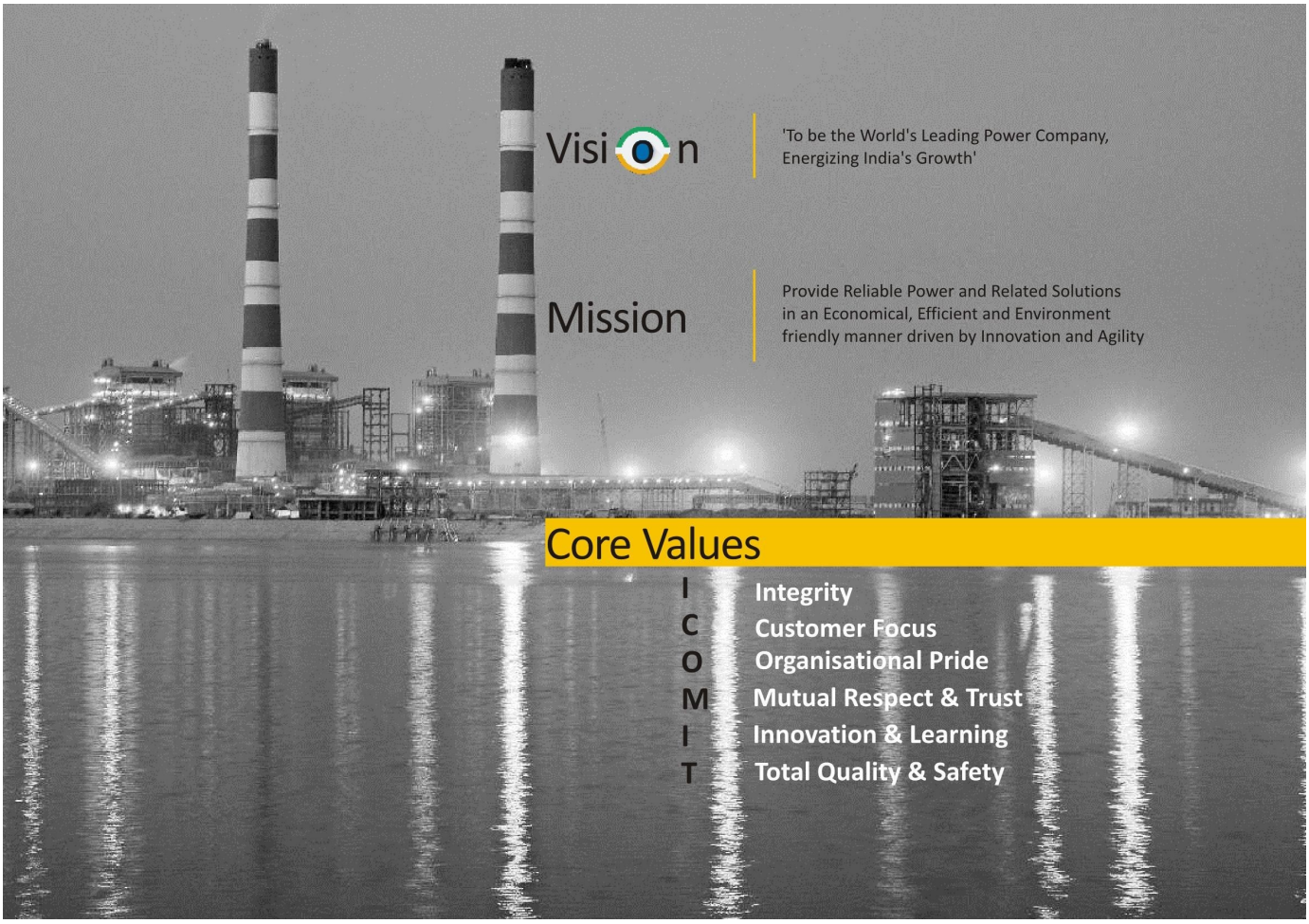

एनटीपीसी
NTPC
A Maharatna Company
Sustainability Report
Financial Year 2016-17
GRI G4 (Comprehensive) & EUSS Compliant


Vision
'To be the World's Leading Power Company, Energizing India's Growth'
Mission
Provide Reliable Power and Related Solutions in an Economical, Efficient and Environment friendly manner driven by Innovation and Agility
Core Values
I Integrity
C Customer Focus
O Organisational Pride
M Mutual Respect & Trust
I Innovation & Learning
T Total Quality & Safety

About the report

This is the fifth Sustainability Report, covering FY 17. The fourth Sustainability Report was published for FY 15 and FY16 on May 8, 2017. All the previous reports are available on the Company website http://ntpc.co.in/en/sustainability/reports-and-policies. NTPC follows financial year reporting period. The details on reporting period, scope, report boundary and methodology are as follows:

REPORTING PERIOD

Reporting period is from April 1, 2016 to March 31, 2017. The report is in line with GRI-G4 'in accordance' comprehensive option, along with its Electric Utility Sector Supplement (EUSS).Business Responsibility Report has also been published along with NTPC Annual Report FY 17, for which the link is : http://www.ntpc.co.in/en/investors/annual-reports

SCOPE AND BOUNDARY OF THE REPORT

There is no significant change in the scope, boundary and measurement methods for this year's report. There are changes in Installed capacity of power generating plants during this reporting period. However, there is no change in company structure or ownership of the company. In previous year's sustainability report, operational projects were 23 thermal power stations, nine solar pv projects and one hydro power plant. In current reporting period, Bongaigaon and Kudgi thermal power station have been added and hence, total operational projects are 25 thermal power plants, 9 solar and one hydro power plant. All projects considered in current sustainability report are located in India and are under operation. There are 26 entities(Joint ventures and subsidiaries)included in NTPC consolidated financial statement. However joint ventures and subsidiaries are excluded from the reporting boundary. All relevant stakeholders have already been identified for the current period as given elsewhere in the report. The aspect boundary has been considered within the operating power plant.

The details of inclusion of performance indicators (unless otherwise stated) are depicted in the chart given below.

Performance indicators	Corporate & Regional Offices	Operating Stations	Under Construction Projects	Mining Projects
• Economic	☑	☑	☑	☑
• Environment		☑	☑	
• Labour Practices	☑	☑	☑	☑
• Society	☑	☑	☑	☑
• Human Rights	☑	☑	☑	☑
• Product Responsibility		☑		

REPORT METHODOLOGY

NTPC has a robust mechanism for reporting performance on the triple bottom line approach i.e. economic, environmental and social. Economic data in the report covers the financial results of NTPC, indicating the economic value retained. The fuel consumption and associated emission figures reported in the environment segment reflect NTPC's concern and efforts towards environmental improvement. Annual GHG emissions through coal and gas has been calculated in current reporting period, as coal and gas are the main fuels used in NTPC plants. The whole range of activities encompassing Human Rights, Occupational Health & Safety, Society, Human Resources and Product Responsibility are covered under social performance section of the report.

For collection of data on performance indicators, a uniform approach has been followed across all NTPC stations. Collected data is then processed at individual operating station in accordance with universally accepted methodologies following approaches of measurement, calculation and analysis. There is no re-statement or significant change in measurement methods applied in this report with respect to the previous report, except if mentioned, wherein applicable. Report content and aspect boundary provided in the report has been reviewed and approved by top management of the Company.

The report conforms to Comprehensive G4 "type 1 high level" as per GRI-G4 framework and has been assured by an independent external assurance provider, M/s SR Asia, India. The information and data contained in the report has been assured in line with the Assurance Standard AA1000AS (2008).

NTPC appreciates feedback from all internal and external stakeholders. For any additional information, please reach out to the address given below:

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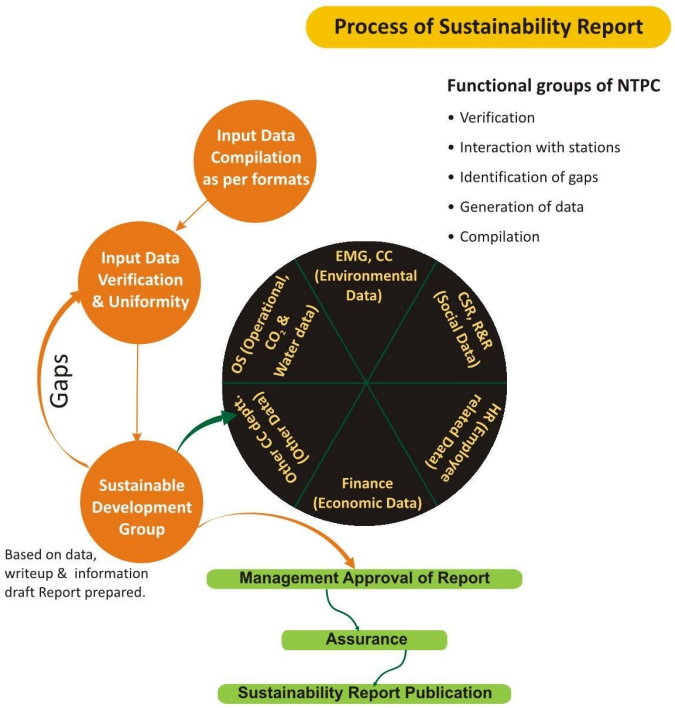

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A Maharatna Company

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Message from CMD

Dear Stakeholders,

I am glad to present to you the NTPC Sustainability report for FY17.

This report is a proactive disclosure of the Company's Triple Bottom Line performance and is third party assured. NTPC has achieved Comprehensive, Type 1, High level of assurance as per the AA1000AS (2008) Assurance Standard. I congratulate our team for achieving an assurance level higher than the previous level.

FY 17 was a year of feats as NTPC became a 50,000+ MW company in terms of installed capacity. NTPC started coal mining operations at its captive mining block at Pakri Barwadih. This backward integration will help the company in securing the fuel supplies for its long-term growth. We commissioned our first 800 MW unit at Kudgi with improved efficiencies and reduced carbon & water footprints.

Today, the question about generation of electricity has changed from "how much?" to "how?" As a strategic move, we have entered into the wind portfolio, and plan to ramp up our presence in solar-based generation. We have revised our long-term corporate plan with a goal to have 30% non-fossil fuel based generation capacity by 2032.

We are also looking at broadening our business footprint by exploring opportunities in the areas of electric vehicle charging infrastructure and distribution.

FY17 saw a wave of change in the approach towards environment and safety.

On the environment aspects, NTPC is the frontrunner in Flue Gas Desulphurization to contain sulfur dioxide emissions, and testing new technologies to contain nitrogen oxide emissions for Indian coal.

We are one of the few utilities in the world to have come out with a dedicated water policy in 2017 to establish the importance of this critical resource. Our commitment is demonstrated by initiating zero liquid discharge for all power plants across NTPC.

In order to move towards being a carbon-neutral company, other than striving for a bigger renewable portfolio and better fuel efficiencies, we have planted 1 crore trees in a short period of three months. NTPC has also successfully tested the co-firing of biomass in our conventional coal-fired boilers and we are going ahead for burning upto 10% of biomass pellets in our boilers in one of our power projects. This will not only reduce coal consumption, but also it has great potential to contain carbon emissions caused by open burning of crop residue in fields in northern parts of the country.

For safety, we have taken a 360° approach to change the culture across the organization. This includes formulating a new safety policy, creating special safety rooms, bringing safety performance into our vendors' as well as employees' performance evaluation, amongst other initiatives.

Our employees are the most important resources that drive the business. Maintaining the credo "People before PLF" has made NTPC grow to its present size, and is the reason we have the best power plant professionals of the country. We provide them the best learning opportunities for their all-round continuous development. Recently, we have released job rotation and career development policies. We are also rethinking our organizational structures and positioning of personnel to gain strategic advantages.

NTPC has invested more than the prescribed Corporate Social Responsibility budget of INR 228 Crore towards creating enabling ecosystems for the communities in which we thrive. The efforts have been aligned to four sustainable development goals relating to our focus areas of health, water, sanitation and education needs.

The recent Unchahar mishap has deeply aggrieved each member of the NTPC family. As we strive to recover from this setback, we have resolved to adopt whatever it takes to have more sustainable operations.

Electricity is the first grade of energy – the one stop solution for all needs, ranging from its conventional uses to cooking to transportation. We look forward to create an India where we become energy exporters rather than fossil fuel importers.

Today NTPC is leading the way in a dynamic environment. How we are responding is delivering results and defining the future of our company and the communities we serve. This is our path forward and we are charging ahead with confidence.

(Gurdeep Singh)
Chairman and Managing Director

Growth Profile

1975
- Setup with 100% ownership by the GoI.

1982
- First 200 MW unit of Singrauli commissioned

1990
- NTPC crossed 10,000 MW mark

1997
- GoI conferred Navratna granting more operational and financial autonomy.

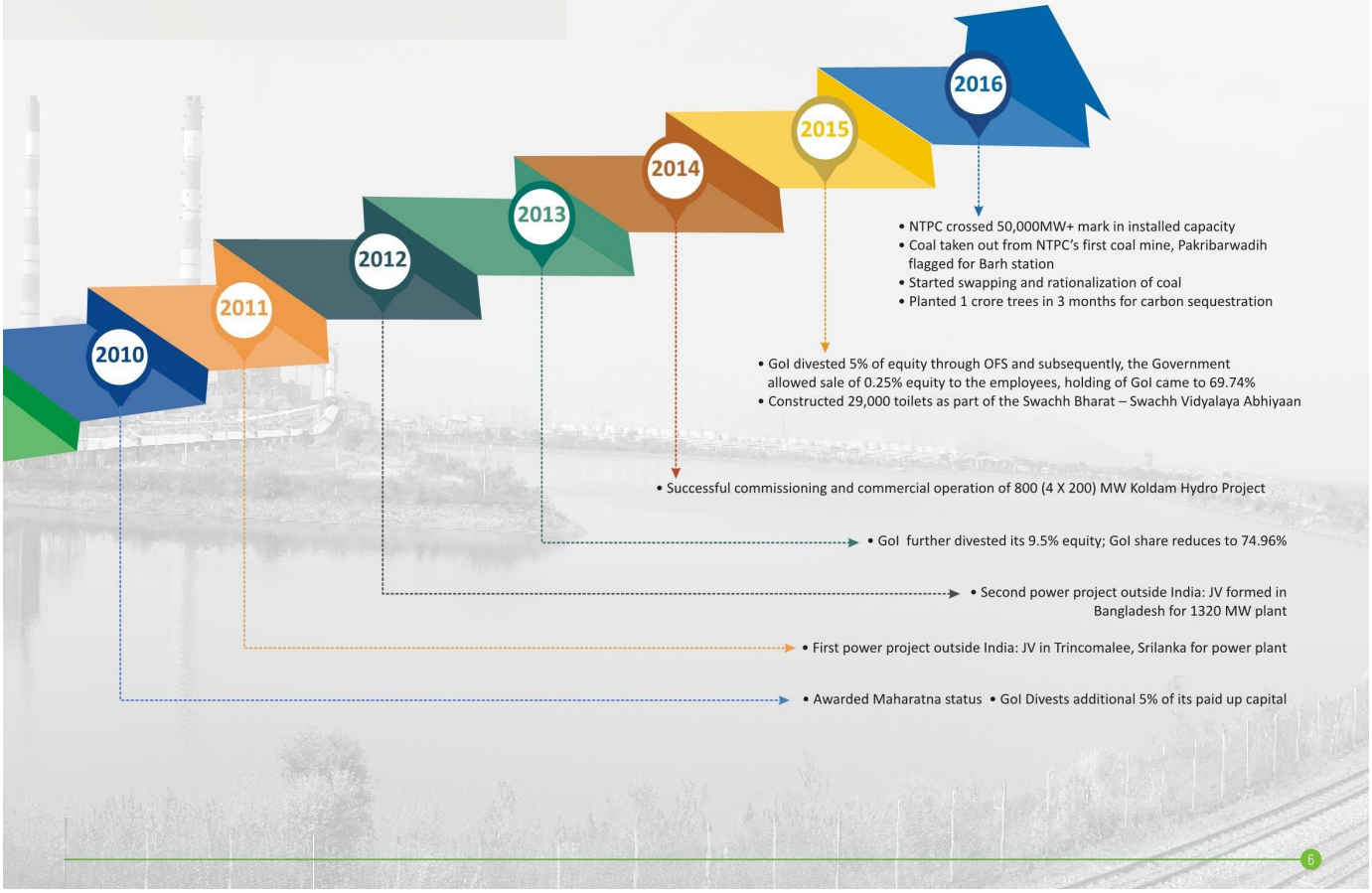
2002
- NTPC exceeds the 20,000 MW installed capacity

2003
- Commenced construction of Hydro Project of 800 MW

2004
- GoI divested 10.5% equity
- Stock listed on BSE & NSE.
- First coal mining block allocated

2005
- Rechristened as NTPC Ltd. in line with diversification in business operations beyond thermal power generation

2009
- Long term (20 yr.) fuel supply agreement with Coal India Ltd.
- NTPC crossed the 30,000 MW installed capacity mark


2010
2011
2012
2013
2014
2015
2016
• NTPC crossed 50,000MW+ mark in installed capacity
• Coal taken out from NTPC's first coal mine, Pakribarwadih flagged for Barh station
• Started swapping and rationalization of coal
• Planted 1 crore trees in 3 months for carbon sequestration
• GoI divested 5% of equity through OFS and subsequently, the Government allowed sale of 0.25% equity to the employees, holding of GoI came to 69.74%
• Constructed 29,000 toilets as part of the Swachh Bharat – Swachh Vidyalaya Abhiyaan
• Successful commissioning and commercial operation of 800 (4 X 200) MW Koldam Hydro Project
• GoI further divested its 9.5% equity; GoI share reduces to 74.96%
• Second power project outside India: JV formed in Bangladesh for 1320 MW plant
• First power project outside India: JV in Trincomalee, Srilanka for power plant
• Awarded Maharatna status • GoI Divests additional 5% of its paid up capital

Approach to **SUSTAINABILITY**

Issue	Objective	SDG
Robust governance	• Constant alignment with government policies/recommendation and best practice • Constant improvement in anti-corruption management • New initiative for managing legal aspects • Corporate membership of national and international bodies • Implementation of policies and system on sustainable development and business responsibility aspects	16 PEACE, JUSTICE AND STRONG INSTITUTIONS; 17 PARTNERSHIPS FOR THE GOALS
Power sector opportunity and challenges	• Development of electric vehicle of charging infrastructure and battery space • Plan to install 2GW Nuclear based power generation capacity through JV company Anushakti Vidyut Nigam (ASHVINI) with Nuclear Power Corporation by 2032 • 15GW of Solar capacity under National Solar Mission • Entering cement manufacturing business for higher ash utilization	7 AFFORDABLE AND CLEAN ENERGY
Building strong profile	• Total installed capacity of 130GW upto 2032 with 30% non-fossil based fuel • Adoption of technologically advanced, efficient and environmentally compliant units in phased manner	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Risk Management and Stakeholder Engagement	• Nine Stakeholders have been identified aimed at understanding the expectation and collaborating with them to achieve desired results • Medium of engagement, purpose of engagement, key priorities derived out of the engagement process • Identification of stakeholder groups and understanding their expectations and key priorities • Robust Enterprise Risk Management (ERM) for identification of top risks and establish risk management plans • 25 risks Identified and out of which 8 risks have been classified as the top risks of the Company	16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Creating Economic value	• Increasing direct economic value by robust operations and capacity expansion • Policy and new practices for strong supply chain management • Delivering sustainable technology solutions through applied research and provide advanced scientific services for power sector • Investment for public benefits	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Bussiness & Governance Issue	Objective	SDG
Taking care of environment	• Optimizing resources • Energy conservation measures • Constant increase of saving energy every year • Best technology adoption for energy management • For promoting sustainable growth, bulk of the new capacity addition would come through super critical units leading to greater efficiency and reduced impact on the environment • Total energy saving of 8.87 million tons of oil equivalent from PAT II Cycle • 3.31% decrease of total water withdrawal as compared to previous year • The company do not have any impact on IUCN red list species and National conservation List species and their habitats • Low carbon initiatives taken. Significant steps undertaken for reduction in LTHCT and pollutant emission • Planted more than 1 crore trees during 2016-17 to mitigate LTHCT emission • Process of phasing out Ozone Depleting Substances (ODS) • Adoption of integrated approach to proper handling and disposal of all types of wastes in a scientific manner • Increase of ash utilization through new initiatives taken	
People and Communities	• Freedom of association and effective recognition of the right to collective bargaining • Prohibited child labour and preventing forced and compulsory labour • Taking care Indigenous Right • Human Right, Labour practices assessment for suppliers • Taking care of employees • Upliftment of marginalized section of society • Well designed structure for occupational health and safety management • Endeavored to be in the forefront of creation and dissemination of Knowledge • Taking care of customers health and safety • Customer Relationship Management(CRM) intiatives have been taken towards strengthening relationship with our customers • Commited to growth and progress of communities through specified programmes for inclusive growth and equitable development • Caring for the local communities • Taking up issues for public advocacy	

MAJOR INITIATIVES

- Adopted air cooled condensers technology which saves water consumption by 60%
- Variable Frequency Drive provided for CEPs, HCSD system and Intake water pumps
- Adopted Unified Human Machine Interface (HMI) for main plant control room is the first such integration
- General layout plan of power plant is optimized from about 1 Acre/MW to less than 0.25 Acre/MW
- Pilot study for NO_x control is in progress in nine NTPC projects
- FGD for SO_2 control is planned for implementation in 64 GW of NTPC and JV projects
- Use of m-sand/bottom ash in lieu of natural sand for filter purpose for cost effective and environment friendly construction
- 222 MW Wind-Solar Hybrid project under construction at Kudgi, one of its kind in India• Heat rate improvement of 168.4 kcal/kWh w.r.t. base case of Sub-critical unit (Kahalgaon STP) with steam parameters of 170 ata/537°C/537°C
- Advanced Ultra Super Critical (AUSC) Technology R&D is underway. R&D is started in 800MW unit at Sipat with steam parameters of 310kg/cm^2-710°C/720°C
- Started first biomass co-firing project at NTPC Dadri to abate pollution owing to crop burning.
- A hybrid Solar thermal plant with a peak output of 3.6 MW to be commissioned at NCPS, Dadri wherein collected heat from solar field will be transferred to feed water of turbine cycle, partially substituting bleed steam for HP heater. This unique integration scheme offers various advantages like shorter start up time compared to a standalone solar thermal plant
- Demonstrating compact WtE (waste to energy) plant with capacity 400 tons per day at Badarpur with grate fired technology
- Using treated sewage water from municipal/local urban bodies in thermal power plants
- To minimize the use of papers as an initiative to "GO GREEN" Paperless technology has been adopted in offices where Scanners now form the interface while the archival is done on meticulous transformation.
- Initiated ZLD (Zero Liquid Discharge) in all NTPC stations (new as well as existing)
- Replacement of existing chlorine dozing system at NTPC Stations by ClO_2
- Generic medicine stores opened at township
- Anti tobacco and Water Policy implemented in NTPC

CORPORATE OBJECTIVES

To realise the vision and mission, eight key corporate objectives have been identified. These objectives would provide the link between the defined mission and the functional strategies:

Business portfolio growth

- To sustain NTPC's position as the leading power generation company in the world.
- To broad base the generation mix with significant proportion of clean energy sources.
- To enable the generation fleet to operate at optimum efficiency while meeting the demand and stability in the grid.
- To diversify into emerging businesses and markets across the power value chain including coal mining, power trading, ancillary services, E-mobility, storage and related adjacencies.
- To establish a strong services brand in domestic and international markets.

Customer focus

- To foster a collaborative style of working with customers, growing to be a preferred brand for supply of quality and reliable power.
- To expand the customer portfolio through profitable diversification into downstream business inter alia E-mobility and direct supply.
- To ensure rapid commercial decision making, using customer specific information, with adequate concern for the interest of the customer.
- To adopt business models and organisation structures to capture value which is progressively shifting towards the customers.

Agile corporation

- To ensure effectiveness in business decisions and responsiveness to changes in the business environment by:
  - o Adopting a portfolio approach to new business development.
  - o Continuous and co-ordinated assessment of the business environment to identify and respond to opportunities and threats.
- To create lean organization and business processes.
- To develop a learning organization having knowledge-based competitive edge in current and future businesses.
- To develop a culture of curiosity and innovation in learning and adopting new technologies, business models and operational philosophies in line with the evolving market and changing customer needs.

Performance leadership

- To continuously strive for innovation in reducing costs, enhancing operational flexibility and in addressing changing customer needs.
- To continuously improve on project execution time and cost in order to sustain long term competitiveness.
- To effectively leverage Information Technology to drive process efficiencies and enable system flexibility in line with the market needs.
- To create capabilities to attain leadership in the new and emerging businesses.
- To embed quality and safety in all systems and processes.

Minister of State (IC) for Power, New and Renewable Energy during his visit to NTPC

- Support evolution of power markets to meet customer needs through products, platforms, services etc. to create a win-win opportunity across stakeholders.
- To lead development efforts in the Indian power sector through stakeholder consultation.
- To assist in capacity creation of key stakeholders.

Human resource development

- To enhance organizational performance by institutionalizing an objective and open performance management system.
- To align individual and organizational needs and develop business leaders by implementing a career development system.
- To build a lean organization with diverse skills and high ability to adapt to change
- To build and sustain a learning organization of competent world-class professionals.
- To institutionalize core values and create culture of team-building, ownership, empowerment, equity, innovation and openness which would motivate employees and enable achievement of strategic objectives.

Financial soundness

- To maintain and improve the financial soundness of NTPC by prudent management of the financial resources.
- To continuously strive to reduce the cost of capital through prudent management of deployed funds, leveraging opportunities in domestic and international financial markets.
- To promote innovative funding models to support entry into new businesses and sustain long term growth.
- To develop appropriate commercial policies and processes which would ensure remunerative tariffs, balance capital work-in-progress and minimize receivables.

Sustainability and Corporate Social Responsibility

- To deliver business and environmental value through projects which are beneficial for business and larger ecosystem.
- To ensure sustainable power development by ensuring minimal wastage across operations.
- To actively contribute towards societal development.
- To lead the sector in the areas of resettlement and rehabilitation and environment protection including effective ash utilization, peripheral development and energy conservation practices.

Research & Development

- To undertake R&D initiatives in sync with the overall business portfolio.
- To pioneer the adoption of reliable, efficient and cost-effective technologies by carrying out fundamental and applied research in alternate fuels and technologies.
- To collaborate with leading institutes, technology players and service providers, particularly in the area of power plant construction, generation technology, operations, renewable energy sources, storage, e-mobility, etc. that can contribute towards efficiency, reliability and environment friendliness.

Performance Highlights

Major highlights for FY 17

- Power projects of 3,845 MW were commissioned.
- Declared 2,190 MW Power Projects on commercial generation including 510 MW of Solar Projects.
- PLF of 78.59% as against all India PLF of 59.88% with two stations of NTPC recording more than 90% PLF. Three stations of NTPC achieved top three position and 11 stations (including JV) are in top 25 stations of the country in terms of PLF.
- Excellent MoU rating by Government of India for the year 2015-16.
- Group Capital Expenditure (CAPEX) including CAPEX of JV/subsidiaries of NTPC for the year 2016-17 was ₹ 33,991 crore.
- 100% realization of current bills from customers.
- Revenue from operations was ₹ 78,273.44 crore and total revenue was ₹ 79,342.30 crore. Net Profit after Tax (PAT) was ₹ 9,385.26 crore.
- Dividend of ₹ 4.78 per share comprising interim dividend of ₹ 2.61 per equity share paid in February 2017 and recommended final dividend of ₹ 2.17 per equity share for the year 2016-17, subject to approval of the shareholders.
- Cash contribution of ₹ 5,998.36 crore to Government of India's exchequer through dividend, dividend distribution tax and income tax in the financial year 2016-17.
- Market capitalization of ₹ 1,36,874.64 crore as on 31.03.2017.
- Six coal based stations out of 18 commercial stations achieved more than 85% PLF.
- Gas stations having a capacity of 4,017 MW achieved annual generation of 8.59 BUs at a PLF of 24.42% as against 8.87 BUs last year, mainly due to less generation schedule which accounted for an opportunity loss of 24.48 BUs.
- 11 NTPC stations were in top 25 stations in the country in terms of PLF.
- Coal based stations operated at average Availability Factor of 88.81% on bus bar.
- Solar generation : 0.528 BUs
- Total coal generation contributed by coal stations is 237.96 BUs during the year against generation of 230.64 BUs last year registering a growth of 3.18%.
- Coal based stations operated at average Plant Load Factor (PLF) of 78.59% (All India PLF 59.88%)
- 20.20% (22.40% including generation by JVs and Subsidiaries) of the total power generated in India registering an increase of 3.44% (5.07% including JVs & Subsidiaries) over the previous year's generation of 241.98 BUs.
- Power stations of NTPC generated 250.31 BUs (276.77 BUs including JVs & Subsidiaries) of electricity (including solar and hydro power)

Target	Achievement
1 Capacity Utilization Generation : 248BU	250.31 BU
2 Production Efficiency: Reduction in Specific Coal Consumption over previous year: 2.5 %	5.12%
3 Production Efficiency: Reduction in Specific Water Consumption over previous year: 2.5 %	4.17%
4 Production Efficiency Reduction in Forced Outage over previous year: 2.5 %	16.97%
5 Technology upgradation: Up gradation of Electro Static Precipitators - No. of units to be completed: 6 Nos.	6 Nos
6 CAPEX: ₹30,000 Cr.	₹30,094.02 Cr.
7 Monitoring Parameter: % of value of CAPEX contracts/ project running/ completed during the year without time / cost overrun to total value of CAPEX contracts running/ completed during the year: 100 %	100%
8 Revenue from Operations (Net of excise duty): ₹74,000 Cr.	₹77,911.20 Cr.
9 Operating Profit (Profit before Tax) (excluding Other Income Extraordinary and Exceptional items): ₹9,000 Cr.	₹12,102.02 Cr.
10 Reduction in Claims against the Company, not acknowledge as debt, over the previous year. Claims raised by CPSEs: 50 %	13.99%
11 Reduction in Claims against the Company not acknowledge as debt, over the previous year. Claims raised by others: 2 %	7.48%
12 Increase in Ash Utilization over previous year (including both Fly and Bottom Ash): 12.5 %	22.32%
13 Trade Receivables as percentage of Revenue from Operations (Gross): 12.5 %	10.35%
14 Return of Investment: Dividend/PAT: 30 %	35.36%
15 Return of Investment:- PAT/ Net Worth: 11.75 %	11.12%
16 Return of Investment: Dividend/Net Worth: 3.53 %	3.93%
17 Sector/ CPSE specific targets : Return from Investment in JVs: 2 %	2.30%

Overall Performance Evaluation Catagory: Excellent

Organisation's Profile

FY 17 turned out to be a pivotal year for NTPC Ltd. as it crossed the 50,000 MW+ mark in installed capacity. With its strong overall performance, the company is expected to retain the "Excellent" rating for the MoU signed with Government of India.

NTPC is a schedule 'A' Maharatna listed CPSE under the administrative control of Ministry of Power with 69.74% shareholding by the GoI (as on March 31, 2017). In pursuit of its vision the Company has diversified its activities through backward, forward and lateral integration in the entire value chain of power generation business.

NTPC subscribes to economic, environmental, social charters principles proposed by NVG, EUSS, UNGC etc.

Shri A.K. Bhalla, Secy. (Power), GoI at NTPC Dadri Control Room


Corporate Plan 2032
A diversified fuel mix comprising 65.4% Coal, 4.6% Gas, 1.5% Nuclear and 28.5% Renewable Energy Sources (RES) including Hydro
Installed capacity of 130 GW with annual generation greater than 600 BU
Replace its old & inefficient units with technologically advanced, efficient and environmentally compliant units in a phased manner
Coal mining operation in NTPC's 10 Coal blocks with a peak production capacity of more than 100 MTPA
Non-fossil fuel based generation capacity to make up 30% of NTPC's portfolio
NTPC Simhadri

Capacity Addition

NTPC owned Coal Based Power Projects	
Kudgi, Unit#1 and 2	1,600
Bongaigaon, Unit#2	250
Mouda, Unit#4	660
Unchahar, Unit#6	500
Total	**3,010**

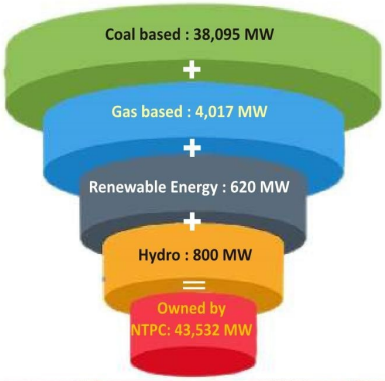
NTPC owned Coal Based Power Projects (subsidiary of NTPC in JV with JBVNL)	
Patratu	325
Total	**325**

Solar Based Power Projects	
Bhadla	260
Ananthapur Solar	250
Total	**510**

Total Addition during FY 17: 3,845 MW

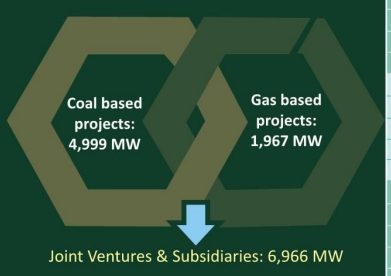
With above capacity addition during FY 17, capacity added in 12th Plan Period was 13,395 MW.

The total installed capacity of the NTPC Group as on March 31, 2017 has become 50,498 MW (owned by NTPC 43,532 MW and Joint Venture & Subsidiaries 6,966 MW) as:



Our Hon'ble Prime Minister at the dedication ceremony of Koldam Hydro Power Station

Capacity Addition



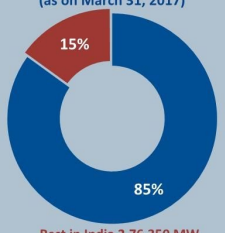
Joint Ventures & Subsidiaries: 6,966 MW

A list of Station wise generation for the FY 17are as under:

Station	Fuel	Gross Capacity* (in MW)			Gross Generation (in MUs)		
		2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
Northern Region		**7,153**	**7,153**	**7,653**	**48,234**	**48,980**	**47,959**
Singrauli	Coal	2,000	2,000	2,000	14,516	16,271	15,219
Rihand	Coal	3,000	3,000	3,000	21,271	21,055	21,969
Unchahar	Coal	1,050	1,050	1,550	7,622	7,013	6,994
Tanda	Coal	440	440	440	3,161	3,130	3,241
Auraiya	Gas	663	663	663	1,664	1,511	536
DBF		**3,787**	**3,787**	**3,787**	**19,667**	**16,389**	**13,742**
Badarpur	Coal	705	705	705	3,281	2,241	1,705
Dadri	Coal	1,820	1,820	1,820	12,285	10,048	8,766
Dadri	Gas	830	830	830	2,530	2,999	2,237
Faridabad	Gas	432	432	432	1,571	1,101	1,034
Western Region		**12,572**	**13,732**	**14,392**	**78,723**	**79,027**	**85,425**
Mouda	Coal	1,000	1,660	2,320	2,311	1,876	4,300
Korba	Coal	2,600	2,600	2,600	20,061	20,429	20,365
Vindhyachal**	Coal	4,260	4,760	4,760	29,574	31,321	32,207
Sipat	Coal	2,980	2,980	2,980	21,773	22,285	23,779
Solapur	Coal			0			2
Kawas	Gas	656	656	656	1,741	1,212	1,718
Jhanor Gandhar	Gas	657	657	657	1,609	962	2,359
Anta	Gas	419	419	419	1,654	942	695
Eastern Region		**9,220**	**9,470**	**9,720**	**58,228**	**60,248**	**65,622**
Farakka	Coal	2,100	2,100	2,100	13,379	12,340	13,744
Kahalgaon	Coal	2,340	2,340	2,340	15,619	15,275	15,948
Barh	Coal	1,320	1,320	1,320	1,747	4,785	7,642
Talcher-Kaniha	Coal	3,000	3,000	3,000	23,699	23,967	22,848
Talcher –Thermal	Coal	460	460	460	3,784	3,764	3,760
Bongaigaon	Coal		250	500		117	1,680
Southern Region		**4,960**	**4,960**	**6,560**	**36,288**	**34,863**	**33,810**
Ramagundam	Coal	2,600	2,600	2,600	20,443	20,250	19,597
Simhadri	Coal	2,000	2,000	2,000	15,026	14,470	14,173
Kudgi	Coal			1,600			25
Rajiv Gandhi CCP	Liquid Fuel	360	360	360	819	143	15
Hydro Region			**800**	**800**		**2,308**	**3,225**
Koldam Hydro	Water		800	800		2,308	3,225
Total**		**37,692*** **	**39,902*** **	**42,912*** **	**2,41,140*** **	**2,41,815*** **	**2,49,783*** **

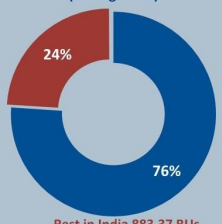
* As on 31.03.2017. ** As per NTPC, Regional location of Vindhyachal in Western Region.
***Exclude 531.1138 MU Solar Power Generation and 620 MW capacity.

Share of Installed Capacity (as on March 31, 2017)



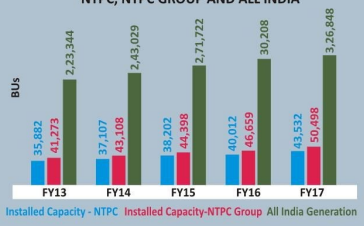
Rest in India 2,76,350 MW
NTPC (Group) 50,498 MW

Share of Electricity Generated (During FY 17)

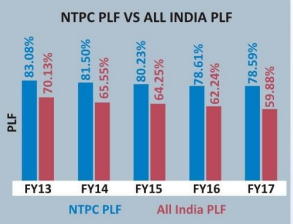


Rest in India 883.37 BUs
NTPC (Group) 276.77 BUs

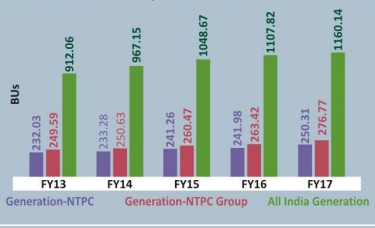
GROWTH IN INSTALLED CAPACITY, NTPC, NTPC GROUP AND ALL INDIA



NTPC PLF VS ALL INDIA PLF



GROWTH IN GENERATION NTPC, NTPC GROUP AND ALL INDIA GENERATION



Coal Based Project (NTPC Owned): 14,710 MW

Renewable Projects (Solar/Small Hydro) (NTPC Owned): 45 MW

Hydro Electric Power Projects (HEPP) (NTPC Owned): 811 MW

Projects under JVs & Subsidiaries: 5,410 MW

Projects under Implementation : 20,976 MW

New Projects

As on July, 2017, NTPC has projects for 3,720 MW Thermal capacity (Patratu 2,400 MW & Talcher-III 1,320 MW)

As on July, 2017, 1,276.5 MW Renewable capacity (Pavagada, Karnataka 1,000 MW Solar PV; Andaman 25 MW Solar PV with Battery backup; Kudgi Roof Top Solar PV of 1.5 MW & 250 MW Wind Project) under bidding.

