ANNUAL REPORT 2023-24

सत्यमेव जयते

Ministry of Power

Government of India

www.powermin.nic.in

MAP OF INDIA

SHOWING

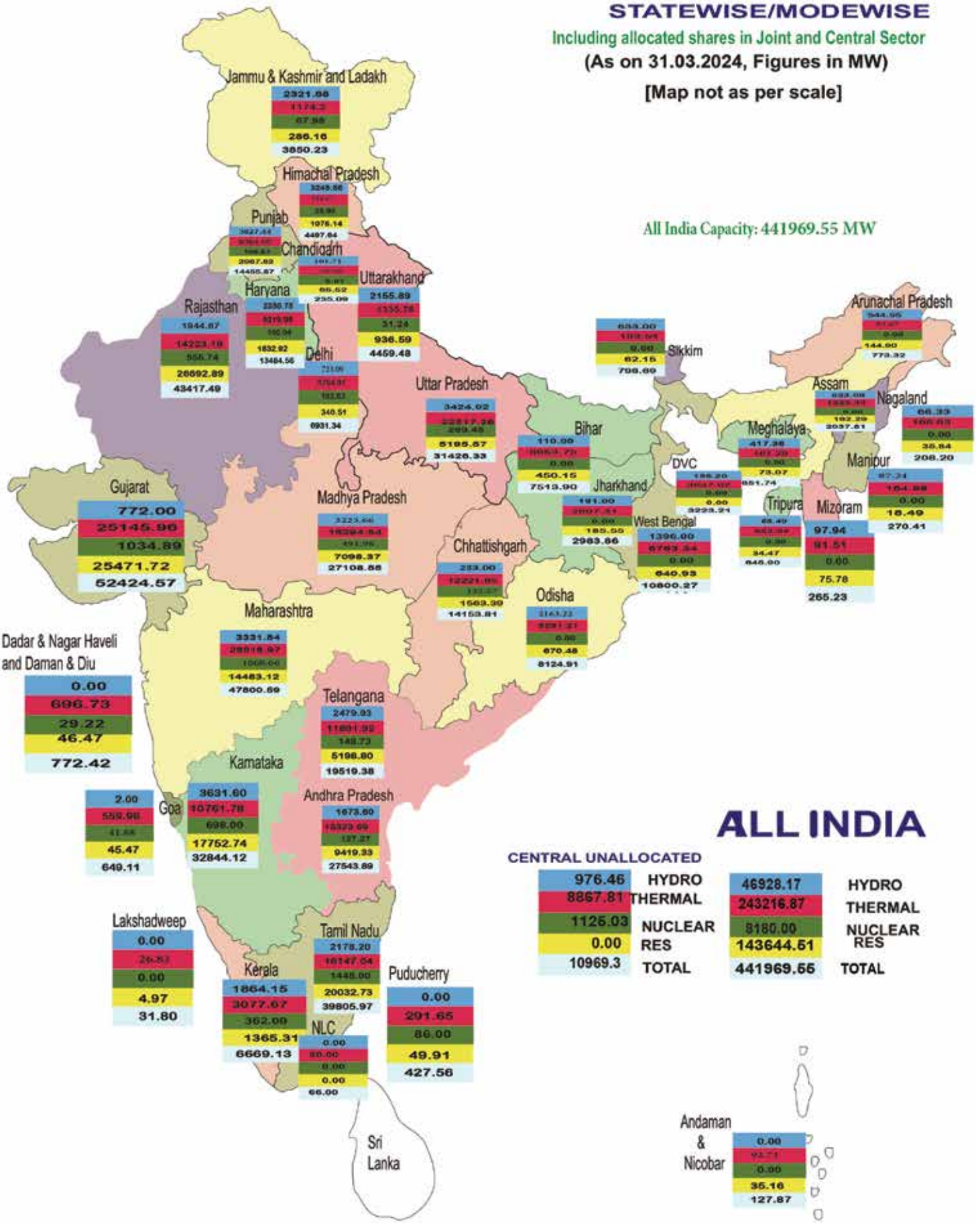
INSTALLED GENERATING CAPACITY STATEWISE/MODEWISE

Including allocated shares in Joint and Central Sector

(As on 31.03.2024, Figures in MW)

[Map not as per scale]

All India Capacity: 441969.55 MW



ALL INDIA

CENTRAL UNALLOCATED

976.46	HYDRO
8867.81	THERMAL
1125.03	NUCLEAR
0.00	RES
10969.3	TOTAL

46928.17	HYDRO
243216.87	THERMAL
8180.00	NUCLEAR
143644.51	RES
441969.55	TOTAL

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CONTENTS

CHAPTER 01

PERFORMANCE HIGHLIGHTS

Robust Transformation of the Power Sector

During the 2023-24, peak shortage was 1.4% and the energy shortage was 0.3% as compared to 4.0% and 0.5% respectively during the corresponding period last year.

Enhanced Generation

The total electricity generation including generation from renewable sources in the country during the 2023-24 was 1739.091 BU as against the generation of 1624.465 BU during the corresponding period last year, showing a growth of 7.06%.

Transmission Performance

India is world's largest synchronous grid by adding 1,94,208 circuit kilometers of transmission lines and 7,20,534 MVA of transformation capacity since April-2014 till March-2024 with Inter-Regional power transmission capacity of 1,18,740 MW, thus achieving. "One Nation – One Grid – One Frequency."

Promoting Use of Biomass in Thermal Power Plants

In order to reduce stubble burning and to reduce carbon footprint of Thermal Power Plants while increasing the income of farmers, Government of India has taken various proactive steps with the establishment of National Mission on Use of Biomass in Thermal Power Plants which is rechristened as Sustainable Agrarian Mission on use of Agri-Residue in Thermal Power Plants (SAMARTH). The agro-residue/ biomass earlier considered as a waste product has now begun to produce net zero-carbon electricity for the citizens of the country. In turn farmers are getting additional income by selling the stubble/ biomass for conversion into torrefied/ non-torrefied biomass pellets. For overall monitoring of the Mission and to facilitate the Mission on inter-ministerial issues/constraints, a Steering Committee under the chairmanship of Secretary, Ministry of Power (MoP) has been constituted. Ministry had notified a policy on "Biomass Utilization for Power Generation through Co-firing in Coal based Power Plants" in October 2021 that mandates all thermal power plants in the country to use 5 to 10% biomass along with coal for power production.

Further, MoP through a policy Addendum dated 03-05-2023 has indicated the various type of various agro residues such as stubble/straw/stalk/husk which are surplus and not being used as animal fodder for making the biomass pellets. This includes agro residue obtained from crops like Paddy, Soya, Arhar, Gwar, Cotton, Gram, Jawar, Bajra, Moong, Mustard, Sesame, Til, Maize, Sunflower, Jute, Coffee, etc. as well as Groundnut Shell, Coconut Shell, Castor Seed Shell etc. In addition, pellets made from the following agro product/crop/waste can also be used for co-firing in TPPs viz Bamboo and its by-products, Horticulture waste such as dry leaves and trimmings obtained from maintenance & pruning of trees and plants and other biomass such as Pinecone/ Needle, Elephant Grass, Sarkanda, etc.

The Ministry of Power issued modification on 16.06.2023 to revise the biomass policy of October 2021 and now it mandates 5% biomass co-firing in Thermal Power Plants (TPPs) from FY 2024-25. This obligation shall increase to 7% from FY 2025-26.

The Government has taken many initiatives to ensure the availability and procurement of biomass pellets for co-firing in TPPs like, Finance Assistance Schemes by MNRE and CPCB have been issued for biomass pellet manufacturing units, Reserve Bank of India (RBI) has approved 'Biomass pellet manufacturing' as an eligible activity under Priority Sector Lending (PSL), Procurement Provision of Biomass Category has been created on GeM portal, Revised Model long term contract for Biomass supply was issued by MOP, Vendor database on SAMARTH website, Awareness Programmes& Advertisement Campaign were carried out, Provision of Udyam Aadhaar on National Single Window System, Bankable Model Project Report for Biomass Pellet Plants, Provision for trading of Agro residue as commodity at MoA&FW's e-NAM portal etc.

With a view to promote and develop sustainable supply chain & at the same time to ensure faster procurement of biomass pellets for co-firing with coal in thermal power plants, the benchmark price for non-torrefied biomass pellets has been issued by Ministry of Power (MoP) on 23.08.2023 and 08.11.2023. The benchmark prices have been fixed as Rs 2.32, Rs 2.27 and Rs 2.24 per 1000 kcal (excluding GST & transportation cost from pellet manufacturing plant site to thermal power plant) for National Capital Region (NCR), Northern (excluding NCR) Region and Western Region respectively. This will also have a stability effect on the prices of raw biomass in the market.

The initiatives have started showing promising results. As on 31.03.2024, approximately 493320 metric tonnes (MT) since inception of biomass cofiring and in FY 23-24 approximately 374808 metric tonnes (MT)of biomass have been co-fired in thermal power plants in the country. Out of this, the biomass co-fired in the NCR region stands at 293628 MT since inception and258772 MTin FY 23-24.

Improved Coal Supply for Thermal Power Projects:

(i) At present there are total of 49 nos. coal blocks allocated to Central, State and Private sector Gencos.

12 nos. of coal blocks are allocated to Central Sector Genco, 33 nos. are allocated to State Sector Gencos, 02 nos. of coal block are allocated to Private Sector Gencos & 02 nos. of coal blocks are allocated to UMPP.

Till Mar'24; total of 33 (thirty three) nos. coal blocks have started producing coal including 02 nos. of UMPP coal blocks.

(ii) Based on the Ministry of Power inputs, Ministry of Coal vide letter dated 08.02.2016 has notified policy guidelines for grant of Bridge Linkage to specified end use plants of Central and State Public Sector Undertakings (Both in Power as well as Non-Power sector) which have been allotted coal mines or blocks. Till Mar'24, bridge linkage has been accorded to 35 nos. of Thermal Projects in Govt. Sector, totalling to 39870 MW capacity.

(iii) Linkage under SHAKTI Policy, 2017

Ministiy of Coal in May 2017 has formulated a new policy for allocation of coal to power sector named SHAKTI (Scheme for Harnessing and Allocating Koyala transparently in India), 2017. Since, the inception of the policy, coal linkage has been accorded to various Govt./ Private power utilities under its various provisions/ clauses. Status up to Mar'24 is as under:

a. Shakti Policy Para B (i):-

Policy: - CIL/SCCL may grant Coal linkages for Central Government, State Government Gencos and JVs fonned between or within CPSUs and State Govt./PSUs at the notified price of CIL SCCL.

Achievement: Till Mar'24, SLC (LT) has accorded coal Linkage to 47 nos. Thermal Power Projects totalling 58,680 MW to Central /State GENCOs. In FY 23-24, 11 nos. of Thermal Projects of capacity 16,120 MW have been allocated long term linkage.

b. Shakti Policy Para B (ii): -

Policy: - CIL/SCCL may grant coat linkages on notified price on auction basis for power producers/IPPs having already concluded long term PPAs (both under section 62 and section 63 of The Electricity Act, 2003) based on domestic coal.

Achievement: - Six rounds of auctions for coal linkage under Shakti B(ii) have been held till Mar'24.

Round of auction under Para B(ii)	Coal Quantity booked in G13 Grade (MTPA)	Number of successful bidders and maximum discount offered on tariff
1st Round (Sep'17)	32.68	10 plants, Max discount 4 Paisa
2nd Round (May'19)	3.335	8 plants, Max Discount 7 Paisa
3rd Round (May'20)	3.466	5 plants, Max Discount 10 Paisa
4th Round (Sept'21)	3.819	5 plants, Max discount 12 paisa
5th Round (Dec'22)	0.058	2 plants, Max Discount 12 Paisa
6th Round (Dec'23)	2.935	7 plants, Max Discount 19 Paisa

c. Shakti Policy Para B(iii): -

Policy: - CIL/SCCL may grant future coal linkages on auction basis for power producers/IPPs without PPAs that are either commissioned or to be commissioned. All such power producers/IPPs may participate in this auction and bid for premium above the notified price of the coal company. Coal drawl will be permitted only against valid long term and medium term PPAs, which the successful bidder shall be required to procure and submit within two years of completion of auction process.

Achievement: - Five rounds of auctions for coal linkage under Shakti B(iii) have been held till Mar'24.

Round of auction under Para B(iii)	Coal Quantity booked in G13 Grade (MTPA)	Premium offered in the auction
1st Round, Feb'2020	7.149	Max Premium Rs. 160 per ton
2nd Round, May'2022	7.011	Average premium is 2.0%.
3rd Round, Sept'2022	5.570	Premium is Zero.
4th Round, Jan'2023	4.868	Average premium is 1.8%.
5th Round, Dec'2023	7.636	Average premium is 4.6%.

d. Shakti Policy Para B(iv): -

Policy: - In this clause coal linkage may be earmarked to the states for fresh PPAs, by predeclaring the availability of coal linkage with description. States may indicate these linkages to Discoms/State Designated Agencies (SDA). The states/Discoms may, based on such linkage,undertake tariff based competitive bidding for long-term and medium-term procurement of Power.

Achievement: - Till Mar'24, SLC (LT) has earmarked coal Linkage to 05 nos. of states for a capacity of 10,819 MW. In FY 2023-24, coal have been eannarked to 03 nos. of States for a capacity of 6,499 MW.

e. Shakti Policy Para B(v): -

Policy: - In this clause, Power requirement of group of States can also be aggregated and procurement of such aggregated power can be made by an agency designated by Ministry of Power or authorized by such States on the basis of tariff based bidding. Coal linkages will be earmarked for such agencies by pre-declaring the availability of coal linkage with description, based on which such agency will undertake tariff based competitive bidding for long-term and medium-term procurement of power and recommend grant of these linkages to successful bidders.

Achievement: - Under this clause, In FY 23-24, PFCCL (designated agency by MoP) invited bids for 4500 MW and issued LOAs for 1560.25 MW.

f. Shakti Policy Para B(viii)(a): -

Policy: - All such power plants including private generators which do not have PPAs, shall be allowed coal linkage under SHAKTI Policy for a period of

minimum 3 months and upto a maximum of 1 year, provided further that the power generated through that linkage is sold through any product in power exchanges or in short term through a transparent bidding process through Discovery of Efficient Energy Price (DEEP) portal.

Achievement: - Seventeen rounds of auctions for coal linkage under SHAKTI B(viii)(a) have been held till Mar'24:

Tranches no. of auction under Para B(viii)(a)	Coal Quantity booked in G13 Grade (MTPA)	Number of successful bidders and Avg. Premium over notified price
Tranche-1 (Apr-Jun'20)	1.34	9 plants, Avg. Premium NIL
Tranche-2 (July-Sep'20)	0.63	8 plants, Avg. Premium NIL
Tranche-3 (Oct-Dec'20)	0.35	6 plants, Avg. Premium NIL
Tranche-4 (Jan-Mar'21)	0.64	7 plants, Avg. Premium 1.4%
Tranche-5 (Apr-Jun'21)	1.07	8 plants, Avg. Premium 0.4
Tranche-6 (July-Sep'21)	0.82	8 plants, Avg. Premium NIL
Tranche-7 (Oct-Dec'21)	1.81	8 plants, Avg. Premium 1.2%
Tranche-8 (Jan-Mar'22)	1.45	11 plants, Avg. Premium 2.95%
Tranche-9 (Apr-Jun'22)	6.13	16 plants, Avg. Premium 152%
Tranche-10 (Jul-Sep'22)	4.25	27 Plants, Avg. Premium 320%
Tranche-11(Oct-Dec'22)	6.01	22 Plants, Avg. Premium 133%
Tranche-12(Jan-Mar'23)	5.39	26 Plants, Avg. Premium 139%
Tranche-13(Mar-May'23)	3.67	21 Plants, Avg. Premium 38%
Tranche-14(May-Jul'23)	3.49	25 Plants, Avg. Premium 24%
Tranche-15(Aug-Oct'23)	4.82	28 Plants, Avg. Premium 60%
Tranche-16(Oct'23-Mar'24)	10.6	33 Plants, Avg. Premium 42%
Tranche-17(Nov'23-Jan'24)	2.09	16 Plants, Avg. Premium 15%

Coal Stock Position:

The coal stock position for thermal power plants (185 nos. as on 31.03.2024) is monitored in Central Electricity Authority on daily basis for regular/ smooth supply of coal. With regular monitoring and follow up with coal companies and Railways, the coal stock position has now become comfortable. As on 31.03.2024, the total coal stock reported by the power utilities was 50.69 Million Tonnes (MT). An overview of source wise coal received in coal based thermal power stations during 2022-23 and 2023-24 is given below:

Source	Coal Receipt in Million Tonnes	
	FY 2022-23 (April,2022 till March,2023)	FY 2023-24 (April,2023 till March,2024)
Coal India Ltd. (CIL)	557.9	593.0
Singareni Collieries Co. Ltd. (SCCL)	57.5	63.2
Captive Mines	86.3	106.9
E-auction	29.9	35.6
Import (Blending purposes)	35.1	23.9
Import (Import coal based plants)	20.5	41.8
Total Receipt	**787.3**	**864.4**

* Figures are Tentative

As reported by the power utilities, the total coal consumption by the power plants monitored in CEA, during 01.01.2023 to 31.03.2023 was about 201.7 MT and during 01.04.2023 to 31.03.2024 was about 849.7 MT.

Achievements in Energy Conservation

Perform Achieve and Trade (PAT) scheme

The Perform, Achieve and Trade (PAT) scheme is a mechanism designed to achieve energy reduction in energy intensive industries and it is designed on the concept of reduction in Specific Energy Consumption (SEC). It involves assessment of SEC in the baseline year and projected SEC in the target year covering different forms of net energy going into the boundary of the plant and the products leaving out of it over a particular cycle. So far eight (08) cycles have been notified covering more than 1333 units from 13 sectors. The programme has saved energy worth Rs. 55,000 crore annually and about 110 million ton of CO_2 emissions have been avoided. PAT Cycle – VII has been notified commencing from 2022-23 to 2024-25 wherein 707 Designated Consumers from 9 sectors have been notified with total energy consumption reduction target of 8.485 MTOE.

Standard and Labelling (S&L) Programme

The Standards and Labelling (S&L) Program is one of the major thrust areas of BEE. This Program was launched with the key objective of providing consumers an informed choice about the energy and cost saving potential of the labelled appliances/ equipment being sold commercially. This program entails laying down minimum energy performance norms for appliances / equipment, rating the energy performance on a scale of 1 to 5, 5 star being the most energy efficient one. As on March 2024, the

S&L program covers the star labeling for 38 appliances, out of which 16 appliances are under mandatory regime and remaining 22 appliances are under voluntary phase. S&L program has led to savings of 81.64 BU and 18419 toe during 2022-23 due to interventions carried out during the FY 2018-23. Achieved a reduction of 58.19 Mn tonne of carbon dioxide emissions.

Guidelines & Standards for Charging Infrastructure for Electric Vehicles

Ministry of Power issued the revised consolidated Guidelines & Standards for charging infrastructure on 14th Jan 2022 with subsequent amendments on 7th Nov 2022, & 27th April 2023. The salient features of revised guidelines and standards are as under:

(i) Land support for deployment of Public EV charging stations: With the objective of enhancing the availability and affordability of land parcels, to entities interested in setting up Public EV charging stations across the country , the Ministry of Power has made a revenue sharing model, in terms of which the land available with Government/ Public entities can be provided to another Government/ Public entity on a revenue sharing basis of Rs.1/kWh and to any private entity on a bidding basis with floor price of Rs.1/kWh

(ii) Electricity support for deployment of Public EV charging stations:

a) MoP Guidelines & Standards for EV charging infrastructure permits the EV owners to use existing electricity connections available at residences / office to charge their EVs.

b) Electricity supply Tariff to a Public EV charging station shall be single part not exceeding the Average Cost of Supply (ACoS) notified by the Appropriate Commission till 31.03.2025. This tariff shall be applicable for Battery Charging Stations (BCS) also.

c) A maximum service fee of Rs 2.50 per unit of electricity during solar hours i.e. from (9 am to 4 pm) and Rs 3.50 per unit during non-solar hours can be charged by a public charging station from an EV user. Similarly, for DC charging a maximum service fee of Rs 10 per unit and Rs 12 per unit of electricity can be charged by a public charging station from a customer during the solar and non-solar hours respectively.

d) A discount of 20% in the Average cost of supply (ACoS) of electricity by DISCOMs to a public EV charging station shall be applicable during solar hours. Similarly, during non-solar hours, a surcharge of 20% shall be applicable on Average cost of supply of electricity.

e) Further, Electricity (Rights of Consumers) Amendment Rules, 2024 require the distribution licensee to release connections for EV charging stations as per following timelines:

- Within three (3) days in metropolitan areas, seven (7) days in other municipal areas and fifteen (15) days in rural areas.

  Provided that for rural areas having hilly terrain, the maximum time period for providing new connection or modifying an existing connection, after submission of application, complete in all respects, shall not exceed thirty (30) days.

  Provided further that where such supply requires extension of distribution mains, or commissioning of new sub-stations, the distribution licensee shall supply electricity within a period not exceeding ninety (90) days.

f) Permits Public Charging Stations/chain of charging stations to obtain electricity from any generation company through open access. Stipulates a timeline of 15 days for grant of Open access. Specifies levy of cross subsidy charges (not more than 20% as per Tariff Policy Guidelines), transmission charges and wheeling charges shall be applicable on PCS for obtaining electricity through open access.

g) Specify requirements of Public Charging Infrastructure (PCI), PCI for long range EVs and/or heavy duty EVs, Location of PCS, Database of Public EV charging stations, Tariff for supply of electricity to EV PCS and service charge at PCS.

"Go Electric" Campaign

Ministry of Power launched the "GO ELECTRIC" Campaign on 19th February 2021.The objective of this campaign is to create awareness among masses about benefits of switching over to Electric Vehicles (EVs), including various initiatives taken by Centre & State Governments to enhance acceptability of Electric Vehicles, and Electrical Cooking. This campaign is being implemented through State Nodal Agencies (SNAs) designated by States for coordinating activities related to rolling out Public Charging Infrastructure in States. Under 'GO ELECTRIC' Campaign, states have conducted 193 nos. of webinars, 114 nos. of EV roadshows / EV Rally and 175 other awareness activities such as radio jingles, poster / leaflets distribution, awareness through social media platform, street plays, etc. in coordination with Bureau of Energy Efficiency.

Road shows are being organized to connect with the masses and spread the message about benefits of switching to electrical cooking and Mobility.

"EV Yatra" web portal and Mobile Application

BEE launched "EV Yatra" web-portal & Mobile App on 14th Dec 2022 with the objective of creating awareness

among the EV users and masses at large to promote e-mobility in the country. The portal has been developed to evolve as a National online database of operational public EV charging stations, in the country wherein an EV users can check availability of the nearest compatible EV charger for complaint with their electric vehicles in addition to other services. The web-portal may be accessed at https://evyatra.beeindia.gov.in/. There are 16,348 public EV Charging stations mapped on EV Yatra Web-portal as on 31.03.2024

EV Accelerator Cells

BEE is supporting State Nodal Agencies in creation of EV Accelerator Cell in seven states (Maharashtra, Delhi, Tamil Nadu, Telangana, West Bengal, Gujarat, and Karnataka) under "GO ELECTRIC" Campaign. Currently, Telangana, West Bengal, Maharashtra, Tamil Nadu and Uttar Pradesh have established EV Accelerator Cell.

Developed Guidebook on EV Charging Infrastructure in India for the use of State Nodal Agencies, and other State Agencies with the objective of highlighting the Central and State Level initiatives requiring harmonization to accelerate deployment of public EV charging infrastructure in India.

Hon'ble Minister of Power & NRE launched Annual publication titled "EV Digest" a comprehensive report on current status of Indian e-mobility ecosystem on 1st March, 2024.

Creation of India Carbon Market

The challenge of meeting future NDC goals makes it imperative that market measures are promoted to facilitate gradual decarbonization of the economy. A robust carbon market mechanism will enable active participation of the public and private stakeholders in decarbonization efforts, in all potential sectors. To facilitate the achievement of India's enhanced NDC targets in cost effective manner, the Government intended to develop a robust framework for the Indian Carbon Market (ICM) with an objective to decarbonize the Indian economy by pricing the GHG emission through trading of the carbon credit certificates. To develop the carbon market, the regulatory framework is established under the Energy Conservation Amendment Act, 2022, where clause (w) of section 14 of the EC Act empowers the Central Government in consultation with the Bureau of Energy Efficiency (Bureau) to specify the carbon credit trading scheme. On the above basis, the Central Government has notified the Carbon Credit Trading Scheme vide notification S.O. 2825(E), dated 28th June 2023 and amendment notification S.O. 5369(E), dated 19th December 2023.

The scheme defines the two mechanisms namely, compliance mechanism and offset mechanism. In the compliance mechanism, the obligated entities shall comply with the prescribed GHG emission reduction norms in each compliance cycle of CCTS. The obligated entities who reduce their GHG emission intensity below the prescribed GHG emission intensity shall be eligible for issuance of Carbon Credit Certificates. In the offset mechanism, the non-obligated entities can register their projects for GHG emission reduction or removal or avoidance for issuance of Carbon Credit Certificates.

Unnat Jyoti by Affordable LEDs for ALL (UJALA):

Hon'ble Prime Minister, on 5th January 2015 launched UnnatJyoti by Affordable LED for All (UJALA) programme. Under UJALA scheme, LED bulbs, LED Tube lights and Energy efficient fans are being sold to the domestic consumers for replacement of conventional and inefficient variants. Across India, 36.87 Crore LED bulbs and 72 Lakh LED Tube lights have been distributed by EESL. As per the Data from Lighting Industry, approximately 382 Crore LED Bulbs and 151 Crore LED Tube Lights have been sold by the private industry, in addition to the bulbs and tube lights distributed by EESL.This has resulted in estimated energy savings of 176.2 billion kWh per year, GHG emission reduction of 125 million tonne CO2 per year and estimated annual monetary savings of INR 70,477 crore in consumer electricity bills. The above programme has been successful in creating the market for above appliances by bring down their price significantly and making them affordable for consumers.

Street Lighting National Programme (SLNP)

Hon'ble Prime Minister, on 5thJanuary, 2015 launched Street Lighting National Programme (SLNP) to replace conventional street lights with smart and energy efficient LED street lights across India. Till date, EESL has installed over 1.30 crore LED Street Lights in ULBs and Gram Panchayats across India. This has resulted in estimated energy savings of 8.76 billion kWh per year with avoided peak demand of 1,459 MW, GHG emission reduction of 6.03 million t CO2 per year and estimated annual monetary savings of INR 6,130 crore in electricity bills of municipalities.

Conference of Power and New & Renewable Energy Ministers of States& UTs

The conference of Power and Renewable Energy Ministers of State / UTs was held 6th to 7th November,2023 in Bharat Mandapam, Pragati Maidan, New Delhi. Shri R.K Singh, the Hon'ble Union Minister for Power and NRE chaired the conference. Chief Minister/ Deputy CM/ Power/ NRE Ministers of States along with Principal Secretaries of States and UTs attended the event.

During the Conference, detailed deliberations were held with focus on Financial Viability & Sustainability of distribution sector, Modernization & upgradation of power systems, Rights of Electricity Consumers, Pump Storage Projects and overall development of Power Sector. The States provided their inputs and suggestions on each of these pertinent issues.

CHAPTER 02

ORGANISATIONAL SET-UP

Shri Manohar Lal assumed charge as the Minister of Power with effect from the 11th June, 2024.

Shri Shripad Yesso Naik assumed charge as the Minister of State for Power with effect from the 11th June, 2024.

Shri Pankaj Agarwal assumed charge as Secretary in the Ministry of Power with effect from the 1st July, 2023. The Ministry has sanctioned strength of two Additional Secretaries, one Financial Adviser, four Joint Secretaries and one Economic Adviser. Presently one post of Additional Secretary, one post of Financial Adviser and Four posts of Joint Secretaries are filled up.

Sh. Srikant Nagulapalli, Additional Secretary, oversees Transmission including Power Grid Corporation of India Limited & Grid Integration of Renewable Energy; Coordination Reforms and Restructuring; Regulatory Compliance Monitoring and New & Renewable energy; Electricity Act, 2003; Tariff Policy; Central Electricity Regulatory Commission; Joint Electricity Regulatory Commission; Appellate Tribunal for Electricity; Standard Bidding Documents for Procurement of Power; Policy & Planning; Power Projects; Monitoring Panel; All Tax related Matters; e-Samiksha; PRAGATI portal; Hydro Power including NHPC Ltd, SJVNL, North Eastern Electric Power Corporation Ltd, THDC India Ltd, Bhakra Beas Management Board, Environment Management for Hydro Projects; Hydro Projects in SAARC countries; G-20; International Cooperation, Media and Information Technology & Cyber Security.

The allocation of work amongst the Joint Secretaries in the Ministry of Power is as under:

Shri Piyush Singh, Joint Secretary look after the work of Thermal Power, NTPC; Damodar Valley Corporation; Ultra Mega Power Project; Fuel Supply; Fuel Supply Agreements; Annual Contracted Quantity (ACQ) Matters; Monitoring of Coal to Thermal Power Plants; Administration and Training & Research including Central Power Research Institute & National Power Training Institute.

Shri Mohammad Afzal, Joint Secretary look after the work of Hydro Power including NHPC, SJVNL, North Eastern Electric Power Corporation, THDC India, Bhakra Beas Management Board, Environment Management for Hydro Projects; Hydro Projects in SAARC countries; Parliament; Public Grievance; Right To Information (RTI); Reservation; Record.

Shri Shashank Misra, Joint Secretary looks after Distribution & Reforms, Distribution and Utility Reforms & Special Intervention.

Shri D Sai Baba, Joint Secretary oversees Transmission including Power Grid Corporation of India Limited & Grid Integration of Renewable Energy; Coordination and Vigilance & Security. Further, Shri Sai Baba holds link Officer charge to EA and looks after Policy & Planning; Power Projects; Monitoring Panel; All Tax related Matters; e-Samiksha; PRAGATI portal;
Two Chief Engineers **Shri Hemant Panday and Shri D. K. Shrivastava** from Central Electricity Authority are taken on loan basis to assist the work relating to Reforms and Restructuring; Regulatory Compliance Monitoring ; Electricity Act, 2003; Tariff Policy; Central Electricity Regulatory Commission; Joint Electricity Regulatory Commission; Appellate Tribunal for Electricity, Standard Bidding Documents for Procurement of Power and Energy Conservation, Energy Transition & Electric Vehicle; Power Project Monitoring.

Further, there is a Principal Accounts Office headed by the Chief Controller of Accounts who in turn reports to the Financial Adviser in the Ministry of Power. Matters relating to reservations for SC/ST, Physically disabled and Ex-Servicemen in the Ministry including Public Sector Undertakings under its administrative control are dealt with by the Deputy Secretary/Director Level Officer who is also the Liaison Officer for SC/ST and another Deputy Secretary level officer is the Liaison officer for Other Backward Classes.

ORGANISATION STRUCTURE OF THE MINISTRY OF POWER

SHRI MANOHAR LAL, MINISTER OF POWER

SHRI SHRIPAD YESSO NAIK MINISTER OF STATE FOR POWER

SHRI PANKAJ AGARWAL SECRETARY(POWER)

Sh. Srikant Nagulapalli AS(SN)

CEA

Chairperson (Sh. Ghanshyam Prasad)

Member (Thermal) (Praveen Gupta)

Member (Hydro) (**Vacant**) [Additional Charge given to Chairperson, CEA]

Member(Planning) (A Balan)

Member (Power System) (A K Rajput)

Member (Grid Operation & Distribution) (Hemant Jain)

Member (Eco.& Commercial) (A Telegaonkar)

Sh. Mahabir Prasad JS&FA

Internal Finance & Budgetary Control

Sh. Shashank Misra Jt. Secretary

Distribution & Reforms

•Distribution
•UR&SI

Sh. Piyush Singh JS (PS)

Thermal Power
. NTPC
. DVC
. UMPP
. IPC
. Fuel Supply
• Fuel Supply Agreements
• ACQ Matters
• Monitoring of Coal to Thermal Power Plants

Administration

OM (including Grid India)

T&R

Sh. Dr. D Sai Baba JS(SBD)

•Transmission
• Power Grid
• Grid Integration of Renewable Energy
• **V&S #**
•Coordination

Sh. Hemant Kumar Pandey CE (HKP)*

• **Reforms and Restructuring**
• **RCM & NRE**
• Electricity Act, 2003
• Tariff Policy
• CERC
• JERC
• APTEL
• Std. Bidding Documents for Procurement of Power

Sh. Mohammad Afzal JS(MA)

Hydro Power including NHPC, SJVNL, NEEPCO, THDC, BBMB, Environment Management for Hydro Projects. Hydro Projects in SAARC countries

•Parliament#
•Public Grievance#
•RTI#
•Reservation#
•Record#

Economic Adviser [Sh Rakesh Kumar, JD]**

•Policy & Planning
. Power Projects Monitoring Panel
. All Tax related Matters
. e-Samiksha
. PRAGATI portal

Sh Dhiraj Kr Srivastava CE(DKS)*

•ECET&EV
•Power Project Monitoring
•Official Language#

IC, G-20, Media and IT&CS [Through DS(IC & IT)]

#Directly reporting to Secy (P)

*CE(DKS) and CE(HKP) are working on loan basis from CEA.

**Shri Rakesh Kumar, JD is looking after the work which was earlier assigned to EA and is reporting directly to AS(SN) for P&P and to JS (PS) for T&R

R&R - *Enactment of Legislation & framing of policies thereunder (Electricity Act 2003, Tariff Policy & National Electricity Policy etc.), Implementation of Electricity Act, 2003, Tariff Policy and National Electricity Policy. Matters relating to CERC/ SERCs/JERCs and Appellate Tribunal for Electricity, Reform & Restructuring of power sector of States/ UTs. Formulation of Guidelines and Standard Bidding Documents (SBDs) for procurement of power.*

IT Cell *- Ensure Information & Communication Technology and e-governance implementation in MoP in coordination with NIC*

PGCIL*- All matters of PGCIL & its implemented Trans projects. Central Transmission Projects and Utility, National Power Grid, Exchange of Power with neighboring countries by Transmission project implemented by Power Grid. Renewable Energy, Separation of CTU from PGCIL, General Network Access (GNA).*

Sh. Srikant Nagulapalli
Additional Secretary

Sh. Benjamin Karunakaran
DS (IC, G-20, Media and IT&CS)

R&R [Through CE (HKP)]

Transmission [Through JS (SBD)]

Hydro [Through JS (MA)]

Sh. R.K. Katiyar
US (IC and IT&CS Desk)

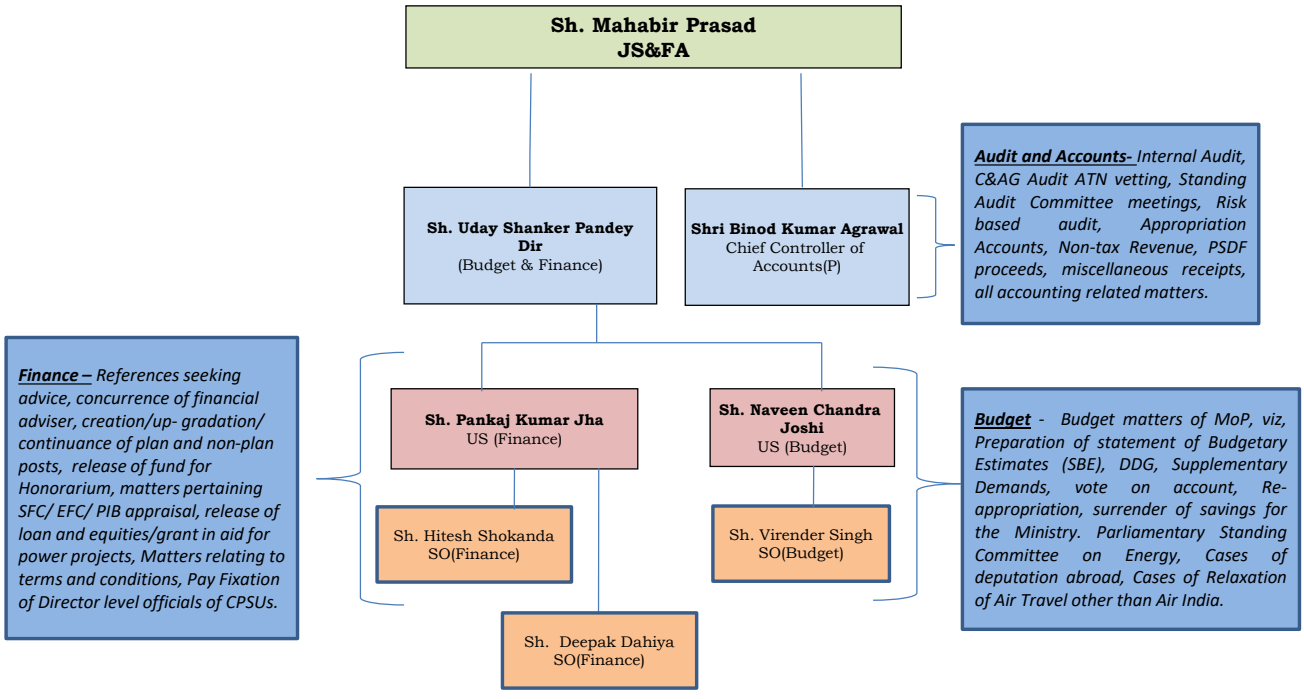
Sh. Naveen Sharan
SO (IC)

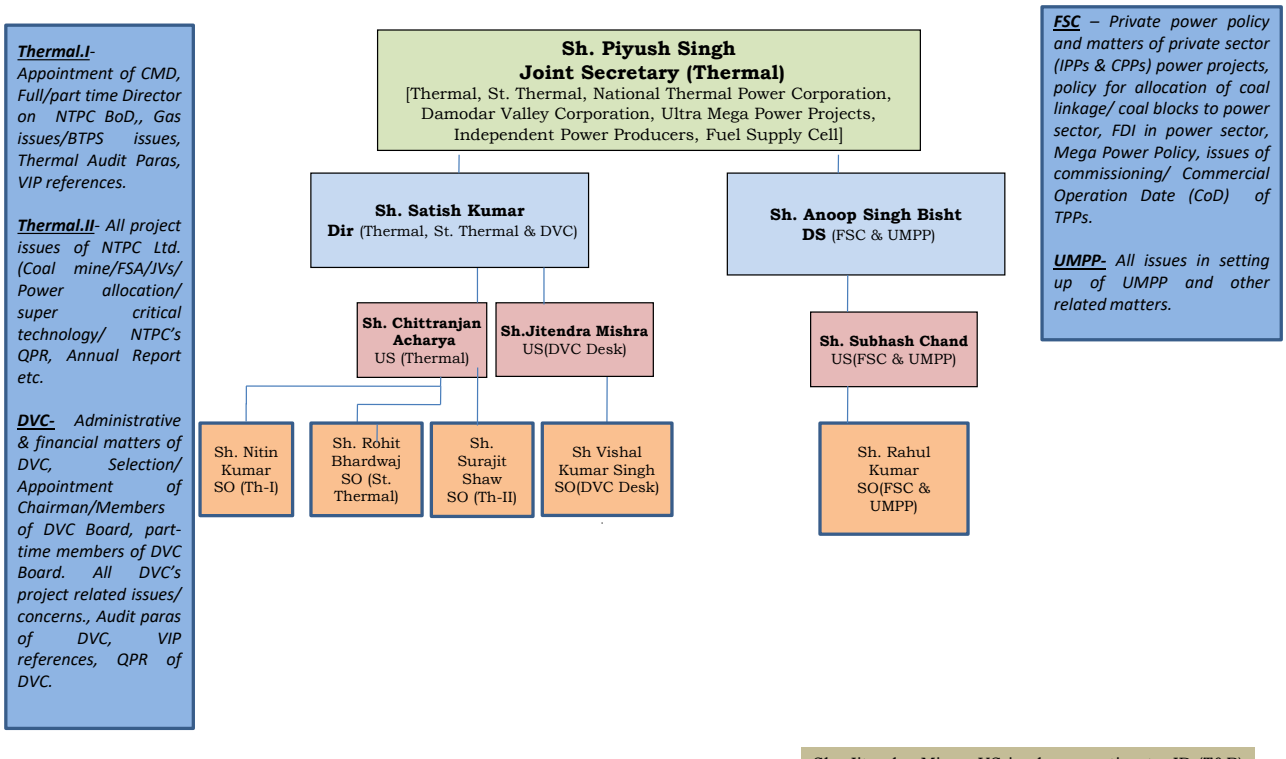
Paritosh Gupta
SO (IT&CS)

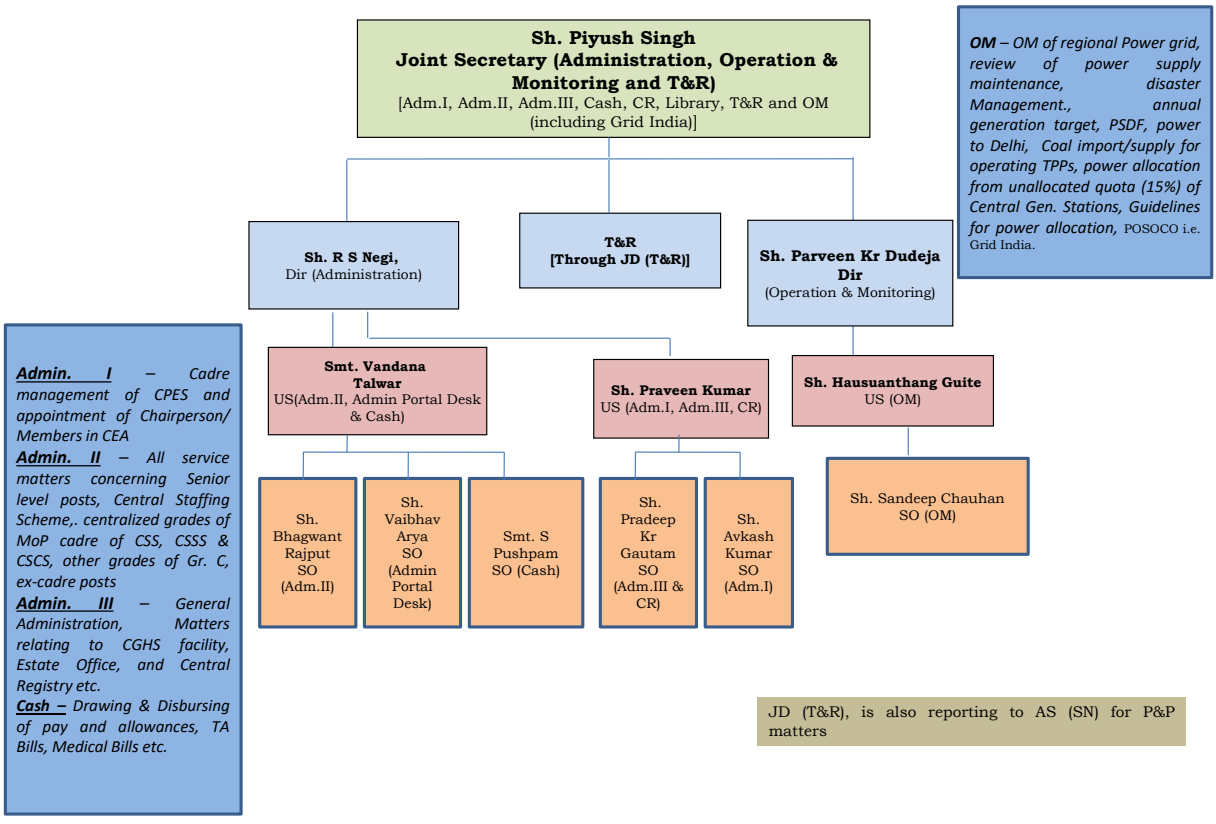
Transmission *– All States/UTs Transmission Projects, REBs/RLDs, PLCC/PTCC matters, Cross Border Trade of Power with neighboring countries, Srinagar-Leh Transmission Project, NERPSIP, Comprehensive Scheme for improvement of Transmission and Distribution System in Arunachal Pradesh and Sikkim, Perspective Transmission Plan.*

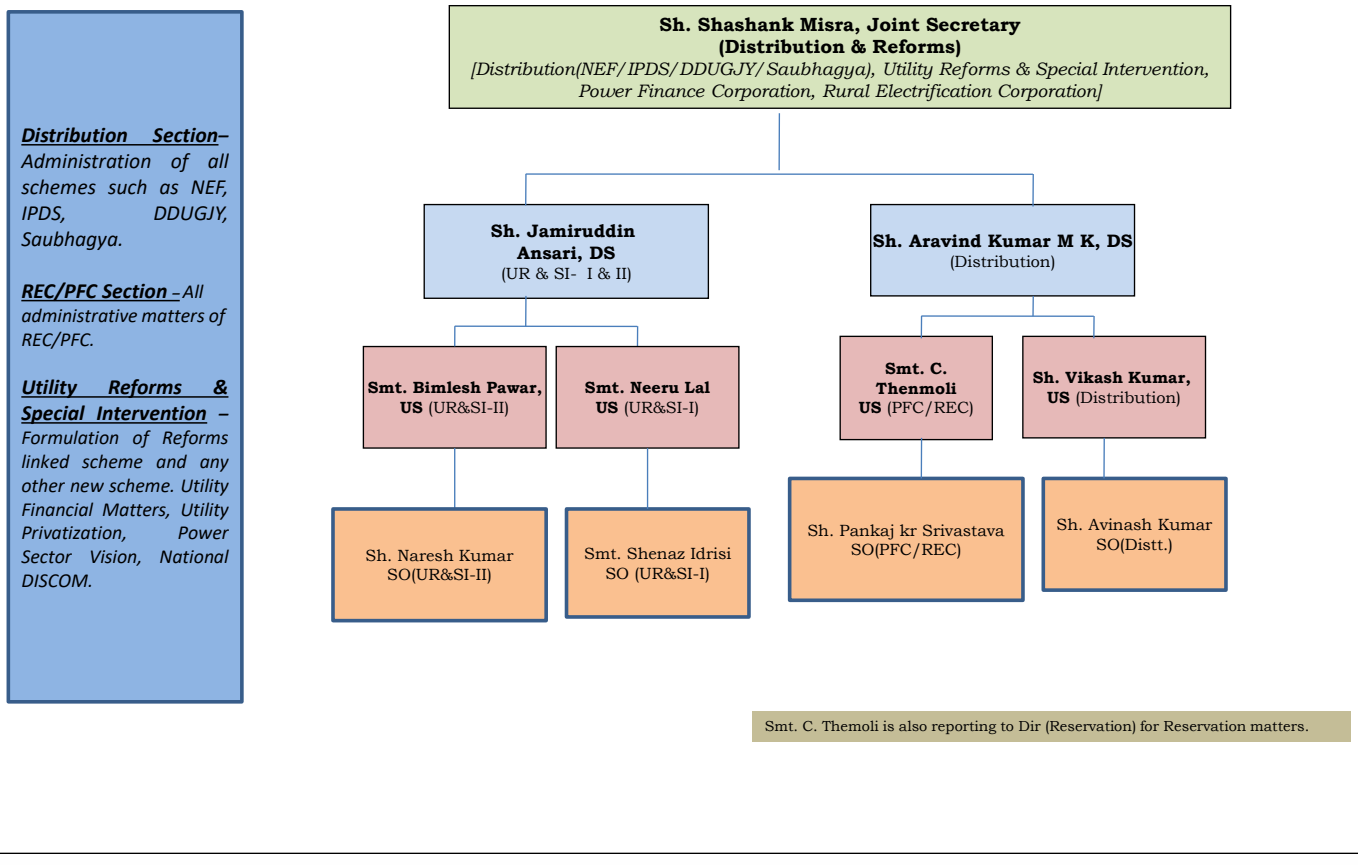
IC Cell – *Matters relating to international cooperation with various countries/multilateral agencies in the power sector (except renewable energy), Tie up of external assistance/ multi lateral funds, Joint Working Group & Joint Commission meetings, Energy Dialogues/ Forum, Updating the country briefs and notes for meetings of foreign dignitaries, Deputation/Delegation abroad, Inter ministerial coordination and consultation for matters relating to international cooperation.*

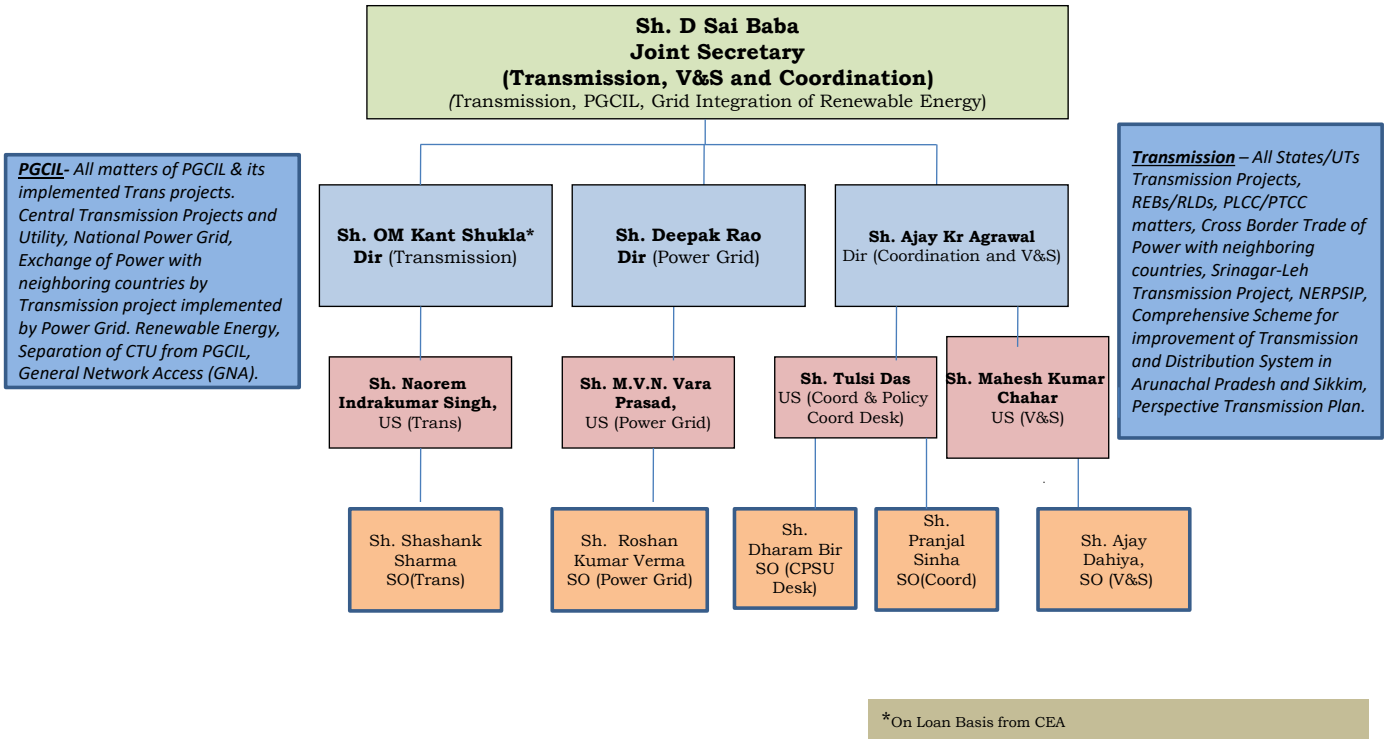
AS (SN) is also looking after the work of P&P through JD (P&P)

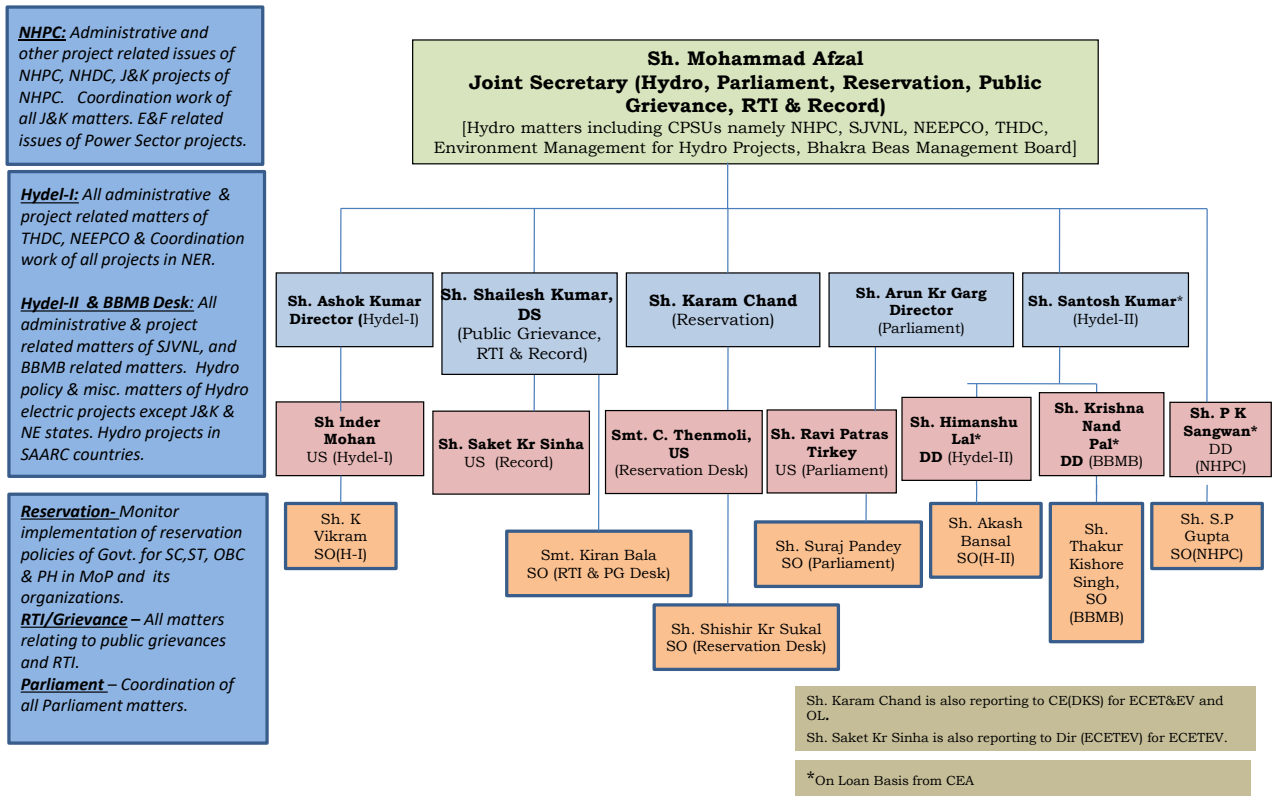

Sh. Mahabir Prasad
JS&FA
Sh. Uday Shanker Pandey
Dir
(Budget & Finance)
Shri Binod Kumar Agrawal
Chief Controller of Accounts(P)
Audit and Accounts- Internal Audit, C&AG Audit ATN vetting, Standing Audit Committee meetings, Risk based audit, Appropriation Accounts, Non-tax Revenue, PSDF proceeds, miscellaneous receipts, all accounting related matters.
Finance – References seeking advice, concurrence of financial adviser, creation/up- gradation/ continuance of plan and non-plan posts, release of fund for Honorarium, matters pertaining SFC/ EFC/ PIB appraisal, release of loan and equities/grant in aid for power projects, Matters relating to terms and conditions, Pay Fixation of Director level officials of CPSUs.
Sh. Pankaj Kumar Jha
US (Finance)
Sh. Naveen Chandra Joshi
US (Budget)
Budget - Budget matters of MoP, viz, Preparation of statement of Budgetary Estimates (SBE), DDG, Supplementary Demands, vote on account, Re-appropriation, surrender of savings for the Ministry. Parliamentary Standing Committee on Energy, Cases of deputation abroad, Cases of Relaxation of Air Travel other than Air India.
Sh. Hitesh Shokanda
SO(Finance)
Sh. Virender Singh
SO(Budget)
Sh. Deepak Dahiya
SO(Finance)


Thermal.I- Appointment of CMD, Full/part time Director on NTPC BoD,, Gas issues/BTPS issues, Thermal Audit Paras, VIP references.
Thermal.II- All project issues of NTPC Ltd. (Coal mine/FSA/JVs/ Power allocation/ super critical technology/ NTPC's QPR, Annual Report etc.
DVC- Administrative & financial matters of DVC, Selection/ Appointment of Chairman/Members of DVC Board, part-time members of DVC Board. All DVC's project related issues/ concerns., Audit paras of DVC, VIP references, QPR of DVC.
Sh. Piyush Singh
Joint Secretary (Thermal)
[Thermal, St. Thermal, National Thermal Power Corporation, Damodar Valley Corporation, Ultra Mega Power Projects, Independent Power Producers, Fuel Supply Cell]
Sh. Satish Kumar
Dir (Thermal, St. Thermal & DVC)
Sh. Anoop Singh Bisht
DS (FSC & UMPP)
FSC – Private power policy and matters of private sector (IPPs & CPPs) power projects, policy for allocation of coal linkage/ coal blocks to power sector, FDI in power sector, Mega Power Policy, issues of commissioning/ Commercial Operation Date (CoD) of TPPs.
UMPP- All issues in setting up of UMPP and other related matters.
Sh. Chittranjan Acharya
US (Thermal)
Sh.Jitendra Mishra
US(DVC Desk)
Sh. Subhash Chand
US(FSC & UMPP)
Sh. Nitin Kumar
SO (Th-I)
Sh. Rohit Bhardwaj
SO (St. Thermal)
Sh. Surajit Shaw
SO (Th-II)
Sh Vishal Kumar Singh
SO(DVC Desk)
Sh. Rahul Kumar
SO(FSC & UMPP)
Sh. Jitendra Misra, US is also reporting to JD (T&R) for T&R Matters.
JD (T&R), is also reporting to AS (SN) for P&P matters


Sh. Piyush Singh
Joint Secretary (Administration, Operation & Monitoring and T&R)
[Adm.I, Adm.II, Adm.III, Cash, CR, Library, T&R and OM (including Grid India)]
OM – OM of regional Power grid, review of power supply maintenance, disaster Management., annual generation target, PSDF, power to Delhi, Coal import/supply for operating TPPs, power allocation from unallocated quota (15%) of Central Gen. Stations, Guidelines for power allocation, POSOCO i.e. Grid India.
Sh. R S Negi, Dir (Administration)
T&R [Through JD (T&R)]
Sh. Parveen Kr Dudeja Dir (Operation & Monitoring)
Admin. I – Cadre management of CPES and appointment of Chairperson/ Members in CEA
Admin. II – All service matters concerning Senior level posts, Central Staffing Scheme,. centralized grades of MoP cadre of CSS, CSSS & CSCS, other grades of Gr. C, ex-cadre posts
Admin. III – General Administration, Matters relating to CGHS facility, Estate Office, and Central Registry etc.
Cash – Drawing & Disbursing of pay and allowances, TA Bills, Medical Bills etc.
Smt. Vandana Talwar US(Adm.II, Admin Portal Desk & Cash)
Sh. Praveen Kumar US (Adm.I, Adm.III, CR)
Sh. Hausuanthang Guite US (OM)
Sh. Bhagwant Rajput SO (Adm.II)
Sh. Vaibhav Arya SO (Admin Portal Desk)
Smt. S Pushpam SO (Cash)
Sh. Pradeep Kr Gautam SO (Adm.III & CR)
Sh. Avkash Kumar SO (Adm.I)
Sh. Sandeep Chauhan SO (OM)
JD (T&R), is also reporting to AS (SN) for P&P matters


Distribution Section– Administration of all schemes such as NEF, IPDS, DDUGJY, Saubhagya.
REC/PFC Section – All administrative matters of REC/PFC.
Utility Reforms & Special Intervention – Formulation of Reforms linked scheme and any other new scheme. Utility Financial Matters, Utility Privatization, Power Sector Vision, National DISCOM.
Sh. Shashank Misra, Joint Secretary (Distribution & Reforms)
[Distribution(NEF/IPDS/DDUGJY/Saubhagya), Utility Reforms & Special Intervention, Power Finance Corporation, Rural Electrification Corporation]
Sh. Jamiruddin Ansari, DS (UR & SI- I & II)
Sh. Aravind Kumar M K, DS (Distribution)
Smt. Bimlesh Pawar, US (UR&SI-II)
Smt. Neeru Lal US (UR&SI-I)
Smt. C. Thenmoli US (PFC/REC)
Sh. Vikash Kumar, US (Distribution)
Sh. Naresh Kumar SO(UR&SI-II)
Smt. Shenaz Idrisi SO (UR&SI-I)
Sh. Pankaj kr Srivastava SO(PFC/REC)
Sh. Avinash Kumar SO(Distt.)
Smt. C. Themoli is also reporting to Dir (Reservation) for Reservation matters.


