which is being used in many units like HEEP Haridwar, CFFP Haridwar, IP Jagdishpur, EPD Bengaluru, and LPG which is being used at HPEP Hyderabad and Trichy unit. This year the diesel consumption in our units has gone down drastically.

Total Direct & Indirect energy consumption in BHEL units in TJ

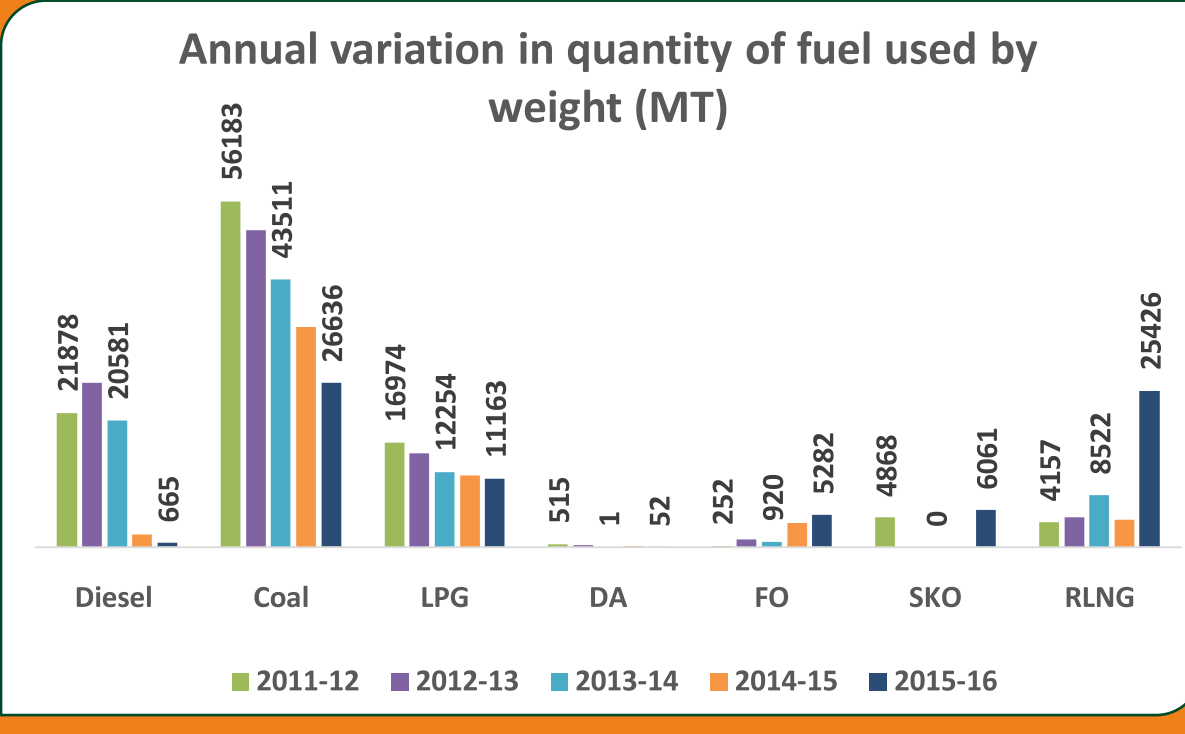
Description	Energy Consumed in TJ (2015-16)	Energy Consumed in TJ (2014-15)	Energy Consumed in TJ (2013-14)	Energy Consumed in TJ (2012-13)	Energy Consumed in TJ (2011-12)
Direct Energy					
Primary Energy (Fuels Consumed like Diesel, Coal, LPG, Kerosene etc.)	2993.3	2845.89	2839.92	3226.86	3169
Primary Energy Produced (Through Solar Energy generation)	29.26	25.34	3.9	0.29	0.07
Indirect Energy					
Electricity Consumed	1154.34	1093	1116.76	1330.8	1372.49
Total Energy consumed (TJ)	4176.9	3964	3961	4558	4542
Gross Turnover (₹ Crore)	26587	30947	40338	50156	49510
Energy Intensity (GJ /Lakh ₹ of GTO)	***1.10***	***1.01***	***0.94***	***0.90***	***0.92***
Energy Productivity (Lakh ₹ GTO achieved / GJ)	***0.91***	***0.99***	***1.06***	***1.09***	***0.97***

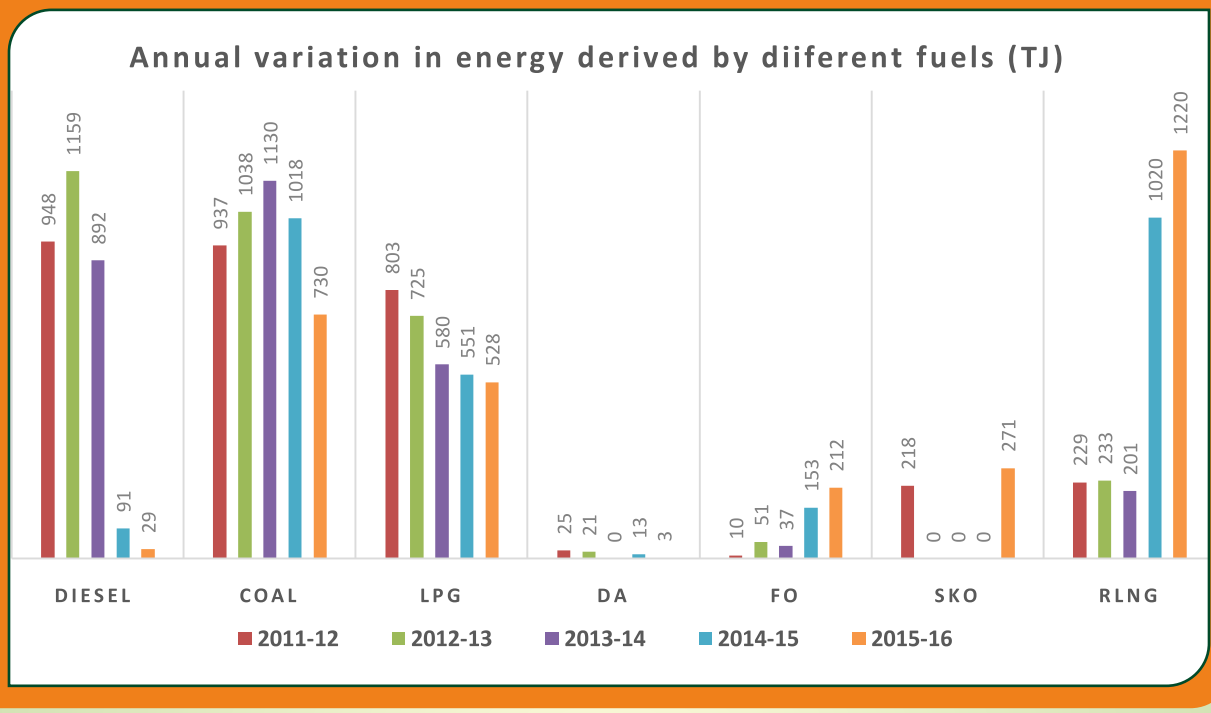
1 Tera Joules (TJ) = 1000 Giga Joules (GJ) = 10^6 Mega Joules = 10^9 Kilo Joules (KJ) = 10^{12} Joules

It may be noted that the data for PPPU Thirumayam has been added to the energy data for 2013-14, 2014-15 and 2015-16 and accordingly the data reported in earlier reports have been modified.

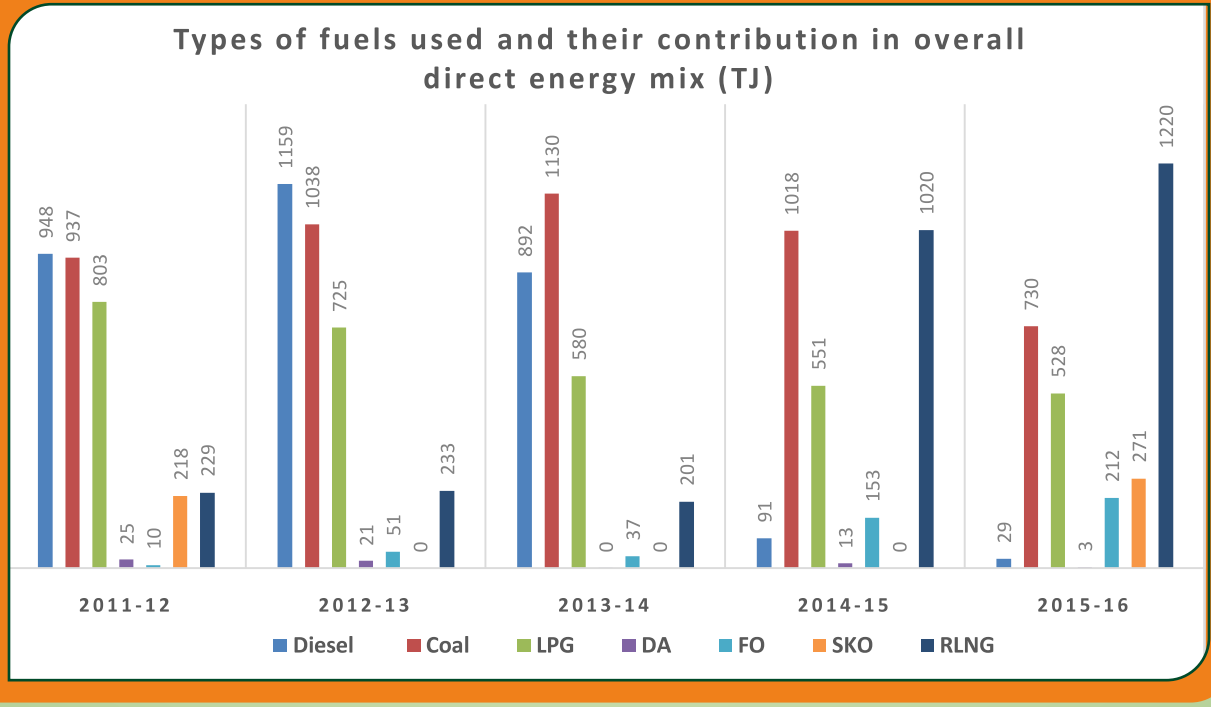


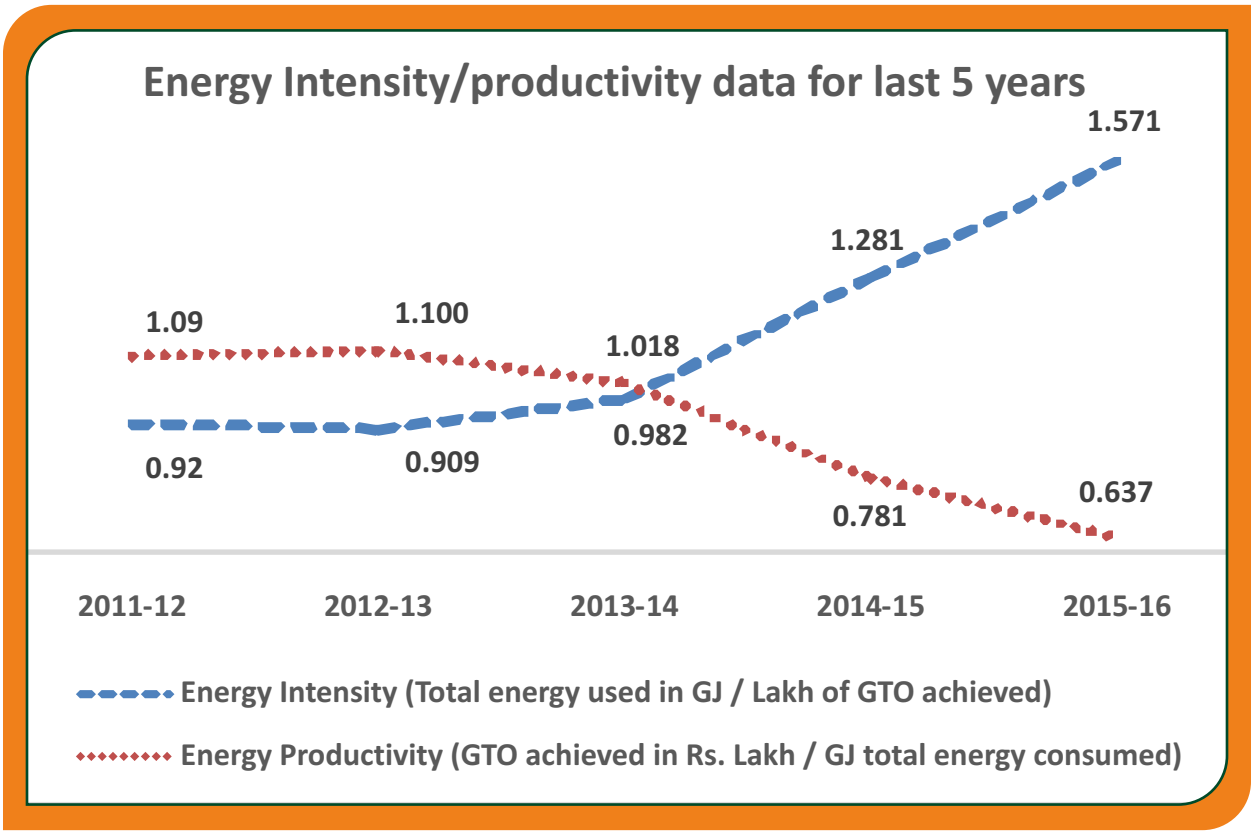
It may be noted that usage of coal in our operations have been coming down since last 2 years with respect to energy derived from primary fuels. Further, the usage of diesel have come down very drastically in the last couple of years. This is largely due to fuel switch from Diesel to RLNG at our energy intensive Central Foundry Forge Plant (CFFP), Haridwar through conversion of all oil-fired burner to natural gas fired burners. Further, our EPD Bangalore unit has switched over to RLNG from LPG.





Further on the tonnage basis, it can be seen that use of fuels like coal, diesel etc. which requires physical carriage through means of transportation is going down which directly contributes towards savings in indirect energy uses for transportation of fuels and thereby reducing the carbon footprint of BHEL.





The average Energy Intensity (defined as Total Energy Consumed in Giga Joules per Lakh ₹ of Gross Turn Over achieved) figures has stood at 1.132 and varied from 0.91 to 1.57 as shown in the figure. Similarly, the figure for Energy Productivity (Defined as GTO achieved in Lakh of ₹ per Giga Joules of total energy consumed) stood at an average of 0.925 for the last 5 years and varied from 0.637 to 1.10. However, it may be noted that the data for GTO 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 achieved was maximum in the history of BHEL. Similarly, the energy intensity was at its lowest for 2012-13 when the GTO was at its peak.

Efforts in conservation of energy & energy efficiency

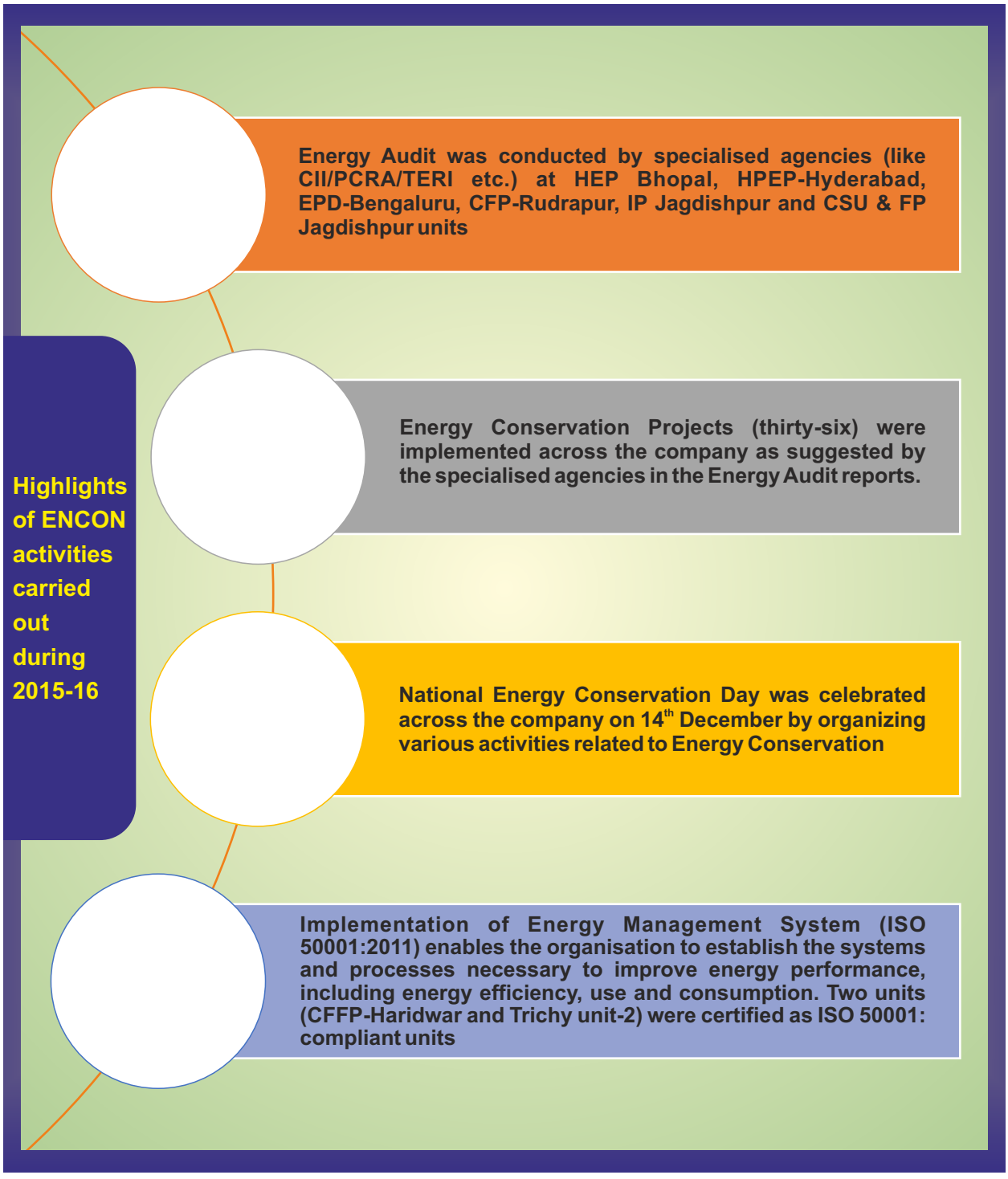
Our Energy Management Policy expresses our commitment for Energy Efficiency in all our activities, products and services.