NTPC awarded first Wind power project at Rojmal (50 MW)

Capacity Addition through Renewable Energy Sources

Under Green Energy Commitment NTPC has committed to develop 10 GW of Renewable Energy Projects under Green Energy Commitment to Govt. of India.

- NTPC has already commissioned 883 MW of RE projects as on July 31, 2017 and 37 MW is under execution.
- NITs have been issued for 1,025 MW of Solar PV projects to be set up in the states of Karnataka and Union Territory of Andaman & Nicobar.
- 250 MW Wind power project in the states of Gujarat, Karnataka, Andhra Pradesh & Madhya Pradesh.

National Solar Mission: NTPC has been entrusted to develop 15 GW Solar PV under National Solar Mission (NSM) Phase-II in three tranches between 2014-15 to 2018-19

- NTPC will purchase power from the developers and sell it to the Discoms.
- Under Tranche-I of 3,000 MW of Solar PV capacity, PPAs have been signed for 2,750 MW solar PV projects till June 30, 2017 and for balance 250 MW, Reverse Auction has been completed. Out of this 3,000 MW, 1,380 MW Solar PV capacity has been commissioned till June 30, 2017.
- The guidelines for the balance 12 GW is awaited from MNRE.

Floating Solar PV at Kayamkulam

DEVELOPMENT OF COAL MINING PROJECTS

Allocated Coal Blocks by GoI

- Kerandari
- Talaipalli
- Bhalumuda
- Pakri-Barwadih
- Chatti-Bariatu & Chatti-Bariatu (South)
- Dulanga
- Banai
- Mandakini-B

Target: About 107 Million Metric Tonnes of coal per annum

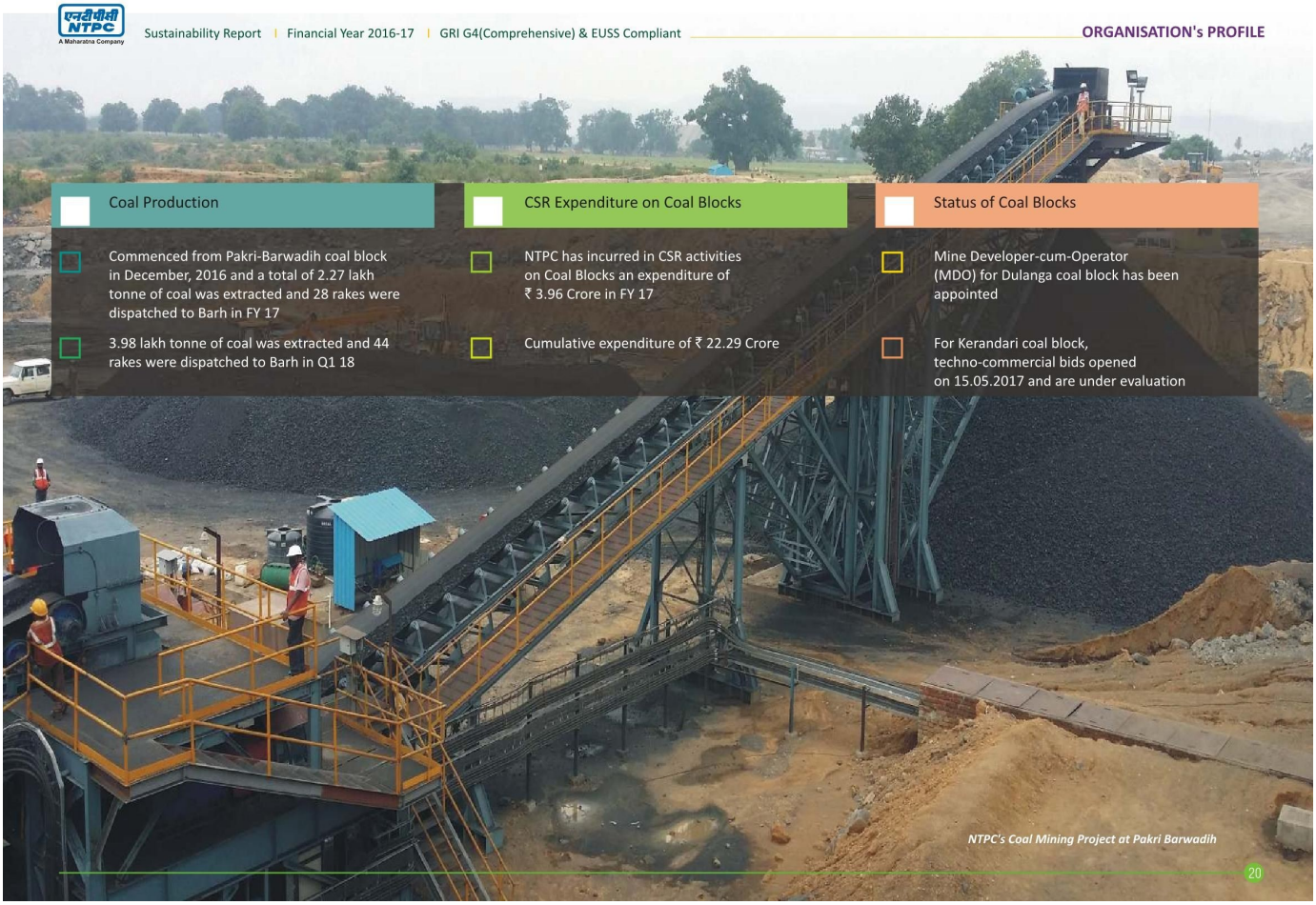
Banhardih coal block, allocated earlier to Jharkhand Urja Utpadan Nigam Ltd., has been assigned to Patratu Vidyut Utpadan Nigam Ltd., a subsidiary of NTPC in joint venture with JBVNL

Assigned Coal Block

Coal block jointly to NTPC and the State of J&K, with NTPC's share of coal reserves in this block being two-third.

Kudanali-Luburi (Underway)

Total estimated geological reserves → About 7.3 Billion Metric Tonnes



Coal Production

- Commenced from Pakri-Barwadih coal block in December, 2016 and a total of 2.27 lakh tonne of coal was extracted and 28 rakes were dispatched to Barh in FY 17
- 3.98 lakh tonne of coal was extracted and 44 rakes were dispatched to Barh in Q1 18

CSR Expenditure on Coal Blocks

- NTPC has incurred in CSR activities on Coal Blocks an expenditure of ₹ 3.96 Crore in FY 17
- Cumulative expenditure of ₹ 22.29 Crore

Status of Coal Blocks

- Mine Developer-cum-Operator (MDO) for Dulanga coal block has been appointed
- For Kerandari coal block, techno-commercial bids opened on 15.05.2017 and are under evaluation

NTPC's Coal Mining Project at Pakri Barwadih

Globalisation Initiatives

Trincomalee Power Company Limited (TPCL)

A 50:50 joint venture between NTPC and Ceylon Electricity Board was formed to undertake the development, construction, establishment, operation and maintenance of a coal based electricity generating station of 2X250 MW capacity at Trincomalee at Sri Lanka.

As per the decision of the Board of TPCL, operations of the Company have been limited till September 2017. Govt. of Sri Lanka (GoSL) had issued letter of intent to Government of India for development of 500 MW LNG based JV power project.

Bangladesh-India Friendship Power Company Private Limited

A 50:50 JV Company between NTPC and Bangladesh Power Development Board (BPDB) was formed for developing a 2X660 MW Coal based power project (Maitree Super Thermal Power Plant) at Khulna Division, Rampal, Bangladesh.

EPC contract of the project except township has been awarded to BHEL. Financial closure has been achieved on 09.04.2017.

Power trading

In line with provisions of amended Tariff Policy, NTPC has commenced trading of the Un Requisitioned Surplus (URS) power in the power exchange through its trading arm NTPC Vidyut Vyapar Nigam Limited (wholly-owned subsidiary) from June 2016.

As per the amended Tariff Policy, gains from these transactions have to be shared in the ratio of 50:50 with the beneficiaries whose URS power is sold.

Consultancy wing

Consultancy wing offers services "From Concept to Commissioning and beyond...." such as in engineering, O&M, project, contracts & procurement, quality, training, solar power projects, coal mining etc.

Consultancy Wing is looking ahead for future business opportunities in areas like implementation of solar and renewable power projects, mine development and supporting other power utilities for meeting new environmental norms.

Suppliers and Vendors

At NTPC, we treat our suppliers as our partners in our sustainability journey. Our suppliers, contract manufacturers and service providers are intrinsic to the business. For setting up of power plants and catering to their operations & maintenance requirements, NTPC engages contractors / suppliers. The contractors / suppliers, while performing their contractual obligations, supply plant equipment and spares manufactured by themselves as well as through other sub-vendors appointed by them. Low value contracts for jobs like hiring of jeeps, gardening, horticulture, housekeeping, cleaning etc. at our plant sites are given to Plant Affected People (PAPs) for supporting their livelihood.

Identification of prospective contractors/suppliers is generally done by formulating qualifying requirements. Selection of Contractors/Suppliers is done through tendering process, whereby bids are invited from prospective bidders. Bids are evaluated in accordance with the evaluation criteria stipulated in the bidding documents. After evaluation, the bidder, whose proposal is found to be responsive and meeting the stipulated qualifying requirements, and has the lowest evaluated price, is selected as the Contractor/Supplier.

Notice Inviting Tenders (NITs) / Invitation for bids (IFBs) are published in regional and national newspapers and also hosted on NTPC's website, accessible to every prospective bidder / supplier. Copy of NITs / IFBs is also sent to contractors / suppliers who have been associated with or executed similar contracts for NTPC in the past. In case of tendering on International Competitive Bidding (ICB) basis, the IFB is published in the Indian Trade Journal and copy of the IFB is sent to High Commissions / Embassies of other countries in India as well for further propagation.

Input details:

Major Fuel Suppliers	FY 16	FY 17	Suppliers
Fuel Cost (coal, Gas, oil, & Naptha) paid (₹ Crore)	43,793.59	47,8572.19	
		% break-up	
Coal	92.86%	95.09 %	Coal India and its subsidiaries, Singareni Collieries Company Limited (SCCL)
Gas	6.06 %	4.29 %	For the six gas based stations (Anta, Auraiya, Dadri, Faridabad, Kawas & Gandhar), GAIL has been supplying domestic gases (APM/PMT/Non-APM), Spot RLNG Suppliers are GAIL, IOCL, BPCL & GSPC.
Oil	0.85%	0.60%	IOCL, BPCL
Naptha	0.23 %	0.02 %	Liquid fuel Naptha is used only by Rajiv Gandhi combined cycle gas power station,Supplier is BPCL.
Water Withdrawal Charges (₹ Crore)	515.12	553.45	NTPC enters into an agreement for water withdrawal with concerned agencies of State Government in which state the power plant is located.

Pre-bid meetings with the prospective bidders are held in case of procurement exceeding certain specified value. The pre-bid meeting provides the prospective bidders a platform to raise queries with respect to the bidding documents. Necessary clarifications are issued by NTPC to all the prospective bidders. In post-award phase, contract review meetings are also held at regular interval with contractor / supplier and other important stakeholders such as the indenting department / executing department to identify and resolve problems at hand during execution of the contract.

Various issues and concerns are raised by prospective Bidders and contractors / suppliers in different forums. These issues and concerns are reviewed and are suitably addressed. If required, necessary changes in policy and procedure are also done after approval of the management.

Procurement practices

Vendor Assessment: Whenever a new bidder participates in a bidding process, the bidder's capacity and capability is assessed to ascertain that it has the required facility and requisite financial health to execute the Contract or complete the Supplies as per the Customer's requirements.

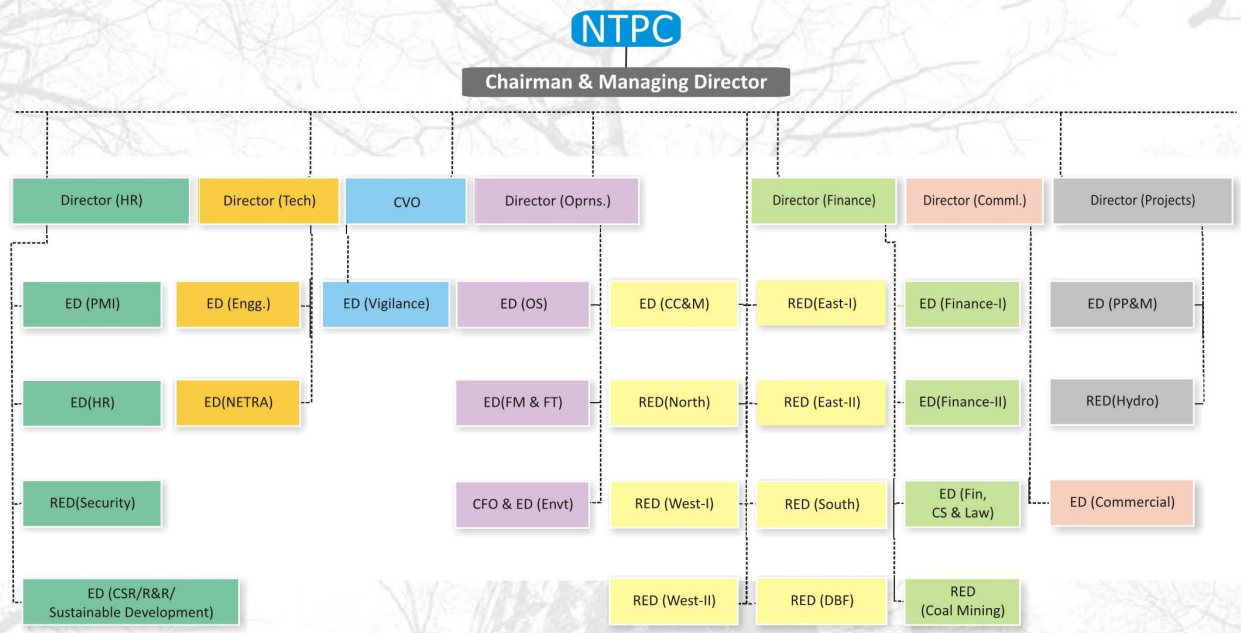
Reference Work Verification: The reference jobs furnished by the bidders in fulfillment of the qualifying requirements are verified with their respective Clients. In case of a new bidder, the capacity & capability assessment may also be taken up.

Performance Reports: During the evaluation of a bidding process, the performance report of all the bidders, who are engaged in or have executed in the past contracts for NTPC, is sought from respective sites. Any areas needing specific attention are addressed through appropriate resolutions with the bidders. In case of major non-performance, the bidder may be rejected too.

Contract Review Meetings (CRMs): During execution of a contract, CRMs are held at regular intervals with all the important stakeholders. CRM provides an important forum to identify and discuss the problems in the supply chain being faced by the Site and the contractor. Wherever needed, necessary resolution is agreed to as a part of minutes of meeting.

Enlistment: In case of regular work packages, which have standardized eligibility criteria, NTPC goes for enlisting the suppliers / contractors / agencies. Once the list of eligible suppliers / agencies is prepared, procurement for such packages from the enlisted agencies is done on limited tender enquiry basis. Enlistment helps reduce lead time as well as maintain long term relationship with the prospective contractors. While selecting suppliers, NTPC follows the domestic price preference as per the extant Govt. guidelines, which are aimed at giving preference to local supplies over supplies from abroad. The preference is given invariably in all procurement for power plants done on international competitive bidding basis.

NTPC
Pan India Presence



Note:
OS-Operation Services, PP&M Project Planning & Monitoring, FM-Fuel Mgmt, FT-Fuel transpotation, IA-Internal Audit, CS-Company Secretary, CFO-Chief Forest Officer, PMI-Power Management Institution

Governance
Ethics and Integrity

Corporate Governance Philosophy

"As a good corporate citizen, the Company is committed to sound corporate practices based on conscience, openness, fairness, professionalism and accountability besides building confidence in its various stakeholders, thereby paving the way for long term success."

Board of Directors

The Board of Directors is entrusted with the utlimate responsibility of the management, general affairs, direction and performance of the company

The Board of Directors function in accordance with the power deligated under the Comapanies Act, 2013, Articles of Association, Maharatna Guidelines issued by DPE

Board Meetings: 14 nos.

Remuneration

Remuneration policies of highest governance body and senior executives are fixed as per guidelines issued by DPE on the terms and conditions as fixed by the Government of India. No. remuneration consultations are involved for determining as the same is fixed by GoI.

Performance evaluation

NTPC enters into Memorandum of Understanding (MoU) with Government of India each year, demarcating key performance parameters for the Company. The MoU targets are internalized and cascaded down and form an integral part of the performance appraisal of the individuals. The internal MoU covers all operational and performance parameters like – Plant Performance and Efficiency, Financial targets, Cost cutting targets, Environment, Welfare, Community development and any other relevant factor. The performances of the Company and Board of Directors are evaluated by the Department of Public Enterprise vis-à-vis MoU entered into with the Government of India.

Composition of Board as on 31.03.2017:

- Seven Functional Directors including the Chairman & Managing Director
- Two Government Nominee Directors and
- Three Independent Directors including one woman Director

Tenure of Board Member:

- The CMD and other whole-time Directors are generally appointed for a period of 5 years from the date of taking over charge or until the date of superannuation or until further orders from the GoI, whichever event occurs earlier
- The tenure of the whole-time Director can be extended further by the GoI till the age of superannuation i.e. 60 years
- Independent Directors are generally appointed by GoI for tenure of 3 years

Director responsible for implementation of policies and systems on sustainable development and business responsibility aspects

No	Policies/ systems	Director (s) Responsible	Web Link
1	Code of Conduct	Director (Finance)	http://www.ntpc.co.in/investors/code-of-conduct
2	Fraud Prevention Policy	Director (Finance)	http://www.ntpctender.com/about/FraudPolicy.asp
3	CDA Rules	Director (HR)	Policy manual available on NTPC Intranet
4	Whistle Blower Policy	Director (Finance)	http://www.ntpc.co.in/sites/default/files/downloads/WhistleBlowerPolicy.pdf
5	Internal Code of Conduct for prevention of insider trading	Director (Finance)	http://www.ntpc.co.in/download/internal-code-conduct prevention-insider-trading-dealing-securities-ntpc-limited
6	Code of Corporate Fair Disclosure Practices for prevention of insider trading	Director (Finance)	http://www.ntpc.co.in/download/code-corporate-fair-disclosure-practices-prevention-insider-trading
7	Related Party Transaction Policy	Director (Finance)	http://www.ntpc.co.in/download/related-party-transactionpolicy-ntpc
8	Policy for determination of materiality of events or information for disclosure	Director (Finance)	http://www.ntpc.co.in/sites/default/files/downloads/NTPC%20% 20Policy%20For%20Determination%20of%20Materiality%20of%20events.pdf
9	Policy on maintenance & preservation of documents	Director (Finance)	http://www.ntpc.co.in/sites/default/files/.../Document%20Preservation%20Policy.pdf
10	Policy for Determining Material Subsidiaries	Director (Finance)	http://www.ntpc.co.in/download/policy-determining-material
11	Training Policy for Directors of NTPC	Director (HR)	http://www.ntpc.co.in/download/training-policy-directors-ntpc
12	Dividend Distribution Policy	Director (Finance)	http://www.ntpc.co.in/sites/default/files/downloads/DividentDistributionPolicyofNTPCLimited.pdf
13	Safety Policy	Director (Operation)	http://www.ntpc.co.in/en/sustainability/health-and-safety
14	Human Resource (HR Policy)	Director (HR)	Policy manual available on NTPC Intranet
15	Placement and Transfer Policy	Director (HR)	Policy manual available on NTPC Intranet
16	R&R Policy	Director (HR)	http://www.ntpc.co.in/en/corporate-citizenship/r-and-r-policies
17	Community Development Policy	Director (HR)	http://www.ntpc.co.in/download/initial-communitydevelopment-policy-2009
18	Environment Policy	Director (Operation)	http://www.ntpc.co.in/en/environment/environment-policy-and-management
19	Policy for CSR and Sustainability	Director (HR)	http://www.ntpc.co.in/download/ntpc-policy-csr-sustainability
20	Commercial systems & Procedures	Director (Commercial)	http://www.ntpc.co.in/sites/default/files/downloads/procurementandworkpolicy.pdf
21	Water Policy	Director (Operation)	http://www.ntpc.co.in/sustainability.report-policies/7312/ntpc-water-policy-2017
22	Career Development	Director (HR)	http://www.ntpc.co.in/en/careers/career-growth-opportunities

Code of Conduct

The Company has in place Code of Conduct for Directors and Senior Management Personnel with a view to enhance ethical and transparent process in managing the affairs of Company. This code is applicable to all the Board Members including Government Nominee(s) and also the Independent Director(s). A copy of the Code of Conduct is available at the website of the Company at the web link: http://www.ntpc.co.in/en/investors/code-of-conduct

Conflict of Interests

All Directors of the Company have to declare their interests in the prescribed from for Notice of Interests pursuant to Section 184 of the Companies Act, 2013. The Directors refrain from participating in discussions on such agenda items that include their interest in any form to any extent, directly or indirectly.

IMPLEMENTATION OF INTEGRITY

The Company is committed to have total transparency to its business processes and as a step in this direction; it signed a Memorandum of Understanding with Transparency International India in December, 2008. The Integrity Pact is being implemented for all contracts having value exceeding ₹10 crore. Presently, the Company is having one Independent External Monitor to oversee the implementation of Integrity Pact Programme.

NTPC's Board at Annual General Meeting, 2017

COMMITTEES OF THE BOARD OF DIRECTORS

(The terms of reference on these committees and details of the members have been given in NTPC's Annual Report FY 2016-17)

i) Audit Committee
ii) Stakeholders' Relationship Committee
iii) Committee for PRP
iv) Nomination and Remuneration Committee
v) Committee on Management Controls
vi) Projects Sub-Committee
vii) Investment/ Contribution Sub-Committee
viii) Contracts Sub-Committee
ix) Committee of Functional Directors for Contracts
x) Committee of the Board for Allotment and Post-Allotment activities of NTPC's Securities
xi) Committee of Directors on Corporate Social Responsibility and Sustainability
xii) Committee for Vigilance Matters
xiii) Exchange Risk Management Committee
xiv) Risk Management Committee

Managing organisational risk related to corruption

NTPC has made great strides in enhancing the ethical standards of the organization by encouraging sound business practices and good corporate governance through an effective balance of proactive and preventive measures. NTPC has a full-fledged vigilance department headed by the Chief Vigilance Officer (CVO) of the rank of Joint Secretary, GoI, who is a nominee of the Central Vigilance Commission. The CVO is assisted by team of experts in dealing vigilance and technical matters for conducting/ examining issues relating to corruption. In order to ensure independence in functioning and also for quick flow of information, relating to corruption, to the highest management, each individual stations/ projects of the Company has a separate vigilance unit reporting directly to the respective head of the stations as well as to the CVO, at the corporate centre. The vigilance mechanism in NTPC is continuous process comprising of three important aspects i.e. preventive vigilance, detective vigilance and punitive vigilance.

To curtail the organizational risk in terms of corruption, NTPC has taken following measures:

1. The Company has implement Whistle Blower Policy, the Complaints Handing Policy, Fraud Prevention Policy and the policy for Banning of Business Dealing to ensure strict anti-corruption measures.
2. Integrity Pact has been implemented in NTPC since 2009. Tenders having estimated value of ₹10 Crore and above are covered under the Integrity Pact.
3. E-procurement process is used to improve efficiency and to ensure transparency in the process.
4. No policy can be brought to effect without complete awareness and optimum participation of the entire fraternity. The same has been ensured through imparting twenty one training sessions on the company's anti-corruption policies and procedures throughout various projects and stations. 477 employees have attended these sessions.
5. In another effort to continue creating anti-corruption consciousness, a Vigilance Awareness Week was observed from October 31, 2016 to November 5, 2016 across all locations of NTPC. During this week, bilingual posters and banners based on the policies were distributed and displayed to premises nearby. Links were also provided for e-pledges to be placed on intranets of all NTPC locations.
6. Use of Social Media (Facebook, Twitter & LinkedIn) and Video Conferencing were made to strengthen a culture of transparency, to work fearlessly in the interest of the organization, aiming to improve upon the productivity of the company as a part of the management function etc.
7. Data for vigilance cases and penalty during the period are as follows:
   - 111 new complaints were received and 55 complaints (including 26 complaints previously received) were closed after verification. 49 complaints (including 11 complaints previously received) were taken up for investigation and 46 were under verification as on 31.03.2017.
   - 71 investigations were finalized recommending initiation of major penalty proceedings against four employees, initiation of minor penalty proceedings against 24 employees and administrative action against 56 employees.
   - Five such instances were observed wherein major penalty proceedings action was taken and services of one official was dismissed and penalty of "Reduction to lower rank with cumulative effect" was imposed on five employees.

Precautionary Approach

NTPC has a system of Statutory Compliance Reporting System (SCRS) for managing compliances as a part of the precautionary approach. This system is hosted on the Company's intranet and covers all locations. The status of statutory compliances is reviewed on a quarterly basis by senior personnel.

Managing Legal Aspect

To ensure regulatory and statutory compliance, NTPC has robust internal systems and applicable processes in place. It complies with relevant laws and regulations. A comprehensive delegation of power exists for smooth decision making which is being periodically reviewed to align it with changing business environment and for speedier decision making.

Quarterly compliance report is being taken from all locations duly complied with relevant laws, orders, regulations and other legal requirements of the central, state and local levels. This report is put to the Board and the observations are taken up for action.

Expert Settlement Council (ESC):

In the absence of Conciliation mechanism in NTPC's contracts, the post contractual unresolved disputes lands in arbitration or in court of law leading to delay in execution of projects and blockage of capital. Therefore, in view of the difficulties being faced by NTPC in resolving issues/disputes arising during execution of contracts, it is essential to constitute casewise Expert Settlement Council (ESC).

Conciliation through ESC is resorted in cases involving disputed amount upto ₹ 250 Crores only. The resolved amount is arrived at after considering the amount of claim and counter claim of the parties.

A Model clause for Conciliation is incorporated in Dispute Resolution Clause in all contracts. The detailed guidelines with regards to process for constitution of Expert Settlement Council for resolution of Post Contractual issues/disputes have been framed.

In case of existing contracts where there is no ESC clause for conciliation, a communication is sent to the Contractors intimating the new process of conciliation through ESC and their choice of settlement mechanism.

Vendor Meet for service providers

Corporate Membership

NTPC has taken membership of following national & international organisations for getting support in areas of environment management, social responsibility and economic performance.

S. No.	Name
1	Central Board of Irrigation & Power (CBIP)
2	Confederation of Indian Industry (CII)
3	Delhi Productivity Council
4	Electric Power Research Institute (EPRI), USA
5	Excellence Enhancement Centre, EEC
6	Federation of Indian Chambers of Commerce & Industry (FICCI)
7	Foundation for Restoration of National Values
8	India Infrastructure Forum
9	Indian Federation of Green Energy
10	Institute of Company Secretaries of India (ICSI)
11	Mining, Geological & Metallurgical Institute (MGMI)
12	Power HR Forum
13	Power Sector Skill Council
14	SCOPE
15	South Asia Forum for Infrastructure Regulation (SAFIR)
16	The Foreign Correspondents' Club of South Asia
17	World Energy Council (WEC)

Power Sector Scenario, Opportunities and Challenges

India's Power Sector Scenario

Power Sector is a key enabler for India's economic growth. The sector consists of generation, transmission and distribution utilities and is a crucial component of India's infrastructure. The achievements regarding developments and various issues/ challenges in various segments of the industry are:

- Gross annual generation of the country increased by 4.72% from 1107.82 BUs in the previous year to 1160.14 BUs in the FY 17.
- Generation capacity of 14209.80 MW (excluding renewable) added during the year compared to 23976.60 MW added in the previous year.
- FY17 has been the Land mark year for renewable energy and total of 14410.85 MW capacity were added during the year.
- 26300 ckt kms of transmission lines were added during the year as compared to 28114 ckt kms in the previous year.
- 81816 MVA of transformation capacity added during the year as against 62849 MVA in the previous year, a jump of 30%.
- PLF of thermal stations declined from 62.24% in FY 16 to 59.88% in the FY 17.During the FY 17, peak power deficit and energy deficit was 2.6% and 1.1% respectively as against the peak power deficit and energy deficit of 3.2% and 2.1% during financial year 2015-16.

(Source: Central Electricity Authority)

Existing Installed Capacity

The total installed capacity in the country as on March 31, 2017 was 326848.54 MW (including renewable) with private sector contributing 44% of the installed capacity followed by State Sector with 32% share and Central Sector with 24% share.

Ownership	Total Capacity (MW)	% share
State	103967.28	32
Centre	80257.25	24
Private	142624.01	44
Total*	**326848.54**	**100**

Source: Central Electricity Authority-Installed Capacity report. *including RES

During the FY 17, capacity of 14209.80MW (excluding renewable) was added. With this, the total capacity addition during the 12th plan period is 99209.47MW (excluding renewable) which is about 112.05% of the planned capacity addition of 88537 MW for the Plan.

Capacity Utilization and Generation

Capacity utilisation in the Indian power sector is measured by Plant Load Factor (PLF).

Sector wise PLF (Thermal)

(in %)

Sector	2015-16	2016-17
State	56.83	54.35
Central	71.03	71.98
Private	60.07	55.59
All India	62.24	59.88

The overall decline in PLF was mainly due to backing down/shut down of units on account of low schedule from beneficiary states (Source: Central Electricity Authority).The outlook of generation looks promising with expected increase in industrial production and Government of India's mission to provide 24x7 electricity to all.

Existing Generation

The total power available in the country during the financial year 2016-17 was 1160.14 billion units as compared to 1107.82 billion units during last year, registering a growth of 4.72%. (Generation figures pertains to monitored capacity by CEA)

Sector-wise and fuel-wise break-up of generation (BUs) for FY17 is detailed as under:

Sector	Thermal	Hydro	Nuclear	Bhutan Import	Total
Central	337.92	57.90	37.92	-	433.74
State	299.59	51.35	-	-	350.94
Pvt/IPP	356.72	13.12	-	-	369.84
Bhutan Import	-	-	-	5.62	5.62
Total	**994.23**	**122.37**	**37.92**	**5.62**	**1160.14**

(Source: Central Electricity Authority)

As far as Thermal generation is concerned, based on the monitored capacity by CEA, the generation contribution of central sector is 33.98% with installed capacity share of 28.32%, state sector contributes 30.13% of generation with installed capacity share of 33.12% and private sector contributes 35.89% of generation with installed capacity share of 38.56%. Central Sector utilities have better performing stations as compared to those of State utilities and Private Sector.

Power Consumption

The per capita consumption of power in India is 1122 units in FY 17. (Source: Central Electricity Authority Report- growth of electricity sector in India 1947-2017).

TG Hall of NTPC Power Plant

Transmission

The transmission network (at voltages of 220 kV and above)in the country has grown at an average rate of ~ 8% p.a. during the 12th Plan. The total inter-regional transmission capacity of country has been enhanced from 27,750 MW to 75,050 MW from 11thplan to 12th plan. During the period April 2016 to March 2017, 17600 MW inter-regional capacity has been added. This augmentation of the national grid will help promote competition and enable merit order dispatch of generation leading to lower cost of power for consumers.

Over the next few years, the demand for transmission capacity is expected to increase significantly, driven primarily by rising trend in power generation capacity, reforms in fuel sector and large scale integration of renewable energy.

Distribution

The electricity business is not merely about setting up power generation stations and transmission systems, but equally, and probably more crucially, about retailing electricity and recovering the cost of service from consumers.

In the past few years the average tariff has increased. However, the rise has not been commensurate with the increase in the cost of supply. The consistent revenue gap, coupled with high AT&C losses have piled up huge losses for the state utilities.

To improve the distribution segment's performance, Government of India launched the most comprehensive power sector reform scheme ever i.e Ujjwal Discom Assurance Yojana (UDAY) on 5th November, 2015.

UDAY has started to show results with improved performance of many of the State Distribution Companies with reduction in AT&C loses and reduction in revenue gaps. In fact one of the state discom has achieved turn around and has posted profit during FY 17.

Power Trading

In India, power is transacted largely through long term Power Purchase Agreements (PPA) entered into between Generating/ Transmission Companies and the Distribution utilities. A small portion is transacted through various short term mechanisms like trading through licensees, bi-lateral trading, trading through power exchanges and balancing market mechanism (i.e. Deviation Settlement Mechanism).

In FY 17, around 90% of power generated in the Country was transacted through the long term PPA route. 10% of the power was transacted through trading mechanism which included trading through short term licensees, bi-lateral trading, trading through power exchanges and through Deviation Settlement Mechanism.

(Source: Central Electricity Regulatory Commission).

Energizing The Power Sector – Key Initiatives / Reforms and Regulatory Changes

(a) **Flexibility in utilization of domestic coal:** GoI has allowed flexibility in utilisation of domestic coal for reducing the cost of power generation. The Annual Contracted Quantity (ACQ) of each coal linkages would be aggregated as consolidated ACQ for each State / Central / Private Gencos. These Gencos now have flexibility in use of such coal amongst their different generating stations. This will facilitate power producers to use coal optimally in more efficient generating stations resulting in reduction in the power purchase cost for Discoms.

(b) **Cross Border Electricity Trade Policy:** At present, Cross Border Trade of Electricity has been taking place with Bangladesh, Bhutan and Nepal under bilateral Memorandum of Understanding (MoU) /Power Trade Agreement (PTA). In order to facilitate and promote cross border trade of electricity with greater transparency, consistency and predictability in regulatory approaches across jurisdictions and minimise perception of regulatory risks, GoI has issued guidelines on Cross Border Trade of Electricity. This policy is likely to help in creating demand for the Gencos.

(c) **Amendment in the IEGC (4th) Amendment to allow compensation on account of partial loading of the units**

i. CERC has allowed Compensation due to degradation of the operational parameters like Heat rate and auxiliary power consumption due to lower loading of the units. For this purpose, CERC has defined the technical minimum level of operation as 55% and has allowed compensation when unit operations are below 85% and upto 55%. These compensations will be in the form of increased norms in the Heat rate and APC as per different factors for different ranges of unit loading, as provided in the Regulations.

ii. It has also been provided that a unit can go under Reserve Shut Down (RSD) in case the schedules are below 55%. In these cases, the Units will be compensated for the additional oil consumption on account of higher start/stop of the units.

iii. CERC in its order dated May 5, 2017 has approved a detailed procedure for calculation of the compensation amount and process of apportionment among the beneficiaries.

(d) **Reduction in coal import:** On account of increased production of domestic coal, imports have fallen from 217.78 MT in 2014-15 to 199.88 MT in 2015-16, a decline of 8%. The trend of fall in import of coal has continued in 2016-17. This has helped the country in reducing cost of electricity generated in coal based power plants and reduction in forex expenditure.

(e) **UJALA:** Government has identified lighting as key focus area for energy efficiency. Under the Unnat Jyoti by Affordable LEDs for All (UJALA), more than 24 Crore LED bulbs have been distributed. This will help in a recurring saving of ₹ 34.95 crore and 87 MU per day in terms of cost and energy respectively. It will also help in reduction of CO_2 to the extent of 70,780 ton per day thereby reiterating India's commitment made at Conference of Parties (COP) 21 Summit held in Paris to reduce its energy intensity.

(f) **SHAKTI (Scheme for Harnessing and Allocating Koyala (Coal) Transparently in India):** During the current financial year (FY 17-18), GoI has introduced the Scheme, 'SHAKTI' to make coal allocation more transparent and bidding based. As per the Scheme, future allocation/grant of linkages to power producers/IPPs will be based on auction. The Scheme shall benefit the sector in terms of coal availability to all power plants in transparent and objective manner, providing cheaper and affordable power, reduction of sectoral stress on account of non-availability of linkages to power projects thereby enhancing confidence of financial institutions on power sector.

(g) **Portal on weather information:** Due to enhanced presence of Renewable Energy in the Indian power sector, weather information like irradiance, wind speed etc. have become very important. Besides, weather information is also very important for load forecasting. During the current financial year (FY 17-18), GoI has launched weather Portal for Power Sector in association with POSOCO and IMD. The information available in the Portal regarding weather forecast shall help State Discoms to take pro-active steps regarding short term and medium term management processes and supply planning requirements and also for better planning for infrastructure availability to ensure cost effective and reliable supply.

Opportunities

As per Niti Aayog, presently more than 300 million people in our country do not have access to electricity and our per capita electricity consumption is about one third of the world average. Further, GDP of the country and even population of the country is on rising trend. India is one of the fastest growing country, hence the Company has sustained opportunities to grow its business.

(a) Electric Vehicles

Ministry of Heavy Industry, under the 'National Electric Mobility Mission Plan 2020', has formulated 'Faster Adoption and Manufacturing of Electric Vehicles (FAME)'scheme to push e-mobility adoption in the country. The scheme envisages a production of 6-7 million electric vehicles in India by the year 2020. This mission will create opportunities for the Company in the form of additional demand of electricity, development of charging infrastructure and battery swapping

Electric Vehicle (EV) charging station installed at NTPC

Robotic Dry Cleaning System (RDCS) for Solar PV panels

facilities. This has also created opportunities for Battery and Vehicle Manufacturers. The Company has decided to enter E-mobility business starting with Electric Vehicle charging infrastructure. Electric Vehicle charging business would not only help the Company in opening up a new business area but would also help increase power demand across the country. The Company has started two Electric Vehicle charging stations on pilot basis in its office premises at New Delhi and Noida. Going forward, the Company envisages to build an e-mobility eco-system.

(b) Nuclear Power

From its present level of 6 GW Nuclear power capacity, India wants to increase the same to 63 GW by 2032. The Company also has a plan to install 2 GW Nuclear based power generation capacity through its JV company Anushakti Vidyut Nigam (ASHVINI) with Nuclear Power Corporation by the same period.

(c) Renewable Energy

GoI has targeted to achieve 175 GW capacity by 2022, comprising of 100 GW Solar, 60 GW Wind, 5 GW of small hydro and 10 GW of biomass and others. Several measures in the solar power sector such as solar park policy, grid-connected rooftop solar plants in conjunction with sharp decline in solar tariff has made the investment in solar power business highly attractive. On the wind power front, National Institute of Wind Energy under MNRE has estimated the country's wind energy potential at 100 meters above ground level to be of 302 GW. The GoI's target for setting-up 60 GW of wind power by 2022, augurs well for wind power developers. The Company has made a target of achieving 32 GW of RE capacity by 2032. The Company is also helping the Country in achieving 15 GW of solar capacity under National Solar Mission. Renewable Energy also opens up doors for foreign investment as India's renewable energy sector has potential to attract the attention of a diverse range of investors including those who desist from investing in thermal power sector and allocate their funds to such companies who score high on environment and social merits. Further, phasing out of old thermal power stations also provides an opportunity for renewable energy projects to replace thermal capacity.

(d) Cross Border Power Trading

NVVN, 100% owned subsidiary of the Company, has been assigned the role of Nodal Agency for cross border trading of power with Bhutan, Bangladesh and Nepal by GOI. NVVN has started supplying 250 MW power to Bangladesh since October 2013. Further, supply of 100 MW has started in March 2016, for which necessary PPA has been signed with BPDB. NVVN has also signed PPA with Nepal Electricity Authority for supply of 160 MW power to Nepal. Country intends to establish power grid connecting countries under BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation). This will open up opportunities for the Company and the Indian power sector.

