SUSTAINABILITY REPORT

2020-21

Committed to Create a Greener Tomorrow

Bharat Heay Electricals Limited


बी एच ई एल
BHEL

CONTENTS

Message from
Director (Human Resources) & Director (Power) - Addl. Charge

For BHEL, Sustainable Development is one of the core elements of management process which guides every decision made by us in one way or another. Following the tenets of Sustainability is a conscious choice made by BHEL which helps the organization in its journey towards corporate excellence, enhancing stakeholder value, enhancing our brand equity and contributing towards making the society more equitable.

BHEL believes in conducting its business in such a way as to minimise its environmental footprint across the value chain. Since BHEL products are having long life cycle, it is imperative that the environmental footprint associated with its use phase is much more than its production phase. To address this, BHEL has been continuously striving for developing cleaner/greener products and introducing cleaner technologies. One such instance of our efforts in conventional energy sector which helped the power producers in transition from subcritical to super-critical and then to ultra-super-critical and latest Advanced-Ultra-Super-Critical technology for increasing the overall efficiency of the power production and reducing the associated impact. Further, we are well established player in the field of electric mobility, renewable energy etc. and further exploring the new frontier such as Green Hydrogen space etc.

Our robust innovation and R&D framework address the technology challenges emanating from business requirements. The R&D expenditure of the company for 2020-21 was ₹726 Crore, approx. 4.45% of the revenue. The company filed 526 patent and copyright applications during the year, enhancing the company's intellectual capital to more than 5000. More than 24% of the company's revenue has been achieved from its in-house developed products and contributing our bit towards making our country "Aatmnirbhar Bharat".

Our environment enrichment programme deployed across the organization helps us in ensuring optimal utilisation of key natural resources such as material and water, management of waste such as scrap and effluent, reduction of emissions, and enhancing the verdant cover across our establishment. It has helped us in adding to our bottom line and garner the trust of our stakeholders including society residing in our vicinity.

The past year has indeed been a year of great challenge with the COVID-19 pandemic affecting economies across the globe, including the

Indian economy and seriously affecting BHEL's performance as well. However, BHEL has shown resilience in dealing with the situation and supplemented the national efforts while at the same time worked towards strengthening its own foundations for long term growth. During the second wave of COVID, BHEL supplied over 5,75,000 Cu Mtrs, i.e., over 80,000 cylinders of medical oxygen. BHEL was, in fact, the major source of emergency medical oxygen for Uttarakhand, Western UP, city of Bhopal, etc., which resulted in saving many lives. We have further developed and supplied medical oxygen plants for hospitals, in collaboration with CSIR-IIP, in record time. BHEL also developed and manufactured disinfection equipment for mass sanitization of towns and cities, and upgraded company's hospitals and dispensaries.

BHEL is cognizant of the ongoing energy transition and subdued economic growth in its current areas of operations. Accordingly, definitive steps are being taken both for maintaining growth in the existing portfolios as well as targeting opportunities in the new, non-coal based businesses. As a result, the company retained its dominant position in the nuclear, hydro and thermal emission control businesses, booking highest-ever orders of more than ₹3,000 Cr. in hydro sector, maintaining market leadership as the sole Indian supplier of nuclear steam turbines in the nuclear sector as well as retaining highest market share in the FGD and SCR segment. Company's efforts towards increasing contribution of non-coal business are also bearing fruit and concerted efforts are also being made for developing a range of new products, systems and solutions for railways, urban mobility, defence, aerospace, among others.

In the long term, the company is targeting to regain its technology lead by investing in technologies of the future including various elements of the Hydrogen economy (generation, storage, utilization), Additive Manufacturing – which is going to disrupt all areas of manufacturing, Industry 4.0 solutions for process industries (remote monitoring & diagnostics, spares & services business, IIoT for internal operations), Coal to Methanol, Upstream Solar Value Chain, and Battery Energy Systems.

However, existence of vast coal reserves in the country and imperatives to keep imports under control, coupled with the need to retire old generating sets which have lower efficiency, higher pollution and are at end of life stage, are expected to lead to opportunities in the thermal sector in the medium to long term, with focus on environment friendly clean coal technologies including gasification/ Coal to Methanol, Carbon Capture, etc., which BHEL is poised to capitalize upon. The successful completion of more efficient and greener Advanced Ultra Supercritical (AUSC) technology is a step in this direction and will further reinforce our technological prowess in the thermal business.

In-house, BHEL has established a total of 28 MW_p of Solar Photo Voltaic (SPV) power plants including rooftop & ground based SPV systems, solar water heaters, solar street lighting, etc., resulting in generation of 27.2 million units of green electricity and resulting carbon footprint avoidance of 26,118 MT CO_2-e during 2020-21. The company has also undertaken a number of projects related to water and energy conservation, tree plantation, waste management, resource conservation, etc. As a step towards fulfilling our commitment to fight plastic pollution, all townships of BHEL are certified as 'Single Use Plastic Free' zones after audit by an external agency. During the reporting period, more than 35,500 saplings were planted across the various premises of BHEL.

It gives me immense pleasure to place before you our annual Sustainability Report for 2020-21 which captures the footprint of our organization left behind while treading the path of Sustainability during the reporting period and appreciate the efforts of entire team involved in making the report. Sustainability is our guiding force which would help us in transforming ourselves into a Vibrant Global Enterprise.

With best wishes,

Yours Sincerely,

Anil Kapoor

ORGANISATIONAL PROFILE

About the Organisation

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

Right from developing country's power generation capacity to creating multiple capabilities in country's core industrial & strategic sectors, BHEL is deeply aligned to the vision of a self-reliant India.

Consistent expenditure of more than 2.5% of its revenue on R&D and innovation; establishment of world-class assets, development and absorption of new technologies; and creating sustainable business solutions and contribution to the society at large through initiatives in skilling youth, health & hygiene, education, cleanliness and environment protection, stand a testimony to our commitment.

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

Company's Pan-India presence includes a network of 16 manufacturing facilities, 2 repair units, 4 regional offices, 8 service centres, 1 subsidiary, 3 active joint ventures, 15 regional marketing centres, 3 overseas offices and current project execution at more than 150 project sites across India and abroad. BHEL manufactures a wide range of high quality & reliable products adhering to national and international standards.

The worldwide installed base of power generating equipment supplied by BHEL exceeds 193 GW, making it the undisputed leader amongst Indian power plant equipment manufacturers. Having installed more than 1000 thermal, hydro, nuclear, gas and solar PV based power generating sets in the country, BHEL is now building strong foundations for cleaner and greener energy usage in future with development of critical technologies such as AUSC and coal to methanol.

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

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

Manufacturing Plants/ Unit Locations

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

YEAR at a glance

01
₹1,02,000 Cr.
Total Order Book

02
Focus on **developing non-coal business**
highest ever orders in Hydro; leadership maintained in Nuclear

03
193 GW+
power generating capacity installed in India and abroad
till date

04
Single largest market share
in **emission control equipment business**
in the country

05
AUSC development on track; R&D phase completed;
HP & IP turbine design completed; creep-fatigue damage estimation Test rig for turbine rotor commissioned

06
Secured first-ever LSTK order for Process Unit for Downstream Oil & Gas business

07
Delivered the 100th Space grade Battery to U R Rao Satellite Centre, ISRO

08
1.2 GW+
Solar PV portfolio; 5 MW Floating Solar Power plant
at Sagardighi commissioned

09
27.2 Million Units of power generated through 28 MWp in-house renewable energy systems

10
Over **₹180 Cr. invested**
in company's assets for **capability building, productivity enhancement & indigenization**

11
> ₹700 Cr. invested
in **R&D** and **innovation;**
526 patents & copyrights filed;
5,052 Total Intellectual Capital

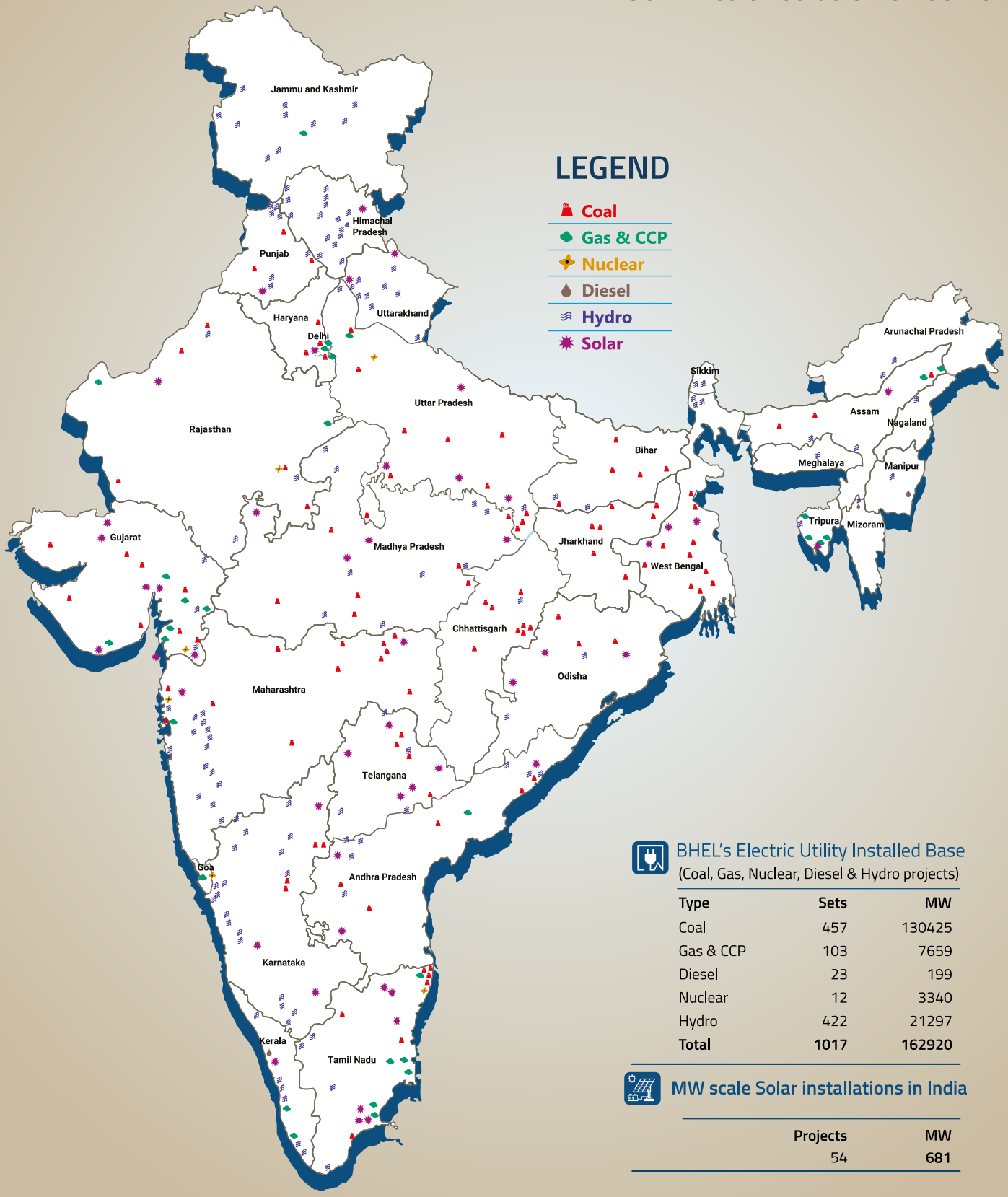
12
32,131
Human capital base
9,000+
engineers

2020-21

BHEL

Make Electric Utility Installations

Commissioned as on 31.03.2021



BHEL's Electric Utility Installed Base
(Coal, Gas, Nuclear, Diesel & Hydro projects)

Type	Sets	MW
Coal	457	130425
Gas & CCP	103	7659
Diesel	23	199
Nuclear	12	3340
Hydro	422	21297
Total	**1017**	**162920**

MW scale Solar installations in India

Projects	MW
54	**681**

World of BHEL

A National Institution

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

Vision

A global engineering enterprise providing solutions for a better tomorrow

Mission

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




Energizing India

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

Unparalleled contribution in core sectors

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

Global Footprints

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

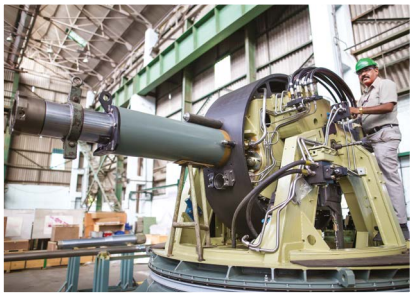
Valuing people

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

Did you know?

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



Technology for a sustainable future

- In house development of Advanced Ultra Supercritical (AUSC) and Coal to Methanol technologies progressing
- Spearheading the development, installation and indigenisation of emission control equipment for coal based power plants in India
- Carbon footprint avoidance of nearly 26,118 MT MT of CO_2-equivalent through in-house 28MWp solar power installations
- Developed efficient EHV Transmission systems and products (including ±800KV HVDC)
- 12 townships of BHEL units declared as 'Single Use Plastic Free'

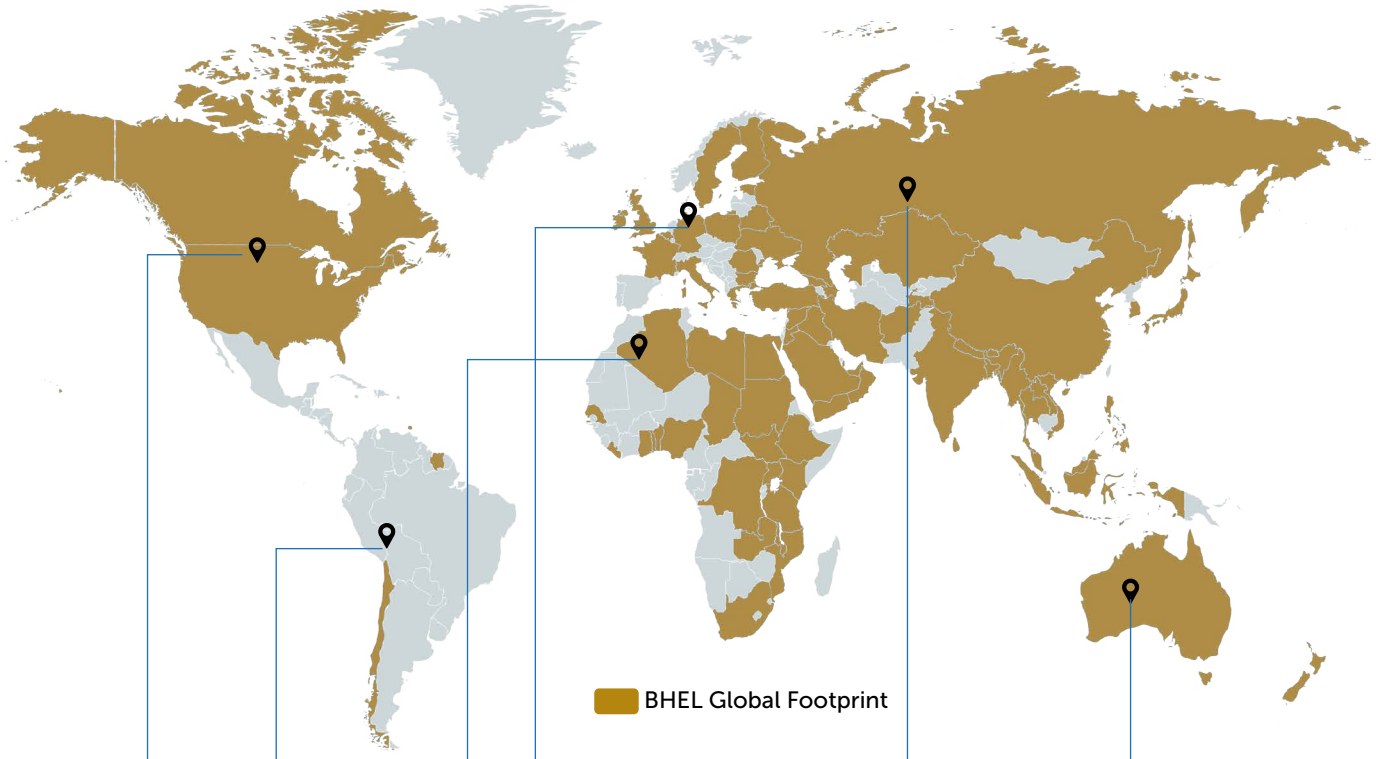
Growing with society

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

Innovation

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

BHEL Global Footprints



North America
Canada
United States of America

South America
Chile
Suriname
Trinidad & Tobago

Europe
Belarus, Belgium, Bulgaria, Cyprus, Estonia, Finland, France, Georgia, Germany, Greece, Iceland, Italy, Malta, Poland, Romania, Russia, Sweden, Switzerland, Turkey, Ukraine, United Kingdom

Africa
Algeria, Benin, Chad, Comoros, DR Congo, Egypt, Eswatini, Ethiopia, Ghana, Kenya, Libya, Liberia, Malawi, Mauriius, Mozamique, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe

Asia
Afghanistan, Azerbaijan, Bangladesh, Bahrain, Bhutan, China, Hong Kong, Indonesia, Iran, Iraq, Japan, Jordan, Kazakhstan, Kuwait, Laos, Malaysia, Myanmar, Nepal, Oman, Philippines, Saudi Arabia, Singapore, South Korea, Sri Lanka, Syria, Taiwan, Tajikistan, Thailand, U.A.E, Vietnam, Yemen

Oceania
Australia
New Caledonia
New Zealand
Samoa

with presence in
86 countries
in all six inhabited continents

This graphical representation does not purport to be the physical map of the world

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

For BHEL's product profile, readers may refer to BHEL's Annual Report 2020-21 (AR 20-21) page 324-331 which can be accessed through the web link https://www.bhel.com/annual-report-2020-21

For the details of profile and performance of different business segments of BHEL, the readers may please refer to BHEL's AR 20-21 page 36-63.

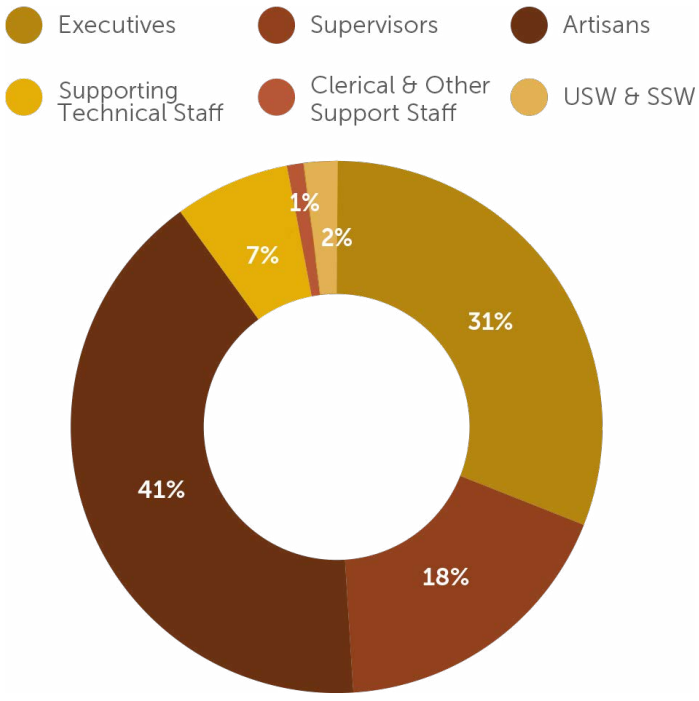
Human Resource

People are the greatest asset for an Engineering organization and our organization has taken up a number of initiatives for developing a dedicated and motivated workforce. The company's Performance Management System has been revamped with a focus on closely linking company's reward system to individual as well as company performance. Other initiatives include focus on manpower development through training/retraining of the workforce in this dynamic business environment, development of e-Modules for ensuring continual training of workforce, leadership development, strengthening of internal communication, simplifying policies for making them employee centric, etc.

A key role was played by the HR function in the Company during the Covid-19 pandemic to ensure safety and security of all its employees and their families. Multiple initiatives were undertaken to tackle the dynamic situation pertaining to the pandemic and adequate support and medical help was provided to all concerned employees.