ENERGY MANAGEMENT POLICY

BHEL is committed to continuously enhance energy efficiency in all its activities, products and services through state-of-the-art energy efficient, eco-friendly technologies and leverage energy efficiency in its operations by adopting energy conservation techniques with the participation of all employees.

Nature of Activities pertaining to Energy Conservation (ENCON) regularly carried out in BHEL:

- Energy Awareness - Conducting awareness programmes at offices, factories, project sites and in townships
- Energy Conservation - Identification of potentials to reduce use of energy, arresting leakages, use of alternate sources of energy, identifying wasteful use of energy and plugging them, use of energy measurement system for buildings etc.
- Energy Efficiency - improving insulations in furnaces, plugging heat loss from heating systems, optimization of loading of furnaces, heat recovery systems, adopting high efficiency lighting systems, high efficiency pumps & motors, use of variable frequency drive (VFD) etc.
- Use of Renewable energy resources
- Periodic energy audits for finding opportunities for improvements
- Adopting concepts of Green Buildings



List of major projects taken in the areas of energy efficiency/conservation during the reporting period is given in the figure below. From the figure, it can be seen that the projects taken during 2015-16 are envisaged to provide a recurring annual saving of about 3.25 Million Units of Electricity per annum.

Major ENCON Projects Undertaken in BHEL During 2015-16			
Sl. No.	Name of unit/Division	Project Title	Energy Saving (kW-hr/Yr.)
1	HPEP-Hyderabad	Installation of Solar Street Lights in Factory area - 50 No.	32850
2		Establishment of 1.5 MW_p Solar Power Plant	2365200
3		Installation of 4kW (2 Nos X 2 kW) Solar Power Systems for lighting corridors of Administrative Building	5840
4	HEP-Bhopal	Conditioning & Monitoring of 8 number Blowers of Pressurization plant, 75 kW each in CIM block.	40000
5		Replacement of Heating Elements of 170 kW Carburizing Furnace of TGM.	15000
6		Complete renovation of 125 kW Electric Annealing Furnace 11/B/2255 in CIM block.	35000
7		Provision of overhead lights at centre place of the block with switching facility at the gate in FYM block.	30000
8		Renovation of 10 kW rating Muffle Furnace to reduce cycle time in TGM.	6000
9		Interconnection of about 50 nos. coolers (2kW rating) by a single switch to enable switching them off during break times or shift change times in TGM.	20000
10		Replacement of existing CFL light fitting with LED Energy efficiency street light fitting (50 Nos.)	15987
11	TP-Jhansi	Installation of 100 nos. self-ventilators in various shops	111791
12		Providing fluid coupling in place of clutch for 5 Tonne coil winding machines (2 nos.).	33000
13		Arresting air leakage by using the clamp at connection points.	15385
14		Replacement of 500/1000 W floodlight by 48W/70WLED- 20 nos.	7692

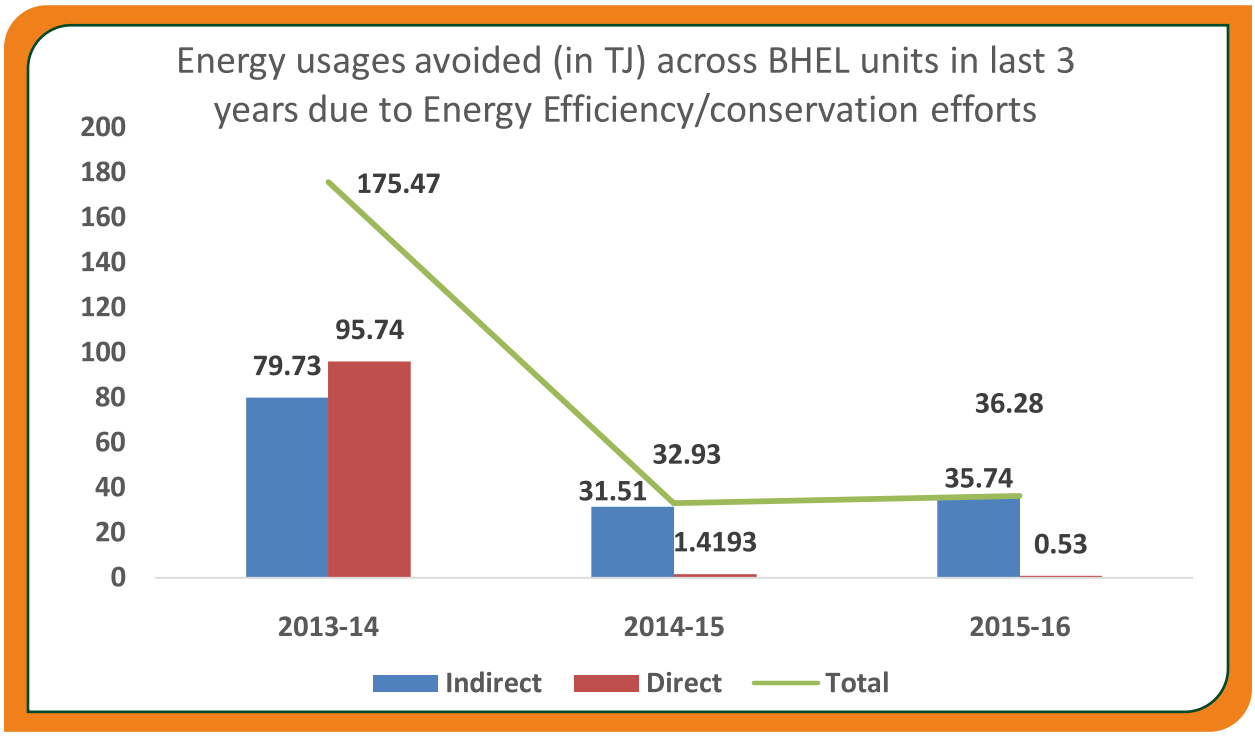
Major ENCON Projects Undertaken in BHEL During 2015-16			
Sl. No.	Name of unit/Division	Project Title	Energy Saving (kW-hr/Yr.)
15	TP-Jhansi	Installation of LED street light.	46153
16	SSTP-Trichy	Installation of motion detectors in office building for lighting circuit	6628
17	CFFP-Haridwar	Installation of energy efficient Hot Water Pump to OWPH	29000
18	HEEP Haridwar	Installation of 100 nos. of 36 W LED indoor fittings in ITX Auditorium, Engineering Building Conference Hall, NC technology Conference Hall & OSBT control Room in place of 106 W conventional fluorescent tube fittings.	11242
19	BAP-Ranipet	Electrically operated portable Reciprocating air compressor of 24 CFM capacity to use exclusively for form-line production areas to avoid under load operation of the 1500cfm reciprocating compressor during off-peak hours.	82728
20		Introduction of copper shrouded DSL in F3 Bay	5279
21		Retrofitting of old 80 kW Bearing Test Rig DC motor & drive to AC motor with VFD.	28800
22		Installation of new radiator for 1000KVA DG Set	42000
23	CFP Rudrapur	Replacement of 16 nos. 250 W SV street Lights with 120 W LEDs.	7592
24	IVP Goindwal	Replacing 10 nos. 1.5 kW Old Man Coolers with Energy Efficient Motor Man Coolers.	16800
25		Replacement of 20 nos. of 250 Watt MH Lamp Fitting with 65 Watt LED Street Lighting.	13320
26		Replacement of 50 nos. of CFL 23 Watt with Energy Efficient LED Lamp 14 Watt.	3240
27		Replacement of 100 nos. of T5 28 Watt FTL with 18 Watt LED Tubes.	3600
28	EDN Bengaluru	Temperature Sensors in Cooling Towers	5993

Major ENCON Projects Undertaken in BHEL During 2015-16			
Sl. No.	Name of unit/Division	Project Title	Energy Saving (kW-hr/Yr.)
29	EDN Bengaluru	Air compressors are switched off during lunch and tea breaks	24408
30	EPD Bengaluru	Energy Efficient lighting for offices & work shops	78000
31		Energy saving system utilising efficient technologies (VFD's for continuous running fans)	121000
32	HERP Varanasi	Replacement of 250 W HPSV Light in Tarna township by 85 W CFL Light Fitting-08 Nos.	5780
33		Replacement of 40 W Tube light Fitting by 18 W LED Light Fitting- 10 Nos.	432
34	IP Jagdishpur	Replacing old 70 W HPSV street light with 30 W LED street light at factory (50 Nos approx.)	17885
35	CSU & FP Jagdishpur	Replacement of existing 400 W street light with 90 W LED Lamps (30 nos.)	39602
36		Replacement of existing 36 W FTL with 21 W LED lamps in shops and offices (50 nos.)	2738
37		Replacement of existing 250 W MH Roof lamp with 100 W LED lamps in FP shop (25 nos.)	13688
38		Replacement of existing 150 W street light with 45 W LED lamps in Township (10 nos.)	3833

Various additional activities were also undertaken like process redesign, conversion and retrofitting of equipments, educational programmes to bring changes in employees behaviour etc. These activities have resulted in overall energy savings of 36.29 TJ of energy, including 35.75 TJ of indirect energy saved in terms of electricity due to ENCON/EE activities during FY 2015-16. During the last 3 years, on an average 81.52 Tera Joules (TJ) of energy usages have been avoided out of which 32.52 TJ was on account of fuel savings and rest 49 TJ were saved on account of savings in the consumption of electricity per annum. It may be noted that recurring savings has not been included in this data and only fresh projects undertaken during the reporting period has been considered for calculation of annual energy saving projections.

Further, it may be noted that the absolute quantity of energy usages avoided on account of ENCON activities have declined during the recent past. It may be attributed to the fact that in earlier times, switching to cleaner fuels and energy efficient technologies have been taken at drastic pace as per the requirement of business. However, with time, the scope in the uptake of newer Energy Efficient technologies has reduced due to marginal returns and as most of the identified opportunities have

already been acted upon leaving lesser scope for newer projects and consequently lesser reporting of annual energy usage avoidance in the recent past.



Green Energy Generation

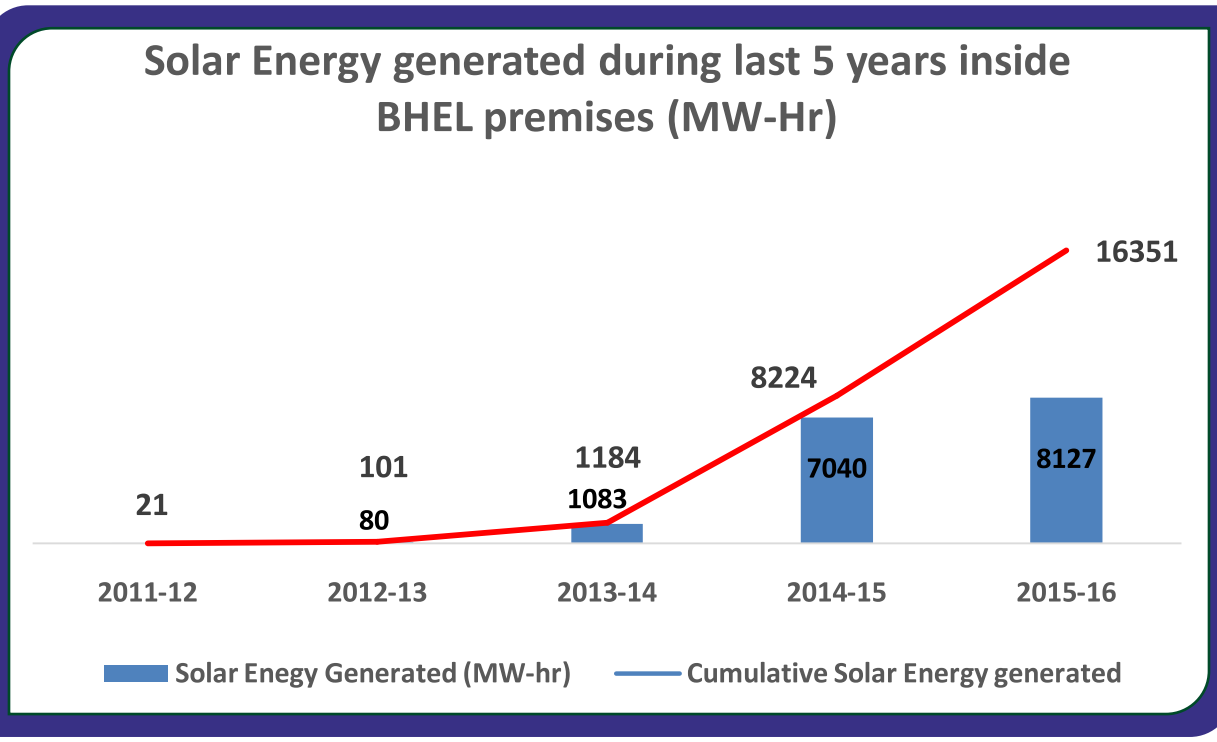
India has a huge solar power potential. As part of clean climate commitments, Govt. of India has setup a target for deployment of 100 GW solar power capacities by 2022. This includes 60 GW of grid-connected ground mounted solar power and 40 GW of rooftop solar power. BHEL offers EPC solutions from concept to commissioning for grid connected and stand-alone PV applications ranging from kW to MW size plants which includes supply of PV modules and Balance of System (BOS), Civil works, Erection & Commissioning (E&C) and Operations & Maintenance (O&M). BHEL manufactures space grade SPV modules and batteries in association with Indian Space Research Organisation (ISRO). All Indian satellites launched by ISRO are equipped with BHEL manufactured solar panels since 2002 and batteries since 2005.

Renovation and modernization of lighting system of ITX Auditorium – HEEP Haridwar

Renovation and modernization of lighting system of New Engineering Building conference hall- HEEP Haridwar

BHEL being a major supplier of power plant equipments is very much aware of its social responsibility for making conscious efforts towards the use of sustainable energy mix in its own operations. Use of renewable energy [solar power] in our manufacturing activities is gradually going up on account of the generation of solar energy.

Talking about Mega Watt scale solar installations – at BHEL's BAP-Ranipet unit we have a 5 MW_p grid interactive solar power plant, at HPEP-Hyderabad unit we have a 1.5 MW_p solar power plant and further a 5 MW_p Solar Power Plant is under installation at our Trichy unit. This will take total installation capacity of MW_P scale plants to 11.5 MW_p. All of these are meant for captive use. Further, we have several Kilo Watt (kW) scale systems which add upto 734 kW_p, including roof-top systems installed across various units of BHEL. Overall these systems have generated around 16.35 Million units of green electricity since 2011-12 which is equivalent to 58.86 Tera Joules of Energy.



BHEL is enhancing the use of clean energy at its units/project sites through usage of solar PV based street lights & solar water heating systems, installation of roof-top and grid interactive solar power plants. List of major solar installations in our units as on 31.03.2016 along with particulars of installed systems is given in the figure below.

List of major solar installations within BHEL premise

Sl No	Name of the unit/division	Details of installed system
1	HEP Bhopal	250 kW_P SPV Plant
2	R&D Hyderabad	250 kW_P SPV Plant
3	R&D Hyderabad	13.7 kW_P Rooftop Solar Power System
4	R&D Hyderabad	13.5 kW_P Rooftop Solar Power System
5	ESD Bengaluru	42 kW_P Rooftop Solar Power Plant
6	Trichy unit	20 kW_P grid connected Rooftop Solar Power Plant
7	Trichy unit	10 Nos. 24 W Solar LED Street Lights
8	Trichy unit	80 Nos. 40 W Solar LED Street Light
9	Trichy unit	2000 Litre Per Day (LPD) Solar Water Heater System
10	Trichy unit	4000 Litre Per Day (LPD) Solar Water Heater System
11	BAP Ranipet	17.5 kW_P Rooftop Solar Power Unit
12	BAP Ranipet	5 MW_P Grid Interactive SPV Plant
13	HPEP Hyderabad	1.5 MW_P Grid Interactive SPV Plant
14	PPPU Thirumayam	Solar Water Heater, Solar Street lights etc.