(e) Cement Business

The Company has decided to enter into Cement manufacturing business, which will benefit it in achieving higher ash utilization level besides its presence in adjacent business area. The Company has sought Expression of Interest from interested parties for establishing integrated cement plant/ cement clinker grinding unit/ cement blending unit/ allied products manufacturing unit adjacent to its Power Plant premises on Built, Own and Operate (BOO)/ JV mode, using ash from its thermal power plants. The interest shown by the various parties is highly encouraging.

Threats/ Challenges

(a) Solar Power

For the Company, solar power is an opportunity as well as a challenge/ threat. Solar tariff has been continuously falling and is quite close to grid parity. Solar power plants being 'must run', get preference in generation scheduling and coal based power plants have to regulate their generation as per solar power supply in the grid. Therefore, influx of more solar power in the grid would require many coal based plants to operate in a flexible manner. This cyclic operation has impact on coal based power plants in terms of lower efficiency at partial load leading to higher generation cost and more stress on the machine.

(b) Environmental Concerns

The environmental concerns particularly relating to coal based thermal stations have emerged as a major issue. In December, 2015, Ministry of Environment, Forest and Climate Change notified the new standards for Thermal Power Stations relating to water consumption, particulate matter, SOx, NOx and mercury. Notification deals with three categories – plants installed before 31.12.2003; those set up after 2003 but before 31.12.2016 and beyond. The Thermal plants have to achieve the standards within two years from the date of publication of notice. Although, it is a step in right direction for controlling pollution generated by Thermal Plants, however, keeping in view tight time lines and several constraints like non-availability of space in older plants and indigenous technology to handle poor quality of Coal, it may be extremely challenging to meet the revised standards. Further, implementation of new technology to take care of revised standards will increase the tariff. Recently, CEA has prepared a list of 373 coal based units aggregating to 146 GW capacity, for scheduled phasing of FGD installation by 31st December, 2023. This list includes units of the Company as well. The Company, aware of its responsibility towards environment and commitment towards clean energy, is awarding contracts for installation of FGDs for its coal based units in a phased manner.

(c) Availability of Gas

The PLF of gas based power plants in the country remained low and the power sector has been struggling to recover costs from capital investment in gas-based capacity. To make gas-based power projects viable, GoI is exploring long term solutions.

Other issues/Concerns

- Availability of land/ Right to use of land/Right of way on land.
- Availability of water.
- Environment and forest clearance at State level to expedite E & F clearance to the project.
- Logistics for movement of heavy machinery like roads and bridges.
- Human resource requirement commensurate with the requirement of the various skilled and unskilled jobs.
- Impact on conventional power capacity: Increasing share of Renewables is not only going to reduce PLF of conventional power plants, but also force to regulate generation to compensate for intra day variation in power generation by RE sources.
- Grid integration issues: The integration of renewable power into power systems results in 'integration costs' for grid which includes cost for balancing services, more flexible operation of thermal plants, reduced utilization of transmission network.

Outlook and Opportunities for the Company

- **Strategic focus of the Company**

The Company is market leader in power generation and has its presence in the entire power sector value chain which gives it a competitive edge in the market. As a state-owned utility, Company's priority is to provide cheaper power and support for country's rapidily developing economy. The Company provides~ 25% of country's electricity supply and as such plays a key role in India's economic activity. The Company continues to focus on scaling up generating capacity through a mix of conventional and non conventional fuel sources, efficiently running its installed capacity, developing own coal mines and providing other value adding services like power trading, consultancy etc.

The key is not to add capacity alone, but to see that the capacity which has been added is financially viable and also does not become stranded as has been the case with many IPP's. As a policy, the Board of Directors of the Company accord investment approval only after having five basic requirements in place viz. land, water, environment clearance, fuel supply arrangements and power purchase agreement(s) (PPAs). As a responsible corporate citizen, the Company is also focused on providing clean energy.

- **In-organic growth opportunities**

The Company scouts for acquisition of power plants at attractive valuations for adding capacity after analysing the technical and financial viability of such assets. Considering a lot of capacity of private/state developers is stranded, there is a good scope for consolidation in the sector.

The Company is in discussions with Rajasthan State Government for acquisition of Chhabra Power Project (Stage I -4x250 MW and Stage II –2x660 MW). This will be a win-win situation for the Company as well as Rajasthan. Rajasthan will have lower tariff, reliable power and learning from best practices of NTPC, while NTPC will have power assets which will immediately start earning revenues.

- **Fuel Security**

GoI has taken a number of measures, including flexibility in utilization of coal, to improve coal supplies as well as quality of the coal. Accordingly, the Company has been receiving better coal supplies under its long term coal supply agreements. Coupled with its captive coal mines, the Company strives to ensure long term fuel security. With increased supplies of domestic coal, reliance on imported coal is negligible thereby contributing to reduction in cost of power. In fact, during the financial year 2016-17, no new contract was awarded for procurement of imported fuel.

The Company led the coal rationalisation initiative of GoI to reduce transport costs and avoid criss-cross movement of coal thereby decongest the railway network.

The Company has been allocated 10 coal blocks with estimated geological reserves of ~7 billion tonnes with estimated mining capacity of 107 million tonnes per annum. During the FY 17, the Company has upped the pace of coal mining developments. Coal production has commenced from Pakri-Barwadih coal mine project and coal is being supplied to Company's Barh Super Thermal Power Project. The Company has appointed Mine Developer-cum-Operator (MDO) for Dulanga coal block on February 9, 2017. MDO for 3 more blocks will be appointed shortly.

- **Renewable Energy**

The Government of India has set a target of 175 GW renewable energy by 2022 and by 2027, Government is planning for 275 GW of renewable energy capacity. Historically, The Company has been engaged primarily in fossil fuel fired electricity generation. The Company is a key stakeholder in ongoing energy transition and is committed to add 10 GW of own renewable power capacity.

The Company takes cognisance of the challenges of adding renewable energy capacity in India and will add such capacity progressively. The Company is also leading the way with installation of 100 KW floating solar PV Plant at its Rajiv Gandhi Combined Cycle Power plant in Kerala.

The Company is also entrusted with the responsibility of adding 15 GW of solar power under National Solar Mission of Government of India.

- **Off-take and realization**

There have been concerns about the capacity addition programme undertaken by the Company due to weak off-take and country presently being power surplus. In real terms, it may not be necessarily so because of restricted off-take by Discoms and huge latent demand. The Company firmly believes that with structural reforms put in place in the distribution segment through UDAY Scheme launched by GoI in November, 2015, economic growth of the country, GoI's mission of power to all by May,2018 and aspiration among the end users to consume more power, the demand will pick-up .

Almost, the entire output of the company's power stations has been contracted under long term PPAs. Further, the Company produces power at a very competitive cost. The average tariff for FY 17 was ₹3.30/kWh as against ₹3.19/kWh for the previous year. The increase was mainly on account of coal cess and increase in freight by railways. Low cost of power mitigates off-take risks. The Company has, for the 14th consecutive year, realised 100% of its dues and is confident of maintaining its track record in future also. Further, with extension of Tri-partite Agreements by most of the states, the risk of non-realization is mitigated to great extent.

- **Pooled Tariff for NTPC Stations**

The Company is aware of its responsibility to provide cheaper power and has taken various measures to reduce the fuel charges through coal swapping, flexibility in usage of coal etc. Recently, the Company has brought-out concept of fixed charge tariff pooling which envisages national merit order operation of all NTPC stations which will effectively reduce the average energy charge rate (ECR) of all NTPC stations and benefit all states. This will provide a framework for URS power from one region to be scheduled by other region since fixed charges of all states are pooled there by replacing the costlier power, resulting in net savings to their end consumers.

- **Leveraging on strengths for delivering better future performance**

The Company derives competitive edge from its strengths and is confident of meeting future challenges in the sector.

a) **Project Management**

The Company has adopted an integrated system for the planning, scheduling, monitoring and controlling of approved projects under implementation. To coordinate and synchronise all the support functions of project management it relies on a three-tiered project management system known as the Integrated Project Management Control System which integrates its

engineering management, contract management and construction management control centres. The Company has successfully effected standardization, bulk ordering of 660 MW and 800 MW units and Engineering Procurement and Construction (EPC) contracting to reduce engineering time and thereby reduce project execution time. The Company has added 13,395 MW capacity in 12th Plan (2012-2017) exceeding the assigned capacity target of 11,920 MW in the Plan. NTPC's Vindhyachal Super Thermal Power Station Stage –V Project has been the Silver Winner in award category-Project Excellence in Mega-Sized Project 2016 by International Project Management Association which is the highest international honour for excellent project performance.

b) **Operational Efficiency**

The operating performance of NTPC has been considerably above the national average. During FY 17 PLF of NTPC coal stations was 78.59% against all India PLF of 59.88%. Over the years, NTPC has consistently operated at much higher operating efficiency as compared to All India operating performance. Also DC of coal stations for FY 17 was 92.80 % as against 92.29 % achieved in last FY 16 In order to achieve cost-competitive, environment friendly, efficient & reliable power generation, the Company has adopted following strategies:-

- Advance alert/support to stations through remote (Special Analytics & Computational services center) analysis of critical operation parameters, which in turn improves system reliability, reduction of outages & maintenance costs.
- Reduction of forced outages through knowledge based unit overhaul & maintenance practices.
- Optimizing planned outage period through implementation of overhaul preparedness index, ensuring all quality checks and time bound monitoring of each activity. To implement best practices at enterprise level, knowledge teams for each equipment has been created.
- Improvement in Heat Rate & Auxiliary Power Consumption achieved by parametric optimization at part loads by operation of units in sliding pressure mode & optimizing excess air.
- To minimize efficiency losses in stations, process interface (PI) system based applications for real time efficiency & loss calculations.
- Structured & regular energy audit helps to identify potential areas of improvement in APC reduction which are being addressed in planned time bound implementation schedule.
- Implementation of Energy Efficiency Management System (EEMS) consisting of periodic assessments, field tests, performance gap analysis deviations and updation of action plans at all stations.
- To reduce cost of thermal generation, steps have been taken to maximize use of domestic coal, swapping of coal sources to reduce transport cost & proper blending.
- Use of comprehensive Performance Evaluation Matrix for relative evaluation of the performance of various power plants over a set of comprehensive performance indicators to create an environment of in-house challenge and competition. The parameters are reviewed annually to include new set of parameters commensurate with market dynamics and development of power sector.
- Adopting advanced technologies in new units e.g. commissioning of super critical units, which improves system efficiency & reduces carbon foot print.
- Renovation & modernization for reduction of greenhouse gas emissions, effective modernized control systems for environment friendly economic generation.

c) **Human Resources**

The Company has a highly talented team of committed professionals and has been able to induct, develop and retain the best talent. The Company has a pool of ~21,000 employees creating value for the Company. The Company has a very low executive attrition rate. The HR vision of the Company is "To enable its people to be a family of committed world class professionals, making NTPC a learning organisation." The Company is deeply passionate about ensuring the holistic development of all its employees as distinct individuals and good citizens. Competence building, Commitment building, Culture building and Systems building are the four pillars on which HR systems of the company are based. The Company has been conferred with various HR awards over the years by reputed institutions and consistently features among the "Great Places to Work For". The commitment of the employees is also reflected in terms of financial parameters such as sales/employee, value added/per employee etc.

d) **Sound Corporate Governance**

The Company's corporate governance practices have been recognised and awarded at several forums. The Company believes in following the highest standards of transparency, integrity and accountability. It enjoys the confidence of all stakeholders alike. The Company not only believes in adopting best practices but also includes public interest in its corporate priorities and has developed extensive social outreach programmes.

e) **Robust financials and systems**

The Company has strong financial systems in place. It believes in prudent management of its financial resources and strives to reduce the cost of capital. The Company enjoys highest credit-rating assigned by CRISIL, ICRA and CARE. The foreign ratings by Fitch and S&P are at par with sovereign ratings. It has robust financials leading to strong cash flows which are being progressively deployed in generating assets. The Company has a strong balance sheet coupled with low gearing and healthy coverage ratios. As a result, the Company has been able to raise resources for its capital expansion projects at very competitive interest rates both in domestic as well international market.

Results from Operations:

Total Revenue

	Descriptions	FY 17	FY 16	% Change
	Units of electricity sold(MUs)	233,617	224,926	4%
	Revenue (₹ Crores)			
1	Energy Sales(Includingelectricity duty)	77,071.11	69,961.62	10%
2	Consultancy &other services	163.71	117.04	40%
3	Lease rentals on assets on operating lease	240.42	223.25	8%
4	Energy internally consumed	68.93	81.82	-16%
5	Interest from beneficiaries	397.09	221.29	79%
6	Provisions for tariff adjustments written back	162.49	154.51	5%
7	Interest income on assets underfinance lease	154.31	84.25	83%
8	Recognized from deferred revenue government grant	15.38	0.03	51167%
	Revenue from operations (₹Crores)	**78,273.44**	**70,843.81**	**10%**
9	Other income	1,068.86	1,165.35	-8%
	Total revenue	**79,342.30**	**72,009.16**	**10%**

The revenue of the Company comprises income from energy sales, consultancy and other services, operating ease rentals on assets, interest and surcharge received from the beneficiaries, interest earned on investments such as term deposits with banks, interest on loan to employees, Subsidiary Companies and dividend income from mutual

Stakeholder Engagement

NTPC's stakeholder engagement is an ongoing journey where the Company aims at understanding the expectations of its stakeholders and collaborates with them to achieve desired results.

Nine broad stakeholders have been identified on the basis of internal analysis. To ensure effective stakeholder engagement, NTPC follows the principles of engagement as given below:

Principle of Openness: Ensure open and transparent communication with stakeholders on issues that are of mutual interest.

Principle of Accountability: NTPC's stakeholders have always shown incredible trust in the Company that is not only the Company's greatest strengths, but also reflects in its reputation as a highly credible power generator and a great workplace. In order to take on to the trust of its stakeholders, NTPC deems it inevitable to link the engagement processes and their results with the core business of decision making.

NTPC Stakeholder Engagement Process

Stakeholder engagement is a part of the business process involving continuous dialogue between the Company and one or more of its stakeholders. NTPC has well defined forums for stakeholder consultation with defined frequencies. These forums have been used for identifying stakeholders' expectations in context of sustainability. The feedback is utilized for deciding the Company's strategies to fulfil these expectations.

Shri R.K. Singh Union Minister of State (IC) for Power, New and Renewable Energy at NTPC Project Monitoring Centre in New Delhi

Government of India

Medium of Engagement
- Secretary level review
- Meeting with MoP, DPE, Parliamentary Committees, CEA etc.

Purpose of Engagement
- Policy development in line with national priorities
- Meeting 5 year national plans
- Target monitoring – Annual MoUs
- Compliance with Govt. Directives and Guidelines
- Transparency and Governance
- Company Performance and its reporting
- New initiative

Key priorities derived out of the engagement process
- Delay in execution of Projects
- Sustaining Efficient Plant Operations
- Coal Mining (Land Acquisition)
- Climate Change
- Environment Issues
- Community Development

Frequency of Engagement
- Quarterly
- Need based

Shareholders & Investors

Medium of Engagement
- Conference Calls
- Analyst and Investors Meeting
- Annual General Meeting
- One on One Meeting and Investor Conferences
- Review meets with Bankers (Domestic and Foreign)

Purpose of Engagement
- Management Vision and future plans
- Company Performance
- Sustainability Challenges and concerns
- Growth opportunities of the Company
- Handling queries of investors, fund managers & analysts
- To discuss debt requirements

Key priorities derived out of the engagement process
- Delay in execution of Projects
- Sustaining Efficient Plant Operations
- Sustaining Growth

Frequency of Engagement
- Quarterly
- Annual
- Regular

Regulators (CERC) & Other Statutory Authorities (CAG, MoEF, CPCB/SPCB etc.)

Medium of Engagement
- Public hearings
- Statutory Audits & Inspections, Meeting for Clearances, Consents & Compliances

Purpose of Engagement
- Issues relating to tariffs
- Optimising cost of electricity Financial Audits & Transparency
- Obtaining Project clearance
- Environment Clearance & Clearance Conditions
- Obtaining Consents and meeting Consent Conditions`

Key priorities derived out of the engagement process
- Environmental Clearances
- Ash Management
- Compliance with changing environmental norms
- Tariff of stations

Frequency of Engagement
- Need based
- As per statutory provisions

Employees

Medium of Engagement

- Participative forums, Communication meetings, Employee Climate Surveys, Intranet, Trainings and Workshop, Internal Magazines

Purpose of Engagement

- Grievances and feedback
- Employee Satisfaction
- Professional Growth
- Health, Safety & Security Issues
- Work – Life balance
- Quality of Life
- Remuneration and Rewards
- Actualisation of Core Values

Key priorities derived out of the engagement process

- Attracting and retaining skilled and experienced employees.
- Safety & security of people and property

Frequency of Engagement

- As per defined frequency or as per requirement

Neighbourhood Communities

Medium of Engagement

- Public hearings, VDAC, Public Information Centres

Purpose of Engagement

- Rehabilitation & Resettlement Issues
- Community development Issues
- Environmental Issues
- Community Grievances

Key priorities derived out of the engagement process

- Community Development
- Land Acquisition

Frequency of Engagement

- Need based
- At least once in a year

Customers

Medium of Engagement

- Regional Customer Meets
- Regional Power Committees (RPCs)
- Commercial Co-ordination Committee
- Technical Co-ordination Committee
- Operation Co-ordination Committee
- Business Partner Meet
- Customer Support Services

Purpose of Engagement

- Top & Middle level Interactions between Customers & NTPC
- Resolving Technical Issues
- Resolving Commercial issues
- Grid Operation, Scheduling and other related issues
- Support services to customers on various area of power business

Key priorities derived out of the engagement process

- Health of State Utilities
- Risk of not getting schedule.

Frequency of Engagement

- Once in two years for each region
- Quarterly
- Monthly
- Yearly
- As per requirement

NTPC Management interacting with suppliers/venders

Suppliers

Medium of Engagement
- Pre-bid conference, Suppliers Meet, Vendor Enlisting, NTPC Website

Purpose of Engagement
- Finalisation of Technical Specifications
- Qualifying Requirements of Vendors
- Sharing Latest Technological Developments in the Area
- Resolving Contractual Disputes

Key priorities derived out of the engagement process
- Inadequate Fuel Supply

Frequency of Engagement
- Before tendering
- Need based

Media

Medium of Engagement
- Press Releases
- Press conferences

Purpose of Engagement
- Information Sharing
- Brand Image
- Keeping the general public and community appraised of developments such as new capacity additions, performance and new developments.

Key priorities derived out of the engagement process
- Brand Image

Frequency of Engagement
- Need based
- Event based

Citizens of India

Medium of Engagement
- Right to Information (RTI) Act, NTPC Website

Purpose of Engagement
- Rehabilitation & Resettlement Issues
- Community Development Issues
- Environmental Issues
- Employee Grievances
- Contractual Disputes

Key priorities derived out of the engagement process
- Community Development
- Environmental Issues

Frequency of Engagement
- Continuous

Materiality Analysis

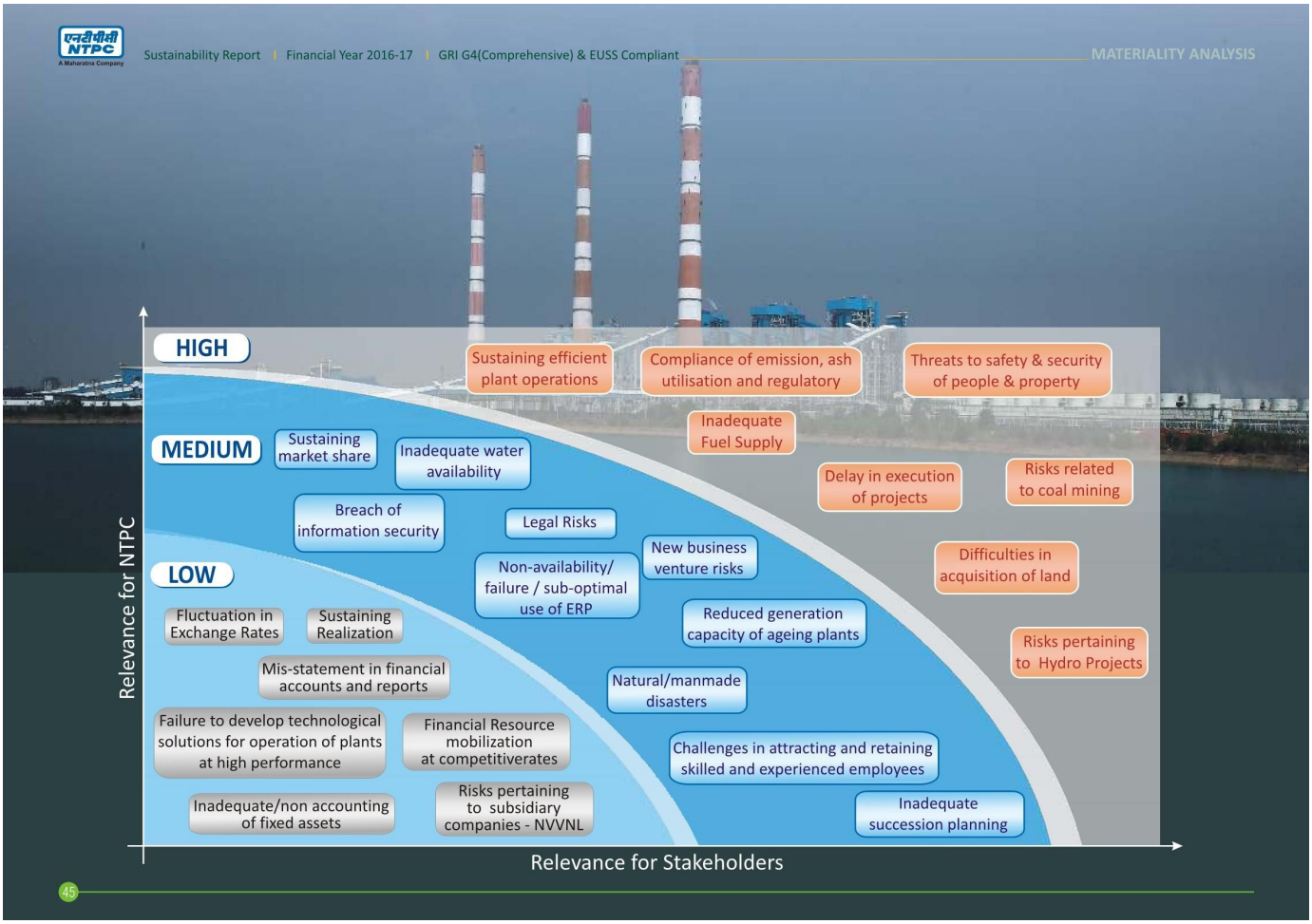
NTPC has an elaborate Risk Management framework in place. A Director level Committee called Risk Management Committee (RMC) has been constituted. The RMC is responsible to identify and review the risks and to formulate action plans and strategies to mitigate risks on short term as well as long term basis. The RMC has identified 25 risks and out of which 8 have been classified as the top risks for the company. All these risks were subjected to materiality analysis in sustainability context on the basis of importance for the Company and for the stakeholders.

These areas are being regularly monitored through reporting of key performance indicators of identified risks and exception with respect to risk assessment criteria. The RMC meets every quarter to deliberate on strategies to mitigate the risks.

Committee on Risk Management

Risk Management Committee comprises following members:

- Director (Technical)
- Director (Projects)
- Director (Operations)
- Executive Director (CP)/ Chief Risk Officer(CRO)
- Regional Executive Director (Coal Mining) / any other Executive Director/ Group General Manager or General Manager


HIGH
MEDIUM
LOW
Relevance for NTPC
Relevance for Stakeholders
Sustaining efficient plant operations
Compliance of emission, ash utilisation and regulatory
Threats to safety & security of people & property
Inadequate Fuel Supply
Sustaining market share
Inadequate water availability
Delay in execution of projects
Risks related to coal mining
Breach of information security
Legal Risks
New business venture risks
Difficulties in acquisition of land
Non-availability/ failure / sub-optimal use of ERP
Fluctuation in Exchange Rates
Sustaining Realization
Reduced generation capacity of ageing plants
Risks pertaining to Hydro Projects
Mis-statement in financial accounts and reports
Natural/manmade disasters
Failure to develop technological solutions for operation of plants at high performance
Financial Resource mobilization at competitiverates
Challenges in attracting and retaining skilled and experienced employees
Inadequate/non accounting of fixed assets
Risks pertaining to subsidiary companies - NVVNL
Inadequate succession planning

Management Approach/ Mitigation Measures on Sustainability Issues

The Management approach on various sustainability aspects is clearly reflected in NTPC's vision, mission, corporate objectives and in various specific policies of the organization, which have already mentioned in the report. However, the management approach/ mitigation measures of all 25 identified risks are summarized below:

S. No.	Risks	Management Approach/ Mitigation Measures taken by NTPC
01	Inadequate Fuel Supply	a. Tie-up coal supply through linkage / bridge linkage
		b. Coal supply rationalization
02	Difficulties in acquisition of land	a. Devising attractive compensation plans on the basis of National R&R, State R&R and NTPC R&R plans
		b. Expedite land acquisition through liaising with state government
03	Delay in execution of projects	a. An elaborate schedule of projected deliveries is prepared taking into account logistics in the area
		b. Procurement activities undertaken in line with the project master network
04	Risks pertaining to Hydro Projects	c. Active follow up with statutory bodies for obtaining required approvals
		d. Online web monitoring system
		e. Well defined procedures/ manuals/ circulars in place in contracts & engineering division to reduce the lead time of activities & to ensure timely supply of materials
05	Risks related to coal mining	a. Outsourcing mining operations to a Mine Developer-cum-Operator (MDO) having the required experience
		b. Continuous liaising with Ministry of Railways for timely development of coal evacuation rail network
06	Compliance of emission, ash utilization and regulatory norms	a. Internal and external audits to monitor compliance
		b. Retrofitting being carried out to meet the norms
07	Sustaining efficient plant operations	a. Centralized overhauling schedule prepared with inputs from customers and generating stations
		b. Standard operating procedure for efficient and safe operation of power plant
		c. Committee at all stations to improve efficiency
08	Inadequate water availability	a. Follow up with Central and State Governments
		b. Adequate storage of water
		c. Zero Liquid Discharge (ZLD) at all locations
		d. Reduced consumption by Air Cooled Condenser, increased CoC etc.
09	New business venture risks	a. Carrying out Techno-commercial feasibility studies
		b. A multi-disciplinary committee is constituted for assessment of New Business
10	Reduced generation capacity of ageing plants	a. Adoption of latest technology under R&M for performance enhancement and changing environment norms
		b. Stations are entrusted with the task of undertaking RLA studies and formulating R&M plans, which are constantly reviewed by PP&M, and Operation Services and Engineering Department.
11	Failure to develop technological solutions for operation of plants at high performance	a. NTPC has been assigning a minimum of 1% of its PAT for R&D activities.
		b. NETRA (R&D division of NTPC) has collaboration with other research organizations, OEMs and IITs

S. No.	Risks	Management Approach/ Mitigation Measures taken by NTPC
12	Legal Risks	a. Overall checklist for legal compliances maintained and monitored by the legal department b. Obtaining clarification on doubts from external legal counsel
13	Breach of information security	a. Access to servers and critical IT equipments is restricted to authorized users only b. Deployment of Firewalls at perimeters
14	Non-availability/ failure / sub-optimal use of ERP	a. Redundancies designed for critical components b. AMCs for maintenance of equipment
15	Challenges in attracting and retaining skilled and experienced employees	a. Providing continued opportunities for learning and growth b. Higher Compensation and allowances for employees located at project sites
16	Inadequate succession planning	a. Policy framed and implemented b. Critical Management Positions identified and threshold job rotation ensured c. Key employees are sent for management development programs in premier institutes
17	Threats to Safety & security of people & property	a. Providing Standard Personal Protective Equipment as per safety guidelines b. Internal audit carried out regularly.
18	Natural/ manmade disasters	a. Plant structures designed in a way that is resistant to natural calamities b. Comprehensive disaster recovery plans to reduce effects of natural calamities
19	Sustaining market share	a. Strategy for capacity addition through JV/Subsidiary root in association with State Government b. Capacity expansion in case of existing plants
20	Sustaining Realization	a. Tripartite agreement for payment security arrangement b. Payment rebate scheme for early bill payments
21	Fluctuation in Exchange Rates	a. Continuous monitoring of exchange rate movement for key currencies b. Periodic reports on FERV are prepared and periodically reviewed
22	Financial Resource mobilization at competitive rates.	a. Regular interactions held with domestic banks, institutions, foreign lenders and investors b. Regular follow up with regulatory/statutory authorities - RBI, MOF etc., for policy advocacy for removing barriers for inflow of debt funds
23	Mis-statement in financial accounts and reports	a. Audits at various locations are carried out b. Checklists devised to have control over the consolidation process
24	Inadequate/ non accounting of fixed assets	a. Periodic physical verifications of the assets are carried out b. Defined roles and responsibilities for updation of financial records for recording of assets at the time of purchase of fixed assets
25	Risks pertaining to subsidiary companies - NVVNL	a. Senior management of NTPC directs, monitors and reviews subsidiary operations on a periodic basis b. Performance of NVVN is regularly monitored by Business Development Group

Economic Performance

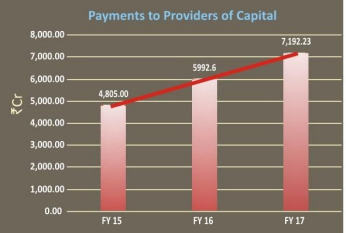
India is the fastest growing major economy in the world with a huge potential appetite for power consumption. Shareholders may appreciate that on September 9, 2016, the actual energy demand met in the country was an all time highest at 3,539 MUs and NTPC (along with group entities) contributed 866 MUs. Thus, green shoots are visible as far as upswing in power demand goes and this is in line with its long held expectations of growth. The Company is one of the engines of economic growth. The more the economy grows, the greater the opportunities for it.

Direct Economic Value Generated and Distribution

NTPC's operational performance during the FY 2016-17 has resulted in an increase in its direct economic value generated from ₹71,520.64 Crore in the FY 2015-16 to ₹79,167.43 Crore.

Particulars	FY 2014-15 (₹in crores)	FY 2015-16 (₹ in crores)	FY 2016-17 (₹ in crores)
A. Direct Economic Value Generated			
Revenues	75,176.22	71,520.64	79,167.43
Sub Total (A)	75,176.22	71,520.64	79,167.43
B. Direct Economic Value Distributed			
Operating Cost	53,398.59	48,831.77	52,163.61
Employee Wages & Benefits	3,669.78	3,609.32	4,324.60
Payments to Providers of Capital	4,805.00	5,992.60	7,192.23
Payments to Government	819.06	268.14	3,464.31
Community investments	125.91	489.89	273.35
Sub Total (B)	62,818.34	59,191.72	67,418.10
Economic value retained (A-B)	**12,357.88**	**12,328.92**	**11,749.33**

Elements of direct economic value distributed, i.e., employee wages, payment of providers of capital and payment to Government have shown improvement as depicted below:



Details of financial performance are given in the Annual Report FY 17 which is available at the link www.ntpc.co.in

Suppliers and Local Sourcing

Under the Procurement and Works Policy of NTPC, transparent tendering procedures are adopted for all procurements. In order to encourage Indian suppliers, provisions regarding price preference and deemed export benefits (Customs & Excise Duty benefits) are stipulated in the bidding documents as per the extant policy of Government of India. The provisions in respect of labour, welfare, safety, etc. are incorporated in the bidding documents for supply cum erection packages, invited on international and domestic competitive bidding basis.

There are economic opportunities for the local suppliers arising out of the need for goods and services by NTPC projects. Many indirect benefits are available to project affected families as additional facilities, over and above the entitlements. Project Affected Persons are given preferences for service opportunities of projects and townships such as Employment with contracting agencies, Allotment of Shops, Kiosks in township, Award of petty contracts, Vehicle hiring in projects.

All local infrastructure services at NTPC plant as well as offices are met through outsourcing of local suppliers which amounts upto as high as 10% contract value at station.

Financial Assistance from Government

NTPC is running on self-sustained basis and is giving regular dividend to the Government of India on its equity. No capital has been invested by the Government of India in NTPC since the year 1999-2000. The Company has not received any direct government benefit by way of subsidies, grants or royalties. As per the provisions of Income Tax Act 1961, NTPC is eligible to avail the deduction generate power upto 31.03.2017. However, this exemption is available to all the companies in the infrastructure sector and is not specific to NTPC.

Research & Development

Vision: Delivering sustainable technology solutions through applied research and provide advanced scientific services for power sector.

Objective: To pioneer the adoption of reliable, efficient and cost effective technologies by carrying out fundamental and applied research in alternate fuels and technologies. To carry out research and development of break through techniques in power plant construction and operation that can lead to more efficient, reliable and environment friendly operation of power plants in the country. To disseminate the technologies to other players in the sector and in the long run generating revenue through proprietary technologies.

R&D Focus Area:

Efficiency & Availability Improvement	New & Renewable Energy	Climate & Environment Change	Advanced Scientific Support
• Waste heat recovery	• Solar Thermal	• CO_2 capture & utilization	• In-situ health assessment
• CFD analysis	• Solar PV	• Bulk Ash utilization	• Failure Analysis,
• Combustion Optimization	• Bio-Fuels	• Waste Management	• Corrosion & water treatment
• ANN Modeling		• Emission reduction	• Coal analysis
• Robotics		• Water Conservation	• Condition monitoring through DGA, Vibration & Tribology
• Nano fluids			
• Elec & Power System reliability			

1.0 Technology Absorption

Specific areas in which following activities have been carried out during FY17:

A. Completion of MoU Projects:

- Indigenous floater development and set up of 100 Kwp Floating Solar PV system at Kayakulam,
- Set up of 120 TPD Flue gas based Desalination Plant at NTPC Simhadri,
- Robot Based Solar PV Panel Cleaning at NTPC Dadri,
- Solar Thermal Hybrid Plant at NTPC Dadri,
- Multi utility heat pump at NETRA,
- Lab Scale development of Super hydrophobic nano-coating for Solar PV panels,
- pH control of Ash pond re-circulation water using Flue gas
- ESP performance improvement using CFD Analysis at Badarpur Unit-4,

B. Developmental Projects (ongoing):

- Development of Smart Invertor
- DC Microgrid Installation at NETRA
- PMU installation at 4 NTPC sites
- Indigenous Solar Thermal (IIT Bombay) (3 Projects)
- 400 T Flue gas based AC system
- Setting up of fly ash based Light Weight Aggregate pilot plant at NTPC-Sipat
- Construction of road using Geo-polymer by converting fly ash
- Bottom Ash as Replacement of Fine Aggregate in Cement Concrete
- Fly ash based Geo-Polymeric Blocks through utilization of Sea Sand and Sea Water
- Flue gas fixation through algae and further utilization through conversion of algae into Bio methane
- Development of Flow Battery (500W, 5H, soluble lead redox flow battery (SLFB)
- 10 TR ground sourced heat pump system at NETRA
- VFD Retrofitting for Air Compressors
- Centralized PV Forecasting

2.0 Benefits derived as a result of above Research & Technology Development:

NETRA activities have helped the stations in analysis of failures and its prevention. Techniques developed by NETRA are implemented at stations wherever required. Regeneration treatments of resins, chemical cleaning/treatment and corrosion control measures supported the stations in improving the efficiency and availability of boilers and various heat exchangers / cooling towers, etc. CFD based modifications have resulted in power saving and have been helpful in analyzing and resolving vibration problems in CW pumps. Studies on CO_2 capture and utilization, solar thermal, bio fuels will result into development of technologies for reduction in the impact on climate change and technologies for affordable renewable energy sources.

3.0 Expenditure on R&D: FY 17

S.No.	Description	Expenditure in (₹Crore)	
		FY 17	FY 16
a)	Capital	**81.88**	21.68
b)	Revenue	**80.40**	108.0
c)	Total	**162.28**	129.68
d)	Target	**101.62**	102.91
e)	Total R&D expenditure as a percentage of PAT of previous year	**1.59%**	1.26%

4.0 Technology Absorption, Adaptation and Innovation:

Particulars of some of the important technology imported during last five (5) years are as follows:

S. No.	Technology	Year	Stations
1	Ultra- supercritical Power plants with steam parameters 270 kg/cm^2 steam pressure and 600/600 deg C at turbine end.	2014-16	Being implemented in Khargone (2X660 MW),Telangana –I (2X800 MW) and Lalam Koduru (4X1000 MW).
2	Air cooled condenser for super critical units.	2013-14	Being implemented in (3x660 MW) North Karanpura.
3	Adoption of USC steam parameters 260 Kg/ pressure and 593/593 deg C at turbine end.	2013-14	Being implemented in (3x660 MW) North Karanpura.
4	Super critical technology with 256 Kg/cm^2 Steam Pressure and 568/596 deg C MS/RHsteam temperature is being adopted at steam generator end for improvement in thermal efficiency and reduced emission of green house gasses.	2012-13	Being implemented in Mauda (2X660MW), Solapur (2X660MW), Meja (2X660MW), Nabinagar (3X660MW) through bulk tendering mechanism & for 9 units of 800 MW units(Kudgi, Darlipalli, Gadarwara & Lara) through bulk tendering.

5.0 R&D Awards & Accolades...

for matchless and considerable efforts!

- MNRE Award–Solar Thermal Cooking
- ENERTIA- Pradeep Pimpley Award
- AREAS, MNRE - Grid Connected Roof Top PV
- Paper accepted in International journal Scientific Reviews & Chemical Communications, Volume(6)-4, 2016 titled "Paper Characterization of Fly Ash from Coal-Fired Thermal Power Plants using Energy Dispersive X-Ray Fluorescence Spectrometry

Investments for Public benefit

NTPC has taken up Decentralized Distributed Generation (DDG) in the vicinity of its existing power stations for assisting GOI in achieving the goal of "Electricity for all" and with an objective of demonstrating a sustainable business model for integrated growth of villages. Such projects cannot be commercially viable & sustainable unless the entire capital cost is provided as grant. This is essential for making the power supply affordable for the rural community. Grant is funded through Funding agencies & gap between actual capital cost and grant is bridged by NTPC Foundation.

Green Initiatives in Investor Relations

NTPC has made use of recent circulars of Ministry of Corporate Affairs and thereby has started sending annual reports and other communications to investors through email after taking their consent. This has resulted in huge savings of paper. In 2016-17, following savings were made:

Nature of Communication	No. of Shareholders to whom e-communication sent	Savings involved
Annual Report 2015-16	3,40,583	Around 238 tonnes of paper saved resulting in saving of~ 5712 trees (taking ~24 trees per ton of paper)
Dividend Intimations: Interim Dividend 2016-17	3,43,001	Monetary Savings: ₹2.59 crore (approx)
Final Dividend 2015-16	3,26,675	

Sustainable Economic Operations

NTPC is committed to provide affordable power 24X7. As a Central Power Sector Utility, the power tariff is determined by a regulator, Central Electricity Regulatory Commission. The cost of generation is subjected to detailed due diligence by the regulator and NTPC is allowed to earn a fixed Return on Equity as decided by regulator who is required to ensure a balance between availing affordable power for the masses and sustainability of the power sector.