A result of all these initiatives resulted in BHEL being ranked 7 in the 'Times Ascent Dream Companies to Work For' survey by 'World HRD Congress', and winning the Platinum Award under 'APEX India HR Excellence Award- 2020' for excellence in HR practices in Engineering Sector, among others

Distribution of different categories of employees in the organization is shown in the figure below.



Supply Chain of BHEL

BHEL has been supporting Micro, Small and Medium Enterprises (MSMEs) and local suppliers in and around manufacturing units from various fronts. They are part of BHEL's supply chain. There have not been any significant changes in supply chain of BHEL during the reporting period.

Policy Advocacy

BHEL is a member of many industry bodies/ Chambers viz., Confederation of Indian Industry (CII), Federation of Indian Chambers of Commerce and Industry (FICCI), Associated Chambers of Commerce and Industry of India (ASSOCHAM), Indian Electrical and Electronics Manufacturers Association (IEEMA) and Standing Conference of Public Enterprises (SCOPE). BHEL uses various mechanisms of interaction with such bodies (e.g. participation in seminars & meetings, participation in working groups etc.) for putting forth its views and opinions in matter related to policy.

Company's interests are represented via inputs to government queries, knowledge sharing, response to surveys, feedback on industry needs, formation of government policies like GST, fiscal budget, foreign trade, Company Law, Industrial Policy, Capital Goods Policy, Export Promotion etc. The company's views are presented in various inter-governmental forums such as Joint Ministerial Commission (JMC), Joint Steering Committee (JSC), Joint Working Group (JWG), Joint Trade Committee (JTC), Joint Economic and Trade Committee (JETCO), Joint Commission Economic Corporation (JCEC), Working Group on Trade (WGT), etc. to facilitate international trade and collaboration. Company also interacts with government bodies like DHI, DPE, DIPP, NITI Aayog and participates in policy formulation like National Electricity Policy, challenges of employment generation, growth and skill development, promotion of in-house R & D, Make in India, AatmaNirbhar Bharat Abhiyan for self-reliant India etc.

Company has actively contributed in a responsible manner towards development of policies meant for strengthening of technology base in country, skill development, development of Indian power sector, development of capital goods sector and Indian manufacturing industry, exports, and growth of Public Sector Enterprises.

Precautionary Approach

BHEL has a well-established Environmental Management System (EMS) accredited to ISO 14001. Based on the corporate HSE policy, all manufacturing units and regions have derived their HSE systems in line with the requirement of ISO 14001 'Environmental Management System' standard. The EMS provides an excellent framework to proactively identify and manage the risks related to environment in a systematic manner. HSE cells at all BHEL units as well as Power Sector regions oversee the implementation of HSE policy supported by Corporate HSE department at apex level to provide strategic guidance. Periodic audits are carried out by the certifying body to ensure the compliance to the EMS and requirements of ISO 14001 are met. The company's HSE policy is available on the internet and can be accessed through the web link:

https://www.bhel.com/sites/default/files/HSEPOLICY.pdf

Ethics, Transparency & Accountability

The company has a Board approved 'Code of Business Conduct & Ethics' for all Board Members and Senior Management personnel in compliance with the requirements of Department of Public Enterprises (DPE) Guidelines on Corporate Governance for CPSEs and SEBI's Listing Regulations.

https://www.bhel.com/code-business-conduct-ethics-boardmembers-senior-management-personnel

The Board has a laid down Charter of the Board of Directors which clearly defines the roles and responsibilities of the Board and individual Directors. Further, the company endeavours to preserve the confidentiality of unpublished price sensitive information and prevent misuse of such information. Towards this, a Board approved policy 'BHEL Code of Conduct for Regulating & Reporting trading by Designated Persons & their Immediate Relatives and for Fair Disclosure' in line with SEBI (Prohibition of Insider Trading) Regulations - 2015 and Listing Regulations directs that Board members and other Designated Employees of the company have a duty to safeguard the confidentiality of all such information obtained in the course of their work at the company. The Code also provides for practices and procedures for fair disclosure of unpublished price sensitive information (UPSI).

https://www.bhel.com/code-conduct-prevention-insidertrading

For effective implementation of the Insider Trading Code, an internal Operating Guidelines is in place. A structured digital database containing names of all 'Designated Persons' along with details of additional persons with whom UPSI was shared is in place. Details of initial and continual disclosures are being submitted by these Designated Persons within prescribed timelines. In addition, emails notifying the 'Designated Persons' that they are in possession of UPSI and that they must ensure its confidentiality, is sent simultaneously along with the emails intimating Closure of Trading Window. A separate email is also sent to those persons with whom UPSI is shared by the 'Designated Persons'.

In line with the requirements of DPE Guidelines on Corporate Governance and the Listing Regulations, BHEL provides progress reports on quarterly basis to DHI and stock exchanges. The audit of the Company's compliance with corporate governance requirements as well as secretarial audit of BHEL's compliance with statutory laws is conducted each year and the said reports form part of the Annual Report of the Company. In compliance with the Listing Regulations, all Board members and Senior Management personnel affirm annually that they have fully complied with the provisions of the Code of Business Conduct and Ethics during the relevant financial year and an affirmation to this effect is given by the Chairman & Managing Director in the Annual Report of the Company. For the purpose of the 'Code of Conduct for Regulating & Reporting Trading by Insiders and for Fair Disclosure, Director (Finance) is the compliance officer of the Company. In addition, the Chief Investor Relations Officer of the Company ensures compliance of 'Code of Practice and Procedure for Fair Disclosure'.

In addition, as a part of BHEL's persistent endeavour to set a high standard of conduct for its employees (other than those governed by standing orders), 'BHEL Conduct, Discipline and Appeal Rules, 1975' is in place. This is augmented by Fraud Prevention

Policy and Whistle Blower Policy which not only arm the company against unacceptable practices but also act as a deterrent. The Company is subject to RTI Act 2005, audit by Statutory Auditors and CAG audit under section 139 of the Companies Act, 2013.

https://www.bhel.com/bhel-fraud-prevention-policy-0

https://www.bhel.com/whistle-blower-policy-0

BHEL has signed MoU with Transparency International India (TII) to adopt 'Integrity Pact' to make procurement and contracting more transparent by binding both the parties to ethical conduct. A panel of two Independent External Monitors (IEMs) has been appointed to oversee implementation of Integrity Pact in BHEL, with due approval of Central Vigilance Commission. Within BHEL, accountability is well defined for various functionaries through 'Delegation of Power'. Works Policy, Purchase Policy and other policy documents facilitate transparency in BHEL's working and commitment of highest order of integrity. In addition, Internal Audit carries out independent audit of purchase/ works contracts. Four representations received from suppliers during 2020-21 under Integrity Pact have been resolved by the IEMs.

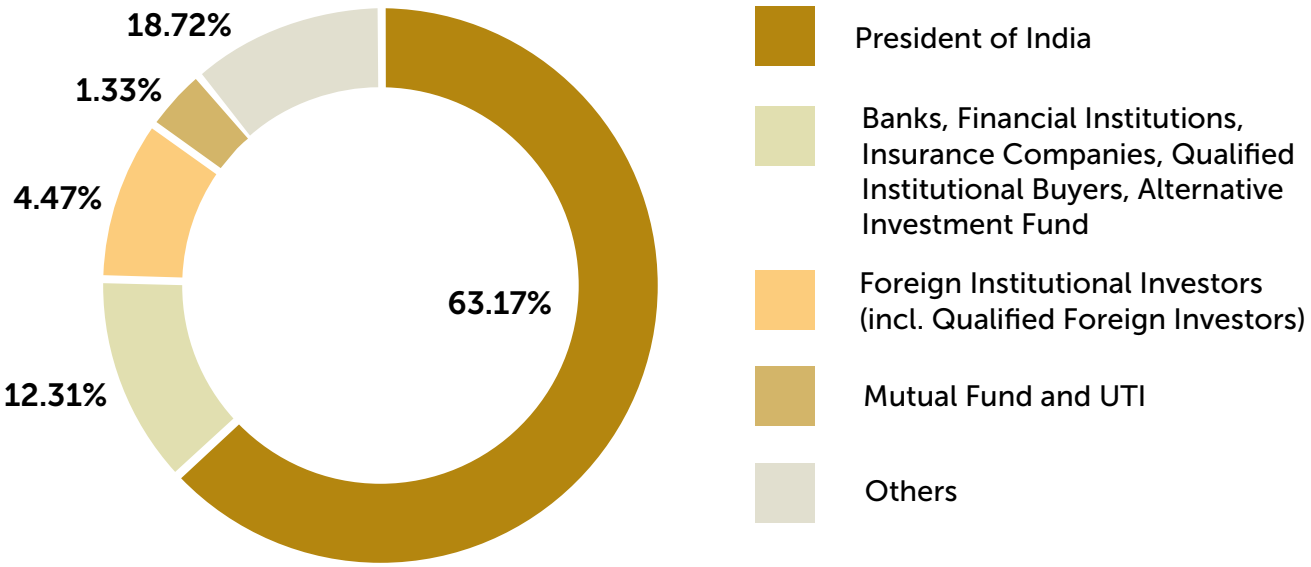
The Company has a Stakeholders Relationship Committee specifically to look into matters related to redressal of shareholders' and investors' complaints. As reported by KFin Technologies Private Limited (RTA of the Company upto December 31, 2020) and Alankit Assignments Limited (RTA of the Company w.e.f. January 1, 2021), 265 complaints were received from the shareholders during the year under review and all complaints were redressed up to March 31, 2021.

In addition, a total of 225 public grievance complaints were received from the general public under the Centralized Public Grievance Redressal and Monitoring Scheme during the year 2020-21. All the grievances were satisfactorily resolved.

Nature of Ownership and Legal Form

The Government of India is the majority shareholder of BHEL. The shareholding pattern as on 31.03.2021 is given in the diagram below. For the details about shareholding pattern and changes in the shareholding pattern during 2020-21, reader may please refer to BHEL's AR 20-21 page 97.

Shareholding Pattern (as on 31.03.2021)



CORPORATE GOVERNANCE

Our Philosophy on Corporate Governance

BHEL functions within a sound Corporate Governance framework, which underlines its commitment to quality of governance, transparency in disclosures, consistent enhancement of stakeholders' value and corporate social responsibility. BHEL endeavours to transcend beyond the basic and regulatory requirements of corporate governance, focusing consistently on building confidence of its shareholders, customers, employees, suppliers and the society at large. BHEL's corporate governance framework rests upon the cornerstones of transparency, full disclosure, independent monitoring, and fairness to all, especially minority shareholders.

The following factors strengthen Corporate Governance in BHEL:

1. Independence and versatility of the Board
2. Integrity and ethical behaviour of all employees
3. Recognition of obligations towards all stakeholders – shareholders, customers, employees, suppliers and the society
4. High degree of disclosure and transparency levels
5. Full legal and regulatory compliance in all areas in which the Company operates
6. Achievement of goals with compassion for people and environment

The Company believes in conducting its business complying with Corporate Governance procedures and Code of Conduct, exemplifying each of the core values, positioning BHEL to deliver long-term returns to the shareholders, favourable outcomes to the customers, attractive opportunities to the employees, opportunity to the suppliers to partner the Company in progress, and enrichment of society.

Governance Structure at BHEL

Pursuant to Section 2(45) of the Companies Act, 2013, BHEL is a 'Government Company' as 63.17% of the total paid-up share capital of the Company is held by the Central Government through the President of India.

The composition of Board of Directors of BHEL has an appropriate mix of Executive Directors represented by Functional Directors including CMD and Non-Executive Directors represented by Government Nominees & Independent Directors, to maintain the independence of the Board and to separate the Board functions of management and control.

The composition of the Board of Directors as on March 31, 2021 is given in the table.

Category of Directors	Board Structure	Actual Strength as on 31.03.2021
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	3
TOTAL	**16**	**10**

As of March 31, 2021, there existed five vacancies of Part-time non-official (Independent) Directors (including at least one Independent Woman Director) and vacancy of Director (Power) on the Board of BHEL. The matter of filling up of these vacancies is under consideration of the Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, Government of India.

As BHEL is a government company, all directors on its board viz. Functional Directors, Government Nominee Directors and Independent Directors are selected and appointed by the government as per a well laid down process for each category of directors. The requirements of core skills, expertise and competence essential for the board to function effectively, in the context of business segment BHEL operates in, forms an integral part of the government's process of selection of these directors. Therefore, the board of BHEL by itself does not identify any such core skills, expertise or competence required for the job.

The Independent Directors play an important role in deliberations at the Board and Committee meetings and bring to the Company their expertise in the fields of engineering, finance, management, law, public policy etc. The Independent Directors are part of important Committees constituted by the Board such as the Audit Committee, Nomination & Remuneration Committee, Stakeholders Relationship Committee and CSR Committee. In terms of Companies Act, 2013 and Listing Regulations, the Audit Committee and the Nomination & Remuneration Committee are chaired by an Independent Director and function within their respective defined terms of references.

In line with DPE Office Memo. dated December 28, 2012 on Model Role & Responsibilities of Non-Official Directors for CPSEs, the Board had constituted a Committee of Independent Directors. The said Committee is in compliance with the requirements of Listing Regulations and the Code of Independent Directors under the Companies Act, 2013.

Details regarding familiarization programme of Independent Directors are available on the company's website under the heading 'Familiarization Programme for Directors' at web link:

https://www.bhel.com/familiarization-programme-directors

In the opinion of the Board, the Independent Directors fulfil the conditions specified in the Listing Regulations and are independent of the Management.

Board's Responsibilities

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. For the agenda placed before the Board, the readers may please refer to page 83-84 of AR 20-21.

In addition to the above, The Board has constituted various Committees to facilitate the smooth and efficient flow of decision making process. The minutes of all Board level committees are circulated and discussed in the Board meetings. There was no instance where the Board had not accepted any recommendation of any Committee of the Board which is mandatorily required, during the reporting period.

The following Board Level Committees have been constituted to ensure in-depth analysis & review as well as to provide requisite guidance, advice and recommendations on important matters:

1. Board Level Audit Committee,
2. Stakeholders Relationship Committee,
3. Share Transfer Committee,
4. HR Committee,
5. Board Level Committee for CSR,
6. Committee of Independent Directors,
7. Nomination & Remuneration Committee,
8. Board Level Risk Management Committee,
9. Committee on Arbitration & Major Legal Disputes,
10. Board Level Project Review Committee,
11. Board Level Committee on Alternative Dispute Resolution,
12. Buy Back Committee

Charter of the Board of Directors

The Board has a laid down the Charter of the Board of Directors which clearly defines the roles and responsibilities of the Board and individual Directors. Further, the company endeavours to preserve the confidentiality of Unpublished Price Sensitive Information (UPSI) and prevent misuse of such information. Towards this, a Board approved policy, namely 'BHEL Code of Conduct for Regulating & Reporting Trading by Designated Persons & their Immediate Relatives and for Fair Disclosure' in line with SEBI (Prohibition of Insider Trading) Regulations - 2015 and Listing Regulations directs that Board members and other Designated Employees of the company have a duty to safeguard the confidentiality of all such information obtained in the course of their work at the company. The Code also provides for practices and procedures for fair disclosure of UPSI.

https://www.bhel.com/code-conduct-prevention-insider-trading

BHEL Board has approved a policy for Training of Directors in line with the DPE guidelines, listing agreement and with the objective of providing the Directors:

a. insight into guidelines and procedures for successful discharge of their statutory duties,
b. a better understanding of the business environment to envision the future and develop strategies,
c. need based training to meet the specific requirements of the board members.

It covers both general and specific trainings more tuned towards company specific areas.

Delegating Authority

BHEL Board has constituted 12 Board Level Committees. For details about these board-level committees, their Terms of Reference, Composition of Committee, Name of Members & Chairperson, meetings and attendance, readers may please refer to pages 85-93 of BHEL's AR 20-21.

In pursuance of the DPE Guidelines on Corporate Governance for Central Public Sector Enterprises and Clause 49 of the Listing Agreement between listed Companies & the Stock Exchanges and Section 177 of the Companies Act, 2013, a detailed Whistle Blower Policy was drafted by the Company and it was duly approved by the Board of Directors in its 464th meeting held on August 12, 2014. The policy is also in line with Listing Regulations. Subsequent to this, a circular notifying the Whistle Blower Policy and informing the

contact details of the Competent Authority and of Chairman, Audit Committee was issued for the notice of all employees. A copy of the Whistle Blower Policy has also been placed on the website of the Company for wide publicity. Changes in address, contact number(s) and email address of the Competent Authority and Chairman, Audit Committee are being notified from time to time.

The complaints received under the Policy are being processed as per the guidelines in this regard. For other details related to Corporate Governance, the readers may please refer to pages 81-97 of BHEL's AR 20-21.

Diversity and Inclusivity

BHEL is a pan India Organization and recruitment is open to all eligible candidates irrespective of States and communities. BHEL has 5.89 % of its workforce as Women Employees. The overall representation of SC, ST, and OBC employees in total manpower as on 31/12/2020 was 20.69%, 7.41% and 35.10% respectively. During the year 2020, no recruitment took place. One candidate recruited in 2019 joined in 2020.

In the year 2019, 10% reservation was introduced for Economically Weaker Sections (EWS) who are not covered under existing reservation for Scheduled Castes, Scheduled Tribes and the Socially & Educationally Backward Classes.

Although the candidates who join BHEL belong to different demographics in terms of qualifications, culture, location, religion etc., BHEL ensures technical and cultural fitment of these candidates as per our Vision Mission Value statement.

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

Feedback Mechanism

Shareholders can 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. Further, shareholders have a dedicated email-id viz. shareholderquery@bhel.in to communicate with the Company.

Risk Management

BHEL has in place a Board approved Risk Management Charter & Policy which provides overall framework for Risk Management in the company. The objective of the charter is to ensure that the risks are being properly identified, assessed and effectively managed by adopting suitable risk mitigation measures. The company has 3-layer risk management framework. At the first level, the Board Level Risk Management Committee (BLRMC) of the company is assigned with the responsibility of reviewing the company's Risk Governance structure, Risk Assessment & Risk Management framework, Guidelines, Policies and Processes thereof. Risk Management Steering Committee (RMSC) at the second level is responsible for adopting & implementing the risk management framework and leading the risk management initiative across the company. Chief Risk Officer (CRO), the convener of BLRMC & RMSC, is responsible for periodic reporting on risk management to Board/BLRMC. Key risks being faced by the company are analysed starting from the Unit level for their respective areas to prepare risk mitigation plans and to ensure implementation.

Some of the key risks the company faces and corresponding strategies for mitigation are mentioned in the table below:

Risk Statement	Mitigation Strategies
Excess domestic manufacturing capacities, changes in business mix due to policy changes and increasing competition leading to lower Order Book	• Cater to opportunities arising out of 'AatmaNirbhar Bharat' and 'Make in India' missions. • Increasing non-coal based and spares business. • Thrust on Strategic tie-ups for venturing into new areas.
Delayed delivery of projects leading to LDs, penalties, customer dissatisfaction and impacting company image	• Implementation of 'Integrated Project Management Software (IPMS)' for real-time project monitoring & for taking proactive actions to arrest delays. • Implementation of PEDM system (Project Engineering Documentation Manager) to expedite drawing/ document submission & approval. • Formation of dedicated business groups to exclusively focus on projects of major customers. • Policy enablement to improve contractor manpower availability and encourage contractor performance at project sites. • Monitoring framework for sequential supplies for seamless execution • Activities like engineering etc., to commence at pre award stage
Rising debtors	• Constitution of Cross Functional Teams for improved efficacy of cash realisation from every element of debtors against Ongoing as well as Commissioned projects. • Action against defaulting customers in line with the Trade Receivables policy of the company including Arbitration/NCLT/ AMRCD proceedings.
Rising direct material cost affecting profitability	• Formation of Cost Optimization Cell (COC), headed by Executive Director level official, to provide focused & sustained approach on cost reduction efforts in the company. • Focused approach for cost reduction in the direction of design optimisation, engineering excellence and judicious procurement right from customer ordering till execution stage.