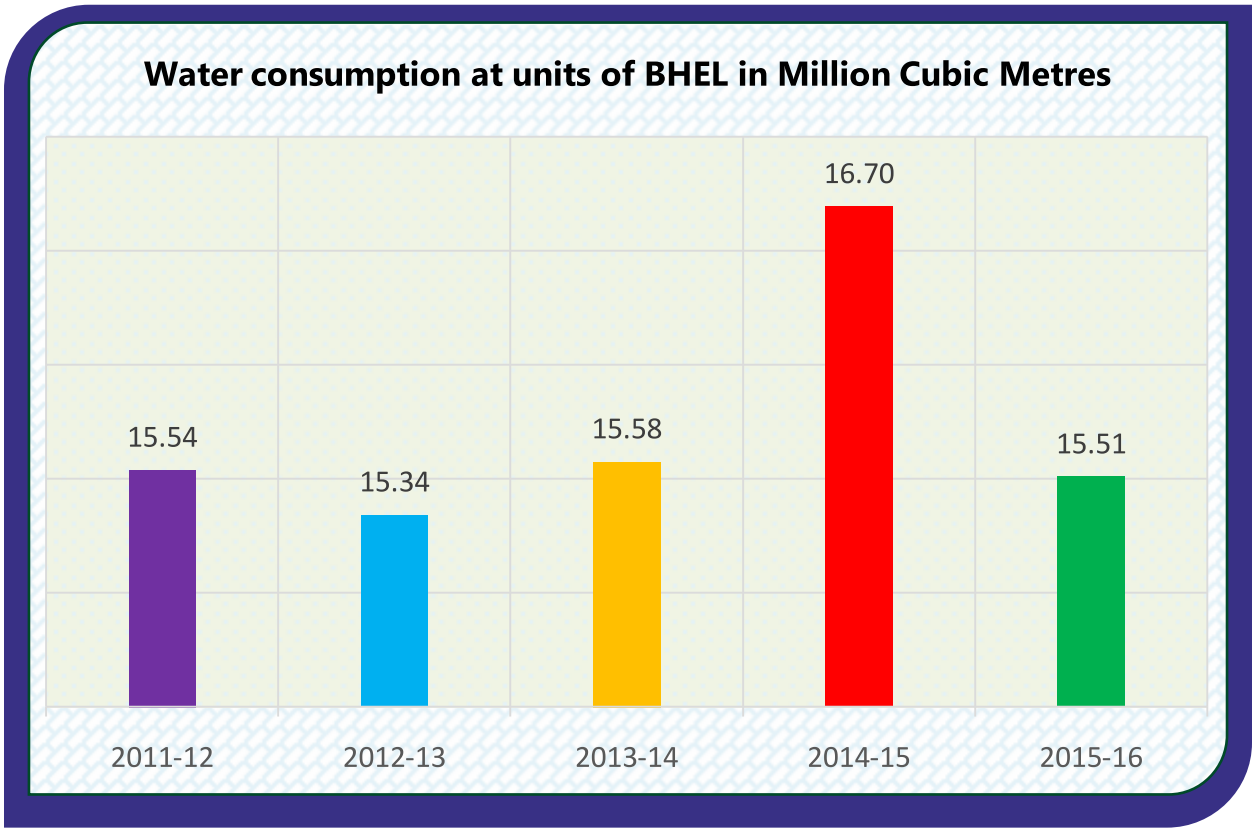
Going by the trend of green energy generation across BHEL, it has grown exponentially during the last 3 years due to the installation of Mega Watt Scale plants. Considering overall energy data for electricity purchase for 2015-16, it can be seen that in our units 2933 TJ of energy generated as electricity was used out of which 29.26 TJ was sourced through solar energy generation. It is equivalent to 1% of the overall energy usages through electricity for the organisation during 2015-16. The data for green energy used as a percentage of total energy used in entire organisation during 2014-15 stood at 0.81% and during 2013-14 at 0.10%.

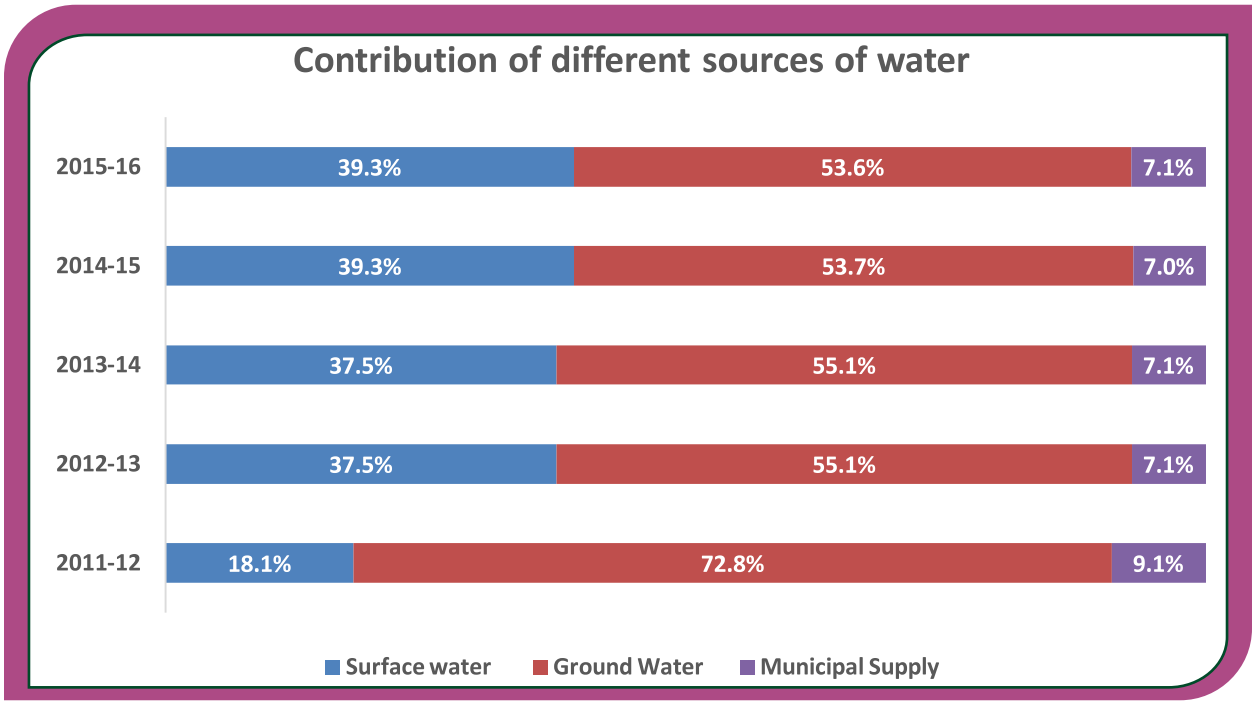
Thrust areas pertaining to generation/ use of Renewable Energy in BHEL's units/divisions
☞ Installation of Roof Top Solar PV Systems
☞ Installation of Solar Water Heating Systems
☞ Installation of Grid interactive SPV Power Plants (sub-MW and MW scale)
☞ Installation of Solar Street lights

60 KWp Photo- voltaic panels mounted on New Engineering Building at EDN Bengaluru

Water usages & its conservation in our premises

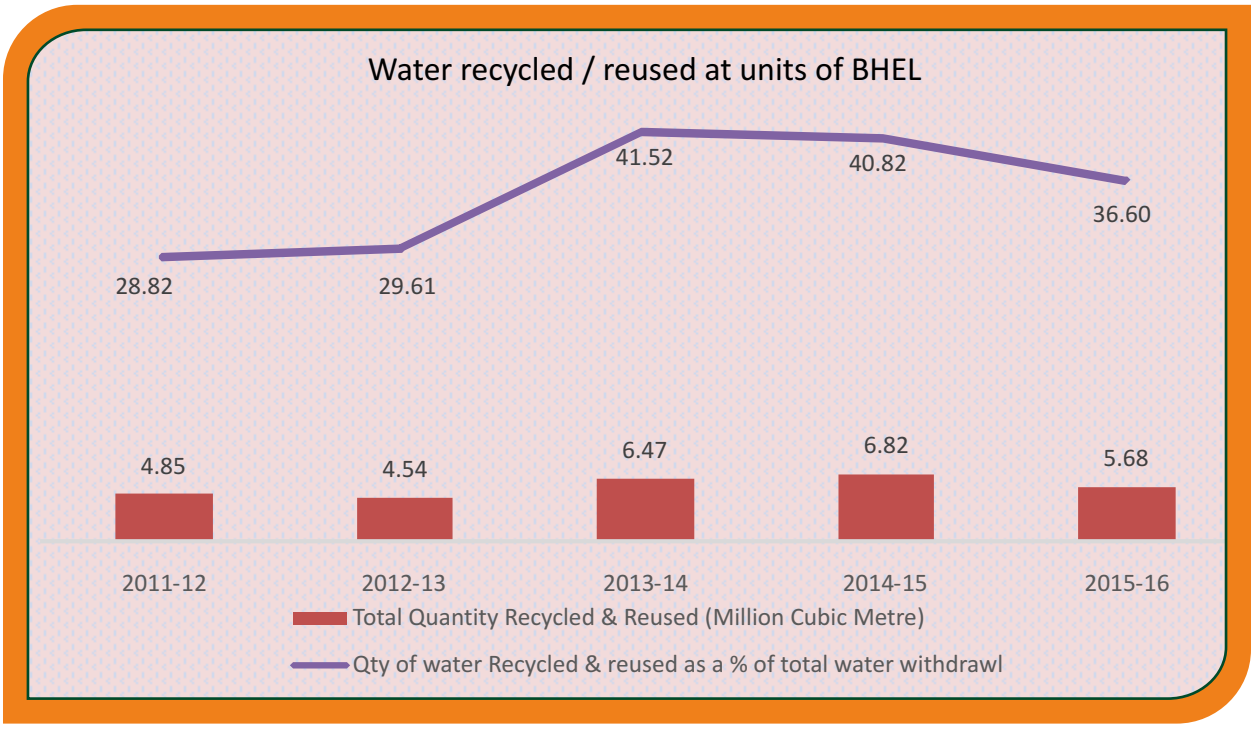
We at BHEL believe that since water is a common natural resource, it is our fiduciary duty to use it efficiently. Efficient usages of water inside the organisation is a value proposition as well. We always strive for managing the water and wastewater system in our premises in a sustainable manner to meet the requirements and expectations of our stakeholders. This is the premise which enabled us in making water management a part of our strategy and despite our growth in the past, our water consumptions have not changed significantly. 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.


Water consumption at units of BHEL in Million Cubic Metres
15.54
15.34
15.58
16.70
15.51
2011-12
2012-13
2013-14
2014-15
2015-16

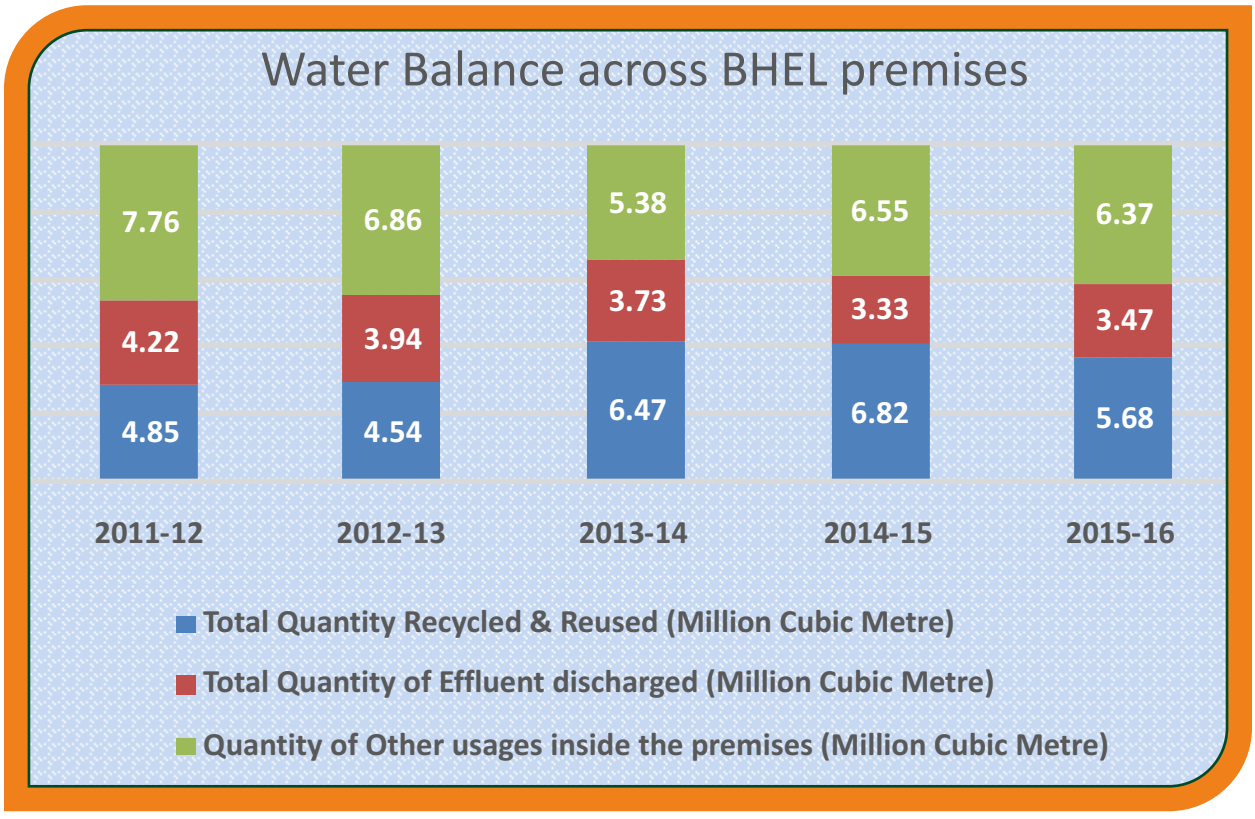

Contribution of different sources of water
2015-16
39.3%
53.6%
7.1%
2014-15
39.3%
53.7%
7.0%
2013-14
37.5%
55.1%
7.1%
2012-13
37.5%
55.1%
7.1%
2011-12
18.1%
72.8%
9.1%
Surface water
Ground Water
Municipal Supply

As can be seen from the figure, the average quantity of water drawn from different sources at our units during the last 5 years stood at 15.73 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 Bengaluru unit, rainwater is collected and used inside the premise. In our premises, water saving is done through creating awareness in employees, measuring water consumption, ensuring optimum use of water, recycling of water, installing water saving equipments, routine checks for pipes leakages etc.

During the reporting period, a total volume of 3.47 Million M^3 of effluent was discharged from various manufacturing units of BHEL which is nearly 22.37% of water drawn for 2015-16. All the waste water quality related parameters were within the prescribed limit of discharge as specified by the respective state pollution control boards at the locations of our manufacturing units.



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 28.36 Million M^3. of water has been reused/recycled in our premises which amount to an average of 5.67 Million M^3 of water recycled/reused per annum during the last 5 years.



The water balance figure is shown in the picture above. In this figure, other usages include the use of water in the 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.

Some specific activities being carried out inside our premises related to water conservation, recycling and reuse are listed below.

Specific Water Conservation Activities across BHEL units
➢ All units have built rainwater harvesting systems for recharging the groundwater table.
➢ EPD-Bengaluru unit has exhausted almost 100% of its rainwater harvesting potential.
➢ Treatment of Trade effluents, its recycling/reuse and then draining remaining quantity.
➢ HERP-Varanasi has become a zero waste water discharge unit, where the water, used as coolant, is recycled and finally exhausted within the process.
➢ At HPBP Trichy unit, 100% of treated trade effluent is used for irrigation purpose within the complex to maintain zero discharge
➢ At SSTP-Trichy unit: Recycling of Hydro Test water, cooling tower, treated sewage water from township and factory

- PPPU-Thirumayam unit: treated water is reused for horticulture activities inside the factory premise – A Zero Liquid Discharge unit.
- In TP-Jhansi unit, water recycling is done within the processes, for e.g. steam is condensed into water, which is recycled back into the boiler
- In compliance with environmental norms, the quality parameters of discharged water are within limits for each and every BHEL unit, as specified by the respective state Pollution Control Boards
- At BAP, Ranipet unit only the treated water from STP is used for horticulture
- At HEP Bhopal, almost 55% of water is Recycled & used in Industrial Cooling and in Horticulture. Firefighting reservoir is also maintained using treated water.

Biodiversity conservation within our premises

None of our units is surrounded by any biodiversity reserve or protected area. With respect to its concern for environmental protection and soil conservation, BHEL has undertaken afforestation activities such as mass tree plantation and development of green belt which has resulted in development of nearly 4.7 million M^2 of green coverage and plantation of nearly 3 million trees.

However, as far as the significant impact of our operations/activities on biodiversity is concerned, there is no significant impact of our activities on biodiversity and as such, there is no habitat which is being protected or restored by the company.

Managing emissions and Carbon footprint

All emissions are being monitored in BHEL units as per the requirements of applicable environment related acts and rules. Records are being maintained and the same is being reported to relevant 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 are always found to be within the permissible limits prescribed by respective state pollution control boards (SPCB) and central pollution control boards (CPCB).

Fume Extraction System at HEP Bhopal:

Installed 50,000 M^3 per hr. suction capacity Fume Extraction System over 3.0 Ton 1500 kilowatt Arc Furnace.

Salient Features:

- System is capturing around 300 kg of fine dust from average 25 heats which were previously emitted into the atmosphere.
- High capacity Bag filters with total surface area of 760 M^2
- Online monitoring of exhaust, suspended particulate matter.
- Variable speed induced draft fan (100 HP)
- 30 Metre high chimney.

Fume suction Arm on Induction furnace

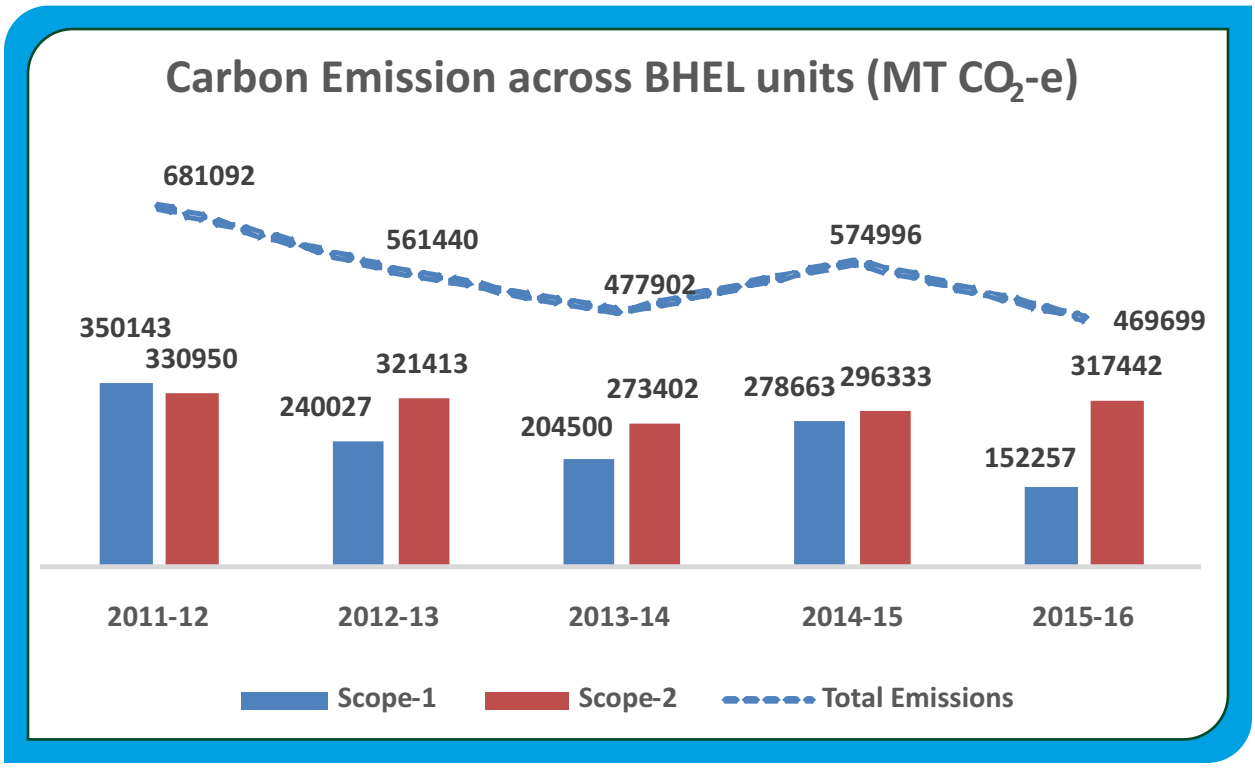
Fume suction arm for Mould Pouring area

However, as regards to GRI G4 requirements for capturing the weight of pollutants being let out from the organisation, 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.