The tariff is primarily composed of two portions: fixed charge and variable charge. In order to contain fixed cost, NTPC has adopted various means in FY17 to reduce the cost of borrowing:

1. Diversifying the loan basket by borrowing from International market, domestic market by way of raising bonds and Rupee term Loans and maintaining a healthy balance amongst these sources.
2. Reviewing and churning the debt portfolio continuously through refinancing and negotiation.
3. Raising fund from innovative instruments and modes available in the market. For instance, NTPC was the first corporate issuer of Green Masala bonds of INR 3628.03 crores having coupon of 7.375% issued under the MTN program.
4. Continuously watching the gearing ratio to ensure that the balance sheet is not overburdened with debt, and earnings are stable to reflect healthy DSCR and Interest coverage ratio.

The variable charge component represents the fuel charges. Fuel entails two challenges: (a) Securing fuel supplies for sustained uninterrupted operations, and (b) Efficient procurement for competitive power tariff.

NTPC has taken several steps to meet above challenges:

1. Securing domestic coal supply:

- Entered into long-term coal supply agreements with coal companies for supply of domestic coal. The contracted quantity is sufficient to meet almost 80% plant load factor.
- Bridge linkage has been tied up for more than 8000 MW for NTPC stations.
- From time to time, NTPC meets spot requirements by participating in e-auctions conducted by the coal companies
- Continuously striving to reduce imported coal consumption. No new procurement action has been taken for imported coal in current fiscal.

2. Ensuring quality of coal at optimized price:

Since graduation from Useful Heat Value (UHV) to Gross Calorific Value (GCV) based grading system for billing purposes of coal, variance in quality of coal billed/analyzed at mine end and power plant end continued to be substantial which had commercial implications.

In order to solve these issues, power utilities started to appoint third party agencies for sampling and analysis at loading end for coal billing. However, difficulties were faced in implementation of third party sampling leading to the widespread disputes.

An important step was initiated in FY17 by jointly appointing Central Institute for Mining and Fuel Research (CIMFR) by the power utilities and coal companies for sampling at loading end. Subsequently, Govt had also mandated CIMFR to carry out sampling at unloading end. Accordingly, tri- and bi-lateral agreements have been signed to undertake third party sampling at loading and unloading ends respectively.

CIMFR has taken over sampling for most of NTPC stations at loading and unloading ends. In case of any GCV difference between "Declared grade" of the mine and "analyzed grade", credit/debit notes are being raised to coal companies. Such disputable matters are also being taken up at CIMFR and Executive committee for faster resolution. This step has been immensely helpful for the reduction in the cost of generation for the benefit of ultimate consumer of the society.

NTPC has realized huge cost efficiencies during FY17 by swapping and rationalization of coal, appointing agency for third party coal sampling, and reducing imported coal consumption by 85% of previous year.

By these measures, NTPC was able to reduce per unit cost by nearly 40 paise in FY17 as compared to FY15. This translates into savings of more than ₹8000 Cr to the states, over two years.

Further, Government of India has approved "SHAKTI" policy which will further increase transparency in coal allocation, and improve cost efficiencies. NTPC has been exploring provisions of this policy for securing coal supply for upcoming projects.

Further, NTPC secures revenue realization through tri-partite agreements amongst Government of India (GOI), the respective State Governments and RBI. These agreements entail recovery of current over dues (remaining outstanding for more than 90 days) of State Power Utilities payable to NTPC and other CPSUs & its

subsidiaries and Joint Ventures of any of these CPSUs with State PSUs as per respective supply agreements of CPSUs with the State Power Utilities.

In this regard, TPAs have been signed with Twenty Seven (27) states and UTs as on 31.12.2017. The Company, therefore, manages fuel and realization risks adequately for uninhibited operations and serving the nation relentlessly by generating low-cost reliable power.

Sustained Operations:

With Capital Work in Progress (CWIP) of approx. ₹ 87,000 crores, NTPC has projects under various stages of construction, and will attain commercial operations and add to cash inflow substantiallyin next 3-4 years.

This is in addition to the fact that NTPC has been giving good dividends consistently for the last 24 years.

Financial promptness:

The Company was successful in customizing its existing ERP framework to the adoption of Ind AS and reported its financial results accordingly. The Companies operations are present in 22 states in India and two International locations and the projects and offices are spread at more than 50 accounting units. The "Nil" comment in the year FY 17 from C&AG is a testimony to consistency of financial processes and transactions in line with Generally Accepted Accounting Principles.

Digitalization initiatives at NTPC:

NTPC is leveraging Information Technology in its goal of sustainable growth in business. Since 2008, NTPC has implemented Enterprise Resource Planning (ERP) application to integrate all its business functions to improve information availability, transparency and decision making. PI data system has been developed to capture, display and analyze the plant performance parameters on real time basis. Non-ERP applications in balance areas such as Engineering Drawings approval, Quality Control Management, Hospital Management, Transit Camp Management, RTI, Security Control etc.

NTPC plants and Offices across India, are connected to Corporate Office and main Data-centre(DC) through 2x12 mbps MPLS links to facilitate seamless communication. The DC and DR(Disaster Recovery) site is connected with 156 mbps MPLS links for data backup.

The progress of ongoing projects and issues of the running power stations are discussed regularly over high definition Video Conferencing system at Project Monitoring Centre of Corporate Office. Dashboards for top management (REDs, Heads of Projects) were developed and deployment of the same is in progress.

Some of the highlights of the progress in IT/ERP area during FY17 are as follows:

- **Paperless Office –** In an effort towards 'Go Green' Initiative, a number of processes like e-MB, Telephone claim, Travel Claim, Probation clearance etc. are made paperless. NTPC is in the process of implementation of Enterprise Content Management to go for 100% digitization across the organization.
- **ERP Hardware Refresh** - The Hardware refresh of both ERP Data centre and Disaster Recovery Centre has been carried out. NTPC has also built and commissioned its own Disaster Recovery Centre. NTPC was awarded with "Data Centre Transformation"Award at Indian Express IT meet. The availability of ERP and DR set up was more than 99.9% during the year.
- **ERP –** The Employee Self Service Portal has been launched on Internet, moving away from Intranet. This enables easy and on-the-go access for all employees.

A number of new processes such as commercial billing as per 2014-19 tariff, Coal mining, FGD, third party coal sampling, Self Booking Travel interface with Balmer Lawrie, PMS for all etc. have been incorporated in ERP.

- **Security –** No major security breach was observed during FY17. A 24x7 Security Operation Centre(SOC) is in operation where round the clock monitoring of all external and internal data traffic is being analyzed with latest tools, and monitored through SOC and latest threat management tools are being applied to prevent any cyber-attack or data theft. Timely communication is being sent to all users based on threat perception.
- **Mobile Apps –** In order to promote digital communication in place of paper communication, a number of mobile apps are being developed. Some of these are apps for fuel tracking, real time generation monitoring, online telephone directory, empaneled hospital listing, safety and business excellence manuals.
- **Vendor Portal** – A Vendor e-portal was launched where all activities such as registration, viewing tenders, participation in the tender, purchase order, submission of bills, bill tracking and final payment are done in electronic mode. This has greatly enhanced procurement process efficiency and reduced timelines. It is also convenient and economic for the vendors.

These are only few of the major digitization drives NTPC has embarked on to, while moving on its path of a more futuristic and automated Company.

NTPC MoU with GOI

NTPC has signed MoU for FY 18 with the Ministry of Power for which the targets are as follows:

Sl.	Evaluation Criteria	Unit	Excellent Targets
1	Revenue from Operations (Net of Excise Duty)	₹ Cr	79,280
2	Operating Profit (PBT) as a % of Revenue from operations (Net)	%	13.39
3	PAT/ Average Net Worth	%	8.60
4	Gross Generation	BU	250
5	Production Efficiency Parameters -		
	i. % Reduction in ECR (Energy Charge Rate) per unit over previous year	%	2.00
	ii. % Reduction in Specific water consumption over previous year	%	1.50
	iii. % Reduction in Forced Outage over previous year	%	1.50
6	CAPEX 1	₹ Cr	23,000
7	% of value of CAPEX contracts/ projects running/completed during the year without time/ cost overrun to total value of CAPEX contracts running/completed during the year	%	100
8	Trade Receivables (Net) as number of days of Revenue from Operations (Gross)	No. of Days	38
9	Reduction in claims against the Company not acknowledged as debt (%) – Total Claims	%	1.50
10	Return (Share of profit/loss) on Investment in JVs	%	1.00
11	HRM related Parameters -		
	i. Online submission of ACR/APAR of all executives (E0 & above) along with compliance of prescribed timelines wrt writing of ACR/APAR	% of no. of executive	100
	ii. Online quarterly vigilance clearance updation for Senior executives (AGM & above)	% of no. of senior executive	100
	iii. Preparation of Succession Plan and its approval by Board of Directors	Date	30-Sep-17
	iv. Holding of DPC without delay for executive (E0 & above level)	%	100
	v. HR Audit & Board Decision on findings of HR audit	Date	30-Sep-17

Environmental Performance

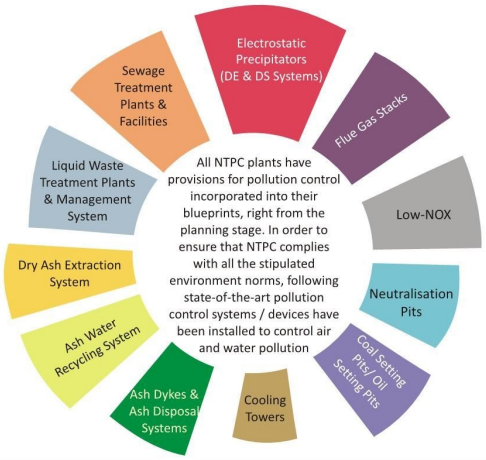
NTPC is committed to protecting the fragile ecology as well as ensuring sustainable growth of electrical power. It is passionate about ensuring a clean environment for the present and future generations. Harmony between man and environment is the essence of healthy life and growth.

NTPC has recently revised its environmental policy to cater to changing requirements and stress the increased stewardship of the Company in environment related matter. The policy focuses on optimal consumption of natural resources, minimization of waste by recycling & reuse, adoption of latest technologies, upgradation of old units for higher efficiency and environmental impact mitigation. NTPC is regularly upgrading the power station for maintaining the environmental parameters as per the norms of regulatory agencies.

NTPC is one of the first companies in India, and very few globally, to have come out with a dedicated water policy, recognising the importance of this very precious resource. Minimizing water consumption and maintaining the right quality of water is at the center-stage of the policy.

All the NTPC stations are certified with Integrated Environment Management System (EMS). At few locations, the Company has adopted the latest standard of EMS, as of 2015.

NTPC has taken various initiatives to reduce the environment impact in and around the power stations by way of conducting the EIA studies before plant commissioning activity and accordingly, Environmental Management Plans has been prepared at all stations as a precautionary approach; wherein, mitigation measures of all the environmental issues are taken into consideration as covered in the study area.



NTPC protects environment of surroundings by implementation of environmental management plans as suggested in EIA studies, adopting the latest technologies through renovation & modernization, in line with environmental action plan, as per the regular updating & changing of regulatory norms and directives.

The Company is undertaking massive renovation and modernization to upgrade air pollution equipments to reduce SPM emissions well below current statutory limits.

Around 12%-15% of the project cost is spent on various environment protection equipments such as Electrostatic Precipitators (ESPs), Liquid Waste Treatment Plants (LWTP), Ash Water Recirculation System (AWRS), dry ash extraction system, dust extraction, suppression system, ambient air quality monitoring system, flue gas conditioning system and desulphurization system etc. It has adopted advanced and high efficiency technologies such as super critical boilers at new stations and upcoming green field projects.

The Company is augmenting its capacity by installing solar power plants in a big way, hydro power systems attached to its thermal power stations, wherever possible, so as to encourage garnering of renewable energy resources. These measures are aimed not only to achieve reduction in pollution and minimize use of precious natural resources but also to lead to reduction of CO_2 emissions per unit of generation thereby reducing global warming.

Environment Policy

To provide cleaner energy by committing to highest possible level of performance in environmental compliance, practices and stewardship

Principles of Environment Policy

NTPC environment policies forms the base for the companies approach towards environment management. This policy is based on the following principles:

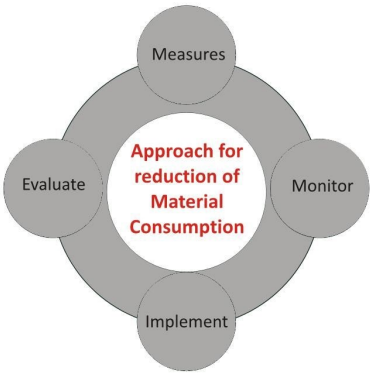
- Develop each employee as environmental steward by improving his/her awareness levels while soliciting his/her commitment.
- Impact of NTPC's business on environment can be minimized by adopting best environment management practices and state-of-the-art technology.
- NTPC's commitment as a responsible corporate citizen is demonstrated by achieving and setting benchmarks beyond statutory compliances.
- Accepting accountability for all operations and expeditiously respond to any aberration.
- Innovation by carrying out Research & Developmental activities, coupled with enablers leads to continual improvement.
- Continuous monitoring and sharing of environmental indicators with stakeholders ensures NTPC's commitment towards continual improvement in environmental performance.
- Consideration of Environmental factors right from the stage of planning, design and operation of projects to ensure that principles of conservation and sustainability are adhered to.

Responsible Consumption

NTPC follows a comprehensive approach for improving material consumption efficiency, with due focus to the regular evaluation of resource consumption intensity, which is improved through measurement, monitoring of the consumption and implementation of improvement plans.

Aspects of emissions, water use and waste disposal are regularly monitored and studied in surrounding area for finding the impact of the thermal power station operation. The recommendations of these finding are implemented as the environment management plan. Also, these aspects are regularly reporting to the monitoring and regulatory agencies such as Central & State Pollution Control Boards, NGOs and ISO certification agencies as per Govt. of India Rules & Regulations.

Only water is recyclable input material, rest others recyclable material such as used oil is auctioned through registered recyclers. NTPC is in the process of implementation of Zero Liquid Discharge (ZLD) from plant premises and some stations. Other than this, several steps are being taken to contain special water consumption to within the stipulated norms of MoEF & CC which 3.5 for old stations and 2.5 for stations commissioned after 01.01.2017. As far as coal is concerned, adoption of higher size units for power generation, the efficiency improvement is causing reduced specific coal consumption.



Switchyard area of NTPC Vindhyachal

In Dadri, NTPC has done pilot testing for bio-mass co-firing in its boiler. This will serve dual purpose of reducing coal consumption and will be instrumental in disposing of the rice-husk and other bio-mass. This biomass is otherwise burnt in farms, causing tremendous pollution. This pilot testing is first of its kind in India, and has been successfully concluded.

Coal and Gas are main raw materials for NTPC and are used as fuel for power generation. Since Actual Calorific Value (ACV) of these fuels are a deciding factor for its specific consumption, higher the calorific value, lower the specific consumption. Efficient use of these resources is a main focus area for NTPC. The trends for performance parameters of specific coal consumption, auxiliary power consumption and specific oil consumption are shown in graph below:

Energy Management

Energy Conservation

Some of the important energy conversation measures taken by NTPC during the year is as under:

Measures Taken For Energy Conservation :

Energy audits	During FY 17, all stations had conducted Auxiliary Power Consumption Energy Audits (26 nos.). Also Water Balance audits were conducted at 9 nos. stations. A Conference of Energy Managers of all NTPC stations was organized to deliberate actions for energy / water conservation and disseminate the activities undertaken at various Stations.
Auxiliary power consumption (action undertaken to reduce APC)	• Retrofitting HT VFD in ID Fans of one unit • Replacement of inefficient BFP cartridges based on high SEC • Energy Efficient Coating on pump internals of Cooling Water / other large water pumps • Installation of VFD's in various LT drives • Installing grid-connected roof top Solar PV systems • Retrofitting FRP blades in CT fans • Replacing existing motors with Energy Efficient motors • De-staging of HPBFP to optimize power consumption • Replacing old compressor with energy efficient screw compressor • ESP hopper heater modification to save energy • BFP Power saving by adopting sliding pressure operation during part loading • Optimization of operation of CW pumps • ARCW, clarified water pumps & Cooling Tower Fans during part load operation and during low ambient temperature conditions • Optimizing mills, BFP and fans during prolonged partial loading • Using TDBFP during unit startups
Heat energy	Boiler modification in 3 units for improving steam parameters and heat rate, CT fill replacement and restoration of HP heaters were undertaken at some of the Stations.
Lighting	Replacement of existing lighting (FTL's, HPSV's) in boiler, turbine, switchgear rooms, offices with LED lighting and replacement of street lighting HPSV / Halogen / FTL fixtures with LED light fixtures in plant and township were undertaken at various stations during the year. Further, NTPC has entered into a pact with Energy Efficiency Services Ltd. (EESL) to implement energy efficient LED lighting solutions for all its projects, stations and offices across the country.

Savings achieved during FY 17 on account of specific efforts for energy conservation:-

S.No.	Area/ Activities	Energy Unit	Saving Unit Qty.			(₹Crore)		
			2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1.	Electrical	MU	115.4	116.9	118.60	29.46	27.76	30.54
2.	Heat Energy (Equivalent MT of coal)	MT	2100	7406	46178	0.44	2.31	12.04
	Grand Total					**29.90**	**30.07**	**32.58**

Energy saving per year:

Energy saved by the initiatives taken in NTPC power plants	2014-15	2015-16	2016-17
for energy conservation / efficiency improvement	115.4 MUs	116.9 MUs	118.6 MUs

Mitigating Climate Change Impact

Vision :"Going Higher on Generation, lowering GHG Intensity"

Along with the financial top line & bottom line, Company puts equally sharp focus on the environmental and social bottom line. Bulk of the new capacity addition would come through Super Critical Units leading to greater efficiency and reduced impact on the environment and thus promoting sustainable growth. Company is a pioneer in undertaking climate changes issues proactively. Environmental concerns buttress NTPC'S growth Strategy for a low carbon future, which includes the followings:

1. Increasing cycle efficiency of fossil fuel based units

With emphasis on efficiency of electricity generation, company has adopted ultra-super technology for new units by improving the steam parameters. For Telangana (2x800MW) steam parameter are 270Kg/cm^2, 600°C/600°C. Plant efficiency of these units is expected to increase by around 4% over that of a conventional sub-critical 500 MW unit using similar coal.

Development of Advance Ultra Super Critical Technology: Company has entered into an MOU with BHEL and Indira Gandhi Centre for Atomic Research (IGCAR) for indigenous development of advanced ultra-super critical technology. This will further enhanced the efficiency of the unit above 48.5 % and less CO_2 emission per unit of power generation as compared to 500 MW sub-critical thermal power units.

2. Increasing share of non- fossil fuel based generation

Company intends to have a more diversified fuel mix based on Coal, Gas, Hydro, Nuclear and Renewable energy sources. NTPC has also commenced preparatory work for setting up of wind farms and solar projects in addition to hydro power plants.

3. Centre for Power Efficiency & Environmental Protection (CenPEEP)

Cumulative CO_2 avoided is 43.7 million tons since 1996

NTPC runs a unique voluntary program of GHG emission reduction by establishing Center for Power Efficiency and Environmental Protection (CenPEEP) have already been installed.

This group is responsible for efficiency improvement and sustenance through strategic initiatives, Energy Efficiency Management System (EEMS), and reliability Improvement through Reliability Centered Maintenance (RCM) and PdM system. A pool of over 350 certified Energy Auditors has been created in the Company, helping in the culture of energy conservation. A dedicated group CEETEM – Centre for Energy Efficient Technology & Energy Management, coordinates regular Energy audits to induce focused actions and activities for improvement. CenPEEP is also coordinating for PG test conductance of units and its evaluation and reduction of specific water consumption.

CenPEEP also co-ordinates the membership of Electrical Power Research Institute (EPRI), and enhances knowledge management on efficient operations of thermal power plants thru' EPRI's huge database and knowledge.

4. Afforestation

The Company is undertaking tree plantation covering vast areas of land in and around its projects and till date about 32 million trees have been planted throughout the country including 10 million trees planted during 2016-17 under accelerated afforestation programme. The afforestation has not only contributed to the 'aesthetics' but also helped in carbon sequestration by serving as a 'sink' for pollutants released from the stations and thereby protecting the quality of ecology and environment. Further, the Company has embarked upon long-term Memorandums with State authorities to assist National Commitment of INDC in COP 21, by planning to plant 10 million trees during 2016-2026 @ 1 million trees per year across the country.

Planted approx. 1 crore trees during 2016-17 to mitigate the GHG emissions arising out of plant operations, thereby bringing total to about 3.2 crore trees planted till end of 31.03.2017.

5. Clean Development Mechanism (CDM)

The Company is addressing climate change issues proactively. The Company has taken several initiatives in CDM projects in Power Sector. It has gone ahead with nine projects in CDM foray. 8 MW Small Hydro Power Project at Singrauli, three 5 MW solar PV projects at Dadri, Port Blair (Andaman & Nicobar) and Faridabad, 50 MW Solar PV project at Rajgarh (MP) and 10 MW Solar PV Project at Unchahar had already been registered with UNFCCC CDM Executive Board with estimated annual Certified Emission Reductions (CERs) potential of approx. 1,57,000. Another three Solar PV projects i.e. 15 MW Singrauli (UP), 10 MW Talcher (Odisha) and 10 MW Ramagundam (Telangana) are in advanced stage of registration.

6. Renewable Energy

NTPC has submitted its Green Commitment to Government of India in February, 2015 for developing 10,000 MW of Renewable Energy Projects during 2014-19. In addition to this, NTPC has been designated as the Nodal Agency forimplementing of a scheme for

setting up of 15,000 MW of Grid connected Solar PV power plants under National SolarMission in five years from 2014-15 to 2018-19.NTPC has already developed 870 MW(as on December 31, 2017) of solar PV projects. Details are as below:

Sl. No.	Solar PV Project	State/ UT	Capacity (MW)
1.	Dadri	Uttar Pradesh	5
2.	Ramagundam	Telangana	10
3.	Talcher-Kaniha	Odisha	10
4.	Unchahar	Uttar Pradesh	10
5.	Faridabad	Harayana	5
6.	Singrauli	Uttar Pradesh	15
7.	Ananthapuramu	Andhra Pradesh	250
8.	Rajgarh	Madhya Pradesh	50
9.	Port Blair	Andaman & Nicobar	5
10.	Bhadla	Rajasthan	260
11.	Mandsaur	Madhya Pradesh	250

The solar project at Rajgarh is the first largest solar PV project in India which was built with domestically manufactured solar PV modules. NTPC has also ventured into wind power and installed 50 MW wind power in Gujarat till December 31, 2017.

NTPC has plans to develop solar PV projects at various projects of NTPC on spare land available at these projects. Further NTPC has planned to harness solar energy on the roof tops of potential buildings on its various upcoming thermal power projects.

PAT : Perform, Achieve & Trade

PAT (Perform, Achieve and Trade) is one of the schemes of National Mission on Enhanced Energy Efficiency (NMEEE). It is a market based mechanism to enhance cost effectiveness of improvements in energy efficiency, in energy intensive large industries and facilities, through certification of energy savings that could be traded. BEE (Bureau of Energy Efficiency) is the nodal agency for implementation of PAT.

PAT is a multi-cycle program. The first cycle of PAT which started in April, 2012, had completed in March, 2015. 144 thermal and gas power plants, including 22 NTPC coal & gas Power stations, were designated consumers. It was mandatory for designated consumers to implement PAT efficiency improvement programme.

A specific energy saving target was mandated on the basis of baseline period performance. PAT targets of Net Heat Rate (NHR) improvement for the NTPC stations was from 9 to 66 kcal/kWh for coal stations, and 3 to 27 kcal/kWh for gas stations.

NTPC has exceeded the targets and earned net 170635 ESCerts. One ESCerts is equivalent to one ton of oil energy saving and cost. Trading of ESCerts has been done in FY 18.

Second PAT cycle has started form April'16 and it will be completed in March'19. All DC has been given the target for PAT Cycle-II. Total energy saving of 8.87 million tons of oil equivalent expected from PAT II cycle, and NTPC is geared up in to over-achieve in this cycle too.

Precautionary Approach:

NTPC has an Environment Management Group (EMG) at Corporate as well as stations, for managing compliances as a part of precautionary approach to prevent any non-compliance. The core processes of Environment Management Groups are monitoring & meeting the Environmental statutory requirement like compliances of Enviromental clearance conditions stipulated, renewal of consents, complying consent conditions, pollution control and environmental monitoring, ensure the compliances of rules & acts applicable under Environment Protection Act 1986. Threat perceptions are reviewed through risk management mechanism, comprising of concerned directors of the Company.

Water

Various water conservation measures have been taken up by the Company to reduce water consumption in power generation by using 3Rs (Reduce, Recycle & Reuse) as guiding principle. Fresh water is being drawn by NTPC stations from various water bodies such as rivers, reservoirs, canal etc. Water is withdrawn as per contractual agreements with state authorities. NTPC takes care not to withdraw water from water bodies which are recognized as environmentally sensitive due to their relative size and location, to protect the endangered species.

The water consumption is being monitored by online water metering systems by our stations which are also being monitored by SPCB (State Pollution Control Board) and State water resource department. Some of the water conservation initiatives being undertaken by NTPC are:

- Recycling of water by increasing CoC (Cycle of concentration) up to 5 or more
- Adopting Rain Water Harvesting for water conservation wherever possible
- Coal Settlement Pit (CHP)
- Air-Cooled-Condenser (ACC) instead of Water-Cooled-Condenser (WCC) in two of its upcoming projects. ACC has the potential to reduce water consumption to 25% of conventional WCC based thermal power plant .
- Use of treated STP water from nearby municipal corporation where available
- The Company has taken a proactive approach of making all its power stations to operate with ZLD (Zero liquid discharge) progressively in phases. ZLD is in advance stages in all stations. It entails following major systems:

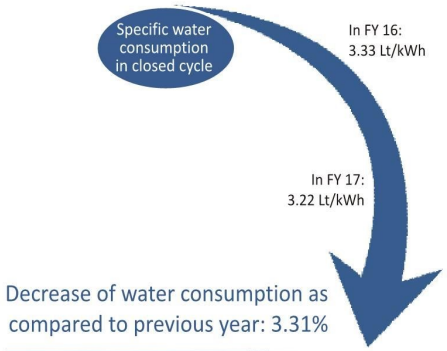
i Ash Water Recirculation System (AWRS): Recycling Systems for Ash Pond Effluent called Ash Water Recirculation System (AWRS) for ash slurry make up etc. NTPC stations have installed AWRS for optimization of water consumption in a closed cycle and achieving the zero liquid discharge from ash ponds. The effluent from ash pond is recirculated back to the plant for further ash slurry makeup and again sluicing to the ash pond. At some old NTPC stations such as Singrauli, Tanda and Talcher thermal plants, where AWRS was not provided with the initial time with the main plant, but the same has been installed now to reduce water consumption as well as effluent discharge.

ii Liquid waste treatment plant (LWTP) : The effluent generated from various sources in the plant such as Coal Handling Plant, main plant area etc, are collected to central monitoring basin of LWTP. The collected effluent is then analysed as quality within the prescribed norms.

iii Sewage Treatment Plant (STP): Sewage Treatment Plants have been provided for treatment and reuse of sewage effluent from plants as well as townships. The effluent quality is being monitored regularly and treated effluent is used further in horticulture purposes in the NTPC premises.

iv Drain separation: to seperate processed water from rain water.

It can be observed that total water withdrawal is decreasing during the last five years because of adopting the zero discharge and water conservation technologies such as rain water harvesting etc. None of the water sources are significantly affected due to water withdrawn by NTPC stations.



Decrease of water consumption as compared to previous year: 3.31%

Biodiversity

NTPC is committed to conduct its operations in a way that promotes the maintenance of regional biodiversity and the habitat upon which it depends, through a coordinated and comprehensive program of avoidance, minimization and mitigation of its impacts.

Biodiversity conservation helps for the survival of many species and habitats which are endangered due to human activities in and around the NTPC power stations. Bio-diversity conservations are also secure valuable natural resources for future generations requirements. During any developmental activity it should be in a Sustainable manner which requires balance between economic, social and environmental concerns.

NTPC is rightly moving in the direction of biodiversity conservation. The Company has the site selection procedure before finalisation of project location and before starting the project construction activity so as to avoid the protected areas, or the areas of high biodiversity outside the protected areas.

As a result, NTPC do not have any impact on IUCN Red List Species and National Conservation List Species and their habitats. NTPC is recycling the treated effluents for reuse back to the plant by NTPC Power stations and not discharging the effluent in any protected water body. Further it is also pertinent to mentioned that NTPC is bound to comply the Biodiversity Conservation Act notified by Govt. of India.

Three projects were declared near wildlife sanctuaries within 10 km after the project was accorded environmental clearance or constructed as per MoEF notification

Kahalgaon Station: The stretch of river Ganga, adjacent to the project, was declared a sanctuary by the State Govt. after the project was accorded environmental clearance by the Ministry of Environment and Forests, and the construction of the project was nearing completion.

Badarpur Thermal Power Project: Okhla Bird Sanctuary and Asola Bhatti Wildlife Sanctuary were declared as sanctuaries by the State Govts. (Uttar Pradesh and Delhi Govts., respectively) after almost a decade of commissioning of the project.

Feroz Gandhi Unchahar Thermal Power Station: Samaspur Bird Sanctuary was established by the State Govt. in 1987 much after the project construction was started by the UP State Electricity Board in 1981. NTPC took over the project in 1992.

NTPC Measures to minimize impacts on bio-diversity

Minimizing the land requirement for power plants during the site selection as the alternate location.	Compliance with the siting criteria for thermal power plants published by MOEF at the time of site selection	Locating the power plants away from protected areas/natural habitats (like national parks and wildlife sanctuaries) or non-protected areas rich in bio-diversity	Avoiding acquisition of forest land for the project, as far as possible	Detailed environmental impact assessment study before construction of a project and post commissioning EIA study	Implementation of environmental management plant during construction as well as in operation phases as suggested in EIA study	Site specific ecological assessment studies, as and when required	Ecological improvements and habitat enhancement through massive tree planation & afforestation activities and creation of water bodies for development of natural habitats

Emissions

NTPC, as a responsible global citizen, has taken various steps i.e readjustment of NTPC's fuel/power generation mix by adopting more & more renewable, introduction of clean coal technologies etc. in line withvarious GoI missions under National Action Plan on Climate Change (NAPCC).NTPC low carbon initiatives may be categorized into following broad categories:

(i) Re-adjustment of NTPC's fuel/ power generation mix

In order to reduce its carbon footprint, NTPC plans to gradually reduce its dependence on the fossil fuels by readjusting its fuel/power generation mix. We intend to include non-fossil fuel based power generation in our portfolio by setting up power plants based on hydro and renewable sources (solar, wind) of energy. Such generation does not have any CO_2 emissions.

(ii) Introduction of Thermodynamically Efficient Technologies

NTPC has constantly improved the steam cycle parameters of its generating units with consequent improvements in the plant efficiencies and reduction in CO_2 emissions. Heat rates (which are a direct indicator of efficiency at which power is generated) of NTPC power plants have evolved and have shown an impressive improvement since inception of its first unit in 1978, resulting in commensurate reduction in CO_2 emission per unit of power generated.

(iii) Renovation & Modernization of old power stations

NTPC has taken up extensive renovation and modernization of its old power generating units to maintain/ upgrade their efficiencies. Schemes are also implemented to reduce plant emissions and hence improve their environmental performance to aid sustainable development.

(iv) Establishment of Research & Development Wings NETRA for addressing climate change concerns

NTPC has established NTPC Energy Technologies Research Alliance (NETRA) which basically focuses on clean technologies, main attention being on climate change concerns. The Company has earmarked 1% of NTPC's distributable profits for this venture. Its R&D wing, NETRA, is engaged in various research and technology development programs with a view to address the climate change issues and mitigate CO_2 emission.

Some significant steps undertaken for reduction in GHG and pollutant emissions are described below:

i) Pilot project for Biomass co-firing

The Company is planning to install biomass cofiring facility as a pilot project at its Dadri station to partially substitute the coal by carbon neutral crop residues obtained from agricultural fields in form of pellets/briquettes. This is intended to cut down carbon emissions and also to discourage crop residue burning by farmers after harvesting by adding economic value to the crop residue and providing extra income to farmers and employment in rural sector.

ii) Hybrid solar thermal plant

The Company has awarded a project for Solar Thermal Integration with the existing coal based unit at Dadri during the financial year 2016-17. The project is under construction and is expected to be commissioned this year. The expected peak electrical output contribution from the plant would be about 3.6 MW.

This shall result in coal savings of around 3,825 Tonnes/year and in CO_2 emissions reduction of around 4,060 Tonnes/year.

iii) Development of Advanced Ultra Super Critical technology

The Company has entered into an MoU with BHEL and Indira Gandhi Centre for Atomic Research (IGCAR) for indigenous development of advanced ultra super critical technology. This will have enhanced efficiency of around 46% and about 18% less CO_2 emission per unit of power generation as compared to 500 MW sub-critical thermal power units. The program is targeted to deliver a plant having 800 MW unit with steam parameters of 310 kg/sq cm, 710°C/720°C. Phase-I (R&D phase-I) of the project is already approved by Government of India.

After development of Adv-USC technology, Mission proposes to establish an 800MWe Adv-USC Demo plant based on indigenous technology. If successful, this will prove to be a major national achievement in the direction of self-reliancein getting an efficient, cleaner and affordable power generation technology.

iv) Environment Protection

The Company has installed Ambient Air Quality Monitoring Systems (AAQMS) employing NOx, SOx, CO, SPM & RSPM analysers in 20 operating stations in 2009-10 and data is being made available to CPCB. Similarly, Continuous Emission Monitoring System (CEMS) have been installed recently in various operating stations.

The Company has already tendered (Under Lot- 1A) on 30.06.2017 for installation of Flue Gas De- Sulphurisation System Package for 11 Projects of total 17,440 MW capacity in order to meet SO_2 emission limits as per New Environmental Norms. The company has also initiated installation of Waste to Energy (WtE) System Package for 400 tpd capacity to be located at Badarpur, New Delhi

v) Automation of environment measurement system

All the power stations are equipped with continuous ambient air quality monitoring stations (AAQMS) to capture the real time data of PM 10, PM 2.5, SO_2, NOx and access thereof viz., and access has been provided to the Regulators such as Central Pollution Control Board and State Pollution Control Boards. Additional ozone analyzers for ambient air are also being provided phase-wise at the existing stations. Continuous Emission Monitoring Systems (CEMS) to monitor emissions of

SO_2 and NOx in all units on real time basis 24x7 are installed and commissioned in addition to the opacity meter installed for monitoring of particulate emission. Installation of real time monitors for pollutants in effluents (EQMS) is also completed for all its existing projects. The real-time data is being transmitted to regulators through the cloud server and alerts are being generated in case of excursions beyond the limits. For all the upcoming projects, real time monitors for ambient air, effluents and emissions are included in the engineering packages during design stage itself.

The Company has recently introduced analysers for Mercury monitoring for both AAQMS and CEMS.

The Company is working to install additional air and water pollution control systems at various projects to comply with the applicable new environmental norms notified by MOEF & CC vide gazette notification dated December 7, 2015.

vi) Revised Emission Norms

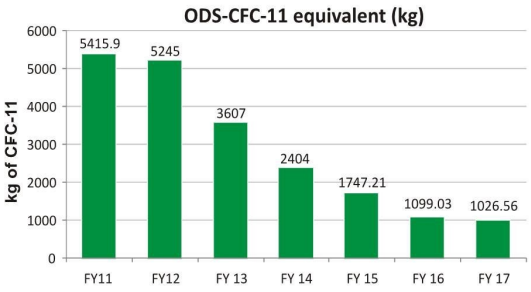
Fugitive emission from ash pond is controlled by maintaining water cover, plantation on abandoned ash ponds, water spray and earth cover in inactive lagoons. Providing dust suppression and extraction system in CHP area has further added to reduction in fugitive dust in the vicinity of power stations.

MOEF & CC vide notification dated December 7, 2015, has stipulated the emission limits for Oxides of Nitrogen (NOx), Sulphur dioxide (SO_2) and Mercury also and made stringent norms for particulate matter. The emission limits of these elements depend on the unit size and age of the units and shall be complied by 7th December, 2017 for all operating units. Various issues due to implementation of revised norms, including relaxation in time period for implementation, has been taken up with MOEF & CC. The Company is designing its new plants to comply with new norms. Parallely various actions are being taken up for operating units and under construction units for meeting revised norms. The Company has already undertaken extensive R&M of ESPs for complying emission limit of particulate matter. High efficiency Electro-static Precipitators (ESPs) with efficiency of the order of upto 99.97%, with advanced control systems have been provided in all coal based stations to keep Particulate Matter (PM) below the prevailing permissible limits. All upcoming new plants are being provided with ESPs designed in such a manner that would cater to the notified future stringent norms. Performance enhancement of ESPs operating over the years is being carried out by augmentation of ESPs fields, retrofitting of advanced ESP controllers, new technology i.e. MEEP (Moving Electrode Electrostatic Precipitators) and adoption of sound O&M practices. Flue Gas Conditioning systems have also been provided at our old units which are helping in reduction of SPM emissions below statutory limits even during coal quality variations. For meeting SO_2 emission limit, First set of tenders for installation of Flue Gas De-sulphurisation (FGD) has been issued for 54 units of around 33GW.

For control of SOx, first FGD has been commissioned at Vindhyachal. Erection of FGD at Bongaigaon is in advance stage. NOx control in coal fired plants is presently achieved by controlling its production by adopting best combustion practices (primarily through excess air and combustion temperatures controls). Over and above this, since tall stacks are provided in coal stations, gases emitted through stacks is widely dispersed and diluted. In gas based stations, NOx control systems (hybrid burners or wet DeNOx) have been provided for good combustion practices.For compliance of new norms, pilot study based on SCR/SNCR technology are being undertaken at 11 locations to find out the optimal solution and suitable technology for DENOx system. Selective catalytic reduction (SCR) will be required for controlling of NOx for which Pilot test studies are being undertaken at various NTPC operating stations to check the suitability of SCR technology for high ash and abrasive ash. Once the technology for DeNOx is established, which is expected by Mid-2018, tendering for implementation for NOx control with SCR will be taken up.

vii) Ozone Depleting Substances (ODS)

NTPC is in the process of phasing out the ozone-depleting substances (ODS) by reducing consumption of its use. There is a continuous decreasing trend in ODS consumption since FY 11 as shown in the graph. Reduction in ODS substances is achieved by replacing ODS substances with less ODS potential substitutes like R-22, R-134A and R-410A

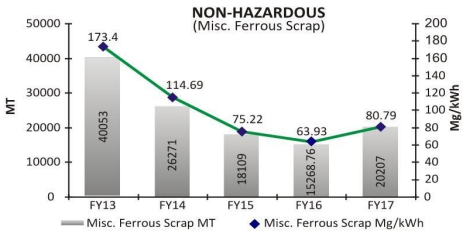


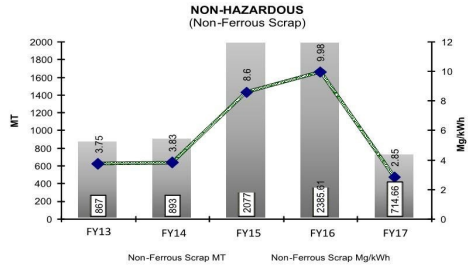
Waste Management

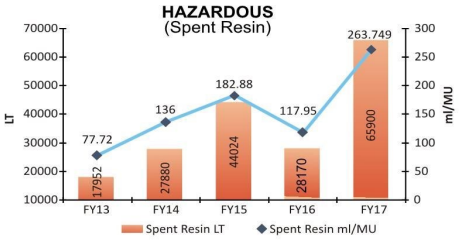
Being a coal-based thermal power company, the primary waste generated at NTPC is ash. Other waste generated during operation and maintenance of the plant includes lubricating oil, transformer oil, metal and non-metal scraps etc. In addition, domestic waste is generated in township and bio-medical waste is generated in NTPC hospitals.