Sh. D Sai Baba
Joint Secretary
(Transmission, V&S and Coordination)
(Transmission, PGCIL, Grid Integration of Renewable Energy)
PGCIL- All matters of PGCIL & its implemented Trans projects. Central Transmission Projects and Utility, National Power Grid, Exchange of Power with neighboring countries by Transmission project implemented by Power Grid. Renewable Energy, Separation of CTU from PGCIL, General Network Access (GNA).
Transmission – All States/UTs Transmission Projects, REBs/RLDs, PLCC/PTCC matters, Cross Border Trade of Power with neighboring countries, Srinagar-Leh Transmission Project, NERPSIP, Comprehensive Scheme for improvement of Transmission and Distribution System in Arunachal Pradesh and Sikkim, Perspective Transmission Plan.
Sh. OM Kant Shukla* Dir (Transmission)
Sh. Deepak Rao Dir (Power Grid)
Sh. Ajay Kr Agrawal Dir (Coordination and V&S)
Sh. Naorem Indrakumar Singh, US (Trans)
Sh. M.V.N. Vara Prasad, US (Power Grid)
Sh. Tulsi Das US (Coord & Policy Coord Desk)
Sh. Mahesh Kumar Chahar US (V&S)
Sh. Shashank Sharma SO(Trans)
Sh. Roshan Kumar Verma SO (Power Grid)
Sh. Dharam Bir SO (CPSU Desk)
Sh. Pranjal Sinha SO(Coord)
Sh. Ajay Dahiya, SO (V&S)
*On Loan Basis from CEA


NHPC: Administrative and other project related issues of NHPC, NHDC, J&K projects of NHPC. Coordination work of all J&K matters. E&F related issues of Power Sector projects.
Hydel-I: All administrative & project related matters of THDC, NEEPCO & Coordination work of all projects in NER.
Hydel-II & BBMB Desk: All administrative & project related matters of SJVNL, and BBMB related matters. Hydro policy & misc. matters of Hydro electric projects except J&K & NE states. Hydro projects in SAARC countries.
Reservation- Monitor implementation of reservation policies of Govt. for SC,ST, OBC & PH in MoP and its organizations.
RTI/Grievance – All matters relating to public grievances and RTI.
Parliament – Coordination of all Parliament matters.
Sh. Mohammad Afzal
Joint Secretary (Hydro, Parliament, Reservation, Public Grievance, RTI & Record)
[Hydro matters including CPSUs namely NHPC, SJVNL, NEEPCO, THDC, Environment Management for Hydro Projects, Bhakra Beas Management Board]
Sh. Ashok Kumar Director (Hydel-I)
Sh. Shailesh Kumar, DS (Public Grievance, RTI & Record)
Sh. Karam Chand (Reservation)
Sh. Arun Kr Garg Director (Parliament)
Sh. Santosh Kumar* (Hydel-II)
Sh Inder Mohan US (Hydel-I)
Sh. Saket Kr Sinha US (Record)
Smt. C. Thenmoli, US (Reservation Desk)
Sh. Ravi Patras Tirkey US (Parliament)
Sh. Himanshu Lal* DD (Hydel-II)
Sh. Krishna Nand Pal* DD (BBMB)
Sh. P K Sangwan* DD (NHPC)
Sh. K Vikram SO(H-I)
Smt. Kiran Bala SO (RTI & PG Desk)
Sh. Shishir Kr Sukal SO (Reservation Desk)
Sh. Suraj Pandey SO (Parliament)
Sh. Akash Bansal SO(H-II)
Sh. Thakur Kishore Singh, SO (BBMB)
Sh. S.P Gupta SO(NHPC)
Sh. Karam Chand is also reporting to CE(DKS) for ECET&EV and OL.
Sh. Saket Kr Sinha is also reporting to Dir (ECETEV) for ECETEV.
*On Loan Basis from CEA

T&R – *All administrative & financial matters of CPRI & NPTI, all policy matters of Training & research in power sector, HRD scheme of CEA, issues of research scheme on power, skill development.*

P&P *– Finalisation of annual/5 yr./mid term appraisal plan, capacity addition program, IEA/WEC matters, Coordination Committee for Energy, Sustainable Development of Energy, Review/Monitoring of Central Sector Power project, e-Samiksha and PRAGATI review.*

Economic Adviser [Shri Rakesh Kumar, JD is looking after the work which was earlier assigned to EA and is reporting directly to AS(SN) for P&P and to JS(PS) for T&R

[Training & Research including CPRI and NPTI, Policy & Planning, Power Projects Monitoring Panel, All Tax Related Matters, e-Samiksha and PRAGATI portal]

Sh. Jitendra Misra
US (T&R)

Sh. Sarat Chandra Dubba
SO(T&R)

Sh. Kushwant Kumar
AD (P&P Desk)

Sh. Jitendra Misra is also reporting to JS(PS) for DVC matters.

ECET&EV- *Matters relating to Energy Conservation & Energy Transition Policy & Planning, implementation of Energy Conservation Act & framing of rules/regulations under the Act etc., Energy audit, Administrative matters of BEE, National Energy Conservation Awards/day. All issues related to EV.*

Sh Dhiraj Kr Srivastava*
Chief Engineer
(ECET&EV**, Power Project Monitoring and Official Language)

Sh. Karam Chand
Dir
(ECET&EV and Official Language)

Sh. Saket Kr Sinha
US (ECET&EV)

Vacant
Joint Director (OL)

Sh. Sachin Kumar
SO(ECET&EV)

Sh. Vikas
SO(ECET&EV)

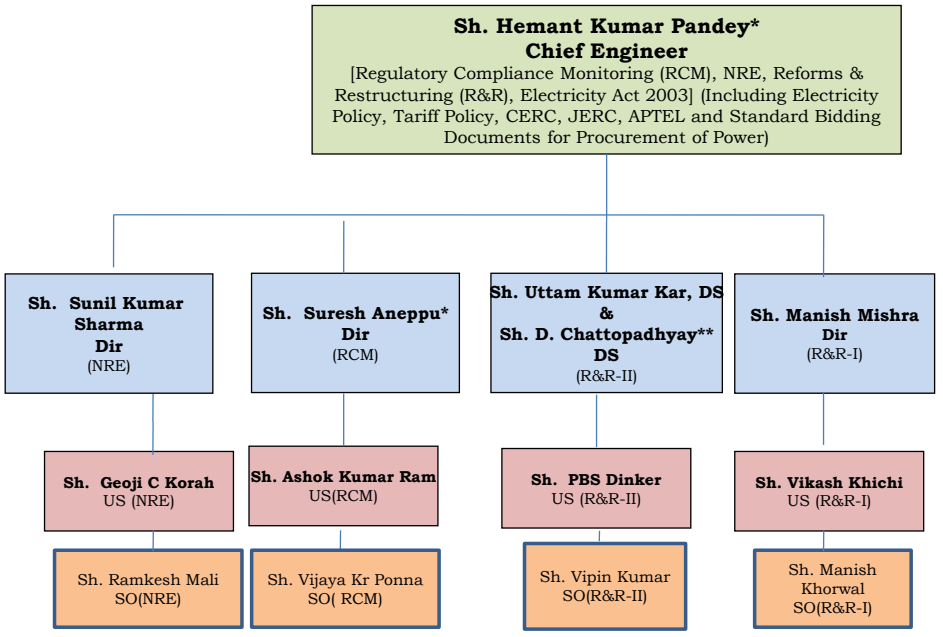
Vacant
AD(OL)

Sh. Sushil Kumar
AD(OL)

** Reporting directly to Secy (Power) for matters of ECET&EV

*On Loan Basis from CEA

Sh. Saket Kr Sinha is also reporting to DS (Record) for Record.



R&R - *Enactment of Legislation & framing of policies thereunder (Electricity Act 2003, Tariff Policy & National Electricity Policy etc.), Implementation of Electricity Act, 2003, Tariff Policy and National Electricity Policy. Matters relating to CERC/ SERCs/JERCs and Appellate Tribunal for Electricity, Reform & Restructuring of power sector of States/ UTs. Formulation of Guidelines and Standard Bidding Documents (SBDs) for procurement of power.*

*On Loan Basis from CEA

** After the retirement of Sh D. Chattopadhyay, DS on 31.07.2024, the entire work of R&R-II will be looked after by Sh Uttam Kumar Kar, DS

Key Abbreviations Used:

ACQ	Annual Contracted Quantity
Adm.	Administration
APTEL	Appellate Tribunal for Electricity
AS	Additional Secretary
BBMB	Bhakra Beas Management Board
CE	Chief Engineer
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CR	Central Registry
DS	Deputy Secretary
DVC	Damodar Valley Corporation
EA	Economic Advisor
ECET&EV	Energy Conservation, Energy Transition & Electric Vehicle
FSC	Fuel Supply Cell
IC	International Cooperation

IT&CS	Information Technology & Cyber Security
JD	Joint Director
JERC	Joint Electricity Regulatory Commission
JS	Joint Secretary
JS&FA	Joint Secretary & Financial Advisor
NEEPCO	North Eastern Electric Power Corporation Ltd
NRE	New & Renewable energy
OL	Official Language
OM	Operations and Mangement
P&P	Policy & Planning
PRAGATI	Pro-Active Governance And Timely Implementation
PFC	Power Finance Corporation Ltd
PGCIL	Power Grid Corporation of India Limited
R&R	Reforms and Restructuring
RCM	Regulatory Compliance Monitoring

REC	RURAL ELECTRIFICATION CORPORATION LTD
SO	Section Officer
T&R	Training & Research
THDC	Tehri Hydro Development Corporation Limited
UMPP	Ultra Mega Power Projects
UR&SI	Utility Reforms & Special Intervention
US	Under Secretary
V&S	Vigilance & Security

CHAPTER 03

CAPACITY

The Indian power sector has come a long way in the past decade, transforming from a power- deficit to a power-sufficient nation. A series of concerted measures led to a 51.29% increase in generation capacity – from 275 GW in Mar'15 to 442 GW in Mar'24. Electricity generation also increased in tandem at a CAGR of 5.3%, enabling India to reduce its energy and peak deficit from 4.2% and 4.5% in 2014 to 0.5% and 4.0% in 2023 respectively. The Peak demand has grown at a CAGR of 4.8% during 2014-15 to 2022-23 while Energy Requirement has grown at a rate of 4.4% during 2014-15 to 2022-23. The peak not met and energy not supplied of the country is observed to be very minimal over last five years and was on account of factors other than lack of generation capacity in the country.

GROWTH IN INSTALLED CAPACITY

The installed generation capacity in the country increased from 3,99,497 MW as on 31.03.2022 to 416 GW as on 31.03.2023. As on 31st March 2024, total installed capacity in the country is 442 GW. Contribution of various fuel sources to the total installed capacity is shown in the tables below:

Category	Installed Capacity (MW) As on 31.3.2022	% Share in Total Installed Capacity	Installed Capacity (MW) As on 31.03.2024	% Share in Total Installed Capacity	% Increase in Installed Generation Capacity
Fossil Fuel Capacity					
Coal	2,04,080	51.1	210969	47.73	2.8
Lignite	6,620	1.7	6620	1.50	0.0
Gas	24,900	6.2	25038	5.67	0.9
Diesel	510	0.1	589	0.13	0.0
Total Fossil Fuel Capacity	**2,36,110**	**59.1**	**243217**	**55.03**	**2.5**
Non-Fossil Fuel Capacity					
Total RE (Including Hydro)	1,56,608	39.2	190573	43.12	10.8
Hydro	46,723	11.7	46928	10.62	0.2
Wind, Solar &Other RE	1,09,885	27.5	143645	32.50	14.8
Wind	40,358	10.1	45887	10.38	7.6
Solar	53,997	13.5	81814	18.51	22.5
Small Hydro	4,849	1.2	5003	1.13	1.2
Bio Power	10,206	2.6	10355	2.34	1.0
Waste to Enegy	477	0.1	586	0.13	5.7
Nuclear	6,780	1.7	8180	1.85	20.6
Total Non-Fossil Fuel Capacity	1,63,388	40.9	198753	44.97	11.2
Total Installed Capacity	**3,99,497**	**100**	**441970**	**100.00**	**6.2**

GROWTH IN GENERATION

The total electricity generation in the country increased from 1491.859 BU during 2021-22 to 1624.46 BU during 2022-23. In the current Financial Year (2023-24), the generation stood at 1739.09 BU as against 1624.46 BU during the Financial Year 2022-23.

Contribution of various fuel sources to the total generation is shown in the tables below

Growth in Generation during 2022-23

Category-wise :	Year 2021-22		Year 2022-23		Growth (%)
	Generation (BU)	% of Total Generation	Generation (BU)	% of Total Generation	
• Generation from Fossil Fuel :					
Coal	1041.487	69.8	1145.908	70.5	10.03
Gas	36.016	2.4	23.884	1.5	-33.69
Lignite	37.094	2.5	36.188	2.2	-2.44
Diesel	0.117	0.0	0.230	0.0	96.58
Total (Fossil Fuel) :	1114.714	74.7	1206.211	74.3	8.21
• Generation from Non-Fossil Fuel :					
Wind	68.640	4.6	71.814	4.4	4.62
Solar	73.476	4.9	102.014	6.3	38.84
BioPower & Others	28.796	1.9	29.724	1.8	3.22
Total : Solar, Wind, BioPower & Others	170.912	11.5	203.552	12.5	19.10
Hydro	151.627	10.2	162.099	10.0	6.91
Bhutan Import	7.493	0.5	6.742	0.4	-10.02
Total RE Generation (Incl. Hydro)	330.033	22.1	372.393	22.9	12.84
Nuclear	47.112	3.2	45.861	2.8	-2.66
Total (Non-Fossil Fuel) :	377.145	25.3	418.254	25.7	10.90
• Total Generation (Fossil Fuel & Non-Fossil Fuel) :					
Total Generation :	1,491.859	100.0	1,624.465	100.0	8.89

Growth in Generation during 2023-24

Category-wise :	Year 2022-23 (April-Dec, 2022)		Year 2023-24 (April-Dec, 2023)		Growth (%)
	Generation (BU)	% of Total Generation	Generation* (BU)	% of Total Generation	
• Generation from Fossil Fuel :					
Coal	1145.90	70.5	1260.90	72.5	10.03
Gas	23.88	1.5	31.29	1.7	31.03
Lignite	36.18	2.2	33.94	1.9	-6.19
Diesel	0.22	0.0	0.4	0.0	81.81
Total (Fossil Fuel) :	1206.21	74.3	1326.54	76.2	9.97
• Generation from Non-Fossil Fuel :					
Wind	71.81	4.4	83.38	4.7	16.11

Solar	102.01	6.3	115.97	6.7	13.68
BioPower & Others	29.72	1.8	26.47	1.6	-10.93
Total : Solar, Wind, BioPower & Others	203.55	12.5	225.83	13.0	10.94
Hydro	162.09	10.0	134.05	7.8	-17.29
Bhutan Import	6.74	0.4	4.71	0.2	-30.11
Total RE Generation (Incl. Hydro)	372.39	22.9	364.60	20.8	-2.09
Nuclear	45.86	2.8	47.93	2.8	4.51
Total (Non-Fossil Fuel) :	418.25	25.7	412.53	23.8	-1.36
• Total Generation (Fossil Fuel & Non-Fossil Fuel) :					
Total Generation :	**1624.46**	**100.0**	**1739.09**	**100.0**	**7.05**

* Provisional

FUTURE GROWTH OF POWER SECTOR

Expected Demand

As per the 20th Electric Power Survey Report published by Central Electricity Authority, the peak demand and energy requirement is around 335 GW and 2280 BU respectively by 2029-30. To meet the growing demand, the generation capacity is required to be added in advance to avoid any shortage scenario in future. Consumers must be given 24x7 reliable, quality power.

Generation Capacity Addition

Central Electricity Authority (CEA) has carried out generation expansion studies with the projected All India peak electricity demand for the year 2029-30. Scenario analysis was also carried out to assess the capacity addition requirement to meet the projected demand in the year 2029-30.

Based on the studies the projected power generation installed capacity required to meet the electricity demand in the year 2029-30 in base case is 777.14 GW comprising of 251.7 GW of Coal, 24.8 GW of gas, 15.5 GW of Nuclear, and 480 GW of RE (including 53.9 GW of Large Hydro, 292.6 GW of PV, 99.9 GW of Wind, 19.9 GW of other RE). Additionally, Pumped storage plants (PSP) based installed capacity of 18.9 GW (with daily storage of 6-7 hours), BESS storage-based capacity of around 41.6 GW with 5-hour may be required in 2029-30.

Energy storage systems can prove useful in combating the challenges posed by integrating intermittent generation sources into the grid and the grid stability issues due to large fluctuations in demand, to ensure quality of supply on real time basis by storing excess generation over different time horizons (minutes, days, weeks). Further, the cost of storage is projected to decrease rapidly in the next decade rending the technology quite competitive to other conventional technologies.

The share of non-fossil fuel based generation capacity in the total installed capacity of the country is likely to increase from around 43.9% as on 30.11.2023 to around 64.4% by 2029-30. The share of fossil fuel based capacity in the total installed capacity of the country as on 30.11.2023 is 56.1%, which is likely to reduce to 35.6 % by 2029-30. The projection of total capacity addition is in line with the target of the country to achieve 50% of non-fossil based installed capacity by the year 2029-30. It is estimated that non-fossil fuels generation contribution is likely to increase from 25.75 % in 2022-23 to around 44.1 % of the gross electricity energy generation during the year 2029-30.

Thermal Capacity Addition

Coal based plants are also required in future because there are various challenges associated with Renewable energy sources (RES) with respect to intermittency and variability of RE generation. Solar PV generation is not available during night hours and wind generation is highly variable across seasons. RES being non-dispatchable energy sources would require flexible coal generation to absorb RE generation variability and intermittency to ensure grid security. Additionally, Coal based plants are dispatchable and dependent energy sources. Coal based capacity addition of around 47 GW is required by the year 2029-30 in various scenarios.

As on 31.03.2024, a capacity totalling to 28,400 MW is under various stages of construction comprising of 15,260 MW from Central sector, 11,540MW from state sector and 1,600 MW from Private Sector. The year-wise schedule for commissioning of

under-construction coal based plants is given below:

Years	Central		State		Private		Total	
	No. of units	Capacity (MW)	No. of units	Capacity (MW)	No. of units	Capacity (MW)	No. of units	Capacity (MW)
2024-25	10	6740	12	8620	0	0	22	15360
2025-26	2	1600	1	800	0	0	3	2400
2026-27	1	660	2	1320	1	800	4	2780
2027-28	2	1460	0	0	1	800	3	2260
2028-29	3	2400	0	0	0	0	3	2400
2029-30	3	2400	1	800	0	0	4	3200
Total	**21**	**15260**	**16**	**11540**	**2**	**1600**	**39**	**28400**

Further, Coal based capacity of 57300 MW is under various stages of development and planning, which comprises of 24100 MW of Central sector capacity, 22700 MW of State Sector capacity and 10500 MW of Private sector capacity. Apart from this a coal capacity totaling to around 5700 MW is from stressed private sector plants which are under review.

Hydropower generation capacity addition

Hydropower provides strong contribution to flexibility in the power system by filling the gap between supply and demand that has been induced by the non-dispatchable variability of RES. The storage capabilities of many hydropower plants make them a perfect instrument for optimizing the use of variable RES over shorter and longer periods, thus facilitating the integration of variable RES into the power system and providing a key tool to maintain a stable and balanced grid. Hydropower also provides a number of ancillary services which are needed in order to manage a transmission system in a way that secures system stability and security of supply. . Hydro based capacity totaling to around 16.73 GW (including Pump Storage Plants [PSP] of 2.7 GW) are under active construction and likely to yield benefit by the year 2031-32. The year-wise schedule of commissioning of hydro plants under-active construction (in MW) is given below:

All figures in MW

Summary (Hydro)				
	Central	State	IPPs	Total
2024-25	800	320	0	**1120**
2025-26	396	1433.5	390	**2219.5**
2026-27	4918	490	0	**5408**
2027-28	1040	48	0	**1088**
2028-29	1022	300	0	**1322**
2031-32	2880	0	0	**2880**
Total	11056	2591.5	390	**14037.5**
Total	**11056**	**2591.5**	**390**	**14037.5**
Summary (PSP)				
	Central	**State**	**IPPs**	**Total**
2024-25	1000	0	1200	**2200**
2025-26	0	500		**500**
Total	**1000**	**500**	**1200**	**2700**

Nuclear generation capacity addition

A nuclear based capacity of 8000 MW is under construction to yield benefits during 2024-25 to 2029-30. Additionally, a capacity of 7000 MW is under various stages of administrative approval and may yield benefit by 2031-32.

Solar and wind-based capacity Addition

As per the studies, a solar and wind-based installed capacity of 293 GW and 100 GW respectively is required by the year 2029-30. As on 30.06.2024, solar installed/pipeline capacity is 229.45 GW which comprises of installed capacity of 85.47 GW, under implementation of 103.68 GW and tendered capacity of 40.3 GW. As on 30.06.2024 Wind Installed/pipeline capacity is 70 GW which comprises of installed capacity of 46.66 GW, under implementation of 21.64 GW and tendered capacity of 1.7 GW

LIST OF POWER PLANTS COMMISSIONED DURING 2022-23

NAME OF PROJECT	SECTOR	STATE	DEVELOPER	CAPACITY (MW)
THERMAL PROJECTS				
North Karanpura STPP, U-1	Central	Jharkhand	NTPC	660
Sri Damodaram Sanjee-vaiahTPP, St-II, U-1	State	Andhra Pradesh	APPDCL	800
			A. Total (Thermal)	**1460**
HYDRO PROJECTS				
Vyasi , U-1 & U-2	State	Uttarakhand	UJVNL	120
			B. Total (Hydro)	**120**
			C. Total (Nuclear)	**0**
			Total Commissioned (A+B+C)	**1580**

LIST OF POWER PLANTS COMMISSIONED DURING 2023-24 (AS ON 31.03.2023)

NAME OF PROJECT	SECTOR	STATE	DEVELOPER	CAPACITY (MW)
THERMAL PROJECTS				
North Karanpura STPP Unit-1	Central	Jharkhand	NTPC	660
Sri Damodaram Sanjeevaiah TPP, St-II, Unit-1	State	Andhra Pradesh	APPDCL	800
Barh STPP, St-I, U-2	Central	Bihar	NTPC	660
Telangana STPP, St- I, U-1	Central	Telangana	NTPC	800
Dr. Narla TataRao TPS, St-V, U-8	State	Andhra Pradesh	APGENCO	800
Kashipur CCPP, Ph-II	Private	Uttarakhand	SEPL	214
Shirpur TPP, U-2	Private	Maharashtra	JPL	150
Jawaharpur STPS Unit-1	State	Uttar Pradesh	UPRVUNL	660
Obra-'C' TPS Unit-1	State	Uttar Pradesh	UPRVUNL	660
Kashipur CCPP, Ph-II	Private	Uttarakhand	SEPL	214
Shirpur TPP, U-2	Private	Maharashtra	JPL	150
			A. Total (Thermal)	**6864**
HYDRO PROJECTS				
Naitwar Mori , U-1 & U-2	Central	Uttarakhand	SJVNL	60
			B. Total (Hydro)	**60**
NUCLEAR PROJECTS				
Kakrapar Atomic Pow-er Project Unit-3	**Central**	**Gujarat**	**NPCIL**	**700**
			C. Total (Nuclear)	**700**
			Total Commissioned (A+B+C)	**7624**

CHAPTER 04

GENERATION & POWER SUPPLY POSITION

Generation:

The total electricity generation including generation from renewable sources in the country during the 2023-24 was **1739.091 BU** as against the generation of 1624.465 BU during the corresponding period last year, showing a **growth of 7.06%**.

The actual electricity generation from **Fossil Fuel Power Plants** (Thermal) during 2023-24 has **increased by 9.98%** over same period last year. The actual electricity generation from Non-**Fossil Fuel Power Plants** during 2023-24 has **decreased by 1.37%** over corresponding period last year primarily due to reduction in hydro generation inpacted by monsoon. Share of generation from Non-Fossil Fuel in total generation has been 23.7% during the 2023-24.

The overall electricity generation in power utilities in the country including import from Bhutan since 2005-06 is as under:

Year	Total Fossil Fuel Generation (Billion Unit)	Total Non-Fossil Fuel Generation (Billion Unit)	Total Generation (Billion Unit)
2005-06	497.2	126.9	624.2
2006-07	527.5	144.8	672.4
2007-08	559.0	170.7	729.7
2008-09	590.1	161.6	751.7
2009-10	640.9	167.6	808.5
2010-11	665.0	185.4	850.4
2011-12	708.8	219.3	928.1
2012-13	760.7	208.8	969.5
2013-14	792.5	227.7	1020.2
2014-15	878.3	232.1	1110.4
2015-16	943.8	229.8	1173.6
2016-17	994.2	247.5	1241.7
2017-18	1037.1	271.1	1308.1
2018-19	1072.2	303.9	1376.1
2019-20	1042.7	346.4	1389.1
2020-21	1032.5	349.3	1381.9
2021-22	1114.7	377.1	1491.9
2022-23	1206.2	418.3	1624.5
2023-24	1326.5	412.5	1739.1

Plant Load Factor (PLF)

The Plant Load Factor (PLF) of Thermal Power Stations (TPSs) is an index of utilization of the installed capacity. The average PLF of TPSs of Power Utilities during the year 2023-24 was 69.1%. The sector-wise and overall PLF since beginning of 9th Plan was as under:

Year	Central	State	Private	Overall
1997-98	64.7	70.4	60.9	71.2
1998-99	64.6	64.6	60.7	68.0
1999-00	67.3	67.3	63.7	68.9
2000-01	74.3	65.6	73.1	69.0
2001-02	74.3	67.0	74.7	69.9
2002-03	77.1	68.7	78.9	72.1
2003-04	78.7	68.4	80.5	72.7
2004-05	81.7	69.6	85.1	74.8
2005-06	82.1	67.1	85.4	73.6
2006-07	84.8	70.6	86.3	76.8
2007-08	86.7	71.9	90.8	78.6
2008-09	84.3	71.2	91.0	77.2
2009-10	85.5	70.9	82.4	77.5
2010-11	85.1	66.7	76.7	75.1
2011-12	82.1	68.0	76.2	73.3
2012-13	79.2	65.6	64.1	69.9
2013-14	76.1	59.1	62.1	65.6
2014-15	74.0	59.8	60.6	64.5
2015-16	72.5	55.4	60.5	62.3
2016-17	72.0	54.3	55.7	59.9
2017-18	71.4	55.1	55.2	59.8
2018-19	72.6	57.8	55.2	61.1
2019-20	64.2	50.2	54.6	56.0
2020-21	63.4	46.2	54.7	54.5
2021-22	69.7	54.5	53.6	58.9
2022-23	74.7	61.9	56.6	64.1
2023-24	75.1	64.7	67.6	69.1

Power Supply Position:

During the year 2023-24, peak shortage has been 1.4% and the energy shortage has been 0.3%.

The power supply position since beginning of 9th Plan was as under:

Year	Energy Requirment	Energy Availability	Energy Shortage	Energy Shortage
	(MU)	(MU)	(MU)	(%)
1997-98	424505	390330	34175	8.1
1998-99	446584	420235	26349	5.9
1999-00	480430	450594	29836	6.2
2000-01	507216	467400	39816	7.8
2001-02	522537	483350	39187	7.5
2002-03	545983	497890	48093	8.8
2003-04	559264	519398	39866	7.1
2004-05	591373	548115	43258	7.3
2005-06	631554	578819	52735	8.4
2006-07	690587	624495	66092	9.6
2007-08	737052	664660	72392	9.8
2008-09	777039	691038	86001	11.1
2009-10	830594	746644	83950	10.1
2010-11	861591	788355	73236	8.5
2011-12	937199	857886	79313	8.5
2012-13	995557	908652	86905	8.7
2013-14	1002257	959829	42428	4.2
2014-15	1068923	1030785	38138	3.6
2015-16	1114408	1090850	23558	2.1
2016-17	1142929	1135334	7595	0.7
2017-18	1213326	1204697	8629	0.7
2018-19	1274595	1267526	7070	0.6
2019-20	1291010	1284444	6566	0.5
2020-21	1275534	1270663	4871	0.4
2021-22	1379812	1374024	5787	0.4
2022-23	1513497	1505914	7583	0.5
2023-24	1626132	1622020	4112	0.3

Year	Peak Demand	Peak Met	Peak Shortage	Peak Shortage
	(MW)	(MW)	(MW)	(%)
1997-98	65435	58042	7393	11.3
1998-99	67905	58445	9460	13.9
1999-00	72669	63691	8978	12.4
2000-01	78037	67880	10157	13.0
2001-02	78441	69189	9252	11.8
2002-03	81492	71547	9945	12.2
2003-04	84574	75066	9508	11.2
2004-05	87906	77652	10254	11.7
2005-06	93255	81792	11463	12.3
2006-07	100715	86818	13897	13.8
2007-08	108866	90793	18073	16.6
2008-09	109809	96785	13024	11.9
2009-10	119166	104009	15157	12.7
2010-11	122287	110256	12031	9.8
2011-12	130006	116191	13815	10.6
2012-13	135453	123294	12159	9.0
2013-14	135918	129815	6103	4.5
2014-15	148166	141160	7006	4.7
2015-16	153366	148463	4903	3.2
2016-17	159542	156934	2608	1.6
2017-18	164066	160752	3314	2.0
2018-19	177022	175528	1494	0.8
2019-20	183804	182533	1271	0.7
2020-21	190198	189395	802	0.4
2021-22	203014	200539	2475	1.2
2022-23	215888	207231	8657	4.0
2023-24	243271	239931	3340	1.4

CHAPTER 05

THERMAL POWER

1. Thermal Power Generation

Thermal power generation capacity (Coal, Lignite & Natural Gas) has increased from 167 GW in 2014 to 242 GW up to March 2024. Thermal power generation (Coal, Lignite & Natural Gas) is 1325 BU as on 31.03.2024..

2. Thermal Capacity Addition-

A total of 5404 MW of thermal Capacity has been commissioned in the current fiscal till Mar 2024, and is under commercial operation. This comprises of Barh-I Unit -2 (660 MW), Telangana Ph-I Unit-1 (800 MW), Dr. Narla TataRao TPS, St-V, Unit-8 (800 MW), Shirpur TPP, Unit-2 (150 MW), Kashipur CCPP, Ph-II (214 MW), Telangana Ph-I Unit-2 (800 MW), North Karanpura TPP, U-2(660 MW), Obra-C STPP, U-1(660 MW), Jawaharpur STPP, U-1(800 MW).

3. Under-construction Thermal capacity-

As on 31st Mar 2024, capacity of 9,560 MW is under construction by NTPC Group (i.e., NTPC 5,840 MW and 3,720 MW of JVs and subsidiaries including PVUNL and THDC). 4,380 MW is under construction by NLC Group (i.e., NLCIL 2400 MW and 1980 MW through JV with UPRVUNL (NUPPL)). SJVNL is constructing a 1320 MW thermal power project through its subsidiary STPL. In addition, a capacity of 11,540 MW under State Sector and 1,600 MW under Private Sector is also under construction.

4. Implementation of FGD in Thermal Power Stations

On December 7, 2015, the Ministry of Environment, Forest and Climate Change (MoEF&CC) introduced stricter environmental standards for coal-based TPPs under the Environment (Protection) Act, 1986. Thereafter CEA proposed a graded action plan upto 2035 for implementation of FGD in TPPs to overcome various challenges and issues of FGD installation. MOEF&CC vide gazette noti¬fication dated 31.03.2021 categorized thermal power plants in three categories having different timelines along with the environment compensation for non-compliance. Further, MOEF&CC vide gazette notification dated 05.09.2022 has revised the timeline for installation of FGD in different categories of TPPs as follows:

Category A: Within 10 km radius of NCR or cities having million plus population as per 2011 census of India. Completion timeline 31.12.2024.

Category B: Within 10 km radius of critically polluted areas or Non-Attainment cities as de¬fined by CPCB. Completion timeline 31.12.2025.

Category C: Other than those included in category A and B. Completion timeline 31.12.2026.

For reduction of SO2 emission, at present, Flue Gas Desulphurization (FGD) is being installed in 537 units out of which FGD installation has been completed in 39 units (19.43 GW). Further, Contract/LoA has been awarded for 238 units. 139 units are under various stages of tendering and 121 units are in pre-tendering stage.

There are different FGD technologies available like Dry Sorbent Injection, Sea Water, Wet lime stone for controlling SO2 in flue gases of thermal power plant. The FGD technology is being selected by Generating utilities for a particular unit on the basis of life cycle cost analysis and more than 90 percent of thermal units are implementing Wet Lime Stone Based FGD (WLFGD).

5. Utilization of Fly Ash

Coal / Lignite based Thermal Power Generation has been the backbone of Power Capacity addition in the Country. Indian coal is of low grade with ash content of the order of 30-60 % in comparison to imported coals which have a low ash content of the order of 3-20 %. A large quantity of ash is, thus being generated at Coal / Lignite based Thermal Power Stations in the Country, which not only requires a large area of precious land for its disposal but is also one of the sources of pollution of both Air and Water.

In order to reduce the requirement of land, for the disposal of ash in the ash ponds and to address the problem of pollution caused by ash, the Ministry of Environment, Forests (MoEF) has issued various Notifications on ash utilization. The First Notification was issued on 14th September 1999 which was subsequently amended in the years 2003, 2009 and 2016 vide Notifications dated 27th August 2003, 3rd November 2009 and 25th January 2016 respectively.

These notification prescribes the targets of Ash utilization Stations in the Country so as to achieve 100% utilization of ash. Ministry of Environment, Forest and Climate Change (MoEF&CC) has now issued a revised Notification on 31st December 2021 in supersession of earlier Notifications in order to widen the scope of ash utilization. Also MoEF & CC has issued amendments dated 30.12.2022 and 1.1.2024 to this Notification.

Ash utilisation during Year 2023-24

No. of Thermal Power Stations from which data have been received	298
Installed capacity (Megawatts)	218137.02
Coal Consumed (Million tons)	882.07
Ash Generation (Million tons)	313.87
Ash Utilization (Million tons)	299.79
Percentage Utilization (%)	95.51
Percentage Average Ash Content (%)	35.58

Note: The data has been taken from the coal Ash Portal.

The information of ash utilization is made available to the concerned so as to help industry and other user to know source and quantum of ash available for disposal.

The progressive utilization of Ash since 1996-97 is showing an increasing trend and it is expected that in near future it would reach 100%

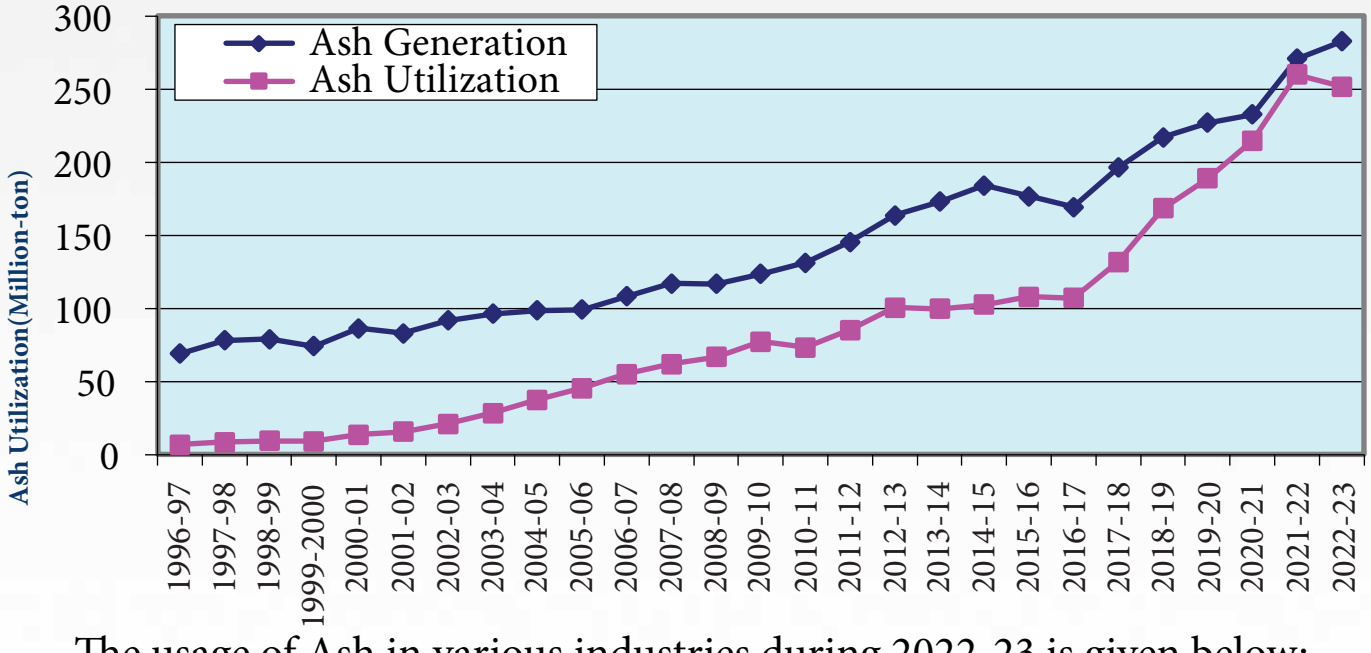
Summary (MW)

S. No.	Sector	Total (MW)	CFBC	Retired	Balance (Total-(CFBC +Retired))	Claims SO2 compliance	Feasibility study not started	Feasibility Study started	Feasiblity Study Completed	Tender specification made	NIT issued	Bid opened	Bid Awarded	FGD installed
1	Central	67250	750	430	66070	0	0	210	0	0	1110	2390	57720	4640
2	State	67741.5	1075	1004	65662.5	0	0	2437.5	10430	5050	19095	9940	18710	0
3	Private	76528	4101	0	72427	1430	1370	6430	6395	5730	7240	11342	25540	6950
	Total	211519.5	5926	1434	204159.5	1430	1370	9077.5	16825	10780	27445	23672	101970	11590

Summary (No of Units)

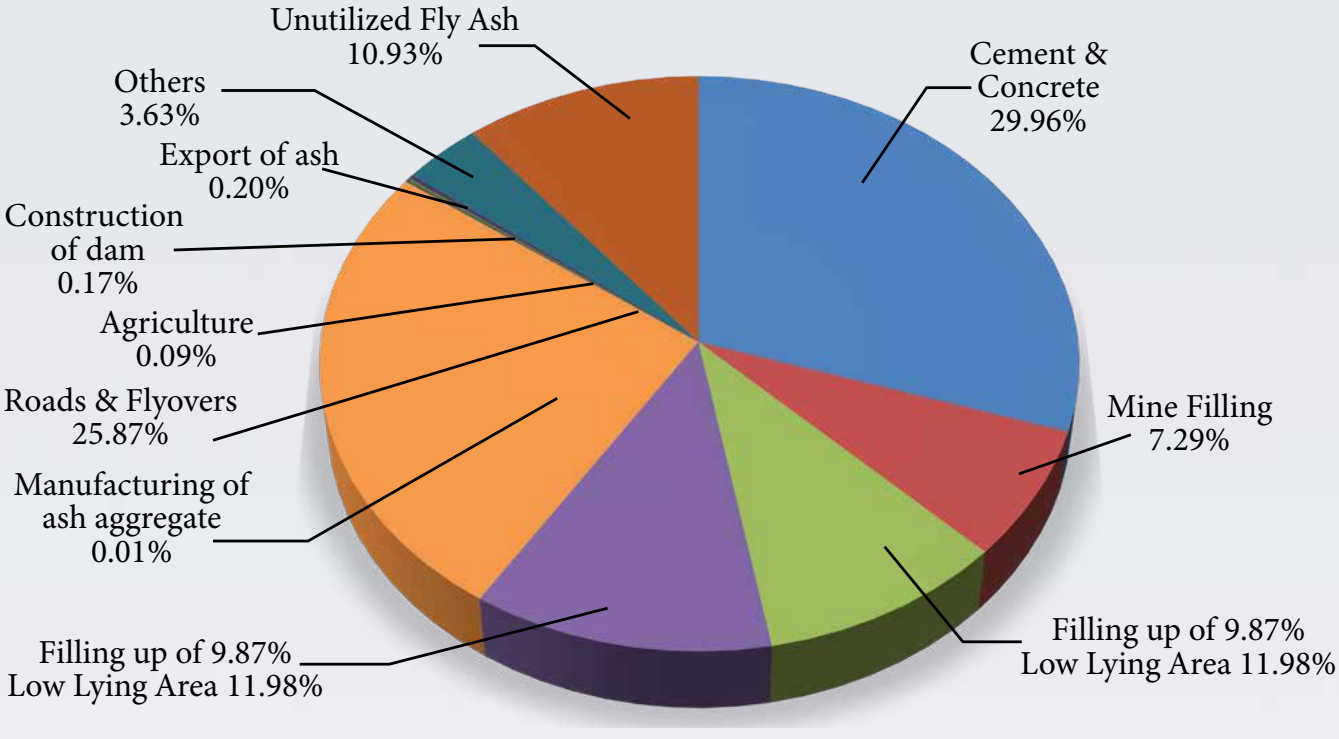
S. No.	Sector	Total (MW)	CFBC	Retired	Balance (Total-(CFBC +Retired))	Claims SO2 compliance	Feasibility study not started	Feasibility Study started	Feasiblity Study Completed	Tender specification made	NIT issued	Bid opened	Bid Awarded	FGD installed
1	Central	168	4	3	161	0	0	2	0	0	6	11	131	11
2	State	221	7	7	207	0	0	11	38	16	72	22	48	0
3	Private	211	42	0	169	6	2	24	16	13	18	29	46	15
	Total	600	53	10	537	6	2	37	54	29	96	62	225	26

PROGRESSIVE ASH GENERATION AND ITS UTILIZATION FROM 1996-97 to 2022-23



The usage of Ash in various industries during 2022-23 is given below:

Major Modes of Fly Ash Utilization during the Year 2022-23



CHAPTER 06

HYDRO POWER

The importance of hydro power has a renewed emphasis due to the changing energy mix of India. Hydro power is critical in India's response to the challenge of meeting the energy needs of an aspiring population even as climate change issues are also addressed.

Government of India has set an ambitious target for enhancement of non-fossil fuel Energy capacity to 500 GW by 2030 (as announced in the COP26 Summit in Glasgow by the Hon'ble Prime Minister of India). The commitment regarding non- fossil fuel capacity is proposed to be met mainly from installation of Solar and Wind power capacities, which are infirm sources of power, i.e. the generation from these sources varies significantly with the availability of wind and sunshine. With the increased share of intermittent Renewables in the energy mix of the country, the existing flexibility in Generation of power will not be sufficient to meet the balancing requirement in the electricity grid and the stable operation of Grid for ensuring 24x7 Power will require. Hydro Power, which has unique features like quick ramping, black start capability etc.

The development of Hydro Power and the Hydro Pumped Storage projects is of paramount importance for achieving above goals. Hydro is clean, green, renewable, non-polluting and environmental friendly. Hydro projects improve quality of life in remote hilly and backward areas by benefits of electrification, industrialization & road/rail communication development. It provides escalation free & cheapest energy in long run. It has the ability for instantaneous starting, stopping and load variation, thereby ideally suited for peaking and balancing operation and improves reliability of power system.

Storage projects increase lean season flows, provide flood control, navigation, irrigation and drinking water supply benefits etc. and thus help in the maximum utilization of scarce water resources. Projects like Hirakund & Bhakra Dam have increased Agriculture Productivity and have been behind the success of Green Revolution in India while the role of Tehri Dam in mitigating the 2013 Uttarakhand disaster floods is well known.

Hydro projects also have a long useful life. Some projects like Bhakra are in operation for last 50 years, while some others like Pykara (59.2 MW) & Mettur Dam (50 MW) in Tamil Nadu, Pallivasal (37.5 MW) in Kerala and Sivasamudram (42 MW) in Karnataka etc., are in existence for more than 70-80 years now.

Installed Capacity and Generation Performance of Hydro- Electric Stations: (31.03.2024)

Installed Capacity – Sector-wise

Sector	Total	
	No.	MW
Central	43	15742.7
State	148	27254.45
Private	22	3931
Total	213*	46928.15

Installed Capacity – Operational category-wise

Sector	RoR		RoR (P)		Storage (S)						Total	
					S(P)		S(MPP)		PSS			
	No.	MW	No.	MW	No.	MW	No.	MW	No.	MW	No.	MW
Central	9	2193.50	19	7263.0	6	1725.00	9	4561.2	0	0	43	15742.70
State	15	892.15	51	7710.0	32	6487.30	43	7569.4	7	4595.6	148	27254.45
Private	5	892.00	13	2592.0	3	297.00	0	0.0	1	150.0	22	3931.00
Total	**29**	**3977.65**	**83**	**17565.0**	**41**	**8509.30**	**52**	**12130.6**	**8**	**4745.6**	**213***	**46928.15**

* - Total No. of HE Stations are 212 as Nagarjuna Sagar has 1 conventional and remaining 7 PSS units.

Abbreviations: RoR - Run of River, RoR(P) – Run of River with Pondage, S(P) – Storage (Purely Power), S(MPP) – Storage (Multipurpose Project), PSS – Pumped Storage Scheme

Generation (BU)

	Actual Generation in BU (% of Target)							
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24*
All India	122.37 (91.33 %)	126.12 (89.20%)	134.89 (103.76%)	155.77 (113.7%)	150.30 (107.1%)	151.63 (101.39%)	162.10 (107.59%)	133.97 (85.49%)

*As on 31st March, 2024.

Hydro Capacity Addition:

Sector-wise Hydro Capacity Addition in the last few years is as under:-

S. No.	Year	Central Sector (MW)	State Sector (MW)	Private Sector (MW)	Total (MW)
1	2015-16	480	610	426	1516
2	2016-17	80	1555	24	1659
3	2017-18	390	200	205	795
4	2018-19	110	30	-	140
5	2019-20	300	-	-	300
6	2020-21	300	111	99	510
7	2021-22	-	-	393	393
8	2022-23*	-	120	-	120
9	2023-24*	60	-	-	60
Grand Total		**1720**	**2626**	**1147**	**5493**

Year-wise anticipated commissioning schedule of Hydro projects presently under construction is as under:-

Year	2024-25	2025-26	2026-27	2027-28	2028-29	2031-32	Total
Capacity Under Construction (MW)	3320	2719.5	5408	1088	1322	2880	16737.5

- Hydro Capacity addition beyond in the recent years- 795 MW during 2017-18, 140 MW in 2018-19, 300 MW in 2019-20, 510 MW in 2020-21, 393 MW in 2021-22 and 120 MW in 2022-23 and 60 MW in 2023-24.
- Capacity under construction – 16737.5 MW

Hydro Capacity Addition by 2030:

Considering the unique advantages of hydropower (including Pump Storage Projects) and the increasing need of hydropower for grid stability/balancing, the Government has envisaged to add 69 no. of hydro schemes with an aggregate Installed capacity of around 55.65 GW (including 31 no. of Pumped Storage Schemes of 42.92 GW).

Reforms in Hydro Power Sector:

Government Policy Measures to promote Hydro Power Sector March 2019

In March 2019, Govt. of India approved number of measures for promoting hydro power sector, which are as under:

i) Declaring Large Hydro Power (LHPs) (> 25 MW projects) as Renewable Energy source.

ii) Hydro Purchase Obligation (HPO) as a separate entity within Non-solar Renewable Purchase Obligation (RPO).

iii) Tariff rationalization measures for bringing down hydro power tariff.

iv) Budgetary Support for Flood Moderation/Storage Hydro Electric Projects (HEPs).

v.) The expenditure towards the idling cost leads to overall increase in the project cost. In order to bring down the same, Ministry issued an advisory to all CPSEs on 19.07.2022 for rationalization of manpower at stalled projects.

vi.) The design, construction and maintenance of the slopes is one of the major challenges during planning, construction and operation of Hydro Power projects. Generally, slope instabilities in hydro power projects are encountered during execution as well as operation. CEA issued Guidelines for Slope Stability in/around Hydro projects on 05.10.2023.

vii.) Contingent liabilities arising due to contractual disputes are not conducive for financial health of the developer. To prevent this, MoP issued Guidelines on 18.03.2022 for early settlement of disputes and to minimize the arbitral claims/disputes in hydro sector.

viii) Budgetary Support to Cost of Enabling Infrastructure, i.e. roads/bridges.

a. Rs. 1.5 crore per MW for projects upto 200 MW.

b. Rs. 1.0 crore per MW for projects above 200 MW.

As a result of these measures, the capital cost as well as the project tariff would be reduced in initial years which would improve project viability & saleability.

Guidelines to reduce the incidence of time and cost overruns in Hydro Power Projects

Construction of Hydro Electric Projects usually gets delayed on account of various reasons resulting in Time and Cost overrun. Guidelines to reduce the incidence of time and cost overruns in hydro power projects were issued on 08.11.2019. These guidelines covered various aspects viz. realistic scheduling, usage of software tools, concept of sunset date, listing critical/ non critical works, delegation of power, timely settlement of claims, adoption of international best practices, resource mobilization, dispute resolution, incentivizing labour on achieving project milestones in time, etc.

Dispute Avoidance Mechanism through 'Independent Engineer'

A Dispute Avoidance Mechanism through 'Independent Engineer' has been put in place for avoidance of contractual

disputes in hydro projects executed by CPSUs under MoP at the inception stage itself or amendment in provisions of old contract with consent of contractor. Ministry has also prepared a panel of domain experts. The CPSE & Contractor shall jointly select one Member from the panel of experts for each package of works. Till Mar'24, Independent Engineers (IEs) has been appointed for 54 packages from 21 under construction hydro projects (18 hydro projects and 3 other than hydro projects) and 19 disputes has also been resolved by IEs.

Dispute Resolution through Conciliation - Constitution of Conciliation Committee of Independent Experts (CCIE)

Government has decided to constitute three (3) Conciliation Committees of Independent Experts (CCIE), for settlement of disputes through Conciliation for Contractual Disputes in Projects implemented by CPSUs / Statutory Bodies under the administrative control of Ministry of Power. Each CCIE shall have three members having high level of integrity and proven track record. Till Mar'24, 15 numbers of disputes has been allocated to CCIE and 7 disputes has also been resolved by CCIE

Early Warning System in Hydro Electric Projects

Hydropower projects are typically situated in hilly and remote regions, making them susceptible to various natural disasters such as landslides, cloudbursts, flash floods, earthquakes, avalanches, Glacial Lake Outburst Floods (GLOFs), and Landslide Lake Outburst Floods (LLOFs). The Himalayan region, in particular, experiences extreme weather events like intense rainfall and cloudbursts, leading to heavy floods and landslides.

Furthermore, rising global temperatures and glacial retreat have resulted in the formation of numerous high-altitude glacial lakes in the Himalayas, increasing the risk of GLOFs and LLOFs. These catastrophic events often inflict significant damage on critical infrastructure associated with hydro-electric projects.

During the year 2022, Ministry of Power has signed MoUs with expert agencies like National Geophysical Research Institute (NGRI), Indian Meteorological Department (IMD), Wadia Institute of Himalayan Geology (WIHG), National Remote Sensing Centre (NRSC)-Indian Space Research Organization (ISRO) and Defence Research & Development Organization (DRDO) for establishing a comprehensive EWS in HEPs. Based on MoUs signed the Hydro CPSUs including NTPC are collaborating with these agencies for development and implementation of a comprehensive EWS in their HEPs.

In the first phase, 47 Vulnerable Hydro Electric Projects (HEPs) were identified for installation of EWS which are either first in the basin or located at 1500 m and above.

Ministry of Power, has mandated all hydro developers (vulnerable and non-vulnerable) to put in place Early Warning System (EWS) in Hydro Electric Projects (HEPs) located in Hilly Regions.

Other recent Policy Measures by GoI:

- Hydropower Purchase Obligation (HPO) trajectory has been notified on 29.01.2021 and varies from 0.18% to 2.82% for the period of 2021-22 to 2029-30 respectively. The above HPO trajectory shall be trued up based on annual basis depending upon the revised commissioning schedule of hydro Projects.
- Waiver of ISTS charges has been inter-alia extended to Pumped Storage Projects for which construction work is awarded up to 30.06.2025, subject to certain conditions. Subsequently, part waiver of ISTS charges, in steps of 25% from 01.07.2025 to 01.07.2028, have been extended for PSPs for which construction work is awarded up to 30.06.2028.
- Waiver/ reduction in transmission charges for PSPs commissioned up to 30.06.2025 have been notified by Govt. vide MoP order dated 21.06.2021.
- Scheme for bundling of Hydro Power with Renewable Energy has been notified vide MoP order dated 15.11.2021
- Basin-wise indication of Hydro Electric Projects: MoP vide order dated 22.12.2021 has done the basin wise allocation of Hydro Electric Projects in Arunachal Pradesh to the Hydro CPSUs [NHPC, SJVN, THDC & NEEPCO] for carrying out suitable analysis and preparing evaluation reports on the projects indicated. Besides, following regions have also been identified to be pursued for Hydro Projects by the respective CPSUs:-

Uttarakhand	THDCIL
Himachal Pradesh	SJVNL
UT of Jammu & Kashmir and Ladakh	NHPC, except Ujh HEP by NEEPCO

- MoP vide order dated 08.08.2022 has indicated identified Pumped Storage Projects sites to the Hydro CPSUs/ DVC/ BBMB for development & to take up the matter with concerned State Govt. & carrying out suitable analysis and preparing evaluation reports on the projects indicated. CPSUs/DVC /BBMB have been indicated PSPs in the following States/UTs :-

BBMB	Himachal Pradesh
NHPC	Jammu & Kashmir, Maharashtra , Odisha, Mizoram, Madhya Pradesh
THDCIL	Uttarakhand, Maharashtra, Tamil Nadu, Kerala
NTPC	Maharashtra, Andhra Pradesh, Tamil Nadu, Karnataka
SJVNL	Himachal Pradesh, Maharashtra, Mizoram
NEEPCO	Arunachal Pradesh, Assam, Manipur, Mizoram
DVC	West Bengal, Jharkhand

- From FY 2022-23 onwards, the energy from all Hydro Power Projects will be considered as part of RPO vide MoP order dated 22.07.2022. The HPO trajectory, as has been notified earlier will continue to prevail for LHPs commissioned after 8th March 2019. All other HPPs will be considered as part of 'RPO' under category of other RPO".
- Waiver of ISTS Charges on the transmission of power from new Hydro Power Projects, for which construction work is awarded and PPA is signed on or before 30.06.2025. Subsequently, part waiver of ISTS charges, in steps of 25% from 01.07.2025 to 01.07.2028, have been extended for HEPs for which construction work is awarded and PPA is signed up to 30.06.2028.
- Ministry on 06.10.2022 issued state wise indication among CPSEs/BBMB/DVC for survey and investigation of potential floating solar capacities across the country as

States/UT	CPSE/ Organization
Uttarakhand, Uttar Pradesh, Chhattisgarh, Kerala, Maharashtra	THDC
UT of J&K and Ladakh, Sikkim, Madhya Pradesh, Lakshadweep, Delhi, Orisha, Telengana, Maharashtra	NHPC
Punjab, Haryana, Rajasthan, Chandigarh	BBMB
West Bengal, Jharkhand	DVC
All North Eastern States except Sikkim	NEEPCO
Himachal Pradesh, Gujarat, Bihar, Daman & Diu, Dadra & Nagar Haveli, Maharashtra	SJVN
Andhra Pradesh, Tamil Nadu, Karnataka, Puducherry, Andaman & Nicobar, Maharashtra	NTPC

- Guidelines to promote development of Pumped Storage Projects issued on 10.04.2023.

Revival of Hydro Sector:

Through untiring efforts of the Government, a number of stalled projects have been revived. Further, few other projects have taken up due to the persistence efforts of the Government in this regard. List of such hydro projects is as under:

a. Teesta III (1200 MW) in Sikkim- The works on the project were held up since September, 2014 due to funds constraints. Works re-started in October, 2015 and the project was commissioned in 2017.

b. Subansiri Lower (2000 MW) of NHPC in Arunachal Pradesh was stalled since 2011. Works restarted after NGT case was dismissed on 31.07.2019. 03 Units of Subansiri Lower Project are planned to be commissioned during 2024-25 and balance 5 units during 2026-27.

c. Teesta VI (500 MW) in Sikkim was allotted to LANCO but was stalled since 2012. It has been revived through NHPC's bid in NCLT in 2019. CCEA has approved the investment of Rs. 5748.04 crore. The project is under construction and is likely to be commissioned during 2027-28.

d. Rangit IV (120 MW) in Sikkim was originally allotted to Jal Power Corporation Ltd (Private Sector) and was stalled since October, 2013. The project has been revived through NHPC's bid in NCLT and NHPC has taken over Jal Power Corporation Ltd. on 31.03.2021. The project is under construction and is likely to be commissioned during 2025-26.

e. Ratle HEP (850 MW) in J&K, was originally allotted to GVK and was stalled since 2014. It was revived after an MoU was signed amongst NHPC, JKSPDC and PDD, J&K. CCEA clearance for the project was accorded in Jan' 2021. The project is under construction is likely to be commissioned during 2026-27.

f. In UT of Jammu & Kashmir, one new hydro project namely Kwar (540 MW) came under construction in this year. The project is likely to be commissioned in 2026-27

Development of stalled Hydro Electric Projects in Arunachal Pradesh:

During the year 2023, Hydro Sector CPSUs under Ministry of Power viz., NHPC, SJVNL, THDCIL and NEEPCO signed Memorandum of Agreement (MoA) with the Government of Arunachal Pradesh for development of 13 Hydro Electric Projects with cumulative installed capacity of 12723 MW in the State. This shall be a significant step towards harnessing the immense hydroelectric potential of Arunachal Pradesh.

It can be seen that the hydro power is being given its due importance given its niche role in the energy mix. The right framework in which viable projects required from the perspective of maintaining a stable grid and providing power at the time of the day it is required get selected for execution is being promoted.

CHAPTER 07

TRANSMISSION SECTOR

The Transmission System in the country has been continuously strengthened with addition of transmission lines and transformation capacity as under:

	Addition in Transmission line (ckm)	Addition in Transformation capacity (MVA)
2014-15	22101	65554
2015-16	28114	62849
2016-17	26300	81816
2017-18	23119	86193
2018-19	22437	72705
2019-20	11664	68230
2020-21	16750	57575
2021-22	14895	78982
2022-23	14625	75902
2023-24	**14,203**	**70,728**

Major Projects commissioned in 2023-24 (till March, 2023):

i. **Commissioning of Interregional Link:** : "765 kV D/C, Warora – Warangal (New) Transmission Line (665 ckm) implemented by M/s Adani Energy Solutions Limited in Oct' 2023 leading to addition of 4200 MW in Interregional capacity.

ii. "400 kV D/C, Neemuch PS – Chhittorgarh (PG) SS Transmission Line (233 ckm) implemented by M/s POWERGRID in March-2024 adding 1600 MW of Interregional capacity.

iii. Re- conductoring of 400kV D/c, Siliguri – Bongaigaon line with Twin HTLS conductor under North Eastern Region Strengthening Scheme-XII (NERSS-XII) (436 ckm) implemented by M/s POWERGRID in March-2024 adding 600 MW of Interregional capacity.

ii. Following important EHV lines have been commissioned:

a. 765 kV D/C, Lakadia - Vadodara Transmission line (670 ckm) implemented by M/s Sterlite, commissioned in Jan' 2023.

b. 765 kV D/C, Hyderabad – Kurnool Transmission Line (335 ckm) implemented by M/s Adani Energy Solutions Limited commissioned in July' 2023.

c. 765 kV D/C, Warangal (New) – Hyderabad Transmission Line (268 ckm) implemented by M/s Adani Energy Solutions Limited in Sep' 2023.

d. 400 kV, 2xD/c, Bikaner-II PS – Khetri line (1102 ckm) implemented by PGCIL, commissioned in June' 2023.

e. 400 kV D/C, Warangal (New) – Chilakaluripeta Transmission Line (392 ckm) implemented by M/s Adani Energy Solutions Limited in Sep' 2023.

f. 400 KV D/C, Koppal PS- Narendra (New) Transmission Line (276 ckm) implemented by M/s ReNew Transmission Venture Private Limited in Oct'2023.

g. 400 kV D/C Lower Subhansiri - Biswanath Chariyali line -II (371 ckm) under Part C of North East / Northern Western Interconnector -I Project in Dec' 2023.

h. 765 kV D/c Khavda PS (GIS) – Bhuj PS transmission line (218 Ckm) implemented by M/s Adani Transmission Ltd- Commissioned in Jan-2024.

i. 400 kV D/CPachora SEZ PP-Bhopal (Sterlite) Transmission line (288 ckm) implemented by M/s G R Infra Projects Limited - Commissioned in Feb-2024.

j. 400 kV D/C, Neemuch PS- Mandsaur s/s Transmission line (236ckm) implemented by POWERGRID - Commissioned in March-2024.

k. 400 kV D/C, Neemuch PS- Mandsaur s/s Transmission line (236ckm)implemented by M/s POWERGRID, commissioned in March-2024.

Transmission Planning for 500 GW of non-fossil fuel capacity by 2030

Continuing to take leadership role in climate change adaption, our Hon'ble Prime Minister of India, in the COP-26 Summit at Glasgow in November 2021, announced that India will bring its non-fossil energy capacity to 500 GW by 2030.

Renewable Energy Projects have short gestation period compared to that of transmission system. Therefore, required transmission system need to be put in place in advance, so that target of 500 GW RE capacity by 2030 is achieved. Accordingly, Transmission Plan titled "Transmission System for Integration of over 500 GW RE Capacity by 2030" has been prepared in December, 2022.

The installed capacity from Renewable Energy Sources including large hydro is about 190.5 GW as on 31st March, 2024. Therefore, about 309.5 GW of RE capacity and associated transmission system needs to be added by 2030. ISTS network for evacuation of power from about 136 GW RE capacity is under construction/under bidding. RE capacity is to be integrated to intra-state network under Green Energy Corridor Scheme (GEC-I & GEC-II) is about 24 GW and there is margin in existing Inter- State Transmission System due to which about 30 GW of RE capacity can be set up in different States. Transmission system has already been planned for additional 16 GW hydro capacity likely by 2030. For balance RE capacity of about 100 GW, the planned transmission system would be being taken up for implementation in a phased manner commensurate with the RE Capacity.

CHAPTER 08

DISTRIBUTION

(i). Privatization of Power Distribution/Utilities in Union Territories:

Government of India announced privatization of distribution business of the electricity departments/ Utilities for the Union Territories under the AatmaNirbhar Bharat Abhiyaan on 16''' May, 2020. The decision is based on the premise that privatization will lead to better service to consumers and improve the operational and financial efficiencies of the Utilities. This will also rovide a model for emulation by other Utilities across the country.

1. In the process, UT of Dadra & Nagar Haveli and Daman & Diu has notified the transfer scheme on March 11, 2022 which has become effective w.e.f. April 1, 2022 vide notification dated March 21, 2022. With the transfer scheme becoming effective from April 1, 2022, the privatization of Electricity Distribution for the UT of Dadra & Nagar Haveli and Daman & Diu has been achieved.
2. The process of privatization for the UT of Chandigarh is in advanced stages. RFP (Request for Proposal) for privatization was released by the UT of Chandigarh and the successful bidder has also been identified.
3. MoP has conveyed it's no objection to the RFP proposed by the UTs of Puducherry and Lakshadweep which is in the process of finalization for release.
4. Revised RFP proposed by UT of ANI is under approval.
5. The process of privatization in the UT of J&K Is in its initial stages.

(ii) Liquidity infusion package announced under AatmaNirbhar Bharat for the power sector:

The finances of most of the distribution companies (DISCOMs) in the country have been under stress for some time. The outbreak of the global pandemic COVID-19 in the country and the consequent nationwide lockdown has exacerbated the liquidity problems for the power sector further as revenues of the power distribution companies have nosedived as people were unable to pay for the electricity consumed while power supply, being an essential service, had been maintained.

To alleviate the immediate problems in the sector, under the AatmaNirbhar Bharat announcements, the Government has announced a liquidity infusion package for the power sector under which the DlSCOMs would be able to discharge their dues to the CPSU Gencos & Transcos; IPPs, and RE Gencos by availing concessional loans from PFC and REC against State guarantees.

Under the AatmaNirbhar Bharat liquidity infusion package, the Ministry of Power has issued guidelines to the States for availing the benefits of concessional loans from PFC and REC on 14th May, 2020. PFC and REC have advised their loan scheme to States on 16th May, 2020.

Against the Liquidity Infusion package, Rs.1.33 Lakh Cr worth of loans have been sanctioned and Rs. 112456 Cr has already been disbursed/ released till 31-03-2023.