Risk Statement	Mitigation Strategies
Technology readiness to meet current/ future market requirements	• Formation of Emerging Technology Strategy Desk headed by Executive Director level official, for exploring opportunities in emerging technology areas. • Since the focus of the company is to increase the share of non-coal business, technology development projects as well as tie-ups/ collaboration agreements with world class global OEM's are underway currently. • Steered by DHI, the AUSC R&D phase of technology development has been completed in Dec'2020. BHEL is now geared to set up 800 MW Technology Demonstration Plant. • Development and upgradation of technologies through inhouse efforts
Online data & information security breach leading to loss and critical information infrastructure breakdown	• All Internet traffic is monitored 24X7 through the Cyber Security Operations Center (SOC) integrated with the Global Threat Intelligence (GTI) database. • Integration of all the internet routers of BHEL with "Cyber Swachhta Kendra" (Botnet Cleaning and Malware Analysis Centre of CERT-In, MeitY). • Integration of Information Security Management System (ISMS) across all the ISO 27001 certified BHEL units.

Stakeholder Identification & Engagement

There has been no change in our stakeholder identification and engagement, process for defining report content and aspect boundary w.r.t. previous report(s). For details of the same, readers may please refer to page 12-14 of BHEL's Sustainability Report 2018-19 which is available on https://www.bhel.com/sustainability-reports.

Reporting Practice

BHEL follows the practice of publication of its annual Sustainability Report. BHEL's Sustainability Report for 2020-21 is available on www.bhel.com.

The present sustainability report captures the brief progress made by our organization while traveling through the path of sustainability during 2020-21. The data on environmental standard GRI 301: 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). The report has been prepared in accordance with GRI Standards with comprehensive option. No external assurance has been sought from any agency for BHEL's Sustainability Report 2020-21.

For any clarification / suggestion on the report the reader may please write to corphse@bhel.in

OUR ECONOMIC PERFORMANCE

Management Approach – Economic

The past year has indeed been a year of great challenge with the COVID-19 pandemic affecting economies across the globe, including the Indian economy. The pandemic also seriously affected our company's performance. However, the company has shown resilience in dealing with the situation and supplemented the national efforts while at the same time worked towards strengthening its own foundations for long term growth.

From the initial days of the pandemic itself, BHEL has been at the forefront in ensuring the safety and well-being of its employees, their families and supporting the society at large. This continued in the second wave as well, with the company supplying over 5,75,000 Cu Mtrs, i.e., over 80,000 cylinders of medical oxygen. BHEL was, in fact, the major source of emergency medical oxygen for Uttarakhand, Western UP, city of Bhopal, etc., which resulted in saving many lives. We have further developed and supplied medical oxygen plants for hospitals, in collaboration with CSIR-IIP, in record time. BHEL also developed and manufactured disinfection equipment for mass sanitization of towns and cities, and upgraded company's hospitals and dispensaries. In keeping with its ethos as a caring company, BHEL introduced an assistance scheme for taking care of families of employees who unfortunately succumbed to the pandemic.

While the second wave of COVID hit the country and company hard, BHEL took steps for ensuring rapid recovery of operations and made efforts for mitigating the effects of any further waves. Company did this by making workplaces COVID compliant and organising extensive vaccination campaigns at its units as well as project sites. The company endeavoured to ensure vaccination of not just employees and their families, but also of all persons working in these premises. To avoid any stoppage of work due to non-availability of oxygen (as happened in the second wave) as well as to support the community at large, in case of any future eventuality, we are additionally installing oxygen generation plants in those units which do not have oxygen production facilities at the moment.

The past year has been a year of consolidation for the company, wherein a number of initiatives taken up in the previous years have come to bear fruit and are playing a vital role in efforts towards building a BHEL of the future. The company has focused on revamping project execution through successful implementation of the IPMS (Integrated Project Management System) supplemented with the ongoing Site Data Digitization Project, ensuring sequential dispatches, closure of punch points, and switching over from Revenue Centric to Project Centric philosophy.

Economic Value Created

During FY 2020-21, the company has incurred a loss of ₹2717 Crore as against a loss of ₹1473 Crore during FY 2019-20, mainly due to lower revenue, higher material cost and additional merit based provisioning of about ₹1800 Crore. Based on a comprehensive review, the provisioning was done as a matter of utmost financial prudence so as to strengthen the receivables management process and improve the quality of assets in the balance sheet. However, stringent budgetary control measures and reduction in operating expenses resulted in restricting the loss.

The company secured orders worth ₹13,472 Crore in FY 2020-21. This comprises orders worth ₹8,984 Crore in the Power segment, ₹4,283 Crore in the Industry segment and ₹205 Crore in International operations. The order book outstanding at the end of March 31, 2021 was around ₹1,02,090 Crore against ₹1,08,443 Crore as on March 31, 2020. The order book figures are inclusive of applicable taxes.

Defined Benefit Plan

The Company has following Schemes in the nature of Defined Benefits Plans:

- Gratuity Scheme
- Post-Retirement Medical Benefit (PRMB) Scheme
- Provident Fund Scheme
- Travel claim on Retirement

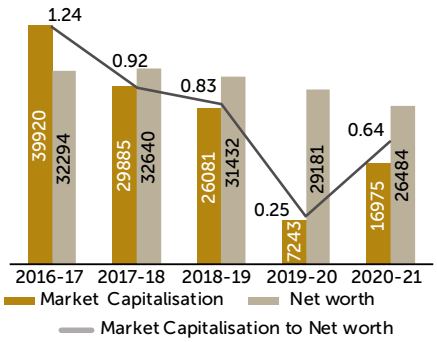
For details about the same, reader may refer to page 207-217 of BHEL's Annual Report 2020-21.

Government grant was received for setting up of solar PV plant and manufacturing of modules which as on 31st March, 2020 stood as ₹25.04 crore.

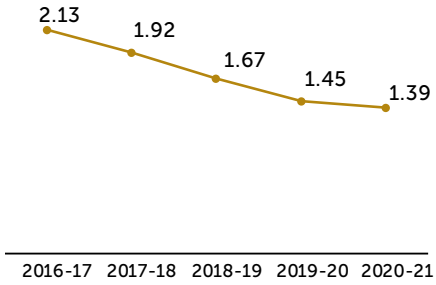
YEAR at a GLANCE 2020-21

(Figures are in ₹ crore unless otherwise stated)

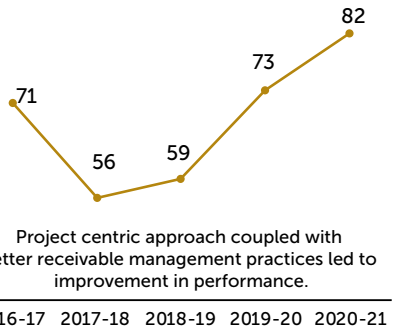
Market Capitalisation to Net Worth



Current Ratio

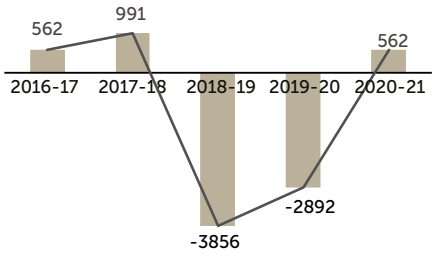


Liquidation out of current year net billing %

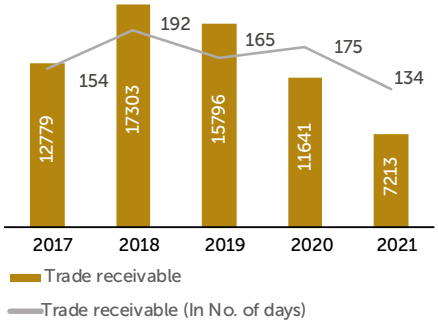


Project centric approach coupled with better receivable management practices led to improvement in performance.

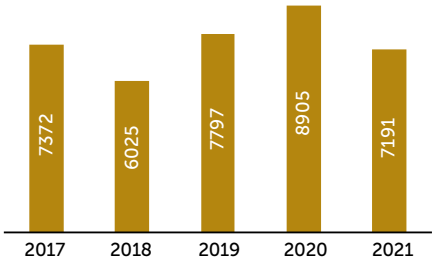
Cash flow from operating activities



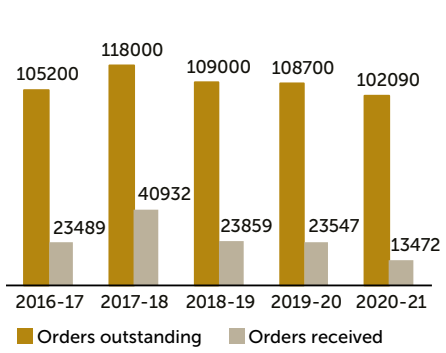
Trade Receivables and no. of days



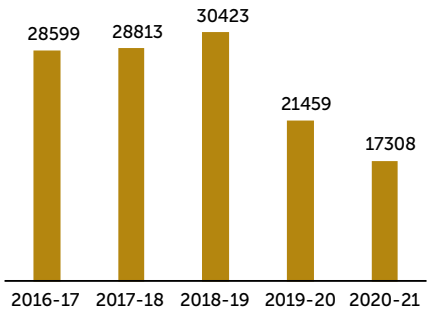
Inventory position



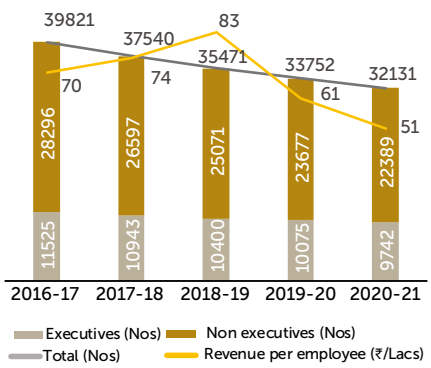
Order outstanding and received



Revenue from Operations



Manpower (nos) and Revenue per employee (₹ Lacs)



OUR ENVIRONMENTAL PERFORMANCE

Management Approach – Sustainability

Sustainable Development tenets are ingrained in the business processes of BHEL and our mission statement – "Providing Sustainable business solutions in the fields of Energy, Industry & Infrastructure" bears the testimonial of the same.

Sustainability is a continuous journey which helps us in reaching newer summits of corporate excellence through implementing sound corporate governance framework, enhancing stakeholder value, reducing environmental footprint of our products & services as

well as internal processes, promoting inclusive growth in the society, and enhancing brand equity.

BHEL manages its environmental impact across the entire manufacturing value chain in a responsible manner. Internally, various initiatives are in place to optimally manage key aspects of materials, water, energy, emissions and biodiversity in the larger interest of society. In addition, we also facilitate our customers in managing their environmental and social impacts throughout the entire operational lifecycle of the power plants by offering them state-of-the-art engineering and technology inputs for reducing greenhouse gas emissions - as well as water consumption, better heat rate, less auxiliary power consumption with less fuel requirement resulting in lesser environmental footprint of our products and services.

Major products which address environmental concerns in their design are power plants operating with steam at supercritical parameters, Flue-gas Desulfurization (FGD) systems, Selective Catalytic Reduction (SCR) systems, Solar Photovoltaic plants, Electrostatic Precipitators (ESP), Effluent Treatment Plants and Sewage Treatment Plant (STP). There is also conscious effort towards reduction of embodied carbon in products. Company has opted to replace polluting fuels with cleaner ones, e.g., gas is now used as a source of heat energy (instead of coal earlier) during production of products like Ceralin.

As sustainable business solution provider, the product offerings in the field of renewable energy includes:

- EPC solutions from concept to commissioning of Solar PV Power Plants with or without BESS (Battery Energy Storage System).
- Ground Mounted, Roof Top, Canal Top and Floating Solar Power Plants.
- Solar-based irrigation and drinking water pumps
- Solar Inverters for utility as well as traction applications
- Loose Solar PV Cells and Modules meeting Domestic Content Requirement (DCR) of MNRE

BHEL's solar portfolio is 1200 MW+ with solar PV plants commissioned across the Nation- ground mounted, roof top, canal top & floating solar PV plants.

We have commissioned 170 MW SPV plants during FY 2020-21 including:

- 50 MW SPV plant for GSECL at Dhuvaran, Gujarat

5 MW AC Grid Connected Floating Solar PV project at Sagardighi Thermal Power Plant commissioned by BHEL

The Delhi-Chandigarh Highway has become the first e-vehicle friendly highway in the country, with a network of Solar-based Electric Vehicle Charging stations (SEVCs) set up by BHEL under the FAME-1 scheme of the Ministry of Heavy Industries

- 39 MW & 30 MW SPV plants for SCCL at Yellandu and Ramagundam, Telangana
- 5 MW Floating SPV for WBPDCL at Sagardighi, among others

BHEL is Nation's leading EPC player in the floating solar PV segment. Several large scale floating solar power plants including 100 MW NTPC Ramagundam, 25 MW NTPC Simhadri, and 22 MW NTPC Kayamkulam are being currently executed simultaneously. BHEL also commissioned 5 MW Floating SPV plant at Sagardighi, one of the largest floating solar power plants in India at the time of its commissioning, in addition to 5 MW floating SPV plant at Simhadri during the year.

Strengthening its technology capabilities, BHEL has indigenously developed Passivated Emitter and Rear Cell (PERC) technology for high efficiency crystalline silicon (c-Si) solar cells, with maximum efficiency of 21.7%, and average efficiency of 21.08%.

Further, we provide complete water management solutions for sustainable use of water resources for power plants, industries and municipal applications through:

- Pre Treatment Plants (PT)
- Sea Water Reverse Osmosis (SWRO) and Demineralization (DM) Plants
- Effluent Treatment Plants (ETP)
- Sewage Treatment Plant (STP) and Tertiary Treatment Plants (TTP)
- Zero Liquid Discharge (ZLD) Systems
- Eco-friendly solutions for water bodies' purification

Also we are into the business of providing solution for e-mobility and Battery Energy Storage System (BESS). Achievement in these areas for the year are as follows:

- Entered in a MoU with IOCL for co-operation in setting up EV Charging stations at IOCL retail outlets across India. Under this MoU BHEL has set-up EV charging stations at 6 IOCL retails outlets along Delhi Chandigarh Highway.
- Delhi-Chandigarh highway is the 1st highway in the country which has been made e-vehicle friendly with successful commissioning of Solar Based EV Chargers by BHEL.
- In-house developed 122KW EV charger has been tested and certified at ARAI.
- BHEL is executing its maiden BESS project of

TERI having a cumulative rating of 410 kWh, located at three different sites in the NCT of Delhi. This will be one of its kind project in India as it caters to multiple applications including Energy time shifting, power backup, DT overload management, Peak shifting, and Energy Arbitrage.

Due to use of green energy generated through the solar systems installed in-house, we have achieved a carbon footprint avoidance of nearly 25574 Metric Tonnes of Carbon Dioxide equivalent (MT CO_2-e) during FY 2020-21.

BHEL is executing its maiden order of setting up of a cumulative 410 kWh Battery Energy Storage Systems (BESS) for TERI

As a responsible corporate entity, BHEL tries to create awareness amongst the families of its employees, students, people residing in the vicinity of our physical footprint and other stakeholders as to how they can contribute towards protection of environment as an individual, by involving them in celebrating World Environment Day (WED) with wider participation. Various programmes organised during WED – 2020 included mass tree plantation, competitions for students like - poster making, quiz, slogan writing, elocution, environmental march for creating awareness about environment etc.

The initiatives taken under environmental sustainability during the reporting period have been enumerated in the following sections.

Material and Natural Resource Management

As an organization involved in manufacturing of plethora of products & systems, BHEL is well aware of its responsibility towards sustainable use of natural resources including raw material. Towards resource conservation activities, the principle of Reduce-Recycle-Reuse is extensively used in our planning and operations. For instance reuse of 1200 MT of Mild Steel Scrap and 32 MT of copper scrap in the foundry shop of Bhopal, despatch of scrap to CFFP Haridwar by sister units for manufacturing of large castings and forgings, reuse of packing wood to make cupboard for storage & packaging of products, reuse of waste oil and recycling of hydraulic oil optimization of nesting plan for sheet cutting to avoid wastage, recovery of 35 MT of oil from the oil skimmer and coolant treatment plant at HEEP Haridwar, reclamation and reuse of 820 MT of sand in foundry shop of HEP Bhopal are some of the activities reflecting our efforts towards sustainable natural resource consumption in our operations during FY 2020-21.

The materials mainly used in our operations have been grouped together and reported in the table.

Statement for raw materials and components consumed (₹ Crore) (page 232, 279 , 320 of AR 2020-21)

	2016-17	2017-18	2018-19	2019-20	2020-21
Group of materials:					
Ferrous materials	2021.85	2431.11	3461.21	3054.31	1721.12
Non-ferrous materials	277.64	333.09	313.91	217.01	137.96
Insulating materials	142.81	168.29	168.39	177.14	155.68
Insulated cables and Magnet wires	57.33	26.76	20.46	29.67	10.89
Components	5955.69	4944.14	6774.46	6122.30	4702.87
Others	4647.49	4193.06	4618.65	2179.68	1430.04
Total cost of materials consumed	13102.81	12118.35	15030.08	11780.11	8158.56
Turnover	27740	27850	29423	20495	16296
Accretion/Decretion in inventories	-994	-736	991	1042	-511
Gross Turnover	**26746**	**27114**	**30414**	**21537**	**15785**

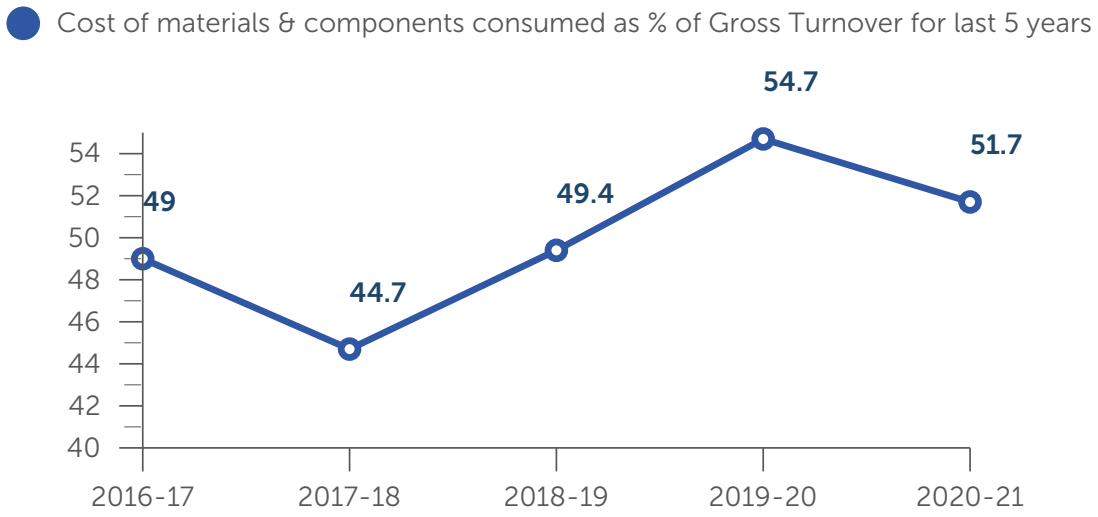
Exhibit 1: Conservation of Resource through Cut-bit utilisation at BAP Ranipet Unit

BHEL-BAP, Ranipet, a pioneer manufacturing unit, catering to the needs of Power Plant Boiler Auxiliaries, Flue Gas De-sulphurization system, Water Systems etc. is major consumer of steel as the raw material for the product manufacture. Typically, about one lakh tonnes of steel is utilized annually. Being an engineered product catering to the requirements of the customers, off-cuts/ wastages in material at every stage is inevitable. This may vary from 5% to 30% of the material consumed depending upon the job profile requirements of the product. To address this issue, a project of effective utilisation of cut-bit was taken up at unit.

Under this project, elaborate arrangement was made for storage, identification, retrieval and utilisation of cut-bit which was earlier sent to recyclers as scrap. Effective implementation during 2020-21 yielded a Cut-bit consumption to the tune of 3000 MT. Cut bits were issued in place of prime materials worth approx. ₹15 Crores. This innovative project attains significance cost saving as well as augment the efforts of the organization in resource conservation with recurring benefit.

Direct material cost as % to turnover has improved in FY 2020-21 as compared to FY 2019-20. It may be noted that due to varied nature of products and associated input materials across the organization, measurement of material consumption in terms of weight or volume of raw materials consumed in physical terms as per Global Reporting Initiative (GRI) standards could not be established and consequently the actual trend of material consumption could not be established at present in absolute physical terms. However, the

data is reported using the metric Cost of materials & components consumed as % of Turnover for last 5 years and the graph is shown here.