The Company has adopted integrated approach to proper handling and disposal of all types of wastes in a scientific manner as detailed in table below:

S.No.	Type of Waste	Disposal Methods
1	Lube Oil, Transfer oil, used Batteries	Sold to registered recyclers ormanufacturing under buy back policy.
2	Ferrous & Nonferrous Scrap	Disposed off through E-Auction
3	Hazardous Waste	• Non-Recyclable waste sent to Treatment ,storage & disposal Facility (TSDF) for proper treatment & Disposal as per the HWM Rules 2016.
4	Domestic Waste	• Domestic waste generated is separated in to bio degradable and non biodegradable category. • Bio-degradable waste is converted into manure through composting /vermi composting / Bio gas/Bio-methanation process. • Bio-methanation plants are operational at NTPC stations. • Non-Biodegradable waste is being disposed off at identified places.
5	Bio-Medical waste	Disposed through authorised agencies approved by SPCB
6	E-Waste	Dispose off through registered& approved recyclers of CPCB or respective SPCB.
7	Fly and Bottom Ash	• Ash issued to user industries from ash storage silo in closed container. • Fly ash issued to user industries, cement industries, ready mix concrete plants, brick, block manufacturers, tile manufacturers, etc. • Ash used in back filling of coal mines as per the guidelines of mine closure plan. • Manufacturing of ash bricks.





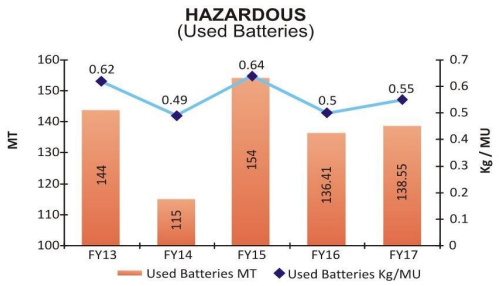


NTPC is not importing and exporting the hazardous waste which comes under Basel Convention-2Annex I, II, III, and VIII.

PCB has already phased out by NTPC and not consuming in plant operations.

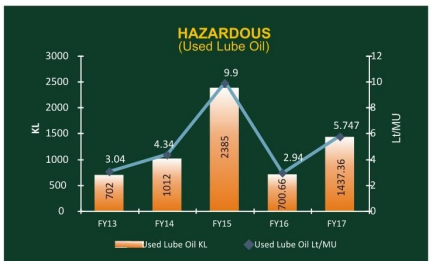
commissioned a solid waste management plant at Karsara in Varanasi. Varanasi now ranks 32nd in Swachh Survekshan Survey by GoI - a jump of 33 positions over previous year.

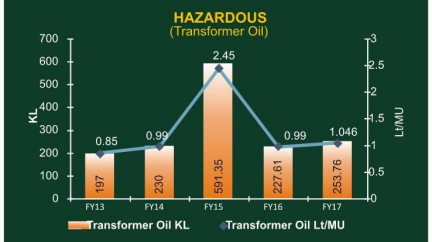
No radioactive waste generated at NTPC stations.

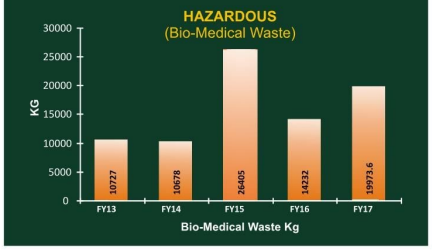


In pursuit to implement relevant assertion of NTPC Environment Policy 2017, this waste management guideline has been made that meets all legislative and regulatory requirements, based on rules notified by the Ministry of Environment, Forest & Climate Change (MOEF&CC), Govt. of India. Applicable list of rules pertaining to NTPC are:

1. Hazardous and other Wastes (M & TBM[1]) Rules, 2016
2. e-waste (Management) Rules, 2016
3. Bio-Medical Waste Management Rules, 2016
4. Solid Waste Management Rules, 2016
5. Batteries (Management and Handling) Rules, 2001.
6. Construction and Demolition Waste Management Rules, 2016





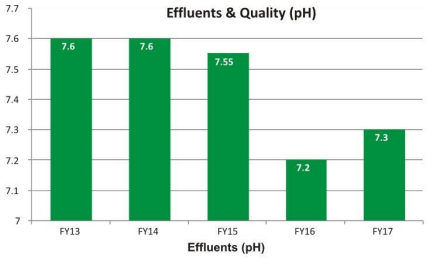


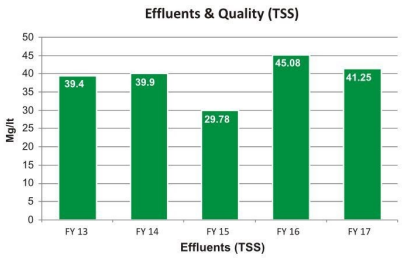
Total waste discharge by quality and destination

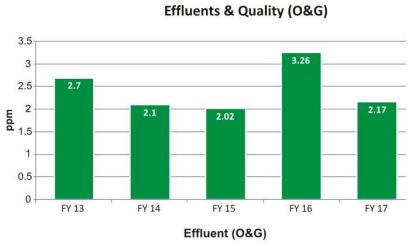
Most of the stations are designed in the closed cycle system. Regarding plant effluent NTPC has taken proactive approach of making all its power stations to operate with Zero Liquid Discharge (ZLD) progressively in phases

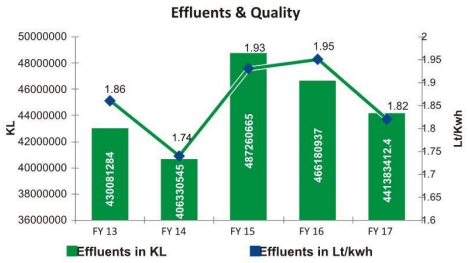
The total quantity and quality of effluent discharge in reporting period have been provided in graph.

During FY 17, no oil spillage has been reported by any NTPC stations.

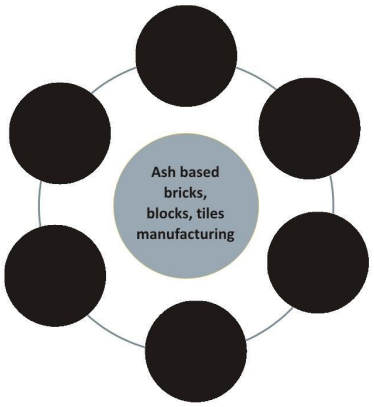








Ash Management



In India, coal as a fuel is currently the main source for power generation and shall remain the dominant source for foreseeable future . The prime concern for coal based power plants is the quality of Indian coal, which has higher ash content (30-45%), resulting in generation of huge amount of ash. Disposal of this ash in ash dykes requires vast areas while the availability of spaces is becoming a progressive challenge at many NTPC stations. Sustainable ash utilization is one of the key concerns of NTPC and the Company strives to maximize it.

NTPC has introduced Ash Policy in 2015, which addresses the plans & vision for ash utilization in an integrated way from generation to end product. This policy aims at maximizing utilization of ash for productive usage along with fulfilling social and environmental obligations, as a green initiative in protecting the nature and giving a better environment to future generations.

Utilization in FY 17

58.46 million tonnes of ash was generated and 50.58% i.e. 29.57 million tonnes of ash had been gainfully utilized in various areas such as issue to industries for cement, concrete, asbestos products, bricks/ blocks making, road embankment construction, ash dyke raising, mine filling, land development works etc.

Six NTPC stations (Badarpur, Dadri, Unchahar, Tanda, Talcher-Thermal, and Mauda) have achieved more than 100% ash utilization. This signifies that ash had to be drained from ash mound /dykes for gainful utilization. Two stations (Simhadri and Ramagundam) have achieved ash utilization >80% .

In order to increase dry fly ash availability at stations for issue to industries, Dry Fly Ash Evacuation System (DAES) capacity at existing stations is being augmented. Further, 100% DAES is being installed at new stations and rail loading facilities are being developed for bulk transportation of fly ash to user industries. Rail loading facility at Ramagundam, Rihand & Kahalgaon has already been created and being developed at Vindhyachal, Sipat, Mouda & Simhadri. It is also planned at all new stations. Dry fly ash is being transported in bags through railway wagon to North-East States from Kahalgaon and through closed railway wagon to Raichur-Gulburga region of Karnataka from Ramagundam. Further, a Trial for loading, Transportation and Unloading of fly ash in BTAP wagons from NTPC Rihandto cement plant located in Satna Region has also been successfully carried out. This will help transportation of fly ash to cement plant located beyond 300 km on cost competitive rates.

New Initiatives

1. Making pond ash available to NHAI/ MoRTH/ Government road projects in line with provisions of MoEF&CC gazette Notification dated January 25, 2016
2. Low lying area development outside of NTPC
3. Use of bottom ash stowing for underground mine of SCCL at Ramagundam and SECL at Korba
4. **Research projects on**
   - (a) Geo-polymer concrete blocks/ pavement using fly ash in association with Advanced Materials and Processes Research Institute (AMPRI), Bhopal & Structural Engineering Research Centre (SERC), Chennai
   - (b) Use of bottom ash in place of sand in cement concrete in association with National Council for Cement and Building Material, Ballabhgarh
   - (c) Manufacture of artificial sand from fly ash using geo-polymer technique through VNIT, Nagpur
   - (d) Use of fly ash in agriculture for sustainable crop production and environment protection through Indian Institute of Soil Science, Bhopal
   - (e) 100 m ash road in Dadri
5. Setting up pilot cum demonstration plant for manufacturing of Light weight Aggregates from Ash at Sipat
6. Studies for ash filling in mines at
   - (a) Gorbi mine of NCL for ash filling from Vindhyachal
   - (b) Manikpur Mine & Bisraram mines of SECL from Korba
   - (c) Medapalli OCP of SCCL from Telangana.
7. Reclamation of stone quarries using ash
8. NTPC is in process for procurement of BTAP wagons for bulk transportation of ash through rail to far distant users.

About 7.15 crore fly ash bricks produced by fly ash brick plants of your Company's stations, which are being utilised in plant and township construction works.

Ash brick manufacturing unit at NTPC plant

NTPC uses only ash based bricks and Fly Ash Portland Pozzolana Cement (FAPPC) in most of its construction activities in all expansion projects as well as in green field projects. Ash brick manufacturing plants have been set up at all NTPC stations. More than 900 million ash bricks have been manufactured by these plants for use in construction activities.

Activities related to creation of awareness seminar/ conference on utilization of fly ash involving regulatory authorities, constriction industry, NHAI, cement industry etc are being conducted on regular basis.

Ash dykes, at NTPC stations, are designed to ensure that all environmental concerns are addressed. Salient features for effective handling and disposal of ash are as follows:

Multi-lagoon ash ponds with provision of overflow lagoons.

Ash slurry pipe lines garlanding arrangement for change-over of ash slurry feed points.

Water sprinklers for spraying water in dried up portion of lagoons for control of fugitive dust.

Monthly ash dyke inspection by cross-functional committee at each station for proper monitoring of dyke health.

Proper raising plan for dyke, as per requirement, prepared in advance for individual stations keeping in mind the expected ash generation and its utilization potential.

Adoption of High Concentartion Slurry Disposal (HCSD) technology for safe disposal & storage of fly ash at new/ upcoming power plants (such as Mouda, Jhajjar, Kudgi, Lara, Khargone) as it helps to save water & land requirement.

Environmental Compliance

No significant fines and non-monetory sanctions imposed upon NTPC by any regulatory agencies/authorities on environmental issues during FY2016-17

NTPC is legally bound by the environmental laws and regulations formulated by statutory agencies. Hence the Company continuously strives to achieve 100% compliance, with least cost and technically feasible engineering solutions, to ensure compliances in a time bound manner.

Before commissioning of any project NTPC conducts EIA studies; wherein, an environmental management plan is prepared for mitigation measures of the possible impacts; and management transparently monitors environmental issue during construction as well as operation stage of any station. NTPC sincerely follows 100% regulatory guidelines to provide environmental friendly power.

Other environmental aspects

Product and Services

The scope of NTPC is to generate power and to make it available up to its own switch-yard. From switch-yard, the electricity is transmitted for distribution through overhead transmission lines which are out of scope of NTPC. Therefore, environmental impacts of electrical power beyond NTPC switch-yards are not in the purview of NTPC.

No packaging material is used in electricity transmission. Impacts of electricity transmission beyond NTPC switch-yards are also not in purview of NTPC.

Supplier Environmental Assessment

NTPC is very sincere to take care of environmental issues and do not have any significant environmental actual impacts in the supply chain process. However, NTPC follows the procedure of environmental guidelines during the raw material transportation & consumption through the supply & chain.

Major suppliers of NTPC are BHEL, Coal India and other multinational OEM suppliers & they are bound to comply with environmental norms as per the regulatory guidelines. Same is also being monitored by NTPC stations during the supply chain process. All existing as well as new suppliers are compulsorily bound to meet the environmental norms of regulatory agencies.

During the years 2016-17, no major grievances on environmental issue was raised. The localised issues were addressed and resolved.

Environmental expenditure

Environment protection expenditure (Water Cess, Consent fees, Environmental studies etc.) for the reporting period is approx. ₹623 Crores. This does not includes the O&M expenditure pertaining to operational & maintenance of pollution control devices like ESP, ETP, STP, Ash Handing Systems, DE/BS, CSSP, waste segregation and disposal, etc.

Sustainable Development Projects

NTPC has adopted the 'triple bottom-line'approach recognizing People, Planet and Profit asthe primary pillars of corporate sustainability andbelieves that Development should not endangerthe natural systems.

Expenditure of ₹35.33 Crore was incurred on SD projects during FY17.

Sustainable Development Projects for FY 17:

Afforestation	Waste Management	Water Management	Biodiversity	Renewable Energy
• Plantation of 10 million trees with state forest deptt. • 4.5 Lacs trees nearby NTPC stations **Approx. 20,000 MT/year CO_2 absorption in future**	• Sewage treatment plant at Amarkantak, MP	• Studies on impact assessment and carrying capacity river basin in Arunachal Pradesh	• Conservation of Olive Ridley sea Turtles at Simhadri • Study on bio-productivity of Gangetic Dolphin at NTPC Kahalgaon	• Installation of 310 kw rooftop of Solar PV at NTPC Dadri on public utilities buildings

Focus areas of Sustainable Development Plan for FY 18:

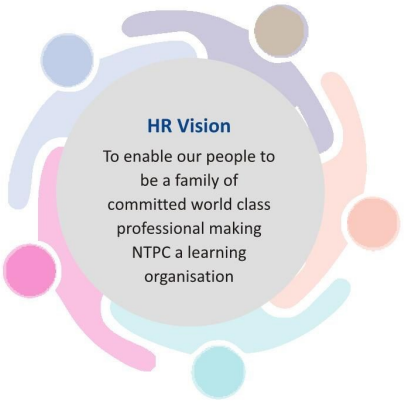
Afforestation	• Tree plantation around 4 lacs
Waste Management	• Horticulture/Bio Mass waste conversion in wooden Pallet at JhanorGandhar • Installation of 2 nos of organic waste to compost converting machines at Kudgi • Vermi composting at Barh • Solid resource management of vindhyachal and Singrauli township • In vessel Composting system for main plant canteen waste at Tanda • Paper Recycling machine at Tanda
Water Management	• Roof Top Rain Water Harvesting at Anta, Jhanor Gandhar and Kayamkulam • Treated Water (STP) recirculation system at Dadri
Biodiversity	• Conservation of Olive Ridley at Simhadri
Energy Conservation Renewable Energy	• Installation of approx. 1200 kWp roof top solar PV System at different locations of NTPC • LED Street lighting at Jhanor Gandhar and Singrauli • Solar powered multi utility vehicle for sweeping and cleaning the road(2x9) at Mauda • High capacity solar pump of 5 HP for remote locations at Mauda • Solar Cooking System for Divya Jyothi Institiute for hearing, blind , mentally retarded disabled children's hostel at Korba • Installation of 50 nos. of solar water heater on rooftop for community buildings at Tapovan Vishnugad • Installation of 5 nos. solar trees of 3KW each at Dadri • Solar street lights (200 nos.) in CM's adopted village Chinnamul kanoor at Ramagundam

Social Performance

Human Rights, Labour Practices, Product Responsibility, Society

Human Rights

NTPC respects human rights and makes conscious effort to safeguard it. The Company privately and publicly condemn any instance of systematic and continuous human rights violation anywhere in the world. Constant consultation within and outside the company with relevant stakeholders including contractors, is done as a part of human rights due diligence process. To help our employees understand and inculcate the importance of human rights, the Company also conducts training sessions on the same. Training for human rights accounted for 77,574 Man Hours and 46.18 % of employees during FY17. As far as issue of Human Rights for external stakeholders is concerned specially with respect to Project Affected Families (PAF), adequate transparency is maintained with a focused approach on consultation and participation. Special provisions for vulnerable communities also find a mention in the relevant policies. In addition to individual benefits, a comprehensive community development has been undertaken. Institutional mechanisms are also in place for Grievance redressal. Human rights are adequately addressed and possibility of any violation is minimal. All significant investment agreements and contracts have included in human rights clauses.



Young Engineers at NTPC

Freedom of association and effective recognition of the right to collective bargaining

NTPC is one of the most preferred employers in the country and its employees enjoy complete freedom of association. The practices regarding the collective bargaining rights of workmen, are in synchronization with the provisions of Trade Union Act, 1926 & Trade Union (Amendment) Act, 2001, the governing statute on the issue.

The workforce in the unionised category are empowered to form bodies to organise and discuss their issues and concerns, to organize, which is creation of a statute. The executives have formed associations at the projects and stations. Regular interactions are held with employees/representative bodies at Project, Regional and Apex level. Formal mechanisms are in place so as to hold bipartite meetings, which inter alia is aimed at getting employee inputs on conditions of employment.

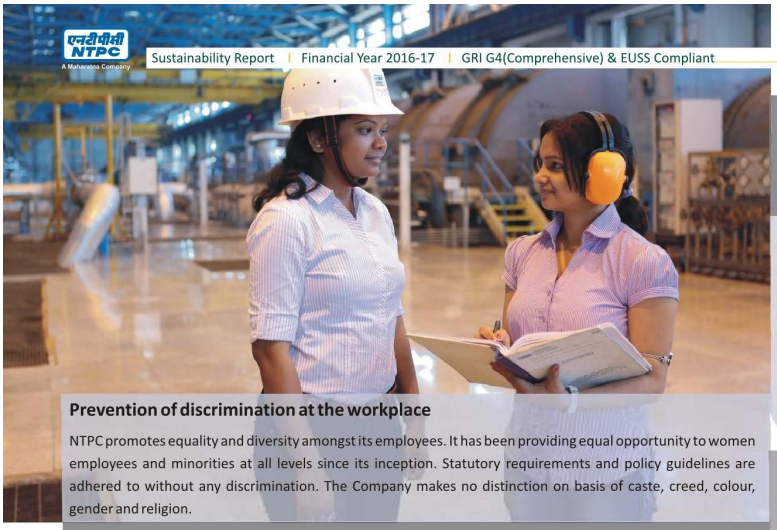
Prohibiting child labour and preventing forced and compulsory labour

NTPC is sensitive and conscious of the demeaning effect of child labour and it ensures the prohibition of the same in its plants and offices. Company service rules stipulate that minimum age for employment is 18 years. The bidding/contract documents etc. also explicitly prohibit engagement of child labour. Further, NTPC's plants being high security installations, the entry is regulated through issue of security gate-pass for workers. Thorough preventive check is done at the time of issuing gate passes to ensure that no contracting agency deploys child labour in NTPC's premises.

NTPC enforces freedom of every kind enshrined in the Constitution of India including zero tolerance for forced or compulsory labour. The manpower working in NTPC enjoys complete freedom to join and leave the organization as per its own volition. The Company not only adheres to international conventions and statutory provisions on employment, but also constantly upgrades its practices on employee engagement, as per emerging scenarios and prevalent best practices. It is pertinent to mention here that a number of NTPC plants/stations are SA 8000 compliant/ certified and as a result, audit/ compliance of various issues like freedom of association and collective bargaining, forced labour, child labour and human rights aspects are well taken care of and documented during the SA 8000 certification/ audit. The company ensures compliance to Factories Act, 1948 and labour Laws at all its operations through periodic reviews.

No complaint on human rights, such as child labour, forced labour, involuntary labour, sexual harassment, discrimination, rights of the disabled etc. was pending as on 31.03.2017. Nevertheless, number of forums are available to all stakeholders to address any violation of rights, including human rights.

None of its operations were found to have risk of child, forced or compulsory labour during the reporting period.



Prevention of discrimination at the workplace

NTPC promotes equality and diversity amongst its employees. It has been providing equal opportunity to women employees and minorities at all levels since its inception. Statutory requirements and policy guidelines are adhered to without any discrimination. The Company makes no distinction on basis of caste, creed, colour, gender and religion.

There was no incident of discrimination in the reporting period.

Suppliers' Human Rights, Labour Practices Assessment

In all contracts/agreements/dealings that NTPC undertakes with its suppliers, the provisions are incorporated in such a way so that there is no scope or possibilities of human rights violation. Hence only those suppliers who agree to the revered principles of human right protection are awarded contracts.Also, the suppliers of NTPC in general are big corporates with evidently no history of human rights violation.

NTPC complies the UNGC principle with Human Resource commitment in their operations at power plants. NTPC has formulated policy and systems to ensure protection of human resource of all operations. The policy covers issues of child labour, force and compulsory labour, non-discrimination, bribery and corruption. NTPC has made the business code of conduct available to all employees, contractors, suppliers etc. available at its sites and corporate office. All the suppliers and contractors are subject to human right practices on regular basis.

During the reporting period, NTPC has not identified any human rights negative impacts in the supply chain.

Indigenous Rights

NTPC projects have till now been located in such areas where no Indigenous people exist. Hence, the issue of Indigenous rights is not applicable to NTPC. However, NTPC has various provisions for Scheduled Tribes in its social as well as HR policies and actions are taken accordingly.

Security Practices

NTPC has a foolproof security system in tune with the Government policy. All the power projects of NTPC fall under the critical infrastructure category. A Govt. of India security force CISF is deployed for securing the vital installations in our project sites/power plants. Similarly, ex-servicemen security agencies are deployed in the non-core areas in our sites like project townships etc., duly sponsored by the Directorate General of Resettlement, under Ministry of Defence, as per norms set by the DPE. Though NTPC do not impart any direct training to the referred security personnel as such, it is understood that they are properly trained in security systems by the Govt. including the Human Rights aspects before their formal induction to the service and also during refresher courses.

Grievance Mechanism

Employees grievances and complaints, which are primarily manifestation of their dissatisfaction against their working conditions, managerial decisions etc. if not promptly attended to, may lead to serious situations. For addressing the grievances of employees, NTPC has a time bound Grievance Redressal Mechanism for all employees. The employee grievances are also captured through different forums like participative forums, communication meetings, employee organizational climate survey etc.

objectives of the grievances handling system

- To settle grievances of the employees in the shortest possible time and at the lowest possible level of authority
- To provide for various stages so that the aggrieved employees derive satisfaction of communicating his grievances to the highest level

Labour Practices

Employment

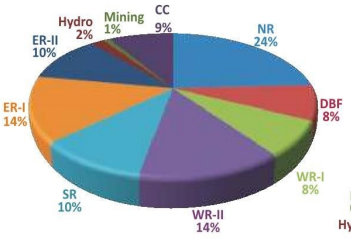
NTPC is proud of its Human Resource that has contributed its best to bring the Company to its present heights. Employees are recognised as the most important stakeholders of the Company and are at the core of its performance and success. The Company has a highly motivated and competent regular workforce of 20,593 employees (excluding joint ventures and subsidiaries) as on March 31, 2017. NTPC does not hire employees on temporary or casual basis.

In NTPC, there is equal opportunity provided to all of them in hiring, remuneration, access to training without any discrimination on the bases of gender, race, nationality, religion or family status etc. Equal wages and other admissible benefits are paid to all employees and there is no gender discrimination. Men and women are treated at par in all respects. However, as per regulation, there are some additional benefits such as maternity leave, are provided to women employees. A special child care of 2 years is provided to women employees. Retention rate after parental leave is 100%. All executives receive performance feedback during mid-year review and final appraisal as performance management system. The non-executives receive feedback in case of unsatisfactory performance. NTPC has a process in place for induction of the executives in the Company on all India basis after due notification through Press advertisements, campus interviews etc. Hiring of non-executives is done at local and regional level with appropriate notifications to the employment exchanges of the expected locations. NTPC does not hire senior management positions from the local community. They are deputed from corporate office for all locations as per requirement. The wage of a lowest level employee in NTPC is same across all locations of the Company which is more than the minimum wage as stipulated by respective state/central government. The remuneration policies for the highest governance body, executives and supervisors are inline with DPE guidelines. The management approach on compensation and benefits is guided by the government guidelines issues from time to time and complies statutory conditions.

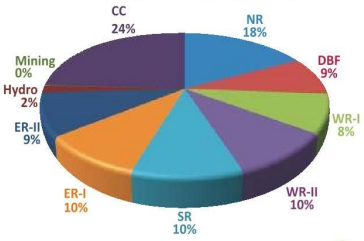
The number of workers employed with contractor varies from time to time due to dynamic nature of work. The average number of contractor's workers in 25 operating stations of NTPC, during 2016-17 was about 51,000. The productivity of employees is demonstrated by increase in generation per employee and consistent reduction of Man-MW ratio year after year. The overall Man-MW ratio for the year 2016-17 excluding JV/subsidiary capacity is 0.51 and 0.47 including capacity of JVs/Subsidiaries. Generation per employee was 12.16MUs during the year based on generation of the Company's stations.

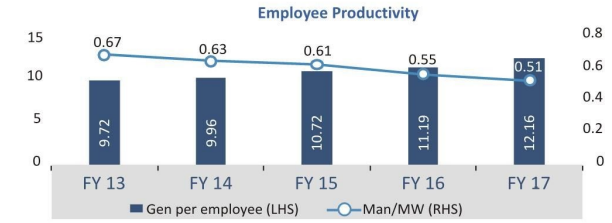
NTPC has a highly talented team of committed professionals and has been able to induct, develop and retain the best talent. The commitment of the employees is also reflected in terms of financial parameters such as sales per employees, PAT per employee, value added per employee etc.

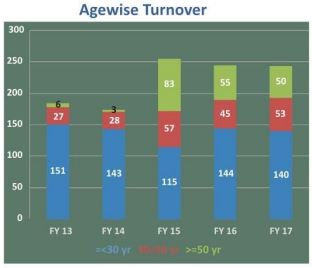
REGIONWISE WORKFORCE - MALE

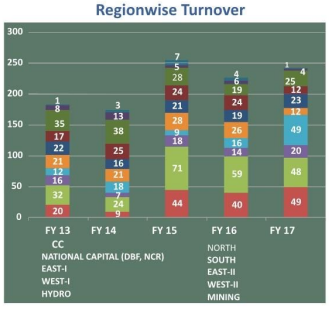


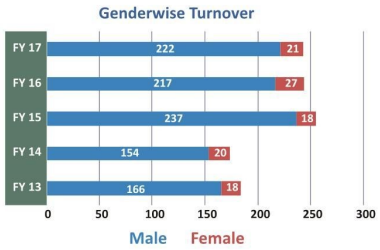
REGIONWISE WORKFORCE - FEMALE











The attrition rate of NTPC Employees (excluding JVs and Subsidiaries) during FY 17 is 1.11%

Percentage of employee due to retire in the next 5 and 10 years

Region	Retirement in next 5 yrs.		Addl. Retirement in next 10 yrs.	
	Executives	Non Executives	Executives	Non Executives
CC	23.14	35.65	18.67	38.8
NR	24.33	39.68	19.78	29.42
NCR	25.09	31.91	17.75	33.85
WR-I	15.57	13.98	15.27	34.94
WR-II	20.54	28.33	16.96	20.54
SR	21.88	29.32	14.59	25.57
ER-I	19.21	23.16	19.82	32.92
ER-II	15.16	29.42	17.06	13.6
Hydro	15.86	7.14	16.83	3.57
Mining	15.29	14.29	15.29	0

Diversity and Equal Opportunity

NTPC has been an equal opportunity employer and upliftment of marginalized section of society has always been a key concern for the Company. Guidelines and instruction issued by DOP and DPE with regard to providing reservation, relaxation, concession and other benefits / facilities to schedule castes, schedule tribes, other backward classes and person with disabilities are followed in letter and sprit. To ensure due compliance with applicable orders and instruction pertaining to the reservation of vacancies in favour of schedule castes, schedule tribes, other backward classes and person with disabilities and other benefits admissible to them. Reservation cell has been setup at Corporate Centre and other locations of NTPC under the direct control of liaison officer. Breakdown of employees for FY 2016-17 indicating diversity of employees in NTPC (including JV and subsidiaries) is as follows:

Year	Total	Male	Female	Minorities	SC	ST	OBC	PWD
FY 15	**24091**	22602	1489	1897	3573	1449	3717	487
FY 16	**23136**	21697	1439	1794	3435	1430	3730	486
FY 17	**22026**	20628	1398	1725	3250	1423	3685	499

Some of the salient employee benefits are given below:

Medical Treatment	Facilities of Higher Studies	Contributory Scheme for Post-Retirement Medical Facilities	Separation / Insurance Benefits	Loans and Advances
• Free medical treatment to self and dependent family members at empaneled hospitals for both in-patient and out-patient treatment. • Regular medical checkups.	• Study Leave. • Incentives for acquiring off-campus additional relevant qualifications. • Long term career oriented education programmes.	• Inpatient and outpatient medical expenses covered, subject to limitations for both, retired employee and spouse.	• Group Personal Accident Insurance • Group Insurance • Leave Encashment • House Building Advance Insurance. • Employee Death Relief Scheme • Gratuity • Provided Fund • Employee Family Economic Rehabilitation • Contributory Pension	• House Building Advance • Multipurpose Advance • Conveyance Advance • Children Education Advance • Household Furnishing Advance • Computer Advance

Occupational Health and Safety

Occupational health and safety at workplace is one of the prime concerns of Company Management and utmost importance is given to provide safe working environment and to inculcate safety awareness among the employees. The company has a 3-tier structure for Occupational Health and Safety management, namely at Stations/Projects, at Regional Head Quarters and at Corporate Centre. Safety issues are discussed in the highest forum of management like Risk Management Committee(RMC), Management Committee Meeting (MCM), ORTs, PRTs etc.

Safety is part of its core values. The Company recognises all accidents are preventable; therefore, safety shall be at the forefront of all our activities. The objective is to provide safe working environment and strive for zero incidents at work. This policy supported by safety rules and procedures are applicable for all business activities carried out by NTPC.

Safety policy is built around following principles:

1. Our activities carry various hazards; however all hazards can be identified.
2. Every job shall be done safely, no matter how important or urgent it is.
3. Putting people to work carries a specific responsibility and accountability for safety which shall be visibly demonstrated.
4. Right procedures and actions can bring the risks under control.
5. Trained and committed team can ensure incident free operations.
6. Compliance to all applicable safety regulations and other legal requirements at the minimum.

Most of the Company's plants have been awarded with prestigious safety awards conferred by various Institutions/ Body like Ministry of Labour & Employment, GoI, National Safety Council, Institute of Directors, Institution of Engineers (India), in recognition of implementing innovative safety procedures and practices.

Management Commitment

Front line focus from Management team:

- Personal contract on Safety.
- Regular Management Site visits to address safety issues, appraise customer.
- Ensure required training to employees on Safety.
- Monitor and encourage other employees to monitor Leading and lagging indicators. (KPI's are defined and monitored for the year)
- Safety Part of agenda during the project reviews.
- Deploy trained safety persons at site.
- Encourage employees to capture deviations.

Effective tools used in improving safety Behaviour

1. Risk Assessment

Evaluate the two criteria:

- The likelihood (frequency and duration of exposure to the hazard, probability that such a hazard will effectively cause harm/ damage),
- The severity (the impact of the harm/damage caused)

2. Tool Box Talk

- An informal group discussion that focuses on a particular safety issue
- Conducted at every site on daily basis to promote our safety culture.
- Intended to facilitate health and safety discussions on the job site.

3. Observation Card

- Observations are a reporting method used to prevent serious accident/injury.
- We capture the positive as well as negative observations. Observations of unsafe activities & behaviors that are reported and recorded for correction and future prevention.
- The observation cards are used to target behaviors unsafe activities and conditions by identifying and reporting them before these behaviors turn into near misses or worse.

4. Safety Observation Visits

- General planned inspection is a tool which is in use at all operational sites.
- Documented weekly (minimum) inspection programme which is led by site management, involves contractors and covers all high-risk activities

5. General Planned inspection

- General planned inspection is a tool which is in use at all operational sites.
- Documented weekly (minimum) inspection programme which is led by site management, involves contractors and covers all high-risk activities

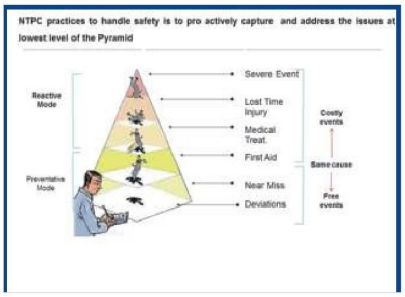
6. Training

New employees shall be given induction training. Specific training requirements exist for certain roles:

- Key site persons are IOSH trained
- The Safety persons are familiarised with Safety systems and procedures before deployment at site.
- All project persons receive Training on ZDP, PoWRA and HRA once in a year.

7. PoWRA

Point of Work Risk Assessment are conducted just before the starting of execution work.



Basically:

- A final check made by the working group before starting work
- Confirmation that all agreed controls are in place
- A means of empowering the workforce to take ownership of their work area
- A route to seek revisions to an approved method of work

Security: The Company recognizes and accepts its responsibility for establishing and maintaining a secured working environment for all its installations, employees and associates. This is being taken care of by deploying CISF at all units of the Company as per norms of Ministry of Home Affairs. Concrete steps are being taken for upgrading surveillance systems at all projects/ stations by installing state-of-the-art security systems.

NTPC believes in "Zero Accident" approach

The steps taken in this direction are:

- Height permit and height check list are implemented to ensure safety of workers while working at height.
- Adequate numbers of qualified safety officers are posted at all units as per statutory rules/provisions to look after safety of men & materials.
- Detailed emergency plans have been developed and responsibilities are assigned to each concerned to handle the emergency situations.
- Safety clauses included in conditions of contract, all strict compliances & enforcement of safety provision by contractors.
- System approach followed by adopting and implementing ISO 14001, ISO 9001-2000 and OHSAS 18001/IS-18001 .
- Installations of state-of-the-art surveillance systems at projects and stations.
- Periodic competitions and compaigns on safety to enhance the safety awareness for employees, contractors' workers and nearby villagers.
- Regular mock drills to check the healthiness of the system and observations are complied with.
- Messages are displayed in the form of posters / hordings at working sites to inculcate safety culture. In house safety films related to different work activities are also screened at such locations.
- 50% of worker's representation in formal joint management committee for safety as per statute.
- Cross functional safety task force is functional at stations and construction projects to monitor working conditions as well as taking remedial actions.
- Regular interations with MHA, IB and CISF as well as the State and District level authorities to augment security preparedness in the power installations.
- Training programmes for contractors' employees are being conducted at all sites on regular basis covering all relevant topics on Occupational Health and Safety.
- To mitigate the onsite emergencies at all operating stations, effective engineering controls are provided to indicate and monitor emergency situations.
- Annual medical health check-ups conducted for the employees above the age of 45 years and once in two years for the employees in the age group of 40-45. These annual check-ups have led to timely diagnosis of deseases and life style changes of many employees. Regular medical examinations are conducted for our workers at work place and monitoring their health conditions.
- Safety training programs and PEP talks are conducted for our workers at site to make them aware about the hazards at work place.

NTPC Safety parameters (employees and contractors)

	FY 17	FY 16	FY 15	FY 14	FY 13
Fatalities	11	14	14	15	10
Frequency Rate (FR)	0.406	0.27	0.30	0.33	0.24
Incident Rate (IR)	1.068	0.65	0.77	0.84	0.62
Injury Rate	0.08	0.05	0.06	0.07	0.05
Total Mandays lost	74,261	79,731	85,911	91,216	61,288

Safety Training

S.No.	Description of training	Nos. of training
01.	Training for expansion projects on safety topics	23
02.	Training for Construction and Erection projects on safety topics	23
03.	Training for Gas Stations on safety topics	14

NTPC Safety parameters by region in FY 17

	NR	DBF	WR	SR	ER	Hydro
Fatalities	5	0	1	0	5	0
Frequency Rate (FR)	0.33	0.31	0.60	0.06	0.42	0
Incident Rate (IR)	0.89	0.78	1.60	0.15	1.12	0
Injury Rate	0.06	0.06	0.12	0.01	0.08	0
Total Mandays cost	30137	53	7027	60	36984	0
Non – Fatalities	9	4	27	1	20	0

Employee – Management Relationship

NTPC respects the rights of its employees to freedom of association in accordance with applicable laws. All NTPC employees in the workman category have freedom to associate themselves with various unions to facilitates collective bargaining agreement. These collective bargaining agreements are inline with the applicable laws including the provision of specified minimum notice period for significant operational changes, wherever applicable.

Following collective bargaining forums have been formalized for regular and structured meetings between management and unions:

Forum		
Apex Level	:	National Bipartitie Committee (NBC)
Regional Level	:	Regional Joint Productivity Council (RJPC)
Project Level	:	Plant Level Committee (PLC)
Shop Floor Level	:	• Shop Level Committee (SLC) • Canteen Management Committee (CMC) • Township Advising Committee (TAC) • House Allotment Committee (HAC)

Training And Awareness

The Company has consistently endeavored for attracting, on-boarding, grooming and motivating its talent recognising that nurturing the talent leads to competitive advantage. In this process, the Company has always endeavored to be in the forefront of creation and dissemination of knowledge. Its sustained performance leadership has, to a large extent, been achieved on the platform of comprehensive learning and development programs for its employees. A large number of professionals from other organizations in the power sector have also benefitted immensely from the learning and development programs of the Company. It is not surprising to see many organisations in the country adopting practices and systems developed by the Company. NTPC's quest to keep the Company in tune with emerging business challenges is reflected in its new tag line for learning "Learning@speed of business".