(iii). Revamped Distribution Sector Scheme:

Government of India launched the Revamped Distribution Sector Scheme (RDSS) to help DISCOMs improve their operational efficiencies and financial sustainability by providing result-linked financial assistance to DlSCOMs to strengthen supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. RDSS has an outlay of INR 3.04 lakh Cr. Over 5 years i.e., FY 2021-22 to FY 2025-26. The outlay includes an estimated Government Budgetary Support (GBS) of -INR 0.98 lakh Cr. The main objectives of RDSS are:

- Reduction of AT&C losses to pan-India levels of 12-15% by FY 2024-25.
- Reduction of ACS-ARR gap to zero by FY 2024-25.
- Improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient distribution sector.

Nearly 50% of the investments under RDSS is envisaged for prepaid Smart metering for consumers, system metering at feeder and DT level with communicating feature along with associated Advanced Metering Infrastructure (AMI) and is to be implemented under TOTEX mode (Total expenditure includes both capital and operational expenditure). With smart meters, utilities will be able to better manage their cash flows. Data gathered as part of the two-way communication in a smart metering solution will help utilities to improving their load forecasting, which will help them in optimizing their power procurement thereby reducing the cost of power supply. The direct impact of this feature will be on reducing the ACS-ARR gap and AT&C losses of the DISCOMs.

Capital investment is also budgeted for loss reduction works, for system strengthening works to cater to load growth and modernization works to make smart distribution system under RDSS. Loss Reduction works majorly includes replacement of bare conductor with AB cable, HVDS systems, feeder bifurcation etc. Similarly, system strengthening includes creation of new substations, feeders, upgradation of transformation capacity, cables etc. Modernization work includes SCADA, DMS, IT/ OT, ERP, GIS enabled applications, ADMS etc. to make to make distributions systems smarter.

To monitor the implementation of lhe scheme, an inter-ministerial monitoring committee has been constituted under the Chairmanship of Secretary (Power). So far, **Thirty Two (32)** meetings of the Monitoring Committee of RDSS have been convened, wherein, Action Plan and DPR of 52 Discoms (32 States/UTs) have been approved.

The DPR of Distribution Infrastructure works having total outlay of Rs. 1,25,226 Crores (GBS of Rs. 80,188 Crores) have been approved. Action Plans and DPRs for Distribution Infrastructure works of Loss Reduction for 52 Discoms (32 States/UTs) namely Assam, Andhra Pradesh, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Madhya Pradesh, Kerala, Tamil Nadu, Gujarat, Telangana, Rajasthan, Jammu & Kashmir, Meghalaya, Mizoram, Bihar, Jharkhand, Haryana, Chhattisgarh, Manipur, Tripura, Maharashtra, Karnataka, Puducherry, Sikkim, Goa, Punjab, Ladakh, Arunachal Pradesh, West Bengal, Nagaland, Delhi, Andaman & Nicobar Islands has been approved by Monitoring Committee of RDSS. The sanctioned outlay also includes DPRs for electrification of PVTG HH under the PM-JANMAN for Andhra Pradesh, Maharashtra, Uttarakhand, Uttar Pradesh, Rajasthan, Jharkhand, Chhattisgarh, Karnataka, Tamil Nadu, Madhya Pradesh, Kerala, Tripura and Telangana. To accord the PVTG sanctions, five special monitoring committee meetings have been held.

The total cost of smart metering works (including PMA cost) sanctioned for 28 States/UTs is Rs. 1,30,474 Cr, out ofwhich the GBS component is expected to be 24,139 Cr (including incentive for phase 1). Overall, about ~19.79 crores pre-paid consumers smart meters, ~52 Lakh smart DT meters and ~1.88 Lakh smart feeder meters are planned to be deployed across 28 States under RDSS.

Of the total sanctioned works, Rs. 13,091 crores have been released as on 31.3.2024.

National Electricity Fund (NEF)

The Government of India had approved setting up of the National Electricity Fund in 2012 at an outlay of Rs 25,000 Crores to provide interest subsidy on loans disbursed to the State Power Utilities over a period of 14 years to augment and strengthen the Distribution sector infrastructure. Under the scheme, interest subsidies were made available on loans taken for infrastructure sector projects in areas not served by the erstwhile Rajiv Gandhi Gramin Vidyutikaran Yojana (RGGVY) and Restructured Accelerated Power Development and Reforms Programme (R-APDRP) schemes.

2. The pre-conditions for eligibility are linked to reform measures taken by the States and the amount of interest subsidy is linked to the progress achieved in reforms linked parameters. The preconditions of eligibility were operationalization of State Electricity Regulatory Commission (SERC); formulation of business plan for turnaround of utilities; re-organisation of State Electricity Boards (SEB); release of subsidy by State Government to DISCOMs; submission of audited annual accounts; and, timely filing of tariff petition.

3. Subsidies were admissible on the interests acrrued on the basis of achievements against specific reform measures, i.e. reduction in AT&C losses; reduction in revenue gap (Average Cost of Supply (ACS) - Average Revenue Realized on subsidy received basis); and, return on equity and multiyear tariff (MYT). Based on the consolidated score achieved on achievement against these parameters, the utilities are eligible for subsidy in interest rates from 3% to 5% in States other than Special category and focused states and 5% to 7% in Special Category and focused states.

4. 920 Numbers of projects approved with sanctioned amount of Rs.24100 crore in respect of 24 DISCOMs in 14 States, after delisting of certain non-starter projects. Cumulative disbursements of loan amount of Rs.20424 crore have been made by the lenders.

5. Year-wise details of Actual Expenditure (AE) incurred under the scheme since inception of scheme till 31-03-2024 are as under:

(Rs. in crore)

Financial Year	Total Actual Expenditure (Rs. In crore)
2014-15	1
2015-16	7
2016-17	9
2017-18	75
2018-19	108
2019-20	75
2020-21	200
2021-22	1000
2022-23	582.89
2023-24	453.70

National Smart Grid Mission (NSGM)

National Smart Grid Mission (NSGM) was established in 2015 to plan and monitor implementation of policies and programmes related to Smart Grid in India. NSGM envisages transformation of last mile connectivity ecosystems i.e.,distribution through AMI, outage management, power quality improvement, etc.

NSGM scheme was extended till 31st March 2024 with focus on

- Completing ongoing sanctioned projects,
- Training and capacity building,
- Technical assistance to utilities and
- Handholding of DISCOMs on their Smart Grid Distribution preparedness, etc.
- **Smart Grid Projects under NSGM**

Currently, under NSGM,two (2) projects with of worth Rs.116.01

Cr. viz. one in Chandigarh (Subdivision No. 5) and one integrated project in 6-towns in Rajasthan for 1.8 lakh consumers are under advanced stages of implementation / nearing closure. As of December 2023, ~1.69 lakh smart meters have been installed in these two projects.

- **IITH R&D project on "Standardised Way of Sharing Energy Data with Third Party Applications"**

  An R&D project by IITH on "Standardised Way of Sharing Energy Data with Third Party Applications" was sanctioned under NSGM. The project is under implementation, wherein Development of APIs and sample app have been completed and tested with utility Meter Data Management System data. NSGM grant amounting to Rs.3.3 lakh has been released. The project report has been prepared and discussions underway at BIS for further standardization/action etc.

- **Smart Meter Statistics Dashboards**

  NSGM has been tasked with collation of smart metering deployment statistics from Nodal agencies (REC& PFC) and information is collated in formats finalized by MoP. The data is being shared regularly (on fortnightly basis) with MoP and is also published on NSGM website.

o https://www.nsgm.gov.in/en/sm-stats-all

o https://www.nsgm.gov.in/en/state-wise-map

As of March 2024, more than 1 Crore smart meters deployed across various states/schemes.

- **Training and Capacity Building**

  NSGM undertakes training and capacity building programs for officials of Utilities/DISCOMs involved in implementation of Smart Grids with 100% funding support. To formalize and conduct regular training and capacity building programs (put on hold due to pandemic), a fresh MoU was signed between NPMU and SGKC in June 2023. Under this MoU, four (4) nos. Smart Grid/ Smart Distribution training programs were conducted at SGKC in the year 2023-24, wherein 114 nos. engineering professionals from different Indian DISCOMs were trained. In total, more than 450 engineering professionals/ DISCOM officials have been given training on smart grid applications under NSGM so far.

- **Smart Grid Knowledge Centre**

  The Smart Grid Knowledge Centre (SGKC), a state-of-the-art platform for demonstration and outreach of smart grid technologies, has been established by the POWERGRID with support from MOP and NSGM. SGKC showcases smart grid technologies through demonstrations and provides training and capacity building support to power distribution companies. Further, SGKC is being developed as one of the leading Centres of Excellence (CoE) under MoP guidance to foster partnerships, innovation and entrepreneurship in Smart Grid technologies and create capacities in the power sector.

  A Virtual SGKC (co-existing with physical SGKC) has been developed to ensure remote access to all SGKC offerings. The VSGKC platform was launched in March 2022 by the Hon'ble Cabinet Minister (Power, New & Renewable Energy) and can be accessed at https://sgkc.powergrid.in. The platform hosts ~51 solutions from 34 technology partners in 8 thematic areas spanning across new and advanced technologies such as AI, ML, blockchain, IOT, etc.

- **Smart Distribution in 5 Identified Indian Cities**

  MoP has constituted a committee under Chairmanship of Chairperson CEA to recommend a complete framework for Smart Grids and accordingly, recommendations for Smart Distribution was submitted in December 2022. Hon'ble Minister of Power and NRE reviewed the recommendations and as per further directions, a concept note on Smart Distribution was submitted to MoP in June 2023. A meeting held under Secretary (Power) reviewed the identified technological interventions and identified 5 cities viz. NDMC, Indore, Guwahati, Patna, and Varanasi and suggested to submit cost estimates for Smart Distribution deployment for consideration under RDSS.

  NSGM with support Nodal agencies (PFC/REC) has carried out the assessments for suitable technology interventions for the identified Smart Distribution cities through virtual meetings and visits to the selected cities/ DISCOMs. Multiple rounds of discussions held with Discoms officials have resulted in preparation of cost estimates for the selected technology interventions as per advice of utilities and submitted for review at Discoms end. Draft Smart Distribution DPRs for NDMC, Guwahati, Varanasi and Indore have already been submitted to respective utilities while for Patna is under discussion. Further, Varanasi and Guwahati Discom's have already submitted their DPRs to Nodal Agencies for appraisal, and the DPR for Varanasi has been sanctioned for Rs.312.24 Cr. during 31st Monitoring Committee Meeting of RDSS held on 11th March 2024.

- **Task Force for Development of 5G Use Cases**

  A task force was constituted by MoP in September 2023 with following ToR:

a. Identifying specific areas where 5G technology can be leveraged.

b. Conceptualizing, Designing, and implementing demonstrable models with potential of 5G usages.

c. For proposing models for showcasing in Indian Mobile Congress.

d. Any other proposal specific to 5G Usages in sector which the committee deems fit.

NPMU is convening the Task Force for development of 5G use cases specific to Power Sector and two meetings were held under Member, CEA & CISO, MoP in October 2023. Committee members identified few potential

5G Use Cases specific to Power sector that may also be showcased in Indian Mobile Congress2024. Further task force agreed that Considering the steps taken by IIT Delhi in advancement of 5G , domain specific solutions can initially be tested at IIT Delhi laboratory while full fledge test lab can be developed in due course for prototype testing of power sector specific 5G use cases at SGKC, POWERGRID Manesar. Suitable funding mechanism for the same need to be worked out under the overall guidance of MoP for the same. and recommendations are under preparation.

- **Advanced Technology and Standard Development**

  NSGM has been actively engaging with BIS, TEC and TSDSI etc. in advanced technology and standard development domain for bringing out best practices and solutions for deployment of Smart Grids.

  NSGM has shared insights on M2M/IoT use cases, cyber security measures & communication challenges for power sector during regional workshop on 'M2M & IoT security & use cases' in Mumbai & Jaipur as well. Major inputs submitted on TEC draft document "IoT & 5G applications in Smart Grid".

  NPMU is engaged with TSDSI technical study group "(SI 87) - Communications Requirements & Recommendations for the Energy Sector" for harmonization and enhancement of communication technology performance in today's grid scenario. Further, NPMU is actively engaging and collaborating with BIS through LITD28 for Standardization/harmonization of RF (Sub-GHz) last mile communication protocol for smart city applications including Smart Grids.

- **Collaboration Activities**

  NPMU is collaborating with USAID SAREP, New Buildings Institute (NBI) and Environmental Design Solutions (EDS) team regarding Building Grid-Integration framework. Work is under progress to ascertain the basic requirements and get requisite data from the identified 2 nos. utilities (Indore-MPPKVVCL & Gurgaon-DHBVN) for developing the suitable metrics like hourly load profile, energy mix, power purchase cost, consumer profiling for energy efficiency and demand flexibility strategies in major building topologies and grid context.

CHAPTER 09

POWER SECTOR REFORMS

The Ministry of Power has undertaken significant reforms through rules, emphasizing the crucial role of State Regulators and State utilities in their successful implementation. To ensure compliance with statutory provisions under the Electricity Act, Policies, and Rules, a dedicated division has been established within the Ministry, consistently monitoring compliance. Quarterly reports on these compliances are regularly published.

Key performance parameters for the fiscal year 2023-24 indicate notable progress across States and Union Territories (UTs) in India. Currently, 25 States/UTs have issued tariff orders for FY 2024-25, and 20 States/UTs have issued true-up orders for FY 2022-23 in the distribution sector. Fuel and power purchase cost adjustments, as mandated by the Electricity (Amendment) Rules, have been notified by 19 States/UTs, while 17 States/UTs are yet to notify regulations in line with the Rules. Furthermore, 21 States/UTs have notified regulations for Green Energy Open Access, 9 have issued draft regulations, and 6 are yet to issue. Additionally, 21 States/UTs have issued green tariffs, indicating the availability of green power which can be demanded by consumers.

The cumulative revenue gap (formerly referred to as regulatory assets) of distribution utilities in the country stands at Rs. 1.57 lakh crores. Tamil Nadu, Rajasthan, and Delhi contribute significantly to this gap, accounting for Rs. 89,735 crores, Rs. 47,833 crores, and Rs. 9,009 crores, respectively, making up 90% of the cumulative revenue gap.

On the implementation front, 19 states/UTs have notified regulations and 17 are yet to issue regulations in line with Electricity (Amendment) Rules, 2022, regarding fuel and power purchase cost adjustments. Concerning the Green Energy Open Access Rules 2022, 21 states/UTs have successfully notified regulations, 9 have issued draft regulations, and 6 are yet to issue regulations to facilitate Green Energy Open Access for consumers. Moreover, 21 states/UTs have issued Green Tariffs, while 15 are yet to do so, indicating a varied pace of adoption nationwide.

The collective progress made by states and UTs in complying with regulatory norms significantly contributes to enhancing the sustainability and viability of the electricity sector in the country.

1. Electricity (Late Payment Surcharge and Related Matters), Rules, 2022:

Electricity (Late Payment Surcharge and Related Matters) Rules, 2022 have been promulgated by Ministry of Power to give huge relief to the DISCOMs as well as electricity consumers and at the same time Generating companies are also getting the benefit from assured monthly payments. This will help the whole power sector to become financially viable. In the Rules, provision has been made for one-time scheme for liquidation of arrears, enabling DlSCOMs to pay total outstanding dues including Late Payment Surcharge (LPS), as on the date of notification, in upto 48 number of monthly installments. No LPS on past outstanding dues will be applicable in case of timely payment of these installments. It will bring discipline in timely payment of dues. It will also benefit DlSCOMs in form of no liability towards LPS, which will ultimately benefit the electricity consumers. DlSCOMs will also be benefitted by way of reduction of LPS from 18% to a rate linked to Bank lending rate. If bank rate reduces, the LPS will also reduce, resulting in lower tariff for the consumers.

Regulation of power supply is mandated in case of non-maintenance of Payment Security Mechanism (PSM) or continuation of default in payment of outstanding dues. Provision for regulation of short-term, medium—term and long-term access may be in a gradual manner in case of non- payment of dues even after 2.5 months from bill presentation has been made to ensure timely payment of dues. Through special provisions for ensuring supply obligation of the Generating Company to maintain sanctity of PPAs DISCOMs' interests are protected to avoid supplying the power in Power Market during high market price period instead of to DlSCOMs as per PPA. At the same time, it ensures the Generators' viability by allowing them to sell in power market in the event of non-maintenance of PSM and continuous payment default of DISCOMs.

Since implementation of the rule, as on 22.07.2024, total bills amounting to Rs. 9,47,232 crores have been settled against total billed amount of Rs. 10,25,965 Cr (excluding EMI Payments against legacy dues and including Disputed Invoices). Against legacy dues of Rs. 1,39,947 Cr as on 03.06.2022, 13 States/ UTs have paid installment of Rs 1,04,828 Cr (24 EMls and prepayment and reconciliation). 10 out of these 13 states opted for loans from PFC/ REC (total loan sanctioned of Rs 1,13,737 Cr). Further, 20 States/ UTs reported to have no outstanding dues as on 03.06.2022.

In February 2024, an amendment was made to address the issue of surplus power within the declared generation capacity that is not requisitioned by distribution companies, resulting in unused power capacity at the national level. With the amendment, to optimize the use of available power, power generators who did not offer their surplus power were no longer be eligible to claim capacity or fixed charges for that surplus. Additionally, this surplus power could not be sold in the power exchange at a price exceeding 120% of the energy charge plus applicable transmission charges. Furthermore, amendments were made to align the rules with statutory provisions related to accessing the national power grid. These changes facilitate quicker restoration of grid access for distribution companies facing curtailment due to payment defaults, once they settle their outstanding dues.

2. Marked Reduction in AT&C Losses of DISCOMS

The AT&C losses of DISCOMs have declined significantly from 22% in FY 2021 to 16.64% in FY 2022 and provisional report shows that the losses have further reduced to 15.41% in FY 2023. This reduction brought about by implementation of revised prudential norms for lending by PFC and REC; the reform conditions of RDSS; conditional additional borrowing window to States, mandatory energy accounting and auditing for all DlSCOMs and the Late Payment Surcharge Rules. This would help in bring financial viability of the DlSCOMs and improve the power sector as a whole.

3. Amendments in Electricity Rights of Consumers:

With the objective of beginning an era of empowering Power Consumers, laying down rights of the consumers and a system of enforcement of these rights, while facilitating ease of doing business in power sector, the Ministry of Power promulgated the Electricity (Right of Consumers) Rules 2020 with the conviction that the power systems exist to serve the consumers and the consumers have rights to get the reliable services and quality electricity.

These Rules lay down the time limits and standards for the various services to be provided by the Distribution Companies across the country, which are monopolies, to provide services in accordance with standards or pay compensation to their consumers. These Rules specify the obligations of the licensee and sets the practices that must be adopted by the licensee to provide efficient, cost-effective, reliable and consumer friendly services to the consumers. These rules are one of the evolving steps to enable the transformation of a DISCOM from a mere power supplying agency to a holistic consumer focused service provider.

First amendment regarding net metering provisions under Consumer Rules 2020 was notified on 29th June, 2021.

Another amendment to these Rules was notified 21st April, 2022, to specify the parameters to maintain the reliability of supply by the distribution licensee namely System average interruption duration index (SAIDI) and System average interruption frequency index (SAIFI), customer average interruption duration index (CAIDI), customer average interruption frequency index (CAIFI) and momentary average interruption frequency index (MAIFI).

Further the consumers, who are using the diesel generator sets as essential back up power, shall endeavor to shift to cleaner technology such as renewable energy with battery storage and the like in five years from the date of commencement of these rules or as per the timelines given by the State Commission for such replacement based on the reliability of supply in that city covered under area of supply of the distribution licensee.

The Government of India has made further amendments to the Electricity (Rights of Consumers) Rules, 2020 on 14.06.2023, bringing an important change to facilitate more and more consumption of power from renewable sources by the introduction of Time of Day (ToD) Tariff, where electricity prices vary based on the time of day, in a time bound manner is essential for giving price signal to change the consumption behaviour of consumers while incentivising use of more electricity during solar hours.

The ToD mechanism aims to encourage consumers to manage their load and reduce electricity bills, as well as facilitate better integration of renewable energy sources by incentivizing shifting of demand to high renewable energy generation periods. Most State Electricity Regulatory Commissions have already implemented ToD tariffs for large commercial and industrial consumers.

Government has also simplified the rules for smart metering for ease of doing business as well as ease of living. To avoid inconvenience / harassment of the consumers, the existing penalties for increase in consumer's demand beyond the maximum sanctioned load/demand have been reduced. As per the amendment in metering provision, post installation of a smart meter, no penal charges will be imposed on a consumer based on maximum demand recorded by the smart meter for the period before installation date. Load revision procedure has also been rationalized in a way that maximum demand shall be revised upwards only if sanctioned load has been exceeded at least three times in a financial year. Moreover, smart meters shall be read remotely at least once in a day and the data shall be shared with Consumers in order to enable them to take informed decision about consumption of electricity.

The time period for obtaining a new electricity connection has been reduced from seven days to three days in metropolitan areas, from fifteen days to seven days in other municipal areas and from thirty days to fifteen days in rural areas.

Rules have been amended to facilitate faster installation and enhance the ease of setting up Rooftop Solar PV systems at the premises of prosumers. Exemption has been given for the requirement of technical feasibility study, for systems up to a capacity of 10 kW. For systems of capacity higher than 10 kW, the timeline for completing the feasibility study has been reduced from twenty days to fifteen days. Further, in case the study is not completed within the stipulated time, the approval will be deemed to have been given. Further, the timeline for the distribution licensee to commission Rooftop Solar PV systems has been reduced from thirty days to fifteen days.

4. Amendments in Electricity (Promoting Renewable Energy through Green Energy open Access) Rules, 2022

For unshackling the RE Sector, i.e. to remove barriers in

availability and utilization of RE and to address the issues that have hindered the growth of open access for a long time, Green Open Access Rules, 2022 have been notified on 6th June, 2022. The Rules reduces the Open Access limit from 1 MW to 100 kW, which pave the way for small consumers also to purchase RE and there is no limit for Captive Consumers.

These Rules provide for that any consumer can demand supply of Green power from DISCOMs. It will allow Commercial and Industrial Consumers to purchase RE on voluntarily basis. The Rules will streamline the Open Access approval process including timely approval, transparency, simplification. Approval of open access to be granted in 15 days or else it will be deemed to have been approved. The special provisions for cross-subsidy surcharge, additional surcharge, standby charge as well as for banking, will incentivise the consumers to get Green Power at reasonable rates. As per these Rules, the tariff for the green power will be determined by the Appropriate Commission, separately. For promoting Green Hydrogen/ Green Ammonia and Waste to Energy Plants, Special concessions are given in the rules. POSOCO has been notified as Central Nodal Agency to set up and operate a single window green energy open access system for renewable energy.

As mandated under these Rules to operationalise green open access, a web portal has been designed and developed by POSOCO the Central Nodal Agency, and launched on 11.11.2022. This portal will facilitate as a single platform for submitting and approval of applications for open access. This will ensure faster and easier open access for utilising green energy by all stakeholders. Further, as mandated under these Rules Forum of Regulators has formulated a model regulations on methodology for calculation of open access charges, as well as banking charges.

Further amendments to these Rules have also been notified on 27.01.2023 and 23.05.2023 for effective implementation. In the recent amendment made in Green Open Access Rules, the following provisions have been made:

i. **Revamped "Entity" Definition:** Previously, an "entity" was any consumer with a contracted demand or sanctioned load of 100 kW or more, except for captive consumers who had no load limit. Now, the definition expands to include those with 100 kW or more, achieved through either single or multiple connections in the same electricity division of a distribution licensee.

ii. **Unlimited Access to Green Energy:** A Proviso, has been updated to grant all entities, whether through a single connection or multiple connections totaling 100 kW or more within the same electricity division, the eligibility to access Green Energy Open Access. Captive consumers, in particular, now enjoy unrestricted access to this green energy resource.

iii. **Extended Surcharge Exemption:** Rule 9 now extends surcharge exemption for electricity generated from offshore wind projects. The new deadline for commissioning such projects is December 2032, offering an extended window of opportunity compared to the previous deadline of December 2025.

5. Extension of Waiver of ISTS charges for Offshore Wind and Green Hydrogen/Green Ammonia Plants

To promote the addition of renewable energy generation in the country, Ministry of Power vide Order dated 29.05.2023 allowed the waiver of Inter-State Transmission (ISTS) charges on electricity generated from Offshore power projects which are to be commissioned on or before December 31, 2032. This waiver applies for 25 years for the Offshore wind projects, with a graded waiver after that period up to December 31, 2035. Additionally the waiver of Inter-State Transmission (ISTS) charges has been extended to Green Hydrogen/Green Ammonia Plants commissioned on or before 31.12.2030 which are utilizing renewable energy from Solar, Wind, Large Hydro commissioned after 8th March, 2019, or Energy Storage Systems (ESS) or any hybrid combination of aforementioned technologies, for the production of Green Hydrogen or Green Ammonia. This waiver applies for 25 years for Green Hydrogen/Green Ammonia Plants, with a graded waiver after that period up to December 31, 2034.

6. Viability Gap Funding for development of Battery Energy Storage Systems

The Government has approved the Viability Gap Funding (VGF) for development of Battery Energy Storage Systems. The scheme has set a target of adding 4,000 MWh of BESS by 2027-28 by providing the VGF of Rs 3,760 crore in the form of Capital subsidy. The VGF support will be provided for Battery Energy Storage Systems (BESS) to be approved during a period of three years viz. 2023-24, 2024-25 and 2025-26. The disbursement of funds shall extend upto 2030-31 and shall be in 5 tranches considering the commissioning period of 18-24 months.

7. Renewable Purchase Obligation

The Ministry of Power has taken a significant stride towards driving demand and promoting Renewable Energy (RE) through the enactment of the Energy Conservation (Amendment) Act, 2022. The notification issued on October 20, 2023 under the Energy Conservation Act mandates the minimum share of non-fossil energy consumption for designated consumers, effective from April 1, 2024. According to the notification, all electricity distribution licensees and all other designated consumers who are open access consumers or captive users to the extent of consumption of electricity from sources other than distribution licensee shall utilise a minimum percentage of energy consumption from different types of non-fossil sources as a percentage of their total share of

energy consumption.

8. Procedure for implementation of Uniform Renewable Energy Tariff

Ministry of Power has notified Electricity (Amendment) Rules 2022 on 29th Dec 2022 for inter-alia, implementation of uniform renewable energy tariff. Under these rules, the Implementing Agency, Grid-India Limited, shall compute 'uniform renewable energy tariff', on a monthly basis for each category of central pool like Solar Power Central Pool, Wind Power Central Pool, etc. The intermediary procurer as notified by the Central Government shall sell power from renewable energy from that central pool to all the end procurers. The implementation of URET will bring uniformity in source-wise renewable energy tariff procured by the consumer.

9. Subsidy Accounting and Framework for Financial Sustainability in Power Sector:

With the amendment in the Electricity Rules, 2005 notified on 26.07.2023, the Government has put in place additional measures to improve financial health of Discoms with streamlining the process of accounting, reporting, billing and payment of subsidy by States to the Distribution Companies. The measures come in the wake of the need for a framework for sustainability of the sector and the fact that improper and non-transparent accounting as well as non-payment or delayed payment of subsidy announced by the States is one of the major reasons for financial distress of Discoms.

The Rules mandate that a quarterly report shall be submitted by the distribution licensee within thirty days from end date of the respective quarter and the State Commission shall examine the report, and issue it within thirty days of submission of the quarterly report. The report will inter-alia cover the findings regarding raising of demands for subsidy based on accounts of the energy consumed by the subsidised categories; and the subsidy payable to these categories as announced by State Government and the actual payment of subsidy in accordance with section 65 of the Act.

Provision has been made that if subsidy accounting and the raising of bills for subsidy is not found in accordance with the Act or Rules or Regulations issued there under, the State Commission shall take appropriate action against those responsible for non-compliance as per provisions of the Act.

Under the framework for sustainability, in order to define a definite and reasonable goal for reduction of Aggregate Technical and Commercial (AT&C) loss, it is prescribed that the AT&C loss reduction trajectory would be approved by the State Commissions for tariff determination in accordance with the trajectory agreed by the respective State Governments and approved by the Central Government under any national scheme or programme, or otherwise. The trajectory for both collection and billing efficiency, for distribution licensee have to be determined by the State Commission, accordingly.

In order to ensure the recovery of full costs incurred by the Distribution licensee in distributing electricity, it has been prescribed that all prudent costs of power procurement, done in a transparent manner, would be taken into account, while approving the tariff. Similarly, all the prudent costs incurred by the distribution licensee for creating the assets for development and maintenance of distribution system would be accounted for subject to fulfillment of prescribed conditions.

It is also provided that Gains or losses accrued to distribution licensee due to deviation from approved AT&C loss reduction trajectory would be shared between the distribution licensee and consumers.

For establishing norms for operation and maintenance of the distribution system, Central Electricity Authority has been mandated to issue guidelines.

Reasonable Return on Equity (RoE) is one of the major factors required to ensure investment in the sector. The Rule provides that the RoE by the State Commission would be aligned with the RoE specified by the CERC in its Tariff Regulations for the relevant period, with appropriate modification taking into account the risks involved in distribution business.

CHAPTER 10

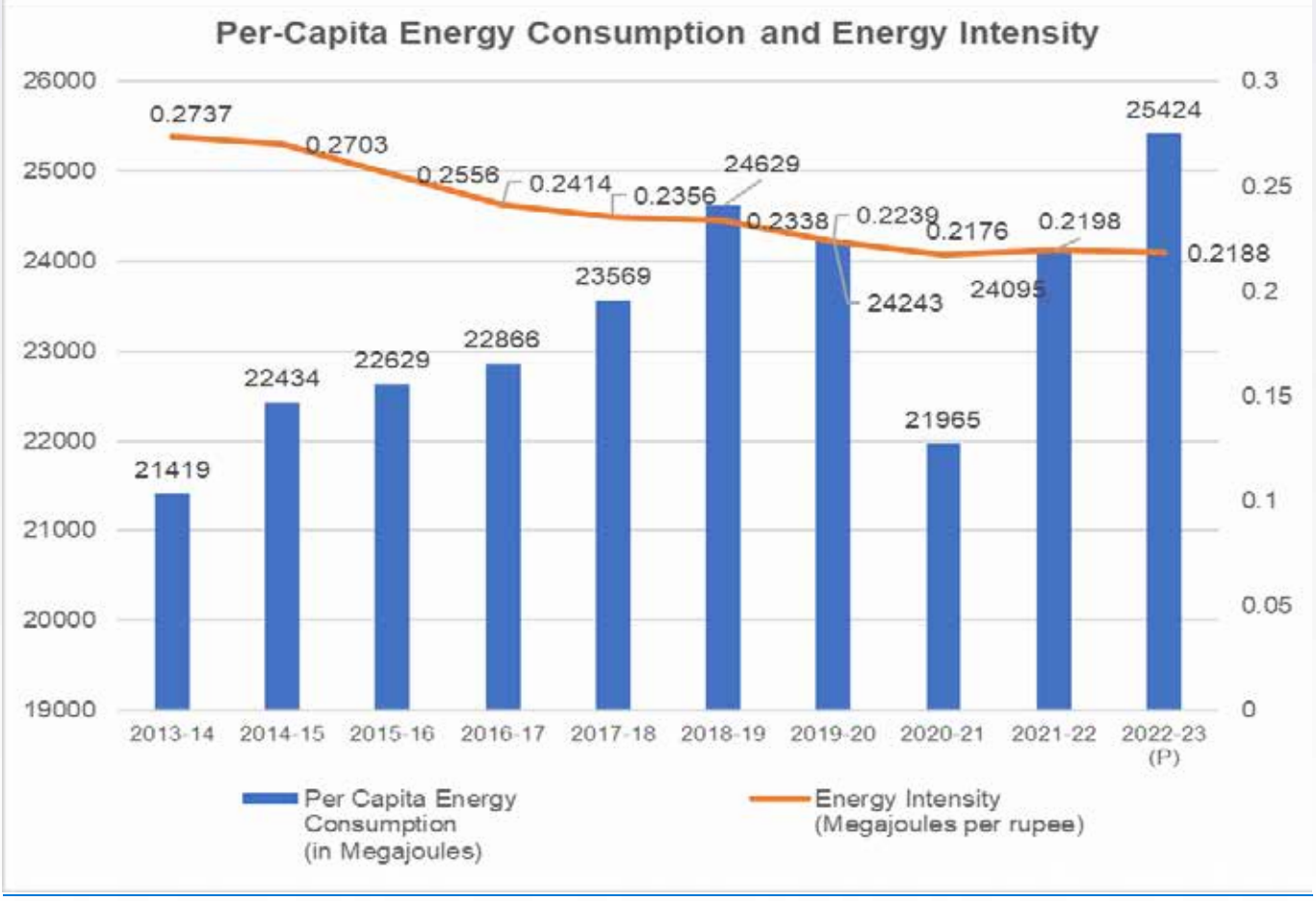
ENERGY CONSERVATION

India has been witnessing a significant rise in the demand for energy across all the sectors with rapid increase in access, affordability and urbanization. India's development path focusses on the need for rapid economic growth which is an essential precondition to poverty eradication and improved standards for living while at the same time focusing on sustainable growth for maintaining ecological balance. Energy Efficiency is a key element that can contribute towards reducing the energy requirements and the associated environmental implications.

The institutional framework in place for pursuing this agenda includes the Energy Conservation Act 2001 (EC Act) and the Bureau of Energy Efficiency (BEE) which is the nodal central statutory body to assist the Government in implementing the provisions of the EC Act. As a regulatory and policy advisory body, the Bureau helps in developing policies and strategies that emphasize self-regulation and market principles to achieve the primary objective of reducing the energy intensity of the Indian Economy. The EC Act also empowers the State Government to facilitate and enforce the efficient use of energy through their respective State Designated Agencies in consultation with BEE. It also empowers the Central Government to specify energy performance standards.

India ratified the Paris Agreement on Climate Change in 2016 under which its member countries have given commitments to keep global average temperatures rise below 2-degree C by the end of century.India has updated its Nationally Determined Contribution (NDC) in 2022 and enhanced its target of electric power generation installed capacity through non-fossil fuel to 50% by 2030 and to reduce the emission intensity of the GDP by 45% as compared to 2005 levels.

To achieve these enhanced targets, it would be necessary to continue aggressively with its ongoing interventions and also enhance the existing policy coverage. Ministry of Power and Bureau of Energy Efficiency has been taking various steps for conserving energy through various flagship programmes in the areas of industries, appliances, buildings, transport, agriculture and demand side management etc. in order to fulfil the goals committed in the NDC and foster long term sustainable development. Owing to the various energy efficiency measures taken so far, energy intensity of the country has declined from 0.2737 MJ/rupee in 2013-14 to 0.2188 MJ/rupee by 2022-23 indicating an improvement of 20%.



Energy Intensity of India in Mega Joule / rupee

Source: Energy Statistics, 2022-(MOSPI)

NATIONAL ENERGY CONSERVATION AWARD - 2023

The National Energy Conservation Awards are presented to industry and other establishments every year by the Ministry of Power with the objective of promoting energy conservation among all sectors of economy. These awards recognize and encourage endeavors of industrial units, institutions and establishments in reducing energy consumption by felicitating them with Energy Conservation Awards on the occasion of National Energy Conservation Day, celebrated on 14th December every year.

Ministry of Power celebrates National Energy Conservation Day on 14th December. Hon'ble President of India Smt Droupadi Murmu felicitated winners of the 33rd National Energy Conservation Awards (NECA).

Group photograph of National Painting Competition Awardees with Hon'ble President of India (14.12.2023)

NATIONAL ENERGY EFFICIENCY INNOVATION AWARDS (NEEIA) - 2023

BEE under the Ministry of Power has also initiated National Energy Efficiency Innovation Award (NEEIA). It is to recognize "Innovative Energy Efficiency Technologies" and instill a sense of competition to motivate industries & sectors to develop innovative energy efficiency efforts in their units. The online applications were invited from 3 categories; ie: Category A (Industry, Transport, Building) & Category B (Students & Research Scholars). A total of 187 applicants participated for NEEIA 2023.

A brief of all the schemes being implemented by BEE is as follows:

I. Standards & Labelling

The Standards and Labeling (S&L) Program is one of the major thrust areas of BEE. This Program was launched with the key objective of providing consumers an informed choice about the energy and cost saving potential of the labelled appliances/equipment being sold commercially. This program entails laying down minimum energy performance norms for appliances / equipment, rating the energy performance on a scale of 1 to 5, 5 star being the most energy efficient one. As on December 2023, 35 appliances are covered under the ambit of Standards and Labeling program. Out of which, 16 appliances are under mandatory regime and remaining 19 appliances are under voluntary regime. List of 35 appliances under S&L program is given below:

S. No.	Mandatory	S. No.	Voluntary
1	Frost Free Refrigerator	1	General Purpose Industrial Motor
2	Direct Cool Refrigerator	2	Agricultural Pump Set
3	Deep Freezers	3	Domestic Gas Stove
4	Room Air Conditioner (Variable Speed)	4	Computer
5	Room Air Conditioner (Fixed Speed)	5	Ballast
6	RAC (Cassette, Floor Standing Tower, Ceiling, Corner AC)	6	Office Automation Products
7	Light Commercial AC Fixed Speed	7	Diesel Engine Driven Monoset Pumps for Agricultural Purposes
8	Stationary Storage Type Electric Water Heater	8	Solid State Inverter
9	Tubular Fluorescent Lamps (TFL)	9	Diesel Generator Set
10	LED LAMPS	10	Microwave Oven
11	Ultra-High Definition (UHD) Televisions	11	Solar Water Heater
12	Colour Television	12	Air Compressors
13	Distribution Transformer	13	High Energy Li-Battery
14	Ceiling Fan	14	Tyres/Tires
15	Chillers	15	Side by Side/Multi Door Refrigerator
16	Washing Machine	16	Pedestal Fan
		17	Table/Wall Fan
		18	Induction Hob
		19	Solar PV
		20	Packaged Boiler
		21	Commercial Beverage Coolers
		22	Grid Connected Solar Inverter

- New S&L program for Solar Photovoltaic, Packaged Boiler, Commercial Beverage Cooler and Grid Connected Solar Inverter launched in during 2023-24.
- Deep Freezer, Light Commercial Air Conditioners (LCAC), UHD Television (UHD TV/4K), Chillers and Washing Machine have been made mandatory during 2023-24.
- Till March, 2024, 3426 brands and 25598 models were registered under S&L program.

II. Energy Conservation Building Code (ECBC)

The Energy Conservation Act, 2001 provides the framework for publishing Energy Conservation Building Code (ECBC). These Building energy codes have been adopted as a regulatory measure for ushering energy efficiency in the building sector.

A. Commercial Building sector

Updated version of Energy Conservation Building code was launched in 2017, as the step towards promoting energy efficiency in the commercial building sector. The Energy Conservation Building Code (ECBC) sets minimum energy performance standards for new commercial buildings having a connected load of 100 kW or more, or contract demand of 120 kVA or more. While the Central Government has powers under the EC Act to publish ECBC, the State Governments have the flexibility to modify the code to suit local or regional needs and notify them.

As on March, 2024, 25 States and Union Territories namely, Andaman & Nicobar, Andhra Pradesh, Assam, Arunachal Pradesh, Goa, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Mizoram, Odisha, Punjab, Puducherry, Rajasthan, Sikkim, Telangana, Tripura, Uttarakhand, Uttar Pradesh, West Bengal, Chhattisgarh, Tamil Nadu and Chandigarh have notified ECBC for implementation in their respective states. Further, among the above 25 states and UTs, 13 States namely, Andaman & Nicobar Island, Andhra Pradesh, Karnataka, Kerala, Telangana, Punjab, Uttarakhand, West Bengal, Rajasthan, Haryana, Uttar Pradesh, Madhya Pradesh and Puducherry have incorporated ECBC in Municipal Bye-laws. About 476 ULBs have been covered under these states for compliance.

Number of ULBs(Urban local Bodies) issued ECBC directives

S. No.	State	No. of ULBs
1	Andaman & Nicobar	02
2	Andhra Pradesh	123
3	Assam	01
4	Haryana	01
5	Kerala	92
6	Madhya Pradesh	85
7	Puducherry	01
8	Punjab	02
9	Telangana	142
10	Uttar Pradesh	27
Total		**476**

Number of Buildings (ECBC) approved by ULBs in states

S. No.	State	No. of buildings approved by ULBs
1	Andhra Pradesh	786
2	Haryana	100
3	Kerala	57
4	Punjab	552
5	Telangana	738
6	Uttar Pradesh	201
7	Uttarakhand	12
Total		**2446**

SuperECBC demonstration project is also initiated in 13 States and buildings are now at various levels of construction.

(i) Star Rating of Commercial Buildings

Launched by Ministry of Power in India in 2009, the programme is based on the energy usage in the building over its area expressed in Energy Performance Index (EPI) in kWh/sqm/year. In this program, buildings are rated on 1-5 scale, with 5 star labelled buildings being most efficient. Presently, four typologies of the buildings are covered in the scope viz. Office buildings, BPO, Hospitals, and shopping malls. The buildings having connected load 100kW and above are considered for BEE star rating scheme. Recently, BEE has revised the EPI band for Star Rating for Office Buildings and BPOs. The revision of the scheme is effective from January 2022. As on March, 2024 more than 346 buildings have been rated under various categories. 90 No. of applications are under process.

Shunya Labelling programme for Net Zero Energy Buildings (NZEB) and Net Positive Energy Buildings (NPEB) is launched in 2021.The programme is named as "Shunya" Labelling Programme. Shunya is the Hindi meaning of Zero (0) thus making it suitable to label the NZEB and NPEB buildings as Shunya. The Shunya programme aims to identify and commemorate the building owners of NZEB and NPEB by providing a label. Till March, 2024 40 No. buildings have been rated and 90 No. applications are under process.

B. Residential Building sector

Eco Niwas Samhita (ENS) which was a voluntary norm targeting the residential sector was launched in 2018. After EC Act amendment in Dec 2022, the code is applicable to all residential buildings having a connected load of 100 kW or more, or contract demand of 120 kVA or more. While the Central Government has powers under the EC Act to publish ENS, now the State Governments have the power to notify it and make it mandatory.

III. Enhancing energy efficiency in Industries– Implementation of Perform Achieve and Trade (PAT)

One of the flagship schemes under NMEEE, the Perform, Achieve and Trade (PAT) scheme is a mechanism designed to achieve emissions reduction in energy intensive industries and it is designed on the concept of reduction in Specific Energy Consumption (SEC). It involves assessment of SEC in the baseline year and projected SEC in the target year covering different forms of net energy going into the boundary of the plant and the products leaving out of it over a particular cycle.

Perform, Achieve and Trade Cycle- I (2012-13 to 2014-15)

Perform Achieve and Trade in its first cycle was designed to reduce the specific energy consumption (SEC) i.e. energy used per unit of production of 478 industrial units in 8 sectors viz. Aluminum, Cement, Chlor- Alkali, Fertilizer, Iron & Steel, Paper & Pulp, Thermal Power Plant and Textile. Energy saving targets were given to these 478 industrial units called Designated Consumers (DCs) based on their current levels of energy efficiency, so that energy efficient units will have low target of percentage reduction, as compared to less energy efficient units which will have higher targets. The overall SEC reduction targets aimed to secure 4.05% reduction in the total energy consumption of these industries totaling to an energy saving of 6.686 Million Tonne of Oil Equivalent (MTOE). Units which were able to achieve SEC level that are lower than their targets could receive energy savings certificates (ESCerts) for their excess savings.

Trading of ESCerts:

Ministry of Power had issued about 38.25 lakh ESCerts to 306 Designated Consumers (DCs of PAT cycle –I) for excess energy saving and 110 DCs of PAT cycle –I were entitled to purchase about 14.25 lakh ESCerts to meet their shortfall to meet energy saving targets. Trading of ESCerts at Power Exchange had commenced in September, 2017. The total volume of ESCerts traded was about 12.98 lakhs resulting into a business of about INR 100 crores.

Perform, Achieve and Trade Cycle-II

"Deepening" –identification of new DCs in existing sectors and "Widening" –inclusion of new sectors, was carried out by

BEE before the commencement of the second cycle of PAT. Deepening study resulted into identification of 89 DCs new from the existing sectors of PAT. Widening study resulted into notification of three new sectors namely Refineries, Railways and DISCOMs under PAT scheme. Energy consumption targets were notified to 621 DCs from 11 energy intensive sectors (eight existing sectors and three new sectors). PAT Cycle II commenced from 1st April, 2016 and was completed on 31st March 2019. Implementation of PAT cycle -II resulted into total energy savings of about 14.08 MTOE translating into avoiding of about 68 million tonne of CO2 emission.

Trading of ESCerts:

Ministry of Power issued about 57.38 lakh ESCerts to 349 DCs and 193 DCs have been directed to purchase 37.06lakh ESCerts under PAT cycle –II. A trading worth around 300 Cr INR took place in 40 sessions where 18.86 lakh ESCerts were traded..

Perform, Achieve and Trade Cycle III

The Parliamentary Standing Committee on Energy, Executive Committee on Climate Change under Prime Minister's Office (PMO) and Group of Secretaries recommended notifying DCs under PAT scheme annually for accelerated coverage. Thus, PAT scheme is being implemented on a rolling cycle basis where new DCs/sectors are notified every year. Since a decision was taken to put PAT scheme under the rolling cycle from PAT-II onwards, PAT cycle-III was notified on 31st March, 2017. PAT cycle -III expected to achieve and overall energy consumption reduction of 1.06 MTOE for which targets have been notified to 116 Designated Consumers from six sectors viz. Thermal Power Plant, Cement, Aluminium, Pulp & Paper, Iron & Steel and Textile. PAT Cycle –III was completed on 31st March 2020. From implementation of PAT cycle –III, energy savings of about 1.594 MTOE and corresponding CO2 reduction of 5.59 million tonne of CO2 emissions has been realized.

Trading of ESCerts:

Ministry of Power issued about 7.44 lakh ESCerts to 75 DCs and 20 DCs have been directed to purchase 1.13lakh ESCerts under PAT cycle –III. The respective cycle trading has commenced on 9th Apr 2024

Perform, Achieve and Trade Cycle IV

The fourth cycle of PAT was notified on 28th March-2018. A total of 106 DCs with a total energy consumption reduction target of 0.6998 million tonnes of oil equivalent were notified. These DCs were from 8 sectors consisting of 6 existing sectors of PAT cycle -I and two new sectors (Petrochemicals & Buildings). Implementation of PAT cycle -IV has completed in FY22.The energy savings of about 0.7508 MTOE is achieved against the target of 0.701 Million TOE.

Perform, Achieve and Trade Cycle V

PAT cycle –V had commenced with effect from 1st April 2019. Under PAT cycle –V, 110 DCs from the existing sectors of PAT i.e. Aluminum, Cement, Chlor-Alkali, Commercial Buildings (Hotels), Iron & Steel, Pulp & Paper, Textile and Thermal Power Plant were notified with a total energy savings target of 0.5130 (MTOE) and the energy savings of about 0.6809 MTOE is achieved.

Perform, Achieve and Trade Cycle VI

PAT Cycle-VI had commenced with effect from 1st April 2020. Under PAT Cycle-VI, 135 DCs from six sectors, i.e. Cement, Commercial buildings (hotels), Iron and Steel, Petroleum Refinery, Pulp and Paper and Textiles, were been notified. With implementation of PAT cycle –VI, it is expected to achieve a total energy savings of 1.277 MTOE.

Perform, Achieve and Trade Cycle VII

PAT cycle –VII was notified for the period of FY 2022-23 to 2024-25 wherein 707 DCs have been notified with overall energy saving target of 8.485 MTOE in the following 9 Energy Intensive Sectors, i.e. Aluminium, Cement, Chlor-Alkali, Iron and Steel, Pulp and Paper, Textiles, Thermal Power Plant, Railways and DISCOM.

Perform, Achieve and Trade Cycle VIII

PAT cycle -VIII has been notified vide S.O. 2794 (E) dated 27th June 2023 for the period 2023-24 to 2025-26. Under PAT cycle -VIII, 138 DCs from sectors namely Aluminium, Cement, Chlor-Alkali, Iron & Steel, Pulp & Paper and Textile have been notified with a total energy saving target of 0.3370 MTOE.

For the widening of the PAT Scheme a gazette notification was published vide S.O. 2523(E) dated June 6, 2023 for new 13 Energy Intensive sectors under PAT Scheme including sectoral energy threshold level, namely Sugar, Chemical, Ceramic, Glass, Zinc, Copper, Dairy, Port trusts, Automobile Assembly Unit, Tyre manufactures, Forging, Foundry and Refractories.

As a result of implementing PAT Scheme, it is estimated that about 25.77 million tonnes of oil equivalent (MTOE) of fuel would be saved with emission reduction of 110.66 million tonnes annually.

IV. Demand Side Management (DSM)

Demand Side Management (DSM) has been traditionally recognized as one of the major interventions to achieve reduction in energy demands while ensuring continuous development. DSM interventions have helped utilities not only to reduce the peak electricity demands and but also defer high investments in generation, transmission and distribution network.

a. Agriculture DSM

This sub-component promises Energy Efficiency through Agriculture Demand Side Management by creating awareness among farmers / pump-technicians about the adoption of Energy Efficient Pump sets for irrigation purpose. To promote the Energy Efficiency in Agriculture sector following interventions are being taken:

Driving nationwide awareness programs for farmers and Pump/ Equipment technicians to promote the adoption of EE pumps. Around 398 numbers of training and

awareness programmes for farmers/ Stakeholders have been conducted and Around 21 numbers of capacity building programmes for pump/equipment technicians have been conducted by State Designated Agency (SDAs).

b. Municipal DSM

Identifying the immense savings potential in municipal sector, BEE initiated Municipal Demand Side Management (MuDSM). The basic objective of the scheme is to improve the overall energy efficiency in drinking water and sewage water pumping system of the Urban Local Bodies (ULBs), public water body, Urban Development Department (UDD) Municipal Corporations (MC's), Nagar Nigam and other implementing agencies in city.

About 112 nos. of Capacity building programmes for the officials/ equipment technicians of ULB's, UDD's, MC's and Nagar Nigams conducted by State Designated Agency (SDAs).

c. Capacity Building of DISCOMs program

The capacity-building initiatives of BEE is crucial for DISCOMs to adapt the evolving industry trends, regulatory changes, and technological advancements. Capacity-building programme for the DISCOMs officials for participating 62 DISCOMs across 36 states/UTs in India is designed in such a way that it will enhance their skills, knowledge, and capabilities while working in the power distribution sector.

In FY 2023-24, DSM programme has already kick-started Phase-III or DSM measures implementation phase. In this phase, 33 DISCOMs are participating across 4 zones i.e., North, North-east, South, and West zone. BEE will support DISCOMs in terms of manpower support (1 technical and 1 financial expert in each DISCOMs) and technical supports through PMAs engaged in the regions for the next two years till FY 2025-26. Till date, out of 33 DISCOMs BEE has already signed tripartite MoUs with 23 DISCOMs and their respective SDAs and also conducted 3 nos. awareness workshops and 1 measure launching ceremony, till date.

Along with DSM measures, BEE has already initiated research cum mapping study on study non-star/in-efficient distribution transformer (DT) for replacement to BEE's 5-star rated distribution transformer at 20 DISCOMs across 5 zones.

Currently, project has already been kick-started at 20 DISCOMs across 5 zones i.e., North, East, North-east, South and West zone. The broad objective of the study is to identify the way and means to improve the operational efficiency and reliability of distribution transformers. Distribution Transformer (DT) is a key asset of the distribution network. According to the final report and mapping outcomes prepared for each of the DISCOMs, the old/inefficient transformer may be undertaken either for performance enhancement through Renovation & Modernization (R&M) effort or replaced with BEE's 5 star rated DT.

V. Energy Efficiency in Small and Medium Enterprises (SMEs)

With Climate Change, transition towards an energy efficient economy is highly imperative for the manufacturing sector, including Micro, Small and Medium Enterprises (MSMEs), which account for a large part of the world's consumption of resources. The MSME sector occupies a position of prominence in the Indian economy, contributing to more than 45% of the industrial output and 40% of the country's exports in value addition terms.

MSMEs, the critical growth driver of the Indian economy, play an important role in the context of energy-intensive industries. Although their individual energy consumption is rather low, their collective use is considerable. Lack of access to latest technologies make this sector vulnerable to energy security and competitiveness in global market. The poor energy and environmental performance are directly related to the lack of technical capacity in these enterprises to identify, access, adapt and adopt better technologies and operating practices.

Bureau has completed the energy and resource mapping studies for 3 sectors for developing technology-policy roadmaps for Textile, Leather and Food Processing. In this study, more than 150 energy audits have been conducted, technology compendiums have been prepared to facilitate the sectors.

In the ongoing activities, the scaling-up of Energy Efficiency (EE) and Renewable Energy (RE) implementation is currently progressing in four sectors: Forging, Foundry, Steel Re-rolling, and Paper. Each of these sectors comprises five clusters, amounting to a total of 20 clusters. The initiative targets a significant scaling up of EE technologies, with a total of 870 units set to benefit from these advancements across the four sectors.

URJA Mitra: - To ensure a continuous presence and provide essential handholding support to Micro, Small, and Medium Enterprises (MSMEs) within these clusters, the Bureau of Energy Efficiency (BEE) has empaneled URJA Mitras. These URJA Mitras play a pivotal role in facilitating the adoption of energy-efficient technologies and practices and provide technical support to the MSMEs. 14 URJA Mitras have been empaneled. More than 250 consultations with SMEs, about 70 walkthrough audits and 15 detailed energy audits have been conducted.

Under the IGEN-EE Program, a knowledge exchange program under the Energy Efficiency-

- Two pilot projects on Industry 4.0 implemented successfully (in Foundry and forging units).
- Digi Twin training simulator developed which was launched by the Hon'ble Minister of Power on BEE's Foundation Day.
- Over 380 energy audits from over 30 cluster completed in steel and paper sector.

VI. Improving Energy Efficiency in Transport Sector

The Ministry of Power, issued average fuel consumption standards for cars on 23rd April 2015. The fuel consumption standards are under implementation from April'2017 onwards, and a second set of standards is implemented from 1st April 2022. The norms were amended to notify revised value of average vehicle mass and were notified in Dec 21.

The fuel economy norms for HDVs & L&MCVs notified earlier were applicable to the vehicles complying with BS-IV norms. A correction factor is notified in March 2022 for BS-VI complied vehicles. The correction factor is to be multiplied with the equations for deriving target fuel consumption value mentioned in earlier notification.

Under GO ELECTRIC Campaign, States have conducted 193 webinars, 114 roadshows and 175 other awareness activities such as radio jingles, poster / leaflets distribution, awareness through social media platform, street plays, etc. in coordination with Bureau of Energy Efficiency.

Bureau of Energy Efficiency (BEE) under the guidance of Ministry of Power launched Web Portal and Mobile Application, "EV Yatra", on 14th December 2022, the National Energy Conservation Day. The "EV Yatra" web-portal and mobile app are aimed at creating awareness among the EV users and masses at large to promote e-mobility in the country. The portal currently has 16,348 Public Charging Stations (PCS) operational across the Country. "EV Yatra" portal has also been upgraded with a feature to monitor grant of electricity connection to a PCS by any DISCOM in the Country.

VII. Energy Accounting in DISCOMS

Regulations for Energy Accounting and Auditing in DISCOMs notified by BEE on 7th October, 2021 with the approval of Ministry of Power, under the provisions of Energy Conservation (EC) Act, 2001 for Energy Audit in DISCOMs

Bureau of Energy Efficiency with the approval of Ministry of Power, Government of India had notified an amendment in regulation vide notification dated 31st October, 2022.

The Energy Conservation (Amendment) Act, 2022 notified in December 2022 has empowered Central Government to specify minimum share of non-fossil fuel energy usage. In this regard, Ministry of Power directed Bureau of Energy Efficiency to propose targets for minimum share of non-fossil fuel energy usage for Electricity Distribution Companies, Captive Power Plants and Open Access Consumers. The Notification was prepared on similar lines of Renewable Purchase Obligations (RPO) office order issued earlier by Ministry of Power.

Accordingly, Gazette Notification dt 20th Oct'2023 specified the minimum share of consumption of non-fossil sources (renewable energy) by designated consumers in respect of electricity distribution licensee and Other designated consumers; who are open access consumers or captive users to the extent of consumption of electricity from sources other than distribution licensee as a percentage of their total share of energy consumption.

This notification shall come into force on the 1st day of April, 2024 and Bureau of Energy Efficiency will maintain data related to compliance and submit report to the Central Government for review.

VIII. Strengthening of State Designated Agencies (SDAs) To Promote Efficient Use of Energy and its Conservation

The EC Act mandates creation of a two-tier organization structure to promote the efficient use of energy and its conservation in the country with BEE as the nodal agency at central level and State Designated Agencies (SDAs) as nodal agencies at State / Union Territory (UT) level. Section 15(d) of the EC Act stipulates that the State Government/ UT Administration may designate any agency at the State level to co-ordinate, regulate and enforce the provisions of the Act within the State/UT.

36 States/UTs have nominated a SDA in their respective State/UT. These agencies differ from State to State with 16 Nos. Renewable Energy Development Agency, 7 Nos. Power Department, 7 Nos. Electrical Inspectorate, 4 Nos. Distribution Companies, and 2 Nos. Standalone SDA. States of Kerala and Andhra Pradesh have established Stand-Alone SDA.

About 26 demonstration projects mainly in areas of street lighting, water pumping, buildings' retrofitting, and waste heat recovery have been successfully implemented by the SDAs. As on date, replacement of existing conventional appliances viz. lights and fans with energy efficient ones has been completed in more than 7000 nos. of Government schools.

29 SDAs have initiated implementation of EE measures as pilot projects in total 233 Government Hospitals across the country out of which actions have been completed in 110 hospitals.

28 States/UTs have formulated their respective State Energy Efficiency Action Plan (SEEAP). Remaining States/UTs are under process of developing their respective SEEAP.

BEE has prepared State Energy Efficiency Index 2023 (SEEI 2023) by evaluating efforts and initiatives of all States/UTs in energy efficiency implementation across different demand sectors. Accordingly, respective States/ UTs were awarded with National Energy Conservation Award 2023 under "State Performance Awards" category.

State Level Steering Committee (SLSC) on Energy Transition

Ministry of Power has directed States / UTs in May 2022 for setting up a State Level Steering Committee (SLSC) on Energy Transition under the chairmanship of Chief Secretary, with involvements of Secretaries from Power, Energy, Housing & Urban Development, Industry, Transport, Rural Development, Agriculture, Environment, PWD Departments, etc., as Members of the above Committee to steer energy transition measures in the States / UTs.

29 States / UTs namely Andaman & Nicobar Islands, Andhra Pradesh Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Chandigarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Ladakh, Madhya Pradesh, Manipur, Maharashtra, Meghalaya, Odisha,

Puducherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Telangana, Uttar Pradesh and Uttarakhand have constituted State Level Steering Committees on energy transition under the chairmanship of Chief Secretary.

IX. Revision of National Mission on Enhanced Energy Efficiency (NMEEE) – ROSHANEE

To align objectives of the erstwhile NMEEE with the revised goals under the NDCs, the mission is revised with the title Roadmap of Sustainable and Holistic Approach to National Energy Efficiency (ROSHANEE). Mission ROSHANEE has a broader vision and takes into account all the potential areas of energy efficiency in key sectors of the economy, covering the macro level in policy and further delineating the respective schemes. The revised mission includes all existing activities of BEE that have contributed significantly towards enhancing energy efficiency and consequent CO2 mitigation and the activities proposed in future, some of which have been identified and others which need to be explored. Mission ROSHANEE clearly outlines the strategies that needs to be adopted for achieving India's Nationally Determined Contribution commitments made under the Paris Agreement.

During COP 26 held at Glasgow, U.K. in 2021, one of the Panchamrit was that "By 2030, India will reduce the carbon intensity of its economy to less than 45 per cent". In order to achieve the 45% target of emission- intensity reduction, preliminary analysis indicate that absolute emissions by 2030 are required to be limited around 4584 MtCO2e. This means that the overall emissions in the economy would have to be reduced by 3753 MtCO2e (over the baseline scenario of 2005 level) to successfully meet our revised NDC commitment.

The sectoral break-up under the energy efficiency domain to achieve 2030 targets are given below:

S. No.	Energy Emissions	Panchamrit Target Savings for 45% Emission Intensity Reduction (in $MtCO_2e$)
1	Industry Sector	258
2	Transport	187
3	Buildings	191
4	Demand Side Management	50
Grand **Total**		**686**

The main sectors which will contribute in this regard are Industry, Transport and Buildings which together shares 90% of the estimated emission reduction of 686 MtCo2 to achieve 45% from 2005 level. Therefore, these three sectors are considered focused areas for coordinated implementation at the Apex level. For effective, coordinated and timely implementation of the intervention, and Inter Ministerial Committee headed by Secretary Ministry of Power is constituted and it is envisaged the efforts of various line ministries and departments associated would cumulatively contribute towards the said NDCs.

Carbon Market

To facilitate the achievement of India's enhanced NDC targets, the Government intends to develop a robust framework for the Indian Carbon Market (ICM) with an objective to decarbonize the Indian economy by pricing the GHG emission through trading of the carbon credit certificates.

To develop the carbon market, the necessary amendments were proposed in the Energy Conservation Act, 2001 (52 of 2001) in the year 2022. The amended act defines the provision to that empowers the Central Government in consultation with the Bureau of Energy Efficiency to specify the carbon credit trading scheme under the Clause (w) of section 14 of the EC Act.

Under the above provision, the Central Government notified the Carbon Credit Trading Scheme, vide notification S.O. 2825(E), dated 28th June 2023 and amendment notification S.O. 5369(E), dated 19th December 2023.

The Central Government constituted the National Steering Committee for Indian Carbon Market (NSCICM) under the Carbon Credit Trading Scheme (CCTS). NSCICM will oversee the functioning of the ICM. The committee consists of members from different Ministries and relevant organizations under the Chairmanship of Secretary, Ministry of Power and Co-Chairmanship of Secretary, Ministry of Environment, Forest and Climate Change.

The Carbon Credit Trading Scheme (CCTS) defines the two mechanisms namely, compliance mechanism and offset mechanism. Under the compliance mechanism of ICM Framework, the Central Government shall specify the registered entities as obligated entities. The obligated entities shall comply with the prescribed GHG emission reduction norms in each compliance year of CCTS. Under the offset mechanism, the non-obligated entities can register their projects for GHG emission reduction or removal or avoidance for issuance of carbon credit certificates upon fulfilment of the eligibility requirements.