Sustainable Energy Management

Sustainable use of energy across our premises is an important element of business decision making process. We have taken numerous initiatives for energy conservation / efficiency which has resulted in substantial saving in our energy consumption. Some of our units which were considered as energy-intensive, have undergone the detailed energy audit process and subsequently obtained ISO 50001 certification to harness energy saving opportunities to the extent feasible.

Reduction in lighting load through switching to energy efficient lighting fixtures in offices/street lighting is a regular activity in our organization. Activities like reconditioning of refractory bricks of 10 Ton Furnace leading to efficient utilization and reduction in fuel consumption at BAP Ranipet, optimization of capacity of air compressor at EDN Bengaluru and HEEP Haridwar, replacement of 538 Nos. 1 & 2 - star ACs with latest 5-star rated ACs and replacement of LPG Cylinder by PNG Gas by laying Natural Gas Line for Canteen no. 3 & 5 at HEEP Haridwar, overhauling and modification in hydraulic circuit of innocenti milling column machine at HEP Bhopal, etc. are some examples of the activities carried out during FY 2020-21 related to energy conservation/efficiency.

The 5-year data for energy consumption (direct & indirect) is shown in the table below. A variety of fuels such as Coal, LPG, Diesel, Super Kerosene Oil (SKO), Furnace Oil (FO), Regasified Liquefied Natural Gas (RLNG), High-Speed Diesel Oil (HSDO) etc. are being used in BHEL.

Total Direct & Indirect energy consumption in BHEL units

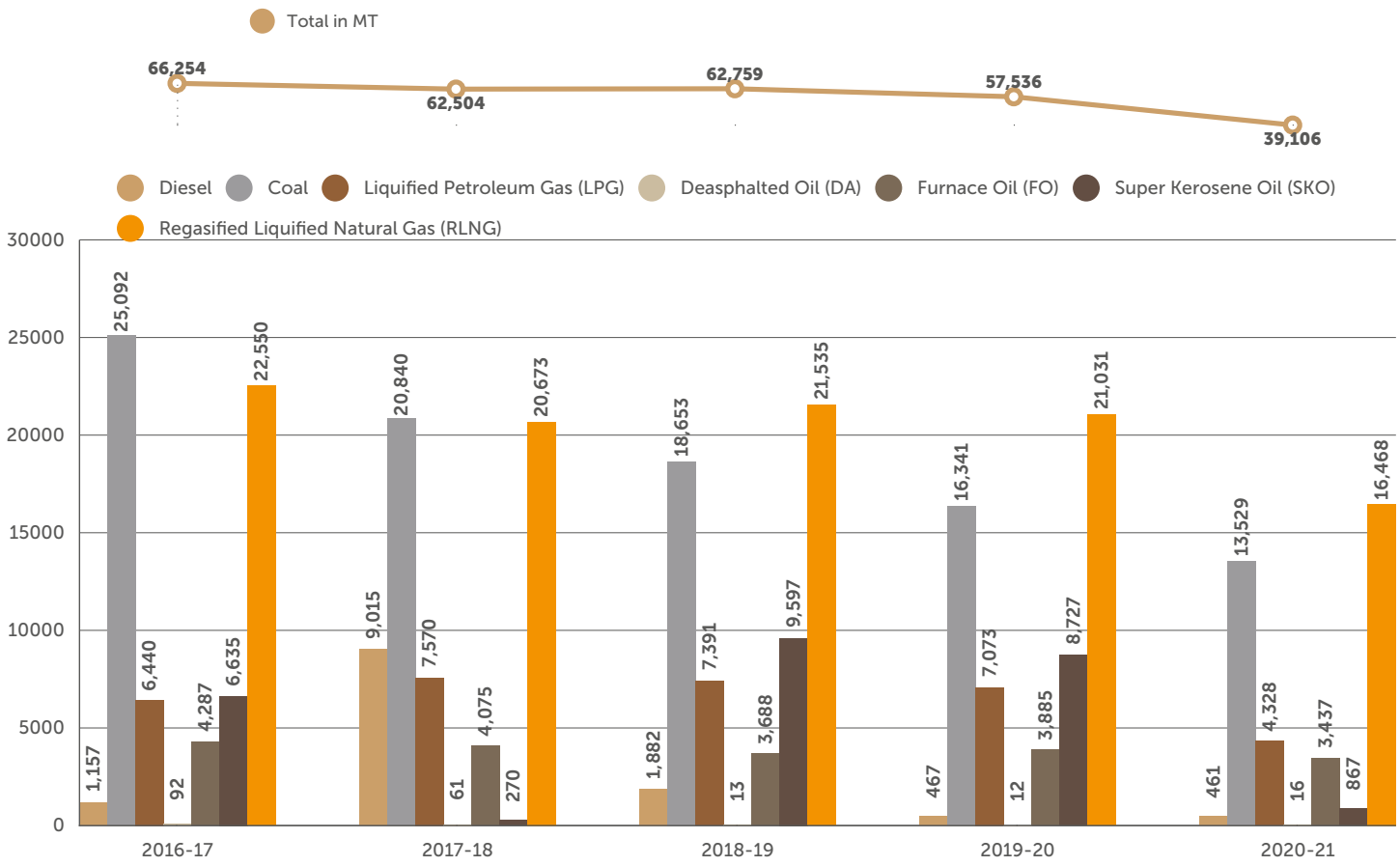
Description	Energy Consumed in TJ				
	2016-17	2017-18	2018-19	2019-20	2020-21
Direct Energy					
Primary Energy (Fuels Consumed like Diesel, Coal, LPG, Kerosene etc.)	2226.94	2398.60	2472.06	2287.28	1527.66
Primary Energy Produced (Through Solar Energy generation)	53.35	56.20	99.37	116.75	97.94
Indirect Energy					
Electricity Consumed	1160.36	1170.78	1128.38	1063.28	854.75

Description	Energy Consumed in TJ				
	2016-17	2017-18	2018-19	2019-20	2020-21
Total Energy consumed (TJ)	3440.65	3625.58	3699.81	3467.31	2480.35
Gross Turnover	26746	27114	30414	21537	15785
Energy Intensity (GJ /Lakh ₹ of GTO)	1.29	1.34	1.22	1.61	1.57
Energy Productivity (Lakh ₹ GTO achieved / GJ)	0.78	0.75	0.82	0.62	0.64

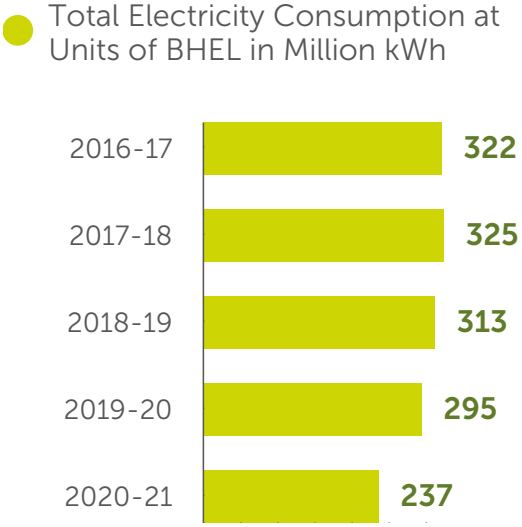
1 Tera Joules (TJ) = 1000 Giga Joules (GJ) = 10^6 Mega Joules = 10^9 Kilo Joules (KJ) = 10^{12} Joules

The following figures show our energy consumption data in different ways.

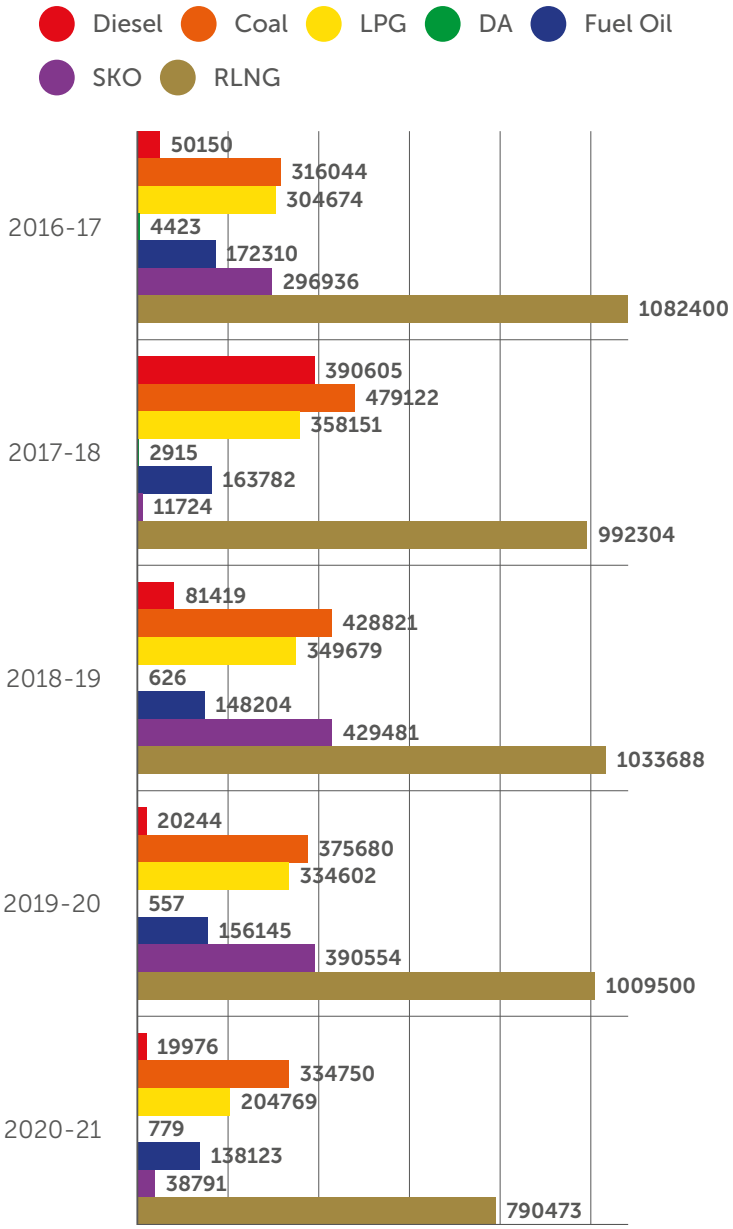
Contribution of different energy sources in total annual energy mix (MT)



As can be seen from the figure, contribution of coal in terms of weight is coming down on year on year basis in our energy mix. Overall, the fuel consumption has decreased for the current year as compared to previous year. This can be attributed to reduced economic activity and lower production of material during COVID-19 induced lockdown.

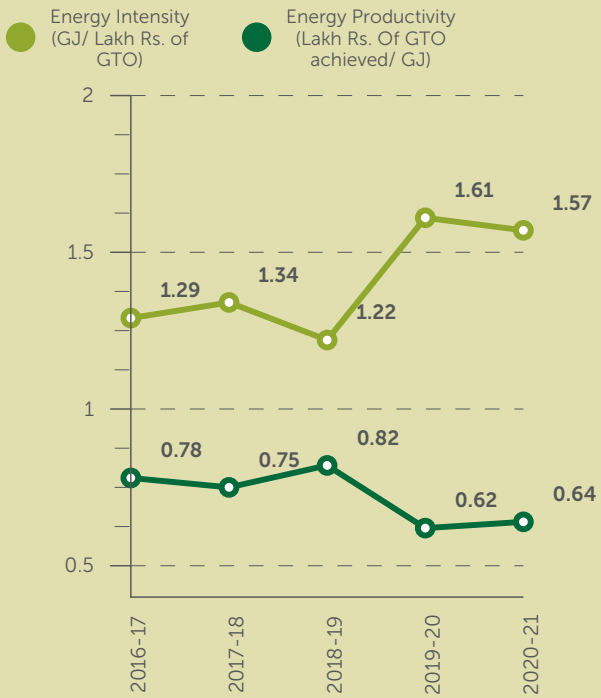


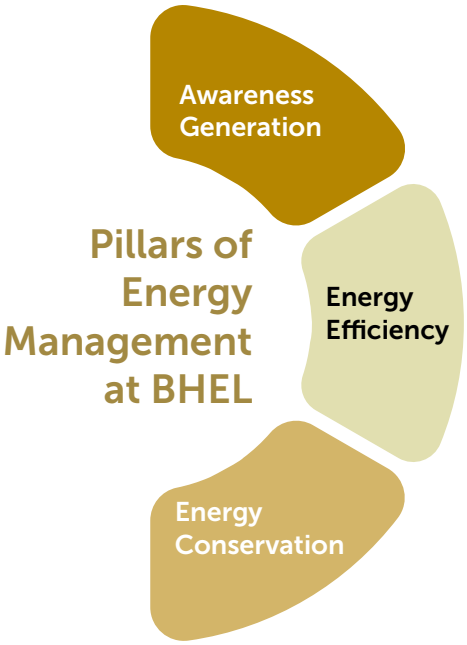
Types of fuels used and their contribution in overall direct energy mix (TJ)



As can be seen from the table, the Energy Intensity (EI) figure defined as Giga Joules of Energy consumed per lakh I of Gross Turn Over achieved, varied from 1.22 to 1.61 and the average EI stood at 1.41. Similarly, the figure for Energy Productivity (EP) defined as Gross Turnover in ₹ Lakhs per Giga joules of Energy consumed for the last 5 years varied from 0.62 to 0.82 and the average figure stood at 0.72.

Energy Intensity/productivity data





Energy Conservation/ Efficiency

Our approach towards energy conservation / efficiency is rooted in the belief that "Energy Saved is Energy Produced".

Energy conservation/ efficiency projects undertaken have resulted into significant saving in energy consumption. Detailed energy audit process has been undertaken and subsequently ISO 50001 certification has been obtained which will harness energy saving opportunities to the extent feasible.

List of various projects related to energy conservation / efficiency / renewable energy generation completed during 2020-21 at our units is given in the table below.

List of various projects related to energy conservation / efficiency / renewable energy generation completed during 2020-21 at BHEL units

Sr. No.	Unit	Project Title	Energy Saving (kWh)/Yr
1	BAP	Conversion of 2x 400W conventional High Mast Lamps to LEDs	165888
2		Conversion of conventional Street lights to LEDs	61776
3		Conversion of office lights to LEDs	103680
4		Conversion of flood lights-to LEDs	63450
5		Introducing LDSS (Load dependent Start Stop) for 3 x 1000kVA DG set using Woodward controller	26880
6	CFFP	Replacement of 50 High Mast tower lights of 400/250W by 100/120W LED Lights	18980
7		Structural revamping with improved insulation and better damper operation of HT-43	1076860
8		Replacement of 50 No street lights of 70W by 35W LED Lights	5110
9		Preheating of Boiler feed water	68372
10		Replacement of 500 No. 20W LED Tube lights in place of 28W T-5 / 40W ordinary Lights	9600
11	CFP	Utilization of 125 HP DG set in place of 320 KVA DG beyond the normal duty hours.	12791
12		Automatic switching of street and boundary lights of the plant	797
13	EPD	Energy conservation through Power factor Improvement of SPV Plant	127172
14	FSIP	Replacement of 40W FTL with 20W LED Tube light (200 Nos.)	45990
15		Replacement of 500W Flood Light with 120 Watt Flood Light (25 Nos.)	26937
16		Replacement of 70W Post Top Lantern with 40W LED Post Top Lantern (20 Nos.)	3942
17		Replacement of 250W HPMV High Bay Light with 100W LED High Bay Light (100 Nos.)	19710
18	HEEP	Reduction of no load losses of transformers by managing transformer distribution.	219000
19		Installation of energy efficient LED street Light of 45W (150Nos) and LED flood light 120W (70 nos) in place of 85W High Pressure Sodium Vapour(HPSV) Street Light and 450W Metal Halide(MH) in Street Lighting System	160846
20		Installation of energy efficient LED Tube Light 20W (13500 Nos) in place of 40W Tube Light Fitting in Offices & Corridors	350000
21		Installation of 40 Nos. 36W LED Panels in place of 2 X 36W CFL False Ceiling Panels in GM Engg. Office, Main ADM Corridor	5360

Sr. No.	Unit	Project Title	Energy Saving (kWh)/Yr
22	HERP	Separation of wiring of shop to ensure their single point operation from Substation.	30000
23		Installation of Automatic on-off system for all Street light	5000
24		Replacement of Transformer welding set with IGBT based welding machine	5000
25		Replacement of 22 KW motor of E-22 Elgi compressor with Energy efficient motor.	3000
26	HPBP	Introduction of closed circuit solar water heater system for LPG vaporizer unit(60KW) in LPG yard –MHD/ Unit-II	9600
27		Installation of 30W LED in place 65W CFL emergency lamps (50 nos.)	5110
28		Optimum Supply of compressed air to production shops (Optimum Operation of compressors, Effective usage of standalone compressors, Reducing air leakages)	200000
29		Reduction of ACs installed in HPBP by suitable redeployment of resources.	600000
30		Automatic switching OFF of auxiliary components of machineries like Hydraulic oil chillers, headstock/table gearbox oil cooling chillers during idle time.	7200
31		Optimizing of operation hours of street lights	31536
32		Optimization of Fume extraction system in STB I, II, III, IV, VI & VIII	41472
33		Optimization of fume extraction system in PPM and 20 Torch machines	36000
34	HPEP	Replacement of conventional lighting with LED lighting in all the offices of HPEP	805047
35	IVP	Installation of 10 nos. of 150 W LED lights in shop floor to replacement existing 250/350W fitting.	2400
36		Installation of 10 nos. of 200W Led lights in shop floor to replacement existing 350W fitting.	3600
37		Installation of 10 nos. of 60W Led lights in Factory to replacement existing 150W fitting.	1440
38		Installation of 50 nos. of 20W Led lights in Offices to replacement existing 2*28W T5-fitting.	918
39	PPPU	Modification in Thermocouple arrangement for 40 MT furnace:	
		Disconnection of heaters from the outdoor units of HVAC system	30222
		Optimization of energy uses by relocation of manpower / equipment at ADMIN Building	4632
		Installation of Heater-Less LPG Vaporizer	199440
40	EPD	Energy Conservation through Power factor Improvement of SPV Plant	127172

Sr. No.	Unit	Project Title	Energy Saving (kWh)/Yr
41	SSTP	Retrofitting of High-bay Luminaires with Direct mains voltage LED lamp	26280
42		Replacement of 90KW Reciprocating Compressor with 75KW Rotary Screw Compressor	126000
		Total expected energy saving per annum	**4874212**

As can be seen from the table, due to various energy efficiency / conservation projects during the reporting period, an estimated energy avoidance of more than 4.87 Million units of annual electricity usages is envisaged.

Exhibit 2:
Energy conservation by structural revamping with improved insulation and better damper operation of HT-43 Furnace

Rated furnace maximum operational temperature was 1020°C, while furnace used to show significant heat loss at operations above 900°C. Complete structural revamping and upgradation with best in-class insulation technology with, Bogie and bogie drive upgradation of HT43 furnace to maximise operational capability (temperature up to 1250°C from existing 1020 °C for AUSC & other advance material grade requirements) and the energy performance of the furnace.

After implementation of the project, Furnace operational temperature has been improved from 1020°C to 1250°C. Up to 2,00,000 SCM of Natural gas will be saved annually, which in turn will result in pollution control and resource optimisation. A verified saving of 35%-50% in daily fuel consumption has been observed in different cycles, while the consumption data is obtained and compared from averaging the consumption in identical furnace cycle before and after revamping of the furnace.

Further, due to renewable energy generation across our premises, 27.2 Million unit of electricity usages from the grid was avoided during the year 2020-21.

Green Energy Generation

BHEL has established many solar power plants across its premises for their captive use some of which are grid interactive systems. Presently, the installed capacity of ground based solar power plants is 28 MW_P. In addition, we have numerous solar rooftop installation as well which cater to local lighting requirements of the building where it has been installed. The share of renewable energy in our electricity consumption is going up, making our indirect energy consumption more sustainable.

In all these systems established inside our premises, real time monitoring of Solar Energy Generation is being done and in case of any significant dip observed during the day, the appropriate corrective measures are taken to ensure the optimal utilisation of solar generation capacity. 1.5 MW_P Solar plant at HPEP Hyderabad and its real time screen is shown in the figure.