The learning activities are being driven by a comprehensive infrastructure comprising Power Management Institute (PMI), Noida, at the corporate level, six Regional Learning Institutes (RLIs) located strategically in six large power stations of NTPC and Employee Development Centers (EDCs) located at almost all power projects and stations. At the foundation of the learning structure of the Company are the EDCs. The EDCs take care of training requirements of non-executives and junior level executives at the projects and stations. The training requirements of middle and senior level executives are catered to by RLIs at regional level and PMI, Noida at the corporate center as the apex learning center.

Together, the PMI, six RLIs and large number of EDCs form a strong learning grid covering the entire human resource of the Company. This learning grid enables to provide learning solutions for practically every aspect of the power value chain, covering the strategic, tactical and operational facets right down to the shop floor and learning domains ranging from mining to distribution.

Initiatives taken by PMI:

Learning and Development (L&D) interventions designed and delivered after a multidimensional Training Need Analysis (TNA) focussed on enhancing technical, functional, strategic and leadership skills.
Specific Planned Learning Interventions after about 7, 13 and 20 years of working in the Company which groom executives for the next level. In FY 17, total 14 such planned interventions were carried for middle and senior level managers.
During FY 17, 387 training programmes conducted covering nearly 8,096 professionals, logging a total of approximately 30,898 training mandays.
Pioneered an Employee Assistance Program, a confidential expert counselling service for employees and their family members.
Launched Harvard Management e-learning modules with 2000 licenses, which is available to NTPC executives.
Conducted about 34 training programs through Web conferencing platform at workstations during the year.
Taken up focused capacity building programs for executives of several Discoms in the country under the IPDS (Integrated Power Development Scheme) of Govt of India. This capacity building mission aims at improving the skills and performance of Discoms, thus strengthening a vital link of the power value chain and NTPC's valued customers .
Developed a Project Analytics based learning module with an aim to bring paradigm change in Project Planning, Monitoring and Control. It will focus on creating single integrated dynamic Project Analytic System to facilitate active task management, measurement of progress, course correction and faster decision making for on-time project delivery.
Facilitating the adoption of existing Government ITIs and setting up of new ITIs in different parts of the country spanning 16 States. Till now, the Company has adopted 18 ITIs and set up 8 new ITIs near its power stations. Of the 18 Govt. ITIs adopted by the Company, 15 ITIs were adopted under the PPP scheme of GoI and 3 ITIs have been adopted under bilateral agreement with different State governments. This has resulted in creation of total 1,831 new seats by starting of new trades/units in the adopted and new ITIs. Cumulatively, a total of 29,109 students benefitted from this initiative till 31.03.2017. For these ITI students, the Company organised 49,559 mandays of industrial training/plant visits.
With the objective of grooming professionals into world class leaders in power sector, the Company has also opened the "NTPC School of Business" for running the flagship program titled "Executive Post-Graduate Diploma in Management" (EPGDM) since 2015. The program is duly approved by AICTE and is being administered at PMI premises. This 15 months' course has been launched with the objective of fulfilling the demand for professionals with focused domain expertise in their business and also having a general management perspective, in power and energy sectors. This rigorous and challenging program also includes learning inputs from international faculty, 2 weeks' international exposure at Nanyang Technical University, Singapore, and exposure to industries within and outside India.
Eminent speaker series, in which eminent personalities are invited for delivering sessions on subjects like innovation, leadership, environment, water conservation, health and wellness, strategy etc. for top management and employees of the Company. This program is also telecasted live to all the locations of NTPC across the country.
Customized training programs for the benefit of State utilities (like Himachal Pradesh, Punjab, Rajasthan and Uttar Pradesh), PSEs (like PFC, REC, THDC, EESL, DVC etc.), private sector companies (Adani, ICICI, Siemens, GE India Power etc.) and overseas based clients (Abu Dhabi, UAE) at their locations as well as at PMI.

Average hours of training per year per employee during FY 17 are as below:

Description	Gender	Total Nos.	Percentage receiving formal performance appraisal	Total Hours of training Imparted	Average no. of hours of training per Employee
Executives	Male	8576	100	300234	35.01
	Female	530	100	18960	35.77
Non-Executives	Male	5224	100	155304	29.73
	Female	318	100	9366	29.45
	Total	**14648**	**100**	**483864**	**33.03**

Program for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings are as below:

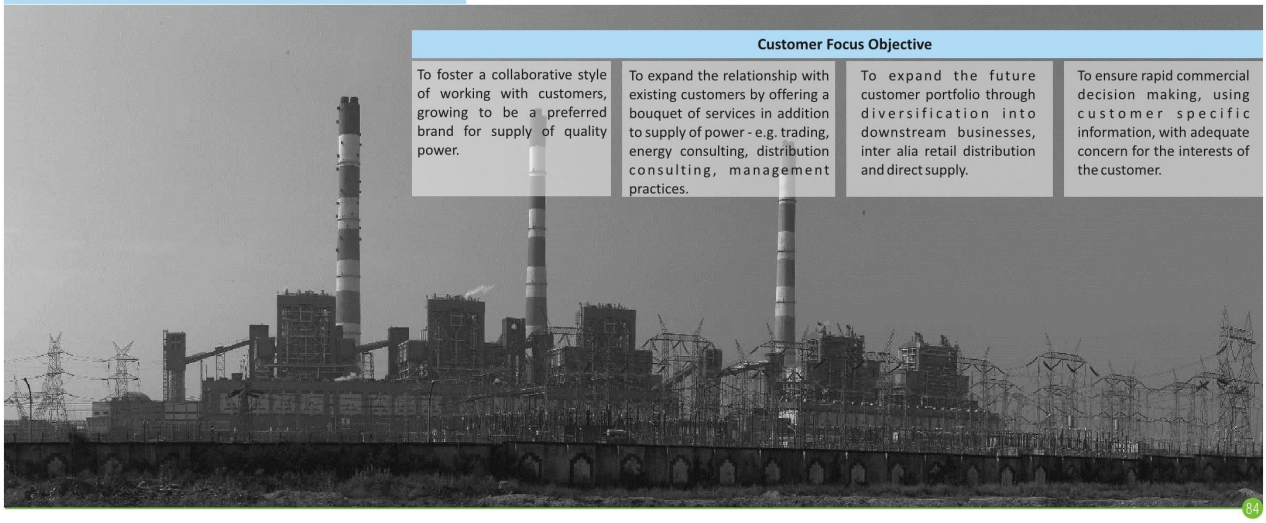
Programme	No. of participants	Mandays	Man hrs	Average No. of hours per employee
Advance Management Programme	111	1332	7992	72
Departmental examination training Program	110	770	4620	42
Enhancing Managerial Competence	194	2328	13968	72
Executive Development Programme	61	671	4026	66
Pre-promotion training (W6-W7)	43	86	516	12
Pre-promotion training	20	60	360	18
Pre-promotion training for E1	8	8	48	6
Other Programmes	37531	76173	457038	12.18

Strategic Management Module at PMI, Noida for young leaders

Product Responsibility

NTPC sells electricity from its Power Generating Stations located across India, to various bulk customers spread throughout the country. Its customers are mainly State Electricity Utilities like State Electricity Boards, DISCOMS, GENCO and TRANSCOs who account for around 90% of the sale of electricity. NTPC supplies bulk power to 52 utilities (within India and neighboring countries) under different agreements.

'Customer Focus' finds place as one of the core values (ICOMIT) of NTPC. Inline with this, the Company has taken up several initiatives targeted towards the external customers. Customer Relationship Management (CRM) and Customer Satisfaction Index (CSI) are some of the most important parts of these initiatives. Company has been implementing several structured activities to share its experiences and best practices with the customers. Some of these activities include providing various support services to the beneficiaries, which involves identifying potential areas of cooperation, feedback, expertise etc. In FY 17, 61 such programmes have been conducted on the basis of requirement expressed. NTPC offers training programs to the representatives of beneficiary companies at Power Management Institute (PMI), NTPC's apex training institute. In FY 17, 134 participants from various customer organizations attended training in 71 programs. The Company has also put in place Customer Satisfaction Index (CSI) survey scheme, to gather customer's feedbacks through a survey and respond to their requirements.



Customer Focus Objective			
To foster a collaborative style of working with customers, growing to be a preferred brand for supply of quality power.	To expand the relationship with existing customers by offering a bouquet of services in addition to supply of power - e.g. trading, energy consulting, distribution consulting, management practices.	To expand the future customer portfolio through diversification into downstream businesses, inter alia retail distribution and direct supply.	To ensure rapid commercial decision making, using customer specific information, with adequate concern for the interests of the customer.

Description	FY 15	FY 16	FY 17
Cases with Appellate Tribunal For Electricity (APTEL)	38	9	31
Cases in Supreme Court	83	33	29

There are no complaints as such from customers. However, as part of the tariff determination process under the overall regulatory system, different cases have emerged between NTPC and Cusomers/CERC.

Customer Health and Safety

Due care is taken to ensure health and safety of our employees, associates and other stakeholders during electricity production and in all areas under operational control of NTPC. Transmission of electricity and its distribution is beyond the scope of NTPC.

Customer Relationship Management (CRM) initiative has been taken by NTPC toward strengthening relationship with our customer. Some of the steps have been taken by NTPC:

Free welfare camps (Health/Family Welfare/Eye/Diabetic/Heart/Cancer etc.) have been organized on regular basis for the neighbourhood community

Fogging, spraying anti larva chemical in the project and its surrounding villages has been done on regular basis

Mobile health clinic has been provided in some of the projects

Annual health check-up and free medical treatment have been arranged for all contractors and sub contractors' employees in all projects and sites of NTPC

DOT centers to eliminate tuberculosis have been established at projects

Emergency facilities and medicines are arranged

Ambulance facility has been provided for the surrounding population to meet the emergency

Modern medical equipment /gadgets including tele medicines arranged to enhance the medical services

No injuries and fatalities reported in the current reporting period to public involving Company assets, including legal judgments, settlements and pending legal cases of diseases.

No incidence of non-compliance with regulations and voluntary codes concerning the health and safety impacts of product and services during their lifecycle.

There has been no monetary fine for non-compliance with laws and regulations concerning the provision and use of products during the reporting period.

NTPC complied with all the laws and regulations concerning provision and use of products and services.

There has been no incidence of non-compliance or wrong business practices pertaining to marketing and communication including advertising, promotion and sponsorship during the reporting period.

Product safety

NTPC's core business is generation of electricity and the Company is not directly involved in the business of transmission and distribution. However, as a responsible power generation company, it offers technical and managerial support services to its customers, as per their requirement. Various customer support activities in different areas are extended in form of workshops and seminars.

As per the requirements of the people around, NTPC takes due care in displaying safety instructions in local languages. Electricity, the sole product of NTPC cannot be labelled due to its intrinsic nature. However, NTPC has been complying with the Grid Code and Grid Standards - National and International, wherever applicable.

Marketing strategy

NTPC is not in the business of Power distribution, and so, it does not directly deal with the demand side management, yet it educates its customers & society in general by offering free seats for beneficiaries Discoms to participate in Programmes conducted at Training Centre of NTPC regarding Demand Side Management. Special Workshops at customer end are also conducted with eminent faculties to educate beneficiary Discoms in this area under Customer Relationship Management activity. Being in the generation business only, Power outage indexes, such as SAIFI and SAIDI, are not applicable to NTPC. However, the average planned outage, forced outage and availability factor of NTPC Coal Stations and Gas Stations during FY 17 are given below:

Description	Planned Outage,%			Forced and other Outage,%			Availability Factor YTD (%)		
	FY 15	FY 16	FY 17	FY 15	FY 16	FY 17	FY 15	FY 16	FY 17
Coal Stations	5.4	4.7	4.2	2.54	2.77	2.30	88.3	88.1	88.8
Gas Stations	5.6	1.8	3.71	0.51	0.03	0.28	45.9	36.5	36.1

Society

A responsible corporate citizen since inception, NTPC envisions, "To be the World's leading power company, energising India's Growth."

NTPC has a well structured process for community engagement and development. The company is committed to growth and progress of these communities who are its important stake holders. The Company also has specified programmes for inclusive growth and equitable development not only at station level but at country level. Formal and informal meetings are organized to understand the needs of communities and their expectations from the Company. Some of the areas of its initiatives and programs undertaken are described below:

Empowerment

- Skill development support to 50 tribal & backward community girls for developing them as ophthalmic assistance in Purulia district, West Bengal under 'Nai Roshini 'Project of NANRITAM
- More than 3200 women were imparted training in various vocational courses like sewing, beautician, food processing etc. for self-employability. Tool kits & sewing machines provided to the successful trainees
- Bicycles distributed to about 200 school going girls of govt. school

Art, Culture and Sports

- In association with Archeological Survey of India (ASI) and National Culture Fund (NCF). Preservation and conservation of 3 monuments [Group of Monuments, Mandu (MP), Excavated site at Vikramshila (Bihar), and Archaeological site, Lalitgiri, Odisha
- Support to Society for Development of Rural Literature under NTPC CSR for Purvasha Folk and Tribal Art Museum, near Chilika Lake, Odisha for protection and promotion of heritage of dying art forms of Odisha
- Various art & culture activities at more than 60 schools
- Promoting Rural Sports Meets and various sports events at about 100 villages

Education

- Education for the community children through 34 schools run by NTPC predominantly benefitttting about 20,000 students of neighbourhood areas.
- Running mobile science labs in schools in vicinity of Darlipalli, Pakri Barwadih coal mining Project and Kahalgaon power station annually benefitting about 12,500 students from 62 schools.
- Merit scholarships awarded to about 1,400 students.
- Solar lanterns distributed to nearly 2,100 students.
- Distribution of uniforms, books, stationery, bags etc in about 210 schools covering more than 30,000 students around NTPC stations.
- More than 17000 dual desk and benches distribution in 125 schools.
- Support of construction of new building block of Geeta Bajaj Bal Mandir Mahila Shikshan Prashikshan Maha Vidyalaya, Jaipur
- Setting up polytechnic at Kaladungi, Nainital, Uttarakhand.
- Support for science and IT laboratories along with equipments/ instruments in new campus of Bhakti Vedanta Gurukula and International School (BGIS) with student capacity of 1,200 in Ajhai village of Vrindavan in rural area of Mathura district.

Health

- Subsidized healthcare to the community through 20 Company owned hospitals.
- Development of King George Hospital, Visakhapatnam
- Construction of Building and purchase of vehicles for Medical Service Centre at Ramkrishna Math, Antpur, Hooghly, West Bengal.
- Mobile Health Clinics operational at 7 NTPC locations covering about 80 villages providing health care facility at doorsteps to more than 1,00, 000 people.
- About 400 Medical Health check-up camps and about sanitation and health awareness camps organized at various locations. About 3,000 surgeries for eye cataract, family planning and minor surgeries were performed during these camps.
- Fogging, spraying, anti-larva spray taken up for preventive health measures.
- Health related infrastructure support to PHCs, CHCs and District Hospitals.
- Regular health related initiatives in the communities around NTPC stations benefitting close to 170 villages and more than 3,50,000 individuals

Sanitation

- Organised intensive awareness and cleanliness campaign through various activities in its Projects / Stations / Offices to bring mass-awareness among employees, associates and family members.
- Nukkad Natak, Debates, Slogan competitions, Essay competitions, Painting competitions, Walkathon etc. organized to spread awareness about cleanliness amongst employees, their family members and other stakeholders.
- Construction of Public Toilet Complexes in the Kathua district of Jammu & Kashmir & community toilets at 04 various locations were constructed.
- Construction of Toilets in more than 60 schools during the year apart from extensive construction of school toilets during Swachh Vidyalya Abhiyaan
- Pilot Project for Mechanized Cleaning of 14 wards in Varanasi
- In order to promote menstrual hygiene among girls Sanitary Napkin vending machines and incinerators were installed in 20 school near Kayamkulam, Kerala.
- Animal Health Camps & other animal health related activities were organized benefitting populations of about 20 villages.

Infrastructure strengthening

- Installation of about 2350 Solar Street Lights and setting up centralized solar lighting system for 04 villages in and around NTPC stations promote use of renewable energy.
- Provided clean lighting and cooking solutions through IDES (Integrated Domestic Energy System) to 1000 households Barethi (MP) and Talcher Kaniha (Odisha) projects.
- Construction of Community Parivarthana Bhavans for catering to the needs of SC/ST persons of Prakasam & Guntur Districts of AP.
- Construction of Community Hall in Vivekanand College, Tundi in District Dhanbad Jharkhand.
- Construction of 24 Community Centres, installation of 33 High Mast Lights & 763 Street Lights, Construction & repair of about 65 kms of roads in more than 60 villages and other infrastructural developmental activities at various locations covering more than 120 villages.

Provision of drinking water

- Installation of about 260 hand pumps at various locations near NTPC operations.
- Installation of more than 50 tube wells/ bore wells, about 45 RO plants and distribution of 1500 water filters/coolers in various villages/schools near NTPC operations.
- During extreme summers water supply through water tankers provided relief to inhabitants of close to 40 villages.
- Thirty piped water schemes, renovation and restoration of about 20 water bodies taken up.
- Regular water related CSR activities around its stations covered close to 130 villages.

Imparting vocational skills

- Training to youth in various ITI trades in 18 adopted & 08 New ITIs at various locations partnering with the State and Central Governments.
- Construction of Industrial Training Institute taken up at Ganjam District, Odisha.
- Regular vocational training in various trades like Electrical Repairing, Mobile Repairing, Motor Rewinding, Welding, Car Driving including obtaining LMV driving license, Screen Printing, Book Binding, Candle Making, Computer Training etc. for improving employability around NTPC stations covered about 35 villages, benefiting amongst others close to 2,500 youths through skills up-gradation.
- Support for construction of Weavers Blocks of Common Facility Centre (CFC) in Handloom Park at Chanderi, District, Ashok Nagar, and MP.
- Supporting "Skill India Mission" of GoI through MoU with NSDC for Skill Development of 30,000 persons around NTPC Projects with focus on eastern region. Training was imparted to about 12,000 youth all across NTPC locations and out of which 5,450 was successfully employed during the year.

Activities for Physically Challenged Persons (PCP)

- Distribution of High –End Prosthetic & Orthotic Artificial limbs to 22 poor and needy persons with disability in Mumbai through ALIMCO
- MoU with ALIMCO for aids and assistive devices to benefit 5,000 persons with disabilities in the neighbourhood areas of stations.
- Distribution of equipment and appliances to about 200 Physically Challenged Persons and activities like inclusive education & vocational training benefitting about 1,000 PCP in villages all across NTPC locations.

Caring for the specially-abled

With a view to focus on its role as a socially responsible and socially conscious organization, NTPC works towards the integration of specially-abled people into mainstream society through various programmes. These programmes encompass rehabilitation, employment, training, education, consultation to maximise their potential, and to help them to be self- reliant and independent. The Company undertakes these initiatives through NTPC Foundation. Some of the initiatives undertaken/ being undertaken by the NTPC during FY 2016-17 are as follows:

Provision for IT education to physically & visually challenged students, in addition to Information and Communication Technology (ICT) centres established earlier at Delhi University and four Govt. Blind Schools, Ajmer, Lucknow, Thiruvanathapuram and Mysore, new ICT Centres established at Gauhati University Guwahati and Devi Ahilya Vishwavidyalaya, Indore benefited 31 students during 2016-17.

Disability Rehabilitation Centre (DRC) at NTPC Tanda, Rihand, Korba, Dadri and Bongaigaon established in collaboration with National Institute for the Orthopaedically Handicapped (NIOH), under the Ministry of Social Justice and Empowerment, Government of India has benefited about 3096 physically challenged people.

Directly Observed Treatment cum Designated Microscopy Centre (DOTs cum DMC) with Mobile ambulance facilities being operated at 11 NTPC hospitals under Revised National Tuberculosis Control Programme (RNCTP) that cater to villages upto 25-30Km benefited about 5085 cases.

In order to encourage and motivate children and youth from neighbourhood villages of NTPC Projects / Stations for higher studies, NTPC has launched its flagship program 'NTPC Utkarsh' - Merit Scholarship which has benefitted 221 students during 2016-17 who are pursuing X, XII, ITI, B. E / B.Tech and MBBS studies. The scheme is envisaged to benefit 7,300 students every year.

Significant Infrastructure Investment and services supported

CSR initiatives during the FY 2016-17 have been taken up on Pan India basis around NTPC operations primarily in 20 states mentioned : Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujarat , Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, West Bengal.

Significant infrastructure investments and services supported are tabulated below:

S. No.	CSR project or activity identified	Amount spent on the projects (₹ in Cr)
1	Swacch Vidyalya Abhiyaan	35.73
2	Healthcare &Sanitation	55.52
3	Education & Skill Development	60.45
4	Rural Development	51.30
5	Environment	35.33
6	Drinking Water	9.36
7	Sports	1.90
8	Protection of National Heritage Art & Culture	0.82
9	Other CSR Activities	16.01
10	Capacity Building (Overheads)	11.39
	Total	**277.81**

Local communities

As a socially responsible entity, NTPC has been sensitive to the needs and aspirations of the Project Affected Persons (PAPs). NTPC always tries to avoid acquisition of homestead to the extent possible. However, in case of physical displacement, the Corporation is passionate about ensuring that sense of displacement felt in the local communities is minimal and accordingly, the Company has always tried for the best possible R&R package for the PAPs based on respective State Government R&R Policy and Government of India Guidelines/ LARR ACT or as decided in Village Development Advisory Committees (VDAC), other similar meeting of participative mechanism. The initial baseline survey conducted under socio economic studies (SES)/ social Impact Assessment (SIA) prepares a basis for initial stakeholder identification, public interest groups affected by the setting up of projects have their concerns, need , aspirations and requirements.

The process of Public Hearing and Public Consultations are undertaken prior to the start of construction of the project which are open to general public, during which they can express their concerns regarding environmental impacts of the project, socio-economic impacts due to acquisition of land and homesteads, rehabilitation and resettlement programmes, expectations from the project, etc. The comments of the general public are recorded and forwarded to MOEF, which takes them into consideration while according environmental clearance for the project.

To address social issues at exploratory stage of its prospective Greenfield/Expansion projects and to win the confidence of local population of such projects by way of building positive image of the Company, NTPC enters the area by initiating actions in line with its 'Initial Community Development (ICD) Policy,' soon after land and water commitments are received from the respective State Governments for setting up a project. Further, detailed Socio-economic surveys are conducted through independent academics

institutes of repute once land boundaries are frozen to have a detailed study on the likely social impacts and suggested mitigation measures.

GoI has made effective the RFCTLARR Act, 2013 (Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013) w.e.f. 01.01.2014 . Now, the land acquisition for the projects would be as per this Act which also mandates the statutory requirement of fulfilling the minimum R&R entitlements envisaged in the Act along with the Compensation. A Social Impact Assessment (SIA) study by the Appropriate Govt., to study the impacts of proposed land acquisition, formulation of SIMP (Social Impact Mitigation Plan) and to judge if the said Project requiring the land serves the Public Purpose is also mandated in the Act prior to Initial Notification for land acquisition.

Organization covers 100% of its operations with implemented local community, engagement, impact assessments and development programs.Human development indicators are taken as reference while measuring the impact. The Social impact studies conducted through external agencies have statistically demonstrated that the CSR interventions of the Company are improving the lives of people. The development indices are far better in the Company's operation as compared to the state and National parameters. Company is continuously making effort for the betterment of the life of the people around its operations.

Recognizing the importance of a sound institutional framework to achieve the desired results, NTPC has set up dedicated R&R groups. These R&R groups operate at projects, Regional Headquarters and the Corporate Centre, associating people with social expertise and philanthropic thoughts, consultants, facilitators, social scientists and NGOs/CBOs. For effective participation, consultation and transparency with the stakeholders in its activities, Public Information Centres (PICs) and Village Development Advisory Committees (VDACs)/ similar participative mechanisms have been set up by the organization in consultation with the district Administration.

Public Information Centre (PIC): To disseminate information on the project, PICs at Corporate Centre and projects house an array of documents such as survey reports, action plans, land records, policy etc. The PAPs are able to get information on various facets of the project and also submit any query or grievance.

Implementation Facilitation and Evaluation: The implementation of R&R Scheme is facilitated and evaluated periodically during the implementation of R&R plan by Regional Head Quarter and Corporate R&R Group. Project Planning & Monitoring (PP&M) also keeps track of R&R Scheme implementation progress through Project Review Team (PRT) meetings regularly.

Social Impact Evaluation: On completion of R&R Plan implementation social impact evaluation (SIE) is conducted to know the efficacy of R&R Plan implementation.

Consultative Mechanisms: Village Development Advisory Committees (VDACs)/ similar participative mechanisms facilitate finalization and implementation of R&R Scheme in a participative manner. The representatives of PAPs, Gram Pradhan, Panchayat representative, Block Development Officer, other representatives of State Government NTPC and NGOs/CBOs constitute it and meet regularly since the formulation of R&R Scheme till completion and closure of R&R Scheme at respective projects.

Grievance Redressal Mechanism: Each project encourages PAPs to approach them if dissatisfied with the arrangements. In an endeavour to not just meet its promise but also transcend its own parameters and perform better, innovative practices are used from time to time depending on the project. R&R activities in the organization endeavour to not just meet the formal organizational commitments made to the PAPs in line with Company's R&R policy but also go beyond them through the application of innovative practices from time to time.

The most effective way of addressing the R&R issue is through a proactive approach and an appropriate planning of land acquisition. Towards this, NTPC adopts the following principles and strategies

- Minimize the land requirement through compact and efficient layout of plant, township and other facilities.
- Minimize the acquisition of prime agriculture land and other assets to the extent possible and avoid acquisition of the homesteads.
- NTPC shares information and carryout consultations through formal mechanism of Public Information Centre (PIC) and Village Development Advisory Committee (VDAC) or similar consultative mechanism during the implementation of R&R Plan.
- A Socio Economic Survey (SES)/ Social Impact Assessment (SIA) is conducted by a professional agency to collect detailed demographic details of the area and peoples which makes basis for the preparation of R&R Plan.
- All PAPs residing in, working, doing business or cultivating land or having rights over resources within the project area as per the categorization and provisions for eligibility in the policy are entitled for compensation for their lost assets as per the law of land and for other R&R benefits as per livelihood loss, sufficient to assist them to improve or at least regain their previous standard of living.
- A comprehensive Community Development Plan is formulated in consultation with stakeholders and District administration for taking up community development activities mainly in the area of education, Health, drinking water, sanitation, infrastructure, women empowerment, welfare etc. in the periphery of the project site in a defined geographic area.
- NTPC has taken new initiatives by setting up new ITIs, Polytechnics, Engineering and Medical Colleges to improve employability of PAPs and local population.

A consultative mechanism is constituted for participation of Stakeholders during the formulation and implementation of R&R Plan including taking up community development activities in the

periphery of the project site in a defined geographic area. Institutional mechanism likes PIC/ VDAC etc are set up for effective consultation & participation of stakeholders. 3 tier institutional set up at project/ RHQ & Corporate level is also available for facilitation of the process. This set up is further strengthened by hiring of sociologists & other professionals as per need and requirement, from time to time. NTPC always tries to avoid acquisition of homestead to the extent possible. However, in case of physical displacement, guidelines of concerned State Govt. and GoI are followed.

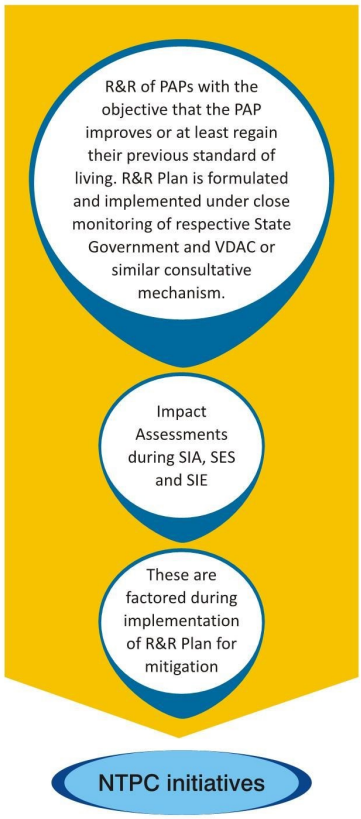
NTPC has been sensitive to the needs and aspirations of the Project Affected Persons (PAPs). Accordingly, R&R issues are addressed by NTPC based on respective State Government R&R Policy and Government of India guidelines/ Act which envisages participatory approach in consultation with the affected persons, their representatives and the District Administration. NTPC believes in fulfilling larger societal purposes, going beyond power generation and wealth creation. NTPC is focusing on being more accessible and becoming a strong local community partner. The respective State Government is closely involved during the whole process.

NTPC's R&R programs have led to positive impact on overall socio economic development of the stakeholders through:

- Public consultation, Public Hearings
- Public Information Centre
- Press repots
- Multi stakeholders VDAC

As far as R&R is concerned, NTPC takes measures for Rehabilitation and Resettlement (R&R) of Project Affected Persons (PAPs) with the objective that the PAP improves or at least regain their previous standard of living. R&R Plan is formulated and implemented under close monitoring of respective State Government and VDAC or similar consultative mechanism. During formulating the R&R scheme, NTPC takes care to restore the common property resources (CPRs).

The R&R Plan implementation is an ongoing process. Land compensation and R&R grants disbursement were in active mode in mainly Darlipalli, North Karanpura, Katwa, Khargone, Gadarwara, Kudgi, Mouda-II and Tanda-II projects in 2016-17.



NTPC expresses its continued support for the Global Compact and its commitment to take action in this regard, as was communicated by the Chairman & Managing Director, NTPC in his letter dated May 29, 2001 addressed to Secretary General, United Nations.NTPC has posted the brief of Global Compact and its commitment to the principles of GC on its website at www.ntpc.co.in.

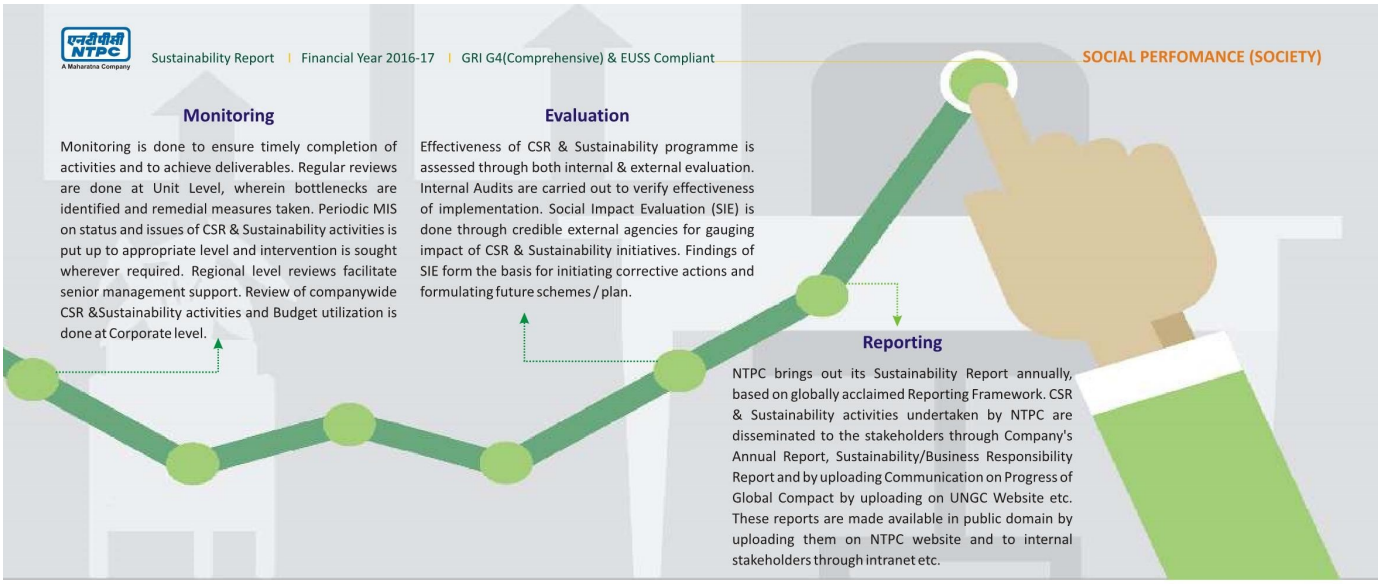
The principles of Global Compact were communicated to all employees through NTPC Internal website and internal training programmes. NTPC, a core member of Global Compact Network India, (GCNI) actively participated in the monthly meetings, and various other activities of the Global Compact Network India.

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Grievance Mechanism for Impacts on Society

Participation of Panchayat, community & local authorities is encouraged during planning, implementation & monitoring of CSR & Sustainability projects, for their acceptance, support & recognition of CSR initiatives. It is done in three phases:

As far as R&R is concerned, in every project, a consultative mechanism comprising of representatives of PAPs, State Government & NTPC is constituted for formulation of R&R Plan including implementation and Grievance Redressal System. NTPC addresses grievance of PAPs as per policy provisions at the project level. Grievances are also received through RTI and VIP references thru GoI which are replied in time bound manner. The RFCT LARR Act stipulates various committees for redressal of complaints. The Act also mandates strict penalty clauses for violation of the provisions. No grievance related to CSR activities by the organization was received during the reporting period.



Monitoring

Monitoring is done to ensure timely completion of activities and to achieve deliverables. Regular reviews are done at Unit Level, wherein bottlenecks are identified and remedial measures taken. Periodic MIS on status and issues of CSR & Sustainability activities is put up to appropriate level and intervention is sought wherever required. Regional level reviews facilitate senior management support. Review of companywide CSR &Sustainability activities and Budget utilization is done at Corporate level.

Evaluation

Effectiveness of CSR & Sustainability programme is assessed through both internal & external evaluation. Internal Audits are carried out to verify effectiveness of implementation. Social Impact Evaluation (SIE) is done through credible external agencies for gauging impact of CSR & Sustainability initiatives. Findings of SIE form the basis for initiating corrective actions and formulating future schemes / plan.

Reporting

NTPC brings out its Sustainability Report annually, based on globally acclaimed Reporting Framework. CSR & Sustainability activities undertaken by NTPC are disseminated to the stakeholders through Company's Annual Report, Sustainability/Business Responsibility Report and by uploading Communication on Progress of Global Compact by uploading on UNGC Website etc. These reports are made available in public domain by uploading them on NTPC website and to internal stakeholders through intranet etc.

Investor Grievances

The Company has always valued its investor's relationship. During the financial year ending March 31, 2017, Company has attended its investor grievances expeditiously except for the cases constrained by disputes or legal impediments. The details of the complaints received, resolved and disposed off during the year are as under:

Particulars	Opening Balance	Received	Resolved	Pending
Complaints relating to				
Equity Shares	0	3308	3308	0
Tax Free Bonds– 2013	0	145	145	0
Tax Free Bonds – 2015	0	114	114	0
Bonus Debentures	0	509	509	0

The Company has implemented Right to Information Act, 2005 in order to provide information to citizens and to maintain accountability and transparency. The Company has put RTI manual on its website for access to all citizens of India and has designated a Central Public Information Officer(CPIO), an Appellate Authority and APIOs at all sites and offices of the Company.

During 2016-17, 1,580 applications were received under the RTI Act, 2005 out of which 1,496 applications were replied to, till 31.03.2017.

Public Policy Participation

The public policy advocacy, at NTPC, encompasses a wide range of activities. NTPC is a corporate member of varied national & international organizations, and participates in these forums for issues pertaining to public policy. The Company takes up the issues for policy advocacy conducive for sustainable development of the Power sector. Being in the electricity generation business, NTPC

shares its experiences and views on key public policy issues, such as Electricity Tariff Regulations, Electricity policy, Grid Code etc., with relevant authorities as and when required. The advocacy includes capacity building, relationship building, networking, and leadership establishment.

The Company does not give any contribution (in-kind or in-cash) to political parties, politicians and related institutions. Due care is taken to ensure that the Company complies with all the statutory requirements from time to time. There has never been an instance of non-compliance with laws and regulations pertaining to workplace discrimination, corruption, fraud etc. No fines or penalties were imposed on NTPC during the reporting period.

Case Study-I

Sustainable sanitation through construction of Individual toilets at Ratadiya village, Rajasthan

Under the "Swachh Bharat Campaign" NTPC has extended its hands and adopted Ratadiya village and pledged to make it Open Defecation Free (ODF) village. NTPC signed MoU for adopting improved sanitation practice by way of toilets construction and creation of awareness on sanitation.

Extensive awareness campaign was carried out before taking up the construction. For ensuring sustainability of the initiative, token money of ₹2,000/- per toilet was shared by the beneficiary household. A sanitation kit comprising a bucket, toilet cleaner, toilet cleaning brush, nail cutter and a soap was distributed to all the owners free of cost.

We would like to share the story of Dakha Bai and her family under "Swachh Bharat Campaign".

Dakha Bai aged 74 years stays with her son Radhy Shyam Mehra in the village Ratadiya, Tehsil Anta, District-Baran. There are six members in the family including a specially abled (paralyzed) grandson (aged 22) of Dakha Bai. The situation was so grim that Radhey Shyam had started feeling mental agony. Dakha Bai couldn't even go to the fields for defecation. Radhey Shyam had dug a pit of 2 Feet deep and 1 Feet wide for his mother which Radhey Shyam's wife had to clean every time it was used. It was a perturbing experience for Dakha Bai and she had started eating less to avoid going to toilet. The financial condition of Radhey Shyam didn't allow him to construct a toilet, but the initiative of NTPC had made it possible for Radhey Shyam Mehra to give his mother a better life.

Dakha Bai and her family members are the happiest of all the villagers of Ratadiya after construction of new Toilet in their premises.

NTPC Anta has created 176 toilets in the villages of Gram Panchayat, Balakheda. NTPC's efforts have borne fruits and Ratadiya Village has been declared Open Defecation Free (ODF) by Govt. of Rajasthan. It is a matter of double pride for us all that Balakheda Gram Panchayat is the first Panchayat in Anta block to get this ODF certificate. On the successful completion of the Projects, NTPC has enabled the neighboring society to live with dignity and self.

Case Study-II

NTPC's initiatives for Livelihood generation

The National Policy for farmers was released aiming to improve net income of farmers through increased production, better prices and support from government through improvement of land, water and services. As Agriculture including Animal Husbandry, Dairy and Fisheries, is a State subject, the emphasis of the Department of Animal Husbandry, Dairy and Fisheries has been on supplementing efforts of the State Governments in the development of these sectors

1. **Crop Projects**

   NTPC has taken up livelihood support and promotion through innovative agriculture practices for the villagers under NTPC Jhanor CSR activities.

   - 500 farmers selected from the nearby villages
   - Farmers were:
     i. Trained to adopt drip-irrigation for water and energy conservation
     ii. Taught crop-diversification, nutrient management, integrated pest management and tissue culture farming
     iii. Involved through financially contribution for installation of Drip Irrigation system
   - Income increased from ₹50,000/ Acre to ₹1,50,000/ Acre
   - The program is being replicated at NTPC Rihand.

Training to Farmers

Training to Farmers

Field Visit

Drip Irrigation

On hand training

Papaya Crop

2. Livestock Projects

NTPC is also implementing an Integrated Livestock Project in the surrounding villages of its Sipat Power Station, aiming to create an appropriate economic and production environment for the dairy farmers.