Use of Ozone Depleting Substances (ODS) in refrigerators and chillers is under phase out process across our units in line with the Government's commitment under Montreal Protocol. As a matter of fact, it has already been discontinued altogether at most of our units. During 2015-16, the quantity of ODS used stood at 16.3 KG CFC-11 equivalent which is showing a declining trend. The corresponding quantity of ODS used in 2014-15 was 261.5 KG CFC-11 equivalent, 282 Kg CFC-11 equivalent during 2013-14 and 307.88 Kg CFC-11 equivalent during 2012-13. The new machines procured in our units are using refrigerants like R-134a, R-410a etc. which are more environment-friendly and having fewer ODP values.

Further, all our units have initiated their Carbon Footprint Calculation for 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.

For calculation of Scope-1 emissions, appropriate UNFCCC protocol has been followed and emission factor for stationary combustion has been used. For the calculation of Scope-2 emission due to usages of purchased electricity in our premise, average grid emission factor has been taken as 0.99 MT CO_2-e/MWh using the CEA data. (Ref: http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf) and applying appropriate CDM methodology for calculation. At the moment Scope - 3 emissions on account of supply chain, employee commute etc. is not being captured and credible data for the same is not available.



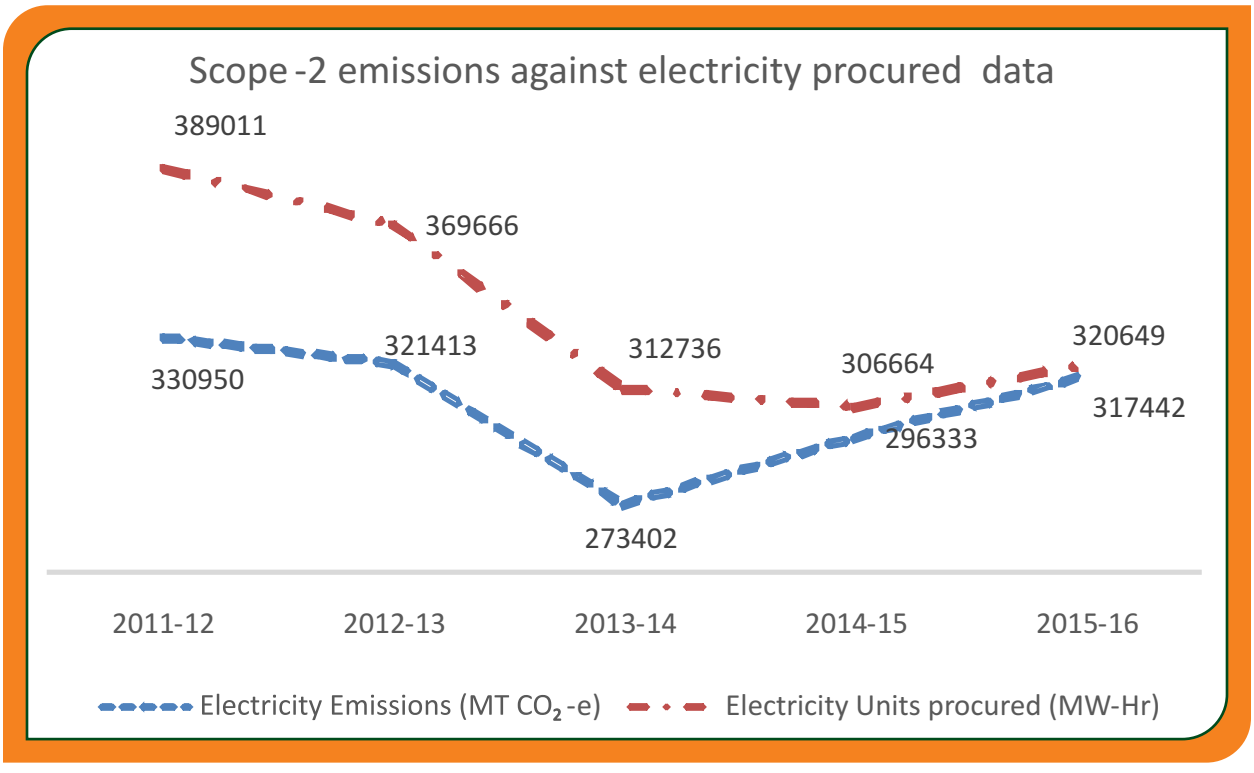
The total emission for the last 5 years stood at 2.77 Million Metric Tonnes (MMT) of CO_2 Equivalent (MMT CO_2-e) indicating an average annual emission figure of 0.55 MMT CO_2-e. It may be noted that during 2012-13, our gross turnover was all time high. However, the corresponding emission was not at its peak.

As can be seen from the figure, the aggregate carbon footprint of our units is showing a declining trend. Scope-1 emissions have come down consistently during the last 5 years. It shows that the use of fuels which are cleaner is being increasingly used across BHEL.

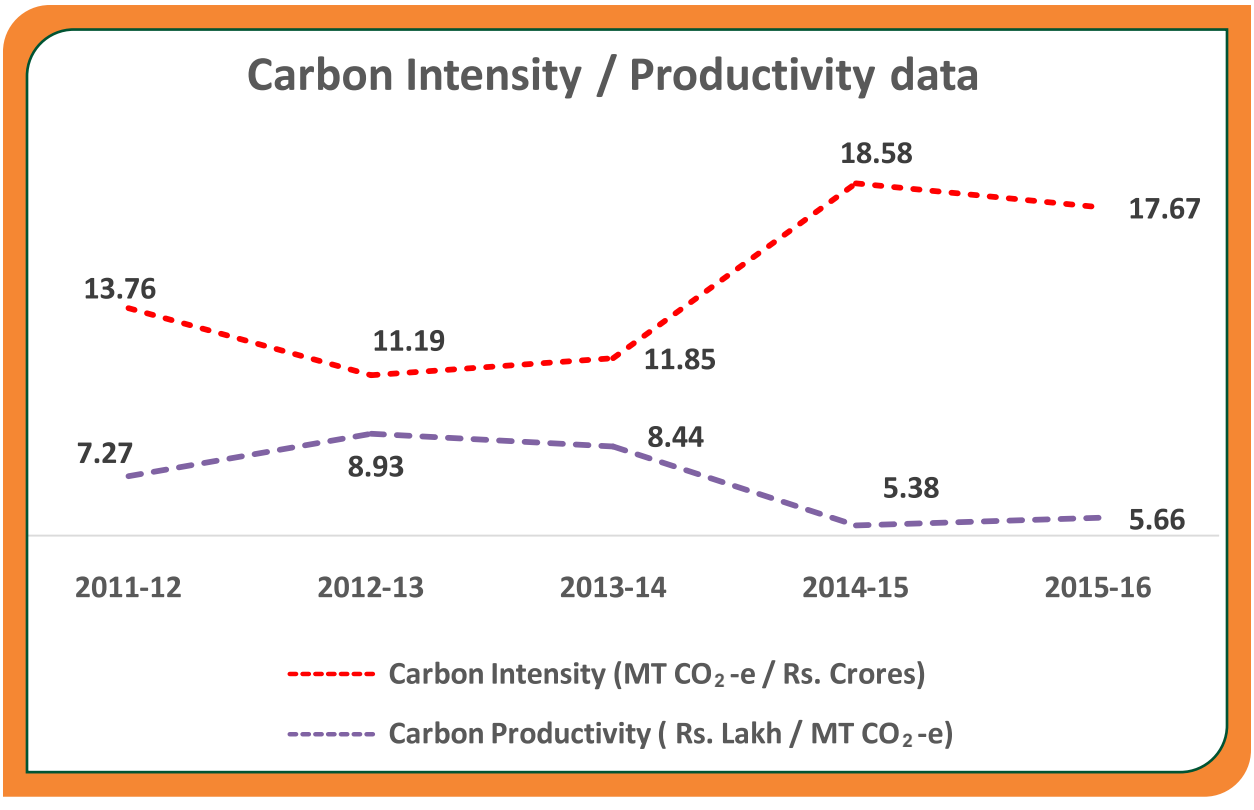
It is pertinent to mention here that the major impact of our products is beyond our premises and at the customer's end during use. However, it is our endeavor to provide greener technologies having lesser carbon footprint to our customers. The quantification of such emissions is beyond our scope.

The figure below gives the information about the electricity purchased by our manufacturing units during the last 5 years and indirect emission (Scope-2) associated with it. The calculation has been done using the grid emission factor for both the electricity grids in India and the same has been shown in the table below. It may be noted that during 2015-16, the grid has become integrated and so there is only one emission factor for the entire grid of the country.

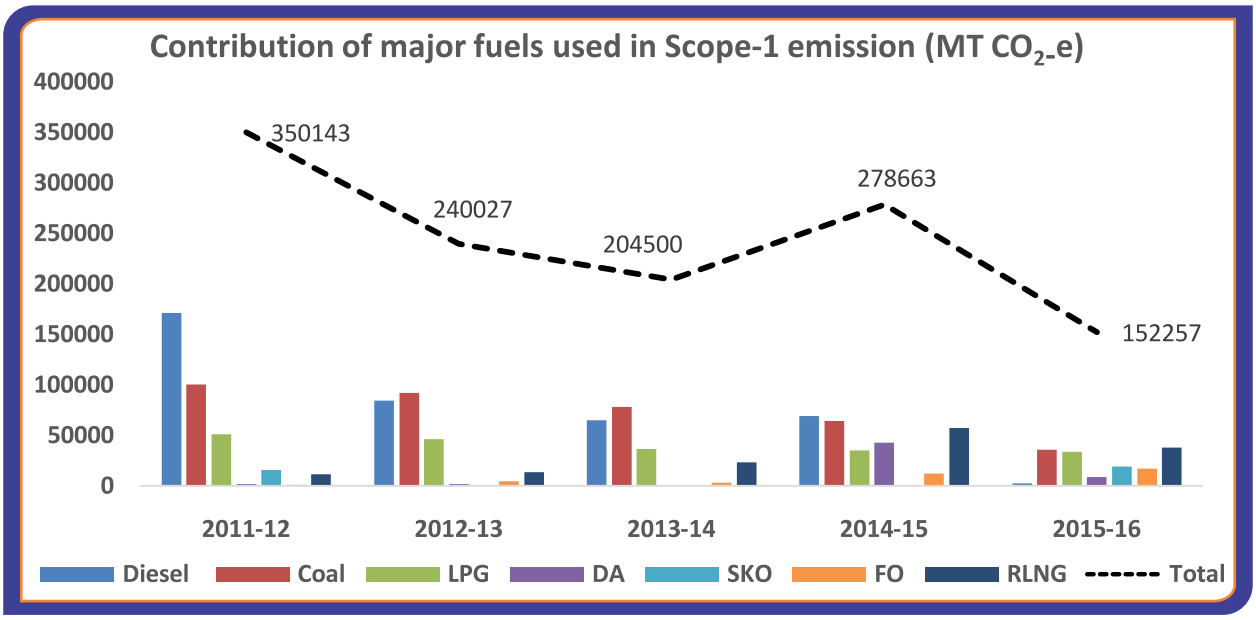
Year	2011-12	2012-13	2013-14	2014-15	2015-16
Emission Factor (tCO_2/MWh) for NEWNE Grid	0.9	0.9	0.9	0.98	0.99
Emission Factor (tCO_2/MWh) for Southern Grid	0.85	0.85	0.85	0.97	



The data for Carbon Intensity defined as Carbon Footprint in MT CO_2-e per Crore ₹ of Gross Turnover and Carbon Productivity defined as Gross Turnover achieved in Lakh ₹ per unit of Carbon Footprint in MT CO_2-e is shown in the following figure. The average figure of Carbon Intensity stood at 14.61 MT CO_2-e per Crore ₹ of GTO, indicating that for ₹ 1 Crore of Gross Turnover achieved during the last 5 years on an average 14.61 MT of CO_2-equivalent was released in atmosphere. Similarly talking about the figure of Carbon Productivity, the average figure for last 5 years stood at ₹ 7.14 Lakh per MT CO_2-e, indicating that for each MT CO_2-e emission a corresponding GTO of ₹ 7.14 Lakh was achieved. However, it may also be seen that though during 2012-13 the organisation achieved a record GTO, but neither the carbon intensity was at its maximum nor the carbon productivity at minimum during 2012-13. Further, the data for carbon intensity has started increasing during the last 3 years on account of drastic reduction in gross turnover achieved.



However, it may be noted that the GTO has been taken for entire BHEL whereas the emissions have been considered only for units 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.



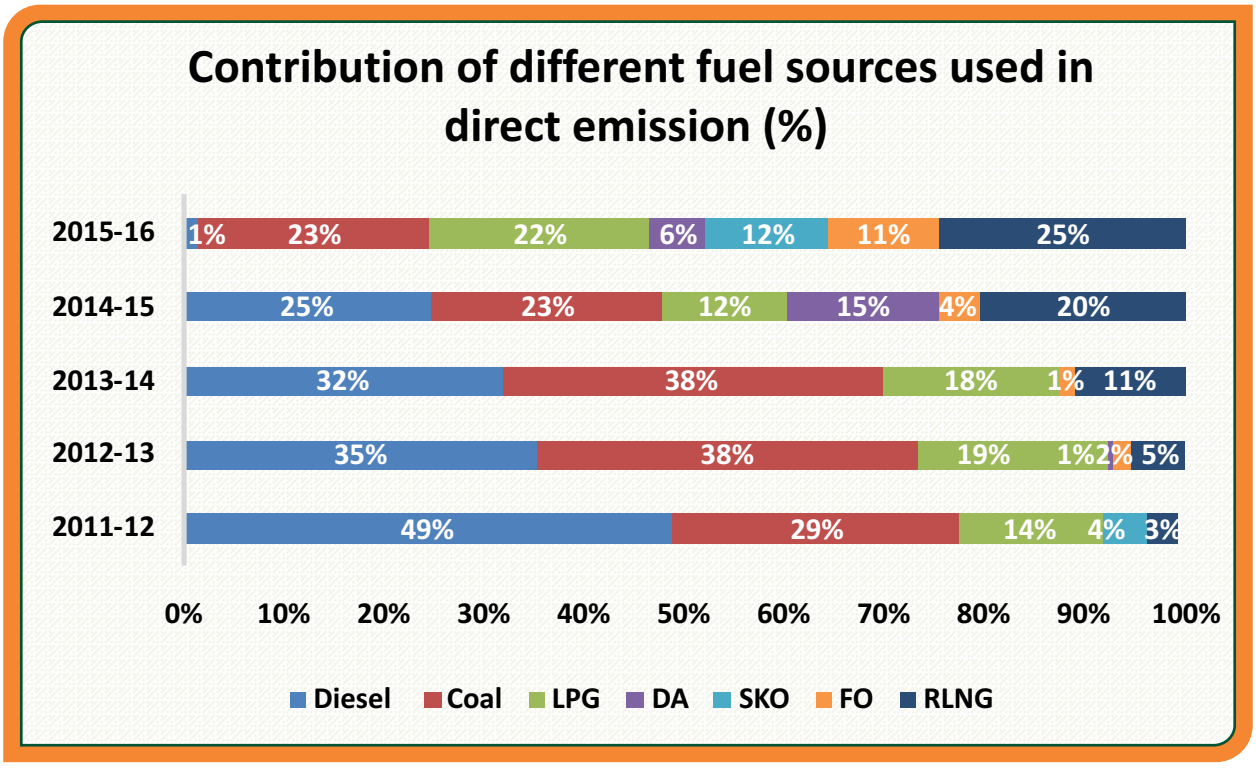
The contribution of major fuels used across BHEL contributing in Scope-1 emission is shown in the figure. As it can be seen from the figure, there is a consistent reduction in Scope-1 emission which may be attributed to the following factors:

- Lesser gross turnover requiring less fuel
- Enhanced use of cleaner fuels in our operations
- Due to generation of green solar energy inside our premises
- Better electricity availability position

Contribution of major fuels used in units in Scope-1 emission (MT CO_2-e)