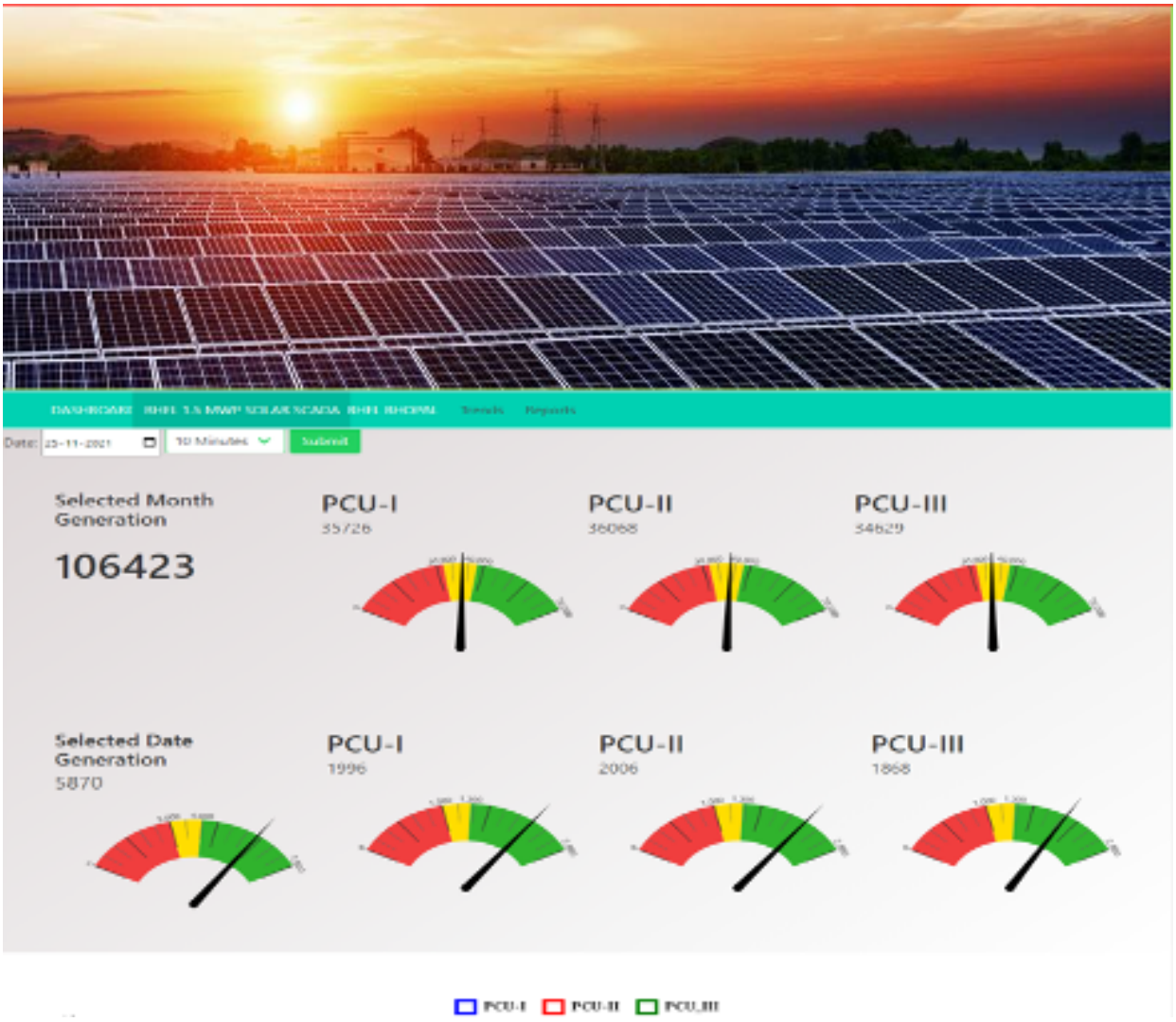


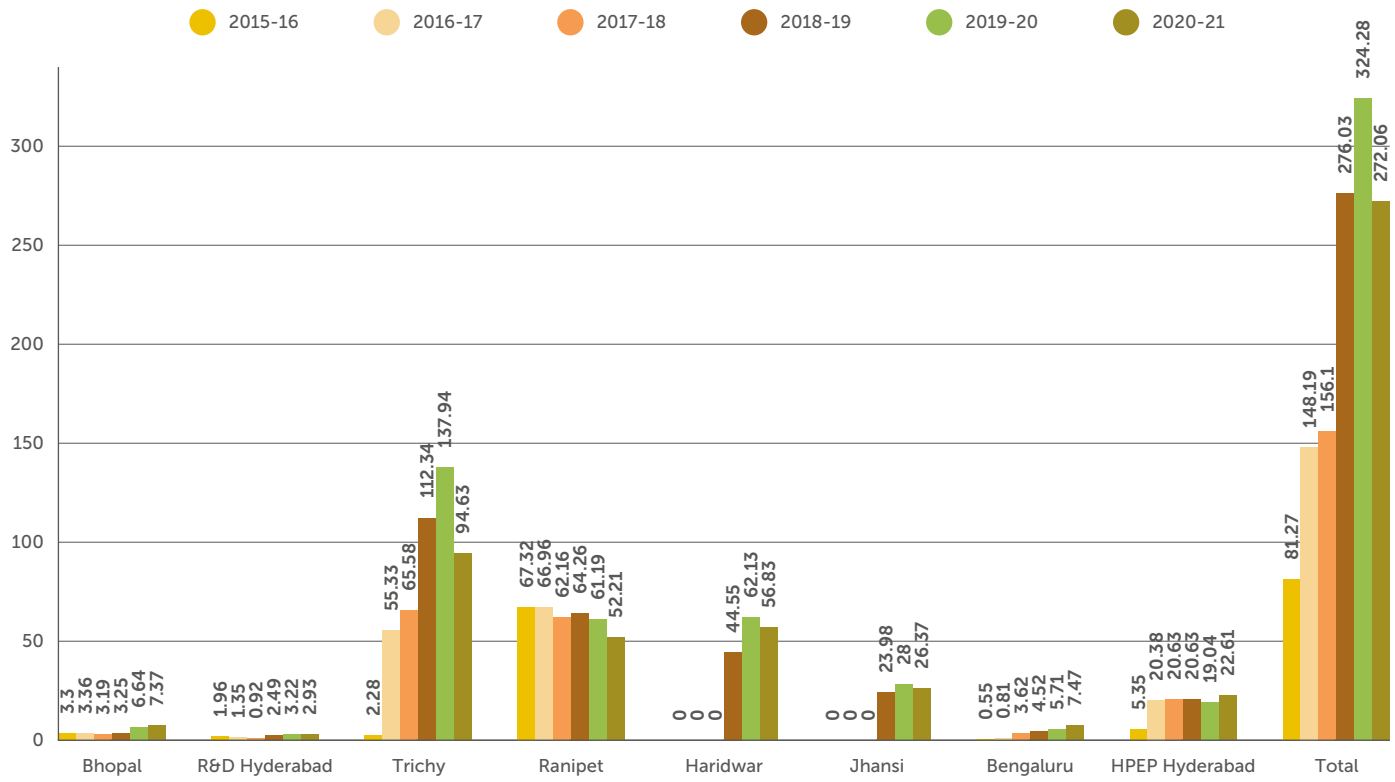
Exhibit 3:
Utilisation of rooftop for green energy generation at HEEP Haridwar

One of our unit, HEEP Haridwar has started its journey towards optimal utilisation of roof top space of its office space and shop floors by establishment of Solar PV Plant on them.

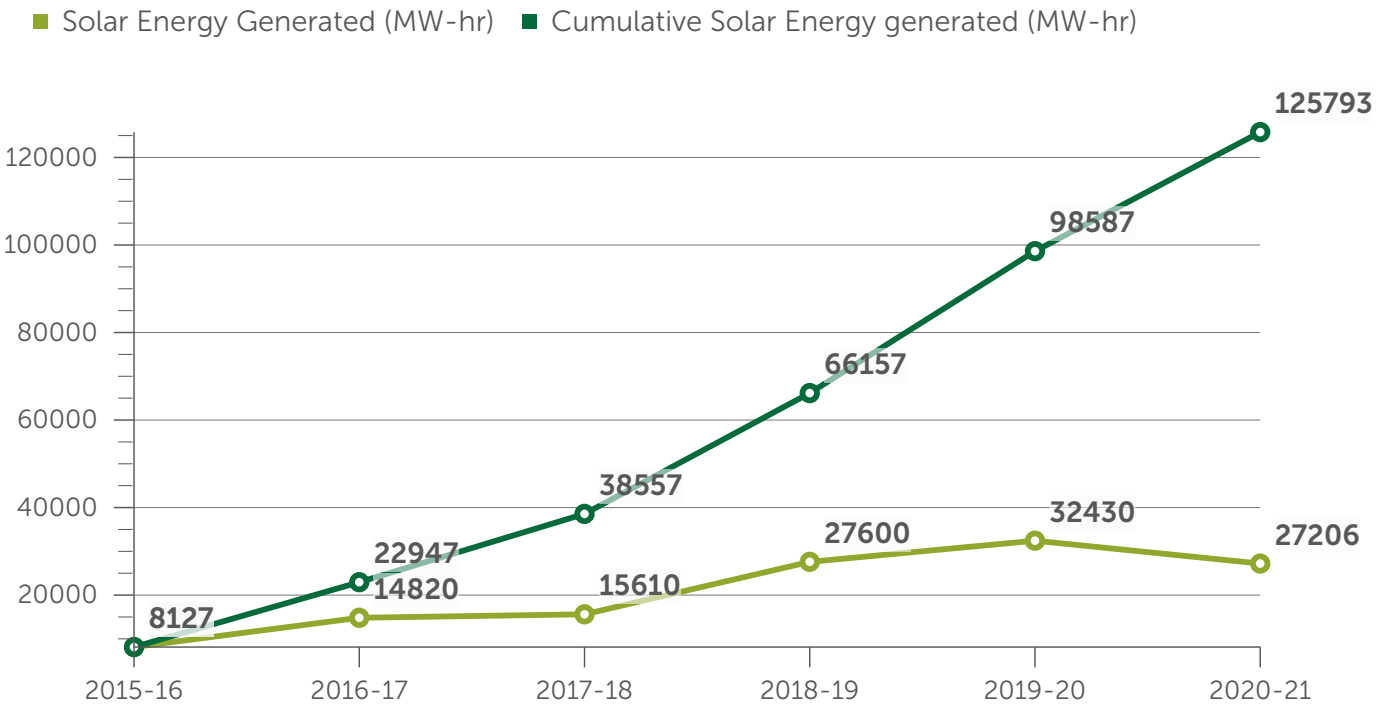
The unit has entered into contract with developer for installation of roof top solar plant on all its roofs. The developer has put up the solar plant totalling a capacity of 1 MW. In this arrangement, unit has only provided the rooftop space, and the developer has installed the rooftop solar plant on its own cost and its O&M is under his scope. The unit is paying to the developer on the basis of electricity generated by these plants. In this way, unit is getting 12 Lakh units of green electricity per annum for its use and this has led to cost saving to the tune of ₹50 Lakh Per annum in terms of difference between the amount charged by Electricity Board and Developer.

Total electricity generated through various Renewable Energy (RE) systems stood at 27.2 Million Units during 2020-21 and since 2015-16, 125.8 Million units of green energy has been generated by various solar systems installed at our premises.

Unit wise Solar Energy Generation data since 2015-16 (in Lakh Units)

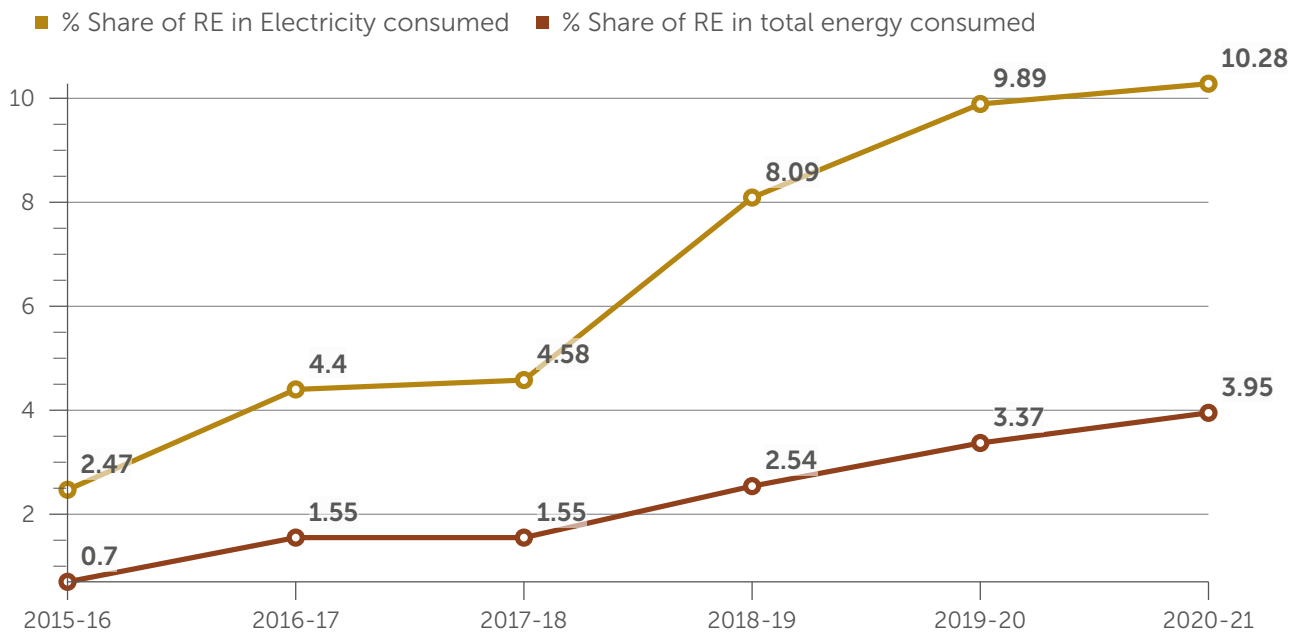


Solar Energy generated inside BHEL premises (MW-Hr)



Further, the % share of RE in total electrical energy consumed as well as total energy consumed in BHEL's energy mix is provided in the figure below. It shows that the share of RE in the total energy mix is increasing every year and is now almost 3.95% as compared to just 0.9% during 2013-14

Share of renewable energy in electrical / total energy mix (%)



Managing Water

As water is a public resource, it is the fiduciary duty of all organizations to use this precious natural resource judiciously. Further, the quantum of water available for human consumption along with its quality is also being impacted severely exacerbating the already perilous situation. In view of this fact, sustainable use of water is one of the important features of the company's management processes to optimise the water footprint of the organization to the extent feasible.

Most of the factories in our units have declared themselves as zero liquid discharge (ZLD) entities. To achieve this feat, we have established various Effluent Treatment Plants (ETP), Sewage Treatment Plants (STP), Oxidation ponds, water harvesting ponds, rainwater collection structures, Water re-circulation system, Piping and associated infrastructure for reuse of treated water etc. Water is being reused and recycled in various application like horticulture, industrial cooling, pisciculture, toilet flushing, kitchen vessel washing, construction work etc.

As on 31.03.2021, we have established 22 ETPs and 15 STPs in our units and 1 STP of 7 MLD is under final stage of construction at HEEP Haridwar unit. These STPs and ETPs help us in treatment of our trade effluent / sewage and subsequently their use inside our premises for horticulture purpose.

Many of our factories viz. HEEP & CFFP Haridwar, HEP Bhopal, HPEP Hyderabad, HPBP & SSTP Trichy, BAP Ranipet, CFP Rudrapur, IP Jagdishpur, IVP Goindwal, and PPPU Thirumayam have been declared as Zero Liquid Discharge (ZLD) entities.

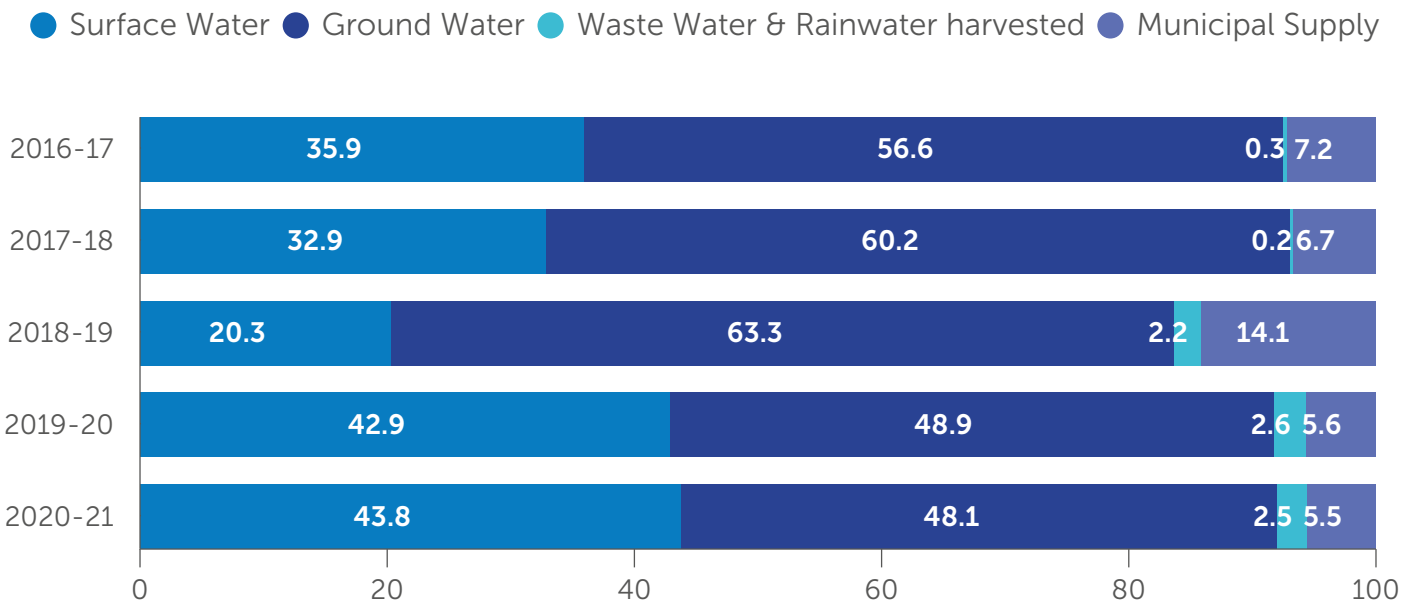
At HEP Bhopal unit 2 nos. masonry dams were constructed during FY 2020-21. The first dam can store the water quantity of 20,000 m^3 and it held the rain water from July 2020 to November 2020 in year 2020-21. The second dam can store water to the tune of 10,000 m^3 and started holding water which lasted till November. The total investment for construction of these two dams was around ₹7.5 Lakh.

All the parameters of effluents are being checked periodically and found to be within the prescribed limit as specified by respective State Pollution Control Boards.