Promoting Energy Efficiency in Cold Chain Sector

Bureau of Energy Efficiency (BEE) is promoting and supporting the activities related to the indigenous development of Energy efficient Cold-chain in the country. BEE has published the report titled 'Cold Chain Energy Efficiency in India: Analysis of Energy Efficiency Opportunities in Pack-Houses', with the support of World Bank Group, Energy Sector Management Assistance Program (ESMAP).

Design, operation and maintenance guidelines for pack house is prepared and under discussion with stakeholders. BEE has completed the feasibility study for prescribing MEPS (Minimum Energy Performance Standards) for walk-in cold rooms and refrigerant compressors under Standard & Labelling (S&L) scheme. Also, initiative to specify energy consumption norms for cold storage under the Perform, Achieve and Trade (PAT) scheme is also underway.

Adoption & implementation of District Cooling Systems (DCS) in India

BEE has launched a report on "Cooling the Cities of Future – Launch of District Cooling Guidelines" in July, 2023 after extensive stakeholder consultation. Also, BEE is in discussion with CPWD, NBCC, various IITs and DISCOMs to carry out feasibility study in District Cooling Systems in their upcoming projects.

X. Impact of Energy Efficiency Schemes / Programmes for the Year 2022-23:

i. Total Electrical Energy Savings of 307 Billion Units.

ii. Avoided capacity generation of 56 GW.

iii. Total annual Energy savings of 51 Millions Tonnes of Oil Equivalent i.e. 6.6% of total primary energy supply of the country.

iv. Total annual cost savings worth INR 1,94,320 Crores approximately.

v. Equivalent reduction in CO_2 emissions of around 306 million Tonnes annually.

Impact of major energy efficiency measures:

i. The Standards & Labelling (S&L) Scheme has resulted in energy savings of 81.6 billion units, which is equivalent to reduction of 58 million tonne of CO2 equivalent.

ii. The Perform, Achieve & Trade (PAT) Scheme has resulted in energy savings of 25.77 million tonne of oil equivalent, which is equivalent to reduction of 110.66 million tonne of CO2 equivalent.

iii. Energy efficient LED bulbs has resulted in estimated energy savings of 176.19 billion units, which is equivalent to reduction of 125 million tonne of CO2 equivalent. About 419 Crore LED bulbs and 151 Crore LED tube-lights have been deployed.

XI. Activities under International Cooperation

(i) 14th Clean Energy Ministerial

The Government of India hosted the 14th Clean Energy Ministerial and 8th Mission Innovation (MI-8) Ministerial meeting from 19-22 July 2023, bringing together representatives from across Mission Innovation (MI) and the Clean Energy Ministerial (CEM) for one of the largest global clean energy events of the year.

Over the course of the four-day event, Ministerial-level discussions were accompanied by a robust and varied schedule of events, including CEO-Ministerial roundtables and high-level dialogues, over 74 thematic side events (1 B2B dialogue, 4 open High-Level Dialogue and 4 Closed door roundtable) organised by the clean energy community, an impressive Technology Showcase, an Electric Vehicle Rally, and a wide range of networking and cultural events. One of the highlights of CEM14/MI8 was the public-facing technology showcase, which demonstrated cutting-edge advances in clean energy from India and around the world.

(ii) Energy Transition Working Group (ETWG) and Energy Transitions Ministerial Meeting (ETMM)

Bureau of Energy Efficiency (BEE) has led discussions pertaining to the priority area titled "Energy Efficiency, Industrial Low Carbon Transitions and Responsible Consumption" under the Energy Transition Working Group (ETWG) track of G20. Prioritizing energy efficiency as the first fuel, the Bureau of Energy Efficiency has developed the "Strategic Plan for Advancing Energy Efficiency across Demand Sectors by 2030", in collaboration with national and international partners. The plan presents priority actions that G20 Members – and other countries worldwide – can roll out in three priority sectors – Buildings, Industry, and Transport - to ramp up investments and realize the benefits of energy efficiency. It also provides recommendations to ramp up investments in energy efficiency and to promote behavior and lifestyle changes. This echoes Hon'ble Prime Minister's Lifestyle for Environment (LiFE) mission to foster a collective shift towards mindful consumption practices, in which every citizen promotes a sustainable lifestyle in harmony with the environment, resources preservation, and climate concerns.

G20 Energy Ministers have taken a note of High Level Deliverable on 'Voluntary Action Plan on Doubling the Rate of Energy Efficiency Improvement by 2030' published along with Energy Transitions Ministerial Meeting-Outcome Document and Chair Summary anchored by Bureau of Energy Efficiency.

- **Launch of Standards and Labelling Program for Packaged Boilers**

  The Standards and Labelling Program for Packaged Boilers was launched, to improve the energy efficiency of packaged boilers and facilitate consumers make informed choices.

o Launch of Standards and Labelling Program for Visi Cooler

The Standards and Labelling Program for – Commercial Beverage Cooler, also known as Visi Cooler - to BEE's S&L Programs. was launched under voluntary phase on 1st March,2024.

o Release of Maiden Edition of India EV Digest

The maiden edition of India EV Digest has released by BEE in light of the growth of electric vehicles in the country as well as the need to spruce up the EV adoption, for the nation to remain aligned with its target of achieving 30% share of EVs in overall vehicle sales by the year 2030.

o Release of State Energy Efficiency Index 2023

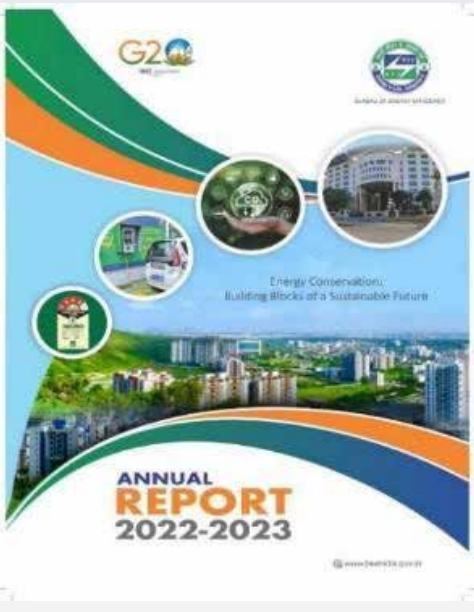
The fifth edition of the State Energy Efficiency Index (SEEI), initiated by Bureau of Energy Efficiency (BEE), in association with Alliance for an Energy Efficient Economy (AEEE), was released to evaluate the annual progress of energy efficiency implementation in the states.

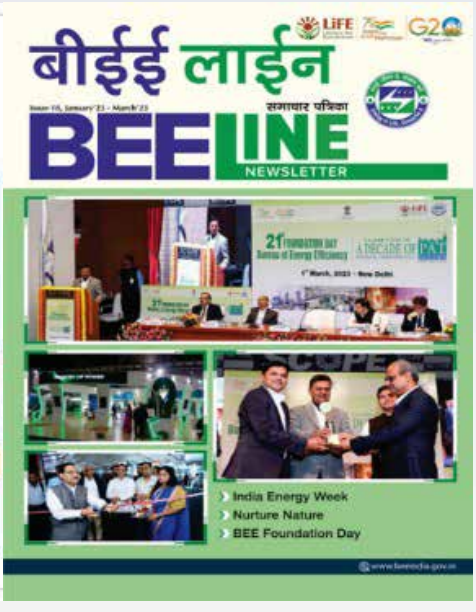
D. **Social Media** – Bureau of Energy Efficiency currently maintains an active presence on the following social media platforms:

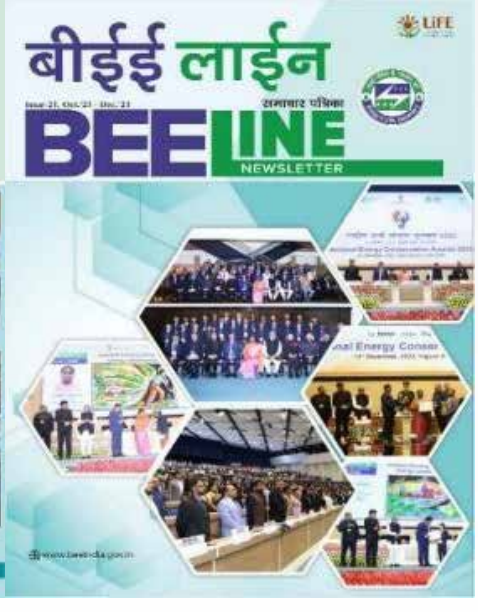
- **Facebook:** https://www.facebook.com/beeindiadigital/
- **Twitter:** https://twitter.com/beeindiadigital
- **LinkedIn:** https://www.linkedin.com/company/beeindiadigital/
- **Instagram:** https://www.instagram.com/beeindiadigital/
- **YouTube:** https://www.youtube.com/bureauofenergyefficiency

E. **Publication:** Bureau published many documents and reports during this year. The copies were distributed to concerned stakeholders and were also uploaded on the BEE's website for wider dissemination. List of the documents and reports are given below:

- Bachat ke Sitare - an in house Hindi magazine
- Annual Report (2022-23)
- 18th 19th & 20th 21st issue of BEE Line Newsletter







CHAPTER 11

FACILITATING ELECTRIC MOBILITY

Electric mobility will not take off unless Public EV charging stations are put up in adequate numbers. In order to facilitate and setting up of charging infrastructure, Ministry of Power issued guidelines on Charging Infrastructure for Electric Vehicles on 13.04.2018 under provisions of the Electricity Act, 2003. It was specified that the charging of battery for use in electric vehicles does not require license under the provisions of the Act.

For facilitating Grid Connectivity and Safety of supply for Charging Stations, CEA has issued amendments to following regulations of Central Electricity Authority (CEA):

a. Central Electricity Authority (Technical Standards for connectivity of the Distributed Generation Resources) Regulations 2019.

b. Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.

Ministry of Power along with Ministry of Road Transport and Highways, Ministry of Heavy Industries and NITI Aayog launched a nationwide "Go Electric" Campaign on 19.02.2021 to educate the public on the benefits of e-mobility & electric cooking, inform the potential EV owners about the Government incentives for EV adoption, generate curiosity and transform the same into demand, discredit misinformation against Electric Vehicles and bring together multiple stakeholders under single platform.

Under GO ELECTRIC Campaign, states have conducted 193 nos. of webinars, 114 nos. of EV roadshows / EV Rally and 175 other awareness activities such as radio jingles, poster / leaflets distribution, awareness through social media platform, street plays, etc. in coordination with Bureau of Energy Efficiency as on 31.03.2024.

The "Charging Infrastructure for Electric Vehicles - Guidelines and Standards" were issued by the Ministry of Power on 14.12.2018 and subsequently revised on 01.10.2019 and 08.06.2020. After careful consideration of progress made and suggestions received from various stakeholders, consolidated revised guidelines were issued by the Ministry of Power on 14.01.2022 to accelerate e-Mobility transition in the country. To promote use of renewable energy for powering public EV charging stations, Ministry of Power issued amendment guidelines on 07.11.2022 and 27.04.2023. The key features of the "Charging Infrastructure for Electric Vehicles –Guidelines and Standards" are as follows:

Issue	Provisions in Guidelines and Standards
Charger Types	The guidelines have been made technology agnostic by including not only the prevailing international charging standards available in the market but also the new Indian charging standards notified by the Bureau of Indian Standards.
Central Nodal Agency	Bureau of Energy Efficiency (BEE)
State Nodal Agencies (SNAs)	• 28 State Governments have nominated SNAs for their respective States. • 30 states have notified EV policy through which state government is providing fiscal and non-fiscal incentives for development of EV ecosystem in respective states.
Tariff for supply of Electricity to Charging Stations	• The tariff for supply of electricity to Public EV Charging Stations has been specified as single part tariff not exceeding the "Average Cost of Supply" till 31st March 2025. This tariff shall be applicable for Battery Charging Station (BCS) as well. • The cost of supply by DISCOM to a public charging station will be 0.8 times of Average Cost of Supply (ACoS) during solar hours and 1.2 times during non-solar hours. Solar hours mean 9 AM to 4 PM and non-solar hours mean the remaining period of the day. • Separate metering arrangement shall be made for PCS so that consumption may be recorded and billed as per applicable tariff for EV charging stations.
Service Charges to EV Owners	• Specified ceiling limits on service charges being levied by public EV charge point operators on the EV customers to recover the cost of servicing the capital investments (excluding GST) made by it in setting up the PCS. The amendment specifies a ceiling of Rs 2.50 per unit and Rs 3.50 per unit of electricity used for slow AC charging of EVs at PCS during the solar (9 am to 4 pm) and non-solar hours (for remaining part of the day) respectively. Additionally, a ceiling limit of Rs 10 per unit and Rs 12 per unit of electricity used for DC Fast charging of EVs at PCS during the solar and non-solar hours respectively.
Range Anxiety	• At least one Charging Station should be available in a grid of 3 km X 3 km in the cities and at every 25 km on Highway/Roads. • Owners may charge EVs at their residence/offices using their existing electricity connections.

Issue	Provisions in Guidelines and Standards
Phase wise Installation	• Phase I (1-3years) – To target 4 million plus cities and connected Expressways/ important Highways • Phase II (3-5years) – To target State Capitals, UT headquarters & important connected Highways.
Land at concessional rates for installation of PCS	• •To enhance availability of land at promotional rates for setting up the Public Charging Stations, a Revenue Sharing Model has been provided in the guidelines. The revenue sharing model fixes a rate of Rs. 1/Kwh for sharing of revenue between PCS and the Government/Public - Land Owning Agency and competitive bidding with a floor price of Re 1/ Kwh where ever Govt. land is leased out to private public charge point developers.
Open Access	• Any Public Charging Station/ Chain of Charging Stations may obtain electricity from any generation company through open access. • Open Access shall be provided for this purpose within 15 days of receipt of the application complete in all respect.
Timelines for providing the connection to PCS	• Distribution Company licensee shall release connection for EV Public charging station (PCS) in accordance with the timelines stated in section 4 sub. (11) of the Electricity (Rights of Consumers) Rules 2020.The timelines have also been specified under the guidelines.
Database of Public Charging Stations (PCS) in the country	Bureau of Energy Efficiency has been tasked to create and maintain a national online database through a Web-Portal/ Software/Mobile Application for the database of Public Charging Stations throughout the country Stations in consultation with State Nodal Agencies (SNAs). In this regard, a mobile application and web- portal, titled 'EV Yatra' has been developed by BEE. This portal is available at evyatra.beeindia.gov.in/. There were 16348 PCS mapped on EV Yatra portal on 31.03.2024.
Renewable energy based Public Charging stations	The cost of supply by DISCOM to a public charging station will be 0.8 times of Average Cost of Supply (ACoS) during solar hours and 1.2 times during non-solar hours. Solar hours mean 9 AM to 4 PM and non-solar hours mean the remaining period of the day.

Initiatives taken by Ministry of Heavy Industries (MHI) and supported by Ministry of Power

i. FAME India Scheme: FAME India (Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India) Scheme was launched on 1st April 2015, wherein it is intended to support the hybrid / electric vehicle market development and its manufacturing ecosystem to achieve self-sustenance.

Under Phase II of FAME India Scheme, 83 public EV charging stations are currently operational across 12 cities.

To expedite deployment of public EV charging stations, Ministry of Heavy Industries amended provisions in FAME-II scheme. In this context, 7432 public EV charging stations have been sanctioned to Oil Marketing Companies (IOCL-3438 nos., BPCL-2334 nos. and HPCL-1660 nos).

CHAPTER 12

INTERNATIONAL COOPERATION

The International Cooperation (IC) Division works towards enhancing cooperation with various countries in the Power Sector. Active interest has been taken in strengthening bilateral cooperation with Bangladesh, Bhutan, Nepal, Sri Lanka, Myanmar, Australia, Denmark, Japan, Germany, Singapore, UK, and USA. Multilateral engagements under the umbrellas of Clean Energy Ministerial (CEM), International Energy Agency (IEA), G20 and BRICS were also undertaken.

BILATERAL COOPERATION

COOPERATION WITH NEIGHBOURING COUNTRIES

India is centrally placed in South Asian region and with cross border interconnections with neighbouring countries, playing a major role in effective utilization of regional resources. Further, to facilitate import/ export of electricity between India and neighbouring countries, Ministry of Power, Govt. of India have issued the "Guidelines for Import/Export (Cross Border) of Electricity-2018" on 18th December, 2018.

To facilitate transfer of power through Real Time Market (RTM) segment of Indian power exchanges under clause 5.3 of the Guidelines, the Procedure for Approval and Facilitating Import/Export (Cross Border) of Electricity by the Designated Authority was modified on 31.07.2023.

Import/Export with neighbouring countries for past three years are as under:

Import (MU) by India					Export (MU) by India			
Year	Bhutan	Bangladesh	Nepal	Myanmar	Bhutan	Bangladesh	Nepal	Myanmar
2023-24	4992.8	0	1655.9	0	1130	8413.5	1810	8.5
2022-23	6579.7	0	1420.9	0	200	8622.1	1420.9	9.8
2021-22	7818.9	0	163.5	0	138	7322.1	2084	8.8

Further, Country wise ongoing engagements are mentioned as under:

INDIA – NEPAL

Arun-3 Hydro –electric Project (HEP), 900 MW, is presently under construction in Nepal being implemented by a wholly owned subsidiary of SJVN Ltd. In addition, projects of about 11.2 GW are at various stages of planning in Nepal with Indian Co-operation viz. Pancheshwar Multipurpose Project (5040 MW) Lower Arun HEP, (669 MW), Sapta Kosi Multipurpose Project (3300 MW), Arun-4 HEP (490 MW), West Seti HEP (750 MW), Seti River-6 HEP (450 MW), Phukot Karnali Project (480 MW).

An Agreement on 'Electric Power Trade, Cross-border Transmission Interconnection and Grid Connectivity' between India and Nepal was signed in 2014. Two mechanisms – JWG and JSC have been set up to take the cooperation forward. The 11th Indo- Nepal Joint Working Group (JWG)/Joint Steering Committee (JSC) Meetings on Cooperation in Power Sector held on 3rd and 5th January, 2024.

1 Muzaffarpur – Dhalkebar 400 kV D/c line is the existing High capacity cross-border interconnection with Nepal. Sitamarhi (India)- Dhalkebar (Nepal) 400 kV D/c (Quad Moose) line associated with Arun-III hydro generation project and Gorakhpur -New Butwal 400 kV D/c (Quad) transmission line are under implementation.

2 Dododhara (Nepal) - Bareilly (New) (India) 400 kV (Quad) D/c line and Inaruwa (Nepal) - Purnea (New) (India) 400 kV D/c (Quad) line were agreed for implementation. Modalities for implementation of Indian portion of these lines are under discussion.

3 Raxaul (New) (Bihar) – Parwanipur (Nepal) 132 kV transmission line, Second circuit of Kataiya (Bihar) – Kusaha (Nepal) 132 kV transmission line and New Nautanwa (UP) – Mainhiya (Nepal) 132 kV transmission lines were inaugurated by Honorable Minister of External Affairs on 04-01-2024. Nanpara (UP) – Kohalpur (Nepal) 132kV D/c line is under construction with expected completion by December 2024.

4 The Modalities for implementation of power exchange between India and Nepal through 132 kV and below links between State grids of Uttar Pradesh, Bihar and Nepal have been approved.

5 India and Nepal signed an agreement for purchase of 10,000 MW of hydropower by India from Nepal which will facilitate export of 10,000 MW of electricity from Nepal to India in the next 10 years.

6 Designated Authority has given approvals to NVVN for export of upto 454 MW of Power to Nepal from Indian Power Exchange(s) upto 31.03.2024.

7. DA has approved import of 620.5 MW of Power from 14 (fourteen) generating stations from Nepal through Muzaffarpur – Dhalkebar 400 kV D/c transmission line. It includes import of about 109.61 MW of power from 2 power projects in Nepal to Haryana Discoms on medium term basis (5 years) through NVVN for wet season months.

8. Further, DA has approved import of 70 MW of Power from 2 generating projects of Nepal through Tanakpur-Mahendranagar 132 kV S/c line.

INDIA – BHUTAN

There are four major river systems in Bhutan namely Torsa, Wangchu (known as Raidak in India), Sankosh and Manas. All these rivers having large snow fed perennial flows, afford attractive possibilities of hydro-electric development. The demand for electricity in Bhutan is expected to be meager in

the near foreseeable future as compared to the hydro-electric potential. The hydro-electric potential of Bhutan could be harnessed for the mutual benefits of both India and Bhutan.

An agreement concerning co-operation in the field of hydroelectric power was signed between Government of India (GoI) and Royal Government of Bhutan (RGoB) on 28.07.2006.

The present Hydro Power installed capacity of Bhutan is about 2326 MW. Out of this, 2136 MW has been developed, in Inter-Governmental (IG) mode, with Indian Technical and Financial assistance [Projects are funded by the Government of India through MEA].

Chukha HEP (336 MW) - [60% Grant and 40% Loan]

Kurichu HEP (60 MW) - [60% Grant and 40% Loan]

Tala HEP (1020 MW) - [60% Grant and 40% Loan]

Mangdechhu HEP (720 MW) - [30% Grant and 70% Loan]

The surplus power from these projects is being exported to India at mutually agreed tariff.

Three (3) projects are presently under construction:

- Punatsangchhu-I -[40% Grant and 60% Loan]
  HEP (1200 MW) in IG Mode
- Punatsangchhu-II -[30% grant and 70% loan]
  HEP (1020 MW) in IG Mode

» **Present Power Transfer:** About 1948MW (power allocated to India, including 311MW from unallocated power)

Generation Project	Inst. Cap. (MW)	Power allocated to India (MW) *(as on 30-06-2022)*	Unallocated share allocated to India *(as on 30-06-2022)*
Tala	1020	867	311
Chukha	336	229	
Kurichu	60	51	
Mangdechhu	720	489.5	
Dagachu	126	JV of Tata & Bhutan. Power being sold through trader.	
Total	**2262MW**	**1636.5 MW**	**311 MW**

Present Interconnections:

- Kurichu HEP– Geylephu (Bhutan) –Salakati 132kV S/c line
- Deothang/Motonga – Rangia 132kV S/c line
- Chukha HEP – Birpara 220kV (3 circuits) line
- Tala HEP – Siliguri 400kV 2xD/c line
- Mangdechhu HEP – Alipurduar (via Punatsangchhu) 400kV D/c (Quad) line
- Jigmeling (Bhutan) – Alipurduar 400kV D/c (Quad) line

» **Future Power Transfer:** Total about 4168MW

Generation Project	Inst. Cap. MW)	Comm. Schedule
Punatsangchu-I	1200	2026-27
Punatsangchu-II	1020	2024-25
Total	**2220**	

Further, an MoU on technical co-operation in the field of Energy Efficiency and Energy Conservation Measures is proposed to be signed between Department of Renewable Energy (DRE), Bhutan and the Bureau of Energy Efficiency (BEE), India soon.

INDIA – BANGLADESH

An MoU between the Govt. of India and the Govt. of the People's Republic of Bangladesh on Cooperation in Power Sector was signed on 11th January, 2010. The 21st meeting of the JWG/ JSC was held on 3rd and 4th May, 2023.

1 Presently, the transmission capacity of 1160 MW between India and Bangladesh {1000 MW through Baharampur (India) – Bheramara (Bangladesh) 400 kV 2xD/c line and 160 MW through Surajmaninagar (Tripura) – Comilla (Bangladesh) 400 kV D/c radial interconnection (operated at 132 kV)} is fully booked.

2 Implementation of the 765 kV D/c Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) cross border link has been agreed for implementation. During the Visit of Prime Minister of Bangladesh to India, Both the Prime Ministers agreed to expeditiously implement projects to connect the two countries' power grids synchronously, including through the proposed high capacity 765 KV transmission line from Katihar (Bihar) to Bornagar (Assam) through Parbatipur in Bangladesh, to be made through a suitably-structured India-Bangladesh Joint Venture fora Special Purpose Vehicle.

3 In the 21st meeting of India-Bangladesh JSC held on 04.05.2023 a Joint Committee comprising three members from each side was formed to examine and recommend the suitable structure and other details of SPV. First meeting of this Joint Technical Committee between India & Bangladesh towards finalisation of structure of SPV held on 12.10.2023. Technical data for carrying out system studies has been sought from the Bangladesh side through MEA.

4 Rampal Maitree Power Project (2x660 MW): The synchronization of Unit-1 of 2x660 MW Maitree Super Thermal Power Project with National Grid has been achieved on 15.08.2022. Unit#1 of the project has declared date of commercial operation (COD) on 23.12.2022. Unit#2 has achieved synchronization on 28.06.2023 and inaugurated on 1 November 2023.

5 M/s Adani, India has established a 1600MW generation plant in India at Godda, Jharkhand for dedicated power supply to Bangladesh (in radial mode without

interconnection with Indian grid).

INDIA – SRI LANKA

The 5th meeting of Joint Working Group (JWG) meeting on India-Sri Lanka Cooperation in Power Sector was held on 26-28th February,2024 in Sri Lanka. In the JWG meeting, the Joint Technical Team (JTT) submitted the DPR for a HVDC overhead link between Madurai (India) to mannar with 2x500MW HVDC terminals based on Voltage Source Converter (VSC) technology.

Benefits of Cross-Border Interconnection between India and Sri Lanka:

- Sri Lanka has a unique advantage of having shallow sea levels with the Indian subcontinent, which can be utilised for establishment of electrical interconnection. The interconnection of Sri Lanka electricity grid with India would open doors for Sri Lankan grid to exchange energy not only with India, but also with other South Asian countries.
- Sri Lanka can even sell its surplus power during off-peak demand scenarios to other countries in the South Asian region.
- Sri Lanka can have access to clean and affordable RE power from India, in turn it would also have access to larger electricity markets in South Asian region. In this context, it may be noted that the Govt. of India "Guidelines for Import/Export (Cross Border) of Electricity-2018" and associated Regulations and Procedures also have provision for trade of electricity by Sri Lanka with third countries, using the Indian grid.
- Optimal utilization of natural resources across interconnected region of India, Sri Lanka &other South Asian nations.
- Large scale development of Renewable Energy (RE) viz. Solar, Wind etc. including off shore wind in Gulf of Mannar, resulting in reduced carbon footprint.
- Sharing of common balancing resources in interconnected region, resulting in economy in operation.
- This link shall also help in realizing the goals of OSOWOG and Off-Shore wind power evacuation

50MW (extendable to 135 MW) Solar Power Project (Phase-I) at Sampur, Sri Lanka

- Trincomalee Power Company Limited (TPCL)-A 50:50 JV of NTPC and Ceylon Electricity Board (CEB) , Sri Lanka is developing the 50 MW (extendable to 135 MW) Solar Power Project (Phase-I) at Sampur , Sri Lanka.
- Joint Venture and Shareholders' agreements were signed on 11.03.2022, and initial equity infused in TPCL (NTPC's 50:50 JV with CEB in Sri Lanka). Feasibility Report of the Project was jointly finalized with CEB.
- The Request for Proposal (RFP) response preparation for Phase I of the 50 MW Solar + 38 KM Transmission Line is in an advanced stage, barring a few inputs over Transmission work from CEB and a few critical confirmations from CEB/GoSL over the project agreements like PPA & IA etc

INDIA – MYANMAR

An MoU between India and Myanmar on cooperation in the Power sector was signed 19th October, 2016 for a period of 5 years. The same has been extended for 5 more years starting from 19.10.2021.

1 In the 5th JWG and 4th JSC meetings held on 16th – 17th September, 2022, both sides agreed on technical scope of works of the Imphal-Tamu-Kalay link, i.e., {Imphal (India) – Tamu (Myanmar) 400kV D/c (Twin ACSR Moose) line, 2 no. 400kV line bays each at Imphal and at Tamu for termination of Imphal – Tamu 400kV D/c line, Establishment of 500MW HVDC back-to-back station at Tamu and Tamu - Kalay 230kV D/c (Conductor Size -Twin ACSR-1272 MCM Bittern) line along with associated line bays at both ends} as single project.

2 Draft Agreement for preparation of detailed project report (DPR) by POWERGRID for the cross border interconnection between India & Myanmar is under finalization

COOPERATION WITH OTHER COUNTRIES

AUSTRALIA

The India – Australia Energy Dialogue was established following visit of the then Australian Prime Minister Ms. Julia Gillard to India in October, 2012. The Dialogue was institutionalized to discuss areas of mutual interest in energy security and key issues in India and Australia's energy markets, as well as regional and globe trends, and developments in both countries.

2. There are the following five Joint Working Groups (JWGs) under the Dialogue:

- Power - led by Ministry of Power.
- Renewable Energy - led by MNRE.
- Coal and Mines - led by Ministry of Coal.
- Critical Minerals - led by Ministry of Mines.
- Oil and Gas - led by MoPNG.

3. The 4th meeting of the India – Australia Energy Dialogue was held on 15th February, 2022 by VC. The dialogue was co-chaired by Hon'ble Minister for Power and New & Renewable Energy, Mr. R.K. Singh from the Indian side and Hon'ble Minister for Energy and Emissions Reduction, Mr. Angus Taylor from the Australian side.

4. Energy Transition was a major area of discussion in the dialogue and both the Energy Ministers spoke in detail about the ongoing Energy Transition activities in their respective countries with focus on renewables, energy efficiency, storage, EVs, critical minerals, mining etc. The need of Climate Finance was also highlighted by India for meeting the Energy Transition goals of developing

countries.

5. With a focus on advancing technology and clean energy transition, the agreed forward action plan includes areas like energy efficiency technologies; grid management; R&D collaboration on flue gas desulphurisation, biomass or hydrogen co-firing, water cycle optimisation, renewables integration, batteries and electric mobility.

6. Further, a delegation led by Hon'ble Minister of Power and NRE visited Australia to participate in the Sydney Energy Forum during 12-15 July, 2022. The following major action points emanated from the visit:

   (i) Collaboration on critical minerals like Lithium, and Solar PV cells and EV battery manufacturing.

   (ii) Collaboration in inter-connection, grid management, oil based to gas based plants, Nickel-Cobalt (Ni-Co) alternative to Lithium-Manganese (Li-Mn), & Carbon Capture (CC) Projects.

   (iii) Collaboration with (CSIRO), Commonwealth Scientific & Industrial Research Organization on repurposing retiring thermal plants, CCUS, etc.

7. The next Dialogue is proposed to be held shortly.

DENMARK

A Memorandum of Understanding (MoU) on Energy Cooperation was signed between the Ministry of Energy, Utilities and Climate, Kingdom Of Denmark and the Ministry of Power, Government of the Republic of India on 5th June, 2020.

2. The areas identified under the MoU include energy planning, forecasting, flexibility in the grid, integration of variable renewable energy, power markets, Consolidation of Grid Codes Ancillary Services, Cross Border Trading of Electricity, Monetization of waste steam from Thermal power plants, Flexibility in operation of power plants for RE integration, emission control from Thermal Power plants, etc.

3. A Joint Working Group has also been established under the MoU for implementation of the identified areas. The last meeting meeting of Joint Working Group (JWG) under the MoU on Energy Cooperation between India and Denmark was held in Jaisalmer, India on 9th November, 2023.Discussions of progress and future activities under the Indo-Danish Partnership Programme were held during the meeting. Progress report/ milestones achieved in the last one year under each area of cooperation that were highlighted during the meeting.The main areas of cooperation between the two sides are as below:

   - Energy Planning and forecasting scenarios in respect of Power sector.
   - Integration of variable renewable energy, including e.g. forecasting
   - Power markets including monitoring tools, etc& Ancillary Services
   - Optimizing flexibility of electrical power systems & Cross Border Trading of Electricity
   - Consolidation of Grid Codes to integrate and operate efficiently variable generation
   - Transfer of technology for emission control from Thermal power plant & Monetization of waste steam from Thermal power plants.
   - Flexibility in operation of power plants for RE integration.

4. Two sector experts have also been deputed by Denmark to work with Indian stakeholders in the above areas.

GERMANY

The Indo-German Energy Forum (IGEF) has been established in 2006 as an institutionalized energy dialogue with the aim of promoting Indo-German co-operation in the areas of energy security, energy efficiency including energy conservation, renewable energy, investment in energy projects and collaborative research and development taking into account the environmental challenges of sustainable development.

2. The IGEF is co-chaired by the Secretary (Power) from the Indian side and the Parliamentary Secretary, Federal Ministry for Economic Affairs & Energy (BMWi) from the German side. The meetings of the Forum are held alternately in Germany and India. Following four Sub-Groups have been constituted under the Forum:

   (i) Sub Group-I: "Efficiency Enhancement in Fossil Fuel based Power Plants" [co-chaired by AS/ JS (Thermal), MoP]

   (ii) Sub Group-II: "Renewable Energies" [co-chaired by JS, MNRE]

   (iii) Sub Group-III: "Demand side energy efficiency and low carbon growth strategies" [co-chaired by DG, BEE]

   (iv) Sub Group-IV: "Green Energy Grid Integration" [co-chaired by JS (BC), DEA]

3. The last meeting of the IGEF Indo – German Energy Forum (IGEF) was held on 22nd April, 2022 by VC. The co-chairs acknowledged the achievements of the Forum since the last meeting and finalized the roadmap for future collaboration between the two countries which, inter-alia, includes support creation of markets to value flexibility of generators; technical and financial support to new innovative solar markets as well as new wind markets along with Green Hydrogen, battery storage plus renewables and grid infrastructure; technical cooperation on energy efficiency in industry with focus on steel and paper sector along with cold-chain and textile sector with financing; and promotion of innovations leading to an integrated energy transition.

JAPAN

The cooperation with Japan in the energy sector is steered under the Indo – Japan Energy Dialogue. The Dialogue is led by Ministry of Power. There are four Working Groups under the India – Japan Energy Dialogue namely,

- Electricity & Energy Conservation - led by Joint Secretary, MoP;
- Coal - led by Adviser (Projects), Mo Coal;
- Renewable Energy and Hydrogen - led by Joint Secretary, MNRE;
- Petroleum and Natural Gas - led by Joint Secretary, MoP&NG.

2. The last (10th) India – Japan Energy Dialogue was held on 10th December, 2019 in New Delhi. Minister of State (IC) for Power, NRE and Skill Development & Entrepreneurship, Shri R.K Singh, and Minister of Economy, Trade and Industry (METI), Mr. Kajiyama Hiroshi signed a Joint Statement at the conclusion of the meeting.

3. Both Ministers took stock of the work done under the different Working Groups. Both the countries endorsed the importance of working towards sustainable growth for preserving our environment. In addition to following the practices like flexibilization of coal fired thermal plants and ramping up RE sources, the countries agreed to work towards utilizing non-conventional sources like Hydrogen.

4. The last meeting of the working group on Electricity & Power Generation (led by MoP) was held on 5th March, 2020 in New Delhi. Discussions were held on (a) Technical cooperation and (b) Personnel cooperation.

5. Further, the 14th India – Japan Annual Summit was held on 19th March, 2022. A Joint Statement was released after the Summit. Both sides welcomed the launch of the India-Japan Clean Energy Partnership (CEP) for cooperation towards achieving sustainable economic growth and addressing climate change. Implementation of the partnership will be undertaken under the existing 'India-Japan Energy Dialogue', among various stakeholders such as Ministries and organizations involved in this mechanism.

6. The next India – Japan Energy Dialogue is to be held shortly.

UNITED KINGDOM

An MoU between the Government of the Republic of India and the Government of the United Kingdom of Great Britain and Northern Ireland on "Co-operation in the Energy Sector" was signed on 11th November, 2015.

2. There are two Joint Working Groups under this MoU, one on Power and one on Renewable Energy. The co-chairs of the JWGs are at JS/ AS level. The JWGs report to a Steering Committee led by Secretary (Power) and Secretary (NRE). There are further two Task Forces under the JWG on Power viz. "Utilities of the Future" and "Energy Efficiency" which feed into the JWG meetings.

3. The third UK-India Energy Dialogue took place on 8th October, 2021 by VC. The Dialogue was co-chaired by Hon'ble Minister for Power and NRE, Shri RK Singh from the Indian side and the UK Government was led by Secretary of State for Business, Energy and Industrial Strategy, Hon'ble Mr. Kwasi Kwarteng.During the Energy Dialogue, Hon'ble Ministers endorsed the Forward Action Plan for bilateral and multilateral collaboration.

4. The last meeting of the JWG on Power was held on 4th October, 2021 through VC which was co-chaired by JS (IC), MoP from the Indian side. The JWG took an update of the domestic policies in both the countries. Discussions were held on the COP26: Energy Transition Campaign by UK. It was agreed that both the sides would work together on COP26 as a priority collaboration theme.

5. Ministry of Power also has a Power Sector Reform (PSR) programme of the Department of International Development (DFID), Government of U.K for £10 million Technical Assistance to India. This programme aims to provide a range of support to various central and state agencies, on matters relating to the power sector reform program and support the clean energy goals set out by the Government of India. The following six streams have been identified under the PSR programme:

- Structural and Regulatory Reforms.
- Power Markets.
- Renewable Energy Deployment & Grid Integration.
- Utility Sustainability.
- 24x7 Access and Welfare.
- Impact Initiatives.

6. Further, a new India-UK partnership programme of Technical Assistance Collaboration on Power Sector titled "ASPIRE" Programme (Accelerating Smart Power & Renewable Energy) was agreed. Under the programme, collaboration is on areas such as smart meters, electricity distribution reforms, industrial energy efficiency and electric mobility. The programme mainly focuses on the following themes:

  - Theme 1: Electricity distribution sector.
  - Theme 2: Energy Efficiency, includes 2 sub-themes:
    - » Industrial Energy Efficiency
    - » Electric mobility charging infrastructure

UNITED STATES OF AMERICA

The cooperation between India and the US in the Power sector is under the umbrella of Indo - US Energy Dialogue. The Dialogue was launched in May, 2005 and has the following objectives:

- To enhance mutual energy security,
- Promote increased energy trade and investment,
- Facilitate the deployment of clean energy technologies.

2. The Dialogue has been renamed as US – India Strategic Clean Energy Partnership (SCEP). The Ministerial meeting of the US – India SCEP is co-chaired by Hon'ble Minister of Petroleum and Natural Gas and the US Secretary of Energy. Currently the US – India SCEP has the following pillars:

S.No.	Pillar	Nodal Ministry on the Indian side
1.	Responsible Oil & Gas	Ministry of Petroleum & Natural Gas
2.	Emerging Fuels and Technologies	Ministry of Petroleum & Natural Gas
3.	Power & Energy Efficiency	Ministry of Power
4.	Renewable Energy	Ministry of New & Renewable Energy
5.	Sustainable Growth	NITI Aayog

3. Secretary of Energy Jennifer Granholm and Indian Minister of Petroleum and Natural Gas Hardeep Singh Puri, held the third ministerial meeting of the U.S.-India Strategic Clean Energy Partnership (SCEP) on18th July, 2023 in New Delhi.

4. During the meeting, the sides noted the growing importance of bilateral energy cooperation between the countries while underscoring the critical importance of bilateral clean energy engagement and the achievements of the SCEP in strengthening energy security, creating opportunities for clean energy innovation, addressing climate change and creating employment generation opportunities.

5. The sides discussed ways of advancing the positive agenda outlined by Prime Minister Modi and President Biden in their Joint Statement of June 22, 2023 which welcomed efforts under the SCEP to develop and deploy energy storage technologies, expand collaboration in support of their respective national hydrogen strategies and cost reduction goals, and accelerate cooperation on new and emerging renewable energy technologies. To that end, the Ministers welcomed establishment of the public-private "Energy Storage Task Force" (ESTF). The objective of the task force is to facilitate an ongoing and meaningful dialogue among U.S. and Indian government officials, industry representatives, researchers, and other stakeholders to scale up and accelerate deployment of energy storage technologies.

Saudi Arabia

During the visit of Saudi Arabia's Energy Minister Prince Abdulaziz bin Salman to India in 2022, issues related to energy sector and trade ties between India and Saudi Arabia were discussed.

2. In line with the discussions, an Memorandum of Understanding on cooperation in the field of Electrical Interconnection, Green/ Clean Hydrogen and Supply Chains was signed on 8th October, 2023. The MoU aims to enhance cooperation in the fields of electricity, Green/ Clean hydrogen and supply chains, particularly on:

- Conducting necessary feasibility studies (technical, economic and environmental) for the purpose of electrical interconnection between the two countries and co-development of projects and co-production of Green/ Clean hydrogen and renewable energy in both countries.
- Formulating a timetable for implementation in stages, in accordance with the outcomes of the study.
- Collaborating with organizations/ companies that are specialized in the field of electrical interconnection and Green/ Clean hydrogen.
- Establishing electrical interconnection(s) and a joint mechanism for co-development of projects and co-production of Green/ Clean hydrogen and renewable energy between the two countries based on (i) to (iii) above.
- Establishing secure, reliable and resilient supply chains of materials used in green/ clean hydrogen and the renewable energy sector.
- Any other areas of cooperation related to the electrical interconnection, Green/ Clean hydrogen and supply chains that the Parties may agree upon mutually.

3. The following three Joint Technical Teams (JTTs) have been formed under the MoU to take the cooperation forward:

   (i) JTT on Electrical inter-connections;

   (ii) JTT on Green/ Clean Hydrogen;

   (iii) JTT on Supply Chains.

United Arab Emirates (UAE)

Ministry of Energy and Infrastructure of the United Arab Emirates (UAE) had proposed to sign Memorandum of Understanding with the Ministry of Power, Government of the Republic of India on cooperation in the field of Electricity Interconnection and Trade.

2. The purpose of the MoU is to create a framework for good-faith cooperation in the field of Electricity Interconnection and Trade between the two countries and to facilitate their sharing of technical knowledge, advice, skills and expertise. The mutually agreed areas of cooperation under the MoU are:

   i. Electricity Interconnection & Trade.

   ii. Regulatory Affairs.

iii. Clean energy development and trade including Green Hydrogen

iv. Energy Storage.

v. Knowledge exchange on Net Zero activities.

3. The MoU was signed on 13th February, 2024. The first meeting to discuss the way forward is to be held shortly.

MULTILATERAL COOPERATION:

BRICS

A Memorandum of Mutual Understanding in energy saving and energy efficiency among the ministries and governmental agencies of BRICS, responsible for energy and energy efficiency was signed in November, 2015. South Africa held the BRICS Presidency for the year 2023. The Meeting of the BRICS Energy Ministers was held on 18 August 2023, in Johannesburg, South Africa. A senior level official from CEA represented Ministry of Power at the meeting while a delegation led by Additional Secretary, Ministry of Power participated virtually in the meeting. Emphasis were laid on the need for maintaining a balance between energy security, energy access and energy transitions while noting the continued risk to the energy security of the region. The BRICS Energy Ministers highlighted the need to take necessary steps to stabilize the energy supply in the global energy markets while continuing the efforts to promote the sustainable development of the energy sector. Access to low cost finance was also highlighted as one of the critical enablers for ensuring sustainable development of the energy sector.

The Energy Ministers resolved to significantly increase the efforts to ensure access to affordable, reliable, sustainable and modern energy for all in line with United Nations Sustainable Development Goal 7 and committed to working together to advance and promote energy transitions as befitting their respective national conditions and circumstances.

G20

The G20 Leaders Summit concluded last year, marking an overwhelming success of India's G20 Presidency in the history of G20 Presidencies held so far. India was able to negotiate and release an exhaustive outcome document with 100 percent consensus.

Ministry of Power with the support from Ministry of New and Renewable, Ministry of Mines, Ministry of Coal, Ministry of Petroleum and Natural Gas and other organizations led the negotiations for the Energy Transitions Working Group (ETWG), which is one of the working groups under the Sherpa Track. Four (4) meetings of the ETWG were held throughout the Presidency culminating finally into the Energy Transitions Ministerial Meeting which was held on 22 July 2023 and chaired by Sh. R.K. Singh, Hon'ble Minister of Power and NRE.

The Energy Ministers adopted several important and critical outcomes, all of which were completely endorsed by the G20 Leaders during the Leaders Summit. Some of the important outcomes concerning the ETWG may be seen below:

Fuels for Future:

A substantial milestone of ETWG has been the successful adoption of the 'G20 High- Level Voluntary Principles on Hydrogen'. G20 Energy Ministers stressed on the need to support the acceleration of production, utilization, as well as development of transparent and resilient global markets for hydrogen produced from zero and low emission technologies by developing voluntary and mutually agreed harmonizing standards as well as mutually recognized and interoperable certification schemes. India's proposal for the establishment of a Global Hydrogen Innovation Center, guided by the International Solar Alliance (ISA) was well noted.

Energy Security and diversified supply chains

Energy Ministers emphasized the need to ensure an undisrupted flow of energy from various sources, suppliers, routes and maintain reliable, responsible supply chains, notably for critical minerals. The member countries noted that Presidency's Voluntary High-Level Principles for collaboration on Critical Minerals for Energy Transitions.

Universal Energy Access and Just, Affordable, and Inclusive Energy Transition Pathways

The Energy Ministers agreed upon accelerating progress on clean cooking, electricity access, and eradicating energy poverty. The member countries noted the Presidency's Voluntary Action Plan for Promoting Renewable Energy to Accelerate Universal Energy Access".

Energy Efficiency and Responsible Consumption

Acknowledging the role of energy efficiency and energy savings, as the "first fuel", G20 members agreed to strengthen global efforts on energy efficiency through international engagements. Presidency's 'Voluntary Action Plan on Doubling the Global Rate of Energy Efficiency Improvement by 2030' garnered overwhelming support from the member countries.

Access to Low-Cost Financing for Energy Transitions

Taking the cognizance of capital-intensive costs involved, Energy Ministers agreed to work towards facilitating access to low-cost finance for technologies supporting the energy transitions. Noting the 'Voluntary Action Plan for Lowering the Cost of Finance for Energy Transitions' prepared by the Presidency, Members recognized the need for international finance institutions and MDBs to enhance and develop new mechanisms and products to scale up the mobilization of private finance for this purpose.

CLEAN ENERGY MINISTERIAL (CEM)

Clean Energy Ministerial (CEM) is a high-level global forum created since 2009, to share lessons learnt and best practices, and to encourage the transition to a global clean energy economy. There are 29 participating members' countries in the CEM. The CEM is focused on three global climate and energy policy goals:

- Improve energy efficiency worldwide.
- Enhance clean energy supply.
- Expand clean energy access.

The Clean Energy Ministerial (CEM) work programme is defined across 6 cross-cutting themes across the clean energy spectrum i.e., Power, Transport, Industry, Buildings, Cross-Sectoral and Enabling Environment. India is a founding member of the CEM, and hosted the Ministerial meeting in 2013 and co-leads and participates across several work-streams.India currently co-leads six initiatives and is a member of five initiatives and one campaign. Presently, India actively participates in 12 out of 21 initiatives and campaigns under CEM's ongoing technical workstreams.

The Government of India hosted the 14th Clean Energy Ministerial and 8th Mission Innovation (MI-8) Ministerial meeting from 19-22 July 2023, bringing together representatives from across Mission Innovation (MI) and the Clean Energy Ministerial (CEM) for one of the largest global clean energy events of the year.

Over the course of the four-day event, Ministerial-level discussions were accompanied by a robust and varied schedule of events, including CEO-Ministerial roundtables and high-level dialogues, over 74 thematic side events (1 B2B dialogue, 4 open High-Level Dialogue and 4 Closed door roundtable) organised by the clean energy community. The Ministerial also showcased an impressive Technology Showcase, an Electric Vehicle Rally, and a wide range of networking and cultural events.

One of the highlights of CEM14/MI8 was the public-facing technology showcase, which demonstrated cutting-edge advances in clean energy from India and around the world. The Technology Showcase was organized under three parts – Vehicle and Charging, Infrastructure Showcase, Mission Innovation (by Department of Science and Technology), and Clean Tech Start-up. The Showcase was a key element of the Clean Energy Ministerial & Mission Innovation meetings.

14th Clean Energy Ministerial was a pivotal moment to bring together the clean energy community to consider the status of clean energy innovation and deployment and initiate actions to accelerate clean energy together.

International Energy Agency

The International Energy Agency (IEA) is an autonomous organization which was set up in response to the 1973-74 oil crisis. The oil crisis was the result of an embargo imposed on the USA by OPEC in retaliation for the US decision to support Israel during the Arab-Israel war. The nodal Ministry dealing with IEA in the Government of India is the Ministry of Power.

2. India had been a partner country until March 30, 2017 and cooperation with IEA has been through the Joint Statement and joint schedule of actions, agreed during the IEA Ministerial every two years. On 30th March 2017, India announced the activation of "Association" status with the International Energy Agency (IEA).

3. India has expressed its willingness for full membership to IEA without any commitment to join the OECD and relaxing the IEA's criteria of maintaining 90 (ninety) days of strategic oil reserves, given India's vast geography, population and energy security commitments. India's interest has been warmly welcomed by IEA Members. An inter-ministerial committee is being formed to discuss the need and future steps for India's membership to IEA.

BIMSTEC

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization that was established on 06 June 1997 with the signing of the Bangkok Declaration. It is made up of Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand.

Ministry of Power hosted the 1st meeting of BIMSTEC Energy Centre and 2nd meeting of BIMSTEC Grid Interconnection Coordination Committee on 27-28th February, 2023 in Bengaluru. In the meeting following issues were discussed:-

a) BIMSTEC Master Study Plan

b) BIMSTEC Policy for Trade, Exchange of Electricity and Tariff Mechanism

c) BIMSTEC Policy for Transmission of Electricity

d) Rules of Procedure for BIMSTEC Energy Centre

CHAPTER 13

POWER DEVELOPMENT IN NORTH EASTERN REGION

In order to strengthen transmission, sub-transmission and distribution system of North Eastern Region and Sikkim, following two Schemes had been approved by the Government of India:

(i) 'North Eastern Region Power System Improvement Project (NERPSIP)': North Eastern Region Power System Improvement Project (NERPSIP) for Six (6) States (Assam, Manipur, Meghalaya, Mizoram, Tripura and Nagaland) for strengthening of the Intra-State Transmission and Distribution Systems (33kV and above)' was approved by Government of India in December, 2014 at an estimated cost of Rs.5111.33 crore with estimated completion time of December 2018. The cost was subsequently revised to Rs.6700 crore with revised completion time of December, 2021. The scheme is funded by Government of India with 50% of project cost funded by loan from World Bank. The project is implemented by POWERGRID. During Jan'23 to Mar'24, total 26 nos. of sanctioned elements (lines and substations) have been completed leading to completion of 433 elements out of sanctioned 446 elements till Mar'24. During the above period (i.e. Jan'23 to Mar'24), Rs.483.71 Crore has been spent by POWERGRID.

ii. Comprehensive Scheme for strengthening of Transmission & Distribution in Arunachal Pradesh and Sikkim: Comprehensive Scheme for Strengthening of Transmission & Distribution Systems in Arunachal Pradesh and Sikkim' was approved by Government of India in October 2014 at an estimated cost of Rs.4754.42 crore with estimated completion time of December 2018. The cost has been subsequently revised to Rs.9129.32 crore, with completion time of December 2021 for awarded scope of work (204 elements) and March 2024 for unawarded packages (88 elements). The project is entirely funded by the Government of India. The project is implemented by POWERGRID. During Jan'23 to Mar'24, total 64 nos. of sanctioned elements (lines and substations) have been completed leading to completion of 175 elements out of sanctioned 294 elements till Mar'24. During the above period (i.e. Jan'23 to Mar'24), Rs.1662 crore has been spent by POWERGRID.

CENTRAL SECTOR PROJECTS

NHPC Projects (Hydro)

(i) Subansiri Lower HEP (8x250 = 2000 MW), Arunachal Pradesh.

The project is located in the districts Lower Subansiri/ Dhemaji in Arunachal Pradesh/Assam on river Subansiri. It was Techno-Economically cleared by CEA on 13.01.2003. The CCEA clearance was accorded on 09.09.2003 for an estimated cost of Rs. 6285.33 crores with the schedule commissioning of the project in September, 2010. The design energy is 7421.59 Gwh. The anticipated cost of the project is Rs. 21248 crores at January-2023 price level.

The Project envisages construction of concrete gravity dam, horse shoe type head race tunnels, circular steel lined pressure shaft and surface power house having Francis turbine driven 8 nos. generating sets of 250 MW each.

Project is in advance stage of construction and about 93% overall physical progress achieved till 31.03.2024.

03 Units of the project are planned to be commissioned during 2024-25 and balance 5 units during 2026-27.

(ii) Teesta-VI HEP (4x125=500 MW), Sikkim

The project is located in South Sikkim district of Sikkim state on river Teesta. The project was Techno-Economically cleared by CEA on 27.12.2006 to M/s Lanco Teesta Hydro Power Ltd (LTHPL), at an estimated cost of Rs. 3283.08 Crs. The project envisages construction of 23.5m high Barrage, 2 nos. of HRT of 9.5m diameter and

11.8 Km long, 4 nos. Pressure shaft each of 5.40m dia and Power House to generate 2441 MU.

Major Civil works were awarded to M/s Lanco Infrastructure Ltd in March, 2007 and E&M works to M/s Alstom Projects, India in April, 2009. Since April 2014 till March 2020, project was stalled due to financial crunch with the developer.

During the year 2018, the Corporate Insolvency Resolution Process (CIRP) was initiated vide order dated 16.03.2018 of Hon'ble NCLT, Hyderabad Bench. In the Bidding process, NHPC emerged as successful bidder for acquisition of LTHPL. Subsequently, the investment proposal for an estimated cost of Rs. 5748.04 crore (Jul'18 PL), which includes Bid amount of Rs. 907 crore for acquisition of LTHPL; was approved by the CCEA on 08.03.2019 for investment, acquisition of M/s LTHPL and execution of balance works of Teesta-VI HE Project by NHPC.

Taking over along with all assets and documents as 'Going concern' completed on 09.10.2019.

The remaining works of the project were re-awarded by NHPC during the year 2020. Construction works of the project are in progress, and about 62% overall physical progress achieved till 31.03.2024. The project is likely to be commissioned by 2027-28.

Due to unprecedented severe flood of 3rd /4thOct 2023 in Teesta river, the heavy inflow with debris overtopped the Dam. The flood caused damage to various structures including Dam, Power Intake, Head Race Tunnel and Power House resulting into shutdown of the power station. Presently, the Power Station is under restoration and is planned to be restored by March'25.

(iii) Rangit-IV HEP (3x40=120 MW), Sikkim

The project is located in West Sikkim district of Sikkim state on river Rangit. The project was Techno- Economically

cleared by CEA on 06.07.2007 to M/s Jal Power Corp. Ltd (JPCL), at an estimated cost of Rs. 726.16 Crs with the design energy is 513 Gwh. The revised cost of the project as vetted by CEA is Rs. 943.20.60 crores at October-2019 price level. The project envisages construction of 44m high and 112.95m long Dam, 1 no. of HRT of 6.40m diameter and 6.453 Km long, Surge Shaft 16m dia and 57m height,1 no. Pressure shaft of 5.50m dia and 241m long.

Hon'ble NCLT approved the NHPC resolution plan vide order dated 24.12.2020. MoP on 30.03.2021 conveyed investment approval for acquisition of JPCL by NHPC and construction of balance works. On 31.03.21, NHPC took over JPCL.

All Civil, HM and E&M packages have been awarded and construction works are in progress. About 73% overall physical progress achieved till 31.03.2024.

The project is likely to be commissioned during 2025-26.

(iv) Dibang Multipurpose Project (12x240=2880MW), Arunachal Pradesh

Dibang Multipurpose Project, one of the largest project having 278m high concrete gravity Dam, one of the highest Dam in the world. The project is located near village Munli in Lower Dibang Valley District of Arunachal Pradesh. The TEC was accorded by CEA on 18.09.20217 & project was cleared by CCEA on 27.02.2023 for an estimated cost of ₹ 31876.39 crores, with the scheduled commissioning of the project as February 2032. The project after construction shall control the flood at downstream for which Govt. of India sanctioned a grant of ₹ 6159.40 Crores for Flood Moderation. The project is envisaged as a storage project for flood moderation & hydropower. The design energy is 11223 MU. In addition, the reservoir created behind the dam will provide flood moderation benefit in the downstream. The flood moderation will save erosion of agricultural land, damage to crops and further save crores of rupees being spent on flood control measures.

The Project envisages utilization of net operating head of 222.50 m by construction of a 278m high concrete dam across river Dibang, horse shoe type head race tunnels, circular steel lined pressure shaft and an underground power house having Francis turbine driven 12 nos. generating sets of 240MW each.

Project is in initial stage of construction and likely to be commissioned during FY 2031-32.

STATE SECTOR PROJECTS

i) Lower Kopli HEP (2x55 + 2x2.5 + 1x5 = 120 MW), Assam

The project is located in Dima Hasao District in northern region of Assam State on Kopli at Longku. The project was Techno- Economically cleared by CEA on 24.05.2016 to M/s Assam Power generation Corporation Ltd. (APGCL) at an estimated cost of Rs. 1115.91 crores with the schedule commissioning in 2023-24. The revised cost of the project is Rs. 1847.07 crores with likely commissioning in 2024-25 (June 2024). The delay of the start in construction work is due to forest clearance/ handing over of forest land for Package-2 of the project. The design energy of the project is 469.58 MU. The project envisages construction of concrete gravity Dam of 66 meter high and 335 meter long, one no. of HRT of 7m Dia and 3641.22 meter long, Surge Shaft of 25 m diameter and 51.5 meter height, one no. of Pressure Shaft of 6.1 m diameter and 451.20 meter long.

All civil major packages were awarded to M/s L&T on 05.08.2020 and the work has started from 1st Sep, 2021. The work of Electro-Mechanical is awarded to M/s

Andritz Hydro Pvt Ltd. on 09.09.2021. Till December'22 about 36% physical progress has been achieved and the project is slated for commissioning by 2024-25.

Till March 2024 about 67% physical progress achieved. The project is likely to be commissioned by 2024-25.

PRIVATE SECTOR PROJECTS

i) Bhasmey HEP (3x17=51 MW), Sikkim

The project is located in East Sikkim district of Sikkim state on river Rangpo/Teesta. The project was Techno-Economically cleared by CEA on 24.12.2008 to M/s Gati Infrastructure Pvt. Ltd (GIPL), at an estimated cost of Rs. 408.50 Crs with the schedule commissioning of the project in June, 2012. The design energy is 244.10 Gwh. The revised cost of the project is Rs. 746.01 crores at Mar., 2018 price level. The project envisages construction of 42m high and 150m long Barrage, 1 no. of HRT of 5.0m diameter and 5.463 Km long, Surge Shaft 13m dia and 97.5m height, Pressure shaft of 3.4m dia and 465m length.

Major Civil works were awarded to M/s Simplex Infrastructure Ltd in April, 2010. About 30% projects works were completed till Aug., 2016. Since September, 2016, project is stalled due to financial crunch with the developer.

ii) Rangit-II HEP (2x33=66 MW), Sikkim

The project is located in West Sikkim district of Sikkim state on river Rimbi. The project was approved by State Govt. on 15.04.2008 to M/s Sikkim Hydro Power Ventures Ltd (SHPVL), at an estimated cost of Rs. 496.44 Crs with the schedule commissioning of the project in the year 2017-18. The design energy is 272 Gwh. The project envisages construction of 47m high and 145m long Dam, 1 no. of HRT of 2.9m diameter and 4.745 Km long, Surge Shaft 10m dia and 65.5m height, 1 no. Pressure shaft of 1.7m dia and 592m long.

Major Civil works were awarded to M/s Coastal Project Pvt. Ltd in Dec, 2011 and E&M works to M/s Gammon India Ltd. in Mar., 2012. About 30% projects works were completed till Nov, 2017. Since Dec. 2017, project was stalled due to financial crunch with the developer. The project is in NCLT since 30th July, 2020.

iii) Panan HEP (4x75=300 MW), Sikkim

The project is located in North Sikkim district of Sikkim state on river Toling Chu/Rangyong Chu. The project was Techno- Economically cleared by CEA on 07.03.2011 to M/s Himgiri Hydro Energy Pvt. Ltd (HHEPL), at an estimated cost of Rs. 1833.05 Crs with the schedule commissioning of the project in July, 2015. The design energy is 1147.82 Gwh. The revised cost of the project is Rs. 2615.00 crores at 2018 price level. The project envisages construction of 115m high and 126m long Dam, 1 no. of HRT of 6.0m diameter and 9.549 Km long, Surge Shaft 15m dia and 102m height, 2 nos. Pressure shaft of 3.4/2.4m dia and 707.40241m long.

Major Civil works were awarded to M/s Essar Project (India) Ltd in Feb, 2014 and E&M works yet to be awarded. About 5% projects works were completed till date.

Construction works is held up. About 48 months will be required for completion of the project after restart of works.

Power projects being developed by NEEPCO in the NE Region are as under:

North-Eastern Electric Power Corporation Limited (NEEPCO)

NEEPCO, is primarily engaged in the business of generation and sale of electricity in the North-Eastern Region of India. It operates 10 power generating stations (6 hydro, 3 Gas and 1 solar) with an aggregated installed capacity of 2,057 MW.

PROJECTS UNDER CONSTRUCTION:

As of now, there are no project (s) of NEEPCO under construction.

FUTURE PROJECTS PLANNED BY NEEPCO ON OWNERSHIP BASIS:

S. No.	Name of the Project	State	Installed Capacity (MW)
Hydro			
1.	Wah Umiam St-III HEP	Meghalaya	85
2.	Wah Umiam St-I HEP		50
3.	Wah Umiam St-II HEP		100
4.	Nafra HEP	Arunachal Pradesh	120
5.	New Melling HEP		90
6.	Naying HEP		1000
7.	Hirong HEP		500
8.	**Tato-I HEP**		**186**
9.	**Tato-II HEP**		**700**
10	**Heo HEP**		**240**
	Total		**3071**

MoA of Tato-I, Tato-II, Heo, Hirong and Naying Hydrelectric Projects was signed with Govt. of Arunachal Pradesh on 12.08.2023

Future Projects Planned By Neepco Through Joint Venture Basis:

S. No.	Name of the Project	State	Installed Capacity (MW)
Hydro			
1.	Kurung HEP	Arunachal Pradesh	330
2.	Siang Upper St-II HEP#	Arunachal Pradesh	3750
TOTAL			**4080**

Note: MoP vide Letter dated 18th Nov'15 communicated its decision to put on hold the works on Siang upper Stage II project till a decision is taken regarding implementation of Siang Upper St-I & St-II HEPs in single stage or two stages. As indicated by MoP on 22.12.2021

Siang Upper HEP is to be developed in single stage with an installed capacity of 10,000 MW in joint venture between NHPC and NEEPCO.