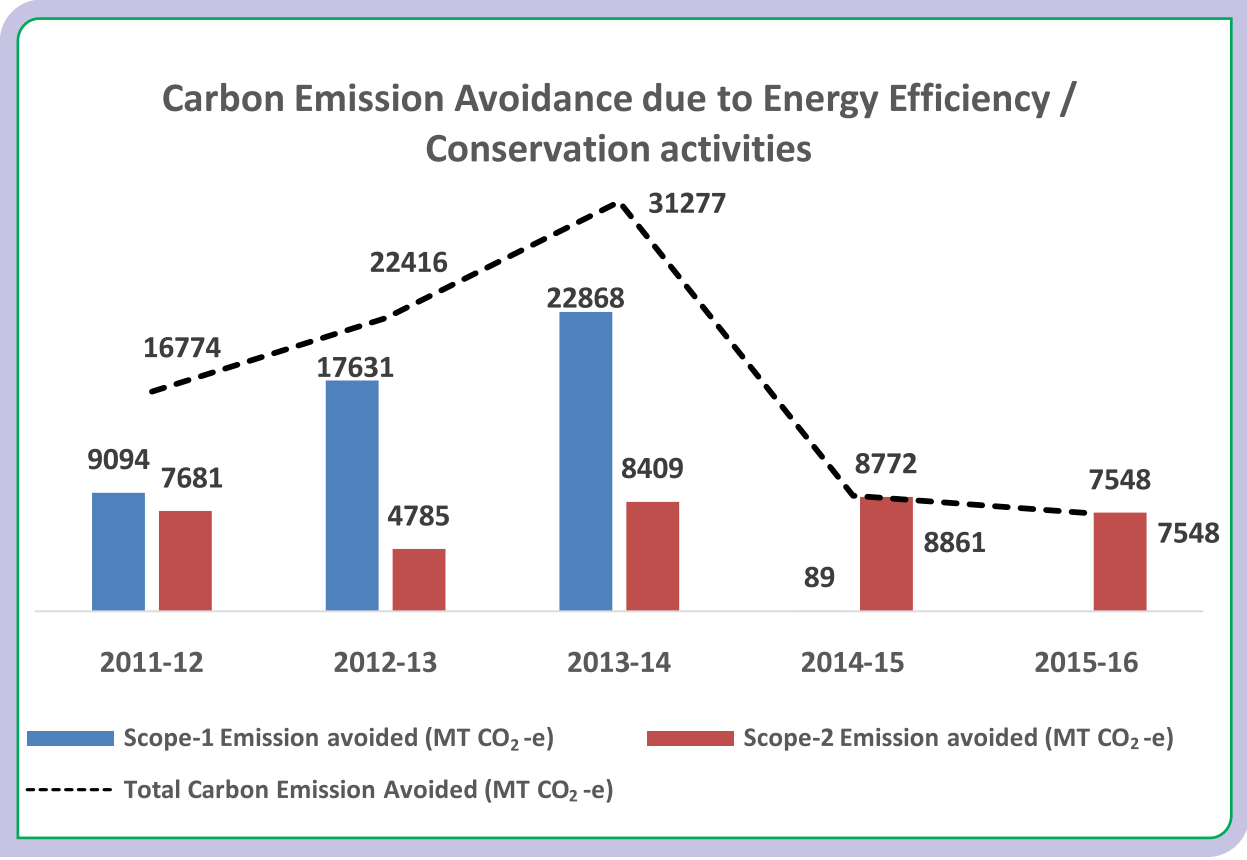
Sl No	Fuel	2011-12	2012-13	2013-14	2014-15	2015-16
1	Diesel	170959	84364	64923	69030	2097
2	Coal	100004	91718	77448	64020	35242
3	LPG	50409	45537	36392	34574	33479
4	DA	1664	1378	2	42108	8420
5	SKO	15176	0	0	0	18896
6	FO	794	4004	2902	11975	16662
7	RLNG	11137	13026	22834	56956	37462
	Total	350143	240027	204500	278663	152257

As can be seen from the figure, the contribution of diesel in overall Scope-1 emission has decreased drastically during last 3 years. The contribution of emissions due to RLNG has gone up significantly indicating a shift from more polluting fuel to the less polluting source of energy. The decrease in carbon footprint contribution due to LPG can be attributed to the fact that at CFFP and EPD Bengaluru, fuel switch has occurred from LPG to RLNG. The emission level is showing a consistently declining trend.



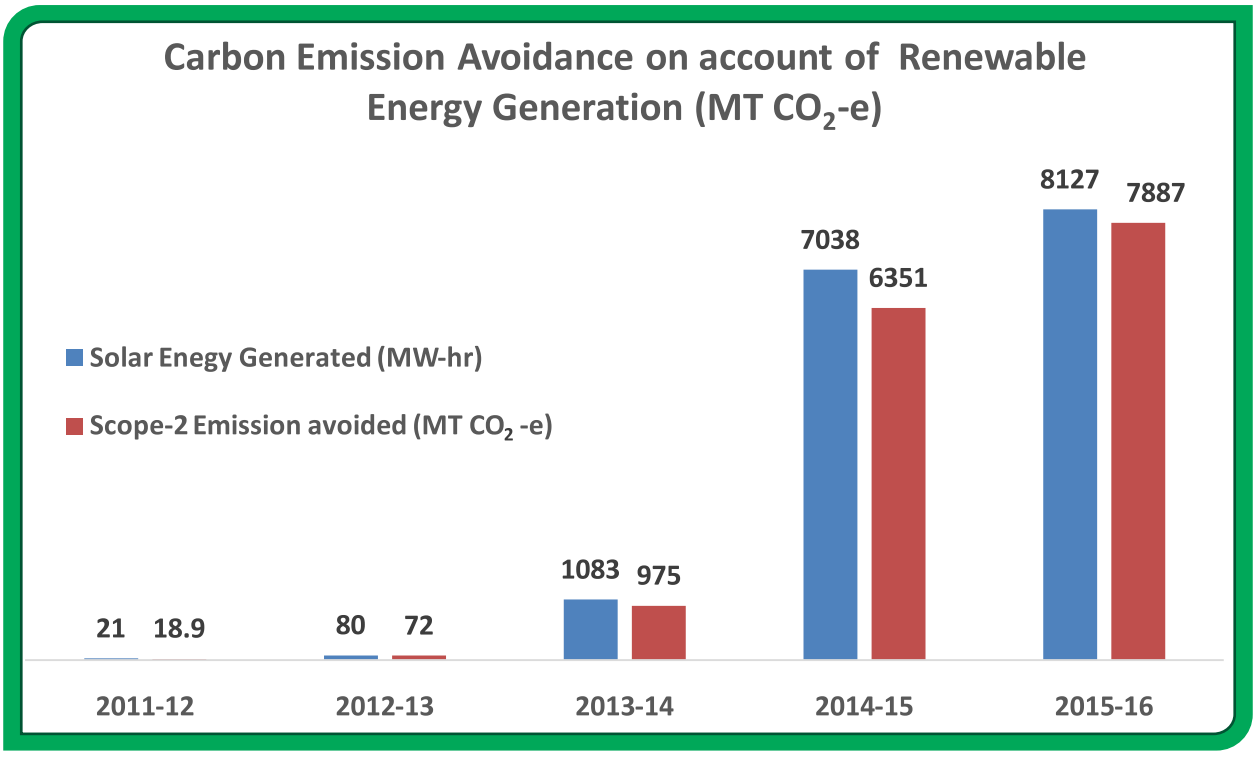
Although, we are not capturing the data for Scope-3 emission yet but it is evident that we are reducing our Scope-3 emissions since we are increasing the use of RLNG which is supplied through pipelines and does not require physical carriage through conventional means of transportation like tanker etc.

Due to sustained efforts for reducing our carbon footprint through various means like energy efficiency & conservation efforts and enhancing usages of solar energy generated in-house, we have avoided a significant amount of carbon emission. As can be seen from the figure, a significant amount of direct emission has been avoided during 2011-12, 2012-13 & 2013-14. It may be attributed to improvement in the calorific value of fuel, fuel saving due to process improvement, fuel switch to cleaner fuels which has led to avoidance of Scope-1 emissions in a considerable way.



The average and cumulative carbon footprint avoided during the last five years stood at 17393.2 Metric Tonnes of Carbon Dioxide – equivalent (MT CO_2-e) and 86966 MT CO_2-e. It included cumulative avoidance of Scope-1 emissions to the tune of 49681 MT of CO_2-e and Scope-2 emissions of around 37195 MT CO_2-e. It may be noted that the calculation for carbon emission avoidance has been done on projected annual energy saving basis and we don't have a procedure in place to measure the exact saving in energy and consequent carbon emission avoidance.

In addition to it, a significant amount of Scope-2 emission is avoided due to the generation of green energy inside our premises. A 1.5 MW_P Solar Power plant has been commissioned in Dec'15 at our HPEP Hyderabad unit. This has resulted in an addition of already existing 5 MW_P generation capacity of solar energy at BAP Ranipet unit. Further, a 5 MW_P plant is under installation at our Trichy Unit. During the reporting period, many solar street lights, rooftop solar power plants, solar water heaters etc. have been installed which has resulted in enhancement of our green energy generation capacity.



As indicated, we have reduced the consumption of diesel and other conventional fuels which require transportation by road thereby reducing the Scope-3 emission on account of carriage of these fuels through road transport. However, no quantification is available for these savings.

Responsible waste management

We at BHEL strongly believe in the popular quote "Waste is just a resource in the wrong place". BHEL has been very conscious about its responsibilities towards conservation and protection of environment right from its inception. We firmly believe that sound waste management is very critical for the success of environmental management system. It is not only critical for ensuring cleanliness, prevention of pollution and conservation of resources, but also very important as a strategic tool for sustainability of businesses. Sound Waste Management is considered to be one of the main pillars of the concept of sustainability.

In view of this, responsible waste management has always been an important thrust area in BHEL. The principle of 3R (reduce-recycle-reuse) is practised widely in our organisation. At the planning stage, efforts are made to minimise the waste. The company has an institutionalised mechanism to recycle wastes in-house to the extent feasible. For example, each MT of the molten steel produced at our CFFP unit contains 54% of the recycled scrap (of CFFP) and 45% of MS Scrap (from other BHEL units), thus making it an almost a 100% recycled product. Various coolants used in our machines are recovered after use and recycled again after appropriate treatment.

Different types of wastes generated in units are segregated at sources and stored and handled in environmentally safe manner. Wastes are categorised in categories like metallic (ferrous & non-ferrous wastes), non-metallic wastes, hazardous wastes, non-hazardous wastes, municipal wastes etc. All metallic & non-metallic wastes having resale value and which can be reused/recycled are sold to authorised recyclers through a government agency, namely MSTC. Hazardous wastes which have resale value are sold to authorised recyclers/processers through MSTC. Other hazardous wastes are handled, stored and disposed of as per prescribed methodology for such wastes. E-wastes are also collected and stored in environmentally safe manner and finally sold to authorised agencies.

It clearly shows the seriousness of the organisation to tackle the waste generated in our operations in a responsible manner. The data for the waste generation for the last 5 years is shown in the figure below. Some of the ferrous scraps are sent to CFFP Haridwar for recycling.

Dry leaves, canteen wastes, waste paper etc. are used to make Vermi-compost, which is a bio-organic fertilizer. Presently, the total annual Vermi-compost production at HERP, Varanasi unit is approx. 2 MT per annum.

भारत हेवी इलेक्ट्रीकल्स लिमिटेड, भोपाल

परिसंकटमय अपशिष्ट (Hazardous Waste) की सूची

निम्नलिखित परिसंकटमय अपशिष्ट को किसी अन्य अपशिष्ट अथवा कचरे के साथ मिलाना दण्डनीय अपराध है। इन्हें सुरक्षित निपटान हेतु केवल एसडीएक्स / स्क्रेप यार्ड को ही भेजें।

यहाँ - वहाँ फेंकने पर पर्यावरण नियमों के तहत आपको दण्ड/सजा हो सकती है।

क्र.	परिसंकटमय अपशिष्ट	श्रेणी	एसडीएक्स/स्क्रेप यार्ड द्वारा निपटान की विधि
1	यूज्ड ऑयल	5.1	के.प्र.नि.बोर्ड / रा.प्र.नि.बोर्ड से पंजीकृत एवं प्राधिकृत री-प्रोसेसर को बेचना।
2	ऑयल स्लज	5.2	
3	तेलयुक्त कपड़ा /जूट/कॉटन	5.2	म.प्र.अपशिष्ट प्रबन्धन प्रोजेक्ट पीथमपुर, जिला धार को भेजना।
4	एलकली रेसिड्यू /लाइम स्लज	12.2	
5	हार्डनर कोटिंग रेसिड्यू	14.2	
6	इंडस्ट्रीयल यूज ऑफ सॉल्वेन्ट (ट्रायक्लोरोएथलीन)	20.2	
7	पेंट स्लज	21.1	
8	एफ.आर.पी (कायबर रेन्फोर्स्ड प्लास्टिक)	21.1	
9	यूज्ड सॉलिड रेजिन एवं हार्डनर	23.1	
10	री-यूजबल लिक्विड रेजीन	23.1	
11	एस्टी ऑयल कन्टेनर	33.3	
12	पेंट के खाली टीन ड्रम, स्प्रायन के खाली ड्रम, कैन,डिब्बे, ट्यूब	33.3	
13	डिस्कार्डेड प्लास्ट ट्यूब (कॉटेमिनेटेड लाइनर्स)	33.3	
14	ई.टी.पी. स्लज	34.3	
15	माइका ग्राईन्डिंग डस्ट	शेड्यूल-2 पार्ट बी	
16	मेटल स्लेग	शेड्यूल-3 पार्ट बी	
17	ब्रास डस्ट	शेड्यूल-4 (1)	के.प्र.नि.बोर्ड / रा.प्र.नि.बोर्ड से पंजीकृत एवं प्राधिकृत री-प्रोसेसर को बेचना।
18	इन्सुलेटेड कॉपर वायर	शेड्यूल-4 (7)	
19	जिंक डस्ट	शेड्यूल-4 (11)	
20	जिंक डस्ट-बॉटम डस्ट	शेड्यूल-4 (12)	
21	जिंक ऐश / स्कीमिंग	शेड्यूल-4 (13)	

DANGER Hazardous waste Handle with care

आदेशानुसार
पर्यावरण प्रबंधन प्रकोष्ठ (एच.एच.एवत.)

Hazardous and Non-Hazardous Wastes generated at units							
Type of wastes	Unit	Quantity (2015-16)	Quantity (2014-15)	Quantity (2013-14)	Quantity (2012-13)	Quantity (2011-12)	Disposal method
Non - Hazardous	MT	33933	57385.1	100902.7	69661.7	76522.1	Sold to the authorised users/ disposal facility
	CuM	1249.6	1140	1050	7778.0	9863.2	
Hazardous	MT	5309.8	6185.0	6877.1	8286.9	3426.0	
	CuM	0	398.4	0.0	0.0	0.0	

Waste Reused / recycled at units							
Type of wastes	Unit	Quantity (2015-16)	Quantity (2014-15)	Quantity (2013-14)	Quantity (2012-13)	Quantity (2011-12)	Remarks
Non - Hazardous	MT	33591	9708	6415.28	3761.48	2373	Includes ferrous as well as non-ferrous materials
	M^3	1249	1140	1050	1260	640	Mostly wood waste reused for making packing boxes
Hazardous	MT	1059	92	3.62	4.11	4.0	Used oil and other materials reused inside or sold to authorised recyclers

As can be seen from the figure almost all the non-hazardous waste generated are either recycled/reused inside our premises, sent to CFFP Haridwar or sold to the authorised agencies for recycling. Further, there has been no hazardous waste as per BASEL Convention which has been shipped internationally. The waste generated has decreased during 2015-16. This may be attributed to lesser physical turnover and efficient use of material leading to reduction in waste generated.

Sample of waste management activities conducted during 2015-16	
Unit	Activity
HERP- Varanasi	2 MT of Vermicompost, a bio-organic fertiliser was produced using canteen & horticulture wastes
HEEP-Haridwar	Recovered about 27.9 MT of used /waste oil through Coolant Recovery System.
	Utilised old packing boxes after repair /modification in Wood Working Shop
HPVP-Vizag	Sent 668 MT of Melting Scrap to CFFP-Haridwar unit for reuse as raw material in steel melting shop.

Initiatives taken to reduce environmental footprint of our products and services

BHEL is contributing to a greener environment through the development of environment-friendly technologies and improvement in efficiency of the products. Continuous improvement in cycle efficiency and reduced emissions have been achieved over time by the evolution of technology from subcritical to supercritical. The performance of BHEL supplied power plant equipments are driven by lower auxiliary power consumption, higher plant efficiency, lower design heat rate & better PLF, all resulting in lower life cycle cost. Some of the steps taken in this direction are detailed below:

Power Sector

- Continuous improvement in cycle efficiency and reduced emissions has been achieved over time by the evolution of technology from subcritical to supercritical, Ultra supercritical and Advanced Ultra Supercritical technologies (AUSC). Details are as given in the table below:

Plant type with power rating	Steam Pressure (kg/cm^2)	Steam Temperature(°C)	Efficiency (%)	Co_2 Emissions (g/kW-hr)
Sub-Critical (500 Mw_e)	170	540	35	900
Super Critical	247	565	40	830
Ultra Super Critical	250	600	42	784
Advanced Ultra Super Critical	310	710	46	740

- Development efforts have been undertaken to achieve breakthrough improvement in cycle efficiency by designing power plants to Advanced Supercritical (AUSC) parameters of 310 bar and 710°C. The project has NTPC and IGCAR as consortium partners.
- Efficiency improvement in various power plant equipment is pursued by improving efficiency and reducing direct energy loss. BHEL make HT Motors have now an improved efficiency upto 98%. BHEL has developed energy efficient IGBT based 1MW High-Performance Low Voltage Variable Frequency Drive (VFD) which has been successfully tested for all its design features on 25 HP induction motor.
- Environment-friendly Air Cooled Condensers (ACC) have collectively improved operating efficiency and helped in the conservation of valuable resources like water. In a typical 2 X500 MW Thermal Power Plant the requirement of cooling water make-up can be eliminated and as a result water requirement can be reduced by almost 70 % by using ACC. BHEL is currently executing ACC based supercritical thermal power plant for 3 X 660 MW NTPC-North Karanpura.
- To reduce emissions and meet the stringent new emission norms, BHEL has initiated several measures like modification in boiler design, improvement in collection efficiency of ESPs; installation of FGD systems for SO_x capture, modifications in the wind box firing system of Boilers and development of SCR catalyst for NO_x reduction.