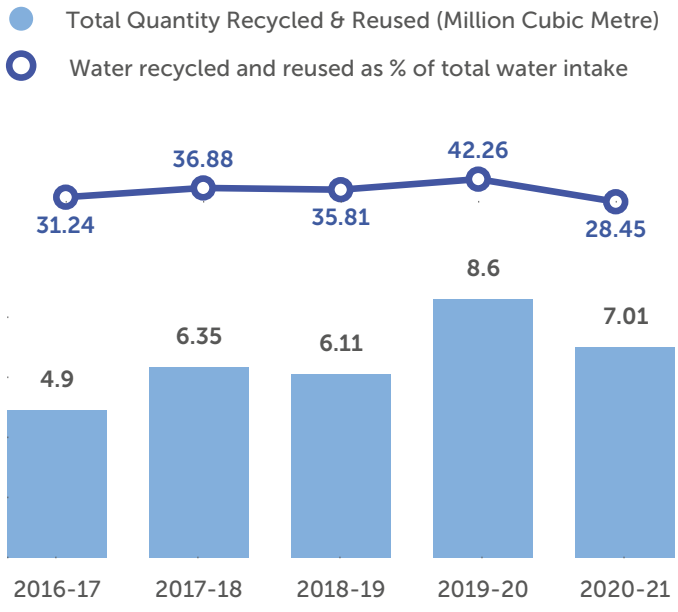
Stop Dam 1: First filling, August 2020 at Bhopal

The data for water consumption is shown in the figure below. As can be seen from the figure, the average water consumption during the last 5 years was 18.99 Million Cubic Metre. The data for 2020-21 also includes water used in the domestic use at townships. The contribution of different sources of water is also shown in the graph below

Contribution of different sources of water

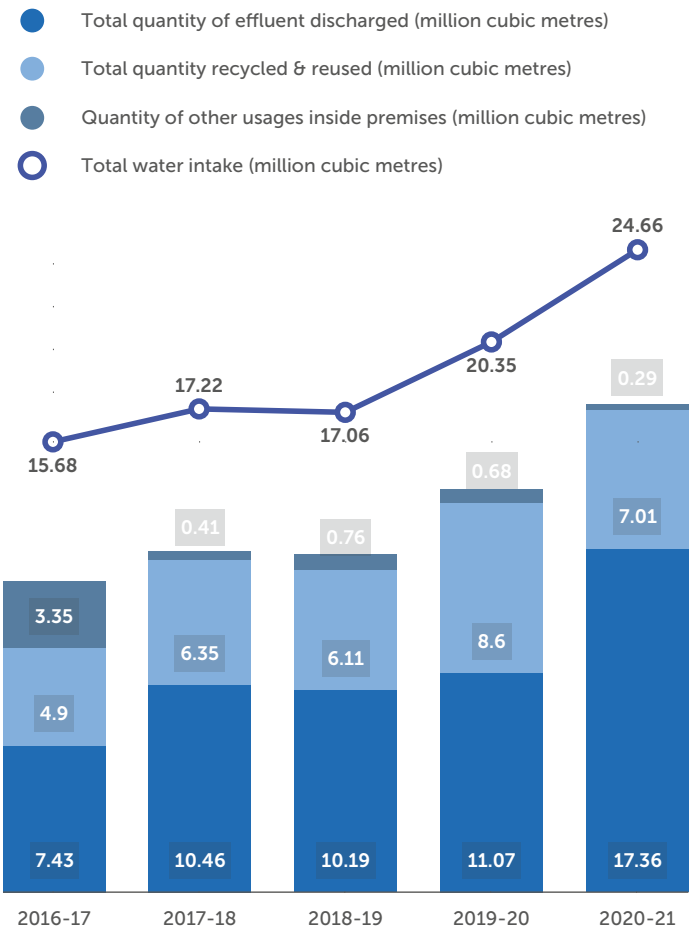


Water recycled/reused across units of BHEL



During FY 2020-21, only 0.29 Million Cubic Meter of water was discharged outside our plants' premises which is 1.18% of total water intake across our units. The trade effluent discharged was let out after wastewater treatment and it was ensured that the parameters stipulated for effluent discharged as per the extant rules are maintained. The figure below shows the water balance diagram for our premises.

Water Balance across BHEL premises



Biodiversity in our premises

Every year, our organization is taking up plantation drives to increase the verdant cover in our premises. Furthermore, plantation of saplings by superannuating employees to commemorate their contribution towards development of the organization on last day of work in the organization has also become a standard practice. We are planting saplings in parks, gardens, central verges, roadside areas and in open land. The purpose of plantation is to augment greenery and enhance beautification in BHEL Township apart from reduction in environment temperature during Summer, reduction in air pollution, increase in oxygen level in the atmosphere, reduction in soil erosion and increase in soil fertility rate through dry/ fallen leaves.

During FY 2020-21, in HEP Bhopal unit alone more than 32000 saplings were planted. The details of area where the saplings have been planted and number of sapling in that location is given in the table below for representation of our efforts towards greening of our campus.

Overall nearly 35,500 saplings were planted across BHEL during 2020-21 to enhance our verdant cover and will act as carbon sink in future.

Sl. No.	Area	No. of Saplings
1	STP Berkheda	1,500
2	Awadhpuri (Site – 1), Berkheda	2,200
3	Awadhpuri (Site – 2), Berkheda	700
4	Indira Nagar, Berkheda	2,400
5	Shyamapalli (West), Piplani	3,000
6	Crystal Campus (West), Piplani	2,700
7	STP Piplani (Site – 1)	4,300
8	STP Piplani (Site – 2)	3,500
9	STP Piplani	1,500
10	Ratnagiri (Part – C), Piplani	1,850
11	Khajuri Road (North), Piplani	3,200
12	In front of Jawahar Bag, Govindpura	2,000
13	GVN School, Govindpura	1,800
14	Flowering & Show Plants in all neighbourhoods in Township	1,958
Total :		**32,408**

Managing Emissions and Carbon Footprint

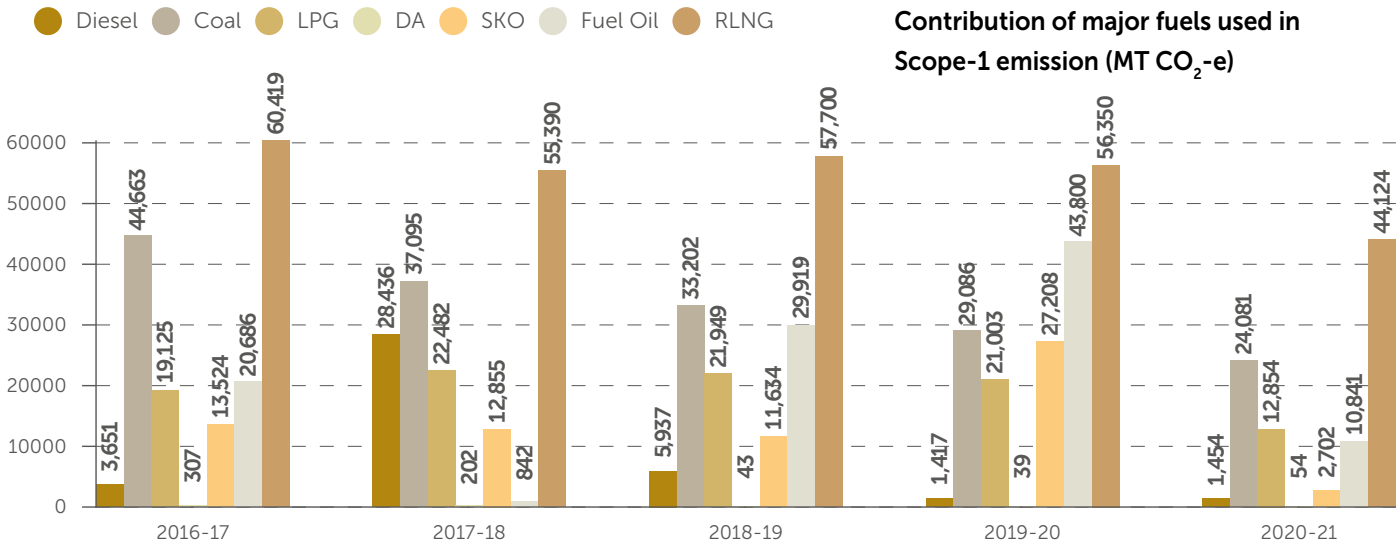
Monitoring of emissions has been a standardised practice across all of our units. At some of our units, even online stack monitoring system has been installed wherein real time environmental monitoring is being carried out. All the emission is monitored and maintained within the stipulated limit as specified by the State Pollution Control Boards. Records pertaining to that are being maintained and report are being sent to statutory authorities as per the requirement.

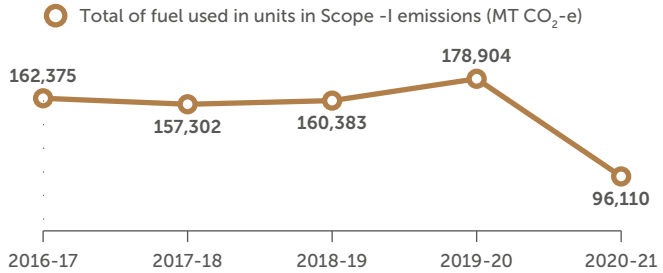
In most of our units, the use of refrigerants having ozone depleting substances (ODS) has already been discontinued. During the reporting period, ODS of 30.26 kg CFC-11 Equivalent was used across BHEL units as refrigerants. The new machines procured at various units are using refrigerant gas like R-134a, R-410a etc. which have zero ozone depletion potential.

Carbon emissions on account of direct and indirect energy consumption (Scope-1 & 2) are being captured by all the units regularly. The emission data is being captured using appropriate methodology as stipulated by United Nations Framework Convention on Climate Change (UNFCCC) protocols and using India Specific Emission Factor. However, system for capturing data pertaining to Scope-3 emissions is yet to be established.

The average value of Scope-1 Carbon Footprint for the last five year stood at 151014 MT CO_2-equivalent. There has been a sharp decline in Scope-1 emission during the reporting period on account of subdued manufacturing activity during COVID-19 induced lockdown. Further, contribution of emission from coal burning is reducing on annual basis.

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





Scope-1 Emissions: Contribution of different components of energy mix (%)

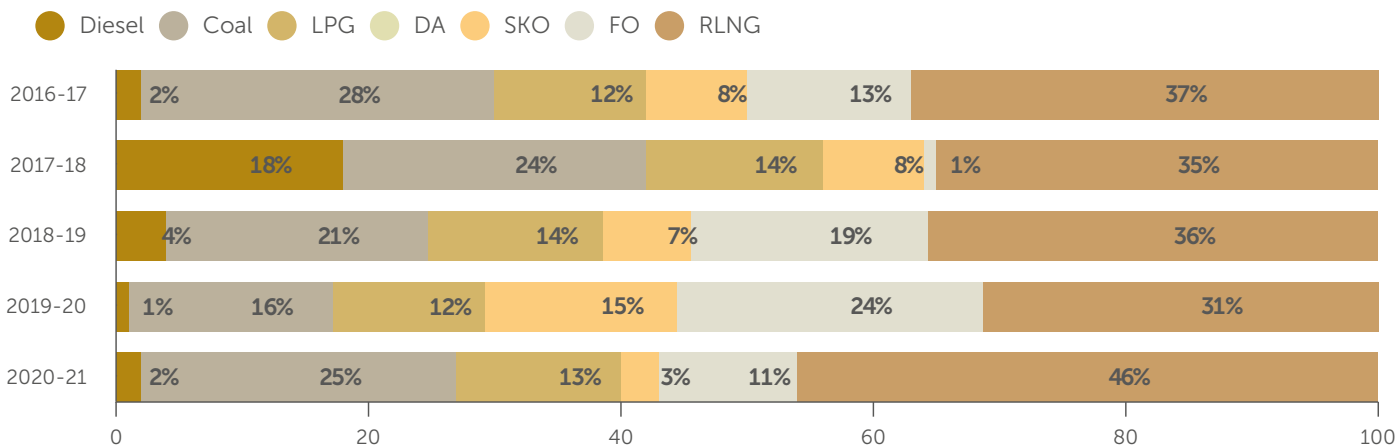
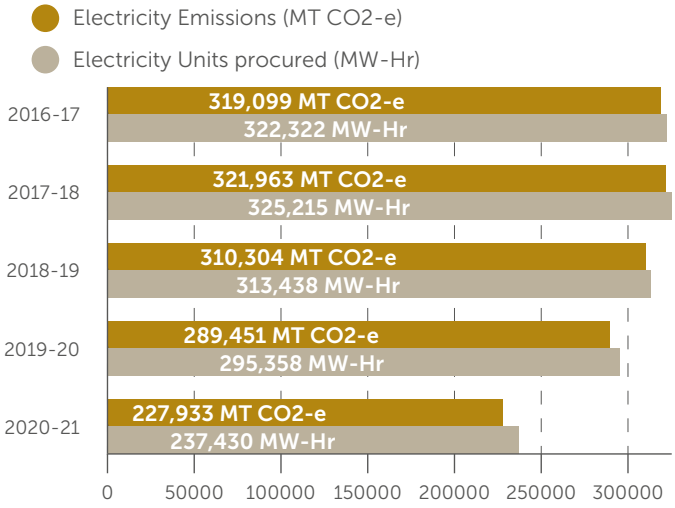


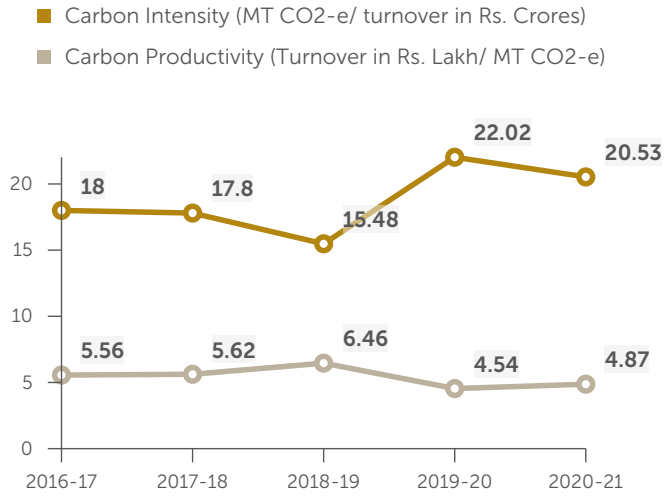
Figure shown below depicts the indirect emissions (Scope-2) due to energy consumption through purchase of electricity. Due to better availability of electricity, electricity consumption has shown an increasing trend in our units and correspondingly use of fuel such as diesel for electricity generation has reduced.

Scope-2 emissions against electricity procured data



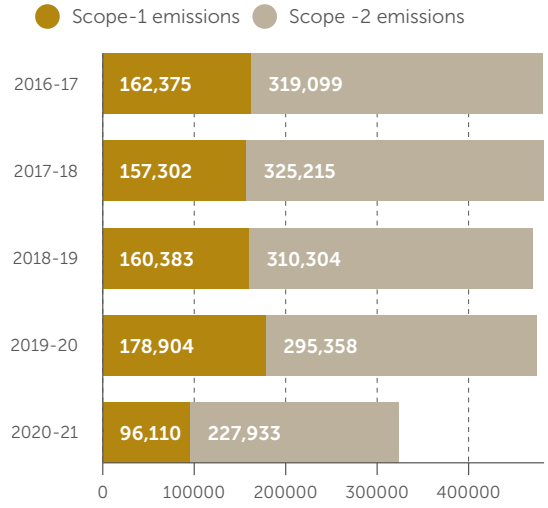
The data for Carbon Intensity (CI) [defined as Carbon Footprint expressed in MT CO_2-e emitted per Crores I of Gross Turn over achieved] is shown in the figure below. The average CI figure stood at 18.76 and average Carbon Productivity (CP) figure stood at 5.41 meaning for every Crore ₹ of Gross Turnover achieved, 18.76 MT CO_2-e has been emitted in the atmosphere whereas for every 1 MT CO_2-e emitted, BHEL has achieved a Gross turnover of ₹5.41 Lakh. However, it may be noted that the Turnover figure includes the data for the entire company, whereas the carbon footprint data comprises of only the emissions from the units as defined in the boundary of the report.

Carbon Intensity/ Productivity data

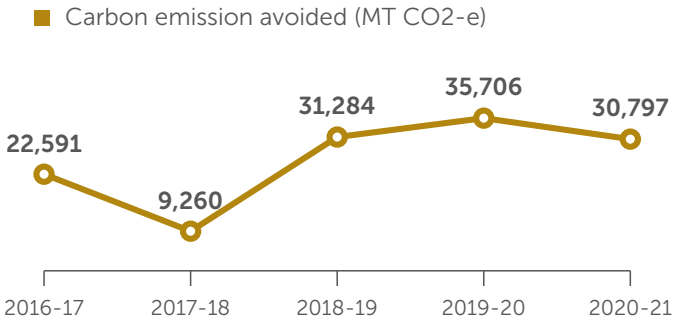


Further, the combined data for Scope-1 and Scope-2 emission has been shown in figure. During the last 5 years, an average Carbon Emission of 0.45 Million Metric Tonnes of Carbon Dioxide equivalent per year has happened across the units of BHEL.

Carbon Emission across BHEL units (MT CO_2-e)



Carbon Emission Avoidance due to Energy Efficiency/ Conservation and Re-generation



Due to enhanced use of RLNG, the scope-3 emission associated with transportation of the fuel through trucks has reduced considerably. However, the same has not been quantified yet.

Due to various energy conservation/ efficiency measures and generation and use of renewable energy inside our premises, considerable amount of carbon footprint avoidance has been achieved. These activities have been listed in the section – Energy. During the reporting year, around 4680 MT CO_2-equivalent of carbon emission was avoided due to various energy efficiency measures taken. In addition, due to generation of renewable energy, further 26118 MT CO_2-equivalent of carbon emission was avoided due to renewable energy generated at our premises. A total of approx. 129638 MT of CO_2-e avoidance was achieved

across our unit in the last five years. There has been a decrease in carbon emission avoidance year on year basis as lot of opportunities for energy efficiency have already been utilised in the past and the data included in this graph is only for activities carried out in that particular year for carbon footprint avoidance. This is largely due to 28 MW_p of Solar Power Plants installed for captive consumption across our units.

Responsible Waste Management

In our processes, waste reduction is taken as a very important activity and our nesting plan for cutting of metal sheet is designed in such a way to take care of this aspect. However, once the scrap is generated, it is either used in the local foundry shop for making castings/ forgings or sent to CFFP Haridwar/ authorised recycler for melting into the furnace for avoidance of virgin material consumption.

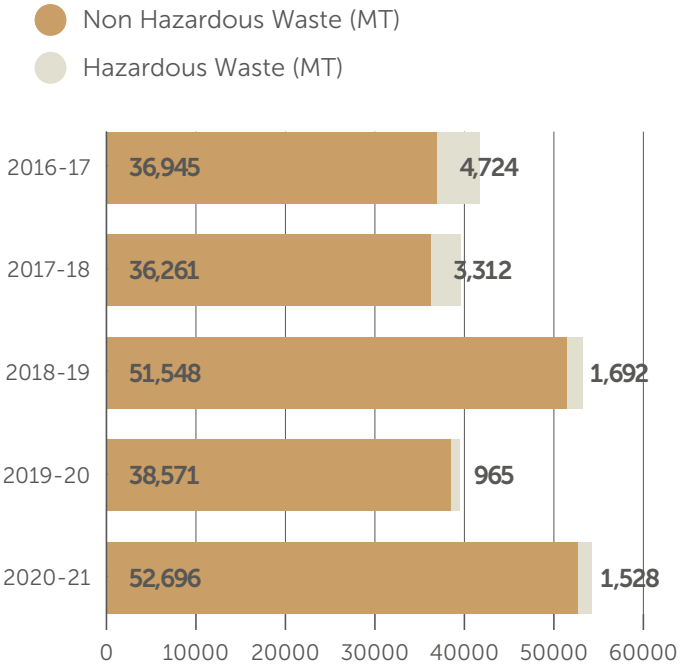
Some of the specific activities related to responsible waste management conducted during FY 2020-21 included:

- Establishment of a 500 Kg/ Day bio-gas plant to utilise kitchen waste and generate energy at HEP Bhopal,
- Development of hazardous waste storage area in HEEP Haridwar,
- Vermi-composting of kitchen waste at HERP Varanasi,
- Setting up an incinerator which works using the Controlled Oxygen Rotating Technology (CORT) to incinerate the solid wastes generated inside Factory and Township premises at BAP Ranipet.

As a special initiative to fight plastic pollution, BHEL has made tremendous efforts to ensure that all our townships are made "Single Use Plastic Free" and to get third party certification for the same for these 14 townships.

Across BHEL, solid wastes/scrap having resale value were collected, segregated, stored and sold to authorised recyclers. Some of it not having any resale value is used for filling up low lying areas. Hazardous wastes / E-waste were disposed of as per the stipulations in the relevant statutes. The data for waste generated during the last 5 years is shown in the graph below.

Hazardous and Non-Hazardous Wastes generated at units (in MT)



Disposal Method : Sold to the authorised users/disposal facility/reused

The hazardous wastes generated at units are disposed as per the regulatory requirement and necessary records for scrutiny by the concerned authority is duly maintained. Hazardous waste which can be used outside is sent to authorised recyclers. Rest of the hazardous waste which is to be incinerated or buried in secured landfill is sent to Treatment Storage and Disposal Facility (TSDF) of their respective states for its ultimate disposal.

The following table shows the details of waste recycled/ reused data for the last 5 years. It may be noted that almost all the quantity of non-hazardous waste generated during the year was sold to authorised recyclers / sent to CFFP Haridwar / reused in-house.