Development of stalled Hydro Electric Projects in Arunachal Pradesh:

In order to review the stalled projects in various parts of the country, especially in Arunachal Pradesh, Hon'ble Minister of Power & NRE had approved the basin wise indication of projects in Arunachal Pradesh for development by the hydro CPSUs viz., NHPC, SJVNL, THDCIL & NEEPCO. NHPC has been indicated 3 projects of aggregate capacity 6680 MW, SJVNL has been indicated 5 projects of aggregate capacity 5097 MW, 2 projects of aggregate capacity 2950 MW have been indicated to THDCIL, NEEPCO has been indicated 17 projects with aggregate capacity of 4988 MW. 2 projects with aggregate capacity of 12700 MW are intended to be developed by NHPC and NEEPCO in JV mode.

Further, Ministry of Power, Vide F. No- 14-15/16/2021-H.I (Pt-1)(266251) dated 11th May'2023 indicated basin wise HEPs in the state of Arunachal Pradesh to CPSUs for development of 29 nos HEPs (installed capacity of project above 100 MW) to the tune of 12307.50 MW. CPSUs were also requested to identify other viable projects in vicinity of the indicated projects from a list of 53 nos HEPs with cumulative capacity 3576 MW (installed capacity below 100 MW)

During the year 2023, Hydro Sector CPSUs under Ministry of Power viz., NHPC, SJVNL, THDCIL and NEEPCO signed Memorandum of Agreement (MoA) with the Government of Arunachal Pradesh for development of 13 Hydro Electric Projects with cumulative installed capacity of 12723 MW in the State. This shall be a significant step towards harnessing the immense hydroelectric potential of Arunachal Pradesh.

Hydro Electric Projects Being Developed by NHPC

NHPC including its subsidiaries, have been operating 24 power stations with installed capacity of 7071.2 MW. Out of these, 3 power stations with total installed capacity of 675 MW are located in North-East region. NHPC has commissioned 105 MW Loktak Power Station in the year 1983 in Manipur. Subsequently, it has commissioned 60 MW Rangit Power station in the year 2000 and 510 MW Teesta-V in the year 2008 both in Sikkim. These Power Stations have generated 62892 MU since commissioning. In addition to this, NHPC has also commissioned two Projects namely 4 MW Kambang and 6 MW Sippi HE Projects on turnkey / Deposit basis.

In addition to above, NHPC is implementing 2000 MW Subansiri Lower HE Project on Subansiri river, a tributary to Brahmaputra on the border of Arunachal Pradesh and Assam. The Project is scheduled to be commissioned in March'24 and as on 31.12.2022 84% of Physical work is completed and 85% of financial progress has been achieved. NHPC has also revived two stalled hydro Projects, 500 MW Teesta-VI and 120 MW Rangit-IV both in Sikkim by acquiring the Projects through NCLT route. With the construction of above Projects, besides power generation the surrounding area has also been benefitted by development of infrastructure, education, medical facilities and employment avenues. Further, the local population in the vicinity of Projects gets benefitted from NHPC's CSR schemes.

A brief summary of these Power Stations / Projects are as under:

NHPC POWER STATION IN OPERATION IN NORTH EAST REGION

S. No.	POWER STATION	INSTALLED CAPACITY (MW)	ANNUAL DESIGN ENERGY (MU)	YEAR OF COMMISSIONING
MANIPUR (105 MW)				
1.	LOKTAK	105 (3X35)	448	1983
SIKKIM (570 MW)				
1.	RANGIT	60 (3X20)	338.61	2000
2.	TEESTA-V*	510 (3X170)	2573	2008
POWER STATION UNDER OPERATION (03 nos.)		**675**	**3359.61**	

NHPC PROJECTS UNDER CONSTRUCTION IN NORTH EAST REGION

S. No.	PROJECT	STATE/DISTRICT	INSTALLED CAPACITY (MW)	ANNUAL DESIGN ENERGY (MU)	LIKELY COMPLETION
UNDER CONSTRUCTION - ON ITS OWN					
1.	SUBANSIRI LOWER (NHPC OWN)	Arunachal Pradesh (Lower Subansiri) Assam (Dhimaji)	2000	7421.59	FY 2026-27
2	Dibang MPP (NHPC OWN)	Arunachal Pradesh (Lower Dibang Valley)	2880	11223	FY 2031-32
UNDER CONSTRUCTION - THROUGH SUBSIDIARIES					
1.	TEESTA-VI (through TLHCL 100% subsidiary of NHPC)	Sikkim / South Sikkim	500	2400.00	FY 2027-28
2.	Rangit-IV (through JCL 100% subsidiary of NHPC)	Sikkim / West Sikkim	120	507.88	FY 2025-26
PROJECTS UNDER CONSTRUCTI ON (04 nos)			**5500**	**21552.47**	

NHPC PROJECTS UNDER CLEARANCE IN NORTH EAST REGION

S. No.	PROJECT	STATE/ DISTRICT	INSTALLED CAPACITY (MW)	ANNUAL DESIGN ENERGY (MU)	REMARKS
1.	Teesta-IV (Completion period-74 months)	Sikkim/ North Sikkim	520	2251.89	FC (St-II) is pending for want of Compliance under FRA 2006. PIB Memo at Apr'21 PL circulated by MoP. PIB memo incorporating reply to comments of appraising departments submitted to MoP on 08.04.2022. PIB/ CCEA date can be ascertained after obtaining consent from remaining 3 GPUs by State Government.
PROJECTS UNDER CLEARENCES (01 nos)			**520**	**2251.89**	

PROSPECTIVE PROJECTS TO BE TAKEN OVER BY NHPC IN NORTH EAST REGION

S. No.	STATE	PROJECT	INSTALLED CAPACITY (MW)*	REMARKS
1.	Arunachal Pradesh	Subansiri Middle (Kamla)	1720	NHPC Limited has entered into a Memorandum of Agreement (MoA) with the Government of Arunachal Pradesh for the development of Kamala HEP on August 12, 2023. The Pre-DPR chapters have been received in CEA and are currently under appraisal. Preparation of DPR is under progress
2.	Arunachal Pradesh	Subansiri Upper	1605	NHPC Limited has entered into a Memorandum of Agreement (MoA) with the Government of Arunachal Pradesh for the development of Subansiri Upper HEP on August 12, 2023. The proposal for preparation of DPR has been received in CEA and is currently under appraisal.
3.	Arunachal Pradesh	Siang Lower	2700	PFR of Upper Siang is in process which may impact the project parameter of Siang lower HEP, hence techno- commercial aspects are uncertain at this stage and shall only be firmed after fixing the parameters of Upper Siang.
4.	Arunachal Pradesh	Upper Siang	10000	MoJS entrusted NHPC for preparation of PFR and DPR of Upper Siang Multipurpose Storage Project. PFR, considering Three (03) Alternatives i.e. at Uggeng, Dite Dime and Parong has been submitted to MoJS & CWC. CWC and GSI are of the opinion that balance Sub-surface geological investigations and drill holes are necessarily required to be completed for firming up the location and layout of the proposed scheme.
TOTAL			16025	

*** Tentative**

SJVN Limited

SJVNL is exploring opportunities in the North-Eastern region for development of hydro projects. Recently, Govt. of India vide letter dated 22.12.2021 identified SJVN for development of five hydro projects namely 3097 MW Etalin, 680 MW Attunli,500 MW Emini, 400 MW Mihumdon and 420 MW Amulin HEPs totaling 5097 MW capacity in Dibang basin in Arunachal Pradesh. MoA for these projects signed with Govt. of Arunachal Pradesh on 12.08.2023.

THDC INDIA imited

The Government of Arunachal Pradesh has entered into a Memorandum of Agreement (MoA) on 30th Dec'2023 with THDC INDIA Limited, to jointly undertake the development of the 1200 MW Kalai-II Hydroelectric Project situated in the Lohit river basin.

NTPC Limited

NTPC's Bongaigaon Thermal Power Station in Assam, with a capacity of 750 MW (3x250 MW), supplies power to the Northeastern Region.

North-Eastern Electric Power Corporation Limited (NEEPCO)

NEEPCO, a wholly owned subsidiary of NTPC, is primarily engaged in the business of generation and sale of electricity in the North-Eastern Region of India. It operates 10 power generating stations (6 hydro, 3 Gas and 1 solar) with an aggregated installed capacity of 2,057 MW.

CHAPTER 14

NTPC LIMITED

1. INTRODUCTION

NTPC Ltd, a Maharatna CPSE has an authorized share capital of Rs.16,600 Crore, while the paid-up capital is Rs. 9,696.67 Crore. As on 31st March ,2024, 51.1% equity is held by the Government of India.

NTPC's Vision is "To be the world's leading power company, energizing India's growth" and Mission is to "Provide reliable power and related solutions in an economical, efficient and environment friendly manner, driven by innovation and agility".

Core Values of NTPC are as below:

- Integrity,
- Customer Focus,
- Organizational Pride,
- Mutual Respect and Trust,
- Innovation and learning and
- Total Quality and Safety.

In short, it is referred to as "ICOMIT".

Over the years, NTPC has attained a global stature. In the Platts Top 250 Global Energy Companies for 2022, NTPC has been ranked as 1st globally in the category of Independent Power Producer and Energy Traders. NTPC has been ranked 433rd globally and 10th largest Indian company in the Forbes Global 2000 List for 2023.

2. OPERATIONAL PERFORMANCE HIGHLIGHTS

2.1 2.1 During FY 2023-24, Gross generation from NTPC stations, excluding joint ventures and subsidiaries was 361.7 BUs, while that including JV and subsidiaries was 422.2 BUs. During this period, NTPC coal-based stations achieved a PLF of 77.3 % with 90.5 % availability (DC %).

2.2 As on 31st Mar'2024, the installed capacity of NTPC group is 75,958 MW (including 16,880 MW under JVs & Subsidiaries, which also includes 1320 MW in Bangladesh). Details of NTPC's installed capacity are placed in Annexure-I.

2.3 Barh-I Unit -2 (660 MW), and Telangana Ph-I Unit-1 & U-2(2x800 MW), North Karanpura Unit-2 (660 MW), NSPCL Durgapur Exp Unit-2 (20 MW) and Maitree STPP Unit-2 (660 MW) have started commercial Operations in FY'24.

3. COMMERCIAL PERFORMANCE

3.1. Billing and Realization: During FY'24, NTPC realized 100% of its dues. The target set by the Government of India (GoI), for realization of dues for energy supply in 2023-24 has also been achieved. Most of the beneficiaries have made timely payments and availed the applicable rebates.

NTPC has in place a robust payment security mechanism in the form of Letters of Credit (LC) backed by the Tri-Partite Agreement (TPA). Apart from the LCs, payment is secured by the Tri-Partite Agreements (TPAs) signed amongst the State Government(s), Government of India (GoI) and Reserve Bank of India (RBI). As per the TPA, any default in payment by the State owned Discoms can be recovered directly from the State's account in RBI. The TPAs signed during 2000-01 were valid up to 31.10.2016. Subsequently these TPAs have been extended for a further period of 10 to 15 years. As of now, 29 out of total 31 States/UTs have signed the TPAs extension documents. The signing of TPAs extension by remaining States is being taken up.

3.2. Customer Relationship Management: Customer Focus is one of the core values of NTPC (ICOMIT). In line with this, NTPC has taken up several initiatives targeted towards the external customers. Customer Relationship Management (CRM) and Customer Satisfaction Index (CSI) are two important aspects of this program. As part of the CRM, Company has been implementing several structured activities with the objective of sharing its experiences and best practices with the customers, capturing their feedbacks and expectations, and also addressing their issues. Some of these activities are described below:

- NTPC has also put in place Customer Satisfaction Index (CSI) Survey scheme, to gather the feedback from customer through a survey and respond to their requirements. This CSI survey has been conducted in 2023-24 and the score falls under Excellent category.
- To further strengthen customer relationship, NTPC has sponsored 12 officials of beneficiaries / Discoms to the PGDM (Executive) program of the NTPC School of Business for the year 2023-24 as a capacity building initiative of power sector personnel for equipping them with managerial and leadership skills.

3.3. Participation in Power Market: Real Time Market (RTM) has been introduced w.e.f. 01st June 2020, which provides an opportunity to generators to sell the on-bar surplus power and the Discoms to meet any incremental power requirement.

NTPC has been participating in both the I-DAM and the RTM for selling any URS power in the Power Exchange through its trading arm NVVN. Besides selling the URS power, it has also been selling any

regulated power, merchant power, relinquished gas power, infirm power also in the Power Exchanges. In the FY 2023-24, record 3,278 million units of power worth of Rs 1,774 Crores. has been sold in the various segment of power exchanges by NTPC. Corresponding gains for this sale have been shared with the beneficiaries as per the extant regulatory provisions.

3.4. Security Constrained Economic Dispatch (SCED): NTPC stations are participating in the Security Constrained Economic Dispatch (SCED) mechanism, which is under implementation by CERC on pilot basis starting from 1st April 2019. This pilot scheme has been extended till further orders. Total SCED gain shared with DISCOM in FY 2023-24 (Apr 23 to Feb-24) was INR. 375.09 Cr.

4. FINANCIAL PERFORMANCE

NTPC has been maintaining sound financial performance and audit of accounts is being done on annual basis. As per the audited annual accounts, for the period FY 2023-24, NTPC recorded a total income of INR 1,65,707 Cr (Rupees One Lakh Sixty Five Thousand Seven Hundred and Seven Crore) and Net Profit After Tax of INR 18,079 Cr (Rupees Eighteen Thousand Seventy Nine Crore), as compared to total income of INR 1,67,724 Cr (Rupees One Lakh Sixty Seven Thousand Seven Hundred and Twenty Four Crore) and net Profit After Tax of INR 17,197 Cr (Rupees Seventeen Thousand One Hundred Ninety Seven Crore) during the period FY 2022-23 respectively.

5. GROWTH

NTPC has prepared its Corporate Plan for a time horizon till 2032, which lays the broad roadmap for NTPC's growth. Under this plan, NTPC has targeted an installed capacity of 130 GW by 2032. Renewable energy is one of the central focus areas in this roadmap and NTPC has a target to achieve 60 GW of renewable power capacity by 2032.

5.1. **Capacity Addition Program:** As on 31st March 2024, construction work is in progress for 20,245 MW capacity (including Joint Ventures & Subsidiaries). Details placed at Annexure-II.

5.2. **Growth through Joint Ventures/ Subsidiaries:** NTPC has formed 16 Joint Ventures and 10 subsidiary companies for pursuing growth. Details of these companies are placed at Annexure-III.

5.3. **Initiatives for Capacity Addition in neighboring Countries**

BANGLADESH

Bangladesh India Friendship Power Company Limited (BIFPCL), a 50:50 Joint Venture company of NTPC and Bangladesh Power Development Board (BPDB) is setting up a coal-based power plant of 1,320 MW (2x660 MW) capacity. The project christened as 'Maitree Super Thermal Power Plant (MSTPP)' is located at Rampal, Khulna and being executed by BHEL on turnkey basis. The Project is financed by Indian EXIM Bank for USD 1.6 Billion. While Unit-1 was earlier commissioned in Dec'22, Unit-2 was jointly inaugurated by the Honorable Prime Ministers of India and Bangladesh on 01st November 2023, after achieving full load on 24th October 2023. Unit-2 was commissioned in Mar'24.

SRI LANKA

Trincomalee Power Company Ltd. (TPCL) a 50:50 Joint Venture company of NTPC and Ceylon Electricity Board, Sri Lanka (CEB), is developing a 50MW (extendable to 120 MW) solar power project at Sampur in Sri Lanka for which the JVSHA was Signed with CEB on 11.03.2022. Environment Clearance (EC) for the project received on 01.06.2023, while for the associated Transmission line EC is in progress. Further, Sri Lanka Sustainable Energy Authority (SLSEA), Sri Lanka issued On-grid renewable energy permit to TPCL in July 2023. On 11st Sep'23, CEB provided the draft Request for Proposal (RFP) documents containing project details and technical requirements, Power Purchase Agreement (PPA), Implementation Agreement (IA), Contract for development of Transmission line and respective schedules for the Phase-I of Sampur Solar Project to TPCL/NTPC. TPCL is required to submit a proposal including projected tariff, in response to the RFP issued. TPCL is arranging the debt and equity finance for the project through its sponsors. Project Agreements of Sampur solar project, are under finalization between NTPC, CEB for TPCL.

On 25th October 2019, a Joint Venture & Shareholders' Agreement (JVSHA) for incorporating a new JV company in Sri Lanka has also been signed between NTPC and CEB, with an objective to develop 300 MW LNG Power Project at Kerawalapitiya.

5.4. **Renewable Energy:**

NTPC has made a roadmap for Renewable Energy Capacity addition program wherein 60 GW installed Capacity from renewable sources has been envisaged by 2032. To focus on renewables, NTPC Green Energy Limited (NGEL) has been incorporated as wholly owned subsidiary of NTPC Limited and NTPC Renewable Energy Limited (NTPC REL), incorporated earlier, has been made a subsidiary to NGEL.

In addition to solar and wind projects, NTPC group is pursuing newer green technologies like biofuels, Round the Clock Renewable Energy (RE-RTC), green hydrogen, energy storage etc. The brief status of NTPC's renewable initiatives, as on 31st March 2024 is given below:

I. NTPC Group Projects:

a) NTPC Group has already commissioned 3528 MW of RE projects under EPC mode (NTPC: 411 MW, JV/Subsidiary: 3117 MW) and 5247 MW of Solar projects under Developer Mode.

b) NTPC has won 11736 MW RE projects, so far, under Competitive Bidding (TBCB).

c) In addition, 8.4 GW RE capacity is under implementation by NTPC Group while another 9.65 GW is under tendering.

d) NTPC has the largest floating solar portfolio in the country with 262 MW total installed capacity and another 372 MW capacity under tendering.

II. Development of UMREPPs:

a) As per guidelines of UMREPP issued by MNRE on 15th June 2020, NTPC Group is exploring tie ups with States/ other organizations for around 42 GW capacity.

b) UMREPP at Gujarat (4.8 GW), DVC (0.7 GW), and Madhya Pradesh (0.6 GW) are being developed by NTPC.

c) Solar Park of 630 MW capacity at Barethi is under tendering.

III. Projects under Developer Mode:

a) 5247 MW under operation and 3306 MW under implementation.

b) Also, MNRE has accorded approval to NTPC to act as a renewable energy implementing agency (REIA) and issue tenders for setting up renewable power projects (wind and solar) under developer mode. In this mode, 5.25 GW of RE projects has been commissioned and 3.3 GW of RE projects are under implementation as of March 2024. In FY'24 RE capacity of 15 GW, comprising vanilla solar and wind, hybrid and FDRE (Firm and Dispatchable Renewable Energy) have been tendered out.

IV. Green Hydrogen Initiatives:

a) Mobility Project at Leh and Greater Noida: Two green mobility projects one at Leh and another at greater Noida are at advanced stage of execution. The project at Leh is aimed at finding the techno-economic feasibility of Hydrogen buses for short haul (less than 200 km), while project at greater Noida long haul operation (more than 600 km) is being tried out.

b) Green hydrogen Blending Project at Kawas: Operational since last 15 months, this pilot has succeeded in blending 8% v/v green hydrogen in November 2023 after satisfying all regulatory approvals. With this NTPC's engineering and project management capabilities are amply demonstrated.

c) Green Microgrid comprising of 3.2 MW Solar plant, 1 MW Electrolyzer and 200 kW fuel cell at Chusul is under tendering.

V. RE-RTC tie-ups with C&I customers:

To diversify its business further and to support other organizations in their energy transition initiatives, NTPC has formed various partnerships with Commercial & Industrial (C&I) consumers for supply of Renewable Energy - Round the Clock (RE-RTC) power for captive use. These are:

a) NGEL has formed JV with Indian Oil under the name "IndianOil NTPC Green Energy Private Limited" for developing Renewable Energy based power projects, to supply 650 MW or more renewable power on round the clock basis for refineries.

b) NTPC REL, has signed agreement with Greenko ZeroC Pvt. Ltd. (a Greenko Group Company) to supply 1300 MW RE-RTC power for powering Greenko's upcoming Green Ammonia Plant at Kakinada, India.

c) NTPC REL has won 500 MW RE-RTC capacity in the tender floated by REMCL.

5.5. Nuclear Power

NTPC Limited had formed a JV company with Nuclear Power Corporation of India Limited (NPCIL) with equity holding 49% and 51% respectively to set up Nuclear Power Projects. This JV Company named "Anushakti Vidhyut Nigam Limited"(ASHVINI) was incorporated on 27.01.2011. This JV company is now in the process of restructuring with equity participation to be in ratio of 50:50 along with other changes in the JV agreement to comply with Atomic Energy act requirements.

a) Two projects based on PHWR technology have been identified for transfer from NPCIL to JV company (ASHVINI), Chutka Madhya Pradesh Atomic Power Project (CMPAPP 2x700 MW) and Mahi Banswara Rajasthan Atomic Power Project (MBRAPP 4x700 MW). A task force of Joint Secretary (ER & Power), DAE and Joint Secretary (Thermal), MOP has been formed for finalizing the modalities for asset transfer. Supplementary JV agreement between NTPC and NPCIL signed on 01.05.2023. Joint note for project transfer (NPCIL to ASHVINI) has been put up, which is under process at Atomic Energy Commission (AEC) of DAE (Department of

Atomic Energy).

b) A joint task force was also formed with members from BARC & NTPC to work on finalization of design, development & deployment for Indian SMR (Small Modular Reactor). The report has been submitted to Atomic Energy commission. For development of Indian SMR, MOU with BARC has been approved by NTPC board and under process in BARC. NTPC has signed an MOU with NIAS (National Institute of Advance Studies) for selection of potential sites for NPP and suitable designs of SMR.

5.6. Strategic Diversification

To strengthen its competitive advantage in power generation business, NTPC has diversified its portfolio to areas such as coal mining, consultancy, power trading etc.

- Development of Captive Coal Mines: As a part of NTPC's fuel security strategies in terms of quantity, quality & sizing, NTPC Group has undertaken development of nine coal blocks with Annual peak rated production capacity of 91.6 MTPA (Million Metric Tons per Annum). NTPC has been allocated 6 coal blocks (Pakri-Barwadih, Chatti-Bariatu, Kerandari, Dulanga, Talaipalli, and Badam) by the Ministry of Coal. Further, three coal blocks have been allocated / won by NTPC's subsidiaries (PVUNL/Banhardih, THDC/ Amelia, NML/North Dhadu East).

  Out of these nine coal Mines i.e., Pakri-Barwadih, Dulanga, Talaipalli, Chatti-Bariatu, Kerandari Amelia (THDC), are under production. Other mines (Badam, Banhardih) are under development.

  During FY 23-24, NTPC achieved coal production of 35.64 MMT with growth of 51.6% over the last year. Growth of coal production from NTPC's captive mines in current financial year has helped in partially offsetting import of coal. To bring in substantial efficiency, focused approach on mining business, NTPC Mining Limited (NML), a wholly owned subsidiary of NTPC, was incorporated. MoC vide order dated 12.01.2023 has allowed amendment in allotment agreement of NTPC mines for transfer to NML. Amendment agreement signed with MoC on 20.03.23. Business Transfer Agreement signed between NTPC & NML on 17.08.23. Deed of Adherence signed between NTPC, NML & MoC on 27.09.23.

- Consultancy: To utilize NTPC's expertise for the benefit of the power sector, the Consultancy Wing of NTPC undertakes consultancy and turnkey project contracts from the conceptualization stage to O&M stage. This includes Owner's Engineer Services, Lender's Engineer Services, Project Management & Construction Supervision, Complete O&M, Renovation & Modernization, Quality Assurance, Inspection services, Customized Training & IT related Services, ERP, Procurement, HR related Services, FGD/ De-NOx installations, PMC of Renewable energy Projects (Ground-mounted and Floating Solar projects), coal mining, Biomass cofiring etc.

- Power trading: NTPC's 100% wholly owned subsidiary, NTPC Vidyut Vyapar Nigam Limited (NVVN), is involved in power trading. In the financial year 2023-24, it has traded 35.02 BU of energy. This includes 5.52 BUs traded under solar & thermal bundled power, 9.02 BU under bilateral trade, 0.84 BU under Power Banking, 11.03 BU through Power Exchange and 8.61 BU traded under Cross Border Power Trading (including power transacted for NEA in Power exchange). NVVN has also traded 0.29 BU of Renewable Energy Certificates (RECs) till 31st March 2024.

6. TECHNOLOGY INITIATIVES

Various technology initiatives have been taken by NTPC for:

- **Green Hydrogen: Pilot for new Electrolyzer technology (Anion Exchange Membrane): Pilot has been recently commissioned by NTPC at Dadri. Following new initiatives have been being undertaken in the pilot plant:**
- **Use of sewage treated water for electrolysis (STP)**
- **Use of fuel cell exhaust water vapor for re-electrolysis**
- **Study of Impact of water quality on performance of Electrolyzer**
- **Study of ramp-up/down times etc.**
- **Waste to Hydrogen: NTPC is also exploring the possibility of setting up a pilot plant for hydrogen generation from waste.**
- **MoUs have been signed with Gas turbine OEMs for co-firing of hydrogen in existing gas turbine plant. As a part of MoU, feasibility studies for hydrogen co-firing in Gas Turbine have been completed.**
- **Electrolyzer/fuel cell simulation models: NTPC is working for the development of software/ simulation models for different electrolysis / fuel cells. The software/simulation model shall help in optimization of design/operational parameters**

& cost, and selection of suitable Electrolyzer technology for commercial hydrogen plants.

- **Sea Water Electrolysis: NTPC is also undertaking studies for development of direct sea water electrolysis (studies are being undertaken along with CSIR) and pilot implementation of the same at NTPC Simhadri.**
- **Thermal Energy Storage system: Pilot project planned for Thermal Energy storage system integrated with thermal power units, which can store the differential amount of steam energy in TSS and shall be discharged during peak demand hours reducing thermal cycling.**
- **Biomass co-firing: After successful demonstration of 10% biomass co-firing at existing plants, forthcoming projects of NTPC are being designed to co-fire 20% torrefied biomass. Work has been initiated for co-firing of methanol in thermal power units in association with BHEL at Vindhyachal.**
- **Other Initiatives include.**
  - Phasing out legacy HMI systems of DDCMIS to improve the cyber security posture.
  - Development and implementation of an In-house Mill Scheduler, "TRANSFORM".
  - Indigenization of various equipment which are being imported currently for FGD and develop Indian vendors for manufacturing of these equipment to promoting 'Make in India' initiatives.

7. NTPC ENERGY TECHNOLOGY RESEARCH ALLIANCE (NETRA)

NETRA is a DSIR recognized in-house Research & Development unit set up of NTPC Ltd., focused on in-house technology development as well as collaborative research. It has networked with various prestigious national and international institutions to harness the specialized knowledge and expertise lying with those institutes. It works broadly in following two verticals, with a focus on applied research delivering "either process and/ or product or plant of scientific solution" as the product.

7.1 Vertical 1: Technology Projects

- **Carbon Capture, Utilization and Storage (CCUS):** It is an important area for CO2 abatement in India where coal is the prime source of energy. NETRA is working on various technology projects for CCUS described as under.
  - 10 TPD Flue Gas CO2 to Methanol plant at NTPC Vindhyachal
  - 10 TPD Flue Gas CO2 to Ethanol plant at NTPC Lara
  - Study on CO2 Geological Storage Potential in Cat-1 Coal Fields
  - CO2 based Carbonated Coarse Aggregate Project
- **Green Hydrogen:** Presently, NETRA is undertaking following R&D projects in this domain.
  a) 1 TPD Green Hydrogen generation from Sea Water at NTPC Simhadri.
  b) Green Hydrogen Grid Design & development – at NETRA premises.
  c) H2 generation through High Temperature Steam Electrolyzer– at NETRA premises.
- **Water Technologies:** To assess the efficacy of various technologies for water purification and Hydrogen generation, parallel work is going on. Two ongoing projects in this domain are, Water purification using Non-Thermal Forward Osmosis (NTFO) at NTPC-Mauda and Electro Coagulation based silica reduction in water, at NTPC-Solapur.
- **Waste to Energy:** Presently, NETRA is undertaking following R&D projects in the domain of Waste to Energy.
  a) 1 TPD Green Hydrogen from Plasma Enhanced Gasification System
  b) 10 TPD Torrefied Biomass Pellet Production plant
- **Ash Technologies:** For converting ash as marketable asset or products like Geo-polymer roads, paver blocks etc. Presently two projects are under execution, one Fly Ash based FALG Aggregate Plant (Capacity 30,000 M3/Yr) at NTPC-Korba.

7.2 Vertical 2: Advanced Scientific Services

NETRA provides a wide range of advanced scientific services in the following domains:

- Metallurgy – Failure analysis to prevent future possible occurrences.
- Non-destructive Evaluation – Health and residual life assessment of critical components.
- Robotics & Drones – Robotic inspection system for in accessing unreachable zones/ space.
- **Computational fluid dynamics** for solving Flue gas path and other flow related problems.
- **Chemistry** – Corrosion analysis, resin analysis, formulation of COC (cycle of concentration) improvement, TOC (Total Organic Carbon) etc.

8. SUSTAINABLE DEVELOPMENT

NTPC has been pioneer in adopting technology and practices that promote environmental management, social responsibility and economic performance (triple bottom line approach). The philosophy of sustainability is embedded in all aspects of NTPC's business activities.

8.1. Efficiency management: 'Center for Power Efficiency

and Environmental Protection' (Cen PEEP), was set up to reduce Greenhouse Gas (GHG) emissions through efficiency improvement. Currently, it is working for improvement of efficiency and reliability through introduction of new technologies and practices. On-line performance monitoring tools are used for identifying the performance gaps and planning suitable improvement actions. Implementation of action plans during unit overhauls and opportunity shutdowns is closely monitored. Parametric Optimization at part loads has been identified as a thrust area including optimization of number of running auxiliaries, sliding pressure operation, excess air optimization etc.

8.2. Energy Conservation: NTPC continues its commitment towards energy conservation through proper monitoring of power consumption of major equipment and by maintaining good operation & maintenance practices. Through a dedicated group CEETEM – Centre for Energy Efficient Technology & Energy Management, NTPC carries out energy conservation initiatives and conducts regular Energy audits to identify potential improvement areas and implementation of actions.

- During the current FY 2023-24, Mandatory Energy Audits (MEA) at 06 stations have been conducted.
- During the current FY 2023-24, water balance audits at 08 stations have been completed.

8.3. Environment Management: NTPC has been proactive in addressing environmental concerns since inception. Environment Management has been identified as a thrust area to achieve excellence. NTPC has adopted sound Environment Management practices and advanced environment protection system to minimize impact of power generation on environment.

All NTPC Stations are equipped with advanced Environmental Protection and Pollution Control Systems such as High Efficiency Electrostatic Precipitators in its coal-based units. Ash Water Re-Circulation Systems (AWRS), Liquid Waste Treatment Plant (LWTP) and Sewage Treatment Plant (STP) are available in most of the Power Stations. NTPC has taken proactive approach of making all its power stations operate with ZLD (Zero Liquid Discharge) progressively. By adopting above measures, NTPC has been able to conserve water while following the principle of "3 R's" (Reduce, Recycle and Reuse).

For reduction of SOx emission, NTPC has installed & commissioned Flue Gas Desulphurization (FGD) units at Vindhyachal Unit#13 (500 MW), Dadri Unit#5 & 6 (2x490 MW), Unchahar Unit#6 (500 MW), Khargone Unit#1 & 2 (2x660 MW), Jhajjar Unit#1 (500 MW), Solapur Unit#2 (660 MW), Tanda Unit#5 (660 MW), Darlipali Uni#2 (800 MW), Lara Unit#1(800 MW), Meja Unit#1 & 2 (2x660) and Dry Sorbent Injection (DSI) in Dadri (4X210MW). Construction works of FGD at various stations and projects (~58 GW capacity) are in progress.

Keeping commitment to environment and safety, NTPC has embarked upon to the more advanced, safer and compact in-situ Chlorine-di-oxide generation system from earlier practice of Gas chlorination system through a comprehensive policy change for its entire fleet of existing as well as upcoming power stations.

Most of NTPC stations have been ISO 14001 certified by reputed National/ International certifying agencies. NTPC has installed Ambient Air Quality Monitoring Systems (AAQMS) to monitor air quality, Continuous Emission Monitoring System (CEMS) to monitor emissions of SO2, NOX, and PM and Effluent Quality Monitoring System (EQMS) for monitoring of treated effluents in all its stations on real time basis with online real-time basis access to the regulators.

NTPC has already planted more than 39 million trees since inception. During FY'2023-24, 1 million saplings have been planted. This includes saplings planted through Miyawaki plantation technology. Biomass production in Miyawaki is 16 times higher than the conventional plantation, thus it creates more efficient carbon sink.

Under 'Cleaning the Cities' initiative, Integrated waste management and Waste to energy projects were taken up on pan India basis and are at various stages. NTPC has revived Municipal Solid Waste Management plant at Karsada, Varanasi. NTPC is implementing following projects at various locations in India:

- 600 TPD Torrefaction Plant (Waste to energy) at Varanasi, Uttar Pradesh
- 400 TPD MSW to Charcoal Plant at Bhopal, Madhya Pradesh
- 200 TPD MSW to Charcoal Plant at Hubballi, Karnataka
- 900 TPD MSW to Charcoal Plant at Greater Noida
- 500 TPD Gorakhpur, UP
- 500 TPD Haldwani Kathgodam, Uttarakhand

8.4. Corporate Social Responsibility (CSR): With a view to have a better connect with stakeholders, NTPC is engages in various CSR activities. The objective of NTPC's CSR is the inclusive growth of the neighborhood areas of its power plants. These CSR

activities are taken up in line with CSR provisions of Companies Act, 2013 and NTPC CSR Policy.

CSR activities are focused in the areas of education, health, sanitation, drinking water, development of rural infrastructure, skill development and other government schemes for inclusive growth. NTPC's CSR activities benefit about 500 villages and touch the lives of about 16 lakh people every year.

NTPC is also supporting the transformation of Aspirational districts, a flagship initiative of the Government of India through its CSR initiatives. Some of the other major CSR initiatives undertaken are:

Health care

- **Infrastructure and Equipment Support:** NTPC is aiding the National Cancer Institute Nagpur, AIIMS Patna, AIIMS Bhubaneshwar, King George Hospital in Lucknow, and King George Hospital in Vishakhapatnam, Chinmaya Mission Hospital and district hospitals at Nagaland by supporting infrastructure creation and medical equipment installation. Ambulances have been provided in Uttarakhand and Bihar (Patna). NTPC has committed to setting up a Tele-Recording Room at AIIMS, New Delhi.
- **Cancer Screening Program:** Collaboration with the Government of Bihar and Tata Memorial Cancer Hospital involves NTPC's support for a Cancer Screening Program in four districts of Bihar.
- Rehabilitation Centre: NTPC has supported the establishment of the Integrated Muscular Dystrophy Rehabilitation Centre "Manav Mandir" in Solan, Himachal Pradesh. Further, NTPC Foundation runs Disability Rehabilitation Centers at various locations in collaboration with the National Institute of Locomotor Disabilities (NILD).
- **Community Outreach:** NTPC has distributed cycles to Asha Workers in Bashbari, Kokrajhar District, Assam. NTPC is actively involved in community initiatives, such as supporting the construction of open gymnasiums in various locations in the Basti Parliamentary Constituency of Uttar Pradesh and conducting the Jan Arogyam Community Healthcare Program in Nuh District of Haryana.
- **Mobile Health Clinics & Health Camps:** Operating Mobile Health Clinics and Maternal Child Healthcare services near NTPC Stations and Projects ensures the provision of essential healthcare services to underserved regions and communities. Support is extended to Dayanand Medical College & Hospital Ludhiana for the procurement of a Mobile Health Clinic.
- **Tuberculosis Control:** NTPC Foundation operates Directly Observed Treatment cum Designated Microscopy Centre (DOTs cum DMC) with Mobile ambulance facilities at 9 NTPC hospitals under the Revised National Tuberculosis Control Program (RNCTP), catering to villages adjoining NTPC stations.

Water & Sanitation

- NTPC has constructed more than 24,000 toilets in about 16000 schools covering 650 blocks in 83 districts spread over 17 states under the Swachh Bharat Abhiyaan. Further NTPC has constructed Individual Household Toilets and Public Toilets in the project affected and adjoining villages with an objective of creating an open defecation free society.
- NTPC has revived MSW Plant at Varanasi and is supporting solid waste management in thirteen villages of Haryana.
- NTPC is supporting the developmental and beautification works of Charminar in Hyderabad under the Swachh Iconic Places Project by the Government of India.
- NTPC has installed sanitary napkin vending machines at various locations along with Incinerators for the safe disposal of used napkins.
- NTPC has extended support for installation of about 10,000 Energy Efficient agricultural Pump System in UP and taken initiatives of rejuvenation of ponds located in the project affected villages to improve ground water table.
- NTPC ensures access to potable drinking water to the community through installation of hand pumps, piped drinking water, RO water plants, and Solar and grid powered Water ATMs in public locations. NTPC also distributes water filters/ coolers in various villages/ schools near NTPC operations. Further, during extreme summers, NTPC ensures availability of water through Water Booths and Water Tankers.

Education, Infrastructure Development and Sports

- Girl Empowerment Mission (GEM) flagship program of NTPC aims at empowerment/ upliftment of girl children through various interventions. Free education is provided for around 388 girl students admitted to different NTPC Township Schools. In the year 2023, NTPC Foundation conducted GEM workshops at 41 NTPC business Units with participation of 2700 girls have. Since conceptualization 10,000 girls have benefitted from GEM Program.
- NTPC Foundation offers "NTPC Utkarsh" merit scholarships to the students of Project Affected Villages.

- NTPC is supporting education in rural areas by augmenting and strengthening school infrastructure, scholarships, study material, & uniforms etc. This Includes
- Financial Support for infrastructure development at Shree Ramakrishna Ashram, M. Rampur, Kalahandi, Vidyabharati Bharatiya Siksha Sankul Samiti, Chiplun, tribal school extension at Sewa Kunj Ashram, Chapki, Govt./ Aided schools in Dharwad (Karnataka), Malleswara Vidyaniketan School, Nellipathi, (Kerala) and English Medium Model College, Mahasamund, Chattisgarh and construction of auditorium at Sewa Bharti, Rajkot. NTPC is also supporting 60 single teacher run small schools in the slums of Jaipur, Rajasthan.
- Supporting the education of Baiga Tribal students through the Commissioner of Tribal Welfare, Chhattisgarh.
- Supporting the holistic education to 54 Special Backward Tribe Pahadi Korwa students.
- Financial support for installation of on-grid solar rooftop panels in Government Schools at Unchahar, Uttar Pradesh and Installation of Solar Power Plants at Akal Academy schools in Punjab.
- Upgradation of Educational, Health facilities and living conditions of children and communities residing in Demchok, Koyul, Korjok, Hanley & Chushul of Ladakh Constituency
- NTPC has provided support for the construction of Netaji Subhash Chandra Bose Military Academy at Silvassa.
- NTPC is providing support for upgradation of Computer Laboratory and Library in Vivekananda Kendriya Vidyalayas, Arunachal Pradesh.
- NTPC is providing support for construction of digital classrooms in Kawnpui College, Mizoram
- NTPC is providing financial support for the Development, Renovation and Advancement project of GHSS Munderi, District Kannur, Kerala
- NTPC has supported infrastructure augmentation by providing 2500 benches/desks to 50 government schools in Supaul, Bihar.
- NTPC has initiated various programs to implement its CSR policy aimed at Improving learning outcomes and quality of Education for children studying in government Schools located in its project-affected villages.

Community Infrastructure

- Installation of LED based Solar Street Lights at various location in Uttar Pradesh, Odisha, Telangana and Madhya Pradesh.
- NTPC is supporting the construction and redevelopment of Shri Badrinath Dham town in Uttarakhand as a spiritual smart hill town, re-development and beautification of Ramna Maidan, Ara, Bihar and construction of War Memorial at Ara Town, Bhojpur
- NTPC is supporting the construction of Community Halls of Machilipatnam Parliamentary Constituency in Krishna District, Andhra Pradesh
- NTPC is supporting for the construction of vertical extension of Chaltlang Branch YMA Hall at Chaltlang, Mizoram
- NTPC is supporting for the Rural Electrification in the District of Mandsaur, MP

Supporting Sports

- NTPC is providing support to Archery sport in India. During 2023, Indian Archers won many medals at World Cup Final at Hermosillo, Para–Archery World Ranking event at Czech Republic, world Archery Para Championship and at World Archery Youth Championship at Limerick Ireland. At the 19th Asian games, Indian Archers bagged 4 medals (3 gold and 1 bronze).
- NTPC Foundation has signed an MOU with National Sports Development Fund to support Archery Sport in the country at the grassroot level including Intermediate/Elite Levels for five (05) Years.
- NTPC is providing infrastructure support to NTPC-SAI Water Sports Centre at Koldam, Himachal Pradesh for promoting Kayaking, Rowing and Canoeing water sports.
- NTPC supports the development of basic infrastructure such as roads, bridges, culverts, bus shelters, community centers, schools, health centers enabling the local community to fulfil their basic needs and to enhance the quality of their lives.

Women Empowerment & Reducing inequalities.

- NTPC Foundation in collaboration with Apparel Made ups & Home Furnishing Sector Council is providing skill & livelihood generation training to around 1250 No. of women. NTPC also provides various training courses in embroidery, dress designing, cutting, stitching, tailoring (including providing sewing machines), beautician, bangle making, food preservation & processing, nursing etc. to women from various villages located in its project vicinity.
- Other initiatives include cultivation of mushrooms and creating sustainable livelihoods through Oyster mushroom cultivation near Aurangabad, supporting construction of Mata Hausabai Bandhu Athawale Old Age Home in Mevali Village, District Fatehpur,

Uttar Pradesh.

Skill Development

- NTPC is supporting the running of 18 Govt. ITIs and is in the process of setting up 8 new Govt. ITIs at various locations. NTPC has supported the GoI "Skill India Mission" in collaboration with NSDC for various employment linked skill development programs for 30000 rural youth including 8000 youth of J&K.
- NTPC has provided various capacity building training programs, exposure visits and provided hand holding through experts to the farmers of villages making the villager entrepreneurial, enterprising, and employable.

Disaster Relief

- NTPC has extended financial support to Uttarakhand State Disaster Management Authority (USDMA) for undertaking reconstruction and restoration of Govt. schools and Govt. health centers in various districts of Uttarakhand.
- NTPC is supporting the redevelopment of Kedar Nath town, Uttarakhand and its surrounding areas devastated during the natural calamity.
- NTPC is supporting for setting up of disaster management control room at Bilaspur, Chhattisgarh

CSR efforts of NTPC has been conferred with various awards, some of the awards are as given below:

CSR efforts of NTPC has been conferred with various awards, some of them include "GOLD Award" in the category "CSR Waste Management Program" in the prestigious "CSR Health Impact Awards-2023" and "Best CSR Project of the Year 2023 (PSU)" award by Brand Honchos. NTPC Ltd has been honored with Excellence in Community Impact – Joint Winner in the "SHRM HR Excellence Award - 2023" for the project "Girl Empowerment Mission" on 12th October 2023.

8.5. Rehabilitation & Resettlement (R&R)

NTPC is committed to help the families affected/ displaced due to acquisition of required land, by respective State Govt./ Authorities. NTPC has been making efforts to improve the socio-economic status of the Project Affected Families (PAFs). In line with its social objectives, NTPC has focused on effective Rehabilitation and Resettlement (R&R) of PAFs and on Community Development (CD) works, in and around its projects.

Post enactment of 'The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCT LARR Act, 2013) by the Govt. of India, NTPC revised its R&R Policy to incorporate the R&R entitlements as per The RFCT LARR Act, 2013. This R&R Policy of NTPC also have the NTPC's good practices / guidelines on facilities to be extended for Project Affected Families (PAFs).

NTPC takes measures for R&R of PAFs as per its R&R Policy/ Govt. Guidelines/ extant LA Act provisions with the objective that the PAFs will improve or at least regain their previous standards of living. A Social Impact Assessment (SIA)/ Census Survey conducted by the Appropriate Govt. to collect detailed demographic details of the area forms the basis for the preparation of 'Rehabilitation and Resettlement (R&R) Plan/ Scheme'. Additionally, need based Community Development (CD) activities are also included for contributing to socio-economic development of the people/ development of area in project vicinity.

R&R Plan expenditure is a part of capital cost of the project, and the Plan is implemented in a time bound manner to complete its implementation by the time the project is commissioned. On completion of the R&R Plan implementation, a Social Impact Evaluation (SIE) is conducted by a professional agency to know the efficacy of R&R Plan implementation for future learnings and appropriate interventions.

R&R Community Development activities are being implemented at the new Greenfield / Brownfield Thermal projects at Darlipali, Gadarwara, Khargone, Telangana, Lara, North-Karanpura, Solapur, Tanda-II, Barh, Barauni, Meja, Kanti, NPGC Nabinagar, BRBCL Nabinagar, Patratu, Hydro project at Tapovan Vishnugad, Rammam-III and Coal Mining Projects at Pakri-Barwadih, Chatti-Bariatu, Kerendari, Dulanga and Talaipalli. These activities are taken up under the approved R&R Plans, and on case-to-case basis requirement for specific projects to cater local requirements / stakeholders' request. The interventions are also focused on the improvement in Social Development Indicators (SDIs) of the project affected villages.

9. CORPORATE GOVERNANCE

As a good corporate citizen, NTPC 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. NTPC firmly believes that sound Corporate Governance is critical for enhancing and retaining investor trust. We are committed to meet our performance goals with ethics and good governance. NTPC is constantly striving to adopt emerging best practices in corporate governance. It is our endeavor to achieve higher standards and provide oversight and guidance to management in strategy implementation and risk management and fulfilment of stated goals and objectives. NTPC is adhering to the best recognized corporate governance practices and continuously benchmarking itself against each such practice in our endeavor to meet the expectations of the stakeholders.

The Company has complied with all the requirements of SEBI LODR, Companies Act, 2013 and Guidelines on Corporate Governance for Central Public Sector Enterprises issued by Department of Public Enterprises, Ministry of Heavy Industries and Public Enterprises, Government of India, except requirement regarding requisite number of Independent Director.

10. SAFETY

Safety is a part of NTPC's core values. The objective is to provide a safe working environment and strive for zero incidents at work. NTPC safety policy is supported by a comprehensive Safety Framework and directives & guidance notes. NTPC recognizes that all accidents are preventable. Therefore, safety is always at the forefront of all the activities. NTPC has 3-tier structure for Occupational Health and Safety management, namely at Stations/Projects, at Regional Head Quarters and at Corporate Centre. Corporate Safety Department is headed by the Executive Director and is responsible for making Guidelines/Procedures/Standards, heir review and implementation. Business Unit Heads of all NTPC stations review the safety performance of their respective stations monthly on a well-defined template.

Cross-functional safety task forces are functional at projects/stations to monitor deviations & non compliances. For strict compliance and enforcement, safety clauses are included in all contracts.

CLIMS (Contract Labour Information Management System) has been implemented for gate pass system for contract workers. Standardized Safety training and medical examination of contract workers has been made mandatory for processing gate pass in CLIMS.

NTPC gives due importance to learning and in FY 2023-24, NEBOSH process safety training was imparted to 60 executives apart from various other safety topics. Most of the NTPC stations are certified with ISO-45001.

Internal as well as External Safety Audits by a team of Safety Officers from different Stations are carried out to review compliance of the system. In FY 23-24, External Audit of 37 NTPC stations were conducted by a reputed audit agency to ensure uniform evaluation & ranking.

"Safety Evaluation Matrix" has been rolled out during FY 23-24 for operating stations. It is a continuous and transparent process for internal benchmarking of safety systems among peer stations. Reporting of safety observations, trainings and talks details, work related injuries and incidents is done through customized mobile application 'Suraksha'. The App is integrated with SAP on real time basis. Enabling capturing the latest data for safety analysis.

Effective engineering controls and emergency plans have been developed to handle emergency situations. Mock drills are regularly conducted at all plants, with agencies like NDRF and SDRF have being associated at many of the stations.

NTPC has initiated NTPC Disaster Management Cell for augmenting the disaster management capacity. This cell will be responsible for formulating policies and long-term action plan to make NTPC more resilient to disasters. The cell will work closely with regions and stations for capacity building, resource management, tie ups with expert agencies, seamless flow of communication etc.

NTPC's efforts have won many safety awards and laurels to the company's units from reputed institutions, namely British Safety Council, National Safety Council-Mumbai, CII as well as awards from State Governments.

11. RISK MANAGEMENT

Risk management scenario has become challenging with increasing regulatory compliance and emerging business risks. Cyber security risk and ongoing pandemic have made the business even more challenging. Therefore, to have a focused approach on risk management and to ensure decision-making is aligned with the organization's long-term objectives, NTPC has an elaborate Enterprise Risk Management framework in place. Ensuring compliance with the Companies Act and SEBI (LODR) Regulations, NTPC has implemented an elaborate Enterprise Risk Management framework for following:

- To finalize risk assessment under the risk management framework,
- Monitor and review risk management plan/ framework, as approved by the Board.
- Informing the Board about the risk assessed and action required to be take/ already taken for mitigating the risks on quarterly basis.
- Take up other matter, as directed by the Board from time to time.

"Risk Management Committee (RMC)" committee comprising of Functional Directors and Independent Director and Chief Risk Officer (CRO), has been entrusted with the responsibility to identify& review the risks and formulate action plans and strategies to mitigate them on short term as well as long term basis. The RMC meets regularly to deliberate on strategies. Risks are monitored through reporting of Key Risk Indicators (KRIs). The RMC ensures that the company's Risk Management Policy adheres to the globally recognized ISO 31000 (Risk Management Guidelines) and NTPC has also received a Letter of Conformity validating this compliance.

12. BUSINESS EXCELLENCE(BE)

NTPC has developed and implemented its bespoke model 'NTPC Business Excellence Model', demonstrating its steadfast commitment to business excellence. The NTPC BE Model is intricately designed, placing significant emphasis on planning, strategic prowess, safety measures, and key areas of paramount importance such as stakeholder engagement, digitization, employee wellness, and learning & development. Each year, our thermal stations undergo a rigorous BE Assessment, aiming to identify opportunities to enhance stakeholder engagement, streamline critical processes, and nurture leadership potential. During FY 23-24, twenty-five stations have been assessed.

In accordance with ISO standards, NTPC stations have adopted "Integrated Management System and Total Quality Management (TQM). To foster knowledge sharing and overcome business

challenges, initiatives like Quality Circles (QC), Professional Circles (PC), Suggestion Scheme etc. have been implemented. NTPC also sponsors the best-performing team to participate in the International Quality Control Circle Convention. Notably, the team "Aqua Power" from NTPC-Bongaigaon qualified for the International QCC Convention 2023 held in Beijing, China."

13. HUMAN RESOURCE DEVELOPMENT:

NTPC takes pride in its highly motivated and trained Human Resource that has contributed its best to bring NTPC to its present height. The total employee strength of NTPC stands at 16,262 as on 31st March 2024 (excluding Trainees and FTEs).

13.1. Induction Plans: Several initiatives have been taken to ensure a robust talent pipeline to meet the increasing requirement of manpower for the Company's growth program. Considering the significant capacity addition plan, Executive Trainees, Experienced Engineers, Diploma & ITI Trainees are recruited as per the requirement & continuous efforts have been made to effectively utilize the manpower. Further, hiring is being done in diversified and niche areas such as Mining, Hydro, Safety, IT, Renewable Energy etc. to attract experienced talent depending upon the business requirement. To meet the short term and project specific manpower requirements, NTPC has also started to engage fixed term employees.

13.2. Training & Development: Learning is one of our Core-Values. Recognizing the need for capability building for current and future roles, NTPC has set up a comprehensive training infrastructure comprising Power Management Institute (PMI) at the apex level, Regional Learning Institutes, Employee Development Centers (EDCs) at the stations and simulator training facilities. NTPC also sponsors employees to external training facilities. During the year 2023-24, 1306 employees were exposed to external training within India, through offline as well as online mode. The training imparted is based on Training Need Analysis (TNA) and is in tune with emerging needs and challenges.

PMI also provides training to domestic and international power professionals. During FY23-24, NTPC has logged a total of 86516 man-days for Future Skill Courses, GPI learn modules and e-learning portal (Eguru).

To ensure training interventions are even more focused and targeted, the following initiatives have been taken:

- Assigning GPiLearn modules, Safety modules and Location Management Instructions (LMI) customized based on area and location to Operation and Maintenance executives.
- Imparting job-rotation facilitation training (called Samarth training) through standardized modules.377 executives have been covered under Samarth training in 2023-24.
- Need based training based on assessment of pre-identified managerial competencies, in the Competency, Potential and Value (CPV) assessment undertaken for them. 482 Executives have been covered under such Competency Development programs in 2023-24 and 95 employees were trained under 10X leadership program. 500 employees were trained under planned interventions since 01.04.2023.
- Certification Programs in Sustainable and Green Finance, Carbon Trading and Markets, Electricity Markets, Financial Modelling & Valuation Analysis, Nuclear Energy Technology, Offshore Wind Energy, Pumped Storage hydro and Energy analytics covering 480 employees.
- Around 824 executives have been given Simulator training in 2023-24.

During 2023-24, Executive trainees (ETs) from Mechanical, Electrical, Civil and C&I Engineering, (932 ETs), IT (11 ETs), HR (13 ETs), Finance (26 ETs), Mining (68 ETs) and ACT (36) are undergoing one year induction training program.

Access to new age digital courses like AI, IoT, Block Chain etc. on the NASSCOM- MeITY Future Skills platform has been provided to all executives. A total of 338 number of executives have completed Future-Skills courses till now. With a view to leverage Virtual Reality (VR) immersive technology for learning,540 minutes VR content has been developed and Train the Trainer programs have been delivered to facilitate leveraging of VR for training.

Focusing on holistic well-being, besides standalone programs on Yoga, Pranayam, meditation etc., 24*7 online Employee Assistance program, named Snehal, was operative throughout the 2023-24 for all employees and their families. This includes unlimited phone/video/chat/e-counselling. Gender sensitization programs and special programs for women employees were also delivered.

14. SUPPORT TO THE SECTOR

NTPC has extended its services for the development of Indian Power Sector in several programs of the Government of India through NSM and NSDF. Some of the highlights of NTPC's role in India's power sector development are as below:

14.1. National Solar Mission (NSM)

NTPC had been entrusted to develop 15 GW Solar PV through NSM Phase-II in three tranches from 2014-15 to 2018-19, where NTPC would be the facilitator/ trader between DISCOMS and the project developers. NTPC would purchase power from the developers and sell it to the DISCOMS. As advised by MNRE target under National Solar

Mission (NSM) Phase-II has been revised from 15 GW to 3 GW, under which 3 GW Solar PV capacity has been commissioned under Developer Mode.

14.2. National Skill Development Fund (NSDF)

NTPC is supporting the skills development initiative of the Government of India, in line with SKILL INDIA MISSION, by partnering with the Central and State governments. NTPC has entered into two tripartite MOUs with National Skill Development Fund (NSDF) and National Skill Development Corporation (NSDC) under Ministry of Skill Development & Entrepreneurship (MSDE). NTPC has provided funds to NSDF as per provisions of the MOU and NSDC with the support of NSDF has executed skill development programs at various locations. Under the initiative, NTPC has supported skill development programs for 30,000 youth in different market linked vocational skills for various sectors like services, manufacturing industry etc.

14.3. Support during Crunch Period:

To meet the escalated power requirement during the crunch period various measures were taken by NTPC to support the grid. These include-

- Increased coal production from the captive mines
- Increased coal transportation through RCR and RSR mode.
- Postponing of scheduled plant maintenance as per MoP directives.
- Additional generation capacity available with NTPC stations was offered through PUSHP portal to DISCOMs.
- MoP nominated NTPC's subsidiary NVVN as a Nodal Agency to facilitate supply of 4000 MW power from Gas Based Power (GBP) plants. This ensured sufficient supply in the DAY AHEAD MARKET and helped in moderating the clearing price.
- To ensured sufficient gas availability for its Gas based stations, LTRLNG contract have been extended for sufficient period with enhanced quantities and flexibilities. Further Sourcing of gas through IGX is also done to meet emergency requirements.

NTPC gas stations and RGPPL operated under crunch period scheme during April–June23 to ensure grid security and provide the much-needed power.

15. AWARDS AND ACCOLADES

NTPC has been consistently recognized by local & international bodies in the fields of Productivity, Environment and Safety. Major awards and rankings received by NTPC during the period 2023-24 are as under:

1. NTPC has been ranked No. 1 Independent Power Producers and Energy Traders Globally in the S&P Global Commodity Insights Top 250 Global Energy Company Rankings®-2022.
2. NTPC has been recognized as one of the "World's Best Employers 2023" in the Forbes World's Best Employers list 2023. It ranked 261st out of top 700 companies in the World ranking and is the only Indian PSU to figure in the list.
3. NTPC has climbed an impressive 52 positions to secure the 433rd rank in Forbes' Global 2000 List for 2023. This prestigious list, compiled by Forbes, recognizes the world's largest companies based on four key metrics: sales, profits, assets, and market value.
4. NTPC Limited has been certified as a Top Employer in India by the Top Employers Institute.
5. NTPC has been bestowed with the prestigious ATD BEST Award which is considered as one of the most coveted and the highest level of award in the field of Learning and Development.
6. NTPC has been awarded "Technology Transfer Award 2022" in Generation Sector, by Electric Power Research Institute (EPRI), US for incorporating Assessment and Benchmarking Tool for Flexible Operations.
7. NTPC ESG Score has ascended by two levels, transitioning from a D rating in 2022 to a commendable C rating in 2023 in the Carbon Disclosure Project (CDP) Water Security Rating.
8. NTPC Secures Top Position in the Institutional Investor 2023 Asia Executive Rankings.
9. NTPC was aw`arded for 'Continuous Excellence in the implementation of the Official Language Policy' by Hon'ble Union Minister (Power, New & Renewable Energy) Shri R K Singh in the meeting of the Hindi Advisory Committee held on 17th August 2023.
10. NTPC has been ranked No. 1 amongst all CPSUs and received "Platinum Award" as Top Organisation wrt GeM Procurement in FY'23.
11. NTPC's Unified Shared Service Centre (USSC) was awarded with the first prize at the 9th Global Procurement Summit.
12. NTPC received Gold Award for Annual Report at the Corporate Governance Disclosures Competition 2022 organised by South Asian Federation of Accountants (SAFA).
13. NTPC has been conferred with "Excellence in Corporate Social Responsibility" award in the prestigious 18th CII-ITC Sustainability Awards 2023.
14. NTPC has been recognized as one of the "Most Preferred Workplace of 2023-24" in the 3rd edition of "Most

Preferred Workplaces" by Team Marksmen.

15. NTPC Barauni is ranked #1 at the National Awards for Water Resources Conservation and Management by the Ministry of Jal shakti, Govt of India in the Best Industry Category. NTPC has been honoured with the CBIP Award 2022 for 'Outstanding Contribution in Power Generation', attributed to its Vindhyachal Super Thermal Power Station, the largest power station in the country for its efficiency and high level of generation.
16. NTPC Mouda has been awarded as the Winner in the "Public Sector Best Performing Unit" for Highest Biomass Cofiring in Thermal Power Plants by SAMARTH (Sustainable Agrarian Mission on Use of Agri-Residue in Thermal Power Plants).
17. Shri R K Singh, Hon'ble Minister of Power presented the Green Ribbon Champions Award to NTPC for its commitment to sustainability.
18. NTPC received SKOCH PSU Award 2023 for implementation of Robotic Process Automation (RPA) in Commercial Billing Process.
19. NTPC won the coveted Gold Award for "Excellence in Reward & Recognition programs" at Economic Times Human Capital Awards 2023.
20. NTPC has been conferred with the prestigious "Sport star Ace Award -2024" in the category "Best PSU for the promotion of Sports" for contributing significantly to Archery Sport in the Country.
21. NTPC Coal Mines bagged Star Rating Awards under the Star Rating System instituted by the Ministry of Coal (MoC) to promote green, safe and sustainable mining practices.
22. NTPC's Unified Shared Service Centre (USSC) was awarded with the first prize at the 9th Global Procurement Summit held in New Delhi.