- BHEL developed a 'NO_x and Ozone Levels Evaluation Tool' to estimate NO_x and residual ozone emissions formed in Electro Static Precipitator (ESP) using Artificial Neural Network (ANN) to predict NO_x values at ESP outlet. The work has resulted in the precise estimation of NO_x and residual ozone at ESP.
- BHEL is also carrying out research in developing technologies related to CO_2 capture namely;
  - Oxy-blown Combustion-systems development and performance demonstration
  - Membrane Electrode Assembly (MEA) based CO_2 capture systems (Post- Combustion Techniques)
  - Chemical looped combustion technology demonstration
  - Algal-based CO_2 decomposition of industrial flue gases
  - Oxy-blown IGCC gasification for H_2 production and syngas to liquid fuel conversion.

Renewables

- BHEL presently has a manufacturing capacity of 8 MW (Cell) and 26 MW (module) which is planned to be increased to 105 MW (Cell) & 226 MW (Module) by Oct'16.
- Continuous R&D in the field has resulted in BHEL achieving solar cell efficiency up to 18.4% for monocrystalline and 17.5% for multi-crystalline cells, which is among the best in the world.
- BHEL has demonstrated a 100 kW_P Solar PV Plant consisting of 50 kW_P SPV system using 18 nos. of 2.8 kW_P capacity polar axis passive trackers and a 50 kW_P SPV system using 36 nos. of 1.4 kW_P capacity horizontal axis passive trackers. This development has led to increased energy output by 15 to 20% with respect to modules mounted on the fixed tilt structures.
- Electric Vehicle mobility is fast gaining recognition as the future mode of transportation. BHEL under a consortium with National Automotive board (NAB) and M/s. Ashok Leyland is developing Motors / Alternators, IGBT controllers and VCU hardware for Electric powered vehicles.
- BHEL has developed 1 kW PEM (Proton Exchange Membrane) fuel cell stack for strategic applications in defence.

Innovation capability and a culture of creative development are important drivers for achieving growth. BHEL's R&D strategy, structure and infrastructure are aligned to meet the challenges of the present and future business environment. To meet the requirements of a dynamic market, the company is focusing its R&D efforts on developing new products and processes using state-of-the-art technologies and also improving the performance and efficiency of existing products.

Over the years, BHEL entered into technology collaboration agreements with leading global manufacturing and engineering companies, such as General Electric of United States, Siemens AG Germany, Mitsubishi Heavy Industries Ltd. Japan and ABB Group Switzerland. The company has successfully indigenized these technologies to meet the requirements of Indian customers and manufacturing at its own facilities. Today, with twelve ongoing collaborations, BHEL is focusing on successful adaptation and timely absorption of these technologies.

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 2015-16.

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.

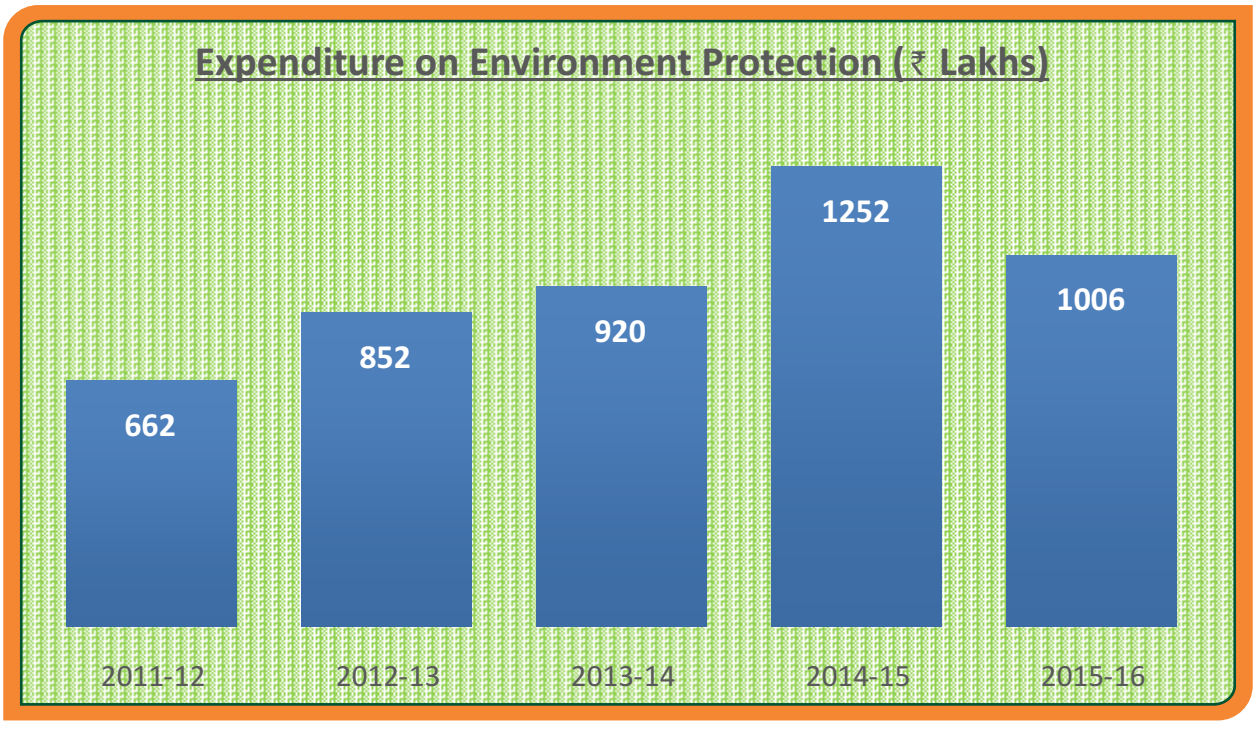
Compliance

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

Environmental Protection Expenditure

BHEL has been taking numerous initiatives for improvement of the environment in and around its units under Sustainable Development and incurring expenditure for the same. These include 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 an 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. It indicates that a total amount of ₹ 4692 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.

OUR SOCIAL PERFORMANCE

Management Approach - Labour Practices & Decent Work

BHEL has been a torchbearer in the area of Human Resource Management (HRM) and has documented HR policies and rules in the form of a codified Personnel Manual. This manual serves the dual purpose of providing information on the benefits & entitlements for the employees as well as to ensure transparency and uniformity of implementation which is the cornerstone of corporate governance. HR's pole star statement is "To ensure availability of competent, motivated and effectively contributing human resource and to facilitate achievement of the full potential of employees at all times to realise the organisational mission."

As digital tools and technologies are profoundly differentiating the way business is being conducted, BHEL has put in place an organisational structure to embrace IT as a strategic tool for opening up the new stream of opportunities in new as well as traditional business areas. Most importantly, to fulfil this target of a robust organisation, we have an unhindered focus on the people development strategy which is today driven by the growing aspirations of the millennial generation of the company. We are embracing social technologies for increasing employee engagement and working towards the development of employee competencies in line with the business plans through the implementation of various learning & development initiatives.

BHEL policies are in line with the principles of Human Rights, The Constitution of India, and various applicable Laws. BHEL has special provisions for ensuring the safeguard of women employee at the workplace. No instance of human rights abuse has been reported in the company.

The company strongly advocates the elimination of all forms of forced and compulsory labour. It neither subscribes to nor indulges in such coercive practices. Towards this, it never asks its employees to deposit their original documents pertaining to their educational qualifications or Date of Birth. Uniform set of rules are mentioned in "Personnel Policy" of BHEL, 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, giving equal opportunity to all eligible candidates, without any discrimination whatsoever.

Profile of the employee base

BHEL has a highly committed employee base spread across the entire country and stood at 42,198 regular employees as on 31st March 2016 out of which around 2300 are female employees. Employee attrition rate of BHEL is less than 1%.

BHEL does not hire employees on the temporary/casual basis. However, BHEL awards job/works contracts to contractors at its various Units/Divisions/Departments as per organisational needs. The number of workers with contractors varies from time to time. Some of the major benefits provided to the BHEL employees include Provident Fund, Employees' Family Pension Scheme, Earned Leave, Half Pay Leave, Gratuity, bonus, medical and Post-Retirement Medical Benefits.

In line with the growing aspirations of the millennial generation of the company, the people development strategy of BHEL is focusing on developing employees' competencies in alignment with the business plans through the implementation of initiatives like e-learning modules and focus on technical & behavioural training.

Number of permanent employees with disabilities as on 31-03-2016 was 929. BHEL has 30 participating unions in respect of workmen. There are two employee associations, one for Executives and one for Supervisors. The percentage of permanent employees who are members of recognised employee association is not available.

In BHEL, manpower sanctions are based on the business requirements and are not vacancy based. It is based on an annual review and aligned to the business requirements. In this regard, Manpower Planning in BHEL is inter-alia dependent on:

Present order book, anticipated orders and Company Financials
Manpower wastages
Skill gaps occurring due to technological advances.

Also, recruitment activities in BHEL have been completely aligned with Government Guidelines as well as Presidential Directives issued from time to time.

Performance and career development

Under the people development initiatives, BHEL executives have gone through technical competency assessments. Assessment of individual executives was conducted at major units and regions. Competency gaps have been identified for desired vis-a-vis possessed levels. These competency gaps have been used for development of in-house Training Needs Identification module (TNI) and are translated into development programmes through company's training institutes/centres.

As regard to the assessment of behavioural competencies, around 2000 executives have been assessed through SHL psychometric tool. Based on the results of the SHL psychometric tool, individual development plans are available for all executives who have further prepared a time-bound action plan for their developmental areas. To prepare and align young employees to face company's challenges and to encourage healthy competition, initiatives like 'Best Employee of the Quarter' and 'High Potential (HiPo) Employees Scheme' have been initiated. Under the HiPo scheme, 210 HiPos have been identified amongst the mid-level executives. The grooming process for such executives, as envisaged in the scheme has been initiated in the Units. In 'Best Employee of the Quarter' scheme, 1200 applications were received during the year and 320 awards have been given in different categories.

Labour / Management relations

In BHEL, there are three distinct cadres of employees namely Workmen, Supervisors and Executives. Out of these, only the workmen cadre, which constitutes approximately 53% of total manpower strength, are covered by agreements on issues like wages, perks & allowances, incentive, etc., arrived at through the process of collective bargaining in the Joint Committee for BHEL. The Industrial Relations' scenario in the various manufacturing units and the business sector/offices of the company remained harmonious and peaceful during the year 2015-16. No man-days were lost during the year on this account.

The thrust on participative culture and communication continued during the year. Two meetings of the apex level bipartite forum, namely "Joint Committee for BHEL" were held during the year. In BHEL, "Plant Council" is the unit level committee and is responsible for the overall working of the unit and it discusses matters which have unit wide repercussions. The plant council is having representation from management as well as workers. Then further there are "Shop Councils" which are departmental level committees dealing with the departmental level operations & issues. It is also having representation from management as well as workers. There were 57meetings of the "Plant Council" and 464 meetings of the "Shop Council" during the reporting period.

In addition, meetings were also held with the representatives of executives and supervisors of the various manufacturing units including the business sector/offices. The focus of discussions in the various fora centred on improvement of the overall performance of the company. The main thrust was on the issues related to increasing the productivity of the employees, cost reduction, quality and sequential delivery in order to meet our commitments to customers.

Further, Quality Circle (QC) movement in BHEL which is being driven by workmen & supervisors is the role model in the country. Every year, inter-unit annual QC summit is held in BHEL where the QCs showcase their case studies. In 2015-16, BHEL Annual Quality Circle Summit (BAQCS) was held at HPEP-Hyderabad unit where 46 QCs participated from all over BHEL and QC no. TC69M of HPEP-Hyderabad was awarded the S R Udupa Trophy for "Best Quality Circle".

Occupational Health & Safety

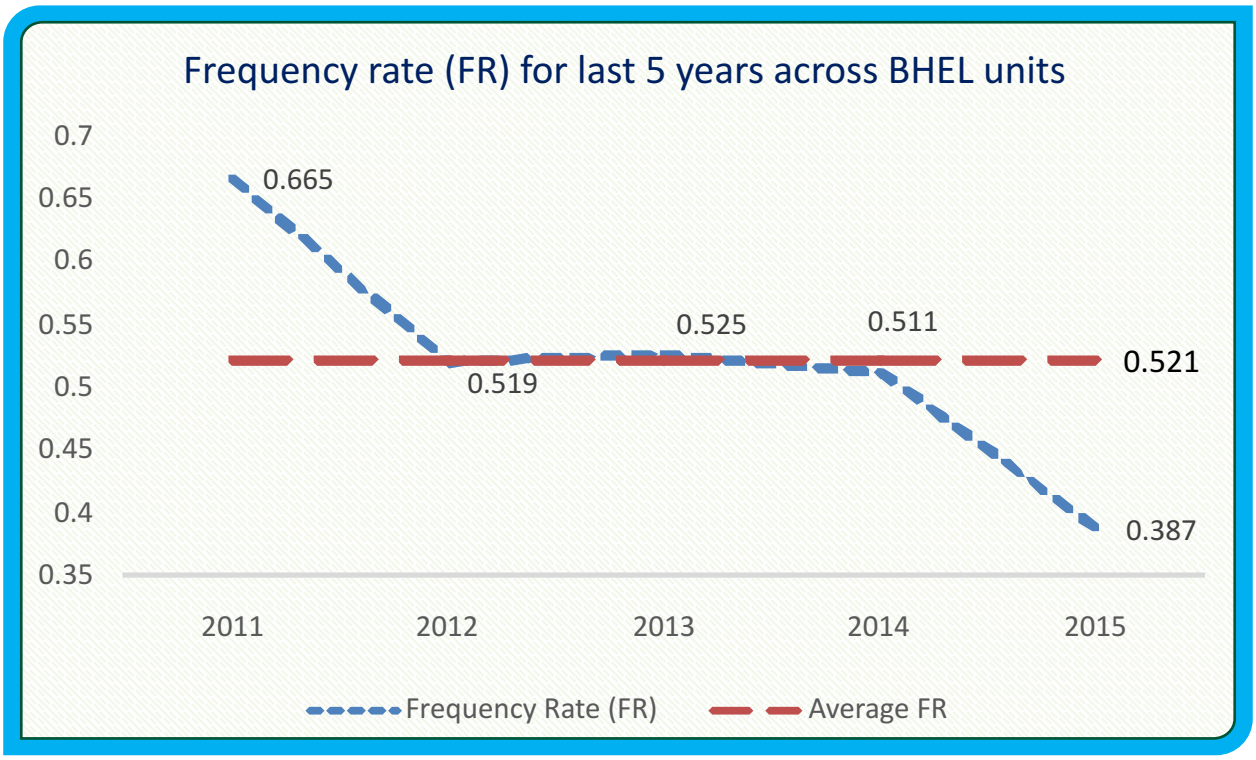
At BHEL, we believe that human life is priceless, loss of which can neither be made up for by monetary compensations nor can its dedication and expertise be substituted. This very premise forms the core of occupational safety programmes in BHEL and inspires us to make the workplace safer for the employees of BHEL as well as for our business associates. BHEL's major manufacturing units are OHSAS 18001 certified, having strong Health, Safety & Environment (HSE) management systems in place. This has resulted in improvement of company's safety performance. At project sites, compared to the year 2014, in the year 2015 there was approximately 27% reduction in incidences of fatalities and nearly 29% reduction in the man-days lost due to various types of accidents. Dedicated Safety and Occupational Health Centres are being run in the factory premises catering to safety and occupational health issues of employees at the workplace. Some of the initiatives taken in our units to build and maintain safety and health culture at work place during 2015-16 included:

Sponsoring BHEL officials for one year advanced diploma course in Industrial Safety, conducted by Central / Regional Labour institute at Mumbai, Kanpur, Kolkata, Chennai and Faridabad
Sharing of good practices through in-house magazines and handbooks on various safety related topics
Creating awareness about safety through display of posters, safety instructions, standard operating procedures and periodic awareness campaigns
Conducting health & safety related training sessions for regular employees, contract workers & trade apprentices
Creating awareness about hazardous chemicals through making available the Material Safety Data Sheet (MSDS) and Standard Operating Procedure
Conducting special programme on health awareness for women employees
Creating awareness about road safety amongst the truck drivers associated with transportation of our products
Internal Audits, External Audits by Certifying Agency, 3rd Party Safety Audit etc.