Quantity of Waste Reused / Recycled at units

Type of wastes	Unit	2016-17	2017-18	2018-19	2019-20	2020-21	Remarks
Non -Hazardous	MT	36028	36261	51548	38571	52696	Includes ferrous as well as non-ferrous materials
Hazardous	MT	2601	1194	1170	714	1225	Used oil and other materials reused inside or sold to authorised recyclers

Initiatives taken to reduce environmental footprint of our products and services

BHEL believes in creating a greener environment through development of environment friendly technologies, reduction of emissions and improvement in efficiency of its equipment. Some of the steps taken in this direction are detailed below:

- In parallel to the improvements made towards reducing Carbon Footprint of BHEL's operation, the company is also working towards reducing the carbon footprint of BHEL made products during their running lifecycle.

BHEL in association with IGCAR, NTPC, is developing Advanced Ultra Supercritical (AUSC) Technology under the aegis of the National Mission on Clean Coal Technology. The technology will yield targeted efficiency of 46% against an efficiency of ~38% of subcritical and ~41-42% of supercritical sets. As a result, this will further reduce coal consumption and CO_2 emission by about 11% as compared to Super Critical plants and by about 20% as compared to Subcritical power plants for single unit of power generation. Company has already introduced Super Critical Technology in India which has lower carbon footprint in comparison to previous generation of subcritical technology.

Unique High Temperature Spin Test Rig (HTSTR) established for testing of advanced materials for AUSC mission project

- Further, new emission norms which have come into force for generation utilities, BHEL is ready with the solutions required to meet the stipulated norms. The company has initiated several measures like modification in boiler design, modifications in the wind box firing system of Boilers and development of Selective Catalytic Reduction (SCR) catalyst and systems for NOx reduction, installation of FGD systems for SOx capture and improvement in particulate collection efficiency of ESPs. BHEL has developed SCR technology exclusively for high ash coal fired Indian thermal power plants through its dedicated R&D efforts and the same has been demonstrated at NTPC Simhadri Super Thermal Power Station.
- BHEL is working indigenously on development of technology for the conversion of high ash Indian coal to methanol. The technology will be demonstrated initially at pilot scale with the production of 0.25 TPD of methanol. Successful implementation of this technology will help in utilizing the vast coal reserve available and significantly curb the rising imports bill of the country due to crude oil and improve upon the energy security of India.

- BHEL is contributing significantly to the nation's green initiatives of promoting renewable energy by manufacturing state-of-the-art solar cells and solar modules. In addition, space-grade solar panels using high efficiency cells and space-grade battery are also being manufactured. In-house BHEL has also developed PV products ranging from Solar Inverters, Solar Passive Trackers, Solar PV cells and PV modules.
- BHEL has indigenously developed Passivated Emitter Rear Contact (PERC) technology for high efficiency c-Si solar cells. Maximum efficiency achieved in the PERC solar cells using optimized processes is 21.7% while an average efficiency achieved is 21.08%. With this development, BHEL has the know-how of PERC technology and process design. The dedicated R&D facility has developed capabilities to support migration from non-PERC manufacturing technology processes to PERC technology. R&D project on development of Passivated Silicon Heterojunction (PIHJ) Solar Cells with 21 % efficiency is also under progress.

- In the urban mobility area, Electric mobility is fast emerging as a future mode of transportation to reduce vehicular emission. BHEL through its in-house R&D efforts has developed & successfully tested at ARAI, Motors, Controllers & Charging infrastructure for E-Bus application. BHEL's 12 m E- Bus has been homologated at ICAT Manesar.
- BHEL is also working on development of environment friendly green technology for power generation and has successfully developed 25 kW PEM (Proton Exchange Membrane) fuel cell stack for strategic

applications and is working further to increase the capacity. BHEL has also developed and demonstrated Proton-exchange membrane (PEM) Fuel cell powered 1.25 kW Hybrid Electric Golf cart vehicle for enhancing the drive range of electric vehicles.

- Phytorid based Sewage Treatment Project (STP) project implemented by BHEL at Telibandha Lake, Raipur, in partnership with National Environmental Engineering Research Institute (NEERI) has been consistently performing with parameters in line with contractual requirements.

- BHEL is offering environment friendly technology of Air cooled condenser to ensure water saving in modern thermal power plants. Further in-house developments are also undertaken to make it more cost competitive.

Management of Significant Spills

Our units are certified to ISO 14001:2015 which is a testimonial of our well established Environmental Management System (EMS). This management system provides us the framework to take control measure related to environmental risks including any spill. However, during the reporting period, no significant spill has occurred. Furthermore, there are no water body and related habitats which are significantly affected by our discharge of water and runoff.

Compliance

Health, Safety & Environment (HSE) management system has been well established across our manufacturing units. Efforts for continual improvement in this HSE Management Systems & Procedures are made by the organization. All manufacturing units and project sites have HSE departments and required resources, including qualified Safety Officers and leadership. Safety inspections, HSE audits, work place environment monitoring, health monitoring etc. are part of our established systems and procedures which helps us to maintain and improve HSE management system. All units and regional offices, having certification for ISO 14001:2015 & ISO 45001:2018, underwent periodic external 3rd party audit by the certifying agency to ensure effectiveness of systems.

Environmental Protection Expenditure

The activities related to Sustainable Development and Environmental Protection like - monitoring of stack emissions & ambient air quality, obtaining required licenses/authorisations/consents under extant HSE legislations, getting certification / recertification / periodic external audit done for ISO 14001:2015 & ISO 45001:2018 management system certification, installation & maintenance of new environment friendly technologies, insurance for environmental liability, tree plantation etc., requires financing under capital and revenue budget. During the reporting period, an expenditure of ₹ 5,720 Million was incurred from revenue budget on such activities.

OUR SOCIAL PERFORMANCE

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

BHEL policies are in line with the principles of Human Rights, The Constitution of India, various Labour Laws, etc. Special provisions have been made in BHEL to safeguard women employees at the workplace. Internal Complaint Committee (ICC) has also been formed to look into cases of Sexual Harassment at workplace for female employees.

The Principles of Natural Justice are scrupulously followed in - "The BHEL Conduct, Discipline and Appeal Rules" (CDA) applicable to all its executives and supervisors, and "Standing Orders" applicable to all workers. The Company neither subscribes to nor indulges in coercive practices. Towards this, it never asks its employees to deposit their original documents pertaining to their education qualifications or Date of Birth.

BHEL has been a frontrunner in the area of human resource management. The guiding principle for company's HRM policy is to ensure availability of competent, motivated and effectively contributing human resources and to facilitate achievement of their full potential at all times to realize organizational mission. Company has documented HRM policies and rules in the form of a 'Personnel Manual' to ensure transparency and uniformity of implementation for regulating employment relationship, career growth/ development and employees' emoluments/ benefits, healthcare and well-being. These policies are further complemented by a grievance redressal mechanism through two schemes – one for workers and other for staff & officers. A grievance for the purpose of the scheme means a grievance relating to any individual employee arising out of the implementation of Company policies/rules or management decisions. Both these schemes provide for three tier resolution. Defined timelines are laid down for resolution of grievance at each stage. Besides, an appellate mechanism is also provided under the scheme, in the case of grievance redressal scheme for staff & officers, which an aggrieved employee can approach in case he/she is not satisfied with the resolution of the grievance.

Within BHEL, accountability is well defined for various functionaries through 'Delegation of Power'. Works Policy, Purchase Policy and other policy documents facilitate transparency in BHEL's working and commitment of highest order of integrity.

Profile of the Employee Base

Total number of regular employee as on 31.03.2021 stood at 32131. Number of permanent women employees as on 31-03-2021 was 1893 which is nearly 5.9% of its total manpower strength. Number of permanent employees with disabilities as on 31.03.2021 stood at 861. The overall representation of SC/ST/ OBC employees in total manpower as on 31.12.2020 was 20.69%, 7.41% and 35.1% for SCs, STs and OBCs respectively.

BHEL does not hire employees on temporary/casual basis. However, BHEL awards job/works contracts to contractors at its various Units/ Divisions/ Departments as per organizational needs. The number of workers with contractors varies from time to time. Further details about human resources is already provided in the section Human Resource in this report.

Performance and Career Development

Performance Management: The Performance Management System has been comprehensively revamped to link Individual employee performance and rewards with the Company's as well as Unit performance. Succession policy and special programs in collaboration with leading management institutes are being implemented for developing leadership at all levels. Mentor-mentee program with 3600 feedbacks has been strengthened to develop technical and behavioural skills in sync with the organization needs/ ethos. The benefit is clearly visible with the organization having one of the lowest attrition rates in the industry.

People Capability Maturity Model (PCMM): The company has prepared a roadmap towards attainment of PCMM Level 3, and various activities were completed during the year according to timelines approved by the company's Board. A process area wise Task Force trained in PCMM Level 3 was constituted to conduct the Internal Assessment against the pre-defined Process definitions developed through an external consultant. This was followed by Gap Analysis and action planning to plug the gaps for all the seven Process Areas.

PEACE: BHEL's Employee Support Initiative PEACE (Positive Emotional Alignment through Counselling Experience) was launched during the year for facilitating our employees to seek help and advice on issues impacting their well-being, performance and behaviour at the workplace, family and society at large by providing confidential counselling services. The facility was made available during the pandemic to enable employees and their dependent family members to cope up with any anxiety or stress due to uncertainty caused by the pandemic and rollout of Unlock 2.0.

Online Development Centre: Towards development of the desired Leadership/ Behavioural Competencies, employees were invited to participate in Online Development Centre exercise, where they were exposed to a series of internationally validated exercises based upon competency framework of BHEL. It was followed by comprehensive feedback report highlighting areas of strength and suggested areas of development, through Individual Development Plans, based upon individual's preferred learning style. Around 950 executives at AGM/ GM level were covered during this exercise.

Centralized Competency Assessment System: During the year 2020-21, Job Descriptions and Competency Profile of more than 1800 key positions were created and updated in 'Job Description Analysis System' (JDAS) in SAP HR module which will help in the long term succession planning of the company.

With the organization maturing to higher levels in HR processes viz career development, succession planning, training & development etc., it becomes imperative to not only rationalize roles/ competencies of key positions in the company but also to have an online database as a central pool for better decision making in manpower positioning. For this purpose, a new system People namely, 'Centralised Competency Assessment System' (CCAS) was developed in SAP-HR module in 2020-21 for assessment of competencies of key positions holders.

Labour / Management Relations

'All round Development through Participation of All', ensured by way of BHEL's policy of open and continuous communication with all sections of employees, has been the driving mantra of our Industrial Relations journey. The impetus given to participatory culture by the Management in close collaboration with various employee groups has been instrumental in maintaining and building up a congenial harmonious Industrial Relations climate within the organization.

Industrial Relations in various manufacturing units, divisions and offices of the Company remained harmonious and peaceful during FY 2020-21.

Owing to the participatory ecosystem prevalent in the Company, 'NIL' man days were lost during the year on account of strike against Company policies, which bears testimony to the concerted efforts undertaken by the Management as well as the employee groups to work jointly towards the organisation's goals.

One meeting of the apex level bipartite forum, namely "Joint Committee" was held during the year. There were 26 meetings of the Plant Councils and 213 meetings of the Shop Councils held at various manufacturing units. In addition, meetings were also held with the representatives of executives and supervisors on business prospects & challenges, company level issues, etc.

The focus of discussions in the various bipartite fora centred on improvement in the overall performance of the Company by way of increase in productivity, improvement in quality, safety and delivery in order to meet customer commitments and adopting various cost reduction measures for betterment of the financial health of the Company eventually benefitting different stakeholders including employees.

Occupational Health & Safety

It has always been our endeavour to consolidate good Occupational Health, & Safety practices and make them a part of our work culture. In view of the same, an online Site Safety Assessment System was developed and launched for monthly self-assessment by all the active sites across Power Sector-Regions. This will help the Project Sites to improve their safety performance continually, through regular self-assessment.

BHEL conducted HSE Trainings / Expert Talks / Webinars on regular basis for their employees and sub-contractors' employees. In addition to the structured trainings, BHEL spread awareness among their employees and society on large scale during HSE campaigns i.e. Environment Awareness Month (5th June – 30th June, 2020), Swachhta Pakhwada (16th – 31st August 2020), National Safety Fortnight (4th – 18th March 2021) etc.

BHEL has made all-out effort to make its townships "Single Use Plastic Free" and get the 3rd party audit/ surveillance audit conducted for declaring them as "Single Use Plastic Free Townships". All 14 townships of BHEL have been declared as "Single Use Plastic Free Townships".

BHEL's effort in increasing its safety performance and environmental enrichment has been well appreciated and BHEL has received many awards as a recognition of these efforts. The awards received during the year include:

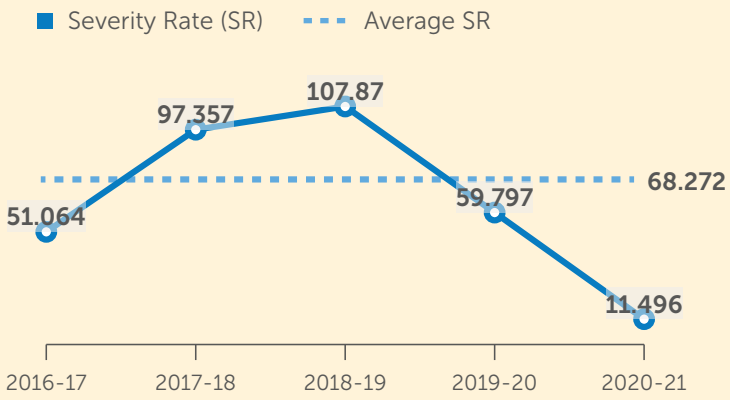
- Golden Peacock Environment Management Award (GPEMA) - 2020 in Power Equipment Sector for exemplary contribution to environment management by Institution of Directors.
- Apex India "Gold Award" 2020 under Occupational Health & Safety in Engineering Sector for exemplary contribution in OHS at BHEL.

Safety statistics for the last 5 years for our units is shown in the table below.

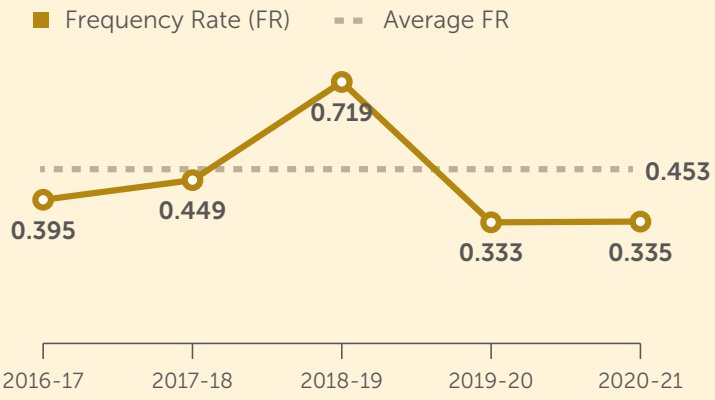
Safety Statistics for BHEL Units

Year	Total Reportable accidents	Total Man-days Lost	Man Hours worked (in Millions)	Frequency rate	Severity Rate
2016-17	56	7232	14,16,24,962	0.395	51.064
2017-18	61	13238	13,59,73,531	0.449	97.357
2018-19	96	14394	13,34,38,268	0.719	107.87
2019-20	41	7360	12,30,83,912	0.333	59.797
2020-21	34	1166	10,14,28,533	0.335	11.496

Severity Rate (SR) for last 5 years across BHEL units



Frequency Rate (FR) for last 5 years across BHEL units



The value of Frequency Rate consolidated over the last 5 financial years stood at 0.453 and the severity rate for the corresponding period stood at 68.272.

Learning and Development

To counter the challenges created by COVID-19 pandemic during the year 2020-21, Learning & Development (L&D) function swiftly transformed its training processes and adopted online training methods to impart continuous training to the employees. Training has been aligned to business requirements by revamping the training need identification process with the strategic goals of the organisation i.e. Revamping Project Execution, Quality First, Defending Core Business, Digital Enablement, Cost Optimisation, Cash Management, New Growth Areas and Employee Focus. Also, to improve two-way communication across the company, 3C (Connect, Collaborate and Create) initiative was launched with an aim to share about the organisation's journey and present challenges, take suggestions from employees and thereby encourage them to make extra effort in developing a stronger BHEL.

In order to make learning more cost effective and knowledge enriched, number of in-house developed e-Modules on topics like 7 Quality Control Tools, Site Management, Water Systems, Project Management, Power Cycle System Engineering, Women Leadership, Stability of structures, Turbo generator, Emotional Intelligence, 6 Modules on Safety, CFD, Understanding Financial Statements, etc. were released on UNNAYAN (BHEL's Learning Management System) and more than 7000 employees completed these modules. 835 employees have participated in e-learning courses offered by Great Learning Academy in domains like Artificial Intelligence, Cloud computing, Big data, Machine learning etc.

A special initiative has been started to capture and disseminate site experiences with all the concerned internal stakeholders on monthly basis. Learning from our own experiences truly deepens explicit and tacit knowledge, thus directly supporting in better Project Execution.

In its endeavour to accelerate the growth of high performers, TRAILBLAZER programme has been introduced to groom them for taking challenging roles in future. The programme also offers mentoring conversation post programme, so that they continue excelling in their journey. 104 executives have been already covered out of 550 identified. As per MoU signed with MSDE, 846 and 116 apprentices under NAPS and NATS respectively, have been provided training in 2020-21.

Extensive programmes were conducted on Health Management and lecture series organized by reputed professionals for employees to cope with the pandemic and keep their morale high. Human Resource Development Centres at Units organised virtual programmes for esteemed customers like ONGC, IOCL, GAIL etc.

The 5th BHEL Learning Week (BLW) - 2020 was organized from 05-11 September 2020 with the theme "Opportunity in the face of adversity".

Learning Week observed in BHEL in Sept. 2020

All these collective efforts helped in achieving 4.54 Training Man Days (TMD) per employee in BHEL during 2020-21 as against 3.70 TMD in the previous year.

Supplier Assessment

BHEL has signed MoU with Transparency International India (TII) to adopt 'Integrity Pact' to make procurement and contracting more transparent by binding both the parties to ethical conduct. A panel of two Independent External Monitors (IEMs) has been appointed to oversee implementation of Integrity Pact in BHEL, with due approval of Central Vigilance Commission. Within BHEL, accountability is well defined for various functionaries through 'Delegation of Power'. Works Policy, Purchase Policy and other policy documents facilitate transparency in BHEL's working and commitment of highest order of integrity. In addition, Internal Audit carries out independent audit of purchase/ works contracts. Four representations received from suppliers during 2020-21 under Integrity Pact have been resolved by the IEMs.

Protecting Human Rights

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

BHEL has been supporting Micro and Small Enterprises (MSEs) and local suppliers in and around manufacturing units on various fronts. Also, as mandated in Public Procurement Policy for Micro and Small Enterprises (MSEs) Amendment Order, 2018 for MSEs (issued by Ministry of MSME-GoI), 25% of BHEL's total procurement is from MSEs during 2020-21. Regular vendor meets and supplier development programs are organized by BHEL units, specifically for MSEs (including local suppliers) as well as specific to SC/STs, which serves as a platform for identification of needs and formulation of action plan for mutual benefits.

BHEL is also working towards supplier/ partner development (especially MSMEs), and organized a workshop- SAMVAAD under the aegis of Ministry of Heavy Industries, for promoting collaborations between PSUs, private industry as well as R&D institutions & academia. BHEL identified items worth more than J3,000 Crore for import substitution through development of local suppliers and hosted an EOI on its website for the same.

BHEL has conducted more than ten online workshops- during December 2020 to February 2021, with the support of Ministry of Heavy Industries (M/o HI), Department for Promotion of Industry and Internal Trade (DPIIT) and Ministry of MSME.

BHEL is one of the founding member of Global Compact Network, India (GCNI) and is a part of its initiatives in India. The company reports its performance on ten principles of UNGC on annual basis since 2001 through Communication on Progress (CoP) which includes BHEL's commitment towards upholding the principles of UNGC. This CoP can be accessed through the webpage: https://www.unglobalcompact.org/participation/report/cop/create-and-submit/active/462070

No instance of Human Rights abuse was reported in the company during the reporting period.