LIST OF NTPC COMMISSIONED STATIONS / PROJECTS (as on 31.03.2024)

I. COAL BASED STATIONS

S N	Station	State	Capacity (MW)
1	Barauni	Bihar	720
2	Barh	Bihar	2640
3	Bongaigaon	Assam	750
4	Dadri	Uttar Pradesh	1820
5	Darlipalli	Odisha	1600
6	Farakka	West Bengal	2100
7	Gadarwara	Madhya Pradesh	1600
8	Kahalgaon	Bihar	2340
9	Khargone	Madhya Pradesh	1320
10	Korba	Chhattisgarh	2600
11	Kudgi	Karnataka	2400
12	Lara	Chhattisgarh	1600
13	Mouda	Maharashtra	2320
14	Ramagundam	Telangana	2600
15	Rihand	Uttar Pradesh	3000
16	Simhadri	Andhra Pradesh	2000
17	Singrauli	Uttar Pradesh	2000
18	Sipat	Chhattisgarh	2980
19	Solapur	Maharashtra	1320

20	Talcher Kaniha	Odisha	3000
21	Tanda	Uttar Pradesh	1760
22	Unchahar	Uttar Pradesh	1550
23	Kanti	Bihar	390
24	Nabinagar Super Thermal	Bihar	1980
25	Vindhyachal	Madhya Pradesh	4760
26	North Karanpura	Jharkhand	1320
27	Telangana	Telangana	1600
	Total (Coal)		**54070**

II. COMBINED CYCLE GAS/LIQUID FUEL BASED STATIONS

S N	STATIONS	State	Capacity (MW)
1	Anta	Rajasthan	419
2	Auraiya	Uttar Pradesh	663
3	Dadri	Uttar Pradesh	830
4	Faridabad	Haryana	432
5	Jhanor Gandhar	Gujrat	656
6	Kawas	Gujrat	657
7	Kayamkulam	Kerala	360
	Total (Gas/Liquid)		**4,017**

III. HYDRO BASED STATIONS

S N	Project	State	Capacity (MW)
1	Koldam	Himachal Pradesh	800
	Total (Hydro)		**800**

IV. RENEWABLE STATIONS

S N	Station	State	Capacity (MW)
1	Singrauli Small Hydro	Madhya Pradesh	8
2	Dadri Solar	Uttar Pradesh	5
3	Andaman Solar	Andaman and Nicobar	5
4	Ramagundam Solar	Telangana	10
5	Faridabad Solar	Haryana	5
6	Talcher Kaniha Solar	Odisha	10
7	Unchahar Solar	Uttar Pradesh	10
8	Singrauli Solar	Madhya Pradesh	15
9	Auraiya Solar	Uttar Pradesh	20
10	Simhadri (F)Solar	Andhra Pradesh	25
11	Ramagundam(F)Solar	Telangana	100
12	Kayamkulam(F)Solar	Kerala	92
13	Kawas Solar	Gujarat	56
14	Gandhar Solar	Gujarat	20
15	Auraiya (F) Solar	Uttar Pradesh	20

16	Solapur Solar	Maharashtra	10
	Total (Renewable)		**411**
	Total NTPC		**59078**

V. POWER STATIONS UNDER JOINT VENTURES AND SUBSIDIARIES

S N	STATIONS	State	Capacity (MW)
	Coal Based Stations		
1	Bhilai (NSPCL)	Chhattisgarh	574
2	Jhajjar (APCPL)	Haryana	1,500
3	Rourkela (NSPCL)	Odisha	370
4	Vallur (NTECL)	Tamil Nadu	1,500
5	Durgapur (NSPCL)	West Bengal	140
6	Meja (MUNPL)	Uttar Pradesh	1,320
7	Jhabua (JPL)	Madhya Pradesh	600
8	Nabinagar (BRBCL)	Bihar	1,000
9	Maitree (BIFPCL)	Bangladesh	1,320
	Total (Coal)		**8,324**
	Gas Based Stations		
1	Ratnagiri (RGPPL)	Maharashtra	1,967
2	Assam Gas (NEEPCO)	Assam	291
3	Agartala Gas (NEEPCO)	Tripura	135
4	Tripura Gas (NEEPCO)	Tripura	101
	Total (Gas)		**2,494**
	Hydro Stations		
1	Tehri HPP (THDC)	Uttarakhand	1,000
2	Koteshwar HPP (THDC)	Uttarakhand	400
3	Ranganadi HEP (NEEPCO)	Arunachal	405
4	Doyang HEP (NEEPCO)	Nagaland	75
5	Pare HEP (NEEPCO)	Arunachal	110
6	Tuirial HEP (NEEPCO)	Mizoram	60
7	Kopili HEP (NEEPCO)	Assam	200
8	Kopili Stage-II HEP (NEEPCO)	Assam	25
9	Khanong HEP (NEEPCO)	Assam	50
10	Kameng HEP (NEEPCO)	Arunachal	600
	Total (Hydro)		**2,925**
	Renewable Stations		
1	Dhukwan SHP (THDC)	Uttar Pradesh	24
2	Patan Wind (THDC)	Gujarat	50
3	Devbhumi Dwarka Wind (THDC)	Gujarat	63
4	Tripura Solar (NEEPCO)	Tripura	5
5	Kasaragod Solar (THDC)	Kerala	50
	NGEL		
1	Rajgarh solar	Madhya Pradesh	24
2	Ananthapur solar	Andhra Pradesh	50
3	Bhadla solar	Rajasthan	63

S N	STATIONS	State	Capacity (MW)
4	Mandsaur solar	Madhya Pradesh	5
5	Bilhaur-1 solar	Uttar Pradesh	50
6	Bilhaur-2 solar	Uttar Pradesh	85
7	Jetsar solar	Rajasthan	160
8	Fatehgarh solar	Rajasthan	296
9	Kolyat-SKB1 solar	Rajasthan	250
10	Kolyat-SKB2 solar	Rajasthan	150
11	Ettayapuram solar	Tamil Nadu	230
12	Devikot solar	Rajasthan	240
13	Nokhra solar	Rajasthan	300
14	Dayapar wind	Gujarat	50
15	Rojmal Wind	Gujarat	50
16	Chattargarh Solar	Rajasthan	150
17	Ayodhya Solar (Pt-1)	Uttar Pradesh	14
	Total (Renewable)		**3,117**
	Total (Under JVs & Subsidiaries)		**16,880**
	GRAND TOTAL (I+II+III+IV+V)		**75,958**

DETAILS OF ONGOING PROJECTS

S N	Project	Type	State	Capacity (MW)
1.	Barh-I	Coal	Bihar	660
2.	North Karanpura	Coal	Jharkhand	660
3.	Singrauli STPP, St-III	Coal	Uttar Pradesh	1600
4.	Talcher-Ill	Coal	Odisha	1320
5.	Lara—II	Coal	Chhattisgarh	1600
6.	PVUNL Patratu	Coal	Jharkhand	2400
7.	NSPCL Durgapur III	Coal	West Bengal	20
8.	THDC Khurja	Coal	Uttar Pradesh	1320
9.	Lata Tapovan #	Hydro	Uttarakhand	171
10.	Tapovan Vishnugad *	Hydro	Uttarakhand	520
11.	Rammam	Hydro	West Bengal	120
12.	THDC Tehri PSP	Hydro	Uttarakhand	1000
13.	THDC Vishnugadh Pipalkoti	Hydro	Uttarakhand	444
14.	Rihand	Solar	Uttar Pradesh	20
15.	Anta Solar	Solar	Rajasthan	90
16.	Solapur Solar	Solar	Maharashtra	13
17.	Nokh	Solar	Rajasthan	735
18.	Shambhu Ki Burj	Solar	Rajasthan	150
19.	Chattargarh	Solar	Rajasthan	150
20.	Bhensada	Solar	Rajasthan	320
21.	GVUNL-I (Amreshwar 200MW)	Solar	Gujarat	200
22.	GVUNL-II (Limbdi 60MW, Radhanpur 60MW, Mesanka 30MW)	Solar	Gujarat	200
23	Dayapar-I (Wind)	Wind	Gujarat	100

S N	Project	Type	State	Capacity (MW)
24	Dayapar-II (Wind)	Wind	Gujarat	200
25	Bhadla-II	Solar	Rajasthan	500
26	Shajapur	Solar	Madhya Pradesh	325
27	Nakhatrana (Part of Hybrid: Dayapar-I)	Solar	Gujarat	300
28	Khavda-I	Solar	Gujarat	1255
29	Khavda-II	Solar	Gujarat	1200
30	Khavda—III	Solar	Gujarat	300
31	Dayapar-III (Wind)	Wind	Gujarat	150
32	Ayodhya Solar	Solar	Uttar Pradesh	40
33	Jamjodhpur	Wind	Gujarat	546
34	Kalyanpur	Wind	Gujarat	308
35	Vanki	Wind	Gujarat	156
36	Bhuj	Wind	Gujarat	600
	Total			**19643**

Work has been stopped since 08.05.2014 as per Hon'ble Supreme Court order dated 07.05.2014.
* Work has been stopped since 05.01.2023 as per order of ADM Chamoli.

NTPC Group – Joint Ventures and Subsidiaries

SI. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
Joint Ventures /Subsidiaries for Capacity Addition			
1	NTPC-SAIL Power Company Pvt. Ltd. (NSPCL) (08.02.1999)	• NTPC- 50% • Steel Authority of India Limited (SAIL)-50%	The company has an installed capacity 1104 MW and operates captive power plants for SAIL at Durgapur (160 MW), Rourkela (370 MW) &Bhilai (74 MW) and Bhilai PP-III (2X250 MW), supplying power to SAIL, Chhattisgarh, Dadra & Nagar Haveli and Daman & Diu.
2	NTPC Tamil Nadu Energy Company Limited (23.05.2003)	• NTPC-50% • TANGEDCO-50%	The JV between NTPC and Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) was formed to set up a coal-based power station of 1,500 MW (3 X 500 MW) capacity, at Vallur, using Ennore port infrastructure facilities. All three units are under commercial operation.
3	Bhartiya Rail Bijlee Company Ltd. (22.11.2007)	• NTPC 74% • Indian Railways-26%	This Subsidiary Company was formed to undertake various activities related to setting up a 1,000 MW coal based thermal power plant (4x250 MW) at Nabinagar, District-Aurangabad, Bihar. All four Units are under commercial operation.
4	Patratu Vidyut Utpadan Nigam Ltd (15.10.2015)	• NTPC-74% • Jharkhand Bijli Vitran Nigam Limited - 26%	This Subsidiary Company was incorporated to improve performance of existing capacity and further capacity expansion of 4000 MW in two phases at Patratu. PVUNL is developing a thermal power project of 2400 MW (3 X 800 MW) in Phase-I. EPC package has been awarded to BHEL & construction activities are under progress. Banhardih coal block has been allocated to PVUNL for captive use and is also being developed.

SI. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
5	Meja Urja Nigam Private Ltd. (02.04.2008)	• NTPC-50% • Uttar Pradesh Rajya Vidyut Utpadan Nigam (UPRVUNL) -50%	This Joint Venture Company was formed to set-up a power plant of 1,320 MW (2x660 MW) at Meja Tehsil of Allahabad district in the state of Uttar Pradesh. Both units have started commercial operation.
6	Aravali Power Company Private Ltd. (21.12.2006)	• NTPC-50% • Indraprastha Power Generation Company Limited(IPGCL)-25% • Haryana Power Generation Corporation Limited (HPGCL)-25%	APCPL has set up Indira Gandhi Super Thermal Power Station of 1,500 MW (3x500 MW) in District Jhajjar, Haryana. All three units are under commercial operation.
7	Ratnagiri Gas and Power Pvt. Ltd. (RGPPL) (08.07.2005)	• NTPC - 86.49%, • MSEB Holding Co.- 13.51%	This company was formed, as a joint venture among NTPC, GAIL, MSEB Holding Co. Ltd. and Indian financial institutions for taking over and operating gas based Dabhol Power Project along with LNG terminal. All the three Power Blocks with a combined capacity of 1,967.08 MW (after re-rating) were commissioned in May 2009. Subsequently, LNG business was separated under new JV by name Konkan LNG Limited (KLL) with mirror shareholding. On 31.12.2020, NTPC Ltd. executed an agreement for a Composite Resolution Plan with Lenders of RGPPL, wherein outstanding debt liabilities of RGPPL have been settled through One Time Settlement (OTS) by NTPC. As a part of the Resolution Plan, 35.47 % of Lenders Equity in RGPPL has been transferred to NTPC. Further, NTPC has executed Share Purchase Agreements with GAIL (India) Limited on 23 February 2021, for purchase of GAIL's share (25.51%) in Ratnagiri Gas and Power Pvt. Ltd. (RGPPL) and sale of NTPC's share (14.82%) in Konkan LNG Ltd. (KLL) to GAIL. With this transaction, NTPC has fully exited KLL and now NTPC shareholding in RGPPL is 86.49%.

SI. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
8	Trincomalee Power Company Limited (TPCL) (26.09.2011)	• NTPC-50% • CEB Sri Lanka-50%	TPCL is developing a 50MW (extendable to 120 MW) solar power project at Sampur in Sri Lanka for which the JVSHA was Signed with CEB on 11.03.2022. TPCL received the Environment Clearance from Central Environmental Authority (CEA), Sri Lanka on 01.06.2023 for Sampur Solar project. The work for taking Environmental Clearance for Transmission line is in progress. Further, Sri Lanka Sustainable Energy Authority (SLSEA), Sri Lanka issued On-grid renewable energy permit to TPCL for Sampur Solar project on 18.07.2023. On 11.09.2023, CEB provided the draft Request for Proposal (RFP) documents containing project details and technical requirements, Power Purchase Agreement (PPA), Implementation Agreement (IA), Contract for development of Transmission line and respective schedules for the Phase-I of Sampur Solar Project to TPCL/NTPC. A Joint Venture and Shareholder Agreement (JVSHA) between NTPC Ltd. and Ceylon Electricity Board (CEB) was signed on 25.10.2019 for a new 50:50 Joint Venture (JV) Company, for 300 MW LNG Power Project at Kerawalapitiya.
9	Bangladesh India Friendship Power Company (Pvt.) Limited (31.10.2012)	• NTPC-50% • BPDB Bangladesh-50%	This Joint Venture Company was formed to undertake the development, implementation, operation and maintenance of the project in Bangladesh on a build, own and operate basis. The company is operating a 1,320 MW (2X660 MW) coal-based power project at Khulna, Bangladesh, with both units of the plant now commissioned - Unit#1 is under commercial operation w.e.f. 23.12.2022. Unit#2 is under commercial operation w.e.f. 12.03.2024.
10	Anushakti Vidyut Nigam Limited (27.01.2011)	• NTPC-49% • NPCIL- 51%	This JV company was incorporated between NTPC Ltd. and Nuclear Power Corporation of India Ltd. (NPCIL) for setting up nuclear power project(s). Department of Atomic Energy has permitted joint venture of two CPSEs to set up Nuclear Power Project, with amendment in definition of Government Company under Atomic Energy (Amendment) Act, 2015. A joint team has been formed under co-chairmanship of JS, MoP and JS, DAE for transfer of Chutka Atomic Power Project, Madhya Pradesh (2X700 MW) & Mahi Banswara Atomic Power Project (4X700 MW), Rajasthan from NPCIL to ASHVINI.

Sl. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
11	THDC India Limited (12.07.1988)	• NTPC-74.496% • Govt. of UP- 25.504%	THDC India Limited was a joint venture of the Government of India (74.496%) and the Government of Uttar Pradesh (25.504%) and is a Mini-Ratna Category-I, Central Public Sector Enterprise. NTPC executed a Share Purchase Agreement with GoI on 25.03.2020 and acquisition of 74.496% equity stake in THDCIL was completed on 27.03.2020. With this acquisition, THDCIL has become a subsidiary of NTPC. Presently, THDCIL has 1,587 MW power generation capacity under Operation and 2,764MW capacity under various stages of construction. Further, THDCIL is also developing 2000 MW UMREPPs (600 MW capacity of Solar Park, each at Jhansi and Lalitpur District and 800 MW at Chitrakoot District of UP) through SPV (a JV of 'THDCIL' and 'UPNEDA' named 'TUSCO') in the state of Uttar Pradesh. A Joint Venture (JV) Company between THDCIL and Rajasthan Renewable Energy Corporation Limited (RRECL) named 'TREDCO.' has also been incorporated on 25.03.2023 for development of 10,000 MW Ultra Mega Renewable Energy Parks in the Rajasthan state.
12	North Eastern Electric Power Corporation Limited (NEEPCO) (02.04.1976	NTPC-100%	Northeastern Electric Power Corporation Limited ("NEEPCO") is a Mini-Ratna Category-I Central Public Sector Enterprise. NEEPCO is primarily engaged in the business of generation and sale of electricity in the north-eastern region of India. NTPC executed a Share Purchase Agreement with GoI on 25.03.2020 and acquisition of 100% GOI equity stake in NEEPCO was completed on 27.03.2020. With this acquisition, NEEPCO has become a wholly owned subsidiary of NTPC. NEEPCO operates 6 Hydro,3 Thermal (Gas) and 1 Solar power stations with a combined installed capacity of 2,057 MW and is executing a Solar project of 300MW capacity in Rajasthan.
13	Jhabua Power Limited (05.09.2022)	NTPC – 50 % Secured Financial Creditors – 50%	NTPC acquired Jhabua Power Limited (JPL) on 05.09.2022 through NCLT route. JPL is now a 50:50 JV of NTPC and Secured Financial Creditors & has an operational thermal power capacity of 1 x 600 MW located in Madhya Pradesh.

Sl. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
14	NTPC Green Energy Ltd. (07.04.2022)	NTPC-100%	NTPC incorporated a wholly owned subsidiary, in the name of NTPC Green Energy Limited (NGEL) on 7th April '2022 for pursuing green/ sustainable energy business. Under the Approved Asset Monetization Scheme for monetization of Renewable Energy (RE) Assets, the transfer of 15 RE assets of 2861 MW (earlier on NTPC's balance sheet) to NGEL through a Business Transfer Agreement and transfer of shares of NTPC in NTPC Renewable Energy Limited ("NREL" a wholly owned Subsidiary of NTPC) to NGEL through a Share Purchase Agreement have been completed on 28.02.2023. NGEL is taking up large Solar, Wind and Hybrid Projects all over the country and developing Gigawatt scale Renewable Energy Parks and Projects in different states under UMREPP (Ultra Mega Renewable Energy Power Park) scheme of Government of India.
Joint Ventures / Subsidiaries — Forward Integration			
1	NTPC Electric Supply Co. Ltd. (21.08.2002)	NTPC-100%	NTPC Electric Supply Company Ltd. (NESCL), a wholly owned subsidiary, transferred and vested all its operations, with effect from April 1, 2015, to NTPC Limited. To explore new business opportunities, NESCL is looking for power distribution in UTs/State Discoms.
2	NTPC Vidyut Vyapar Nigam Limited (01.11.2002)	NTPC-100%	NTPC Vidyut Vyapar Nigam Ltd. (NVVN), a wholly owned subsidiary, was incorporated on 1st Nov 2002, is engaged in the business of Power trading. NVVN has a trading License under Category-I (highest category). It is also engaged in lower capacity Solar, Waste to Energy, Electric Vehicle Infra and other green initiatives. NVVN has been designated as the nodal agency for cross border trading of power with Bangladesh, Bhutan, and Nepal.
Joint Ventures / Subsidiaries — Strategic Alliance			
1	CIL NTPC URJA PRIVATE LIMITED (27.04.2010)	• NTPC-50% • CIL-50%	CIL NTPC Urja Pvt. Ltd. (CNUPL) is a 50:50 JV incorporated between NTPC Ltd. and Coal India Ltd. for undertaking the development, operation & maintenance of Brahmini and ChichroPatsimal coal blocks in Jharkhand and integrated coal-based power plants. MoC vide its communication dated 14.06.2011, de-allocated Brahmini &Chichro-Patsimal coal blocks from the JV Company. New business opportunities are being explored.
Joint Ventures / Subsidiaries — Strategic Diversification			
1	Hindustan Urvarak & Rasayan Limited (HURL) (15.06.2016)	• NTPC -29.67% • CIL - 29.67 % • IOCL-29.67% • FCIL- 7.33% (non-cash) • HFCL- 3.66% (non-cash)	HURL was incorporated on 15.06.2016, under the guidance of Government of India for revival of Gorakhpur & Sindri fertilizer plants of Fertilizer Corporation of India Limited (FCIL) and Barauni fertilizer plant of Hindustan Fertilizer Corporation Limited (HFCL), as a joint venture company of NTPC, Coal India Limited (CIL), Indian Oil Corporation (IOCL), FCIL and HFCL. All three units are in commercial operation.

Sl. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
2	Transformer & Electricals Kerala Ltd. (09.12.1963)	• NTPC- 44.60% • Govt. of Kerala- 54.56% • Others- 0.84%	NTPC Ltd. joined hands with the Government of Kerala (GoK) for strategic acquisition of 44.60% stake in TELK in 2007. TELK manufactures and repairs high-voltage transformers and associated equipment. Due to changes in the business environment, NTPC Board has accorded in-principal approval for withdrawal of NTPC from TELK. MoP has also given approval for NTPC's exit from TELK. Exit is possible with consent of GoK and follow up is being done with GoK.
3	NTPC BHEL Power Projects Private Ltd. (28.04.2008)	• NTPC-50% • BHEL-50%	NTPC BHEL Power Projects Pvt. Ltd. (NBPPL) is a joint venture company formed between NTPC and BHEL for taking up activities of Engineering, Procurement and Construction (EPC) of power plants and manufacturing of equipment. NBPPL is presently doing EPC work at NTPC Unchahar which is nearing completion. Due to changes in the business environment, both the promoters have decided to wind up the JVC. In 2018, both Promoters had approached respective Ministries to exit from NBPPL/ closure of NBPPL.
Joint Ventures / Subsidiaries — Service Business			
1	Utility Powertech Ltd. (23.11 .1995)	• NTPC-50%, • Reliance Infrastructure Ltd. - 50%	Utility Powertech Ltd. (UPL) is a joint venture company of NTPC and Reliance Infrastructure Limited formed to take up assignments of construction, erection, and supervision of business in power sector and other sectors like O&M services, Residual Life Assessment Studies, non-conventional projects etc.
2	NTPC GE Power Services Private Limited (NGSL) (27.09.1999)	• NTPC- 50% • GE Power Systems- 50%	NTPC GE Power Services Private Limited (NGSL), earlier known as NTPC Alstom Power Services Private Limited, is a joint venture company of NTPC and GE Power Systems. NGSL operates and takes up renovation & modernization (R & M), retrofit solutions for power plants, O&M of power plants and provides integrated end to end engineering procurement & construction solution for Solar, Electrical Lines & Substations and Flue Gas Desulphurization (FGD) projects.
3	National High-Power Test Laboratory (Private) Ltd. (22.05.2009)	• NTPC- 20% • NHPC- 20% • PGCIL- 20% • DVC- 20% • CPRI- 20%	National High-Power Test Laboratory Pvt. Ltd. (NHPTL) is a JV Company formed in association with NHPC Limited, Power Grid Corporation of India Limited, Damodar Valley Corporation and Central Power Research Institute. The Company was incorporated on 22.05.2009 for setting up facility for short-circuit testing of transformers and other electrical equipment. The laboratory is located at Bina, Madhya Pradesh and has started Commercial operations w.e.f 01.07.2017.

SI. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
4	Energy Efficiency Services Ltd. (10.12.2009)	• NTPC- 37.72% • PGCIL- 37.72% • PFC- 13% • REC- 11.56%	Energy Efficiency Services Ltd. (EESL) is a joint venture company formed with Power Finance Corporation Ltd., Power Grid Corporation of India Ltd., and Rural Electrification Corporation Ltd., for implementation of Energy Efficiency projects and to promote energy conservation and supplement climate change mitigation efforts. The Company is taking up different energy efficiency improvement related works like replacement of bulbs, Street Light National Program (SLNP), Smart Metering & other new business areas like Electric Vehicle (EV), Electric Charging Infrastructure etc.
Joint Ventures / Subsidiaries — Mining Business			
1	NTPC Mining Limited (29.08.2019)	NTPC-100%	A wholly owned subsidiary Company has been incorporated on 29.08.2019 for hiving-off of coal mining business of NTPC in the name of 'NTPC Mining Limited'(NML). NTPC is in the process of transferring its coal mining business to NML through a Business Transfer Agreement (BTA).
Joint Ventures / Subsidiaries —Waste Management			
1	NTPC EDMC Waste Solutions Private Limited (01.06.2020)	• NTPC -74% • East Delhi Municipal Corporation (EDMC) -26%	NTPC EDMC Waste Solutions Pvt. Ltd (NEWS) was incorporated on 01.06.2020 to develop & operate Integrated Waste Management & Energy Generation facility in NCT, Delhi. However, due to non-availability of clear land site and Power Purchase Agreement, Waste to energy project could not be taken forward. NTPC has taken up with EDMC to buy out EDMC's stake in the JVC.

PHOTOGRAPHS (OF NEW PROJECTS COMMISSIONED /VISITS OF HON'BLE MOP AND SENIOR OFFICERS OF MOP DURING THE LAST ONE YEAR)

Shri Narendra Modi, Hon'ble Prime Minister of India dedicates First 800 MW Unit of Telangana STPP of NTPC to the Nation

Hon'ble Prime Minister Shri Narendra Modi today dedicated the MGR System connecting Talaipalli Coal Mine to NTPC Lara in Chhattisgarh on September 14th, 2023.

Run for Unity to mark National Unity Day on Nov 31st,2023 commemorating the birth anniversary of Sardar Vallabhbhai Patel was held today by NTPC under the banner of Ministry of Power.

Shri Pankaj Agarwal, Secretary (Power) visited NETRA on 23rd September 2023, along with Shri Ghanshyam Prasad, Chairperson, CEA and Shri Piyush Singh, JS (Thermal). CMD, NTPC, Director (Projects), and senior officials were present.

CHAPTER 15

POWER GRID CORPORATION OF INDIA LIMITED (POWER GRID)

Power Grid Corporation of India Limited was incorporated on 23rd October 1989 under the Companies Act, 1956. The company is a Schedule 'A', 'Maharatna' Public Sector Enterprise of Govt. of India, with 51.34% holding of Government of India and the balance is held by public. As on 31st March 2024, POWERGRID has 47 wholly owned subsidiaries, 12 Joint Ventures and 4 Associate Companies.

POWERGRID is engaged in bulk transmission of power through its (765/400/220/132kV) Extra High Voltage AC and (±800/±500/±320 kV) Extra High Voltage DC transmission network.

POWERGRID has consistently been rated as "Excellent" under the Memorandum of Understanding (MoU) with Govt. of India (GoI) since its first MoU for the year 1993-94

As one of the largest transmission utilities in the world, POWERGRID has been significantly contributing to the development of the Indian power sector and over the years demonstrating its excellence to execute large and critical transmission projects efficiently.

1. PROJECT IMPLEMENTATION

During FY 2023-24, POWERGRID added 4,036 circuit km of Extra High Voltage transmission lines, 6 new substations and 19,720 MVA transformation capacity.

Major Transmission Assets Commissioned:

- Transmission System for immediate evacuation of Power from Lower Subhansiri HEP under North East / Northern Western Interconnector -I Project- Part C
- POWERGRID Meerut Simbhavali Transmission Limited
- Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II- Part- A
- Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II- Part- F
- Eastern Region Strengthening Scheme-XVII (Part-B)
- North Eastern Region Strengthening Scheme -III
- Transmission system for power evacuation from Arun-3 (900MW) HEP, Nepal of M/s SAPDC-Indian Portion
- Transmission System Strengthening beyond Kolhapur for export of power from Solar & Wind Energy Zones in Southern Region.
- Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II- Part- F1.

As on 31stMarch 2024, the inter-regional power transfer capacity of the transmission assets belonging to the Company and its subsidiaries was 99,580 MW (i.e. 83.86%) out of 1,18,740 MW inter-regional power transfer capacity of the national grid.

2. OPERATIONAL PERFORMANCE

As on March 31st, 2024, POWERGRID operates a transmission network of around 1,77,699 circuit kilometers (ckm) of transmission lines and a power transformation capacity of around 5,27,446 Mega Volt Amperes (MVA) with 278 substations spread across the country.

POWERGRID's operational performance in FY

Valve Hall: Raigarh-Pugalur-Thrissur 6000 MW HVDC system

2023-24 showcased exceptional reliability, strategic foresight, and a commitment to cutting-edge technology. Our transmission network achieved 99.85% availability with tripping per line reduced to 0.28.

For increased efficiency and transparency in operation of POWERGRID transmission system, transmission assets are being remotely monitored & operated from remote control centers i.e NTAMC/RTAMCs. As on 31stMarch, 2024, POWERGRID is operating all its 278 sub-stations remotely through control centers. For increased efficiency and transparency in operation of POWERGRID transmission system, transmission assets are being remotely monitored & operated from remote control centersi.e NTAMC/RTAMCs.

Major Highlights

- 132 kV, 20 MVAR Bus Reactor at Aizawl was retrofilled with eco-friendly Natural Ester Oil by replacing conventional insulating oils.
- POWERGRID is diligently working towards making its asset management practices compliant to ISO 55001, thus demonstrating a robust framework for strategic decision-making and sustainable value creation.
- POWERGRID has successfully implemented Reliability Centered Maintenance (RCM) practices for its critical assets, including Transformers, Reactors, and Transmission Lines. It will lead to significant 25% reduction in man-hours spent on maintenance activities.
- POWERGRID has established Centre of Excellence (CoE)-Protection & SCADA to manage & validate the database of around 36,000 IEDs and 190 SAS gateways, to ensure uniformity of settings/configurations and resolution of issues from centralized location.
- International Transmission Operation and Maintenance Study (ITOMS), a global Operations & Maintenance (O&M) benchmarking platform has ranked POWERGRID in the first quadrant for low cost with high performance levels in asset maintenance.
- International Transmission Asset Management Study (ITAMS) 2021-22: POWERGRID emerged as the transmission utility with best operational performance including both Technical and Financial Parameters.

Digital Initiatives of Asset Management

- In-house development of AI/ ML based defect identification tool POWERGRID Asset Management though Artificial Intelligence in Transmission (PG AMRIT) which has been integrated with transmission line patrolling platform POWERGRID Digital Application for Routine Patrolling & Assessment of Network (PG-DARPAN). This has aided in optimizing the efforts of line maintenance manpower and move the focus from defect identification to defect rectification.
- Implementation of Asset Management Dashboard (UDAAN-Unique Digital Analysis of Asset and Network) to ensure a single window access to all the key performance indicators (KPIs) by integrating data stored in various formats.
- Intelligent Inspection in POWERGRID (I2P) module utilizes QR codes enabled resulting in efficient daily, monthly, quarterly, and half-yearly inspections of substation equipment. The module also provides analytics for comprehensive asset assessment, addressing issues like erroneous readings and lack of real-time information for on-site teams.
- POWERGRID has embraced the transformative potential of 3D printing technology to enhance its Operations and Maintenance (O&M) performance. This innovative technology has been leveraged to develop 11 Pressure Relief Devices (PRD) at the HVDC Vizag Substation. By incorporating 3D printing in the development of PRDs, POWERGRID not only ensures a tailored and optimized solution for its specific needs but also demonstrates a forward-thinking approach to technology adoption in the power sector.
- POWERGRID has successfully conducted drone-based patrolling of transmission lines, covering an impressive 900 kilometers. This initiative demonstrates POWERGRID's commitment to leveraging cutting-edge technology for the reliable and secure operation of its transmission infrastructure.

3. FINANCIAL PERFORMANCE

During FY 2023-24, POWERGRID recorded total income of ₹ 46,913 crore and Profit After Tax (PAT) of ₹ 15,573 crore on consolidated basis. Gross Fixed Assets of the company are ₹ 2,75,991 crore, on consolidated basis.

During FY 2023-24, Capital Expenditure (CAPEX) of over ₹ 12,500crore has been achieved till 31stMarch 2024 for implementation of various projects and anticipated to achieve CAPEX target for the year.

4. COMMERCIAL PERFORMANCE

POWERGRID, through regular follow up with its customers (DICs) and timely regulatory actions has achieved collection efficiency of 100.06% of billing in FY 2023-24 against collection efficiency of 98.84% of billing in FY 2022-23.

During the FY 2023-24,POWERGRID has realized ₹ 42,820/- crore (100.06 %) including previous outstanding, against the ₹ 42,793/- crore of total bills raised. The benefits under Electricity (Late Payment Surcharge and other related matter) Rule 2022, one-time dispensation for liquidation of past outstanding dues, were extended to DISCOMs and 6 nos. of DISCOMs opted for instalment payments for their outstanding transmission charges of ₹ 2438 crore. Balance amount of ₹ 773 crore out of ₹ 2438 crore is being liquidated through instalments by 3Discoms viz J&K PDD, UPPCL and TANGEDCO, in accordance with LPS Rules 2022 notification by MoP on June 03, 2022.

5. SIGNIFICANT DEVELOPMENTS

- The Cabinet Committee on Economic Affairs, chaired by the Hon'ble Prime Minister, has approved the project on Green Energy Corridor (GEC) Phase-II – Inter-State Transmission System (ISTS) for 13 GW Renewable Energy Project in Ladakh. The project is targeted to be set up by FY 2029-30 with a total estimated cost of ₹ 20,773.70 crore and Central Financial Assistance (CFA) @ 40 percent of the project cost i.e., ₹ 8,309.48 crore. POWERGRID will be the Implementing Agency for this project and will deploy State of the art Voltage Source Converter (VSC) based High Voltage Direct Current (HVDC) system and Extra High Voltage Alternating Current (EHVAC) systems. Currently, Front End Engineering Drawing (FEED) studies are underway.
- During FY 24, POWERGRID emerged successful bidder in 13 TBCB projects with an aggregate tariff of ₹2,888 crore which is about 64% in terms of annual tariff of projects participated.

6. ENERGY TRANSITION AND SUSTAINABILITY INITIATIVES

India has envisaged to augment the non-fossil fuel-based installed electricity generation capacity to over 500 GW by 2030. At present, about 180 GW of non-fossil fuel generation capacity (including large hydro) is already integrated into the grid at various voltage levels.

POWERGRID has implemented / implementing transmission evacuation system of more than 110 GW of non-fossil energy capacities. POWERGRID has implemented inter State transmission system (ISTS) in eight (8) RE resource rich states which has facilitated integration of about 6 GW of renewable energy generation capacity under Green Energy Corridors (GEC).POWERGRID has implemented Transmission scheme for seven (7) solar parks facilitating evacuation of about 6.5 GW of renewable energy. Further, POWERGRID has implemented Transmission System for Solar Energy Zones in Rajasthan – Phase-I: for transfer of about 8.9 GW power from various Solar based generation projects in Rajasthan.

Further, POWERGRID has implemented Renewable Energy Management Centers (REMCs)/ EMCs at 13 locations, to address forecasting and scheduling of RE generation.

POWERGRID is actively promoting sustainability by aligning its initiatives with the Government of India. The principles of Environment, Social and Governance (ESG) are being embedded by your Company into business operations and the Company continues to attach importance to ESG ecosystem. The company has set goals of Net Zero by 2047, Water positive by 2030 and Zero waste to land fill by 2030. POWERGRID also aims to consume 50% of its electricity from renewable sources by 2025 and plans to achieve this through large-scale solar PV plants and rooftop Solar PV.

Installation of 10.2 MWp rooftop solar PV systems at more than 153 locations is complete and about 15 MWp Projects are under implementation/planning.

POWERGRID's first large-scale commercial project for the establishment of 85 MW Solar PV project at Nagda is under development. In addition, a DPR for 82 MW at Jabalpur, Wardha, Aurangabad, and Khammam Substations has also been initiated for approval. Further, preparatory work for another 100MW Solar PV Power Plants at various locations is under process.

To reduce its carbon footprint, the company is implementing several initiatives including the development of digital substations, exploring alternatives to SF6 gas, replacing conventional insulating oils with environment friendly natural Ester oil, massive plantations with suitable indigenous species, and the use of e-carts in place of traditional vehicles.

Figure 2: Hon'ble Prime Minister, Shri. Narendra Modi dedicated Phase-I of Inter-State transmission system for Green Energy Corridor (GEC).

POWERGRID has commissioned its first greenfield digital 220/66kV substation at Chandigarh. With this, company has joined elite league of utilities worldwide who have achieved commercial implementation of Process Bus based Digital Substation. Further, construction of green field 400 kV Digital Substation at Navsari, Gujarat is under progress.

7. RESEARCH & DEVELOPMENT

Recently, POWERGRID has been granted two patents by the Patent Office, Government of India.

- Patent (No. 418166) for an invention entitled 'ENERGY EFFICIENT ALL-SEASON ROOF SCREENING'. This roof coating /screening technique offers energy efficiency round the year without compromising the comfort level. Also, the invented screening process takes care of reflection issue on nearby buildings, dust settlement and expense towards deployment.
- Patent (No. 448560) for A micro-grid controller integrating the output from multiple types of renewable energy conversion systems, namely, wind and solar along with diesel generator as well as battery storage has been indigenously developed with source and load control features using Field Programmable Gate Arrays (FPGAs).

POWERGRID's Protection Automation and Control laboratory earned UCAIug Accreditation for IEC 61850 Conformance Testing positioning itself as one of the only three organizations in India with this prestigious distinction. Collaborating with IIT Kanpur, company is developing Substation Inspection Robot, enhancing Asset Management through AI/ML.

In the realm of renewable energy, POWERGRID is pioneering the first 500MW offshore wind power evacuation system. POWERGRID has signed an MoU with the National Institute of Oceanography and collaborated with IIT Madras to develop technical specifications and facilitate project development. Collaborating with IIT Kanpur, POWERGRID is developing nano material-based superhydrophobic self-cleaning coatings to reduce insulator maintenance, promoting sustainability.

8. CYBER SECURITY

POWERGRID has implemented ISO 27001:2013 Information Security Management System across all its offices, ensuring a robust foundation for information security. Through extensive training programs and active participation in initiatives led by CERT-In and NCIIPC, POWERGRID is well-prepared to address evolving cyber threats. POWERGRID has signed Memorandum of Association with IISc Bangalore for setting up and operation of Centre for Excellence in Cyber Security at Bangalore.

9. OTHER BUSINESS

9.1. TELECOM

The Commercial Operations of POWERGRID Teleservices Limited (PowerTel), a wholly owned subsidiary of POWERGRID has commenced from 01.10.2023. The telecom network spans over 100,000 kilometers, with Points of Presence at more than 3000 locations maintaining the backbone availability of ~ 99.99%.

POWERTEL is taking up the establishment of Data Centre near Gurugram and plans to expand into Hyper Datacenter & EDGE Datacenter. Setting up a 500 Rack Disaster Recovery (DR) Data Centre at Bengaluru is also being planned. In Company's endeavours towards ILD Business, permission has been received from Department of Telecom (DoT), for operations of International Long Distance (ILD) Gateway at Muzaffarpur for providing International Telecom connectivity to Nepal.

PowerTel network reach across the country, including remotest locations such as Leh, J&K, NER etc., has led to one step forward towards Digital India's flagship program driven by Government of India with a vision to transform India into a digitally empowered society and knowledge economy.

PowerTel has also partnered in providing Telecom links to ISRO for successful launch of CHANDRAYAAN-3 and Aditya Mission.

9.2. CONSULTANCY

9.2.1. DOMESTIC CONSULTANCY

POWERGRID has signed several domestic consultancy orders encompassing various projects such as TBCB projects, consultancy works, and diversion work. One of the key highlights includes securing consultancy projects worth ₹ 1,970 crore under the RDSS scheme for loss reduction works in the Union Territories of Jammu & Kashmir and Ladakh.

POWERGRID is at the forefront of exploring opportunities to undertake transmission projects under the BOOM basis for Renewable Energy Developers, Distribution Licensees, and Bulk Consumers and is exploring opportunities to form Joint Ventures with various state utilities for the development of Intra-State transmission systems.

In addition to it, POWERGRID is planning towards venturing into the emerging field of Green Hydrogen.

9.2.2. INTERNATIONAL CONSULTANCY

POWERGRID has footprints in 23 countries worldwide with a strong foothold in South Asia, Central Asia, Africa & Europe. It has proved its competency by successfully undertaking projects in some of the toughest geographies.

A cooperation agreement has been signed with Africa 50 on, 'Promoting Private Sector

Participation in Power Transmission in Africa' in Kenya and Tanzania for development of Transmission Project on PPP-JV Model.

Butwal Gorakhpur Cross Border Power Transmission Limited, a JV between POWERGRID (50%), Nepal Electricity Authority (50%) have been formed to build, maintain and operate transmission systems between India and Nepal.

Certificate of Appreciation from the Honourable Prime Minister of Nepal for contribution to the commissioning of the Inaruwa Substation and another from the Minister for Energy, Water Resources, and Irrigation for Company's role in the

Figure 3: Ground breaking ceremony of Gorakhpur – New Butwal 400 kV Power Transmission line (India Portion) by Hon'ble PM of India Shri Narendra Modi and Hon'ble PM of Nepal Shri Pushpa Kamal Dahal

Kushma-New Butwal Transmission Line project was received.

POWERGRID has implemented commissioning of 132 kV D/c Kole-Gulu and 132 kV Karuma-Lira transmission lines along with 132 kV Gulu and 132 kV Kole substation under prestigious Grid Expansion Reinforcement Project (Uganda).

Capacity-building initiatives remained a cornerstone of international endeavours, with successful study tours for senior-level delegations from Kenya Electricity Transmission Company (KETRACO), Ceylon Electricity Board (CEB) in Sri Lanka, and Energy Fiji Limited. Additionally, training program for Engineers of Ethiopian Electric Power (EEP) were also being conducted.

9.3. CROSS BORDER INTERCONNECTIONS

The present cumulative power transfer through cross-border interconnections with neighboring countries(Bangladesh, Bhutan and Nepal) is about 4,745 MW.

- Transmission System Strengthening in Indian System for Transfer of Power from Mangdechhu Hydroelectric Project in Bhutan.
- 400 kV D/c Baharampur (India) - Bheramera (Bangladesh) line - India portion.

10. CORPORATE SOCIAL RESPONSIBILITY

For social and economic development of communities, POWERGRID undertakes CSR activities in areas of healthcare, drinking water & sanitation, education, skill development, rural development and other areas of national importance. The projects are conceived in consultation with the stakeholders, primarily in the vicinity of its area of operations.

During the FY 2023-24, the company has spent ₹ 330.48 crore and completed 124 projects under CSR activities.

Major Achievements during FY 24 are mentioned below:

- POWERGRID has completed 03 Vishram Sadan (RIMS Ranchi, SSG Vadodara & NIMHANS Bangalore). Till 31stMarch 2024, POWERGRID has completed a total of Eight (08) Vishram Sadans and seven more Vishram Sadans are under construction.
- Works of toilet repair, toilet reconstruction along with water arrangements has been completed and are made functional in 4244 Schools of 07 No. states of Andhra

Figure 4: POWERGRID Vishram Sadan at NIMHANS Bangalore was inaugurated by Hon'ble Minister of Power, New & Renewable Energy, Shri R K Singh

Pradesh, Assam, Bihar, Chhattisgarh, Madhya Pradesh, Odisha, and Uttar Pradesh.

11. LEVERAGING HUMAN CAPITAL TO ACHIEVE EXCELLENCE

POWERGRID endeavours to create organization culture that promotes continuous learning, creativity, sharing and development. The HR processes/systems are designed to acquire, nurture and empower power professionals in line with core values of the company in an equitable, collaborative, healthy, safe environment. As on 31stMarch2024, the employee strength of the Company stood at 8,327 which is exclusive of the employees on contract and inclusive of 11 employees on deputation from CEA.

POWERGRID Academy of Leadership (PAL) located in Manesar provides a diverse array of training and development opportunities for both its employees and other stakeholders within India and internationally. Recognized as a Category-I Institution for Training in Transmission by the Central Electricity Authority (CEA) under the Ministry of Power, Government of India, PAL is committed to delivering high-quality training in the field. During the year, more than 370 training and development programs were organized at PAL, Employee Development Centres at Regions and associated premier educational institutes in India and abroad.

Through "SANDARSHIKA", a portal for Mentoring and Coaching of employees, approximately 8000+ employees are benefited.

During the year, POWERGRID provided following learning courses to its employee: 3rd Batch of 50 employees for Artificial Intelligence / Machine Learning course from IIIT-Bangalore.

2nd batch of 15 employees sponsored for M.Tech program in POWER System and reliability by NIT Jalandhar.

Inhouse e-learning modules:

- POWERGRID has developed 150 e-Learning modules related to different business verticals and 11 refresher courses related to various company domains benefiting around 8200+ employees. In addition to above, POWERGRID has hosted 7 modules related to Power transmission for GOI's ambitious "Mission Karmayogi" Programme.
- Leveraging its people's capabilities and infrastructure available at PAL for capacity development of Power sector, POWERGRID has taken the following initiatives for stakeholder development:
- 1000+ apprentices have been engaged in different trades as per the Apprentice Act.
- An MoU signed amongst National Skill Development Corporation (NSDC), National Skill Development Fund (NSDF), Power Sector Skill Council (PSSC) & POWERGRID for Skill development training of 6000 unemployed youth in power Sector. At present, 5400+ trainees have completed the training across 25 locations in India.
- MoU with Power Sector Skill Council (PSSC) to provide skill development training to 6000 candidates for implementation of Smart Metering under RDSS of GoI across India has been signed.
- Under Capacity Building and Institutional Strengthening - North Eastern Region Power System Improvement Project (CBIS-NERPSIP), POWERGRID is undertaking Capacity Building and Institutional Strengthening program for State Power Utilities in 6 (six) states (Assam, Meghalaya, Mizoram, Manipur, Nagaland, Tripura) and Capacity Building under Comprehensive Scheme in 2 (Two) States (Arunachal Pradesh & Sikkim)).

12. RECRUITMENT

POWERGRID is undertaking direct recruitment in Mission Mode as per the directives of Government of India for engineering graduates, diploma engineers, HR & other professionals. The data for vacancies are being uploaded regularly on Vacancy Status Portal of DoPT. The appointment letters are being issued to candidates during Rozgar melas.

13. MAKE IN INDIA

POWERGRID has promoted local sourcing for its transmission system development and operations through various initiatives. As a result, many foreign manufacturers have set up new plants and facilities in India to produce equipment such as GIS, transformers, reactors, STATCOM, and OPGW, leading to a larger vendor base and improved supply chain efficiency. The company is striving to enhance its vendor base by supporting local suppliers, MSE firms, and existing vendors, and is committed to advancing the Make in India initiative.

14. PROMOTION OF MSMEs

POWERGRID has aligned its policies with the government's efforts to promote MSMEs and is registered on all three TReDS platforms (RXIL, M1xchange, and Invoicemart). It has included provisions in its bidding documents for procurement from Micro and Small Enterprises (MSEs) in accordance with the Public Procurement Policy. The company exceeded its target of mandatory procurement of 25% from MSEs with procurement worth ₹ 1448 crore in 2023-24. POWERGRID also runs Vendor Development Programs for MSMEs to support them and include them in the development of the transmission system.

15. PROCUREMENT UNDER Government e- Marketplace (GeM)

In line with GoI mandate, procurement of Goods & Services is being done through GeM portal. Procurement through GeM in POWERGRID started in FY 2018-19 and in subsequent years, with persistent emphasis now 100% procurement through GeM has been achieved.

16. "VIVAD SE VISHWAS I– RELIEF FOR MMES" SCHEME

POWERGRID received 286 claims under "Vivad Se Vishwas I– Relief for MSMEs" scheme on GeM portal. Under this scheme relief was provided to all the MSME contractors, for the difficulties faced die to the COVID-19 pandemic, by refunding of 95% of the performance security/EMD forfeited, Liquidated Damages deducted, risk purchase amount realized and by revoking debarment for all the eligible claims as per the scheme. All the eligible claims have been resolved and settled on GeM portal by POWERGRID.

17. ATMANIRBHAR BHARAT ABHIYAN

POWERGRID prioritizes domestic participation and primarily procures through Domestic Competitive Bidding, where only Indian bidders are eligible to participate. The company places significant emphasis on indigenous sourcing and strengthening

the capacity for equipment and materials in line with the Indian government's "Atmanirbhar Bharat" initiative.

18. "Mission LiFE" (Lifestyle For Environment)

Hon'ble Prime Minister introduced Mission LiFE to the world at the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow.

In line with Mission LiFE of Government of India, POWERGRID undertook major outreach and advocacy activities for mass mobilisation on mission LiFE (Lifestyle For Environment), which covers seven themes of Mission LiFE - (a) Save energy (b) Save water (c)Say no to single use of plastic (d) Adopt sustainable food systems. (e) Reduce waste (f) Adopt healthy life system. (g) Reduce e-waste. The programme concluded on 5th June (World Environment Day) by Mass Plantation Drive across POWERGRID establishments. Major outreach activities included banning of single-use plastic, theme-based pledges, competitions, cycle rally, save energy measures at offices, waste reduction, segregation and re-use, media & FM campaign, expert talks on themes etc.

19. DISTRIBUTION REFORMS

POWERGRID is implementing infrastructure in distribution system under flagship schemes of Govt. of India. such as DDUGJY, Saubhagya, PMDP and RDSS. At present, POWERGRID is carrying out village electrification strengthening work in UTs of J&K & Ladakh and Intra- State Transmission works at 220&132 kV voltage level under PMDP-2015 scheme in UT of J&K.

POWERGRID Energy Services Ltd (PESL), a wholly owned subsidiary of POWERGRID, has signed commercial agreements with two Gujarat DISCOMs for Implementation of prepaid Smart Metering infrastructure. Under this agreement, PESL shall install approx. 69 lakhs Smart Meters along with associated communication and IT infrastructure.

20. DEVELOPMENT OF NORTH EASTERN REGION (NER

Government of India has sanctioned Intra State power transmission and distribution schemes for North Eastern States. These schemes intend to create reliable state power grid and improve its connectivity to the upcoming load centers and thus extend benefits of grid connected power to all categories of end consumers in NER States.

POWERGRID has been assigned to undertake implementation of following intra state transmission schemes.

- North Eastern Region Power System Improvement Project (NERPSIP) for Six (6) States (Assam, Manipur, Meghalaya, Mizoram, Tripura and Nagaland) for strengthening of the Intra-State Transmission and Distribution Systems (33kV and above).
- Comprehensive Scheme for Strengthening of Transmission and Distribution System in Arunachal Pradesh and Sikkim

Under NERPSIP 443 elements out of 446 elements and Under Comprehensive Scheme for Strengthening of Transmission and Distribution System in Arunachal Pradesh and Sikkim 153 elements out of 292 elements have been completed till Dec'23 and balance works are under progress.

POWERGRID is also constructing new transmission lines, extension/ upgradation of existing substations, augmentation of transformation capacity, re-conductoring of transmission lines etc. in NER states under Inter State transmission System (ISTS) projects allocated by GoI, through Regulated Tariff Mechanism (RTM). These schemes will strengthen the North-Eastern Grid, improve the quality of power and will reduce transmission losses.

21. CERTIFICATIONS

POWERGRID is certified for Integrated Management System as per Publicly Available Specification, PAS 99:2012 integrating requirements of ISO 9001:2015 (Quality Management System), ISO 14001:2015 (Environment Management System) and ISO 45001:2018 (Occupational Health & Safety Management System). No non- conformity (NC) Observed during the surveillance audit by external auditor.

Apart from above, POWERGRID Corporate office is also certified for ISO 50001:2018 for effective Energy Management System and ISO 27001:2013 for Information Security Management System.

All the Establishments of the POWERGRID have been certified with Social Accountability Standard, SA 8000:2014.

22. AWARDS AND ACCOLADES

- Hon'ble Cabinet Minister (Power & NRE) presented CBIP India Award for 'Best Performing Power Transmission Utility-Central Sector' to POWERGRID. The award was received by Sh. R. K. Tyagi, the then Director (Operations) POWERGRID.

Figure 5: Best Performing Power Transmission Utility - received by Shri R K Tyagi, the then Director (Operations)

- Global Gold Award at The Green World Awards on 24th April 2023 in Miami, USA, For the project "Improving Rural Livelihoods and Protecting Environment through farmer-centric Integrated Watershed Management."

Figure 6: Global Gold Award at The Green World Awards received by Dr Yatindra Dwivedi, Director (Personnel)

- International CSR Excellence Award-2023 on 20th November 2023 at London, United Kingdom for the project of POWERGRID –Vishram Sadan, constructed at AIIMS, Delhi.
- 2023 Platt Global Energy Award, USA (25th Anniversary) by S&P Global in category Corporate Impact – For the project "Improving Rural Livelihoods and Protecting Environment through farmer-centric Integrated Watershed Management."
- POWERGRID was conferred prestigious ATD Best Awards 2023 in a ceremony held at San Diego, California, USA & ranked 17th amongst Top 72 leading global companies. The award recognizes excellence in field of Learning & Development.
- POWERGRID won the Dun & Bradstreet PSU Award 2023 in Power Transmission. It was bestowed by Mr. Vivek Joshi, Secretary, Deptt. Of Financial Services & Mr. Ajit B. Chavan, ACEO GeM.

Figure 7: POWERGRID won the Dun & Bradstreet PSU Award 2023 in Power Transmission

- POWERGRID has been ranked Third amongst "Top 10 Profit-Making CPSEs" in FY 2021-22.
- POWERGRID has been ranked 1st in Services Sector across categories as per the "Public Enterprises Survey 2021-22" published by the Department of Public Enterprises, Govt. of India.

CHAPTER 16

POWER FINANCE CORPORATION (PFC) LTD.

1.1. Overview of PFC

Power Finance Corporation Limited (PFC) was incorporated on July 16, 1986, as a public limited company under the Companies Act 1956, with 100% shareholding by the Government of India (GoI). PFC was incorporated by GoI to finance, facilitate and promote power sector development in India. It was declared a Public Financial Institution (PFI) under Section 4A of the Companies Act in 1990. PFC is a Systemically Important Non-Deposit, Non-Banking Financial Company (NBFC) registered with the Reserve Bank of India (RBI) under section 45 IA of the RBI Act, 1934. On July 28, 2010, the Company was classified as an Infrastructure Finance Company ("IFC") by RBI, a category under NBFC.

PFC is a Schedule-A, Central Public Sector Entity (CPSE) under the administrative control of the Ministry of Power (MoP), with majority ownership by the GoI. As on September 30, 2023, the government holds a 55.99% stake in PFC. PFC has been conferred with the status of 'Maharatna' in October, 2021. PFC group is the largest CPSE in terms of the balance sheet size. PFC is also the largest Infrastructure Finance Company and largest NBFC in India on consolidated basis.

PFC is the leading NBFC, specialized in providing assistance to the country's power sector. PFC plays a strategic role in the initiatives of the GoI for the development of power sector in India and also works with GoI agencies, state governments, power sector utilities, other power sector intermediaries and private sector clients for the development and implementation of policies and for structural and procedural reforms in the Indian power sector. Further, PFC has been granted the mandate by MoP to extend lending support to the infrastructure and logistics sector, which will play a crucial role in PFC's long term business growth. In addition, PFC is involved in various GoI programs relating to the power sector, including acting as the nodal agency for the Revamped Distribution Scheme (RDSS), Integrated Power Development Scheme (IPDS) (including R- APDRP subsumed), Ultra Mega Power Projects (UMPPs), Late Payment Surcharge (LPS) Rules 2022, serving as the Bid Process Coordinator for Independent Transmission Projects (ITPs) and facilitating privatization of distribution sector in Union Territories.

1.2. Products & Services

PFC provides a comprehensive range of financial products and other services to its clients in the power sector, including:

- Financing for projects ranging from project construction to the post-commissioning stage, including generation (conventional and renewable), transmission and distribution projects, and related renovation and modernization projects; through various forms of fund-based & non fund based assistance, including long-term project finance, short-term loans, underwriting of debt and debt refinancing schemes;
- various fee-based technical advisory and consultancy services for power sector projects through our wholly owned subsidiary PFC Consulting Limited (PFCCL).

The focus areas of PFC have been strategically expanded to include projects that represent forward and backward linkages to core power sector projects, including manufacturing of capital equipment for the power sector, fuel sources for power generation projects and related infrastructure development. PFC also funds power trading initiatives, e-mobility projects and energy efficiency initiatives.

PFC's clients includes State power utilities, central power sector utilities, power departments, private power sector utilities (including Independent Power Producers), joint sector power utilities, etc.

1.3. Associations with Government of India

PFC is involved in various GoI programs relating to the power sector, including acting as the nodal agency for the Revamped Distribution Scheme (RDSS), Integrated Power Development Scheme (IPDS) (including R-APDRP subsumed), Ultra Mega Power Projects (UMPPs), Late Payment Surcharge (LPS) Rules2022, serving as the Bid Process Coordinator for Independent Transmission Projects (ITPs), facilitating privatization of distribution sector in Union Territories (UTs).

1.4. Subsidiaries and Joint Ventures

In March, 2019, PFC had acquired a majority stake (52.63%) in Rural Electrification Corporation (REC) from GoI and REC became subsidiary of PFC. PFC has a wholly owned subsidiaries, PFC Consulting Limited and PFC Projects Limited, for consultancy services and bidding in lenders' backed resolution plans respectively. PFC is also a promoter and equity shareholder in Energy Efficiency Services Limited (EESL) and PTC India Limited. Further, the company is also in the process to set-up subsidiary in GIFT City, Gujarat to expand its international footprint. The GIFT City platform provides a conducive environment for international lending activities and a world-class infrastructure, which can be leveraged to carve a niche in the global market.

1.5. Funding power sector with focus on renewables

PFC is the largest lender in the power sector, with about 20 per cent market share. So far, PFC has cumulatively sanctioned more than Rs. 15.69 Lakh Crs and disbursed loans of almost Rs. 10 Lakh Crs to the power and allied sectors. As of 31.03.2024, PFC had an outstanding loan

book of Rs 4.81 lakh crore, supporting about 230 GW of installed capacity in the power sector.

In the past decade, we have consciously adapted our business model to increase the renewable energy business by integrating climate risk into our appraisal, lending and pricing strategies. As a result, our renewable assets have grown at a CAGR of over 16 per cent during the period, and today, we have the largest renewable loan book in the country, amounting to more than Rs 60,000 crore. Till 31st March 2024, we have funded renewable projects of over 62 GW with cumulative sanctioned loans of almost Rs. 2.1 lakh crore and cumulative disbursement of Rs.1 lakh crore.

1.6. Expansion and Diversification Strategy

Embracing the motto **'Nayi Soch Nayi Raahein'** – PFC steering into new directions', PFC is boldly moving into new directions, shaping the future through innovative ideas and forward-looking perspectives. With the amendment in the Memorandum of Association, PFC's lending capabilities have been extended to encompass the wider infrastructure and logistics sectors with focus on e-vehicle fleets, charging infrastructure, roads, ports, metro rail, smart cities, and other large infrastructure projects.

2. PFC's Strengths

2.1. Memorandum of Understanding (MoU) with Govt. of India

PFC has been signing MoU with the Govt. of India since 1993-94 and has consistently been rated 'Excellent' based on MoU targets in respect of various performance parameters.

2.2. Favourable Credit Rating

PFC maintains the highest credit ratings of AAA from domestic agencies and investment grade ratings internationally, (BBB-/Baa3), at par with sovereign ceiling ensuring access to various cost-competitive funding sources.

2.3. Effective Resource Mobilization

PFC efficiently raises funds through diverse sources, including domestic and foreign markets, which includes Taxable Bonds, 54EC Bonds, Term Loans, Commercial papers, FCNR(B), ECBs and term loans from multilateral agencies.

2.4. Experienced Human Capital

The company boasts an experienced and committed management and employee base with expertise in the power sector and financial services industry.

2.5. High Net Worth

PFC's high net worth enables significant exposure to large projects, facilitating early financial closure and faster capacity addition.

2.6. Robust Appraisal Methodology

PFC's comprehensive credit appraisal and project monitoring processes contribute to a low number of defaults and enhance profitability.

2.7. ISO Certification

PFC holds ISO certifications, indicating adherence to high standards in both occupational health and safety (ISO 45001:2018) and quality management (ISO 9001:2015).

3.0. Performance Highlights

PFC has consistently been profitable, registering impressive net profit growth. The net profit for the year ended 31 March 2024 is Rs.14,367 crore. Stage III Assets are Rs. 4,110 crore, which is less than 1% of total loan book as on 31.03.2024

PFC's financial performance for the last 2 years based on Ind AS Financials are as under:

Particulars	2021-22	2022-23	2023-24
Profit before tax	12,228	14,171	17,626
Profit after tax	10,022	11,605	14,367
Dividend (Interim + final)	3,168	3,498	4,455

4. Awards & Accolades

Environmental:

1. PFC secured the 3rd position in the "Swachhta Ranking" for offices in the NDMC area under the Swachh Bharat Mission led by the Hon'ble Prime Minister, emphasising PFC's dedication to cleanliness and vision for a garbage-free India.
2. PFC was conferred with the prestigious "Swachhta Pakhwada Award 2023" for its exemplary performance under Swachh Bharat Abhiyan
3. PFC was conferred with the prestigious Indian Chamber of Commerce Gold Award as the "Top Financing Institution" in the Renewable Energy and Energy Efficiency (RE & EE) category at the 11th Green Energy Summit.

Social & Governance

4. In FY2022-23, PFC was ranked 2nd among Central Public Sector Enterprises for procuring goods and services from MSME Businesses in the ₹ 10 crore to ₹ 100 crore range. This achievement highlights PFC's commitment to diversity and empowerment in procurement practices.
5. PFC secured SCOPE's Meritorious Award for "Best Managed Financial Institution" in the Institutional Category I (Maharatna/Navratna PSEs). Shri Jagdeep Dhankar, Hon'ble Vice President of India,

presented the award.

6. PFC won the prestigious "South Asian Federation of Accountants (SAFA) Gold Award in Best Presented Accounts/Annual Report Awards (BPA) for the Financial Year 2021-22 in the 'Public Sector Entities' category.

7. PFC was conferred with the prestigious Indian Chamber of Commerce Award in the "Operational Excellence" category at the 12th PSE Excellence Awards.

Others

8. PFC was selected as India's "Leading Infrastructure Finance Company" at the BFSI & FinTech Summit 2024 by Dun & Bradstreet

9. 'Rajbhasha Kirti' Puruskar for Best Performance in Official Language - PFC won the prestigious 'Rajbhasha Kirti' third prize for the year 2022-23 in the category of Public Sector Undertakings in the region 'A' for best performance in the implementation Official Language Policy.

5. Operational Highlights

PFC disbursed loans totalling Rs. 1,66,444 Crore from January 2023 to March 2024. As of March 31, 2024, the loan assets stand at Rs. 4,81,462 Crore.

6. Resource Mobilization:

PFC mobilised Rs.1,08,796 crore domestically until 31.03.2024, with notable sources including Rs. 68,333 Crores from taxable bonds/54EC Bonds/commercial paper and Rs. 40,463 Crores from rupee term and short-term loans. Further, PFC raised foreign currency of Rs. 23,890 crores from the international market (including FCNRB) until March 2024.

7. New Business Initiatives:

PFC has modified MoA to fund Non-power infrastructure sectors. PFC has provided financial assistance to projects such as metro rail, petroleum refining, desalination plant, bio ethanol manufacturing and nuclear energy. We are focused on maintaining a 25% market share in India's renewable capacity and exploring funding opportunities in clean technologies. Active focus is to tap funding opportunities in clean and emerging technologies such as energy storage - Battery & Pumped Hydro, e- mobility, Green Hydrogen etc. Under LPS Rules notified by Govt, PFC has formulated a policy for providing financial assistance to State DISCOMs for clearance of Outstanding Dues of Suppliers.

8. Risk Management:

PFC has an integrated risk management framework which identifies the risk(s) impacting PFC and the appropriate measures to mitigate the same. To monitor the liquidity and interest rate risk, PFC has an Asset Liability Management Committee (ALCO) headed by Director (Finance). The Asset Liability Management framework includes periodic analysis of long term liquidity profile of asset receipts and debt service obligations. The Board Level Risk Management Committee (BLRMC) comprising of Board level members are then appraised on the key risks associated with the business, its root causes and measures taken to mitigate the same. Further, in line with RBI's directions, PFC has appointed Chief Risk Officer (CRO) to implement the Risk Management Framework.

9. Institutional Development of Borrowers:

For purposes of funding, PFC classifies State Power Generation and Transmission utilities into A++, A+, A, B, C and Non-responsive categories. The categorisation is arrived based on the evaluation of utility's performance against specific parameters covering operational & financial performance. As on 31st March 2024, 167 utilities were categorized with 16 as 'A++', 46 as "A+", 41 as "A", 30 as "B", 29 as "C", 0 as "D" and 5 as "Non-Responsive".

From 10th Integrated Ratings onwards, the exercise covers all state distribution utilities (including SEBs/utilities with integrated operations), private distribution utilities and Power Departments. The integrated rating is carried out on an annual basis by independent agency. McKinsey & Co., Inc. has been appointed as the consultant for carrying out the Integrated Rating exercise. PFC has been nominated by MoP as the nodal agency for coordinating the activities relating to integrated rating of power distribution utilities including appointment of independent agencies.

So far, Eleven Annual Integrated Ratings have been approved by Ministry of Power with the last i.e. Eleventh Annual Integrated Ratings covering 69 power distribution utilities including state & private sector discoms and state power departments having been released in April 2023. The twelfth Integrated Rating exercise for rating year FY 2022-23 is in progress.