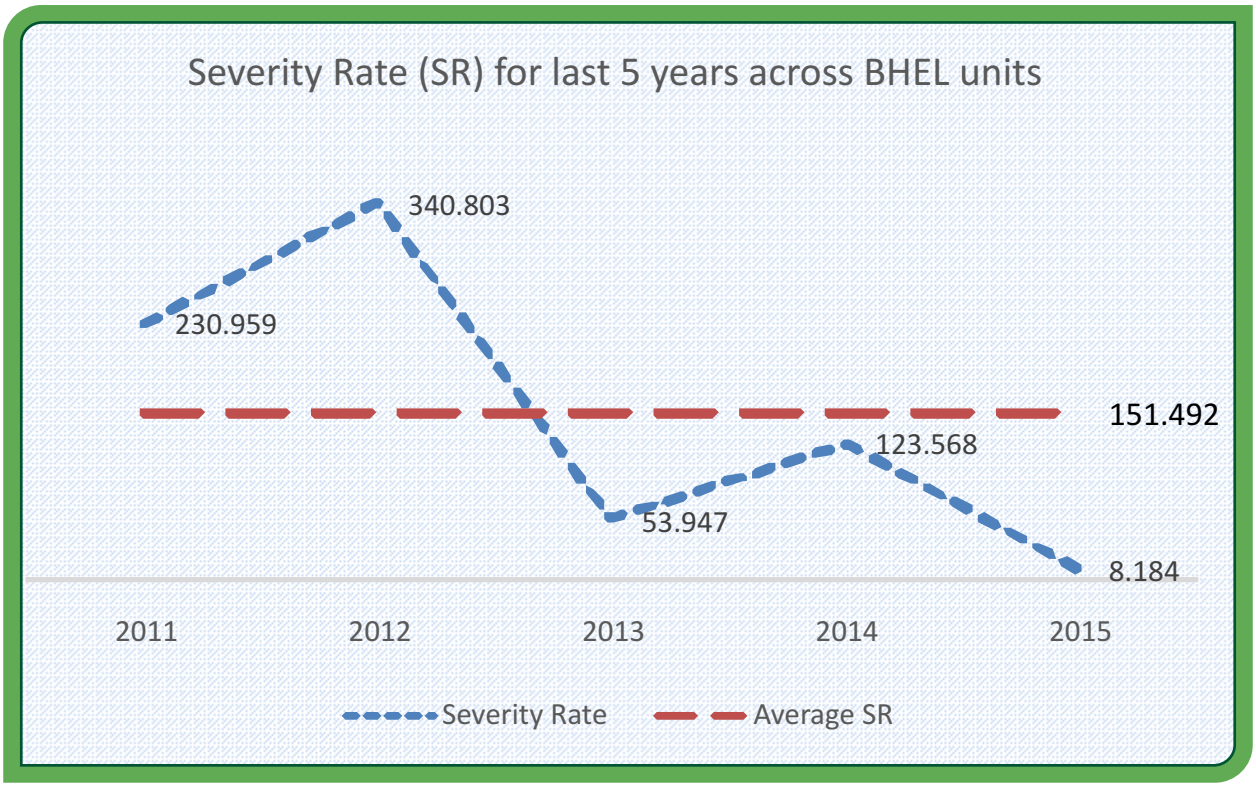
Safety Statistics for BHEL units

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

This data is given for the calendar years (1st Jan to 31st December of respective years). A lot of efforts are being made to further improve the safety culture in BHEL which has resulted in better safety performance during the reporting period. There is no specific area where workers with high incidence or high risk of diseases related to their occupation have been identified/reported.



BHEL has no specific agreement signed with the trade unions related to health and safety related matter. However, there are various participative forums like "Works Committee", "Shop Council", "Central Safety Committee", "Hygiene committee", "Hospital Apex Committee" etc. in our units, where health & safety related issues are discussed/deliberated.



Annual HSE Heads Meet took place at HEEP Haridwar on 19th & 20th November 2015. A number of good practices adopted by Units and Regions were shared during the meet.

Safety pledge being administered

Learning and Development

Learning and development are accorded utmost importance in BHEL. The Human Resource Development Institute (HRDI) along with Advanced Technical Education Centre (ATEC) at Hyderabad and Human Resources Development Centre (HRDCs) at different units play a key role in training and development of employees. Aligned to the changing needs of the organisation, these learning centres facilitate knowledge transfer, skill development and behavioural interventions to build winning attitude in BHEL employees.

Inter Unit HSE Heads meet held at HEEP Haridwar on 19th & 20th November 2015

During the year, the company achieved 4.18 training man-days per employee. BHEL also provided skill development to various Act-apprentices thus contributing actively to the 'Skill India' campaign of Govt. of India. BHEL as member of governing body of Capital Goods Sector Skill Council and

Power Sector Skill Council was involved in creation of national occupational standards for these two sectors. During the year, live classroom facilities were introduced at some of the locations to gain virtual access to live classes being conducted at different locations to improve the reach and sharing of knowledge.

The highlights of learning and development in BHEL during 2015-16 include:

Revision of content, design and methodology for leadership development programmes
Introduction of new leadership program titled "Resilient Leadership" for middle management to face the Volatility, Uncertainty, Complexity, Ambiguity (VUCA) world and covered 110 executives in 4 programs with exposure to outbound methodology
Conceptualisation of program to enhance belongingness for the organisation titled 'Winning Together' for young executives and covering 2,928 executives in more than 100 programs across the organisation with the help of 75 internal trainers specifically trained for this initiative.
Thrust on technical training on new advanced technology areas like AUSC, IGCC, carbon capture, solar energy, transmission business etc.
Successful launch of 'Horizon & Inspire' for cadre change promotions
Successful implementation of e-learning modules of: • Harvard Manage Mentor leadership for 1000 executives and • In-house developed project management module covering 500 executives
Launch of online Training Need Identification (TNI) portal across the organisation

Diversity and equal opportunity

BHEL as an organisation recognises the contributions that individuals from diverse backgrounds can bring in to its talent pool. This is reflected in our recruitment policy which provides for equal opportunity to individuals irrespective of cast, creed or gender. Our recruitment process has special members in the interviewing committee to ensure diversity in the recruitment and selection of new inductees. In the multi-pronged approach, we continue to focus on ensuring that diverse talent is represented across all tiers of the organisation. Special benefits such as additional leaves/choice of postings/Child Care Leave/special training are part of our HR Policy structure to provide special support to our women employees to meet their personal and career needs.

Supplier assessment

For tenders of value ₹ 5 Crore or more, signing of Integrity Pact with the vendor is a must in the organisation. Registration of new suppliers in BHEL is based on Organisational Soundness, Quality System, Technical Competence, besides financial information. Suppliers are made aware of company's code of conduct through various platforms/communication channels. BHEL is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines for Suspension of Business Dealings with Suppliers/ Contractors" framed by the Principal.

Management approach - Human rights & Anti-corruption

BHEL policies are in line with the principles of Human Rights, The Constitution of India, and various applicable statues. BHEL has special provisions for ensuring safeguard of women employees at the workplace. The principles of Natural Justice are enshrined in "The BHEL Conduct, Discipline and Appeal Rules" applicable to all its employees except workmen category who are governed by the Standing Orders.

BHEL is a lifetime 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. This is also uploaded on company web-site for public viewing and can be accessed at http://www.bhel.com/healthsafety/global_compact.php.

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 honest, decent and fair manner. The Company has zero tolerance approach towards all forms of corruption. BHEL is committed to enhancing transparency in all its business dealings for which it has a Vigilance set-up in place to prevent irregularities. The main objective of the Company is to curb corruption by focusing more on the preventive and educative aspects, rather than investigative/punitive processes. Training programmes, seminars/conferences and interaction between Chief Vigilance Officer with the employees is a regular feature in the Company.

Protecting human rights in Supply Chain

BHEL procures materials and components on a regular basis from suppliers spread all over the world. For this purpose, BHEL is backed by a strong supplier base which is continually updated. New suppliers and traders (only those who are sole/authorised representatives of OEMs) both from within India and abroad, who give BHEL competitive inputs, are being added to the list of existing suppliers.

BHEL has pioneered entrepreneurship development in and around its manufacturing units by providing regular support to Micro and Small Enterprises (MSE) through knowledge sharing, training and development and resource mobilisation etc. During 2015-16, BHEL has procured about 17% of its total procurement from MSE in compliance to Public Procurement Policy-2012 for MSEs. BHEL units regularly organise Vendor Meets, specifically for MSEs (including local suppliers) towards capacity and capability building, which also provides opportunities for open communication for mutual benefits and support.

BHEL, being a Public Sector Undertaking (PSU) has statutory obligation to enter into contract with only those suppliers and contractors who comply with human rights requirement and the same is incorporated in the contract agreement (Rate contract agreement, Standard Condition of Contract etc.). The agreement comprehensively contains clauses related to child labour, UN convention on Human Rights, Health & Safety requirements, forced/ bonded labours, contract labours, Minimum wage payment, insurance, welfare etc.

Training on UN Global Compact Principles forms an essential part of Induction training in the organisation which covers all the new inductees in the organisation.

No human right review has been done during the reporting period as there has not been any incident of human right violation which has been brought to the notice of the organisation. Further, in BHEL no such operations have been identified in which the right to exercise freedom of association and collective bargaining, may be at significant risk, and thus no actions taken to support these rights.

Human rights grievance mechanism

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

The provisions of the Act and the rules thereon are being strictly complied with. In accordance with the Act, Internal Complaints Committee has been constituted in all units of BHEL and their constitution and contact details have been hosted on unit's website. A poster has been designed, which includes key provisions of the Act, Duties of the Employer, Complaints Redressal Mechanism, Action for Malicious Complaints & various misconceptions about sexual harassment and the same was circulated to all units for display at conspicuous places. Posters in Hindi, English and Regional languages have been displayed in all units. 45 workshops/awareness programmes were conducted in units on gender sensitization, self-defence and on awareness about the Act. The Annual Report showing details on the number of complaints of sexual harassment received during the year 2015-2016 and status thereof is given in the figure below:

	Report on Safeguard of Women at Workplace for 2015-16	
1	Number of complaints received during the year 2015-16	4
2	Number of complaints disposed of during the year 2015-16	4
3	Number of cases pending for more than ninety days	0
4	Number of workshops or awareness programme against sexual harassment carried out	45
5	Nature of action taken by the employer on recommendations of ICC	
The aggrieved woman was upset about the dual meaning comments from her colleagues on her married life and wanted transfer from that product group. She was transferred and the case closed.		Case Closed
On inquiry, ICC concluded that this was not the case of harassment as per the Act. On the request of aggrieved woman to drop the case, case was closed.		Case Closed
According to the aggrieved woman, respondent had unauthorised information about her personal mail ids and used to send derogatory remarks to her spouse using fake e-mail ids. Case investigated by ICC, respondent submitted written apology and transferred from the unit.		Case Closed
On inquiry, ICC concluded that as per the Act, the case was not of sexual harassment but was of misconduct and recommended the case for departmental inquiry.		Case Closed

Periodic surveillance & internal audits, statutory compliance reports, legal compliance reports are some of the mechanism in place to ensure compliance with our human rights policy.

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 engaged in social activities throughout the country.

BHEL has supported various CSR initiatives in diversified fields across the country and was awarded "Pandit Madan Mohan Malviya Bronze Award" for the CSR initiative - Arivalayam at Trichy, Tamil Nadu. Dr R.P. Centre for Ophthalmic Sciences, AIIMS, New Delhi honoured BHEL for outstanding contribution to the National Eye Bank. On 13th Nov. 2015, 57 CSR events were organised across all units of BHEL for celebrating the 51st Anniversary of BHEL's incorporation.

BHEL's CSR Policy is the structural framework which guides the organisation while undertaking any initiative related to CSR from conceptualisation to execution and ultimately assessing the impact. The policy clearly lays down BHEL's CSR Vision, Mission, Objectives and defines the thrust areas in which CSR interventions are generally carried out.

CSR Vision

A responsible corporate citizen working towards a better tomorrow.

CSR Mission

To sincerely & effectively discharge company's responsibility in the identified CSR thrust areas and other areas listed out in the Companies Act, 2013.

Objectives

The objectives of this policy are:

- *To define CSR projects or programs which BHEL plans to undertake and which falls within the purview of the Companies Act 2013, the Companies (CSR Policy) Rules, 2014 and the prevailing guidelines issued by Department of Public Enterprises, Govt. of India;*
- *Modalities of execution of such CSR projects or programs;*
- *Monitoring process of such CSR projects or programs;*
- *To make the stakeholders aware of CSR practices in BHEL.*

☞ *To work keeping in mind the larger objectives of sustainable development in conduct of business and in pursuit of CSR agenda*

Clean India

Green India

Educated India

Healthy India

Heritage India

Inclusive India

Responsible India

Focus Areas for CSR Initiatives

Major CSR initiatives undertaken

BHEL undertakes CSR initiatives for implementation through various NGOs/Trusts/Social Welfare Societies engaged in social activities throughout the country. Details of some of the major CSR initiatives carried out during 2015-16 is listed below.

Healthy India

☞ In partnership with Help Age India, PHDRDF and Wockhardt Foundation, BHEL has provided support for running operations of 11 Mobile Medical Units (MMUs) in the vicinity of our Project sites and Manufacturing Units, benefitting more than one lakh patients. Some of these MMUs were also deployed for the benefit of disaster affected people in J&K during floods, during Hud-Hud cyclone in Andhra Pradesh and in Chennai, Tamil Nadu during floods.

☞ With financial support from BHEL, 'Life Line Express Train' the World's first hospital on wheels, was stationed for 21 days at Lalitpur railway station, U.P., India. During this period of 3 weeks, it provided free medical services such as restoration of sight, hearing, correction of cleft lips, dental and gynaecological treatment etc. to around 7700 patients.

In partnership with Help Age India. BHEL provided Mobile Medical Units in the vicinity of its projects sites

Inauguration of Life Line Express Train deployed by BHEL at Lalitpur Railway station Uttar Pradesh for providing free medical aid

- BHEL continued its support to its own CSR initiative - 'Heal a Soul' by providing Anti-Haemophilic Factor (AHF) to 480 Haemophilic patients including children. The initiative focuses mainly on patients coming from below-the-poverty-line (BPL) families located in the vicinity of our Transmission Business Group (TBG) project sites.
- 10,650 people voluntarily pledged to donate their eyes under initiative "Vision to All- BHEL's Call", taking the total number of pledges to over 92000.
- Provided financial support for construction of "Ganga Prem Hospice" – a 30-bed cancer hospice (a home providing palliative care to terminally ill cancer patients) near Rishikesh through an NGO named "Shradha Cancer Care Trust"
- Provided financial support for palliative care to terminally ill patients including cancer patients, in Delhi/NCR region and Bhopal, coming from poor background and with inadequate means of subsistence through an NGO named "Global Cancer Concern India (GCCI)"

BHEL felicitated by Haemophilia Federation (India) for its outstanding contribution to the society.

Clean India

- More than 60 projects on "Swachh Bharat" viz. construction of toilet facilities at schools in nearby villages, construction of drain, purchase of solid waste collection & transportation vehicles etc. valuing more than ₹ 10.0 Crore were undertaken across BHEL.
- BHEL is providing financial support for "Installation of 25 Clusters of Bio-Digestor toilets in Haridwar & Rishikesh" with safe & clean drinking water facility at each location.

- ❖ Installed 11 Community RO water plants at various locations near BHEL's presence.
- ❖ BHEL contributed ₹ 20.00 Crore to 'Swachh Bharat Kosh' under the 'Clean India Initiatives' of the Govt. of India
- ❖ BHEL has signed an agreement with Varanasi Nagar Nigam for providing financial support for automated solid waste collection and transportation systems in 14 wards of Varanasi.

Inauguration of one Bio-digester toilet cluster by our CMD and Ardh-Kumbh Mela Adhikari

- ❖ Supported CSR Initiative "Forest-based sustainable livelihood project", which aims to manufacture biodegradable leaf cups & plates at Sundergarh District, Odisha.

Educated India

- "Running of Mobile Science Labs in the vicinity of three units of BHEL viz. Haridwar, Jhansi and Trichy".
- Providing support for running 30 schools located in BHEL manufacturing Units, benefitting more than 40,000 school children.
- Successfully conducted experiment for providing low-cost internet facility using TV white space especially in rural area. The experiment was conducted at Kashi Krishak Inter College, Harhua, Varanasi in collaboration with ERNET India.
- Initiated Infrastructural development activities in 108 Govt. Schools in Lucknow.
- Provided custom-built bus for benefit of differently-abled students at JNU campus
- Provided financial support for Renovation and Modernization of Library at National College, Trichy (Tamil Nadu).

Mobile science lab deployed by BHEL for children as part of the Educated India Campaign

- Supported a project to promote education and skill development of disadvantaged children and youth by imparting non-formal education to 1260 street/slum children including skill training to 240 youth (both boys and girls) living in ten slum clusters of Delhi. Appropriate teaching & learning materials, visual aids, puppets, stories, songs, educational games, etc. have been prepared for creating joyful and child-centric learning environment for the children. Bridge courses and cooperative learning are also included in the curriculum to support quick learning and also improve their functional literacy.

Desks & benches provided by BHEL for one of the Govt. Schools in Goindwal, Punjab

Inclusive India

- Undertook a project "Technology-based advanced agricultural interventions" in tribal dominated Khargone district of Madhya Pradesh for upliftment and economic empowerment of marginalised farmers.
- Provided quality training to apprentices at different Units of BHEL to develop their skillsets and open employment opportunities for them.
- Conducted different vocational training programs like beautician and tailoring courses for the benefit of needy and deprived.

Responsible India

- Carried out infrastructure development activities such as Construction/ Renovation of Community Centres, Construction of Toilets, Construction of Classrooms in Schools, Installation of Solar Lights etc. in the nearby villages of Haridwar, Bhopal, Trichy and project sites located in Power Sector Eastern Region.
- Supported "Adoption of 15 Villages for Sustainable use of rainwater harvesting to enhance livelihood of poor small farmers" in Bijawar block of Chhatarpur district, (M.P), which is poverty-stricken and predominantly inhabited by tribal and OBCs with drastically poor irrigation facilities.
- Construction of overhead tank of 5,00,000 Litre capacity in Thuvakudi Municipality of Trichy District, Tamil Nadu

Inauguration of Overhead water tank by CMD, BHEL & Director (HR) at Thuvakudi Municipality, Trichy, Tamil Nadu

- In association with the NGO 'Kalyanam Karoti', provided Artificial Limbs and Medical Aid Instruments to 143 poor & needy people of Agra
- Provided custom-built bus for benefit of differently-abled students at JNU campus

Green India

- Installed 50 kW_P Grid Interactive Solar Power Plant in Jnanakshi Vidyaniketan, Rajarajeshwari Nagar, Bengaluru.
- Initiated a signature project in partnership with IIM Ahmedabad for the Installation of solar water pumps of 5 HP capacity to encourage the use of solar energy by farmers in the villages.

50 kWp Grid Interactive Solar Power plant installed by BHEL in Jnanakshi Vidyaniketan, Bengaluru.