Grievance Mechanism

The Company has a Stakeholders Relationship Committee specifically to look into matters related to redressal of shareholders and investors complaints. As reported by KFin Technologies Private Limited (RTA of the Company upto December 31, 2020) and Alankit Assignments Limited (RTA of the Company w.e.f. January 1, 2021), 265 complaints were received from

the shareholders duringthe year under review and all complaints were redressed up to March 31, 2021.

To address the grievances of vendors a centralized Vendor Grievance Redressal System (SUVIDHA), where vendors can lodge as well as view and track the status of grievance(s) lodged, was developed and launched during Vigilance Awareness Week - 2020 (VAW). As a part of awareness series, 09 nos. animated clips (VAW Theme, policy matters, lodging of complaints, CDA Rules, password protection, Whistle Blower Policy, Medical Dependency etc.) were developed in-house and released during the VAW. These clips were shared with employees and were also uploaded on the BHEL's website / social media platforms.

BHEL's Human Resource Management policies are further complemented by a grievance redressal mechanism through two schemes – one for workers and other for staff & officers. A grievance for the purpose of the scheme means a grievance relating to any individual employee arising out of the implementation of Company policies/rules or management decisions. Both these schemes provide for three tier resolution. Defined timelines are laid down for resolution of grievance at each stage. Besides, an appellate mechanism is also provided under the scheme, in the case of grievance redressal scheme for staff & officers, which an aggrieved employee can approach in case he/she is not satisfied with the resolution of the grievance.

A total of 225 public grievance complaints were received from the general public under the Centralized Public Grievance Redressal and Monitoring Scheme during the year 2020-21. All the grievances were satisfactorily resolved.

PERFORMANCE ON SOCIETAL IMPACT

Management Approach – Contribution towards overall well-being of the society

BHEL has a well-structured organizational set-up, policy & procedures through which various CSR programmes are implemented. The CSR policy has identified several activities from Schedule-VII of the Companies Act, 2013 as its thrust areas.

BHEL has clearly identified the disadvantaged, vulnerable, poor, needy & marginalized stakeholders in the vicinity of the BHEL manufacturing units / regions / divisions / sites / offices and their concerns are addressed as per BHEL's CSR Policy which is in compliance with section 135 & Schedule VII of the Companies Act 2013 and rules made thereunder as well as DPE Guidelines on CSR for CPSEs and the same is available through the link:

https://www.bhel.com/sites/default/files/BHEL_CSR_Policy_July2017.pdf

Major CSR initiatives undertaken

BHEL has identified seven thrust areas for CSR interventions. Brief description of some key interventions in these thrust areas are given below.

Clean India

- BHEL continued with its program for constructing Bio-digester toilets in Haridwar & Rishikesh. Twenty-Two clusters of these Bio-digester toilets have been completed.
- Construction of toilets block in Christian cemeteries located in Bairagarh & Bhadbhada area of Bhopal.

Educated India

- Distribution of scholarship to 44 Widow Ward / Orphan / PH school students in BHEL adopted villages and 15 physically challenged ITI students.
- Financial support for construction of Tin shed at Govt. Hr. Primary School, Lunkaransar, Bikaner (Rajasthan).
- Financial support for construction of Tin shed & Chowki at Govt. Sr. Sec. School, Janglu,

Bicycles handed over to girl students by BHEL Jhansi

Bikaner (Rajasthan)

Healthy India

- Providing Anti Hemophilic Factors (AHF) to Persons & Children with Hemophilia (P &Cwh) in various Aspirational Districts across India

Inauguration of Bio-digestor toilets constructed by BHEL at Haridwar and Rishikesh

under our CSR initiative "Heal-A-Soul IV"

- Financial support to "Nav Bharat Jagriti Kendra (NBJK), Hazaribag (Jharkhand)" for free cataract surgery of cataract-blind patients from nearby areas in Bihar and Jharkhand .
- Financial support to the Artificial Limbs Manufacturing Corporation of India (ALIMCO) for distribution of Aids and Appliances to Divyangjan at Aspirational Districts Haridwar (Uttarakhand), Khammam (Telangana), Damoh (Madhya Pradesh), Khagaria (Bihar).
- Financial support to the "Cure International India Trust (CIIT), New Delhi" for treating children born with club foot disability using ponseti method at Rishikesh (Uttarakhand),

Financial support to ALIMCO for distribution of aids and appliances at aspirational districts of the country

Jhansi (UP), Guwahati (Assam) and Bhubaneshwar (Odisha), covering patients from nearby areas, including aspirational districts".

- Financial support to HelpAge India for providing service of 03 (three) Mobile Healthcare Units, one each at Satpura (MP), Bikaner (Rajasthan) & Noida (UP).
- Financial Support to NGO - "Cankids KidsCan" for Providing Medical Assistance to 200 children aged between 0-19 and Medical Equipment for Hospitals & Palliative Care Centre for the Children suffering from Cancer across India (covering Aspirational Districts).

Responsible India, Inclusive India & Disaster Relief

- Financial support for construction of Bridge and Road across the canal at Makali to Harokyathanahalli, Dasanapura Hubli,Bangalore North Taluk.
- Distribution of wheel chairs to rural poor people at Chennai, Tamil Nadu

Inclusive India

- Financial support to Municipal Commissioner, Varanasi for Installation of Heritage Street Lighting system in Varanasi.
- Financial support to the "Professional Assistance for Development Action (PRADAN)" for the project: Motivating Agrarian communities of Aspirational District Kandhamal (Odisha) for their Economic Transformation.
- Vocational & Skill Development Training to

BHELMister was used to sanitise ghats during Kumbh Mela 2021

Several health camps organised by BHEL during Covid period

Differently Abled & Visually Impaired Children, Vizag, Andhra Pradesh.

Disaster Relief

- Distribution of essential grocery items to the affected families of workers during flash flood in Chamoli distt, Uttarakhand.

Compliance

Customer value is an integral part of BHEL's culture which is also been reflected in our Vision, Mission and Values statement. Company is constantly working towards creating value for customer through products and services. Every product offering of BHEL is labelled with detailed product labels/ name plates/ test certificates as per the requirement and terms of contracts with customers besides the mandatory requirement of the applicable law.

Given BHEL's diverse and large scale nature of operations, customer complaints get registered and resolved through multiple ways. Two dedicated centralized online complaint systems, i.e., Customer Care Management System (CCMS) and Site Action Request (SAR)/ Commissioning Action Request (CAR) are in operation. Major quality issues reported were taken up for Root Cause Analysis (RCA) and are being resolved.

Skill development training given to women in various trades through BHEL Ladies Club at its major units

Over the year, this has led to a decreasing trend in numbers of major quality issues. Apart from complaints, customer feedback is taken through customer satisfaction surveys, customers' meets, face-to-face interactions, video-conferencing and appreciation letters.

There is no case filed by any stakeholder against the company regarding unfair trade practices, irresponsible advertising and/or anti-competitive behavior during the last five years and pending as on end of financial year i.e., 31 March, 2021.

Research & Development and Technological Achievements

BHEL is one of the highest spenders on R&D and innovation in its field, with consistent expenditure of over 2.5% of its revenue over the past many years. As a result, BHEL's products have been in line with the latest technologies and consistently displayed high reliability, efficiency and cost-competitiveness. However, recent times have witnessed a rapid change in the technological landscape, which has had a far reaching impact on existing businesses as well as thrown up many new hitherto unaddressed opportunities. The company's innovation ecosystem has been revamped over the past year with renewed focus on introducing new products and services as per market requirements in the shorter term as well as working in emerging and futuristic areas in line with the GOI's policy for a decarbonized economy. The company aims to achieve this by a judicious mix of in-house development coupled with collaborations with technology leaders/ global OEMs as well as academia.

BHEL's engineering and R&D base is now focused on in-house development of new products in areas like renewables, railway transportation, defence and aerospace, Industry 4.0, EVs and chargers, etc. The R&D set up is also working on development of ambitious future technologies like Hydrogen, clean coal, etc. to ensure the country's technology leadership in technologies of tomorrow.

Continual strengthening of knowledge and information throughout its innovation ecosystem for the intellectual growth of its workforce is a vital part of the R&D strategy. BHEL's five-pronged R&D strategy comprises of Strategic Direction, Portfolio Management, Partnerships & Alliances, Knowledge Management and Enablers to address its growth needs.

BHEL has a robust innovation and R&D framework in place to address the technology challenges emanating from business requirements. The R&D expenditure of the company for 2020-21 was ₹ 726 Crore, approx. 4.45% of the revenue. The company filed 526 patent and copyright applications during the year, enhancing the company's intellectual capital to more than 5000. More than 24% of the company's revenue has been achieved from its in-house developed products.

Additionally, the company has also created a technology innovation platform (Sanrachna) for finding innovative solutions by involvement of students, academia, experts, etc., a step towards self-reliance in technology. Further details about our R&D achievement has been provided in page 142-145 of Annual Report 2020-21.

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.

GRI Content Index for 'In Accordance' - Comprehensive

GENERAL STANDARD DISCLOSURES				
Indicator	**Description**	**Page No. / explanation**	**Omissions**	**External Assurance**
STRATEGY AND ANALYSIS				
G4-1	Statement from the most senior decision – maker of the organisation about the relevance of sustainability to the organisation and the organisation's strategy for addressing sustainability	-5		
G4-2	Description of key impacts, risks, and opportunities	BHEL's Annual Report (AR) 2020-21 Page 36-37		
ORGANISATIONAL PROFILE				
G4-3	Name of the organisation	6		
G4-4	Primary brands, products, and services	6		
G4-5	Location of organisation's Headquarters	6		
G4-6	Number of countries where the organisation operates	10		
G4-7	Nature of ownership and legal form	15		
G4-8	Markets served	6-7		
G4-9	Scale of the organisation	7		
G4-10	Details of workforce broken down by gender, employment contract, employment type etc.	47		
G4-11	Percentage of total employees covered by collective bargaining agreements	48-49		
G4-12	Description of the organisation's supply chain	13		
G4-13	Significant changes during the reporting period regarding the organisation's size, structure, ownership, or its supply chain	None		
G4-14	How the precautionary approach or principle is addressed by the organisation	14		
G4-15	Externally developed economic, environmental and social charters, principles, or other initiatives to which the organisation subscribe or which it endorses	BHEL's AR 2020-21 Page 36-37		
G4-16	Memberships of associations and national/ international advocacy organisations in which the organisation holds a position on the governance body and participates in projects or committees			

GENERAL STANDARD DISCLOSURES				
Indicator	**Description**	**Page No. / explanation**	**Omissions**	**External Assurance**
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES				
G4-17	Entities included in the organisation's consolidated financial statements with indication of coverage in the report	Only BHEL		
G4-18	Process for defining the report content and the Aspect Boundaries	BHEL's Sustainability Report 2018-19 Page 14		
G4-19	Material Aspects identified in the process for defining report content			
G4-20	Description of Aspect Boundary within the organisation for each material aspect			
G4-21	Description of Aspect Boundary outside the organisation for each material aspect		Not reported	
G4-22	Explanation of the effect of any re-statement of information provided in the earlier Report.		Not applicable	
G4-23	Significant changes from previous reporting periods in the Scope and Aspect Boundaries			
STAKEHOLDER ENGAGEMENT				
G4-24	List of stakeholder groups engaged by the organisation	BHEL's Sustainability Report 2018-19 Page 12-14		
G4-25	Basis for identification and selection of stakeholders with whom to engage			
G4-26	Organisation's approach to stakeholder engagement			
G4-27	Key topics and concerns that have been raised through stakeholder engagement, and how the organisation has responded to those key topics and concerns			
REPORT PROFILE				
G4-28	Reporting Period	2020-21		
G4-29	Date of most recent previous Report	2019-20		
G4-30	Reporting cycle	Annual		
G4-31	Contact point for questions regarding the report or its contents	ajitshar@bhel.in		
G4-32	GRI Content Index	59-71		
G4-33	Organisation's policy and current practice with regard to seeking external assurance for the report; relationship with the assurance providers; the highest governance body's involvement in seeking assurance for the organisation's Sustainability Report			No External Assurance taken

GENERAL STANDARD DISCLOSURES				
Indicator	**Description**	**Page No. / explanation**	**Omissions**	**External Assurance**
GOVERNANCE				
G4-34	Governance structure of the organisation; committees responsible for decision-making on economic, environmental and social impacts	BHEL's AR 2020-21 Page 85-93		
G4-35	Process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees			
G4-36	Executive - level positions with responsibility for economic, environmental and social topics			
G4-37	Processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics			
G4-38	Composition of the highest governance body and its committees			
G4-39	Function of the Chair of the highest governance body within the organisation's management and the reasons for his arrangement as an executive officer			
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			
G4-41	Processes for the highest governance body to ensure conflicts of interest are avoided and managed; disclosure of conflicts of interest to stakeholders			
G4-42	Highest governance body's and senior executives roles in development, approval, and updating of the organisation's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental and social impacts			
G4-43	Measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics			
G4-44	Processes for evaluation of the highest governance body's performance with respect to governance of economic environmental and social topics; actions taken in response to evaluation results			

GENERAL STANDARD DISCLOSURES				
Indicator	**Description**	**Page No. / explanation**	**Omissions**	**External Assurance**
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	BHEL's AR 2020-21 Page 85-93		
G4-46	Highest governance body's role in reviewing the effectiveness of the organisation's risk management processes for economic, environmental and social topics			
G4-47	Frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities			
G4-48	Highest committee or position that formally reviews and approves the organisation's sustainability report and ensures that all material Aspects are covered			
G4-49	Process for communicating critical concerns to the highest governance body			
G4-50	Nature and total number of critical concerns that were communicated to the highest governance body and the mechanism(s) used to address and resolve them			
G4-51	Remuneration policies for the highest governance body and senior executives; how performance criteria in the remuneration policy relate to the highest governance body's and senior executives' economic, environmental and social objectives			
G4-52	Process for determining remuneration			
G4-53	How stakeholders' views are sought and taken into account regarding remuneration			
G4-54	Ratio of the annual total compensation for the organisation's highest- paid individual to the median annual total compensation for all employees (excluding the highest – paid individual)			
G4-55	Ratio of percentage increase in annual total compensation for the organisation's highest – paid individual to the median percentage increase in annual total compensation for all employees (excluding the highest – paid individual)			

GENERAL STANDARD DISCLOSURES				
Indicator	**Description**	**Page No. / explanation**	**Omissions**	**External Assurance**
ETHICS AND INTEGRITY				
G4-56	Organisation's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics	14-15		
G4-57	Internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organisational integrity			
G4-58	Internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organisational integrity			

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
CATEGORY: ECONOMIC				
ECONOMIC PERFORMANCE				
G4-EC1	Direct economic value generated and distributed	22		
G4-EC2	Financial implications and other risks and opportunities for the organisation's activities due to climate change	BHEL's AR 2020-21 Page 42		
G4-EC3	Coverage of the organisation's defined benefit plan obligations	BHEL's AR 2020-21 Page 207-217		
G4-EC4	Financial assistance received from government	23		
MARKET PRESENCE				
G4-EC5	Ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation		Not applicable	
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	54-56		
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	BHEL's AR 2020-21 Page 137		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
CATEGORY: ENVIRONMENTAL				
MATERIALS				
G4-EN1	Materials used by weight or volume	27-28		
G4-EN2	Percentage of materials used that are recycled input materials			
ENERGY				
G4-EN3	Energy consumption within the organisation	29-31		
G4-EN4	Energy consumption outside of the organisation		Not reported	
G4-EN5	Energy intensity	31		
G4-EN6	Reduction of energy consumption	31-34		
G4-EN7	Reductions in energy requirements of products and services			
WATER				
G4-EN8	Total water withdrawal by source	37-38		
G4-EN9	Water sources significantly affected by withdrawal of water	None		
G4-EN10	Percentage and total volume of water recycled and reused	38-39		
BIODIVERSITY				
G4-DMA	Aspect specific DMA	39		
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)	40-41		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
G4-EN16	Energy indirect greenhouse gas (GHG) emissions (scope 2)	40-41		
G4-EN17	Other indirect greenhouse gas (GHG) emissions (scope 3)	41		
G4-EN18	Greenhouse gas (GHG) emissions intensity			
G4-EN19	Reduction of greenhouse gas (GHG) emissions			
G4-EN20	Emissions of ozone-depleting substances (ODS)	40		
G4-EN21	NOx, SOx, and other significant air emissions			
EFFLUENTS AND WASTE				
G4-EN22	Total water discharge by quality and destination	38		
G4-EN23	Total weight of waste by type and disposal method	42		
G4-EN24	Total number and volume of significant spills	None		
G4-EN25	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel convention, annex i, ii, iii, and viii, and percentage of transported waste shipped internationally		This standard disclosure is not applicable as there was no transport, import, export or treatment of waste deemed hazardous under the terms of Basel Convention Annex I, II, III & IV	
G4-EN26	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organisation's discharges of water and runoff		Not applicable	
PRODUCTS & SERVICES				
G4-EN27	Extent of impact mitigation of environmental impacts of products and services	43-45		
G4-EN28	Percentage of products sold and their packaging materials that are reclaimed by category	None		
COMPLIANCE				
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.	45		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
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	45		
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			
ENVIRONMENTAL GRIEVANCE MECHANISM				
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	45		
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	BHEL's AR 2020-21 Page 77		
G4-LA2	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	BHEL's AR 2020-21 Page 176		
G4-LA3	Return to work and retention rates after parental leave, by gender		Not applicable	
LABOR/MANAGEMENT RELATIONS				
G4-LA4	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements		Not applicable	
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	48-49		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
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	49-50		
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation			
G4-LA8	Health and safety topics covered in formal agreements with trade unions			
TRAINING AND EDUCATION				
G4-LA9	Average hours of training per year per employee by gender, and by employee category	51		
G4-LA10	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	50-51		
G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	47-48		
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	13		
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	51		
G4-LA15	Significant actual and potential negative impacts for labor practices in the supply chain and actions taken			
LABOR PRACTICES GRIEVANCE MECHANISMS				
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved through formal grievance mechanisms	51		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
HUMAN RIGHTS				
LABOR PRACTICES GRIEVANCE MECHANISMS				
G4-HR1	Total number & percentage of significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	51-52		
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	None		
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	None		
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	None		
SECURITY				
G4-HR7	Percentage of security personnel trained in the organisation's human rights policies or procedures that are relevant to operations	47		
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	51-52		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
SUPPLIER HUMAN RIGHTS ASSESSMENT				
G4-HR10	Percentage of new suppliers that were screened using human rights criteria		Not reported	
G4-HR11	Significant actual and potential negative human rights impacts in the supply chain and actions taken			
HUMAN RIGHTS GRIEVANCE MECHANISMS				
G4-HR12	Number of grievances about human rights impacts filed, addressed, and resolved through formal grievance mechanisms	51-52		
SOCIETY				
LOCAL COMMUNITIES				
G4-SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	51-52		
G4-SO2	Operations with significant actual and potential negative impacts on local communities			
ANTI CORRPUTION				
G4-SO3	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	BHEL's AR 2020-21 Page 148-149		
G4-SO4	Communication and training on anti-corruption policies and procedures			
G4-SO5	Confirmed incidents of corruption and actions taken			
PUBLIC POLICY				
G4-SO6	Total value of political contributions by country and recipient/beneficiary		Not applicable	
ANTI COMPETITIVE BEHAVIOUR				
G4-SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	None		
COMPLIANCE				
G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	None		
SUPPLIER ASSESSMENT FOR IMPACTS ON SOCIETY				
G4-SO9	Percentage of new suppliers that were screened using criteria for impacts on society		Not reported	

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
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	None		
PRODUCT RESPONSIBILITY				
CUSTOMER HEALTH & SAFETY				
G4-PR1	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	Not applicable		
G4-PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning the health and safety impacts of products and services during their life cycle, by type of outcomes	None		
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	56		
G4-PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes			
G4-PR5	Results of surveys measuring customer satisfaction			
MARKETING COMMUNICATIONS				
G4-PR6	Sale of banned or disputed products		Not applicable	
G4-PR7	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship, by type of outcomes	58		

SPECIFIC STANDARD DISCLOSURES - Material Aspects				
Indicator	**Description**	**Page number / explanation**	**Omissions**	**External Assurance**
CUSTOMER PRIVACY				
G4-PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	56		
COMPLIANCE				
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	56		

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