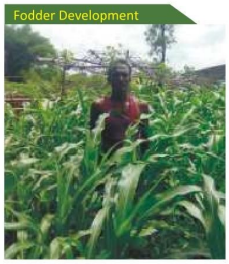
- Local indigenous low milk-yielding cows and buffaloes are upgraded by breeding them through Artificial Insemination (AI) with the use of high pedigree frozen semen of indigenous / exotic breeds
- "Integrated Livestock Development Centre" (ILDC) are being setup
- Each centre will cover about 8 villages within a radius of 5-8 kms
- To be operated by 'Gopal' for which a local educated unemployed youth is being extensively trained for four months to carry out animal breeding and health and nutrition related services.
- The Gopal is provided with a motorcycle for effective working to carry out breeding and provide other veterinary services like veterinary first aid, castration of scrub bulls, de-worming, preventive vaccination against various diseases, infertility treatment etc.
- All these services are provided at the doorstep of the farmers.

Artificial insemination

Artificial insemination

Treatment of animal

Fodder Development



Case Study-III

Revival of Municipal Solid Waste Processing Plant

The State of Uttar Pradesh is the most populous state in the country. The state is having five cities above one million populations.Varanasi is one million plus populated city situated in the State of Uttar Pradesh. It is the fourth largest city of the state and known for its mystic Ghats and rich architectural heritage.

MSW processing plant in village Karsada of Varanasi was proposed under PPP model and the related tripartite agreement in this regard was signed on 17.04.2010 between Varanasi Nagar Nigam, C&DS, UP Jal Nigam and M/s A2Z Waste Management (Varanasi) Ltd.

MSW processing plant with dedicated Sanitary Land Fill (SLF) was set up with the primary aim of:

- Reduction in net waste to be dumped by 80% by recovering compost (20%), recyclables (15%), landfills(25%) and Refuse Derived Fuel i.e. RDF(20%)
- Scientific filling of remaining waste (mainly inerts) in SLF to block contamination of ground water.

Project was funded by central and state government under Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and about 60% of sanctioned budget was released and balance budget was still available towards incomplete work. However, work remained incomplete due to dispute between concessionaire (M/s A2Z) and State Govt and the plant was not in operation till 2016.

NTPC accepted the challenge to make installed facilities of MSW processing plant at Karsada, Varanasi operational. As project was in dispute and a pending litigations between A2Z and VNN, NTPC requested an NOC from concerned department of UP Government to take up the work. The related NOC in this regard was issued by Government of Uttar Pradesh.

A team of NTPC executives visited the plant to make first hand assessment of the work involved in making the existing installations operational and listed out the activities required to be made available.Plant was made operational by NTPC by Repairing /overhauling of equipments available in plant with supply and fixing of missing/stolen component, existing equipments/machines and ready for processing of MSW.

Activities undertaken to revival and completion the MSW

- Development of Sanitary Land Fill (SLF)
- Development Leachate Treatment facility
- Installation of Refuse Derived Fuel (RDF) facilities
- Arrangement of Vehicle for SLF and RDF
- Repair of vehicles of compost area (1 JCB, 1 Tractor, 5 dumpers) and radial loaders
- Deployment of earthmovers
- Providing chemicals to control foul smell/flies

Before starting of MSW plant

Monitoring

The monitoring of the project was done by Ministry of Power and UP Govt. The project is also monitored by Northern Region headquarter, NTPC Tanda, NTPC Unchahar and Corporate level. Minister of State with Independent Charge for Power, Coal, New and Renewable Energy and Mines in the Government of India has visited the project and praised the progress of the project. Apart from Minister, NTPC official from Regional Headquarter and Corporate Center has also visited the project for monitoring the progress.

Impact

The solid waste management (SWM) plant at Karsada, which was known for its non-functionality and responsible for poor ratings in national rankings, is now not only processing large quantities of wastes but has also started producing compost which is being sold as organic fertilizer to farmers.

The work of conversion of waste to compost began at the plant. The dispatch of compost began to fulfill the order of 80 tonnes in two weeks. Around 500-600 metric tonne of garbage is transported and processed at the SWM plant every day.

About 15% (60 to 80 tonnes) of compost is produced from an average of 500-600 metric tonnes of waste processed every day.

3000 MT of processed waste is being taken by Cement Industry (ACC) as RDF raw material on free of cost basis.

Varanasi has soared up the cleanliness scale occupying the 32nd position in 'Swachh,' which is a part of the Modi government's flagship Swachh Bharat Abhiyan (SBA) programme or Clean India Mission. **It ranked 65th last year and 418th in 2014**.


MSW Plant- Before


MSW Plant- After

Case Study-IV

Health at Doorsteps
(Reach to Unreach)

NTPC Farakka, observed that situation of elderly population was life threatening, due to remote locations, bad roads& lack of facility at health centers. To address this problem, NTPC Farakka took the initiative of providing health services at doorsteps, especially focusing the elderly people in 34 villages near its operations.

The main objective of the initiative was

- To provide health check-up & diagnostic services to elderly tribal, forest dwellers, old, infirm, sick and other weaker sections of the society.
- To reach maximum elderly who cannot afford medical care and have less access to improved health services.
- To provide psychosocial support and counseling to old age community for their mental and physical well being.

Achievement

- Approximately 8,200 elderly people got benefitted by the intervention
- 87% sugar patients are spending their normal life after taking treatment from our camp.
- Patients with high blood pressure reduced from 75% to 30%.
- 23 patients were diagnosed for cataract and successfully operated for cataract by NTPC.
- Identified 35 nos. of TB patients and referred to community health center, 28 among them are receiving DOTs regularly.

Key Data at a Glance

Economic Indicators:

Particulars	FY 13 (₹ In Crores)	FY 14 (₹ In Crores)	FY 15 (₹ In Crores)	FY 16 (₹In Crores)	FY 17 (₹ in Crores)
A: Direct Economic Value Generated					
Revenues	69,614.92	74,507.95	75,176.22	71,520.64	79,167.43
Sub Total (A)	69,614.92	74,507.95	75,176.22	71,520.64	79,167.43
B: Direct Economic Value Distributed					
Operating Cost	44,881.02	50,031.33	53,398.59	48,831.77	52,163.61
Employee Wages & Benefits	3,360.12	3,867.99	3669.78	3,609.32	4,324.60
Payments to Providers of Capital	6,665.52	7,147.74	4805.00	5,992.60	7,192.23
Payments to Government	4,527.83	3,664.00	819.06	268.14	3,464.31
Community investments	77.08	120.21	125.91	489.89	273.35
Sub Total (B)	**59,511.57**	**64,831.27**	**62,818.34**	**59,191.72**	**67,418.10**
Economic Value Retained (A-B)	**10,103.37**	**9,676.68**	**12,357.88**	**12,328.92**	11,749.33
C: Employee remuneration and other benefits					
Nos. of Employees (year-end)	23,865	23,411	22,496	21,633	20,593
Average Salary, Wages and Benefits per Employee per Annum (Rs)	15,76,840	18,28,865	17,61,375	18,60,648	24,22,597
Average Cost of other Benefits per Employee per Annum (Rs)	2,17,199	2,70,514	3,51,337	3,65,955	3,39,398
Average Cost of Employee Remuneration & Benefits per Annum (Rs.)	17,94,039	20,99,379	21,12,712	22,26,603	27,61,995

Environmental Indicators:

	Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
			Material Used				
Input Material	Lube Oil	KL	2,093	1192.2	1599	1,073.30	980.12
		Lt/MU	9.06	5.12	6.64	4.49	3.92
	Transformer Oil	KL	259	410	276	395.95	395.84
		Lt/MU	1.12	1.76	1.15	1.66	1.58
	Chlorine	MT	3,559	4,317	4,267	4537	5,460.48
		Kg/MU	15.41	18.53	17.70	18.99	21.83
	Ammonia	MT	1,764	550	455	2974	3,869.39
		Kg/MU	7.64	2.36	1.89	12.45	15.47
	Alum	MT	9,838	10,672	11,165	8900	10,549.32
		Kg/MU	42.59	45.81	46.30	37.27	42.18
	HCl	MT	14,500	13,784	14,758	14,030	44,657.65
		Kg/MU	62.77	59.16	61.20	58.74	178.57
	H_2SO_4	MT	6,156	10,392	11,703	13,946	16,923.99
		Kg/MU	26.65	44.60	48.53	58.39	67.67
	Hydrogen	MT	42.56	39.46	37.18	37.42	41.83
		gm/MU	178.20	165.22	155.67	156.68	167.26
			Direct energy consumed				
Energy	Coal	MMT	155	158.2	162.1	160.6	162.50
		Kcal/Kg	3276	3,334	3,368	3,408	3527
		TJ	21,19,115	22,08,839	22,82,083	22,87,818	23,95,714
		Kg/Kwh	0.731	0.718	0.71	0.70	0.68
	Natural Gas	MMSCMD	10.70	6.88	6.44	5.21	5.16
		Kcal/SCM	9,465	9,400	9,354	9,428	9347
		TJ	1,54,767	98,830	91,908	74,942	73,585
		SCM/Kwh	0.198	0.200	0.203	0.214	0.22
	Naptha	MT	2,67,296	1,66,790	1,44,577	26,854	2882
		Kcal/Kg	11,401	11,385	11,376	11,341	11,238
		TJ	12,759	7,950	6875	1,273	135

	Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
Energy	LDO	KL	25,583	34,733	23,246	15,862	21,545
		Kcal/KL	9,551	9,098	9,476	9,467	9,333
		GJ	1,023	1,323	921	628	841
	HFO	KL	70,062	53,116	63,407	76,943	68,354
		Kcal/KL	9,784	9,838	9,896	9,893	9,869
		GJ	2,870	2,187	2,623	3,182	2,820
	Specific Oil Consumption	ml/Kwh	0.45	0.40	0.38	0.40	0.25
	HSD	KL	998	434	1241	388	97
		Kcal/KL	9,052	8,760	9,050	8,992	9,042
		GJ	38	16	47	15	3.67
	Sector Disclosures-Coal stations						
	Installed Capacity	MW	31,855	33,015	33,615	34,175	35,085
	Commercial Generation	MU	2,11,294	2,20,411	2,29,550	2,29,954	2,37,735
	Net Energy Export	MU	1,96,688	2,05,198	2,13,623	2,14,392	2,21,568
	PLF	%	83.10	81.50	80.2	78.6	78.6
	Cycle Efficiency	%	35.83	35.88	36.04	36.05	35.63
	Planned Outage	%	4.92	4.2	5.4	4.7	4.2
	Forced Outage	%	2.93	2.8	2.54	2.77	2.3
	Availability Factor	%	90.20	90.3	88.3	88.1	88.8
	Sector Disclosures-Gas stations						
	Installed Capacity	MW	4,017	4,017	4,017	4,017	4,017
	Commercial Generation	MU	19,699	12,569	11,588	8,870	8,594
	Net Energy Export	MU	19,235	12,222	11,256	8,594	8,330
	PLF	%	56.0	35.7	32.9	25.1	24.4
	Cycle Efficiency	%	42.55	42.57	42.38	41.81	42.01
	Planned Outage	%	3.50	3.7	5.6	1.8	3.71
	Forced Outage	%	0.58	0.46	0.51	0.03	0.28
	Availability Factor	%	71.40	47.4	45.9	36.5	36.1

	Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
	Sector Disclosures – Solar Stations (RE)						
Energy	Installed Capacity	MW	----	75	110	110	620
	Commercial Generation	MU	----	13.289	123.8	162.649	531.1
	PLF	%	----	12.56	14.32	16.83	17.83
	Sector Disclosures – Hydro Stations						
	Installed Capacity	MW	----	----	----	----	800
	Commercial Generation	MU	----	----	----	----	3225
	PLF	%	----	----	----	----	46.02
	Total Installed Capacity (Coal+Gas+Solar+Hydro)	MW	35,820	37,107	37,742	38,302	40,522
	TOTAL Commercial Generation (Coal+Gas)	MU	2,30,993	2,32,980	2,41,138	2,38,824	2,46,329
	Total Net Generation (Coal+Gas)	MU	2,15,923	2,17,421	2,24,879	2,22,986	2,29,898
	Total Gross Generation (Coal+Gas+ Solar+Hydro)	MU	2,32,028	2,33,284	2,41,139	2,39,506	2,50,085
	Auxiliary Power Consumption						
	Coal Stations	MU	14,451	15,029	15,180	15,210	15,874
		%	6.84	6.82	6.61	6.61	6.68
	Gas Stations	MU	468	351	316	261	251
		%	2.38	2.80	2.73	2.95	2.92
	Energy Saved						
	Electrical	MU	119.9	115.1	115.4	116.9	118.6
	Heat Energy (Equivalent MT of coal)	MT	9,366	11,678	2,100	7,406	46,178
Water	Total Drawn	Lakh KL	44,414	46,711	45,463	44,111	5,533.16
	Total Drawn for closed cycle stations	Lt/Kwh	-----	-----	-----	3.33	3.22

	Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
			Stack Emission (All Stations)				
Emissions	SPM	MT	1,00,226	1,03,016	1,09,573	1,01,722	98,071.26
	Specific SPM	gm/Kwh	0.46	0.47	0.46	0.44	0.39
	SO_2	MT	8,47,919	9,42,700	10,47,914	8,46,003	8,32,362.2
	Specific SO_2	gm/kWh	3.93	4.34	4.4	3.7	3.32
	NOx	MT	4,89,711	5,22,375.0	5,56,351	4,96,262	4,32,876.7
	Specific NOx	gm/kWh	2.27	2.40	2.3	2.2	1.73
	Greenhouse Emissions						
	CO_2 (Coal Stations)	MT	19,22,28,461	19,22,28,262	20,61,08,871	22,34,00,199	21,74,55,761
	CO_2 emission intensity (Coal Stations)	Gm/kWh	977	973	968.9	970.50	981.44
	CO_2 (Gas Stations)	MT	87,66,230	88,08,232	69,42,090	82,71,286.2	37,66,734
	CO_2 emission intensity (Gas Stations)	gm/kWh	456	459	553.3	455	452.71
	Ozone Depleting Substances						
	ODS	CFC-11 equivalent (Kg)	3,607	2,404	1,747.21	1,099.03	1,026.56
Waste Material	**Non Hazardous**						
	Misc. Ferrous Scrap	MT	40,053	26,271	18,109	15,268.76	20,207
		mg/kWh	173.40	114.69	75.22	63.93	80.79
	Non Ferrous Scrap	MT	867	893	2,077	2,385.6	714.66
		mg/kWh	3.75	3.83	8.6	9.98	2.857
	Hazardous						
	PCB	MT	0	0	0	0	0
	Used Batteries	MT	144	115	154	136.41	138.55
		Kg/MU	0.62	0.49	0.64	0.506	0.55
	Spent Resin	Lt	17,952	27,880	44,024	28,170	65,900
		ml/MU	77.72	136	182.88	117.95	263.74
	Used lube oil	KL	702	1,012	2,385	700.66	1,437.36
		Lt/MU	3.04	4.34	9.9	2.94	5.747
	Transformer Oil	KL	197	230	591.35	227.61	253.76
		Lt/MU	0.85	0.99	2.45	0.99	1.04
	Bio-medical waste	Kg	10,678	19,565	26,405	14,232	19,973.6

	Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
		Main Plant Effluents					
Effluents	Quantity	KL	43,00,81,284	40,63,30,545	48,72,60,665	46,61,80,937	44,13,83,412.4
	(Excluding once through CCW of Farakka & Singrauli)	Lt/kWh	1.86	1.74	1.93	1.95	1.82
	PH		7.6	7.6	7.55	7.2	7.3
	TSS	mg/Lt	39.4	39.9	29.78	45.08	41.25
	O&G	ppm	2.7	2.1	2.02	3.26	2.17
		Ash data					
Ash	Ash generated	Lakh Ton	562.9	578.26	591.53	588.28	584.60
Ash Utilized	Total Ash utilized	Lakh Ton	309.7	253.74	233.79	243.24	295.70
		%	55.02	43.88	39.52	41.35	50.58
	Land Devpmt	Lakh Ton	40.92	24.71	6.49	14.37	29.72
		%	7.27	4.27	1.10	2.44	5.08
	Issue to cement & other industry	Lakh Ton	81.45	71.53	67.73	58.25	53.37
		%	14.47	12.37	11.45	9.90	9.13
	Ash Dyke Raising	Lakh Ton	86.01	75.43	67.61	68.58	80.98
		%	15.28	13.04	11.43	11.66	13.85
	Bricks	Lakh Ton	27.24	23.36	28.02	37.96	42.51
		%	4.84	4.04	4.74	6.45	7.27
	Roads/Rail Embankment	Lakh Ton	18.46	7.22	8.13	6.26	30.24
		%	3.28	1.25	1.37	1.06	5.17
	Mine filling	Lakh Ton	13.34	18.04	20.89	24.15	26.55
		%	2.37	3.12	3.53	4.11	4.54
	Others	Lakh Ton	42.27	33.51	34.91	33.66	32.33
		%	7.51	5.79	5.90	5.72	5.53
Environment Expenditure	Total	(₹ Crores)	124.8	135.4	961.64	742.86	623*

*Environment protection expenditure includes Water Cess, Consent fees, Environmental studies etc. This does not includes the O&M expenditure pertaining to operational & maintenance of pollution control devices like ESP, ETP, STP, Ash Handing Systems, DE/BS, CSSP, waste segregation and disposal, etc.

Social Indicators:

Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
Employment						
Executive	Male	11,761	11,867	11,665	11,219	10,887
	Female	827	832	821	782	749
Non-Executive	Male	10,637	10,081	9,412	9,038	8,376
	Female	640	631	598	594	581
TOTAL		**23,865**	**23,411**	**22,496**	**21,633**	**20,593**
Region Wise Distribution						
Corporate & Consultancy	No.	2,401	2,306	2,220	2,272	2,097
North	No.	4,151	4,019	5,339	5,236	4,902
DBF	No.	2,880	2,701	2,415	1,751	1,585
South	No.	2,667	2,602	2,315	2,201	2,137
East - I	No.	3,207	3,221	3,212	3,083	2,868
East - II	No.	2,403	2,347	2,263	2,192	2,128
West - I	No.	1,095	1,130	1,367	1,598	1,584
West - II	No.	4,399	4,437	2,771	2,744	2,763
Hydro	No.	449	436	417	388	361
Mining	No.	213	212	177	168	168
Total	**No.**	**23,865**	**23,411**	**22,496**	**21,633**	**20,593**
New Employee joined during the year						
Gender Diversity	Male	633	149	334	174	152
	Female	53	11	20	16	16
TOTAL	**No.**	**686**	**160**	**354**	**190**	**168**

Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
Employee Turnover						
Gender Diversity	Male	166	154	237	217	222
	Female	18	20	18	27	21
Age Diversity	=<30 yr	151	143	115	144	140
	30<50 yr	27	28	57	45	53
	>=50 yr	6	3	83	55	50
Region Wise Turnover	CC	20	9	44	40	49
	North	32	24	71	59	48
	DBF	16	7	18	14	20
	South	12	18	9	16	49
	East - I	21	21	28	26	12
	East - II	22	16	21	19	23
	West - I	17	25	24	24	12
	West - II	35	38	28	19	25
	Hydro	8	13	5	6	4
	Mining	1	3	7	4	1
	Total	**184**	**174**	**255**	**227**	**243**
Attrition Data	Cc		0.47	1.98	1.77	2.24
	North		1.29	1.33	1.13	0.94
	National Capital		0.53	0.75	0.80	1.04
	South		1.28	0.39	0.70	1.93
	East - I		1.33	0.87	0.84	0.78
	East - II		1.47	0.93	0.84	1.07
	West - I		2.98	1.76	1.50	0.69
	West - II		1.79	1.01	0.68	0.87
	Hydro		3.43	1.20	1.55	1.09
	Mining		1.54	3.95	2.38	0.58
	Total (excluding JVs & subsidiary)		**1.37**	**1.13**	**1.04**	**1.11**

Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
Employee Productivity						
Gen/ Employee	MU	9.72	9.96	10.72	11.19	12.16
Man/MW	Ratio	0.67	0.63	0.61	0.55	0.51
Training imparted to employees (Nos)						
Executives	Male	7,562	9,479	7,766	7,322	8576
	Female	416	705	420	393	530
Non-Executives	Male	9,772	9,718	8,896	8,439	5224
	Female	466	573	458	451	318
Total		**18,216**	**20,475**	**17,540**	**16,605**	**14,648**
Average no. of hours training per employee(PMI)						
Executives	Male	52.83	47.56	52.46	51.42	35.01
	Female	57.98	47.66	56.14	50.27	35.77
Non-Executives	Male	55.85	47.57	49.81	50.97	29.73
	Female	52.37	47.57	50.94	48.63	29.45
Total		**54.56**	**47.57**	**51.17**	**51.09**	**33.03**
Vigilance						
No. of Training Conducted in various stations	No.	29	19	41	51	21
No. of Employee Participated	No.	745	529	1,230	1,371	477
Safety						
Reportable Accident*	Fatal	10	15	14	14	11
	Non Fatal	19	28	31	27	61
Total Workforce* (Regular+Contract)	No.	47,070	51,294	58,732	62,597	67,414
Total Man hours	Hrs	12,33,19,841	12,17,35,030	14,94,70,965	15,22,45,904	17,72,89,902
Total Man Days Lost	Days	61,288	91,216	85,911	79,731	74,261
Frequency Rate(FR)		0.24	0.33	0.30	0.27	0.406
Incident Rate(IR)		0.62	0.84	0.77	0.65	1.068
Injury Rate (IR)		0.05	0.07	0.06	0.05	0.0812
Occupational Disease Rate		0	0	0	0	0

*including extension projects in operating stations

Percentage of employees eligible to retire in the next 5 and 10 years broken down by job category and by region

Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
% of Employee due to retire in next 5 years						
CC	Executives	15.81	18.64	24.48	25.34	23.14
	Non- Executives	28.92	30.91	31.25	31.52	35.65
East - I	Executives	13.33	14.38	17.36	19.91	19.21
	Non- Executives	31.27	21.25	19.95	22.48	23.16
East - II	Executives	17.92	10.86	11.97	13.86	15.16
	Non- Executives	34.50	33.57	32.77	29.73	29.42
Hydro	Executives	10.69	12.14	8.82	13.33	15.86
	Non- Executives	6.41	17.54	11.11	12.07	7.14
Mining	Executives	13.95	10.26	12.42	12.99	15.29
	Non- Executives	22.53	5.88	12.5	14.29	14.29
National Capital	Executives	20.00	19.54	23.38	24.36	25.09
	Non- Executives	24.39	32.78	34.63	32.05	31.91
North	Executives	13.25	17.29	18.82	22.56	24.33
	Non- Executives	18.02	37.13	35.63	39.45	39.68
South	Executives	10.70	22.18	26.58	28.71	21.88
	Non- Executives	32.06	28.97	29.98	33.64	29.32
West - I	Executives	10.45	11.34	13.5	16.72	15.57
	Non- Executives	23.40	8.56	9.78	10.62	13.98
West - II	Executives	8.29	16.25	18.07	19.7	20.54
	Non- Executives	5.00	24.83	27.34	28.29	28.33
% of Employee due to retire in next 10 years						
CC	Executives	25.33	25.14	49.87	49.11	18.67
	Non- Executives	27.47	30.65	69.6	70.2	38.8
East - I	Executives	25.09	20.27	38.26	40.08	19.82
	Non- Executives	38.12	33.25	50.6	55.35	32.92
East - II	Executives	22.09	15.36	29.34	29.9	17.06
	Non- Executives	20.69	17.14	48.44	44.13	13.6

Name of Indicator	Unit	FY 13	FY 14	FY 15	FY 16	FY 17
Hydro	Executives	19.29	12.40	23.97	27.27	16.83
	Non- Executives	18.86	8.77	15.87	17.24	3.57
Mining	Executives	20.23	14.36	26.09	27.92	15.29
	Non- Executives	30.02	29.41	18.75	21.43	0
National Capital	Executives	25.07	23.66	47.14	46.29	17.75
	Non- Executives	37.73	24.66	63.52	62.08	33.85
North	Executives	18.82	24.76	42.07	44.78	19.78
	Non- Executives	30.86	36.21	67.7	74.05	29.42
South	Executives	13.05	23.88	49.58	47.7	14.59
	Non- Executives	20.18	35.60	62.01	63.27	25.57
West - I	Executives	11.44	20.64	34.93	35.98	15.27
	Non- Executives	12.77	17.12	33.91	41.37	34.94
West - II	Executives	12.44	19.51	41.41	39.75	16.96
	Non- Executives	20.00	30.60	53.06	54.07	20.54

NTPC best in PSU- Great Places to Work

In a study carried out by Great Place to Work and The Economic Times, NTPC has been recognized for being among the best in the Industry - Public Sector Company to work for the year 2017. NTPC is overall ranked 38 among 100 organizations across the country who participated in the assessment of the study - "India's Best Companies to Work for 2017".

Best Association for Talent Development (ATD) USA Award

NTPC has received the prestigious ATD Best 2017 Award -a globally respected award in the L&D and Talent Development space. This global award is conferred by the Association for Talent Development (ATD) USA to the organizations that demonstrate enterprise-wide excellence in L&D and Talent Development area in a ceremony held at Washington DC on October 5, 2017.

Dun & Bradstreet Award

NTPC was presented with the Dun & Bradstreet award in the Power Generation Category at an event held at Mumbai on November 2, 2017. The award was presented by Shri Nitin Gadkari, Union Minister of Road Transport &Highways, Shipping and Water Resources, River Development &Ganga Rejuvenation, GoI Shri P.Srinivas, GM (OS) NTPC, WR-I-HQ, Mumbai received the award on behalf of NTPC.

Platts IPP ranking

NTPC Limited ranked #2 in Independent Power Producers and Energy Traders Globally, in Platts Top 250 Global Energy Company Rankings – 2017 instituted by Platts.In the overall ranking as well NTPC has improved its position to No-#39 from No # 46-2016 and No #56 in 2015.

SCOPE Award for RTI Act, 2005

NTPC has been given SCOPE Award for RTI Act, 2005 Compliance at SCOPE Meritorious Awards. The Award was received by Shri Gurdeep Singh, CMD, NTPC from Shri Pranab Mukherjee, President of India at a function held in New Delhi on April 11, 2017.

Business Standard 'Star PSU' award

NTPC received Business Standard 'Star PSU award. 'The award was presented to Shri Gurdeep Singh, CMD by Finance Minister,Govt of India, Shri Arun Jaitely at the BS Awards held in Mumbai on March 25, 2017.

India Pride Award

NTPC has been bestowed with India Pride Award 2016 -17 for best performance in the Power Sector.

Sustainability 4.0 Award

M/s Frost &Sulivan and the Energy Resource Institute, Delhi have instituted Sustainability 4.0 Award. NTPC has won this award for FY 2017. The award ceremony was held at Mumbai on May 26, 2017. The award has been received for 04 pillars of business sustainability i.e people, profit, planet and purpose.

Top Plant 2016 award

The National Capital Power Station, Dadri (NTPC Dadri) has bagged the Top Plant 2016 award by prestigious Power Magazine of USA in the coal fired generation category. The award was announced by Power Magazine on October 1, 2016.

Golden Peacock Award for Corporate Social Responsibility

NTPC has been awarded 'Golden Peacock Award for Corporate Social Responsibility" for the year 2016 in January, 2017 by His Holiness Sri Sri Ravi Shankar, Founder, The Art of Living.

"Ascender of the Decade" Award –Platts Award

NTPC has been ranked 46th position by Platts as a Top Energy Company globally. In the year 2015, NTPC was ranked 56th position.

Forbes Global List

NTPC has been ranked #400th biggest public company in the World on the Forbes Global List 2016.

Good Corporate Citizen Award

NTPC was conferred Good Corporate Citizen Award instituted by PHD Chamber of Commerce, New Delhi on November 26, 2016.

Best Thermal Power Utility by CBIP

NTPC was awarded as the Best Thermal Power Utility of the country by Central Board of Irrigation and Power (CBIP) on December 29, 2016 at a function held in New Delhi. Union Minister of State for Water Resources, River Development and Ganga Rejuvenation, Dr. Sanjeev Kumar Balyan presented the award to Shri Gurdeep Singh, CMD, NTPC.

National Project Excellence Award 2016

NTPC Vindhyachal has bagged the IPMA International Project Excellence's Silver Award for the year 2016 for project management on November 17, 2016. IPMA International Project Excellence Award recognizes project from different countries, industries and organisations and motivates project teams to develop and improve project management.

Express Intelligent PSU Award

NTPC got the prestigious "Express Intelligent PSU Award" for the Data centre Transformation (Winner).This is in recognition for the SAP Hardware refresh & unique migration of SAP system to a new Hardware platform in a virtualized environment. NTPC is the first PSU to carry out the cross platform migration. Sh S.V. Srinivas Rao, GM(IT), CC received this award from Shri M.M. Ali, Deputy Chief Minister of Telangana in a function held at Hyderabad on November 19, 2016

Research Investor Communication Award

NTPC Ltd has been conferred the Research Investor Communication Award amongst the "Large Corporates" category on March 4, 2016 for following transparent and fair communication practices by Research Bytes in an independent poll having participation of over 3000 Fund Managers/Analysts/ Non Institutional Investors.

SCOPE Corporate Communication Excellence Awards

NTPC has bagged 1st Prize of SCOPE Corporate Communication Excellence Awards 2016 in the Category of "Brand building through inclusive Growth initiatives", 2nd Prize in the Category of "Best Internal Communication Programme" and Consolation Prize in the Category of "Crisis Handling" at the Corporate Communication Summit organized by SCOPE in New Delhi on July 21, 2016.

Shri Saptarshi Roy, ED to CMD & ED (Corporate Planning and Corporate Communication) and Shri P.K Sinha, GM(Corporate Communication) received the award from Shri Sudhir Chaudhary, Senior Editor & Business Head of Zee News and Padma Shri Dr. K.K. Aggarwal, in the presence Shri Nirmal Sinha, Chairman, SCOPE & CMD, HHEC; Dr. U.D. Choubey, Director General, SCOPE amidst other dignitaries.

Best Maharatna PSU and Top Performer in the Power Generation Sector Award

NTPC has been bestowed The Best Maharatna PSU and Top Performer in the Power Generation Sector Award by the leading Information Service Company Dun & Bradstreet on August 22, 2016. The Awards were received by Shri K. Biswal, Director (Finance) NTPC from Shri Anil Swarup, Secretary, Coal at a function held in New Delhi. Shri A.K. Rastogi, Executive Director & Company Secretary and Shri S.P. Singh, General Manager (HR) NTPC were present on the occasion.

Maharatna of the Year in the Manufacturing Award

NTPC, India's largest power utility has been awarded "Maharatna of the Year in the Manufacturing Category by leading Investment Journal DSIJ at a function held in New Delhi. The award was presented by Shri Mahesh Sharma, Minister of State, (Independent Charge) for Culture, Tourism and Civil Aviation to Shri K. Biswal, Director (Finance), NTPC. Shri Sudhir Arya, Executive Director (Finance), NTPC, Smt. Sangeeta Bhatia, General Manager (Finance), Shri Sanjay Padode, Director, DSIJ were present on the occasion.