- Installation of Solar Street lights – 90 at Deoli, Bilaspur (H.P.), 47 at Phulpur (U.P.) and 47 at Bhadohi (U.P.)
- Provided financial support for setting up of a 60 kW multiple-grid interactive SPV Power Plant in two rural Akal Academies – schools for children coming from poor & rural background (30 kW each in Akal Academy, Dadehar Sahib and Akal Academy, atTeja Singh Wala of Tarn Taran district, Punjab) through Kalgidhar Trust (a non-profit charitable organisation)
- Installing Solar Water Heaters in Guru Granth Sahib Sri VidyaKender, Chattarpur, Delhi for the benefit of orphaned children who are being imparted Value education & vocational training

CSR Activities During Disasters & Calamities

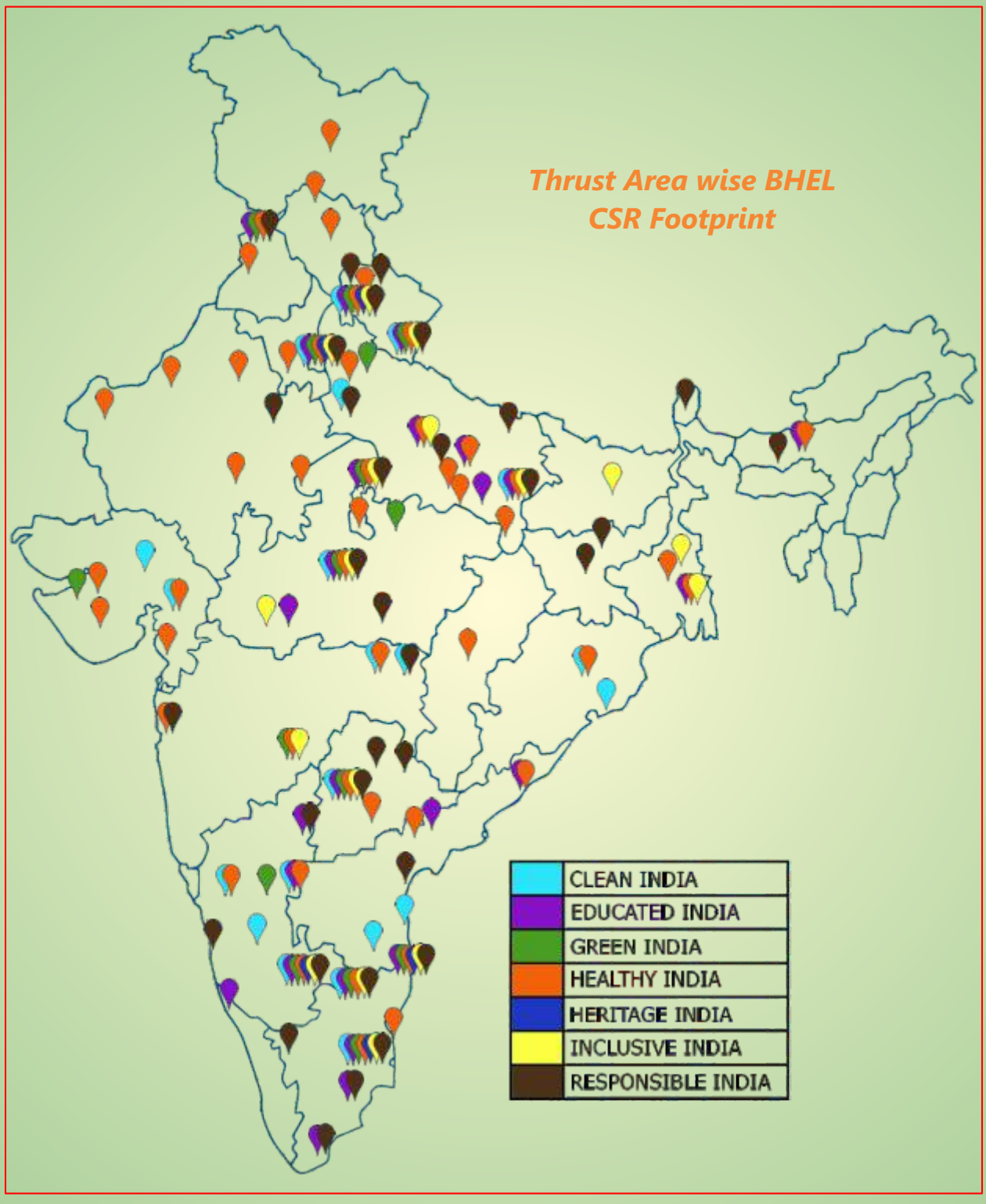
- At the time of Chennai floods, BHEL extended its support for the relief of flood-ravaged people through various nearby Units of BHEL viz. BAP Ranipet, HPEP Hyderabad, HPVP Vizag, PPPU Thirumayam, PSSR Chennai and HPBP Trichy by deploying Mobile Medical Vans, providing food, groceries & clean drinking water and distributing blankets, toiletries, basic medicines etc.
- During Hud-Hud disaster in Andhra Pradesh, on receiving SOS requests from GVMC, APEPDCL, Post Office, SBI a BHEL-HPVP team was quickly pressed into service for their assistance. Alternate Office accommodation was arranged for Post Office. Breakfast and Lunch were arranged for the NDRF teams and police personnel, fire brigade personnel, who were deployed in surrounding areas.

- Construction of 96 houses for Hud-Hud cyclone victims at Vizag, A.P. The construction is being carried out by the state government with financial support from BHEL.

Construction of Houses for victims affected by Hud-Hud Cyclone in A.P.

Vehicles containing relief materials flagged off by BHEL for undertaking relief operations during Chennai floods

Relief activities by BHEL during Chennai Floods


Thrust Area wise BHEL
CSR Footprint
CLEAN INDIA
EDUCATED INDIA
GREEN INDIA
HEALTHY INDIA
HERITAGE INDIA
INCLUSIVE INDIA
RESPONSIBLE INDIA

Compliance

No substantiated complaint regarding breach of customer privacy and loss of customer data has been made 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 pending as on end of financial year i.e., 31-03-2016. Further, there were no significant fines and non-monetary sanctions for non-compliance with laws and regulations levied on the company during 2015-16.

Product Responsibility

Over the past few years, BHEL is deeply focused on innovation than ever before. The company is transforming its R&D and innovation in a structured and focused manner through five-pronged approach consisting of Strategic Direction, Portfolio Management, Partnerships & Alliances, Knowledge Management and Enablers. Strategic direction is provided to R&D through a policy framework under the guidance of R&D Advisory Council comprising of reputed Indian scientists, captains of industry and academia. The company's R&D focus is realigned with the National Mission objectives like cleaner and green environment, efficient power transmission, smart grids, smart cities, indigenous production of defence and strategic equipments, high-speed rail and metro transportation, e-mobility etc.

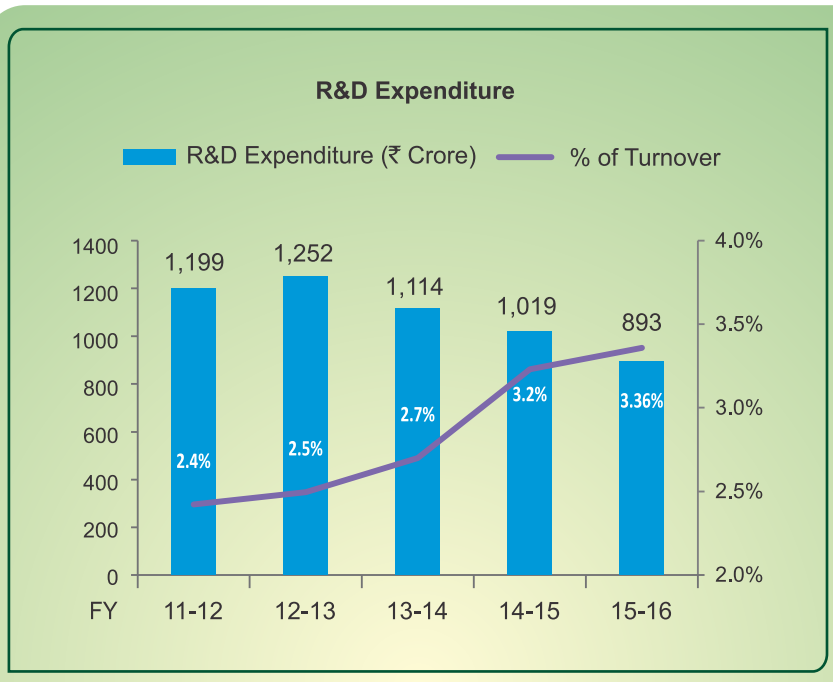
A portfolio of 15 missions leading to 146 technology initiatives is helping the company to build and consolidate capabilities in emerging and existing areas. All these projects are being executed and monitored for successful completion of the plan period ending in 2017.

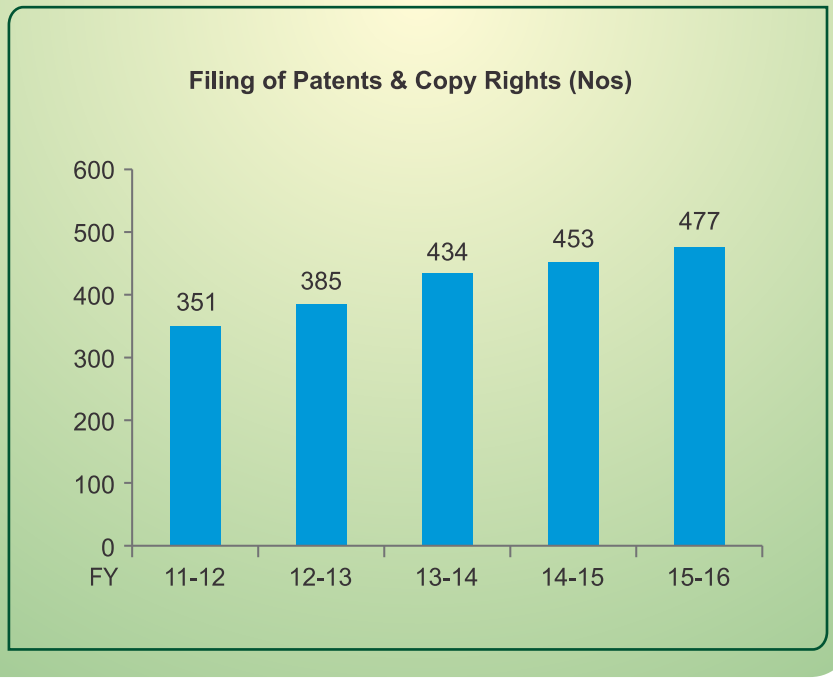
Major Mission Projects

- Establish capability for 800 MW Advanced Ultra supercritical Power plants with parameters 710 °C/310 ata covering design, engineering, manufacturing installation & commissioning;
- In-house capability to establish grid connected Solar Power plant with matching BOS;
- To develop in-house capability for HVDC (± 800 kV) transmission products/substations;
- To develop total capability for transmission products/substation of GIS up to 765 kV;
- To develop 3-phase propulsion systems for all railways needs covering electric/diesel- electric loco, EMU, DEMU,MEMU, Coaches, metro and rolling stock addressing urban transportation;
- To develop & commercialise applications in the area of emerging technologies like High Temperature Superconducting (HTSC) Motor, Fuel cell up to 2 kW rating, efficiency improvement of crystalline silicon solar cells from 16% to 25%, etc.;
- Water/sewage treatment plants for power plant, industrial/municipal and river clean-up applications.

Innovation in engineering processes including managing its knowledge base is identified as focus area in these centres of innovation & technology development. Continuing its focus on Knowledge Based Engineering (KBE) for reducing design cycle time and design optimisation in all its products,

BHEL has initiated a number of KBE projects aimed to build expertise in KBE and facilitate Product Lifecycle Management (PLM) related activities. Further, with a view to bridge knowledge gaps, BHEL has increased collaboration with academia and R&D Institutes for basic as well as applied research. Currently, BHEL has Memorandum of understanding (MoU) with over 15 leading academic and research institutes. The company is also putting in place all enablers like people capabilities, infrastructure, processes and organisational support to succeed in its ambitious technology endeavours.





BHEL has recorded significant achievements on R&D performance parameters during the year. The R&D expenditure of the company for the current financial year is ₹ 893.07 Crore which is 3.36% of the turnover. This includes the expenditure by manufacturing units on R&D efforts towards major modifications/ improvements in product/ designs against customer requirements which are not covered in Corporate R&D projects. The company filed 477 patent and copyright applications during the year 2015-16, enhancing the company's intellectual capital to 3441. A total of ₹ 6675.68 Crore of the company's total turnover has been achieved from its in-house developed products, introduced in last five years.

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, advice 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.

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. 31-03-2016.

GRI Content Index for 'In accordance' – Comprehensive

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G4-10	Details of workforce broken down by gender, employment contract, employment type etc.	83-84		
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GENERAL STANDARD DISCLOSURES				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
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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			
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES				
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G4-19	Material Aspects identified in the process for defining report content	38		

GENERAL STANDARD DISCLOSURES				
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G4-21	Description of Aspect Boundary outside the organisation for each material aspect	38-39		
G4-22	Explanation of the effect of any re-statement of information provided in the earlier Report.	None		
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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			
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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 97 of BHEL's Annual Report 2015-16		
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GENERAL STANDARD DISCLOSURES				
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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	Page 28-29 of BHEL's Annual Report 2015-16		
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			

GENERAL STANDARD DISCLOSURES				
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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	Page29 of BHEL's Annual Report 2015-16		
G4-52	Process for determining remuneration			
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CATEGORY: ECONOMIC **ECONOMIC PERFORMANCE**				
G4-EC1	Direct economic value generated and distributed	42		
G4-EC2	Financial implications and other risks and opportunities for the organisation's activities due to climate change	40-41		
G4-EC3	Coverage of the organisation's defined benefit plan obligations	Page 178 of BHEL's Annual Report 2015-16		
G4-EC4	Financial assistance received from government	45		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
MARKET PRESENCE				
G4-EC5	Ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation	45		
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	45-46		
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	45-46		
CATEGORY: ENVIRONMENTAL **MATERIALS**				
G4-EN1	Materials used by weight or volume	48-51		
G4-EN2	Percentage of materials used that are recycled input materials			
ENERGY				
G4-EN3	Energy consumption within the organisation	51-54		
G4-EN4	Energy consumption outside of the organisation		Not Reported	
G4-EN5	Energy intensity	54-55		
G4-EN6	Reduction of energy consumption	56-61		
G4-EN7	Reductions in energy requirements of products and services			

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
WATER				
G4-EN8	Total water withdrawal by source	64-66		
G4-EN9	Water sources significantly affected by withdrawal of water	64		
G4-EN10	Percentage and total volume of water recycled and reused	66		
BIODIVERSITY				
G4–DMA	Aspect specific DMA	64		
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)	70-74		
G4-EN16	Energy indirect greenhouse gas (GHG) emissions (scope 2)			
G4-EN17	Other indirect greenhouse gas (GHG) emissions (scope 3)			

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
EMISSIONS				
G4-EN18	Greenhouse gas (GHG) emissions intensity	72		
G4-EN19	Reduction of greenhouse gas (GHG) emissions	74-76		
G4-EN20	Emissions of ozone-depleting substances (ODS)	69-70		
G4-EN21	NO_x, SO_x, and other significant air emissions	69-70		
EFFLUENTS AND WASTE				
G4-EN22	Total water discharge by quality and destination	66-68		
G4-EN23	Total weight of waste by type and disposal method	76-78		
G4-EN24	Total number and volume of significant spills	81		
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 deeme 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	79-80		
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.	81		
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	81-82		
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	81		
ENVIRONMENTAL GRIEVANCE MECHANISM				
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	81		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
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	83		
G4-LA2	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	82-83		
G4-LA3	Return to work and retention rates after parental leave, by gender			
LABOR/MANAGEMENT RELATIONS				
G4-LA4	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements	82-83		
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	85		
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	86-87		
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation	85-88		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
OCCUPATIONAL HEALTH AND SAFETY				
G4-LA8	Health and safety topics covered in formal agreements with trade unions	85-88		
TRAINING AND EDUCATION				
G4-LA9	Average hours of training per year per employee by gender, and by employee category	88		
G4-LA10	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	88-89		
G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	88-89		
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	89		
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	89		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
SUPPLIER ASSESSMENT FOR LABOR PRACTICES				
G4-LA15	Significant actual and potential negative impacts for labor practices in the supply chain and actions taken	89		
LABOR PRACTICES GRIEVANCE MECHANISMS				
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved through formal grievance mechanisms	89		
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	88-89		
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	90-91		

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	90-91		
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	90-91		
SECURITY				
G4-HR7	Percentage of security personnel trained in the organisation's human rights policies or procedures that are relevant to operations	90-91		
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	90-91		
SUPPLIER HUMAN RIGHTS ASSESSMENT				
G4-HR10	Percentage of new suppliers that were screened using human rights criteria	90-91		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
SUPPLIER HUMAN RIGHTS ASSESSMENT				
G4-HR11	Significant actual and potential negative human rights impacts in the supply chain and actions taken	90-91		
HUMAN RIGHTS GRIEVANCE MECHANISMS				
G4-HR12	Number of grievances about human rights impacts filed, addressed, and resolved through formal grievance mechanisms	90-91		
SOCIETY **LOCAL COMMUNITIES**				
G4-SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	90-91		
G4-SO2	Operations with significant actual and potential negative impacts on local communities			
ANTI CORRUPTIONS				
G4-SO3	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	Page27-28 of BHEL's Annual Report		
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	

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
ANTI COMPETITIVE BEHAVIOUR				
G4-SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	103		
COMPLIANCE				
G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	103		
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	
GRIEVANCE MECHANISMS FOR IMPACTS ON SOCIETY				
G4-SO11	Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms	103		
PRODUCT RESPONSIBILITY **CUSTOMER HEALTH & SAFETY**				
G4-PR1	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	103-104		
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 out-comes			

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	Description	Page No. / explanation	Omissions	External Assurance
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	105		
G4-PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of out-comes			
G4-PR5	Results of surveys measuring customer satisfaction			
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, promo-tion, and sponsorship, by type of outcomes	105		
CUSTOMER PRIVACY				
G4-PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	105		
COMPLIANCE				
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	105		

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