Further, PFC has been publishing the Report on Performance of Power Utilities annually. The Report publishes key financial and operational parameters e.g. profitability, ACS-ARR Gap, Cash Adjusted Gap, net worth, borrowings, receivables, payables, AT&C losses (%) and DSCR (Cash Adjusted) of the sector at utility, state and national level.

10. Memorandum of Understanding (MoU) with Govt. of India:

MoUs have been signed between PFC and the Ministry of Power for FY 2023-24 and FY 2024-25.

11. Human Resource Management and Training:

The company has implemented effective human resource acquisition and maintenance functions. The attrition rate from 1st January 2023 to 31st March 2024 is less than 1%. As of 31st March 2024, 21 Nos. of in-house training programs for its employees were organised by PFC. A total of 2,787

man-days were achieved through conducting various in-house programs and by sponsoring PFC employees to the programs organised by other training agencies.

MoP has entrusted PFC with training and capacity building under RDSS. Through 245 training programs held under RDSS, over 7935 DISCOM officials across India have been trained on aspects of Smart Metering and AMI.

12. Corporate Social Responsibility (CSR):

Through its CSR initiative, PFC implements various environmental sustainability activities, including healthcare, education, sports, sanitation, drinking water, skill development, rural development, livelihood, etc. During the FY2022-23 and FY2023-24, PFC earmarked a budget of Rs. 178.58 crore for FY2022-23 and Rs.215.40 crore for FY2023-24, i.e. 2% of its average profit before tax for the last three immediate preceding financial years. PFC has sanctioned CSR projects worth Rs. 37.84 crore during Q4 of FY2022-23 and Rs.215.40 crore during FY2023-24 under CSR activities

13. PFC Consulting Ltd (PFCCL):

PFC Consulting Ltd (PFCCL) is a wholly owned subsidiary of Power Finance Corporation Limited to provide consultancy services to the Power Sector. It Offers smart solutions, policy formulation support, transaction advisory, project development, project management, and other services. It has rendered consultancy services for more than 80 clients across 27 states and union territories.

14. Government of India Initiatives:

PFC has been designated by the Government of India as the nodal agency for the implementation Revamped Distribution Sector Scheme (RDSS). RDSS has an outlay of Rs. 3,03,758 crore covering Smart metering and infrastructure works, with an estimated Government grant of Rs. 97,631 crore. The objective of the scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25 and reduction of ACS-ARR gap to zero by 2024-25. The funding under the scheme will be from the Government grants, and balance will be counterpart funding from PFC and its subsidiary REC or State's own equity for infrastructure works.

The Government of India has implemented the Electricity (Late Payment Surcharge and Related Matters) Rules, 2022, with PFC designated as the nodal agency for efficient execution. PRAAPTI, a web portal, facilitates this implementation, generating daily execution reports to address defaulting DISCOMs/PDs. This initiative has significantly improved outstanding dues recovery.

Additionally, the government is privatizing Power Departments/Utilities in Union Territories (UTs) under the Aatma Nirbhar Bharat Abhiyan, with PFCCL providing transaction advisory services.

The Government of India had launched an initiative for the development of coal-based Ultra Mega Power Projects (UMPPs) each with a capacity of 4,000 MW. PFC incorporated a total of 19 Special Purpose Vehicles (SPVs) as its wholly-owned subsidiaries for 14 UMPPs. Out of these, 4 UMPPs are awarded and 4 UMPPs are closed. Considering the country is making energy transition from fossil to non-fossil fuel, MoP deliberated that the UMPPs may be closed. PFC is in process of closure of SPVs incorporated for UMPPs.

PFCCL is also acting as a Bid Process Coordinator for development of Independent Transmission Projects (ITPs). So far 49 ITPs have been transferred to successful bidders. Sixteen (16) Projects are yet to be bid out.

Further, MoP has entrusted PFCCL to conduct the bidding process for 3rd, 4th, 5th & 6th rounds of coal auction under para B (ii) of SHAKTI Scheme. PFCCL successfully conducted 3rd, 4th, 5th & 6th round in 2020, 2021, 2022 and 2023 for 2.8 MT, 3.1 MT, 0.05 MT & 2.6516 MT respectively.

Further, GoI launched a scheme for "Setting up of Manufacturing Zones for Power and Renewable Energy Equipment" to promote 'Make in India' and 'Atmanirbhar Bharat' .PFCCL is assisting the Project Management Agency constituted by MoP to assist Scheme Steering Committee for selection of the Proposer for the pilot project.

CHAPTER 17

REC LTD.

1. REC Limited (REC) was incorporated as a Company under the Companies Act, in the year 1969 with the main objective of financing rural electrification schemes in the country. The mandate/object clause of REC was expanded from time to time and in 2022, it was again expanded to tap emerging business opportunities in the Logistics & Infrastructure sector. In the year 1992, REC was notified as a Public Financial Institution under Section 4A of the Companies Act, 1956 (corresponding Section 2(72) of the Companies Act, 2013). In the year 1998, REC was registered as a Non-Banking Financial Company (NBFC) under Section 45 IA of the RBI Act, 1934. The Government of India upgraded REC as a Schedule "A" PSU in the year 2001. REC was granted Mini Ratna Grade-I Status in the year 2002 and thereafter conferred with "Navratna Status" in May, 2008. REC has also been categorized as an Infrastructure Finance Company (IFC) by Reserve Bank of India (RBI) in September 2010. The equity shares of REC are listed on the National Stock Exchange of India Limited (NSE) and BSE Limited (BSE) since March, 2008. In September 2022, REC was conferred 'Maharatna' status by Government of India, the highest recognition for a public sector company. REC is a subsidiary of PFC Ltd.

   REC is a premier financial institution for development of Power Sector in the country, with the objective of financing schemes for extending and improving the rural electricity infrastructure. REC finances projects in the complete power sector value chain, encompassing generation, transmission and distribution segments. REC provides financial assistance to State Governments, Central/State Power Utilities, Independent Power Producers and Private Sector Utilities, which are critical to the projected addition of installed capacity in the country. The Registered Office of REC is located at New Delhi and its Corporate Office is in Gurugram, Haryana with Regional Offices in 22 states across the country, in addition to a Training Institute viz. REC Institute of Power Management & Training (RECIPMT) at Hyderabad. REC also has one wholly owned subsidiary REC Power Development and Consultancy Limited (RECPDCL), involved in significant work in the fields of smart metering, Distribution Infrastructure Project, TBCB and Transmission Project and consultancy etc.

   Now, REC has also diversified into the Non-Power Infrastructure sector comprising Roads & Expressways, Metro Rail, Airports, IT Communication, Social and Commercial Infrastructure (Educational Institution, Hospitals), Ports and Electro-Mechanical (E&M) works in respect of various other sectors like Steel, Refinery, etc.

   REC has been appointed as a Nodal Agency for Government of India's flagship schemes viz. Deen Dayal Upadhaya Gram Jyoti Yojana (DDUGJY) facilitated '24x7 Power For All' in the rural areas of India, and Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGAYA) for electrification of households in the country, which have been successfully completed in the financial year 2021-22.

   REC is the nodal agency for operationalization of National Electricity Fund (NEF), an interest subsidy scheme, provides interest subsidy on interest paid for loans availed by State power utilities & distribution companies, both in public and private sector, to improve the infrastructure in the distribution sector.

   Further, alongwith PFC, REC is currently a nodal agency for Revamped Distribution Sector Scheme (RDSS), for revamping the distribution sector which has been struggling for long with various financial & operational issues. Besides, REC assists Ministry of Power in monitoring of the Ujjwal Discom Assurance Yojana (UDAY), Power for All and Late Payment Surcharge (LPS) scheme.

   REC has been recently designated as the National Program Implementing Agency for the "PM Surya Ghar Muft Bijli Yojana", which aims to install rooftop solar systems on 1 crore residential households and with an allocated budget of ₹ 75,021 crore. This scheme is anticipated to play a pivotal role in the nation's energy transition while aiding households in reducing their electricity bills.

2. Highlights of Performance (during 2022-23)

2.1 The highlights of performance of REC Limited for the financial year 2023-24 are given below: -

(₹ in crore)

Particulars	Amount
Loans Sanctioned	4,34,780.88
Disbursements	1,98,401.70
Recoveries (including interest)	1,53,947.27
Resource Mobilization	1,66,027.88
Profit before Tax	21,591.86
Profit after Tax	17,020.12
Net Worth (as on March 31, 2024)	68,783.15
Dividend (Interim + Final)	4,897.60#
Business per employee*	686.84

*(Business per employee = Disbursements + Recoveries / No. of Employees as on March 31, 2024)

#Dividend declared during the period from January 1, 2023 to March 31, 2024.

2.2 Memorandum of Understanding:

The performance of REC in terms of Memorandum of Understanding (MoU) signed with the Power Finance Corporation Limited (PFC) for the FY 2022-23 was rated as "Excellent" & performance

rating for FY 2023-24 is awaited.

2.3 Share Capital:

As on March 31, 2024, the Authorised share Capital of the Company was ₹ 5,000 crore consisting of 500 crore equity shares of ₹ 10/- each. Further, PFC held 1,38,59,93,662 equity shares i.e. 52.63 % of the paid-up equity share capital of the Company and is the holding Company of REC Limited.

2.4 Mobilization of Funds:

The Company has mobilized ₹1,66,027.88 crore during the period of January 1, 2023 to March 31,2024.

The domestic debt instruments of REC continued to enjoy "AAA" rating, the highest rating assigned by CRISIL, CARE, India Ratings & Research and ICRA - credit rating agencies. Further, REC enjoys international credit ratings at par with sovereign ratings of "Baa3", "BBB-" and "BBB+" respectively from Moody's, Fitch and Japan Credit Rating Agency (JCR), the International Credit Rating Agencies.

3. Progress made during the period of January 1, 2023 to March 31, 2024:

3.1 Sanctions:

REC has sanctioned financial assistance as detailed below:

(₹ in crore)

Sl. No.	Particulars	Achievements from January 1, 2023 to March 31, 2024
1	Generation (Conventional + Coal Purchase/Mining)	70,240.65
2	Transmission & Distribution	1,12,790.12
3	Renewable Energy	1,36,866.17
4	Infrastructure and Logistics	1,00,908.92
5	Short Term Loan /Medium Term Loan*	13,975.02
	Total	**4,34,780.88**

* includes Short Term Loan for Coal Purchase

3.2 Disbursements:

The details of Disbursements are as below:

(₹ in crore)

Sl. No.	Particulars	Achievements from January 1, 2023 to March 31, 2024
1	Generation	31,993.08
2	Renewable	18,822.12
3	Transmission	7,277.83
4	Distribution	1,07,474.05
5	Infrastructure & Logistics	7,675.84
6	Infrastructure (Power Components)	13,514.64
7	Short Term Loan /Medium Term Loan	11,644.14
	Total	**1,98,401.70**

* includes Short Term Loan for Coal Purchase

3.3 REC Performance Highlights:

(₹ in crore)

Sl. No	Financial Parameters	Unit	FY 2023-24		
			Achievement as at September 30, 2023 (Annualised)	MoU targets for the year 2023-24	% Achievement
1	Revenue from Operations	₹ crore	47,146	46,935	100
2	EBITDA as a percentage of Income (EBDTA/ Total Income)	%	37.71	37.00	102
3	Return on Net Worth (PAT/ Average Net Worth)	%	29.23	21.05	139
4	Asset Turnover Ratio	%	8.62	10.60	81
	Asset Turnover Ratio (excluding EBR)	%	9.03		85
5	Return on Capital Employed EBIT/ Capital Employed)	%	11.25	12.24	92
6	Net NPA Ratio/ Loan Assets (Net NPA / Net Loan Assets)	%	0.88	1.15	Within Limit

3.4 Sanctions under National Electricity Fund:

NEF Scheme provides interest subsidy to State Power Utilities, Distribution Companies (DISCOMs) based on achievement of pre-defined reform parameters against the interest paid on loans availed by them – both in public and private sector, for capital investment in distribution sector.

Budgetary outlay was envisaged at ₹ 8,466 crore, which was planned to be released over 14 years w.e.f. FY 2012-13 up to FY 2027-28, would cover payment of interest-subsidy to the borrowers, service charges to the nodal agency, payment to independent evaluators and other incidental charges.

Under NEF, interest subsidy spread over 14 years, for loan approved during financial years 2012-13 & 2013-14 against the sanction of 920 projects with loan component of ₹ 23,973 crore for 24 DISCOMs in 14 States.

Ministry of Power has so far released ₹ 2,462.35 crore of interest subsidy to the State Power Utilities based on evaluation i.e., Reduction of AT&C losses and Revenue Gap as carried out by Independent Evaluator and Nodal Agency till March 31, 2024.

For the period of January 1, 2023 to March 31, 2024, the achievement for release of subsidy to the State DISCOMS are as under:

(₹ in crore)

Information the period of January 1, 2023 to March 31, 2024	Amount (In Rs. Crore)
Subsidy approved by Steering Committee and released to the State Discoms from January 1, 2023 to March 31, 2024	620.71
Total	**620.71**

3.5 Project Monitoring:

REC has implemented a comprehensive framework for project monitoring which adheres to the highest standards of risk management and oversight. Project Monitoring Guidelines-2023, approved by the Board of Directors form the foundation of monitoring framework. It takes into consideration the risks associated with the projects and lays down monitoring procedures accordingly.

Performance from January, 2023 to March, 2024

During the above-mentioned period, 55 number of monitoring (40 under-construction and 15 commissioned) were identified for monitoring by Project Monitoring Group. Against the target, 60 nos. of monitoring were carried out. The category wise details are as under:

Sl. No.	Category of Projects	Target (nos.)				Achievements (nos.)			
		Under Construction		Post-CoD		Under Construction		Post-CoD	
		State	Private	State	Private	State	Private	State	Private
1	Thermal Generation	12	2	5	4	12	2	5	4
2	Hydro Electric Generation	4	-	-	-	4	-	-	-
3	Transmission & Distribution	2	1	1	-	2	1	1	-
4	Renewable Energy	1	2	-	1	1	2	-	2
5	Irrigation	12	-	4	-	14	-	5	-
6	Infra & Logistics	4	-	-	-	5	-	-	-
Total		35	5	10	5	38	5	11	6
Grand Total		55				60			

3.6 Awards:

"During the period, REC has been:

1. Conferred with Golden Award by GeM in 'highest value single bid procurements in FY22-23'.
2. Honoured with 'Issuer of the Year' award at the 6th National Summit for corporate bond market by Assocham.
3. Awarded first prize among power PSUs for implementing official language.
4. Felicitated with Mahatma Awards 2023 for excellence in its CSR initiatives.
5. Secured place in coveted Morgan Stanley Capital International (MSCI) Global Standard Index with effect from September 1, 2023.
6. Conferred with the Dun & Bradstreet Award-2023 for 'Best Central PSU' - Financial Services category.
7. Felicitated with prestigious Golden Peacock Awards instituted by the Institute of Directors (IOD) in Risk Management category.
8. Honoured with XIII-PSE Excellence Award by Indian Chamber of Commerce in Operational Performance Excellence, CSR and Corporate Governance category.
9. Accolated with the ICAI Award for Excellence in Financial Reporting 2022-23.
10. Honoured with the prestigious SCOPE Excellence Award in Special Institutional Category (Digitalization) from Hon'ble Vice President of India.
11. Conferred with the Best Green Bond - Corporate Award at the Asset Triple A Awards for Sustainable Finance
12. Presented with the Innovative Technology Development Award at IIT Madras CSR Summit: 'Building India 2047:Technology for Better Tomorrow'."

4. Subsidiary Company - REC Power Development and Consultancy Limited (RECPDCL)

REC Power Development and Consultancy Limited (RECPDCL) is a wholly owned subsidiary of REC Limited and an ISO 9001:2015 (Quality Management System), ISO 14001:2004 (Environmental Management System).

RECPDCL is providing consultancy and fee based services in the areas of rural electrification, AT&C Loss reduction strategies, IT implementation work including setting up of Data Centre, Customer care centre, etc. with GIS integration, Implementation of Smart Grid Projects covering Smart Metering with AMI, Construction of Solar PV Plants, SCADA implementation, MRI/AMR based meter reading & billing works, DPR preparation & Project Management Consultancy for Power Distribution projects, Strengthening works of Power Distribution, Energy Efficiency projects and Quality & Quantitative Surveillance/ Inspections of the works executed.

Progress of work done/achievement during the period from January 1, 2023 to March 31, 2024

During the period from January 1, 2023 to March 31, 2024, RECPDCL has been working on its ongoing projects, as detailed below:

A. Project Management Agency (PMA)/Consultancy Services:

a) RECPDCL has been appointed as PMA under Revamped Distribution Sector Scheme (RDSS) scheme in Brihan Mumbai Electric Supply & Transport (BEST) Undertaking of Maharashtra State.

b) RECPDCL is carrying out works of PMA under Revamped Distribution Sector Scheme (RDSS) scheme in MSEDCL of Maharashtra State.

c) RECPDCL has been providing Consultancy Services for Energy Audit and Analytical Support for Fiscal Improvement of UP Discoms floated by UPPCL.

d) Further, RECPDCL has been providing Project Management Services under Central/ State sponsored schemes in various states viz.:

i. PMA services for implementation of High Voltage Distribution System (HVDS) by installation of new DTRs and AB cable in semi urban and rural areas in different districts of West Bengal,

ii. PMA for overhead conductor to underground cable works in 4 divisions of BESCOM,

iii. PMA Services for R-APDRP Part-B project in Goa,

iv. Consultancy services to Power Development Department of UT-LADAKH for Operationalization of LPDD, formulation of Master Plan for Ladakh sustainable power development and Handholding support,

v. PMA services for PMDP (Rural & Urban) for JPDCL, KPDCL & LPDD in UT of J&K and Ladakh.

B. Advance Metering Infrastructure (AMI) projects under RDSS implemented by RECPDCL as Project Implementing Agency (PIA):

RECPDCL has been awarded as a Project Implementation Agency (PIA) for the implementation of Smart metering projects in different DISCOMs:

i. RECPDCL has been awarded the work of installation of 23.66 lakh Smart Meters in Paschim Gujarat Vij Company Limited under the RDSS Scheme. AMISP contract has been signed on October 4, 2023. About 8,050 Single Phase Smart Meters have been supplied in the project.

ii. RECPDCL has been awarded the work of installation of 17.70 lakh Smart Meters in Dakshin Gujarat Vij Company Limited under the RDSS Scheme. AMISP Contract has been signed on September 13, 2023. About 1,19,997 Single Phase Smart Meters have been supplied in the project.

iii. RECPDCL has been awarded the work of installation of 7.62 lakh Smart Meters in Jammu Power Distribution Corporation Limited under the RDSS Scheme. AMISP has been finalized and Letter of Award has been issued on October 6, 2023.

iv. RECPDCL has been awarded the work of installation of 7.28 lakh Smart Meters in Kashmir Power Distribution Corporation Limited under the RDSS Scheme. AMISP has been finalized and LOA has been issued on December 26, 2023.

C. Advance Metering Infrastructure (AMI) projects under other Schemes implemented by RECPDCL as Project Implementing Agency (PIA):

i. Installation of 1.27 lakhs Smart Meters in Jammu & Srinagar towns under PMDP (U) Scheme. RECPDCL has delivered the project and closure of the project is going on.

ii. Installation of Smart meters for 3 lakhs consumers in UT of Jammu & Kashmir on DBFOOT basis, Lot-A. At present 1.83 lakhs smart meters (61%) have been installed in the project.

iii. Installation of Smart meters for 2.5 Lakhs consumers in UT of Jammu & Kashmir on DBFOOT basis, Lot-B. Till date 2.02 lakhs smart meters (81%) have been installed.

iv. Smart Metering Implementation for 60,000 consumers in UT of Ladakh. Installation works of 25,000 smart meters (42%) have been completed.

v. Smart Metering Implementation for 24,275 Consumers in UT of Chandigarh. Installation works have been completed and the closure has been done. At present the project is in operation and maintenance phase.

vi. National Feeder Monitoring System (NFMS)

D. The NFMS is a comprehensive and centralized initiative aimed at monitoring and managing the 33/22/11 kV outgoing distribution feeders across the country. The peak pursuits of the project are being enumerated below:

- Single platform for monitoring(centralized) the Reliability and Quality of Power of all outgoing distribution feeders
- Automated web-based system (seamless machine to machine technology intervention) for monitoring 66/33/22/11 kV outgoing distribution feeders
- Navigating the Data Landscape with Analytical Excellence in distribution sector's performance
- Near-real time monitoring by the key stakeholders MoP, CEA, Utilities, Nodal Agencies like REC/PFC.
- Mobile app for field officers and senior management for efficient monitoring

This project aims to monitor ~2.5 lakh outgoing distribution feeders across 85 discoms in the country.

Currently, 15 states and 29 discoms with ~1 lakh feeders

have been on boarded to NFMS.

In a nutshell, NFMS is a technical intervention that leverages technology to centralize and automate the monitoring of distribution feeders. By integrating data from various sources and adopting an online data transmission mechanism, it aims to enhance the efficiency and effectiveness of the monitoring process while providing real-time information to key stakeholders.

E. Project Implementing Agency (PIA) for other projects:

Project Implementing Agency (PIA) for other projects namely Implementation of urban distribution infrastructure in Jammu & Kashmir under PMDP (Urban) Package- A & B.

New Assignments:

During the current financial year 2023-24, the Company has undertaken following new assignments:

i. Implementation of End-to-End Revenue Management System and Customer Call Centre for Ladakh Power Development Department, UT of Ladakh.

ii. For rolling out new business opportunities in distribution sector, RECPDCL has taken initiative for empanelment of Technology Service Providers (TSPs) shortlisted under Powerthon-2022 for providing AI/ML solution for improvement of AT&C losses, Demand Forecasting etc. in various DISCOMs across the country.

iii. Memorandum of Understanding has been signed between RECPDCL and BHEL for joint development of Renewable Energy Projects. The MoU thus aims to contribute to the clean energy targets of the nation.

"RECPDCL has continued to profitable business and total revenue and Profit before tax was ₹ 53,636 lakhs and of ₹ 30,539 lakhs", respectively, during January, 2023 to March, 2024

F. Tariff Based Competitive Bidding (TBCB) Projects

Pursuant to amalgamation of RECTPCL with RECPDCL, the company (RECPDCL) is acting as Bid Process Coordinator (BPC), for selection of developer as Transmission Service Provider (TSP) through Tariff Based Competitive Bidding Process. In order to initiate development of each transmission project, RECPDCL incorporates a project specific Special Purpose Vehicle (SPV) as Wholly Owned Subsidiary Company and after the selection of successful bidder through Tariff Based Competitive Bidding Process notified for transmission projects. The respective project specific SPV along with all its assets and liabilities is transferred to the successful bidder.

During the period from January 1, 2023 to March 31, 2024, the bid process of the 17 transmission projects have been completed. Further, the bidding process of 15 Inter-State as well as 2 Intra-State transmission projects is under process which is expected to be concluded in FY 2024-25.

Till date, RECPDCL has successfully concluded the bidding process for total 60 Nos transmission projects (54 Nos. Inter -State and 6 Nos Intra-State) having estimated project cost of ₹ 82,210 crore.

In addition to above, Ministry of Power, Government of India has notified RECPDCL as one of the Bid Process Co-ordinators for conducting bidding process on behalf of generators willing to bundle their conventional power with RE power (RE-Bundling scheme). Accordingly, under the said scheme, RECPDCL has concluded the bid process of 1,750 MW of Solar projects of NTPC (1,250

Sl. No.	Name of RE Bundling Projects	Procurer	Remarks
	INTER-STATE		
1.	Selection of Solar Power Developers for setting up of 500 MW ISTS-Connected Solar PV Power Projects in India under Tariff-based Competitive Bidding	DVC	Expected to conclude during 2023-24
2.	Selection of Solar Power Developers for setting up of 1250 MW ISTS-Connected Solar PV Power Projects in India under Tariff-based Competitive Bidding-Tranche-I.	NTPC Limited	
3.	Selection of Wind Power Developers for setting up of 100 MW ISTS-Connected Wind Power Projects in India under Tariff-based Competitive Bidding	DVC	
4.	Selection of Solar Power Developers for setting up of 290 MW Grid-Connected Solar (PV) Power Projects in India under Tariff-based Competitive Bidding with Greenshoe option of additional capacity of 290 MW	PPGCL	Expected to conclude during 2024-25

Sl. No.	Name of RE Bundling Projects	Procurer	Remarks
5.	Selection of Solar Power Developer for setting up of 250 MW ISTS-Connected Solar (PV) Power Projects in India under Tariff-based Competitive Bidding with Greenshoe option of additional capacity of 250 MW	MPL	Expected to conclude during 2024-25
6.	Selection of Solar Power Developers for setting up of 223 MW ISTS-Connected Solar PV Power Projects in India under Tariff-based Competitive Bidding	NTPL	

MW) & DVC (500 MW) and 100 MW of Wind Project of DVC amounting to 8,500 Crore.

Tarang (Transmission App for Real Time Monitoring & Growth): - Tarang monitors the progress of transmission system in the country, both Intra State and Inter State Transmission Projects through Tariff Based Competitive Bidding (TBCB) as well as Regulated Tariff Mechanism. Tarang also shows the prospective upcoming Intra-State as well as Inter - State Projects along with NITs being floated by different Transmission Utilities Pan-India. Tarang provides advance information of upcoming transmission projects approved by Empowered Committee on Transmission helping bidders to gear up for future transmission projects.

5. Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

The Hon'ble President of India sanctioned the launch/ implementation of Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), an integrated scheme covering all aspects of rural power distribution which was conveyed by the Ministry of Power on December 3, 2014. Under the scheme, 60% of the project cost (85% for special States) is provided as grant by Government of India and additional grant upto 15% (5% for Special Category States) was provided by Government of India on achievement of prescribed milestones. All erstwhile RE schemes (including Rajiv Gandhi Grameen Vidyutikaran Yojana) were subsumed into DDUGJY. REC Limited was designated as the Nodal Agency for operationalization of DDUGJY. The DDUGJY scheme (including RE) has been completed and closed on March 31, 2022.

5.1 Sanction of projects

5.1.1 DDUGJY (RE component):

Under erstwhile Rural Electrification (RE) programme, as on March 31, 2022, cumulatively 1,365 nos. of Projects Sanctioned with a cost of ₹ 66,206 crore. The closure cost of these projects is ₹ 62,063 crore.

5.1.2 DDUGJY (New):

As on March 31, 2022, cumulatively 3,781 nos. of projects sanctioned with a cost of ₹ 44,629 crore. The closure cost of these projects is ₹ 42,305 crore.

5.1.3 DDUGJY (Addl. Infra Projects)

An amount of ₹14,183 crore has been sanctioned to 20 States for creation of additional infrastructure exclusively for Households covered under Saubhagya on the requests of State.

5.2 Cumulative Achievement (as on March 31, 2022)

5.2.1 DDUGJY (RE component):

As on March 31, 2022, cumulatively Government of India grant of ₹ 54,627 crore has been released to the States. The physical progress is as below:

- 2,942 Sub-stations (Incl. augmentation of 2,054 Sub-Stations) commissioned
- 10.25 Lakh Distribution Transformers commissioned
- 8.00 Lakh CKm of LT Lines erected
- 4.78 Lakh CKm 11KV Lines erected
- 0.16 Lakh Ckm 33 & 66 KV HT Lines erected

5.2.2 DDUGJY (New):

As on March 31, 2022, cumulatively Government of India Grant of ₹ 26,715 crore (including ₹ 1003 crore towards Additional HH) has been released to the States. The physical progress is as below

- 4,048 Sub-stations (including augmentation of 2,131 Sub-stations) commissioned
- 3.99 Lakh Distribution Transformers commissioned
- 1.41 Lakh CKms of new 11 KV line erected
- 3.28 Lakh CKms of LT Lines erected
- 0.25 Lakh CKms of HT Lines (33 & 66 KV Lines) erected
- 1.13 Lakh CKms of 11 KV Feeders segregated

- Energy Meters in 187.94 Lakh consumer premises, 2.32 Lakh Distribution Transformers & 0.14 Lakh 11 KV Feeders installed

5.2.3 DDUGJY (Additional infrastructure):

As on March 31, 2022, cumulatively GoI Grant of ₹ 7,566 crore has been released to the States. The physical progress is as below:

- 241 Sub-stations (including augmentation of 225 Sub-stations) commissioned
- 2.22 Lakh Distribution Transformers commissioned
- 0.63 Lakh CKms of new 11 KV line erected
- 2.04 Lakh CKms of LT Lines erected
- 0.000734 Lakh CKms of HT Lines (33 & 66 KV Lines) erected

6 SAUBHAGYA- Pradhan Mantri Sahaj Bijli Har Ghar Yojana

The Hon'ble Prime Minister launched Saubhagya scheme on September 25, 2017 to achieve universal household electrification covering every village and every district in the country. Universal household electrification requires creation of electricity access through last mile connectivity. Scheme outlay is ₹ 16,320 crore including Gross Budgetary Support of ₹ 12,320 crore.

The Saubhagya scheme has been completed & closed on March 31, 2022.

6.1 Cumulative Financial Progress:

- Projects worth ₹ 14,082 crore has been sanctioned and these projects are completed & closed at approved Closure Cost of ₹ 9,244 crore.
- ₹ 6,308 crore of GoI grant has been released to States/DISCOMS.

6.2 Cumulative Physical Progress:

Ministry of Power along with the active support and cooperation of States/Power Utilities and other stakeholders, provided electricity connections to 2.86 crore households since the launch of SAUBHAGYA scheme.

7. Revamped Distribution Sector Scheme(RDSS)

7.1 Overview: REC and PFC are the nodal agencies for the Reforms-based and Results-linked, Revamped Distribution Sector Scheme, notified by Government of India vide OM dated 20.07.2021, with an outlay of ₹ 3,03,758 crore and estimated GBS from Central Government of ₹ 97,631 crore. REC, as Nodal Agency, has been assigned 19 States/Union Territories (UTs) for overseeing and monitoring of implementation of the Scheme, namely Assam, Meghalaya, Arunachal Pradesh, Chhattisgarh, J&K, Ladakh, Goa, Tamil Nadu, Karnataka, Bihar, Rajasthan, Uttar Pradesh, West Bengal, Andaman Nicobar, Sikkim, Mizoram, Manipur, Nagaland and Tripura. The remaining States/UTs have been assigned to PFC. The Scheme allows the States to adopt customized reform measures and plan infrastructure works to meet specific needs of the State with the approval of the Government of India.

7.2 Objectives:

a) to improve the quality, reliability and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector,

b) to reduce the AT&C losses to pan-India levels of 12-15% by 2024-25, and

c) to reduce the ACS-ARR gap to zero by 2024-25

7.3 Components:

Part A – Metering & Distribution Infrastructure Works:

Component– I: Prepaid Smart Metering

Component– II: System Metering and upgradation of the Distribution Infrastructure

Component– III: Project Management

Part B – Training & Capacity Building and other Enabling & Supporting Activities:

Ongoing approved projects: Projects sanctioned under PMDP 2015 in the erstwhile State of Jammu & Kashmir have been subsumed in RDSS.

7.4 Funding pattern:

The release of funds under the scheme will be linked to achievement of results and reforms laid down under an evaluation framework as under:

Part A: Metering & Distribution Infrastructure Works

Component– I: Prepaid Smart metering solutions, including at consumer, DT, and feeder level including integration of existing infrastructure, will be funded through GBS as under:

- for DISCOMs in "Other than notified Special Category States", a fixed amount of ₹ 900 per consumer meter or 15% of the cost per consumer meter worked out for the whole project, whichever is lower.
- for DISCOMs in "notified Special Category States", a fixed amount of ₹ 1,350 per consumer meter or 22.5% of the cost per consumer meter worked out for the whole project, whichever is lower.

The Scheme is also providing incentives for deployment of prepaid Smart meters within the

targeted timeline of December 2023.

Component– II: Distribution Infrastructure works, including SCADA, DMS, AB cables, feeder segregation etc. maximum financial assistance to be funded through GBS will be as under:

- for DISCOMs in "Other than Special Category States", up to 60% of the approved project cost, and
- for DISCOMs in "Special Category States", up to 90% of the approved project cost.

Part-B: Training & Capacity Building and other Enabling & Supporting Activities:

- 100% of the approved project cost will be eligible for funding through GBS

7.4.1 Projects sanctioned under RDSS with Outlay

(Amount in ₹ Crore)

Sl. No.	State	Discom	Smart Metering works - sanctioned amount		Loss reduction work* - sanctioned amount	
			Project Cost incl PMA	GBS for Project Cost incl PMA & incentives	Project cost including PMA	GBS for Project cost including PMA
1	Andaman & Nicobar Islands	ED-ANI	53.56	16.76	461.99	415.78
2	Arunachal Pradesh	Arunachal PD	183.56	54.41	922.95	830.66
3	Assam	APDCL	4,049.54	1,051.65	2,609.10	2,348.19
4	Bihar	NBPDCL	968.08	193.19	3,299.65	1,979.79
		SBPDCL	1,053.14	219.14	3,781.40	2,268.84
	Bihar Total		**2,021.22**	**412.33**	**7,081.05**	**4,248.63**
5	Chhattisgarh	CSPDCL	4,105.31	804.43	3,597.55	2,158.53
6	Goa	GOA -PD	469.17	94.51	247.08	148.25
7	Jammu & Kashmir	JPDCL	549.54	141.36	2,285.29	2,056.76
		KPDCL	514.07	131.95	2,350.27	2,115.24
	J&K total		**1,063.62**	**273.31**	**4,635.56**	**4172.00**
8	Ladakh	Ladakh PDD	Not sanctioned under RDSS		875.79	788.21
9	Manipur	MSPDCL	121.16	38.14	400.98	360.88
10	Meghalaya	MeECL	309.55	86.35	796.50	716.85
11	Mizoram	Mizoram PD	181.61	61.08	237.33	213.60
12	Nagaland	DOPN	207.57	59.66	391.18	352.06
13	Rajasthan	JdVVNL	2,888.15	499.07	3,609.65	2,165.79
		AVVNL	3,676.85	611.71	2,456.49	1,473.89
		JVVNL	3,149.81	575.77	3,305.37	1,983.22
	Rajasthan Total		**9,714.81**	**1,686.55**	**9,371.51**	**5,622.91**
14	Sikkim	Sikkim PD	97.44	30.43	397.73	357.95
15	Tamil Nadu	TANGEDCO	19,235.36	3,398.46	9,066.27	54,39.76
16	Tripura	TSECL	318.55	80.42	484.56	436.10
17	Uttar Pradesh	PuVVNL	4,956.25	912.89	4,826.89	2,896.13
		PVVNL	4,965.45	848.34	3,454.06	2,072.44
		MVVNL	5,028.14	1,016.76	4,296.92	2,578.15
		DVVNL	3,676.83	651.85	3,882.53	2,329.51
		KESCO	329.63	70.72	624.15	374.49
	Uttar Pradesh Total		**18,956.3**	**3,500.57**	**17,084.55**	**10,250.72**
18	West Bengal	WBSEDCL	12,670.46	2,089.18	7,222.57	4,333.54
	Discom-wise Total		**73,758.78**	**13,738.24**	**65,884.25**	**43,194.63**

*Including Additional Household and Border Area Infra works

The proposal of 18 states out of 19 States/UTs under REC i.e. Andaman & Nicobar Islands, Assam, Bihar, Chhattisgarh, Goa, Manipur, Mizoram, Meghalaya, Nagaland, Jammu & Kashmir, Tamil Nadu, Rajasthan, Sikkim, Tripura, Uttar Pradesh, Ladakh, Arunachal Pradesh and West Bengal have been approved by the monitoring committee and Sanction letters are issued to the corresponding DISCOMs.

7.4.2 Cumulative Achievement under RDSS (as on March 31, 2024)

Smart Metering Works: As on 31.03.2024, the state wise physical progress of smart metering works where works has already been awarded is given below:

Sl. No	State	Discom	Sanctioned		Awarded		Installed	
			Consumer	Syste m Metering	Consumer	System Metering	Consumer	System Metering
1	ANI	ED-ANI	83,573	1,262	-	-	-	-
2	Arunachal	PD-Arunachal	2,87,446	10,804	-	10,804	-	-
3	Assam	APDCL	63,64,798	80,329	64,60,098	98,348	13,90,933	8,884
4	Bihar	NBPDCL	10,30,000	1,47,489	10,30,000	1,38,646	6,89,923	886
5	Bihar	SBPDCL	13,20,000	1,09,664	13,20,000	1,09,664	9,03,677	1,298
6	Chattisgarh	CSPDCL	59,62,115	2,17,364	70,70,288	2,75,315	-	131
7	Goa	GED	7,41,160	9,196	-	-	-	-
8	J&K	JPDCL	7,21,346	48,490	7,21,346	42,649	-	-
9	J&K	KPDCL	6,85,699	42,155	6,85,694	42,155	-	-
10	Ladakh	LPDD	Not Sanctioned					
11	Manipur	MSPDCL	1,54,400	11,808	1,54,400	11,808	-	-
12	Meghalaya	MePDCL	4,60,000	12,743	-	-	-	-
13	Mizoram	MPED	2,89,383	2,698	-	-	-	-
14	Nagaland	DPON	3,17,210	6,668	-	6,668	-	-
15	Rajasthan	JdVVNL	40,80,082	1,78,131	-	15,788	-	10,084
16	Rajasthan	AVVNL	54,32,231	1,66,460	-	-	-	-
17	Rajasthan	JVVNL	47,62,643	1,17,145	-	-	-	-
18	Sikkim	Sikkim PD	1,44,680	3,862	1,44,680	3,862	-	-
19	Tamil Nadu	TANGEDCO	3,00,00,000	4,90,774	-		-	-
20	Tripura	TSECL	5,47,489	15,381	4,15,647	11,366	-	-
21	Uttar Pradesh	PuVVNL	73,27,988	4,22,548	73,27,988	4,22,548	-	-
22	Uttar Pradesh	MVVNL	75,28,737	3,84,903	75,28,737	3,84,903	-	-
23	Uttar Pradesh	DVVNL	53,54,069	1,92,303	53,54,069	1,92,303	-	-
24	Uttar Pradesh	PVVNL	61,43,261	5,40,513	61,43,261	5,40,513	-	-
25	Uttar Pradesh	KESCO	6,25,000	7,408	6,25,000	7,408	-	-
26	West Bengal	WBSEDCL	2,07,17,969	3,17,293	37,14,273	3,17,294	41,400	-
	Discom-wise Total		**11,10,81,279**	**35,37,391**	**4,86,95,481**	**26,32,042**	30,25,933	21,283

Loss Reduction Works: As on March 31, 2024, the state wise physical progress of loss reduction works is given below:

(Amount in ₹ Crore)

Sl. No.	State	DISCOM	Sanctioned Cost for Loss Reduction works (excl. PMA)	Actual awarded Cost	Sanction cost corresponding to awarded works (excl. PMA)	Physical Progress (%)
1	A&N	ED-ANI	455.16	-	-	0
2	Arunachal Pradesh	PD-Arunachal	929.19	230.44	-	0
3	Assam	APDCL	2,570.54	2,450.62	2,570.54	17%
4	Bihar	NBPDCL	3,250.89	3337.11	3,050.89	16%

Sl. No.	State	DISCOM	Sanctioned Cost for Loss Reduction works (excl. PMA)	Actual awarded Cost	Sanction cost corresponding to awarded works (excl. PMA)	Physical Progress (%)
5	Bihar	SBPDCL	3,725.52	3772.72	3,524.76	13%
6	Chhattisgarh	CSPDCL	3,577.43	3,030.52	3,406.86	6%
7	Goa	GED	243.43	291.83	205.03	0%
8	J&K	JPDCL	2,251.52	1,690.18	1,517.14	13%
9		KPDCL	2,315.54	2445.05	2,287.63	4%
10	Ladakh	LPDD	862.84			0
11	Manipur	MSPDCL	395.05	364.57	356.04	0
12	Meghalaya	MePDCL	1,213.98	923.91	784.72	0
13	Mizoram	PED-Mizoram	303.17	188.00	209.56	3%
14	Nagaland	DOP-Nagaland	449.54		-	0
15	Rajasthan	JdVVNL	3,561.19	2767.83	3,203.01	3%
16		AVVNL	2,422.09	2,124.77	2,095.90	3%
17		JVVNL	3,296.26	2,674.08	3,040.50	3%
18	Sikkim	Sikkim PD	391.85	595.68		0
19	Tamil Nadu	TANGEDCO	9,426.32	2852.43	339.34	0
20	Tripura	TSECL	538.01	456.24	447.33	4%
21	Uttar Pradesh	PuVVNL	6,228.13	4,480.66	4,514.09	17%
22		MVVNL	4,546.50	3,749.20	4,065.32	7%
23		DVVNL	3,937.24	3,755.87	3,721.57	14%
24		PVVNL	3,404.09	3,335.22	3,351.41	17%
25		KESCO	614.93	588.22	589.93	26%
26	West Bengal	WBSEDCL	7,115.83	7,289.79	6,894.53	0
	Total (REC DISCOMs)		**68,026.24**	**53,394.94**	**53,601.44**	**10%**

Financial Progress: As on March 31, 2024, the state wise fund released is given below:

(Amount in ₹ Crore)

Sl. No.	State	DISCOM	Funds Released			
			LR	SM	PMA	Total
1	A&N	A&N PD	-	-	-	-
2	Arunachal Pradesh	APDA	-	-	-	-
3	Assam	APDCL	582.07	56.09	6.98	645.14
4	Bihar	NBPDCL	507.28	73.34	2.96	583.57
5	Bihar	SBPDCL	586.19	96.04	6.22	688.45
6	Chhattisgarh	CSPDCL	212.66	-	3.26	215.92
7	Goa	GOA -PD	14.61	-	-	14.61
8	J&K	JPDCL	202.64	-	3.01	205.64
9		KPDCL	207.95	-	2.57	210.53
10	Ladakh	LPDD	77.66	-	0.93	78.58
11	Manipur	MSPDCL	35.55	-	0.59	36.15
12	Meghalaya	MeECL	51.19	-	-	51.19
13	Mizoram	Mizoram PD	21.04	-	1.63	22.67
14	Nagaland	Nagaland PD	-	-	0.62	0.62
15	Rajasthan	AVVNL	137.60	-	2.44	140.04
16		JdVVNL	193.84	-	0.65	194.49
17		JVVNL	195.42	-	0.71	196.13
18	Sikkim	Sikkim PD	23.37	-	0.40	23.77

Sl. No.	State	DISCOM	Funds Released			
			LR	SM	PMA	Total
19	Tamil Nadu	TANGEDCO	92.36	-	-	92.36
20	Tripura	TSECL	42.31	-	0.61	42.92
21	Uttar Pradesh	DVVNL	534.20	-	5.23	539.44
22		KESCO	78.93	-	1.29	80.22
23		MVVNL	507.87	-	2.95	510.82
24		PuVVNL	638.88	-	5.90	644.78
25		PVVNL	459.63	-	3.83	463.46
26	West Bengal	WBSEDCL	213.48	-	7.62	221.10
	Total (REC DISCOMs)		**5616.73**	**225.46**	**60.40**	**5902.59**

7.4.3 Achievement January 1, 2023 to March 31, 2024 under RDSS:

The proposals of REC states/UTs i.e. Andaman & Nicobar Island, Arunachal Pradesh, Assam, Chhattisgarh, Meghalaya Mizoram, Nagaland, Tamil Nadu, Tripura, Karnataka Ladakh, Rajasthan and Uttar Pradesh were approved by Monitoring Committee, overall ~₹ 53 crore sanctioned under Smart metering works (ANI) and ~₹ 5,641 crore sanctioned under distribution infra works (additional household works, PVTG works, VVP works, LT auxiliary works, Modernization works and loss reduction).

Annual Evaluation FY 2021-22: The annual evaluation FY 2021-22 was carried out for 11 states (14 REC DISCOMs) during April 1, 2023 to March 31, 2024. Further, the annual evaluation FY 2021-22 for 4 states (6 REC DISCOMs) had already been carried out during January 1, 2023 to March 31, 2024.

Fund Released (FY 2023-24): Funds released from April 1, 2023 to March 31, 2024.

Sl. No.	State	DISCOM	Funds Released			
			LR	SM	PMA	Total
1	A&N	A&N PD	-	-	-	-
2	Arunachal Pradesh	APDA	-	-	-	-
3	Assam	APDCL	573.82	56.09	4.85	634.75
4	Bihar	NBPDCL	507.28	73.34	-	580.61
5	Bihar	SBPDCL	586.19	96.04	4.75	686.98
6	Chhattisgarh	CSPDCL	167.28	-	3.26	170.53
7	Goa	GOA -PD	14.61	-	-	14.61
8	J&K	JPDCL	152.48	-	1.91	154.40
9		KPDCL	194.37	-	-	194.37
10	Ladakh	LPDD	77.66	-	0.93	78.58
11	Manipur	MSPDCL	18.95	-	0.59	19.54
12	Meghalaya	MeECL	51.19	-	-	51.19
13	Mizoram	Mizoram PD	21.04	-	1.22	22.26
14	Nagaland	Nagaland PD	-	-	0.62	0.62
15	Rajasthan	AVVNL	137.60	-	2.44	140.04
16		JdVVNL	193.84	-	0.65	194.49
17		JVVNL	195.42	-	0.71	196.13
18	Sikkim	Sikkim PD	23.37	-	0.40	23.77
19	Tamil Nadu	TANGEDCO	92.36	-	-	92.36
20	Tripura	TSECL	25.74	-	0.61	26.35
21	Uttar Pradesh	DVVNL	421.05	-	3.14	424.19
22		KESCO	60.48	-	0.80	61.28
23	Uttar Pradesh	MVVNL	382.91	-	0.32	383.22
24		PuVVNL	523.91	-	3.85	527.77
25		PVVNL	402.27	-	1.92	404.18
26	West Bengal	WBSEDCL	213.48	-	7.62	221.10

Sl. No.	State	DISCOM	Funds Released			
			LR	SM	PMA	Total
	Total (REC DISCOMs)		5,037.29	225.46	40.59	5,303.34

Note: The funds released shown above are net fundsreleased after deducting funds lapsed.

7.4.4 Achievement during the period i.e., from January 1, 2023 to March 31, 2024

Annual Evaluation FY 2022-23: During January 1, 2023 to March 31, 2024, the annual evaluation was carried out for 16 REC states.

7.5 Promoting the use of advanced technologies in Power Distribution Sector:

RDSS lays special emphasis on leveraging advanced technologies to analyse data generated through Information Technology (IT)/ Operational Technology (OT) devices including system meters and prepaid smart meters, to materialize the envisaged goal i.e., introducing advanced technologies like AI/ML in power distribution by leveraging partnerships and consultations.

REC plays a role as designated agency to select DISCOMs and identify key intervention areas, empanelling incubator(s) to select TSP (Technology Service Provider) through a competitive screening process, and establishing governance mechanisms for the pilot projects and their scale-up. A competition named "Powerthon" was launched by Hon'ble Union Cabinet Minister of Power and Renewable Energy on February 7, 2022, to select Technology Solutions Providers (TSPs), across problem statements submitted by willing DISCOMs.

The key objective of Powerthon-2022 is to create a forum for the participation of TSPs, start-ups, educational institutions, research institute, equipment manufacturers, state power utilities and other state and central power sector entities, brief them on the current challenges faced across the power distribution sector and TSPs to participate in Powerthon-2022. Accordingly, the applications were invited from the TSPs can showcase their technology driven solutions based on advanced emerging technologies like AI/ML, Blockchain etc. to solve the complex problems of DISCOMS.

Achievement:

Applications were received across nine (9) identified problem/ challenge areas submitted by DISCOMs, and same were evaluated and after detailed deliberations 37 TSPs were selected for the Proof of Concept (PoC) stage. TSPs submitted their PoC report and after detailed evaluation, 18 POC were selected for the Pilot stage. The selection criteria for the pilot were (a) Suitability of solution, (b) testing result in PoC, (c) Feedback from the various stakeholders including DISCOMs. However, out of 18 TSPs, 17 TSPs completed the pilots. The pilots were evaluated by the committee and 7 were declared as successful.

Evaluation of Distribution Companies in Consumer and Operational parameters: Consumer Service Rating of DISCOMs (CSRD).

Context and Objective

The Ministry of Power has a consumer centric approach with the goal of supplying round-the-clock high quality and reliable power to all consumers. The Hon'ble Union Cabinet Minister of Power and Renewable Energy has always maintained that the electricity institutions and power systems exist to serve the consumers, and the consumers have the right to get reliable services and quality electricity.

In this context, a 'Consumer Service Rating of DISCOMs' to measure the ease of living with respect to electricity is envisaged to be developed with the following objectives:

- To create a minimum set of parameters related to quality and reliability of electricity supply and consumer service
- Track performance of DISCOMs across these aspects over a period of time
- Develop a spirit of healthy competition amongst DISCOMs to enhance consumer experience

Methodology:

The DISCOM Consumer Service Rating has been developed across four key dimensions which are central to enhancing level of consumer services. This includes operational reliability; connection and other services; metering, billing, collection linked services; fault rectification and grievance redressal. Across all these dimensions, key performance indicators have been shown in the figure below:

- Hours of Supply
- SAIFI
- DT Failure Rate

- Alignment of regulations with industry best practices w.r.t timelines
- Predetermined demand charges for up to 150kW
- Applications processed through online portal
- Average deviation from SoP in time taken for providing connection
- Prosumers (under net or gross metering)

- Replacement of defective metres
- Bills generated based on actual metre reading
- Bills generated through non-manual meter reading
- Billing frequency for domestic category
- Bills generated for domestic category
- Consumers receiving billing updates on mobile
- Prepaid consumers
- Tariff categories (incl. subcategories & slabs)
- Number of consumers paying digitally

- 24x7 customer care call centre
- Average customer call waiting time
- Outage alerts through registered mobile
- Deviation from speciffied time of complaints resolved through call centre
- Adequacy of Grievance Redressal Mechanism

- Nudge the DISCOMs to assess the gap areas and promote inter-se learning

This exercise has enabled the DISCOMs to introspect their performance across various service parameters, undertake a comparative performance assessment with peer DISCOMs and take corrective measures.

The first edition of the Consumer Services Rating of DISCOMs (CSRD) for the FY 2020-21 was released on August 5, 2022, subsequently the last edition of the CSRD for FY 2022-23 has been released on 19th January, 2024.

Result Areas and Weightages:

- o Operational reliability (45% weightage) – This will help assess the reliability of electricity supply. The parameters include hours of supply, SAIFI, and DT failure rate. Considering its importance, 45% weightage has been given to it.
- o Consumer service (55% weightage) – The key parameters include connection & other services; metering, billing and collection linked services; fault rectification and grievance redressal. Because of the large number of services, which are important from a consumer point of view, higher weightage i.e. 55% is assigned to these parameters.

After detailed discussion with all stakeholders especially DISCOMs in public and private domain, data was collected and verified with evidences and field visit. Total 60 DISCOMs are being graded in this exercise out of 70 DISCOMs (12 DISCOMs excluded due to inadequate data/evidences).

The DISCOMs have been assigned grades across the above parameters as per quantitative grading as below :

Marks (M)	M>90	80<M<90	70<M<80	60<M<70	50<M<60	40<M<50	30<M<40
Grades	A+	A	B+	B	C+	C	D
No. of DISCOMS	0	9	13	16	12	4	4
	NIL	**Andhra Pradesh :** APEPDCL | APSPDCL **Delhi :** BRPL | BYPL | TPDDL **Maharashtra :** AEML **Telangana :** TSSPDCL **Andhra Pradesh:** APCPDCL **Gujarat:** MGVCL | UGVCL **Karnataka:** BESCOM **Kerala:** KSEBL **Uttar Pradesh:** KESCo | NPCL	**Andhra Pradesh:** APCPDCL **Gujarat:** MGVCL | UGVCL **Karnataka:** BESCOM **Kerala:** KSEBL **Uttar Pradesh:** KESCo | NPCL **Madhya Pradesh:** MPMKVVCL **Maharashtra:** MSEPDCL | TPCL **Punjab:** PSPCL **Tamil Nadu:** TANGEDCO **Telangana:** TSNPDCL **Uttarakhand:** UPCL	**Assam:** APDCL **Chandigarh:** CED **Chhattisgarh:** CSPDCL **Goa:** GED **Gujarat:** DGVCL | PGVCL **Haryana:** DHBVNL | UHBVNL **Karnataka:** CESCOM **Madhya Pradesh:** MPPoKVVCL | MPPsKVVCL **Rajasthan:** AVVNL | JdVVNL | JVVNL Tripura: TSECL **West Bengal:** WBSEDCL	**Bihar:** NBPDCL **Himachal Pradesh:** HPSEBL **Karnataka:** GESCOM | MESCOM **Ladakh:** LPDD Maharashtra: BEST **Odisha:** TPCODL | TPNODL | TPSODL | TPWODL Puducherry: PED **Uttar Pradesh:** PsVVNL	**Karnataka:** HESCOM **Uttar Pradesh:** DVVNL | MVVNL PuVVNL	**Bihar:** SBPDCL **Jammu & Kashmir:** JPDCL | KPDCL **Jharkhand:** JBVNL

The report is available on the REC's website (https://recindia.nic.in/consumer-service-rating-of-discoms)

The CSRD for the financial year 2022-23 is under finalizaton and likely to be released soon by Hon'ble Union Cabinet Minister of Power.

8. Renewable Energy Projects

Under the Renewable Energy, REC has sanctioned loan assistance of ₹ 86,006 crore to 35 projects with installed generation capacity aggregating 9,087 MW and 5,750 E-Buses, which includes private & state sector projects of various technologies viz. Wind, Solar, Wind-Solar Hybrid, E-Mobility, Solar Manufacturing, Solar Park Infrastructure, Green Ammonia, Hydro, Pumped Storage, E-Mobility etc. The disbursement achieved during the period from January 1, 2023 to March 31, 2024, was ₹ 18,215 crore.

9. North Eastern States

During the period of January 1, 2023 to March 31, 2024, REC has sanctioned loan assistance of ₹ 4,919.29 crore to NE states. Further, an amount of ₹ 143.13 crore was disbursed to North Eastern states during that period.

10. International Cooperation and Development (IC & D)

REC had two lines of ODA (Official Development Assistance) credit with JICA, Japan, under JICA-I & II ODA loans with cumulative amount of JPY 16,949.38 million and JPY 11,809.48 million respectively. These lines have been fully repaid as on March 31,2024.

Further, REC has 6 lines of ODA credit with KfW, Germany. Out of which, first three lines with aggregate amount of EUR 240 million for financing energy efficient programs in Andhra Pradesh & Telangana, HVDS projects in Haryana and Renewable projects in the country, which had been fully drawn as on March 31, 2024. In Fiscal 2019, REC had entered into a 4th loan agreement with KfW for financial assistance of USD 228 million for re-financing renewable energy projects. Under this facility, total amount of USD 228 Million has been fully drawn.

In 2021, REC had entered into 5th line of credit with KfW for availing ODA term loan of USD 169.5 Million under Indo-German Bilateral Partnership in accordance with the approval granted by Department of Economic Affairs, Ministry of Finance, Government of India for part financing of innovative Solar PV Technology based. Under this facility, total amount of USD 123 Million has been drawn till March 31,2024.

Further, in 2023, REC signed a 6th line of credit with KfW for availing ODA term loan of 200 million Euro. This line of credit under the Indo-German Development Cooperation will be utilized to refinance investments in the distribution infrastructure of DISCOMs in alignment with the Revamped Distribution Sector Scheme (RDSS) of the Government of India. Under this facility, no amount has been drawn till March 31,2024.

11. Training activities at REC Institute of Power Management & Training, Hyderabad

A. Progress made during the current year from January 1, 2023 to March 31, 2024

11.1 **REC Institute of Power Management and Training** (RECIPMT) was established at Hyderabad in 1979 under the aegis of REC Limited to cater to the training and development needs of engineers and managers of Power Sector organisations. The programmes are conducted on the state-of-art subjects of Power Generation, Transmission, Distribution and Renewable Energy Sources.

11.2 International Programmes under Sponsorship of MEA, GoI under ITEC

RECIPMT has organised 4 Classroom Programs of 3 weeks duration for executives of International Power Sector Organisations on (1) "Design, Construction & Operation of Distribution Systems"; (2) "Planning & Management of Power Transmission Systems" ;(3) "Certificate Course in Power Distribution Management" & (4) "Testing, Operation, Maintenance & Protection of EHV Sub-Station & Lines" Sponsored by Ministry of External Affairs (MEA) GoI under Indian Technical and Economic Cooperation (ITEC) scheme. 97 Power Sector executives from countries viz. ALGERIA, AZERBAIJAN, BANGLADESH, BHUTAN, ECUADOR, ETHIOPIA, GAMBIA, GHANA, MALAWI, MALDIVES, MAURITIUS, MONGOLIA, MOROCCO, MYANMAR, NEPAL, NIGERIA, SIERRA LEONE, SOUTH SUDAN, SYRIA, SRILANKA, TAJIKISTAN, TANZANIA, THAILAND, TOGO, TUNISIA, VIETNAM and ZIMBABWE participated in the programs.

RECIPMT has also organized 1 classroom training program for 4 weeks duration on "Emerging Trends in Rural Electrification " and 1 online webinar for 3 weeks on "Concept to Commissioning of Solar Power Plants" wherein 14 and 22 participants attended the program respectively.

11.3 Regular National Programs:

RECIPMT has organised 23 Classroom Program of 4 day duration for the executives of various power sector utilities on different topics such as "Distribution Transformers – Operation & maintenance for Failure Minimization ", "Open Access & Power Trading ", "Tariff Policy, ARR & Regulatory Compliance ", "Distribution Transformers-Operation and Maintenance for Failure Minimization"; "O&M of EHV Substations. Lines and Quality Assurance"; "Power Transformer -Testing, Commissioning, Protection & Maintenance"; "Smart Metering Technologies for Distribution sector"; "Distribution Loss Reduction – Pilferage of Electricity Issues, Challenges and Remedies"; "Design, Construction & Testing of Distribution Sub-stationed Lines; General Network Access (Open Access), Power Trading and Exchanges"; "Best Practices in HR Management for Power Distribution Utilities"; "Tariff Policy and Submission of ARRs – Regulatory Compliance"; "Operation, Maintenance and Protection of Distribution Sub-stations and Lines"; "RDS Scheme & Smart Metering Technologies - Effective Implementation for Sustainable DISCOM Operation"; "Labor Laws and Labor Codes - Procedures in dealing with Court Cases"; "Energy Transition, Promotion of Green Energy and Best Practices"; "Design, Construction and Quality Control of EHV Sub-Station and Lines"; "Recent regulations in grid management and security issues"; "Protection system in EHV sub–stations & lines"; "Techno commercial improvements of discoms – issues & challenges"; "Underground cables –selection, sizing, laying, monitoring & fault detection"; "Power Purchase Agreements and intricacies in power management"; "Concept to commissioning of solar power plants – on grid and off grid"; were conducted.

RECIPMT has also organised 5 Online Webinar Training Programme for 2 Days Duration on "Protection Systems in EHV Sub-Stations and Lines ", "Earthing Practices & Protection in Distribution System ", "Concept To Commissioning of Solar Power Plants ", "O&M of EHV Sub-Station & Lines Including Quality Assurance ", "Labour Laws & Procedure in Dealing Court Cases "and 63 participants attended.

A total number of 349 participants attended the above programs.

11.4 REC Sponsored Programs:

a. 3 day Classroom Trainings on "Electrical Safety":

RECIPMT has organised 76 batches on "Electrical Safety" programs and trained 1880 Executives for various Power Utilities like MSEDCL JDVVNL, HPSEBL, APSPDCL, APCPDCL, AVVNL, ED of GOA, MESCOM, SBPDCL, TSGENCO, HESCOM, APEPDCL, TSSPDCL, NBPDCL, RRVPNL, MESCOM, MPMKVVCL (PTDC), PSPCL, BESCOM, etc.

b. 3 day Classroom Trainings on "Best Practices in Power Utility":

RECIPMT has organised 66 batches on "Best Practices in Power Utilities" and trained 1648 Participants for various Power Utilities like MSEDCL JDVVNL, APSPDCL, APCPDCL, APEPDCL, RRVPNL, HPSEBL, MPMKVVCL, BESCOM, AVVNL, PSPCL, etc.

c. 2 Day Online Training on "Techno-Commercial

Improvement of DISCOM's Performance":

RECIPMT has organised 78 batches of 2-day webinars on "Techno-Commercial Improvement of DISCOM's " and trained 2129 executives of various Distribution Companies viz. APCPDCL, APEPDCL, MSEDCL, HPSEB, MPMKVVCL (PDTC), BESCOM, BEST, WBSEDCL, APDCL, TPNODCL, HESCOM, APSPDCL, DNH&DD, etc.

11.5 Customised Programmes:

RECIPMT has organised 6 nos. Customised Classroom training programs on the topics of "Safety at Project Site" for SECI , "Power Purchase Agreement and Legalities" for BESCOM; "Power Transformers - Testing, Commissioning, Protection and Maintenance for RRVPNL"; "Concept to Commissioning of Solar Power Project for HPPCL" ; "Power Distribution Management for PSPCL" and "Procurement and Supply Chain Management" for KSEBL Engineers and trained 170 participants in the program. **11.6 In-house Training Programmes:**

RECIPMT also organised 4 in-house classroom programs for REC employees on the topics of "Project Appraisal & Loan Documentation"; "RDS Scheme & Smart Metering Technologies & Applications"; "Enterprise Resource Planning (ERP)"; "Finance for Non-Finance Executives" and 6 Webinars of 1 day on "Vigilance Aspects" and trained a total of 202 Employees in these programs.

11.6 In-house Training Programmes:

RECIPMT also organised 8 in-house classroom programs for REC employees at RECIPMT Campus on the topics of "Project Appraisal & Loan Documentation"; "RDS Scheme & Smart Metering Technologies & Applications"; "Enterprise Resource Planning (ERP)"; "Finance for Non-Finance Executives"; "Advanced Excel and MS Power point "; "Purchase Procedure and Procurement through GeM"; "General Management" , and 1 off-campus program on "Leadership & Communication Skills" and 10 Webinars of 1 day on "Vigilance Aspects" ; 1 webinar of 2 days on "Project Appraisal " and trained a total of 381 Employees in these programs.