GRI G4 Index: 'In accordance - Comprehensive' & EUSS Compliant

General Standard Disclosures

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
Strategy and Analysis					Yes: Independent Assurance Statement
G4-1	Statement from the most senior decision-maker of the organization	CMD Statement	03-04		
G4-2	Description of key impacts, risks, and opportunities.	Power Sector Scenario, Opportunities & Challenges	31-39		
Organizational Profile					
G4-3	Name of the organization.	Organization's Profile	14		Yes: Independent Assurance Statement
G4-4	Primary brands, products, and services.	Organization's Profile	16		
G4-5	Location of the organization's headquarters.	About the Report	Initial page		
G4-6	Number of countries where the organization operates, and names of countries where either the organization has significant operations or that are specifically relevant to the sustainability topics covered in the report.	Organization's Profile	23		
G4-7	The nature of ownership and legal form.	Organization's Profile	14		
G4-8	Markets served (including geographic breakdown, sectors served, and types of customers and beneficiaries).	Product Responsibility	84		
G4-9	Scale of the organization:	About the Report	Initial page		
G4-10	Total number of employees – workforce breakup by gender, contract and employment type.	Labour Practices/ Key Data at a Glance	76/108		
G4-11	Percentage of total employees covered by collective bargaining agreements.	Human Rights	74		
G4-12	Description of the organization's supply chain.	Organization's Profile	22		
G4-13	Significant changes during the reporting period regarding the organization's size, structure, ownership, or its supply chain.	About the Report	Initial page		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
Commitment to External Initiatives					
G4-14	Explanation of whether and how the precautionary approach or principle is addressed by the organization.	Environmental Performance	61		Yes: Independent Assurance Statement
G4-15	List externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses.	Organization's Profile	14		
G4-16	Memberships of associations (such as industry associations) and national or international advocacy organizations in which the organization.	Governance, Ethics and Integrity	30		
Identified Material Aspects and Boundaries					
G4-17	a. List all entities included in the organization's consolidated financial statements or equivalent documents. b. Report whether any entity included in the organization's consolidated financial statements or equivalent documents is not covered by the report.	About the Report	Initial page		
G4-18	Report content and the Aspect Boundaries.	About the Report	Initial page		Yes: Independent Assurance Statement
G4-19	All the material Aspects identified in the process for defining report content.	Materiality Analysis	45		
G4-20	Aspect Boundary within the organization	About the Report	Initial page		
G4-21	Aspect Boundary outside the organization	About the Report	Initial page		
G4-22	Explanation of the effect of any restatements of information provided in previous reports, and the reasons for such restatements.	About the Report	Initial page		
G4-23	Significant changes from previous reporting periods in the Scope and Aspect Boundaries	About the Report	Initial page		
Stakeholder Engagement					
G4-24	List of stakeholder groups engaged by the organization.	Stakeholder Engagement	40		Yes: Independent Assurance Statement
G4-25	Basis for identification and selection of stakeholders with whom to engage.	Stakeholder Engagement	40		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
G4-26	organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process.	Stakeholder Engagement	41-43		Yes: Independent Assurance Statement
G4-27	Key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns, including through its reporting. Report the stakeholder groups that raised each of the key topics and concerns, including through its reporting.	Stakeholder Engagement	41-43		
Report Profile					
G4-28	Reporting period	About the Report	Initial page		Yes: Independent Assurance Statement
G4-29	Date of most recent previous report (if any)	About the Report	Initial page		
G4-30	Reporting cycle (such as annual, biennial)	About the Report	Initial page		
G4-31	Contact point	About the Report	Initial page		
G4-32	• Report the 'in accordance' option the organization has chosen.	About the Report	Initial page		
	• Report the GRI Content Index for the chosen option	GRI Index	116-134		
	• Report the reference to the External Assurance Report, if the report has been externally assured.	External Assurance Statement	140-141		
G4-33	Policy and current practice with regard to seeking external assurance for the report.	Organizational Policies	26		
Governance					
G4-34	Governance structure of the organization, including committees of the highest governance body. Identify any committees responsible for decision-making on economic, environmental and social impacts.	Governance, Ethics and Integrity	28		Yes: Independent Assurance Statement
G4-35	Process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees.	Governance, Ethics and Integrity	26		
G4-36	Whether the organization has appointed an executive-level position or positions with responsibility for economic, environmental and social topics, and whether post holders report directly to the highest governance body.	Governance, Ethics and Integrity	26		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any) reference	External assurance
		Section Name	Page Number		
G4-37	Processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics. If consultation is delegated, describe to whom and any feedback processes to the highest governance body.	Stakeholder Statement	40-43		Yes: Independent Assurance Statement
G4-38	composition of the highest governance body and its committees	Governance, Ethics and Integrity	28		
G4-39	Whether the Chair of the highest governance body is also an executive officer (and, if so, his or her function within the organization's management and the reasons for this arrangement).	Governance, Ethics and Integrity	25		
G4-40	Nomination and selection processes for the highest governance body and its committees, and the criteria used for nominating and selecting highest governance body members.	Governance, Ethics and Integrity	25		
G4-41	Highest governance body to ensure conflicts of interest are avoided and managed.	Governance, Ethics and Integrity	27		
G4-42	Highest governance body's and senior executives' roles in the development, approval, and updating of the organization's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental and social impacts.	Governance, Ethics and Integrity	26		
G4-43	Measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics.	Social Performance	81-83		
G4-44	Highest governance body's performance evaluation	Governance, Ethics and Integrity	25		
G4-45	• Highest governance body's role in the identification and management of economic, environmental and social impacts, risks, and opportunities. Include the highest governance body's role in the implementation of due diligence processes. • Whether stakeholder consultation is used to support the highest governance body's identification and management of economic, environmental and social impacts, risks, and opportunities.	Governance, Ethics and Integrity	25-26, 52		
G4-46	Highest governance body's role in reviewing the effectiveness of the organization's risk management processes for economic, environmental and social topics.	Governance, Ethics and Integrity	28		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
G4-47	Frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities.	Stakeholder Engagement	41-43		Yes: Independent Assurance Statement
G4-48	Highest committee or position that formally reviews and approves the organization's sustainability report and ensures that all material Aspects are covered.	Governance, Ethics and Integrity	28		
G4-49	Process for communicating critical concerns to the highest governance body.	Materiality Analysis	44		
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.	Materiality Analysis	45-47		
G4-51	Remuneration policies	Governance, Ethics and Integrity	25		
G4-52	Process for determining remuneration. Report whether remuneration consultants are involved in determining remuneration and whether they are independent of management. Report any other relationships which the remuneration consultants have with the organization.	Governance, Ethics and Integrity	25		
G4-53	How stakeholders' views are sought and taken into account regarding remuneration, including the results of votes on remuneration policies and proposals, if applicable.	Stakeholder Engagement	28, 41-43		
G4-54	Ratio of the annual total compensation for the organization's highest-paid individual in each country of significant operations to the median annual total compensation for all employees (excluding the highest-paid individual) in the same country.	Governance, Ethics and Integrity	25		
G4-55	Ratio of percentage increase in annual total compensation for the organization's highest-paid individual in each country of significant operations to the median percentage increase in annual total compensation for all employees (excluding the highest-paid individual) in the same country.	Governance, Ethics and Integrity	25		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
Ethics and Integrity					
G4-56	Values, principles, standards and norms of behavior such as codes of conduct and codes of ethics.	Governance, Ethics and Integrity	27		Yes: Independent Assurance Statement
G4-57	Report the internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity, such as helplines or advice lines.	Governance, Ethics and Integrity	27		
G4-58	Report the internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organizational integrity, such as escalation through line management, whistleblowing mechanisms or hotlines.	Governance, Ethics and Integrity	27-28		
Specific Standard Disclosures					
Economic Performance Indicators					
ASPECT: Economic Performance					
G4-DMA	Management Approach	Corporate Objective	10-11		Yes: Independent Assurance Statement
G4-EC1	Direct Economic Value generated and distributed.	Economic Performance/ Key Data at a Glance	48-49, 102		
G4-EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change.	Environmental Performance	60-61		
G4-EC3	Coverage of the organization's defined benefit plan obligations.	Social Performance	78		
G4-EC4	Financial assistance received from government	Economic Performance	48-49		
ASPECT: Market Presence					
G4-DMA	Management Approach	Economic Performance, Social Performance	52-53, 85		Yes: Independent Assurance Statement
G4-EC5	Ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation.	Social Performance	76		
G4-EC6	Proportion of senior management hired from the local community at significant locations of operation.	Social Performance	76		
ASPECT: Indirect Economic Impacts					
G4-DMA	Management Approach	Economic Performance	49, 52-53		Yes: Independent Assurance Statement
G4-EC7	Development and impact of infrastructure investments and services supported	Social performance	91		
G4-EC8	Significant indirect economic impacts, including the extent of impacts	Social performance	96-101		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
ASPECT: Procurement Practices					
G4-DMA	Management Approach	Organization's Profile	22		Yes: Independent Assurance Statement
G4-EC9	Proportion of spending on local suppliers at significant locations of operation	Organization's Profile	22		
	Environmental Performance Indicators				
ASPECT: Material					
G4-DMA	Management Approach	Environmental Performance	57		Yes: Independent Assurance Statement
G4-EN1	Materials used by weight or volume	Environmental Performance/ Key Data at a Glance	58, 103		
G4-EN2	Percentage of materials used that are recycled input materials	Environmental Performance	57		
ASPECT: Energy					
G4-DMA	Management Approach	Environmental Performance	58		Yes: Independent Assurance Statement
G4-EN3	Energy consumption within the organization	Environmental Performance/ Key Data at a Glance	58, 103-105		
G4-EN4	Energy consumption outside of the organization		NA	NTPC considered scope of boundary within the plant. Thus, it is not applicable to the organization.	
G4-EN5	Energy intensity	Key Data at a Glance	103-105		
G4-EN6	Energy Saving Initiatives	Environmental Performance	59		
G4-EN7	Reductions in energy requirements of products and services	Environmental Performance	59		
ASPECT: Water					
G4-DMA	Management Approach	Environmental Performance	62		Yes: Independent Assurance Statement
G4-EN8	Total water withdrawal by source	Environmental Performance/ Key Data at a Glance	62, 105		
G4-EN9	Water sources significantly affected by withdrawal of water	Environmental Performance	62		
G4-EN10	Percentage and total volume of water recycled and reused	Environmental Performance	62		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
ASPECT: Biodiversity					
G4-DMA	Management Approach	Environmental Performance	63		Yes: Independent Assurance Statement
G4-EN11	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Environmental Performance	63		
G4-EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected area	Environmental Performance	63		
G4-EN13	Habitats protected or restored	Environmental Performance	63		
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	Environmental Performance	63		
ASPECT: Emissions					
G4-DMA	Management Approach	Environmental Performance	64		Yes: Independent Assurance Statement
G4-EN15	Direct greenhouse gas (GHG) emissions (Scope 1)	Key Data at a Glance	106		
G4-EN16	Energy indirect greenhouse gas (GHG) emissions (Scope 2)		NA	NTPC is in the business of power generation, which does not purchase electricity, steam etc. from other organization. Hence, this indicator is not applicable to the organization.	
G4-EN17	Other indirect greenhouse gas (GHG) emissions (Scope 3)			NTPC being in the process of calculating Indirect GHG emission (Scope 3)	
G4-EN18	Greenhouse gas (GHG) emissions intensity	Key Data at a Glance	106		
G4-EN19	Reduction of Green House Gas (GHG) emissions	Environmental Performance	64-65		
G4-EN20	Emissions of Ozone Depleting Substances (ODS)	Environmental Performance/ Key Data at a Glance	65, 106		
G4-EN21	NOx, SOx, and other significant air emissions	Key Data at a Glance	106		
ASPECT: Effluents and Wastes					
G4-DMA	Management Approach	Environmental Performance	66		Yes: Independent Assurance Statement
G4-EN22	Total water discharge by quality and destination	Environmental Performance	68		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
G4-EN23	Total weight of waste by type and disposal method.	Environmental Performance/ Key Data at a Glance	66		Yes: Independent Assurance Statement
G4-EN24	Total number and volume of significant spills	Environmental Performance	68		
G4-EN25	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the basel convention 2 annex i, ii, iii, and viii, and percentage of transported waste shipped internationally	Environmental Performance	66		
G4-EN26	Identity, size, protected status, and bio diversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff	Environmental Performance	63		
ASPECT: Product and Services					
G4-DMA	Management Approach	Environmental Performance	71		Yes: Independent Assurance Statement
G4-EN27	Extent of impact mitigation of environmental impacts of products and services	Environmental Performance	71		
G4-EN28	Percentage of products sold and their packaging materials that are reclaimed by category		NA	NTPC is a power generating company and hence this disclose is not applied to organization.	
ASPECT: Compliance					
G4-DMA	Management Approach	Environmental Performance	71		Yes: Independent Assurance Statement
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.	Environmental Performance	71		
ASPECT: Transport					
G4-DMA	Management Approach	Environmental Performance	71		Yes: Independent Assurance Statement
G4-EN30	Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce	Environmental Performance	71		
ASPECT: Overall					
G4-DMA	Management Approach	Environmental Performance	55-56		Yes: Independent Assurance Statement
G4-EN31	Total environmental protection expenditures and investments by type	Environmental Performance	107		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
ASPECT: Supplier Environmental Assessment					
G4-DMA	Management Approach	Environmental Performance	71		Yes: Independent Assurance Statement
G4-EN32	Percentage of new suppliers that were screened using environmental criteria	Environmental Performance	71		
G4-EN33	Significant actual and potential negative environmental impacts in the supply chain and actions taken	Environmental Performance	71		
ASPECT: Environmental Grievance Mechanisms					
G4-DMA	Management Approach	Environmental Performance	55-56		Yes: Independent Assurance Statement
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	Environmental Performance	71		
Social Performance Labor Practice and Decent Work					
ASPECT: Employment					
G4-DMA	Management Approach	Social Performance	76		Yes: Independent Assurance Statement
G4-LA1	Total number and rate of new employee hires and employee turnover by age group, gender and region.	Social Performance/ Key Data at a Glance	77, 108-109		
G4-LA2	benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	Social Performance	78		
G4-LA3	Return to work and retention rates after parental leave, by gender	Social Performance	76		
ASPECT: Labor/Management Relations					
G4-DMA	Management Approach	Social Performance	81		Yes: Independent Assurance Statement
G4-LA4	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements	Social Performance	81		
ASPECT: Occupational Health and Safety					
G4-DMA	Management Approach	Social Performance	78-79		Yes: Independent Assurance Statement
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	Social Performance	80		
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	Social Performance/ Key Data at a Glance	81, 110		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation	Social Performance	80		Yes: Independent Assurance Statement
G4-LA8	Health and safety topics covered in formal agreements with trade unions	Social Performance	80		
ASPECT: Training and Education					
G4-DMA	Management Approach	Social Performance	81		Yes: Independent Assurance Statement
G4-LA9	Average hours of training per year per employee by gender, and by employee category	Social Performance/ Key Data at a Glance	83		
G4-LA10	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	Social Performance	83		
G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	Social Performance	83		
ASPECT: Diversity and Equal Opportunity					
G4-DMA	Management Approach	Social Performance	77		Yes: Independent Assurance Statement
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	Social Performance	77		
ASPECT: Equal Remuneration for Women and Men					
G4-DMA	Management Approach	Social Performance	76		Yes: Independent Assurance Statement
G4-LA13	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation	Social Performance	76		
ASPECT: Supplier Assessment for Labor Practices					
G4-DMA	Management Approach	Social Performance/ Key Data at a Glance	75		Yes: Independent Assurance Statement
G4-LA14	Percentage of new suppliers that were screened using labor practices criteria	Social Performance	75		
G4-LA15	Significant actual and potential negative impacts for labor practices in the supply chain and actions taken	Social Performance	75		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
ASPECT: Labor Practices Grievance Mechanisms					Yes: Independent Assurance Statement
G4-DMA	Management Approach	Social Performance	75		
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved through formal grievance mechanisms	Social Performance	75		
	Human Rights				
ASPECT: Investment					
G4-DMA	Management Approach		73		Yes: Independent Assurance Statement
G4-HR1	Total number and percentage of significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	Social Performance	73		
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	Social Performance	73		
ASPECT: Non-discrimination					
G4-DMA	Management Approach	Social Performance	75		Yes: Independent Assurance Statement
G4-HR3	Total number of incidents of discrimination and corrective actions taken	Social Performance	75		
ASPECT: Freedom of Association and Collective Bargaining					
G4-DMA	Management Approach	Social Performance	74		Yes: Independent Assurance Statement
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	Social Performance	74		
ASPECT: Child Labor					
G4-DMA	Management Approach	Social Performance	74		Yes: Independent Assurance Statement
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	Social Performance	74		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
ASPECT: Forced of Compulsory Labor					
G4-DMA	Management Approach	Social Performance	74		Yes: Independent Assurance Statement
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	Social Performance	74		
ASPECT: Security Practices					
G4-DMA	Management Approach	Social Performance	75		Yes: Independent Assurance Statement
G4-HR7	Percentage of security personnel trained in the organization's human rights policies or procedures that are relevant to operations	Social Performance	75		
ASPECT: Indigenous Rights					
G4-DMA	Management Approach	Social Performance	75		Yes: Independent Assurance Statement
G4-HR8	Total number of incidents of violations involving rights of indigenous peoples and actions taken	Social Performance	75		
ASPECT: Assessment					
G4-DMA	Management Approach	Social Performance	73		Yes: Independent Assurance Statement
G4-HR9	Total number and percentage of operations that have been subject to human rights reviews or impact assessments	Social Performance	73		
ASPECT: Supplier Human Rights Assessment					
G4-DMA	Management Approach	Social Performance	75		Yes: Independent Assurance Statement
G4-HR10	Percentage of new suppliers that were screened using human rights criteria	Environmental Performance	75		
G4-HR11	Significant actual and potential negative human rights impacts in the supply chain and actions taken	Social Performance	75		
ASPECT: Human Rights Grievance Mechanisms					
G4-DMA	Management Approach	Social Performance	75		Yes: Independent Assurance Statement
G4-HR12	Number of grievances about human rights impacts filed, addressed, and resolved through formal grievance mechanisms	Social Performance	75		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
Society					
ASPECT: Local Communities					
G4-DMA	Management Approach	Social Performance	91		Yes: Independent Assurance Statement
G4-SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	Social Performance	91-93		
G4-SO2	Operations with significant actual and potential negative impacts on local communities	Social Performance	91-93		
ASPECT: Anti-corruption					
G4-DMA	Management Approach	Governance, Ethics and Integrity	28		Yes: Independent Assurance Statement
G4-SO3	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	Governance, Ethics and Integrity	28		
G4-SO4	Communication and training on anti-corruption policies and procedures	Governance, Ethics and Integrity	28		
G4-SO5	Confirmed incidents of corruption and actions taken	Governance, Ethics and Integrity	28		
ASPECT: Public Policy					
G4-DMA	Management Approach	Social Performance	94		Yes: Independent Assurance Statement
G4-SO6	Total value of political contributions by country and recipient/beneficiary	Social Performance	94-95		
ASPECT: Anti-competitive Behavior					
G4-DMA	Management Approach	Governance, Ethics and Integrity	28		Yes: Independent Assurance Statement
G4-SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	Social Performance	95		
ASPECT: Compliance					
G4-DMA	Management Approach	Social Performance	95		Yes: Independent Assurance Statement
G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	Social Performance	95		
ASPECT: Supplier Assessment for Impacts on Society					
G4-DMA	Management Approach	Economic performance	49		Yes: Independent Assurance Statement
G4-SO9	Percentage of new suppliers that were screened using criteria for impacts on society	Economic performance	49		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
G4-SO10	Significant actual and potential negative impacts on society in the supply chain and actions taken	Economic performance	49		Yes: Independent Assurance Statement
ASPECT: Grievance Mechanisms for Impacts on Society					
G4-DMA	Management Approach	Social Performance	93		Yes: Independent Assurance Statement
G4-SO11	Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms	Social Performance	94		
Product Responsibility					
ASPECT: Customer Health and Safety					
G4-DMA	Management Approach	Social Performance	84		Yes: Independent Assurance Statement
G4-PR1	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	Social Performance	85		
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	Social Performance	85		
ASPECT: Product and Services Labeling					
G4-DMA	Management Approach	Social Performance	85		Yes: Independent Assurance Statement
G4-PR3	Type of product and service information required by the organization's procedures for product and service information and labeling, and percentage of significant product and service categories subject to such information requirements		NA	NTPC sells electricity from its power generating station located across India to the bulk customers. Hence, this indicator is not applicable to the organization.	
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	Social Performance	85		
G4-PR5	Results of surveys measuring customer satisfaction	Social Performance	85		
ASPECT: Marketing Communications					
G4-DMA	Management Approach	Social Performance	85		Yes: Independent Assurance Statement
G4-PR6	Sale of banned or disputed products		NA	NTPC generates electricity, which is being supplied to their bulk customers through power grid transmission and distribution lines. Thus, the electricity is not banned or disputed product in the market. Hence, the disclosure is not applicable to the organization.	

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
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	Social Performance	85		Yes: Independent Assurance Statement
ASPECT: Customer Privacy					
G4-DMA	Management Approach	Social Performance	84		Yes: Independent Assurance Statement
G4-PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	Social Performance	85		
ASPECT: Compliance					
G4-DMA	Management Approach	Social Performance	84		Yes: Independent Assurance Statement
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	Social Performance	85		
Standard Disclosures tor the Electric Utility Sector (EUSS)					
Organizational Profile					
G4-10 (ADR)	Total contractor workforce	Social Performance	76		Yes: Independent Assurance Statement
G4-11 (ADR)	Percentage of contractor employees (contractor, sub-contractor and independent contractor) working for the reporting organization covered by collective bargaining agreements by country or regulatory regime.	Social Performance	74		
G4-EU1	Installed capacity, broken down by primary energy source and by regulatory regime	Organization's Profile	17, 23		
G4-EU2	Net energy output broken down by primary energy source and by regulatory regime	Organization's Profile	17		
G4-EU3	Number of residential, industrial, institutional and commercial customer accounts		NA	NTPC is not the business of power distribution and so, it does not directly deal with the demand side management. Hence, the disclosure is not applicable to the organization.	
G4-EU4	Length of above and underground transmission and distribution lines by regulatory regime		NA		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
G4-EU5	Allocation of CO_2 emissions allowances or equivalent, broken down by carbon trading framework	Environmental Performance	60		Yes: Independent Assurance Statement
		Economic Performance			
Availability and Reliability					
G4-DMA		Social Performance	85		Yes: Independent Assurance Statement
G4-EU10	Planned capacity against projected electricity demand over the long term, broken down by energy source and regulatory regime.	Social Performance	85		
Demand-Side Management					Yes: Independent Assurance Statement
G4-DMA	Management Approach	Social Performance	85		
Research and Development					Yes: Independent Assurance Statement
G4-DMA	Management Approach	Economic Performance	49		
Plant Decommissioning					Yes: Independent Assurance Statement
G4-DMA	Management Approach		NA	Nuclear power sites is not in the scope of report. Hence, this disclosure is not applicable to the organization.	
System Efficiency					
G4-EU11	Average generation efficiency of thermal plants by energy source and by regulatory regime.	Power Sector Scenario, Opportunities & Challenges	31-32		Yes: Independent Assurance Statement
G4-EU12	Transmission and distribution losses as a percentage of total energy		NA	The company is not directly involved in the business of transmission and distribution	
		Environmental Performance			
Material					
G4-DMA	Management Approach	Environmental Performance	57		Yes: Independent Assurance Statement
G4-EN1 (ADR)	Materials used by weight or volume	Key Data at a Glance	103		
Water					
G4-DMA	Management Approach	Environmental Performance	62		Yes: Independent Assurance Statement
G4-EN8 (ADR)	Total water withdrawal by source	Environmental Performance/ Key Data at a Glance	62, 105		
Biodiversity					
G4-DMA	Management Approach	Environmental Performance	63		Yes: Independent Assurance Statement
G4-EN12(ADR)	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	Environmental Performance	63		

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
G4-EU13	Biodiversity of offset habitats compared to the biodiversity of the affected areas	Environmental Performance	63		Yes: Independent Assurance Statement
Emissions					
G4-EN15 (ADR)	Direct greenhouse gas (GHG) emissions (scope 1)	Key Data at a Glance	106		Yes: Independent Assurance Statement
G4-EN16 (ADR)	Energy indirect greenhouse gas (GHG) emissions (scope 2)		NA	NTPC is in the business of power generation which does not purchase electricity, steam etc. from other organization. Hence, this indicator is not applicable to the organization.	
G4-EN21 (ADR)	NOx, SOx, and other significant air emissions	Key Data at a Glance	106		
Effluents and Waste					
G4-DMA	Management Approach	Environmental Performance	66		Yes: Independent Assurance Statement
G4-EN22 (ADR)	Total water discharge by quality and destination	Environmental Performance	68		
G4-EN23 (ADR)	Total weight of waste by type and disposal method	Environmental Performance	66 - 67		
Social Performance					
Labour Practice and Decent Work					
Employment					
G4-DMA	Management Approach	Social Performance	76		Yes: Independent Assurance Statement
G4-LA1 (ADR)	Total number and rates of new employee hires and employee turnover by age group, gender, and region	Key Data at a Glance	108-109		
G4-EU15	Percentage of employees eligible to retire in the next 5 and 10 years broken down by job category and by region	Key Data at a Glance	111		
G4-EU17	Days worked by contractor and subcontractor employees involved in construction, operation & maintenance activities	Social Performance	76		
G4-EU18	Percentage of contractor and subcontractor employees that have undergone relevant health and safety training	Social Performance	78-79		
Occupational Health and Safety					
G4-LA6 (ADR)	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	Social Performance	81		Yes: Independent Assurance Statement

General Standard Disclosures	Description of Disclosures	Section reference		Omissions (if any)	External assurance reference
		Section Name	Page Number		
		Human Rights			
Freedom of Association and Collective Bargaining					Yes: Independent Assurance Statement
G4-DMA	Management Approach	Social Performance	74		
		Society			
Local Communities					
G4-DMA	Management Approach	Stakeholder Engagement	42		Yes: Independent Assurance Statement
G4-EU22	Number of people physically or economically displaced and compensation, broken down by type of project	Social Performance	91-93		
Disaster/Emergency Planning and Response					Yes: Independent Assurance Statement
G4-DMA	Management Approach	Materiality Analysis	47		
		Product Responsibility			
Customer Health and Safety					
G4-DMA	Management Approach	Social Performance	85		Yes: Independent Assurance Statement
G4-EU25	Number of injuries and fatalities to the public involving company assets, including legal judgments, settlements and pending legal cases of diseases	Social Performance	85		
Access					
G4-DMA	Management Approach	Social Performance	84		Yes: Independent Assurance Statement
G4-EU26	Percentage of population unserved in licensed distribution or service areas		NA	NTPC's core business is generation of electricity and the company is not directly involved in the business of transmission and distribution. Hence, this indicator is not applicable to the organization.	
G4-EU27	Number of residential disconnections for non-payment, broken down by duration of disconnection and by regulatory regime		NA		
G4-EU28	Power outage frequency	Social Performance	NA		
G4-EU29	Average power outage duration	Social Performance	NA		
G4-EU30	Average plant availability factor by energy source and by regulatory regime	Social Performance	85		
Provision of Information					
G4-DMA	Practices to address language, cultural, low literacy and disability related barriers to accessing and safely using electricity and customer support services	Social Performance	85		Yes: Independent Assurance Statement

Glossary

Abbr.	Details
A&N	Andaman & Nicobar
AAQMS	Ambient Air Quality Monitoring Station
AC	Alternating Current
ACC	Air Cooled Condenser
ACV	Actual Calorific Value
ADB	Asian Development Bank
AFGC	Ammonia Flue Gas Conditioning
AMP	Advanced Management Programme
APC	Auxiliary Power Consumption
APH	Air Pre Heater
APIO	Assistant Public Information Officer
APM	Administrative Price Mechanism
APTEL	Appellate Tribunal for Electricity
ASCI	Administrative Staff College on India
ASI	Archaeological Survey of India
AT&C	Aggregate Technical and Commercial
ATDC	Apparel Training & Design Centre
AWRS	Ash Water Recirculation System
BCSD	Business Council for Sustainable Development
BD	Business Development
BEE	Bureau of Energy Efficiency
BFP	Boiler Feed Pump
BG	Bank Guarantee
BHEL	Bharat Heavy Electricals Ltd.
BOP	Balance of Plant
BP	Basic Pay
BPL	Below Poverty Line

Abbr.	Details
BRICS	Brazil Russia India China and South Africa
BTPS	Badarpur Thermal Power Station
BU	Billion Units
CAG	Comptroller and Auditor General of India
CAGR	Compounded Annual Growth Rate
CAPEX	Capital Expenditure
CARE	Credit Analysis and Research Ltd.
CBIP	Central Board of Irrigation & Power
CBOs	Community Based Organisations
CC	Corporate Centre
CCP	Combined Cycle Plant
CD	Community Development
CDA	Community Development Authority
CDM	Clean Development Mechanism
CDSL	Central Depository Services (India) Limited
CEA	Central Electricity Authority
CEMS	Continuous Emission Monitoring System
CenPEEP	Centre for Power Efficiency & Environmental Protection
CEO	Chief Executive Officer
CERC	Central Electricity Regulatory Commission
CFC	Chlorofluoro Carbons
CFD	Computational Fluid Dynamics
CFL	Compact Fluorescent Lamps
CFO	Chief Forest Officer
CIC	Cluster Innovation Centre
CIGRE	International Council of Large Electric Systems

Abbr.	Details
CII	Confederation of Indian Industry
CIL	Coal India Limited
CISF	Central Industrial Security Force
CMC	Canteen Management Committee
CMD	Chairman and Managing Director
CO_2	Carbon Dioxide
COC	Cycles of Concentration
COP	Communication on Progress
CP	Corporate Planning
CPCB	Central Pollution Control Board
CPIO	Central Public Information Officer
CPSE	Central Public Sector Enterprise
CREDA	Chattisgarh State Renewable Energy Development Agency
CRISIL	Credit Rating Information Services of India Ltd.
CRM	Customer Relationship Management
CRO	Chief Risk Officer
CSA	Coal Supply Agreement
CSI	Customer Satisfaction Index
CSR	Corporate Social Responsibility
CTU	Central Transmission Utility
CVO	Central Vigilance Officer
CW	Cooling Water
D&B	Dun & Bradstreet
DA	Dearness Allowance
DC	Designated Commission
DDCMIS	Distributed Digital Control Monitoring and Information System

Abbr.	Details
Deptt.	Department
DGH	Directorate General of Hydrocarbons
Dir.	Director
DISCOMs	Distribution Companies
DM Water	Demineralised Water
DMC	Designated Microscopy Centre
DNV	Det Norske Veritas
DOT	Directly Observed Treatment
DPE	Department of Public Enterprises
DRCs	Disability Rehabilitation Centres
DSIJ	Dalal Street Investment Journal
DSM	Demand Side Management
EA	Electricity Act
EPI	Economic Performance Indicator
ECBC	Energy Conservation Building Code
ECS	Electronic Clearing Service
ED	Executive Director
EDC	Employee Development Centre
EIA	Environmental Impact Assessment
EMC	Enhancing Managerial Competence
EMS	Environmental Management System
EN	Environmental Performance Indicator
EOC	Engineering Office Complex
EPC	Engineering Procurement Construction
EPS	Electric Power Survey
ER	Eastern Region
ERM	Enterprise Risk Management
ERMC	Enterprise Risk Management Committee
ERP	Enterprise Resource Planning
ES Certi.	Energy Saving Certificates
ESP	Electrostatic Precipitator
ETP	Effluent Treatment Plants

Abbr.	Details
EUSS	Electric Utility Sector Supplement
EVOICE	Employees Voluntary Organization for Initiative in Community Empowerment
FAPPC	Fly Ash Portland Pozzolana Cement
FGC	Flue Gas Conditioning
FICCI	Federation of Indian Chambers of Commerce and Industry
FIIs	Foreign Institutional Investors
FIs	Financial Institution
FRP	Financial Restructuring Plan
FSA	Fuel Supply Agreement
FTL	Fluorescent Tube Light
FY	Fiscal Year
GCN	Global Compact Network
GCV	Gross Calorific Value
GDP	Gross Domestic Product
GHG	Green House Gases
GJ	Giga Joules
GM	General Manager
GOI	Government of India
GPP	Gas Power Plant
GPTW	Great Place to Work
GRI	Global Reporting Initiative
GSAs	Gas Supply Agreements
GSI	Geological Survey of India
GT	Gas Turbine
GW	Giga Watt
HAC	House Allotment Committee
H2	Hydrogen
H2SO4	Sulphuric Acid
HCA	Host Country Approval
HCFC	Hydro ChloroFluoro Carbon

Abbr.	Details
HCl	Hydrochloric acid
HFO	Heavy Fuel Oil
HIV	Human Immunodeficiency Virus
HMLs	High Mast Lighting
HPGCL	Haryana Power Generation Corporation Limited
HPSV	High Pressure Sodium Vapours Lamps
HQ	Head Quarters
HR	Human Resources
HR	Human Rights
HVDC	High Voltage Direct Current
HW	Hardware
IB	Intelligence Bureau
ICD Policy	Initial Community Development Policy
ICRA	Investment Information and Credit Rating Agency
ICT	Information and communication Technology
ICU	Intensive Care Unit
IDAAS	Integrated Data Acquisition and Analysis System
IERE	International Electric Research Exchange
IGCAR	Indira Gandhi Centre for Advanced Research
IGCC	Integrated Gasification Combined Cycle
IGP	Inspector General of Police
IIPE	India Institute of Plant Engineers
IMS	Integrated Management System
IOCL	Indian Oil Corporation Limited
IPGCL	Indraprastha Power Generation Corporation Limited
IPMA	International Project Management Association
IPMCS	Implementation of Integrated Project Management and control system
IIP	Independent Power Producers
IPS	Indian Police Service
ISD	Investor Service Department

Abbr.	Details
ISO	International Organization for Standardization
IT	Information Technology
ITES	Information Technology Enabled Services
ITIS	Industrial Training Institutes
ITRHD	Indian Trust for Rural Heritage and Development
IUCN	International Union for the Conservation of Nature
JNNSM	Jawaharlal Nehru National Solar Mission
JV	Joint Ventures
Kg	Kilograms
KL	Kilo Litres
km	Kilometer
kwh	Kilo watt hour
kwp	Kilo watt peak
LA	Labor Practices & Decent Performance Indicators
LED	Light Emitting Diode
LPG	Liquified Petroleum Gas
LOA	Letter of Award
LWA	Light Weight Aggregate
LWTP	Liquid Waste Treatment Plant
M&V	Measurement and Verification
MCM	Million Cubic Metre
MDGS	Millennium Development Goals
MDI	Management Development Institute
MF	Mutual Funds
MGR	Merry go round
MHA	Ministry of Home Affairs
ml	Milli litters
MOP	Ministry of Power
MMSCMD	Million Metric standard cubic meter per day
MNRE	Ministry of New &Renewable Energy
MOEF	Ministry of Environment and Forests
MOU	Memorandum of understanding

Abbr.	Details
Pa	Megapasca
MT	Metric Ton
MMT	Million Metric Ton
MU	Million Units
MW	Mega Watt
NBC	National Bipartite Committee
NBPPL	NTPC BHEL Power Project Limited
NCF	National Culture Fund
NCR	National Capital Region
NCTPP	National Capital Thermal Power Plant
NCYM	National Competition for Young Managers
NECL	North Eastern Coalfields Limited
NEFI	NTPC Executives Federation of India
NEFT	National Electronic Funds Transfer
NELP	New Exploration Licensing Policy
NESCL	NTPC Electric Supply Company Limited
NETRA	NTPC Energy Technology Research Alliance
NFCH	National Foundation for Communal Harmony
NGOs	Non Governmental Organizations
NHR	Net Heat Rate
NH3	Ammonia
NIOH	National Institute for the Orthopedically Handicapped
NIT	Notice Inviting Tender
NMEEE	National Mission On Enhanced Energy Efficiency
NOCET	NTPC Open Competition for Executive Talent
NJPC	NTPC Joint Productivity Council
NRIs	Non Resident Indian
NO2	Nitrogen Dioxide
NOX	Oxides of Nitrogen
NR	Northern Region
NSDL	National Security Depository Limited

Abbr.	Details
NSPCL	NTPC SAIL Power Company Pvt. Limited
NVG	National Voluntary Guidelines
NVVN	NTPC VidyutVyapar Nigam ltd
O&G	Oil &Grease
O &M	Operations and Maintenance
OBC(CL+NCL)	Other Backward Class (Creamy Layer + No Creamy Layer)
ODP	Ozone Depleting Potential
ODS	Ozone Depleting Substances
OHSAS	Occupational Health and Safety Assessment System
OS	Operation Services
OTSS	One Time Settlement Scheme
PADO	Performance Analysis & Diagnostic Optimization
PAF	Plant Availability Factor
PAPs	Project Affected People
PAT	Perform, Achieve and Trade
PAT	Profit After Tax
PBDIT	Profit Before Depreciation Interest and Tax
PC	Professional Circles
PDC-RVM	PolarisationDeplolarisation Current – Recovery Voltage Measurement
PE	Partially Electrified
PEM	Performance Evaluation Matrix
PEPSE	Performance Evaluation of Power System Efficiency
PFC	Power Finance Corporation
PHCs	Primary Health Centre
PhD	Doctor of Philosophy
PI	Process Interface
PICs	Public Information Centre
PLC	Plant Level Committee

Abbr.	Details
PLF	Plant Load Factor
PM	Particulate Matter
PMC	Project Monitoring Committee
POP	Persistent Organic Pollutants
PMI	Power Management Institute
PMS	Paryavaran Monitoring System
PPA	Power Purchase Agreements
PPEs	Personal Protective Equipments
PR	Product Responsibility
PSDF	Power System Development Fund
PSE	Public Sector Enterprise
PSU	Public Sector Undertaking
PV	Photo Voltaic
Q4E	Quest for Excellence
QC	Quality Circle
QCFI	Quality Circle Federation of India
QMS	Quality Management System
QPR	Quarterly Progress Report
3 R's	Reduce, Recycle & Reuse
R&D	Research & Development
R&M	Renovation & Modernization
R&R	Resettlement and Rehabilitation
RAC	Research Advisory Council
RAP	Rehabilitation Action Plan
R-APDRP	Re-Structured-Accelerated Power Development & Reforms Program
RCM	Reliability Centered Maintenance
RED	Regional Executive Director
REDG	Renewable Energy and Distributed Generation
RES	Renewable Energy Sources
RFD	Result Framework Document
RFID	Radio Frequency Identifier

Abbr.	Details
RGCCP	Rajiv Gandhi Combined Cycle Power Project
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojna
RJPC	Regional Joint Productivity Council
RLDC	Regional Load Dispatch Centers
RNTCP	Revised National Tuberculosis Control Programme
RO	Reverse Osmosis
RPCs	Regional Power Committees
RPO	Renewable Purchase Obligation
RTI	Right to Information
SA-8000	Social Accountability 8000 Standard
SAC	Scientific Advisory Council
SACS	Special Analytical and Computational Sciences
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SC	Scheduled Caste
SCCL	Singareni Collieries Company Limited
SCOPE	Standing Conference of Public Enterprises
SD	Sustainable Development
SEB	State Electricity Board
SEBI	Stock Exchange Board of India
SERC	State Electricity Regulatory Commission
SES	Socio Economic Survey
SHRM	Strategic Human Resource Management
SIE	Social Impact Evaluation
SLC	Shop Level Committee
SMILE	Strategic Management Initiative for Leadership Effectiveness
SO	Society Performance indicators
SO2	Sulphur Dioxide
SPCB	State Pollution Control Board
SPM	Suspended Particulate Matter

Abbr.	Details
SR	Southern Region
ST	Scheduled Tribes
STCS	Solar Thermal Cooking System
STP	Sewage Treatment Plant
STPP	Super Thermal Power Plant
SW	Software
T&D	Transmission and Distribution
TAC	Township Advisory Committee
TANGE	Tamil Nadu Generation and Distribution DECO Corporation Limited
TEKL	Transformers and Electricals Kerala Limited
TERI	The Energy and Resources Institute
TL	Tube Light
TOR	Term of Reference
TSDF	Treatment Storage and Disposal Facilities
TSS	Total Suspended Solids
UE/DE	Un-Electrified/ De-Electrified
UMPP	Ultra Mega Power Project
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNGC	United Nations Global Compact
USAID	United States agency for International Development
VAM	Vapour Absorption Machine
VDAC	Village Development Advisory Committees
VFD	Variable Frequency Drive
WBCSD	World Business Council for Sustainable Development
WCC	Water Cooled Condenser
WEC	World Energy Council
WHRB	Waste Heat Recovery Boiler
WR	Western Region

AA1000 Licensed Assurance Provider xxxx-1

Independent Assurance Statement

Number: 001/000-174/2017/SR-Asia/India

NTPC Ltd (the Reporting Organization), engaged Social Responsibility Asia (SR Asia) to assure and provide an Independent Assurance Statement on its **Sustainability Report 2016-17**. The Reporting Organization is India's largest power utility, public sector company.

We performed our work using SR Asia @assurance methodology, which is based on our professional experience, international assurance best practice including International Standard on AccountAbility's AA1000 Assurance Standard 2008 ((AA1000AS (2008)) and the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines Version 4 (GRI G4) including the Electric Utilities Sector Suppliment (USSB).

SR Asia's responsibility in performing assurance work is to the management of the Reporting Organization only and in accordance with the terms of reference with the Reporting Organization. The content and presentation of the Report is the sole responsibility of the Reporting Organization. We do not therefore accept or assume any responsibility for any other purpose or to any other person or organization. Any dependence that third party has placed on the Report is entirely on its own risk. The assurance report should not be taken as a basis for interpreting the Reporting Organization's overall performance or sustainability except for the areas covered in the scope of assignment.

Scope of Assurance Service and Limitation

The scope of assurance service covers

1. Data and information related to the Report for the reporting period of 1st of April 2016 up to 31st of March 2017.
2. Sustainability specific data and information related to the six material aspects that have been identified by the Reporting Organization.
3. Visit to the plant site to review the data, information and indicators as specified, to identify supporting documents or evidences, and also to observe business practices in the field.

Exclusion

The assurance scope excludes:

1. Aspects of the Report other than those mentioned under the defining materiality section and discussion on defining Report content.
2. Data and information outside the reporting period.
3. Data and information in the public domain not covered in the reporting period.
4. The Reporting Organization's statements and claims describing expression of opinion, belief, expectation, advertisement, and future planning.
5. Financial performance data and information from the Reporting Organization's documents other than those mentioned in the Report.

Type and Level of Assurance

Our responsibility, in accordance with the agreement with management, was to carry out:

1. Type1, high level of assurance service on the Report content with respect to the AA1000AS (2008) Assurance Standard and AA1000APS (2008) AccountAbility Principles Standard.
2. Evaluation on publicly disclosed information, the system and process of the Reporting Organization has in place to ensure adherence to the principles.

Methodology

The approach and procedures developed during AA1000AS verification process include:

- Sustainability Report 2016-17 content review;
- Understanding the process of generating information for the Sustainability Report;
- Research of public information about the company and industry (media, websites and legal bases);
- Interviews with plant heads / department heads anad managers from key areas regarding the relevance of information for reporting and sustainability management;
- Interviews with the company's external stake holders
- When relevant, confronting the sustainability performance information with the company's management;
- Assessment of evidences for the selected indicators and external stakeholders consultations;
- Assessment of the evidences of external stakeholders consultations;
- Site visits (plant sites, offices)
- Based on sample testing, confirmation of the Sustainability

Report information with supporting documentation, management reports, internal controls and official correspondences.

Adherence to AA1000APS (2008) and GRI G4

Inclusivity – The report demonstrate commitment and accountability of the NTPC's to the internal and external stakeholders for the impact from the operations. The areas include the aspects of economy, environment, employment, community and others. Overall, the Report has satisfactorily presented the management approaches and the stakeholder engagement performed.

Materiality – The management has identified seven key materiality aspects which are Acquisition of land, Risks related to coal mining, Risks pertaining to Hydro Projects, Inadequate Fuel Supply, Delay in execution of projects, Compliance of emission, Ash sustaining efficient plant operations. The material aspects are in line with the short and long term sustainability goals. The Report presents data and information about sustainability performance of material aspects at different levels and is acceptable.

Responsiveness – In general responses to sustainability indicators at operational and local levels are addressed, this includes issues social needs, climate change mitigation, carbon footprints study, marine study, massive tree plantation, use of super critical technology, renewal energy etc. The numbers of practices are ongoing and implemented across plants and functions.

In "Accordance" with Comprehensive Option – The Report follows the Comprehensive option of GRI G4 where indicators of each material aspect is presented and discussed in the Report. When relevant, indicators of Power/Energy Sector Disclosures are also addressed and appropriately presented. The discussion on Disclosure of Management Approach (DMA) of material aspects in general is satisfactorily presented in the Report.

GRI G4 Principles – In developing the Report, the Reporting Organization has applied the Principles for Defining Report Content (stakeholder inclusiveness, sustainability context, materiality, and completeness) and the Principles for Defining Report Quality (balance, comparability, accuracy, timeliness, clarity, and reliability). Supporting documents were adequately presented as the evidence for assurance during the visit. As required by GRI G4, the Report identifies data and information that cannot be supported by evidences or cannot be presented due to management discretion or system and data administration issue.

Recommendation

On the basis of our assurance methodology and procedure, it is our opinion that future reports may be improved by addressing the following:

1. Sustainability Policy, needs linkage of organisational overall vision and mission and goals . Special focus required in participation, involvements and motivation levels to engage and driving sustainability at various levels.
2. Materiality and risk assessment may be followed using structured approach and available national/ international standards.
3. Climate change, Social and biodiversity are not among the material aspects though sustainability data and information on the same and management thereof is well presented in the Report. The Reporting Organization may consider these as material aspect because of their significance and influences on business.
4. Safety Practices in general are not in line with safety policy towards zero accidents. Safety mock drills, access controls needs to be assessed in view of the precise outcome.

Statement of Competency, Independency and Impartiality

SR Asia is an international organization among reputable organizations in Asian countries and promoting sustainable development through various activities, such as policy studies and advocacy, CSR studies and reporting, capacity building, researches, and various other services in sustainable development and sustainability.

The Assurance Team was consisted of a number of sustainability experts in ISO 26000, sustainability accounting standards of SASB, and the principles and standards of AA1000 AccountAbility, GRI Sustainability Reporting Guidelines, and International Integrated Reporting (IR) Framework. The experts also have experiences in writing and reviewing sustainability reports and integrated reports of organizations from various industries.

SR Asia has ensured no member of the Assurance Team has any relationships with the Reporting Organization that could be perceived to affect the ability to provide an independent and impartial statement. SR Asia confirms that sufficient mechanism and professional codes of practices are designed and in place to ensure independency and free from bias and conflict of interest.

The assurance provider,

India, 6th December 2017

Birendra Raturi

International Director of

Social Responsibility Asia (SR Asia)

AA1000 Licensed Assurance Provider xxxx-1

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