In all, from 1st Jan 2023 to 31st March 2024, RECIPMT has organised 280 programs and trained 6,690 Employees of various power utilities including REC employees as detailed below:

Sl. No.	Type of Programmes	No. of programmes conducted	No. of Participants trained	No. of Man days
MEA Sponsored Program				
1.1	International Training Programs (3 weeks duration) classroom program	4	97	1843
1.2	International Training Programme 4 weeks - Classroom Training program	1	14	456
1.3	International Training Programme 3 weeks - Webinar	1	22	330
REC Sponsored Program				
2.	Classroom program on "Electrical Safety for Power Utilities", 3 days duration	76	1880	5640
3.	Classroom Program on "Best Practices for Power Utilities" 3 days duration	66	1648	4944
4.	Webinar on "Techno-Commercial improvement of DISCOM's" , 2 days duration	78	2129	4258
National Regular Programmes				
5.1	Classroom programme, 4 Days duration	23	286	1144
5.2	Online Webinar Training Programme – 2 Days Duration	5	63	126
In-House Programmes (for REC employees)				
6.1	Classroom Program (3 days)	8	95	285

6.2	Off-Campus Classroom Program (3 days duration)	1	26	78
7.1	Online Webinar on Vigilance Aspects, CDA Rules & Disciplinary procedures, for 1 Day duration	10	246	246
7.2	Online Webinar on Project Appraisals for 2 Days Duration	1	14	28
Customised Programmes				
8.	Classroom Programme	6	170	486
	Grand Total	280	6690	19864

12. Sustainable projects under Corporate Social Responsibility initiative by REC:

12.1 Progress made during the period

In line with the REC Corporate Social Responsibility Policy, Board of Directors, REC, has approved budgetary allocation of ₹ 249.86 crore for CSR activities for the financial year 2023-24. In pursuance of the Policy, REC has undertaken Sustainable projects under Corporate Social Responsibility initiatives in project mode. While identifying CSR initiatives REC has adopted an integrated approach to address the community, societal and environmental concerns.

12.2 Major CSR projects undertaken :

- Learn and Earn- A REC Foundation Initiative to impart bachelor's degrees to 300 youths in garment manufacturing and entrepreneurship, over the period of 3 years;
- Procurement of four e-buses, two charging stations for transportation of students in the campus of Maulana Azad National Institute of Technology;
- Assistance for creating "REC Foundation-Rupantar Role Model Schools" to align with the New Education Policy in 250 schools of 02 states and 02 union territories in 3 years;
- Providing 1000 school benches, 1250 bunk beds, 5000 rPET(recycled polyester) T-shirts made from plastic waste;
- Procurement, operation and maintenance of 10 nos. of mobile health clinics for primary health care services for a period of three years in Bhojpur district, Bihar;
- Construction of 2 hostel tower (G+9) with furniture, fixtures, landscaping, external lighting & approach road for post graduate students and installation of grid connected 100kWp roof top solar PV Panel under School of Medical Research and Technology on IIT, Kanpur campus;
- Broad basing of Sports (Athletics & Boxing) and promotion of excellence in sports in India;
- Construction of two multipurpose community hall in two villages of Krishna District, Andhra Pradesh;
- Setting up of 500 of solar street lighting system (12 Watt) with remote monitoring system (RMS) and 5 year comprehensive AMC IN 6 village panchayats of bilaspur district, Himachal Pradesh;
- Providing 4300 nos. of aids and appliances (approx.) to specially-abled persons in Assam, Bihar, Chhattisgarh, Jharkhand, Maharashtra, Rajasthan, Uttar Pradesh and Tamil Nadu;
- Construction of 500 nos. toilets blocks at work place of BSF troops in Gurdaspur, Amritsar, Ferozpur and Abhohar Districts in Punjab;
- Procurement and installation of Bhabhatron Multi Leaf Collimator (MLC) Radiotherapy equipment at Virat Hospice (run under aegis of Brahmarishi Mission Samiti), Jabalpur, Madhya Pradesh; and

12.3 CSR Expenditure during the period of January 1, 2023 to March 31, 2024:

The CSR expenditure from January 1, 2023 to March 31, 2024 is ₹ 350.48 crore.

CHAPTER 18

NHPC LTD.

NHPC Ltd. was incorporated on November 7, 1975 as a private limited company under the name "National Hydroelectric Power Corporation private Ltd". NHPC was converted to Public limited company w.e.f. April, 2, 1986. The name of the company was changed to its present name "NHPC Limited" in 2008.

NHPC is a Schedule-'A' Enterprise and a Mini Ratna company with 67.40% ownership of Government of India with an Authorized share capital of ₹15,000 crore and an investment base of over ₹ 78,803 crore (as on 31.03.2024). NHPC is ranked as the premier organization in the Country for development of Hydropower. NHPC is an ISO - 9001:2015, ISO - 14001 : 2015 and ISO - 45001 : 2018 certified company.

VISION

NHPC's vision is "To be a global leading organization for sustainable development of clean power through

competent, responsible and innovative values".

MISSION

- To achieve excellence in development of clean power at international standards.
- To execute & operate projects through efficient and competent contract management and innovative R&D in environment friendly and socio-economically responsive manner.
- To develop, nurture and empower the human capital to leverage its full potential.
- To practice the best corporate governance and competent value based management for a strong corporate identity and showing concern for employees, customer, environment and society.
- To adopt & innovate state-of-the-art technologies and optimize use of natural resources through effective management.

OBJECTIVES

- To plan, promote and organize an integrated and efficient development of power in all its aspects through Conventional and Non-Conventional Sources in India and Abroad, including planning, investigation, research, design and preparation of preliminary, feasibility and definite project reports, construction, generation, operation and maintenance of power stations and projects, transmission, distribution, trading and sale of power generated at Stations in accordance with the national economic policy and objectives laid down by the Central Government from time to time and release of water and other needs to the State Government as per the agreed parameters.
- To undertake, where necessary, the construction of inter-state transmission lines and ancillary works for timely and coordinated inter-state exchange of power.
- To coordinate the activities of its subsidiaries, to determine their economic and financial objectives / targets and to review, control, guide and direct their performance with a view to secure optimum utilization of all resources placed at their disposal.
- To act as an agent of Government / Public Sector financial institutions, to exercise all the rights and powers exercisable at any meeting of any Company engaged in the planning, investigation, research, design and preparation of preliminary, feasibility and definite project reports, construction, generation, operation, maintenance of Power Stations and Projects, transmission, distribution, trading and sale of power in respect of any shares held by the Government, Public financial institutions, nationalized banks, nationalized insurance companies with a view to secure the most effective utilization of the financial investments and loans in such companies and the most efficient development of the concerned industries.
- To carry on the business of purchasing, selling, importing, exporting, producing, trading, manufacturing or otherwise dealing in all aspects of planning, investigation, research, design and preparation of preliminary, feasibility and definite project reports, construction, generation, operation and maintenance of Power Stations and Projects, transmission, distribution and sale of Power, Power Development, including forward, backward or horizontal integration ancillary and other allied industries and for that purpose to install, operate and manage all necessary plants, establishments and works.

STRATEGIC ACTIONS

- Expansion of existing Hydro power capacity
- Diversification
- Exploring new opportunities in Renewable viz. wind & solar etc.
- Business generation from consultancy assignment
- Investment in state-of-the-art technologies
- Exploring business opportunities in Joint Venture modes.

PROJECT PORTFOLIO

UNDER OPERATION	26 nos.	7144.20 MW
HYDRO POWER STATIONS	22 nos.	6971.20 MW
NHPC OWN	20 nos.	5451.20 MW
JOINT VENTURE / SUBSIDIARY	02 nos.	1520 MW
OTHER RENEWAL PROJECTS (WIND / SOLAR)	04 nos.	173 MW
NHPC OWN	02 nos.	100 MW
JOINT VENTURE / SUBSIDIARY	02 nos.	73 MW
PROJECTS UNDER CONSTRUCTION	**13 nos.**	**10402 MW**

HYDRO (NHPC OWN)	03 nos.	5680 MW
NHPC OWN (SOLAR)	03 nos.	1000 MW
JOINT VENTURE / SUBSIDIARY (HYDRO)	06 no.	3634 MW
JOINT VENTURE / SUBSIDIARY (SOLAR)	01 nos.	88 MW
PROJECTS UNDER CLEARANCES	**12 nos.**	**4981 MW**
HYDRO (NHPC OWN)	04 no.	3116 MW
SOLAR (NHPC OWN)	04 no.	490 MW
HYDRO (JOINT VENTURE)	01 no.	930 MW
SOLAR (JOINT VENTURE)	03 nos.	445 MW
PROJECTS UNDER SURVEY & INVESTIGATION	**05 nos.**	**4750 MW**
HYDROPROJECTS	04 no.	4110 MW*
PUMP STORAGE	01 no.	640 MW
NEW INITIATIVES	**13 nos.**	**25030 MW**
HYDRO PROJECTS (IN NEPAL)	03 nos.	1680 MW
HYDRO PROJECTS IN ARUNACHAL PRADESH	02 nos.	13900 MW
PUMP STORAGE	08 nos.	9450 MW

* 4110 MW includes GarbaTawaghat Hydro Project (630 MW), in Uttarakhand State which falls under "Mahakali Treaty" and consent of Govt. of Nepal is required.

MAJOR ACHIEVEMENTS

- World's longest inclined Pressure Shafts (1546 m) in 800 MW Parbati-II H.E. Project
- India's largest reservoir at 1000 MW Indira Sagar Power Station having 12.22 Bm3 storage capacity.
- India's first Concrete Faced Rock-fill Dam (CFRD) in 280 MW Dhauliganga Power Station.
- Introduction of jet grouting in India at 510 MW Teesta-V Project.
- Commissioning of Chamera-II, Indira Sagar, Omkareshwar and Kurichu Project (Bhutan) ahead of schedule.
- Highest monthly progress of 816 m by TBM in the Country at 330 MW Kishanganga H.E. Project.

COMPANY(Date of Incorporation)	PROMOTERS & SHARE	PROJECTS
NHDC Limited (JV) (01.08.2000)	NHPC : Govt of Madhya Pradesh 51:49	Indira Sagar (1000 MW) Madhya Pradesh Commissioned in 2004
		Omkareshwar (520 MW) Madhya Pradesh Commissioned in 2007
Loktak Downstream HECL (23.10.2009)	NHPC : Govt. of Manipur 75:25	Loktak Downstream H.E. Project, (66 MW) Manipur
Bundelkhand Saur Urja Ltd. (JV) (02.02.2015)	NHPC : UPNEDA 74:26	Solar Project (65 MW) Jalaun, Uttar Pradesh
Lanco Teesta Hydro Pvt. Ltd. (09.10.2019) Date of Acquisition by NHPC	Wholly owned subsidiary of NHPC 100	Teesta-VI HE Project (500 MW) Sikkim
Jal Power Corporation Ltd. (JPCL) (31.03.2021) Date of Acquisition by NHPC	Wholly owned subsidiary of NHPC 100	Rangit-IV HE Project (120 MW) Sikkim
Ratle Hydroelectric Power Corporation Ltd. (JV) (01.06.2021)	NHPC : JKSPDC 51:49	Ratle HE Project (850 MW) UT of Jammu & Kashmir
CVPPPL (JV) (13.06.2011)	NHPC : JKSPDCL 51:49	Pakal Dul (1000 MW), Kiru (624 MW), Kwar (540 MW) Kirthai-II (930 MW) UT of Jammu & Kashmir
NHPC Renewable Energy Limited (16.02.2022)	Wholly owned subsidiary of NHPC 100	For Renewable Energy, Small Hydro and Green Hydrogen Projects of NHPC.

JOINT VENTURES

COMPANY(Date of Incorporation)	PROMOTERS & SHARE	PROJECTS
NHPTL PVT. LTD. (22.05.2009)	NHPC : NTPC : POWERGRID : DVC : CPRI NHPC : 12.5 %	For Constructing High Voltage Transformer Lab & Medium Voltage Transformer upto 765 KVA in Madhya Pradesh

FINANCIAL PERFORMANCE

During the financial year 2023-24, NHPC achieved net sale of ₹ 8405 crore and earned a Profit After Tax (PAT) of ₹ 3744 crore as against ₹ 3834 crore and ₹ 3538 crore for FY 2022-23 and FY 2021-22 respectively. The total dividend payout during the year

2023-24 is ₹1858 crore. As on 31.03.2024, Paid up Capital of NHPC is ₹ 10,045.03 crore.

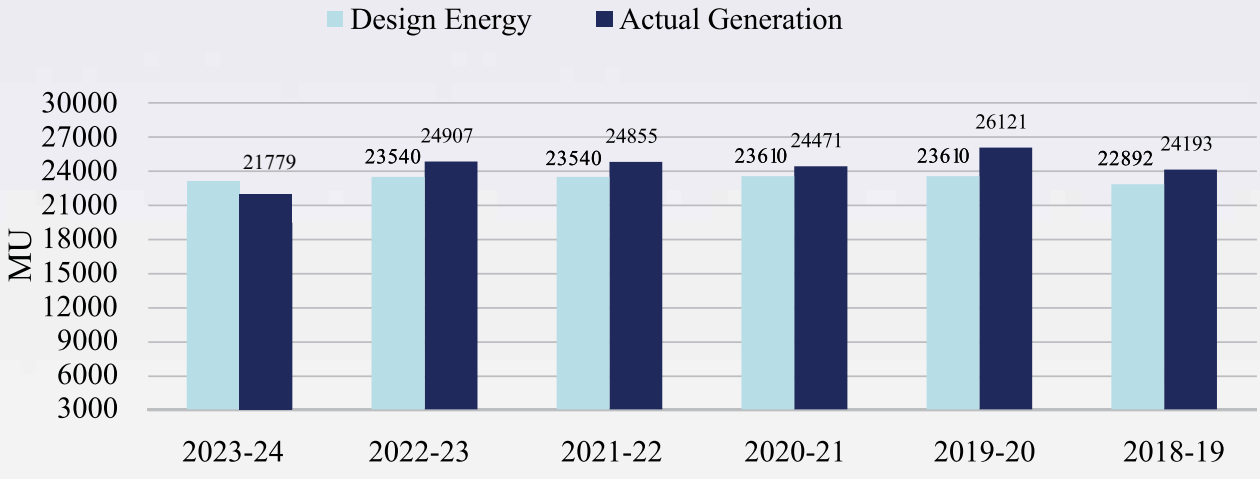
OPERATIONAL PERFORMANCE

The performance of Power stations can be evaluated in terms of their actual Generation w.r.t. their Design Energy. Other Parameter for Performance of Hydro Plants can be taken from their Plant Availability Factor (PAF). PAF of any Hydro Station is the average availability of Power Plant during a specific time period.

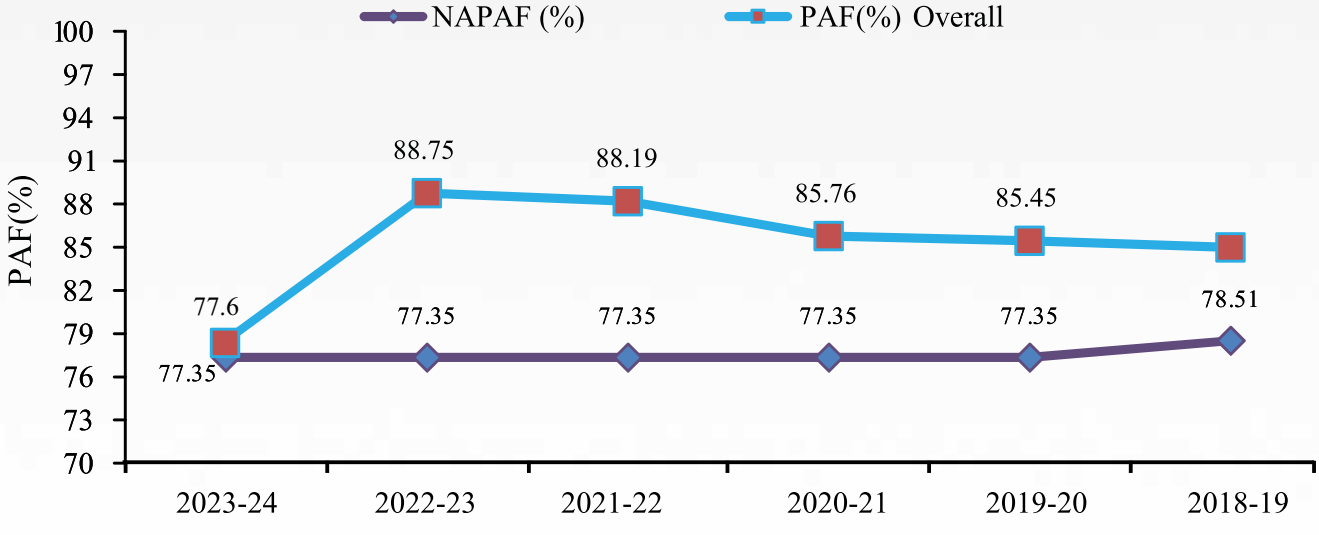
The actual Generation of all NHPC Power Stations w.r.t. their Design Energy and PAF during last during last five year and PAF of NHPC Hydro power Stations are as under:

PARTICULARS		2023-24	2022-23	2021-22	2020-21	2019-20	2018-19
GENERATION	Design Energy (MU)	23540	23540	23540	23610	23610	22892
	ACTUAL (MU)	21779	24907	24855	24471	26121	24193
PAF (Plant Availability Factor)	NAPAF (%)	77.35	77.35	77.35	77.35	77.35	78.51
	ACTUAL (%)	77.60	88.75	88.19	85.76	85.45	84.97

Performance of NHPC Power Stations – Actual Generation in last 05 years



Performance of NHPC Power Stations – Plant Availability Factor (PAF) % in last 05 years



RECENT HIGHLIGHTS

- NHPC has issued offer letters to 397 provisionally selected candidates (for post of Trainee Engineer/ Officer in disciplines of Civil, Electrical, Mechanical, Finance, HR and Law) during the 4th Tranche of Rozgar Mela held on 13.04.2023. All the selected candidates virtually attended the event wherein Hon'ble Prime Minister of India Shri Narendra Modi addressed the new recruits.
- In a major step towards venturing into Green Hydrogen business, NHPC has awarded the work to develop Grid connected Green Hydrogen Fuel Cell based 25 kW Microgrid Pilot Project at Nimmo Bazgo Power Station (UT of Ladakh) to M/s Uneecops Technologies Limited.
- On 1st June 2023, an MoU has been exchanged between NHPC Limited and Vidhyut Utpadan Company Limited (VUCL), Nepal for development of Phukot Karnali H.E. Project (480MW) in Nepal.
- An MoU has been signed between NHPC Limited and Department of Energy, Govt. of Maharashtra on 6thJune 2023 for the development of four Pumped Storage Projects aggregating to 7350 MW and other Renewable Energy Source Projects in the state of Maharashtra.
- A MoU has been signed between NHPC Limited and Govt. of Odisha through GRIDCO Limited on 23rd June 2023 for "Development of Pumped Storage Projects (PSPs) and Renewable Energy in the State of Odisha".
- Indira Sagar- Omkareshwer Pump Hydro Storage project with estimated storage capacity of (525 MW X 6 Hours) has been allotted to NHDC (Subsidiary of NHPC) on 7th June 2023 by Department of New and Renewable Energy, Govt. of Madhya Pradesh.
- Memorandum of Agreement has been signed between Government of Arunachal Pradesh and NHPC Ltd on 12th August'2023 in the august presence of Hon'ble Minister of Power & NRE for acquiring of Kamala HEP (1800 MW) and Subansiri Upper HEP (2000 MW) for further development by NHPC Ltd.
- NHPC signed an MOU on 23rd August'2023 with Andhra Pradesh Power Generation Corporation (APGENCO) Limited (A Govt. of Andhra Pradesh Undertaking) for Implementation of Pumped Hydro Storage Projects and Renewable Energy Projects under Joint Venture Mode in Andhra Pradesh.
- NHPC reviewed the Detailed Project Report submitted by VUCL and furnished Inception Report of Phukot Karnali HE Project, Nepal to VUCL on 30.08.2023 well within the period of 3 months from signing of MOU with VUCL.
- NHPC and Gujarat Industries & Power Company Limited (GIPCL) signed an MoU on 17th October 2023 to develop Energy Storage & Renewable Energy Projects as a joint endeavour in the State of Gujarat.

45 MW Nimmo Bazgo, UT of Ladakh

690 MW Salal, UT of J&K

540 MW Chamera Power Station Stage-I, Himachal Pradesh

- NHPC has issued Letter of Award (LOA) to 8 successful bidders on 7th December 2023 for "Development of 3000 MW ISTS (Inter State Transmission system) connected solar power projects on anywhere in India basis".
- The Tripura Power Generation Limited on 20th December 2023 has conveyed the allotment of 04 nos. Pumped Storage Projects to NHPC Limited by the Government of Tripura.
- An MOU has been signed on 16th December 2023 between NHPC and ONGC for "Cooperation in exploration & development of Pumped Hydro Storage & other Renewable Projects".
- NHPC has awarded the work to develop Green Hydrogen Based Mobility Station, near its Chutak Power Station, Kargil to M/s Gensol Engineering Limited. The Pilot Project comprises of a 500 kW Grid-connected Solar Power Plant and Electrolysers to produce 40 Kg of Green Hydrogen per day & Dispensing Station.
- A Power Purchase Agreement (PPA) was signed on 3rd January 2024 at Jaipur between Ratle Hydro Electric Power Corporation Limited (RHPCL) (a Joint venture company of NHPC Limited and JKSPDC) and Rajasthan UrjaVikas and IT Services Limited for off take of power generated from 850 MW Ratle Hydroelectric Project, Kishtwar, UT of J&K for the period of 40 years from the COD of project and Power allocation to be notified by Ministry of Power, Govt. of India.
- In a major thrust towards achieving Government of India's ambitious Renewable Energy capacity addition target and the goal of Net Zero by the year 2070, Hon'ble Prime Minister of India, Shri Narendra Modi laid the foundation stone of NHPC's 300 MW Solar Power Project located in Bikaner district of Rajasthan through video conferencing mode on 16th February, 2024. The project is being developed as a part of government of India's CPSU Scheme, phase-II, tranche-III, with a total investment of over Rs. 1,732 crores. The project aims to produce around 750 million units of green power annually, considering a Capacity Utilization Factor (CUF) of 28.50%. This will thereby offset carbon dioxide emissions of approximately 18,000 million Metric tons over its lifetime. The project is scheduled for commissioning by September 2024.
- NHPC, designated as a Renewable Implementing Agency (REIA) by Ministry of New & Renewable Energy, Govt. of India, commissioned 380 MW Solar Power Project at Neemba, Fatehgarh, Rajasthan on 07.02.2024 through the developer M/s Altra Xergi Power Pvt. Ltd. Out of total 2000 MW projects awarded earlier by NHPC, 320 MW Solar Project already commissioned during FY-2022-23 making cumulative commissioned capacity of 700 MW under this tranche.
- Hon'ble Prime Minister of India, Shri Narendra Modi inaugurated 380 MW Solar Project (located at Village Nimba & Magre ki Dhani, Jaisalmer District, Rajasthan) being implemented by NHPC as Renewable Energy Implementing Agency and also laid the foundation of 1200 MW Jalaun Ultra Mega Renewable Energy Power Park of BSUL (NHPC's JV with UPNEDA) on 4th March 2024. 380 MW Solar Project has been developed by 'M/s Altra Xergi Power Private Limited' (SPV of M/s O2 Power SG Pvt Ltd).
- Hon'ble Prime Minister of India Shri Narendra Modi laid the foundation stone of 2,880 MW Dibang Multipurpose Hydropower Project of NHPC Limited located in Lower Dibang Valley district of Arunachal Pradesh, at a Viksit Bharat Viksit North East Program in Itanagar, Arunachal Pradesh on 09th March, 2024. The Dibang Dam will be the highest dam structure in the country. The Project will generate 11,223 million units every year, providing clean and green energy which will be fed into the Grid. With a construction period of 108 months, the project is scheduled to be commissioned in February 2032 with estimated cost of Rs. 31,876.39 crore at May '2021 price level.
- NHPC on 28th March 2024 has signed an agreement with Japan Bank for International Cooperation (JBIC), Japan for a loan of JPY 20 billion for implementation of renewable project including 300 MW Solar power Project, Bikaner being developed under CPSE 1000 MW Scheme.

SUBANSIRI LOWER H.E. PROJECT (DAM VIEW)

CHAMERA-I POWER STATION (540 MW) – DAM VIEW

CHAPTER 19

NORTH EASTERN ELECTRIC POWER CORPORATION (NEEPCO)

North-Eastern Electric Power Corporation Ltd. (NEEPCO) is a Central Sector PSU incorporated in April 1976 to plan, investigate, construct, operate & maintain power stations in the North-Eastern Region of India. The domain has later been expanded to other parts of the country and outside. NEEPCO was upgraded to a Schedule 'A' PSU in 2008 and later conferred with Mini Ratna Category-I status in 2013. The authorized share capital of NEEPCO is ₹5000 Cr.

NEEPCO was earlier a wholly owned Govt. of India Enterprise and the President of India and its nominees held 100% (Hundred Percent) equity shares of the Company. On 25th March 2020, pursuant to the decision of the Government of India, a Share Purchase Agreement (SPA) was signed between the President of India (Seller) and NTPC Limited (Buyer), transferring the entire shares to NTPC Limited and its nominee shareholders. It is wholly owned subsidiary of NTPC Ltd.

NEEPCO's total installed capacity is 2057 MW, out of which 1525 MW is in Hydro, 527 MW in Gas and 5 MWp in Solar Sectors.

POWER STATIONS OF NEEPCO:

S. N.	Name of Station	Installed Capacity (MW)	Design Energy (MU)
HYDRO			
1	Khandong Power Station, Assam	50	217
2	Kopili Power Station, Assam	200	994
3	Khandong Stage- II Power Station, Assam	25	86
4	Doyang Hydro Power Station, Nagaland	75	227
5	Panyor Lower Hydro Power Station, Arunachal Pradesh	405	1294
6	Tuirial Hydro Power Station, Mizoram	60	251
7	Pare Hydro Power Station, Arunachal Pradesh	110	506
8	Kameng Hydro Power Station, Arunachal Pradesh	600	3353
GAS			
9	Assam Gas Based Power Station, Assam	291	1746
10	Agartala Gas Based Power Station, Tripura	135	810
11	Tripura Gas Based Power Station, Tripura	101	752
SOLAR			
12	Monarchak Solar Power Station, Tripura	5	8.32

OPERATIONAL PERFORMANCE:

Physical:

The generation from NEEPCO's Power Stations during 01.01.2023 to 31.03.2023 is 1407 MU. Plant Availability Factor (PAF) for Hydro Power Stations and Gas Power Stations during this period was 73.79% and 82.93% respectively.

For the period 01.04.2023 to 31.03.2024, the generation from NEEPCO's Power Stations was 8001 MU. Plant Availability Factor (PAF) for Hydro Power Stations and Gas Power Stations during this period was 88.60% and 72.76% respectively.

Financial:

The total expenditure and total income during FY 2023-24 are ₹ 3642.04 Cr. and ₹ 4264.23 Cr. respectively.

Commercial:

Total billing against sale of power during last quarter of FY 2022-23 (i.e. 01.01.2023 to 31.03.2023) was ₹ 925.13 Crore, against which ₹ 989.91 Crore has been realized from the beneficiaries.

Total billing against sale of power during the FY 2023-24 (i.e. 01.04.2023 to 31.03.2024) was ₹ 4084.68 Crore, against which ₹ 4229.35 Crore has been realized from the beneficiaries.

FUTURE VISION OF NEEPCO:

NEEPCO signed MoAs for development of several Hydro projects in the states of Arunachal Pradesh and Meghalaya. In addition to the above, Pre-feasibility Reports (PFRs) have been prepared for a few Pumped Storage Projects in NER.

The brief details of the projects under active consideration for development are as below:

Hydro Projects in Arunachal Pradesh:

- **Tato-II HE Project (700 MW):** CEA concurrence and Project proponents in Environment Clearance (EC) has been transferred to NEEPCO. Land acquisition process is completed. The proposal for the diversion of forest land was recommended in the PSC-II meeting held on 28.06.2024. As advised by CEA, Cost has been updated, which would be scrutinized by CEA. Tender for Diversion Tunnel works has been floated. Bid level consultancy work awarded. Topographical & Hydrographical survey completed.
- **Tato-I HE Project (186 MW) & Heo HE Project (240 MW):** CEA concurrence and Project proponents in Environment Clearance (EC) has been transferred to NEEPCO. FC-I of the projects transferred to NEEPCO.

Compliances for grant of FC-II have been completed and FC-II for the projects are expected shortly. Land and property survey completed. Land awards expected shortly. PIB Memos have been circulated by MoP to the appraising departments and support letters from Ministry of Jal Shakti, GOI and Govt. of Arunachal Pradesh received. Topographical & Hydrographical survey completed. Bid level / construction stage consultancy works awarded for Tato – I HEP and Bid level consultancy works awarded for Heo HEP.

- **Naying HE Project (1000 MW):** CEA concurrence has been transferred in favour of NEEPCO. As directed by MoEF&CC, de-novo application through PARIVESH portal for grant of EC and FC is under process. The TOR has been recommended by the EAC. Demand letter of DLR&SO, Siang District, GoAP for land survey charges issued on 11.07.2024 and same is under process. Topographical & Hydrographical survey completed.
- **Hirong HE Project (500 MW):** DPR revision works has been awarded on 13.10.2023. Topographical & Hydrographical survey completed.
- **Kurung HE Project (330 MW):** Preparation of Detailed Project Report (DPR) is under progress. EIA/EMP study is under progress. Topographical & Hydrographical survey completed.
- Nafra HE Project (120 MW): CEA concurrence has been transferred in favour of NEEPCO. The project is currently sub-judice as the former developer is seeking reimbursement of prior expenditures.
- New Melling HEP (180 MW): The project is currently in sub-judice as the former developer is seeking reimbursement of expenditures incurred before termination by State Govt.

Hydro Electric Projects in Meghalaya:

- Wah Umiam St – III HEP (85 MW): All formalities for Forest Clearance, land acquisition, etc. of Stage-III are under process at concerned departments of Govt. of Meghalaya.
- Wah Umiam St-I HEP (50 MW) & Wah Umiam St- II HEP (100 MW): MoA for the projects was signed with the Govt. of Meghalaya in October 2022. After Preliminary study, commercial viability could not be established. Fresh study was carried out and a Pumped Storage Project (PSP) i.e. Wah Umiam PSP (800 MW) has been proposed.

Pumped Storage Projects:

- **Indicated PSP sites, Mizoram**

  Pre-Feasibility Reports (PFR) for Leiva Lui (1500 MW), Nghasih (500 MW), Tuiphai Lui (1650 MW) in Mizoram have been prepared and cost & tariff for the projects are found to be on higher side on initial examination. NEEPCO shall further examine the feasibilities for future development of the projects.

- **Kopili PSP (320 MW), Assam**

  NEEPCO has also identified Kopili PSP (320 MW) at Kopili HPS of the Corporation. PFR for the project is completed and is under examination. Cost is found to be on higher side on initial examination. On establishment of feasibility, DPR activity shall be initiated.

- **Wah Umiam PSP (800 MW), Meghalaya**

  PFR preparation for the project completed by NEEPCO. The PFR has also been examined and concurred by the Hydro and Renewable Energy Department (HRED), IIT Roorkee. Process initiated for preparation of DPR in respect of the project.

- **Wah Umsong PSP (1500 MW), Meghalaya**

  PFR study under progress by NEEPCO. In the Initial proposed site, the head was found to be very high and therefore, the exploration of alternative site is in progress.

Solar Projects:

- **300 MW (Phase - I) ISTS connected Ground mounted Solar Project:**

  Notification of award for EPC package with land for development of 300 MW ISTS connected ground mounted solar PV projects at Bikaner, Rajasthan issued on 29.02.2024. Acquisition of land is in process.

- **300 MW (Phase - II) ISTS connected Ground mounted Solar Project:**

  Online tender for EPC package with land for development of ISTS connected ground mounted Solar PV Project (upto 300 MW-Phase II) anywhere in India is floated by NTPC Green Energy Limited on behalf of NEEPCO on 18.01.2024. Techno-Commercial Evaluation is in progress.

- **35 MW Kopili Floating Solar Project:**

  Detailed Project Report (DPR) for 35 MW (AC) Floating Solar Project at Kopili Hydro Power Station is completed and Tender for EPC contract is under preparation.

GREEN HYDROGEN:

NEEPCO has undertaken an R&D study in November 2022 for Development of low cost sustainable and efficient electro-catalyst and proton exchange membrane for electrolyser assembly for producing Green Hydrogen through IIT, Guwahati. The completion period is 3 years.

CSR ACTIVITIES:

Over the years, NEEPCO has undertaken CSR activities on Health and Sanitation, Promotion of Education, Entrepreneurship Development Program, Rural Development and Swachh Bharat Abhiyan for all round development of the people residing in and around its operational areas. Every year, NEEPCO ensures at least 2% of the average net profit of the Company made during the 3(three) immediately preceding financial years is spent for CSR activities as per the NEEPCO CSR Policy and the guidelines laid down by the Government of India.

CHAPTER 20

GRID CONTROLLER OF INDIA LTD.

GRID-INDIA Overview

'Power System Operation' is a mission critical function of national importance for smooth evacuation of power from generating stations and supply to the end consumers in the electricity supply value chain. System operators ensure the power balance in the interconnected power system on a real time basis in a secure and reliable manner.

GRID-INDIA has the onerous responsibility of operating the All India synchronous grid, one of the largest and most complex in the world, ensuring reliability and security. India is ranked third in terms of electricity generation, electricity consumption, installed generation capacity and size of transmission system in the world. The power sector in India has witnessed a transformational change with progressive policy-level reforms and effective implementation of the same in the recent years. GRID-INDIA, through its National Load Despatch Centre (NLDC) and five (5) Regional Load Despatch Centres (RLDCs), facilitates the inter-state transmission of power to utilities across India ultimately reaching to over 1.40 billion people. GRID-INDIA also administers India's electricity market through coordination with thousands of entities every day for balancing demand and generation every 15 minutes in line with the regulations of Central Electricity Regulatory Commission (CERC).

The functions of GRID-INDIA have been evolving with the Integration of power systems, increase in electrical energy demand, growth in the economy and changes in technology, regulations, market design, administration and management of the power system. GRID-INDIA is a knowledge based organization and is fulfilling various other functions assigned by the Govt. of India, from time to time. GRID-INDIA is facilitating and enabling power sector reforms by Ministry of Power, regular feedback is being provided to the CERC, Central Electricity Authority (CEA) and Central Transmission Utility (CTU) on design & operational aspects pertaining to Power System and Power Market Operation.

GRID-INDIA is committed towards ensuring Integrated Operation of Regional and National Power Systems to facilitate transfer of electric power within and across the regions and trans-national exchange of power with Reliability, Security and Economy. It ensures independent system operation and provides level playing field to all stakeholders.

Operational Highlights

The tremendous pace of expansion of the generation, transmission and distribution in terms of higher voltages, large footprint and new technologies has strengthened the Indian power grid supporting the Government of India's vision on attaining 'Power for all'. GRID-INDIA has continued to advance grid operations and market design initiatives to prepare Indian grid for the future. The operational highlights for 2023-24 are as follows:

Particulars	2023-24	20222-23	% Change	Highest ever
All India Energy Met (BU)	1620	1510	7.3	5224 MU on 02nd September 2023
All India Highest Demand Met (GW)	240.0	211.9	13.3	240.0 GW on 01st September 2023
All India Hydro Generation (BU)	144.2	174.0	-17.1	877 MU on 30th August 2022
All India Thermal Generation (Coal & Lignite) (BU)	1234.2	1131.3	9.1	3835 MU on 29th March 2024
All India Wind Generation (BU)	80.2	71.8	12.7	611 MU on 02nd August 2023
All India Solar Generation (BU)	107.9	95.2	13.4	398 MU on 8th March 2024
Energy facilitated through inter-regional exchange (BU)	249.5	236.2	5.7	-
Import from Bhutan (MU)	3862.8	6379.8	-39.5	45.8 MU on 30th June 2023
Export to Bangladesh (MU)	8413.5	8622.1	-2.4	26.4 MU on 17th September 2023
Export to Nepal (MU)	154.1	158.0	-2.5	15.9 MU on 12th May 2023
Export to Myanmar (MU)	8.5	9.8	-13.3	-
Energy approved through Short Term Open Access (BU)	171.7	169.2	1.5	-

Note: All generation figures are ex-bus

Achievements

Frequency Profile

During FY 2023-24, Frequency remained within Indian Electricity Grid Code (IEGC) band of 49.90-50.05 Hz for 73.90% of time. Frequency remained within the IEGC band for highest 87.4% of time on 25th Sep 2023 in the year. On most of the days, average frequency was close to the national reference frequency of 50 Hz.

Security Constrained Economic Despatch (SCED)

Based on Govt. of India Policy framework and Regulatory directions, to optimize the national resources a Pilot on Security Constrained Economic Despatch (SCED) in ISGS Pan India was implemented w.e.f. 1st April 2019. The pilot was implemented by GRID-INDIA for all the thermal ISGS that are regional entities and whose tariff is determined or adopted by the Central Commission for their full capacity honouring the existing scheduling practices prescribed in the Grid Code. A robust, integrated SCED software application was developed in-house, which runs every 15 minutes on 24x7 basis to optimize the all-India variable cost of generation, while fulfilling grid security constraints. As on 31st March 2024, a total of 52 plants with installed capacity of ≈ 63.42 GW form part of the SCED optimization. As on 31st March 2024, the cumulative reduction (savings) in total production costs / variable charges due to SCED generators is approx. ₹ 3546 Crore (exc. Heat compensation). SCED has moved from pilot phase to full-fledged implementation from 1st October 2023 onwards with implementation of Indian Electricity Grid Code, 2023.

Development of Ancillary Services

Ancillary services are one of the four essential pillars of market design; the other three being scheduling & despatch, imbalance handling and congestion management. Ancillary services have gained increased importance in today's restructured power systems to ensure reliable operation of the grid. CERC notified the Ancillary Services Regulations, 2022 which had replaced the Reserve Regulation Ancillary Service (RRAS) mechanism in operation since 2015. The regulations introduced Secondary Reserve Ancillary Service (SRAS) and Tertiary Reserve Ancillary Service (TRAS). The regulations provide for estimation of quantum of reserve required for SRAS and TRAS by NLDC.

The secondary frequency control is being accomplished by SRAS providers through the Automatic Generation Control (AGC) technology. Hon'ble Cabinet Minister of Power and New & Renewable Energy, Government of India dedicated the Automatic Generation Control (AGC) to the nation on 03rd January, 2022. As on 31st March 2024, 70 power plants with total capacity of ≈70 GW have been integrated with AGC at national level and are continuously operating round the clock. The pan-India AGC project, shall enable efficiency and grid security in the India power system, making it ready to handle 500 GW of non-fossil generation capacity targeted by 2030. The requirement for grid integration of renewables have been streamlined and at the same time grid requirements compliance monitoring has also been strengthened for grid reliability.

The tertiary frequency control is being facilitated through Tertiary Reserves Ancillary Services (TRAS) w.e.f. 1st June 2023 as per the CERC order dated 28th April 2023. For the first time in the Indian Power system, reserves under TRAS are being procured through power exchanges in Day Ahead Ancillary Market and Real Time Ancillary market. TRAS Up and Down bids collected by power exchanges from TRAS providers are forwarded to NLDC where clearing and price discovery is being done. Dispatch of TRAS is being done fifteen minutes in advance from the cleared TRAS providers. A sophisticated software implementation has been developed for bid collection, clearing, dispatch and scheduling of TRAS in a fully automated manner. As of 31st March 2024, 85 TRAS providers have registered on the NOAR platform.

National Open Access Registry (NOAR)

NOAR has been successfully operating round the clock from 1st May 2022. NOAR has been designed as an integrated single window electronic platform accessible to all stakeholders including open access participants, traders, power exchanges, national/regional/state load dispatch centres for electronic processing of short-term open access application thereby automating the administration of the short-term open access in inter-state transmission system. NLDC operated by GRID-INDIA has been designated as the nodal agency for implementation and operation of NOAR. NOAR is the key to facilitate faster electricity markets and enable integration of Renewable Energy (RE) resources into the grid. It enables seamless market participation by the open access consumer with easier and faster access to the short-term electricity market, comprising of about 10% of all India demand. NOAR is part of the Ministry of Power, Government of India's initiative and the required regulatory framework has been notified by the CERC through operationalization of the 5th Amendment Regulation of Open Access in inter- State Transmission.

As on 31st March 2024, around 2300 no. of users are registered on NOAR platform. 118399 no. of Open Access transactions with a cumulative energy quantum of 171660 MU were approved through NOAR during the FY 2023-24.

Green Energy Open Access

Ministry of Power has notified Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 on 06.06.2022 in order to further accelerate the ambitious renewable energy programmes, with the objective of ensuring access to affordable, reliable, sustainable and green energy for all. Union Minister of Power & New and Renewable Energy launched the Green Energy Open Access portal on 11th November 2022. The portal provides a transparent, simplified, uniform and streamlined procedure for granting open access to green energy that would be key to facilitating deepening of electricity markets and enabling integration of Renewable Energy (RE) resources into the grid. The portal may be accessed at https://greenopenaccess.in/ .

As on 31st March 2024, 194 no. of users are registered on GOAR

platform. 19797 no. of Green Energy Open Access applications with a cumulative energy quantum of 14834.81 MU were approved through GOAR from November'22 to March'24.

Renewable Energy Management Centres (REMCs)

13 number of Renewable Energy Management Centres (REMCs) co-located with the State Load Despatch Centres (SLDCs) in Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Madhya Pradesh, Gujarat, Rajasthan, Telangana & Andaman and in RLDCs at Bengaluru, Mumbai and New Delhi and at the NLDC, New Delhi have been commissioned. As on 31st March 2024, 103.56 GW of renewable (58.21 GW Solar and 45.35 GW Wind) is being monitored through the REMCs. REMCs serve as dedicated RE management system to facilitate safe & secure grid operation in the area of responsibility. REMCs are equipped with Forecasting and Scheduling Tool & Real Time Monitoring of RE generation which enables safe, secure and optimal operations of the overall grid. REMCs facilitated significant renewable integration in the grid, with maximum wind and solar generation touching 73 GW (Wind ~ 25 GW& Solar ~ 48 GW).

Renewable Energy Certificate Mechanism

Renewable Energy Certificate (REC) Mechanism is a market-based instrument in India for promotion of RE sources. It was introduced in India in November 2010. REC Mechanism provides a means to address the dispersed availability of renewable energy sources across various States in the Country and separates the 'green' component from the 'electricity' component and facilitates meeting of the Renewable Purchase Obligation (RPO) by the obligated entities. The REC Regulations, 2022 has been notified by CERC on 9th May 2022 and the same has been operationalized w.e.f. 5th December 2022. A Revamped REC Web portal has been launched by GRID-INDIA on 5th December 2022 to implement the new REC Mechanism framework. A total of 2.84 Crore RECs were issued in FY 2023-24. Approx. 1.39 Crore RECs were traded in FY 2023-24 through IEX, PXIL, HPX and Electricity Traders.

Introduction of Uniform Renewable Energy Tariff

The Ministry of Power (MoP) has introduced the Uniform Renewable Energy Tariff for Central Pool of Renewable Energy sources vide the Electricity (Amendment) Rules, 2022. A uniform tariff for the renewable energy is expected to encourage distribution companies (DISCOM) to sign power purchase agreements (PPAs) and promote the development of the renewable energy sector. The uniform tariff structure is expected to create a stabilizing environment, promoting efficiency and stability.

Carbon Credit Trading Scheme, 2023

The Ministry of Power, has notified the Carbon Credit Trading Scheme (CCTS), 2023, on 28.06.2023, under the Energy Conservation Act, 2001. This scheme establishes the framework for the Carbon Credit Trading Scheme, 2023, in India, aiming to promote greenhouse gas emissions reduction through trading of carbon credit certificates. The Central Government has established National Steering Committee for Indian Carbon Market to govern and oversee the Indian carbon market. The Bureau of Energy Efficiency (BEE), in consultation with GRID-INDIA, is developing a web portal for the registry of the CCTS, ensuring an efficient and streamlined process for all stakeholders.

Indian Electricity Grid Code (IEGC) Regulations, 2023

IEGC Regulations 2023 were implemented w.e.f. 1st October 2023 which replaced the IEGC, 2010. The Resource adequacy planning, resilience, Unit Commitment and Economic Despatch provisions are included in the Grid Code, 2023 considering increased Renewable energy penetration and to ensure reliable electricity supply. In a major shift from the earlier paradigm of scheduling, access to the grid and scheduling as per contracts have been delinked under General Network Access (GNA). The buyers can flexibly schedule power under any type of contract which would help in optimizing their power procurement costs. GRID-INDIA facilitated the transition to new Grid Code from 1st October 2023 onwards by drafting 19 detailed procedures delegated under IEGC and undertaking the vast changes required in various software and development of new software.

High Price Day Ahead Market (HP-DAM)

Ministry of Power has launched a High Price Day Ahead Market on 10th March 2023 as an initiative to ensure greater availability of power during the peak demand season. HP-DAM segment will enable sellers with high-cost generation and willing buyers to trade on Exchanges. Through this segment, gas-based power generators, imported coal- based plants and battery-energy storage systems will now be able to sell electricity on Power Exchanges. This will help in availability of additional generation capacity in the grid to meet power requirement during the peak days. Hon'ble Commission vide order in Petition No. 04/SM/2023 dated 31st March 2023 has introduced a price ceiling of ₹ 20 per kWh in the HP-DAM segment in Power Exchanges. In FY 2023-24, total quantum of 39.83 MU has been traded in High Price Day Ahead Market.

Energy Efficiency and Perform, Achieve and Trade (PAT) Scheme

To promote energy efficiency in the large-scale energy intensive industries, MoP, Govt. of India has launched Perform, Achieve and Trade (PAT) scheme under National Mission for Enhanced Energy Efficiency (NMEEE). MoP has notified Energy Conservation Amendment Rules, 2022 vide notification dated 30th August 2022, wherein the floor price for ESCert has been introduced and notified that Energy Savings Certificates issued shall remain valid till these energy saving certificates are sold.

Battery Energy Storage Systems (BESS)

India has set a target to achieve 50 percent cumulative installed capacity from non-fossil fuel-based energy resources by 2030 and has pledged to reduce the emission intensity of its GDP by 45 percent by 2030, based on 2005 levels. The availability of adequate Energy Storage Systems (BESS, hydro pump storage

plants etc.) is essential to achieve this target. As per 4th National Electricity Plan notified in March 2023, the energy storage capacity required for 2029-30 is likely to be 60.63 GW (18.98 GW PSP and 41.65 GW BESS) with storage of 336.4 GWh (128.15 GWh from PSP and 208.25 GWh from BESS). Ministry of Power vide resolution dated 10.03.2022 has issued detailed guidelines for procurement and utilization of BESS as part of generation, transmission, or distribution assets, or along with ancillary services. Based on these Guidelines, Solar Energy Corporation of India (SECI) has carried out bidding of 500 MW/1,000 MWh BESS project which has been awarded at a cost of Rs.10.835 Lakh/MW/month. The successful bidder/ bidders is in the process of signing the Battery Energy Storage Purchase Agreements (BESPA).

Participation in Policy & Regulatory Reforms

GRID-INDIA actively supported Ministry of Power in the various policy and legislative processes. At the regulatory level too, GRID-INDIA has been associated with introduction of Uniform Renewable Energy Tariff, Carbon Credit Trading Scheme, Green Energy Open Access, National Open Access Registry, Gate Closure, Real Time Markets, pilot on five-minute scheduling and settlement, Security Constrained Economic Despatch, Sharing of Inter-State Transmission Charges and Losses etc.

Grid Resilience

The impact of climate change leading to adverse weather conditions and/or natural disasters in many pockets as well as the increasing number of high impact low probability incidents bring about a need for making the system more resilient. GRID-INDIA-NLDC as the Nodal Agency for Disaster Management in Power Sector coordinated for preventive measures and quick restoration during natural calamities such as very severe Cyclone Biparjoy in June 2023 & severe cyclonic storm Michaung in December 2023.

Institution Building and Strengthening

Human capital management and building sustainable institutions is a key priority area for GRID-INDIA. Employees are encouraged to learn new skills, take up more responsibilities and be unfazed in the face of challenges. As part of the GRID-INDIA's emphasis on development of human capital, employees now have greater access to upgrade themselves through online training platforms as well as training conducted by in-house and external trainers. GRID-INDIA is also collaborating with the State Load Despatch Centres in various functional areas, leading to knowledge sharing and overall development of the sector. GRID-INDIA is well-positioned to lead the transition to greater renewable energy penetration in the Indian power sector, given our quality resources, experience and technical knowhow.

Forum Of Load Despatchers (FOLD)

- 3rd LDC Excellence Award ceremony was hosted on 18th December 2023. ERLDC, SLDC-Maharashtra, SLDC-Bihar and SLDC-Meghalaya were awardees in RLDCs, Large SLDCs, Medium SLDCs and emerging SLDCs categories respectively.
- Two new Working Groups were formed in 2023 viz.
    i. Implementation and benefits from Scheduling, Accounting, Metering and Settlement of Transactions in Electricity (SAMAST) scheme.
    ii. Integration procedure for Renewable Energy or Inverter Based Resources (IBR)
- 2 Working Group Reports on Cyber Security and Resource Adequacy, drafted with collaboration from RLDCs, SLDCs were released during the year.

Corporate Social Responsibility

Every year GRID-INDIA carries out CSR activities in compliance of the provisions of the Companies Act, 2013. An amount equivalent to 2% of average of previous three-years' net profit of the company is allocated on the CSR activities. During FY 2023-24, an amount of Rs. 110.88 Lakh was utilised against the earmarked allocation of Rs. 108.86 lakh towards taking up CSR activities. Following activities were implemented under CSR, during FY 2023-24:

- Design of prosthetic hand for below-elbow disabilities
- Supply of Medical equipment and other healthcare Infrastructure items in Govt. hospital/Polyclinic/ Maternity home/ Maternity & Child Welfare Centre
- Organizing camps for providing aids and assistive devices to Persons with Disabilities in one of the Aspirational Districts identified by NITI Aayog Activities promoting Swachch Bharat Abhiyan/ Swchchta Pakhwada/ Swasthya/ Contribution to Swachch Bharat Kosh
- Capacity Building in the field of Computer education
- Activities promoting Swachch Bharat Abhiyan/ Swasthya/ Contribution to Swachch Bharat Kosh
- Promoting research and studies related to Power Systems in the engineering institutions to encourage excellence in the area

CHAPTER 21

SJVN Ltd.

1.0 About SJVN

SJVN Limited, a Mini Ratna, Category-I and Schedule –'A' CPSE under administrative control of Ministry of Power, incorporated on May 24, 1988 as a joint venture of Government of India (GoI) and Government of Himachal Pradesh (GoHP) to plan, promote, develop all forms of power, both renewable as well as non-renewable and all ancillary activities related thereto, in India and abroad.

GoI through an IPO of SJVN in the month of May, 2010 offered 10.03% of its share to public and financial institutions. Present equity share holding of GoI, GoHP and Public is 55%, 26.85% and 18.15% respectively. The authorized capital of SJVN is Rs. 7,000 crore and paid-up capital is Rs. 3930 crore. The share and market capitalization of SJVN as on 01.04.2023 was Rs. 33.25/- and Rs. 13067 crore respectively, improved to Rs. 121.40/- and Rs. 47707.77 crore respectively as on 31.03.2024, registering 265 % growth.

Beginning with construction of India's largest 1500 MW Nathpa Jhakri Hydro Power Station in Himachal Pradesh, SJVN is presently implementing power projects in Himachal Pradesh, Uttarakhand, Gujarat, Bihar, Uttar Pradesh, Punjab, Madhya Pradesh, Arunachal Pradesh, Mizoram, Maharashtra, Assam, Rajasthan, Karnataka and Odisha in India besides neighbouring country of Nepal. Apart from hydropower, SJVN has ventured into thermal power, wind power, solar power, power transmission and power trading. SJVN has commissioned 60 MW Naitwar Mori HPS, 37 km 220 kV transmission line for the project in Uttarakhand, 75 MW Gurhah SPP (UP), 50 MW Gujrai SPP (UP) and 100 MW Raghenesda SPP (UP) during FY 2023-24.

During FY 2023-24 NJHPS and RHPS have generated 6312 MUs and 1778 MUs respectively up to 31.03.2024. From all other projects, 1402 MU energy has been generated cumulatively up to 31.03.2024 during FY 2023-24.

Presently, SJVN has a total of eighty-six power projects having 56802 MW total capacity and three transmission lines of 340 km. Out of this, 2377 MW (11 power projects) and two transmission lines of 123 km are under operation, 4926 MW (17 power projects) and one transmission line of 217 km are under construction. 19 projects totaling 9167 MW are under Pre- construction State, 15 projects totaling 6990.90 MW under Survey & Investigation and 25 projects including 9 PSPs totaling 33342 MW are under various stages of development/ allotment.

SJVN has paid a total dividend of Rs. 707.36 crore for FY 2023-24. The year-wise details of dividends paid in the last three years is given as follows:

Year	GoI	GoHP	Public	Total
2020-21	518.06	232.10	114.40	864.56
2021-22	400.32	179.35	88.40	668.07
2022-23	404.81	186.74	104.03	695.58
2023-24	389.04	189.90	128.42	707.36

2.0 Progress Made During 2023-24

The Progress made during the year 2023-24 up to 31.03.2023 is as under:

Description	Actual Achievement up to 31.03.2024 during the FY23-24
Hydro Power (MUs)	8131.38
Wind Power (MUs)	150.99
Solar Power (MUs)	210.07
Total	8492.44

*Four projects of SJVN i.e. 60 MW Naitwar Mori HEP, 75 MW Gurhah SPP, 50 MW Gujrai SPP and 100 MW Raghenesda SPP have been commissioned in FY 2023-24.

3.0 Achievements and Awards

- Commissioning of 60 MW Naitwar Mori HEP in Dec, 2023.
- Commissioning of 75 MW Gurhah Solar Power Project in Dec, 2023.
- Commissioning of 75 MW Gujrai Solar Power Project in Feb, 2024.
- Commissioning of 100 MW Raghenesda Solar Power Project in Feb, 2024.
- Recommendation for Investment approval of 669 MW Lower HEP by Public Investment Board.
- Signing of Project Development Agreement of 669 MW Lower Arun HEP. SJVN has also signed MoA with Govt. of Arunachal Pradesh for five projects of 5097 MW.
- MoU with REC for financing power projects for amounting to Rs. 50,000 crore and with PFC for Rs. 1,18,000 crore. SJVN has

also secured Rs. 10000 crore construction finance facility from group of leading Domestic and International lenders.

- First CPSU in Power Sector to successfully implement Anti-Bribery Management System (ISO 37001: 2016)
- SJVN awarded with prestigious 'RE Developer of the Year for Rajasthan Silver Award'.
- SJVN awarded with prestigious 'IEI Industry Excellence Silver Award 2023'.
- SJVN awarded with prestigious '23rd Annual Greentech Environment Award 2023'.
- SJVN's Subsidiary SGEL awarded with prestigious 'Diamond Award for Large Scale Solar Developer'.
- SJVN has also been certified as Great Place To Work by Great Place To Work™, India.

4.0 Financial Parameters of SJVN

The financial performance of SJVN for the last five financial years is as under:

(Rs. crore)

Description	2023-24	2022-23	2021-22	2020-21	2019-20
Total income	2833.56	3298.84	2625.54	3213.07	3095.24
Profit after tax	908.40	1363.45	977.52	1633.04	1557.43
Dividend	707.36	695.58	668.07	864.56	864.56
Other (equity) Reserves and Surplus	10100.48	9892.17	9198.81	8832.04	8104.51

5.0 Future Plan for Capacity Addition

As per National Electricity Plan of Govt. of India, likely Installed Capacity of India by the year 2031-32 is estimated to be 900 GW. In line with same, SJVN has drawn a comprehensive capacity addition plan to emerge as a major contributor in power generation with a vision of installed capacity 25 GW company by 2030 and 50 GW company by 2040 and 60 GW company by 2047.

6.0 Current Project Portfolio

SJVN has currently a portfolio of eighty-three power projects and three transmission lines (TL) in India and abroad as per details given below:

S. N.	Project	Location	Capacity (MW)
Projects under operation			
1	Nathpa Jhakri HPS	Himachal Pradesh (H.P.)	1500
2	Rampur HPS	H.P.	412
3	Khirvire Wind PP	Maharashtra	47.6
4	Charanka Solar PP	Gujarat	5.6
5	Sadla Wind PP	Gujarat	50
6	Solar PV PP at NJHPS	H.P.	1.3
7	Parasan Solar PP	Uttar Pradesh (U.P.)	75
8	Naitwar Mori HEP	Uttarakhand	60
9	Gurhah SPP	U.P.	75
10	Gujrai SPP	U.P.	50
11	Raghenesda SPP	U.P.	100
12	400 kV Transmission Line (CPTC-JV-26% share)	Sursand (Nepal border) to Muzaffarpur (Bihar)	86 km
13	Mori Snail Transmission Line	Uttarakhand / HP	37 km
14	Arun - 3 HEP	Nepal	900
15	Luhri HEP Stage-1	HP	210
16	Dhaulasidh HEP	HP	66
17	Sunni Dam HEP	HP	382
18	Buxar Thermal PP	Bihar	1320
19	Bagodara Solar Power Project	Gujarat	70
20	CPSU Scheme: Bikaner Solar Power Project (SPP)	Rajasthan	1000
21	Omkareshwar Floating SP	Madhya Pradesh	90
22	PSPCL Solar PP	Punjab	100
23	Floating Solar PP (BBMB)	H.P	15
24	BBMB Ground Mounted Solar PP	H.P	18
25	GUVNL Phase-XIII Solar PP	Gujarat	100
26	GUVNL Phase-XIV Solar PP	Gujarat	260
27	GUVNL Phase-XVII Khavda Solar PP	Gujarat	200
28	Jamui Solar PP	Bihar	75

S. N.	Project	Location	Capacity (MW)
	Projects under operation		
29	APDCL Solar PP	Assam	70
30	APDCL Solar PP	Assam	50
31	Arun-3 Transmission Line	Nepal	217 km
32	Lower Arun HEP	Nepal	669
33	Etalin HEP	Arunachal Pradesh	3097
34	Attunli HEP	Arunachal Pradesh	680
35	Jakhol Sankri HEP	Uttarakhand	44
36	Wind Power Project from SECI (Tranche XIV)	Anywhere in India	200
37	Wind Power Project from SECI	Anywhere in India	100
38	GUVNL Phase-V WPP	Gujarat	100
39	Jamui SPP	Bihar	50
40	Banka SPP	Bihar	75
41	Solar PP (Phase-VII)	Maharashtra	200
42	Solar PP (Phase-IX)	Maharashtra	200
43	Solar PP from PSPCL	Anywhere	1000
44	Solar PP from PSPCL	Punjab	200
45	Solar Power Project (APDCL)	Assam	200
46	RUVNL Solar PP	Rajasthan	100
47	GUVNL Phase-XXI SPP	Gujarat	500
48	GUVNL Phase-XXII SPP	Gujarat	200
49	GUVNL Phase-XXIII SPP	Gujarat	200
50	Solar Project under Mukhya Mantri Saur Krushi Vahini Yojna 2.0	Maharashtra	1352
51	Devsari HEP	Uttarakhand	194
52	Luhri Stage-II HEP	HP	228
53	Purthi HEP	HP	234
54	Bardang HEP	HP	166
55	Reoli Dugli HEP	HP	456
56	Sach Khas HEP	HP	287
57	Tandi- Rashil HEP	HP	268
58	Arun-4 HEP	Nepal	630
59	Tindi Small HEP	HP	4.4
60	Choo Small HEP	HP	3.5
61	Emini HEP	Arunachal Pradesh	500
62	Amulin HEP	Arunachal Pradesh	420
63	Mihumdon HEP	Arunachal Pradesh	400
64	Unit 3 at Buxar TPP	Bihar	800
65	Daizo Lui PSP	Mizoram	2400
66	Jalvara PSP	Maharashtra/ Karnataka	2220
67	Dhaulasidh (Sadda) PSP	HP	180
68	Dhurmu PSP	HP	400
69	Sunni PSP	HP	645
70	Purthi & Sach Khas PSP	HP	190
71	Kolmondapada PSP	Maharashtra	800
72	Sidgarh PSP	Maharashtra	1500
73	Chornai PSP	Maharashtra	2000
74	Baitarni PSP	Maharashtra	1800
	Sub-Total		9735

Other projects:

Apart from these, MoP identified ten more projects totaling to 2507 MW capacity in Dibang Basin in Arunachal Pradesh for allocation to SJVN. Also six projects of 21100 MW are under allotment stages for which MoUs has already been signed with different State Governments.

7.0 Industrial Relations

Regular meetings are held with the representatives of various Associations/ Unions to sort out the local issues as well as policy related matters. Recreational, Cultural and Sports functions on different occasions were also held, thus, resulting in better employee-employer relations and cordial industrial relations were maintained during the year.

8.0 Environment

SJVN is aware of its obligation to conserve and protect the environment. SJVN strictly adheres to all policies and guidelines of the Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India (GoI) concerning identification and mitigation of environmental impacts of projects. To achieve sustainable development, an Environment Management Plan is prepared and suitable measures are adopted to negate any adverse impact on the environment and ecology during construction and operation stages.

All the legal requirements related to emission and waste generation are being complied by the company and compliance reports are periodically submitted to concerned authorities such as MoEF&CC, SPCB, etc. Environment monitoring of projects

is carried out regularly by the regulatory authorities as well as SJVN through its internal monitoring mechanism or by NABL accredited labs.

SJVN is successfully implementing environment management measures such as Catchment Area Treatment (CAT), Compensatory Afforestation (CA), Muck Management, Restoration of muck disposal sites, quarry sites and construction areas, Green-Belt development, Biodiversity Management, Fisheries Management, etc. in its projects. Environment Management System at SJVN projects are IS/ISO 14001:2015 compliant, while the Quality Management systems are IS/ ISO 9001:2015 compliant. SJVN has adopted an Environment

Policy that reaffirms its commitment towards sustainable power generation and transmission with utmost care for the environment. Further, SJVN becomes the first CPSE to implement ISO 31000:2018 - Risk management system and also implemented 45001:2018- Occupational health and safety management system.

9.0 Corporate Social Responsibility and Sustainability (CSR)

SJVN being a responsible corporate citizen has been implementing CSR programs integral to its core business activities. In accordance with The Companies Act, 2013 and Companies (Corporate Social Responsibility Policy) Rules, 2014, SJVN has constituted a committee of Directors on CSR and also framed and adopted its CSR and Sustainability Policy. SJVN has been consistently spending much more than the statutory requirement on CSR i.e. a minimum of 2% of the average net profits made during the three immediately preceding financial years.

Against the CSR & Sustainability statutory budget of Rs. 34.61 Cr. expenditure of Rs. 45.46 Cr. have been incurred during the financial year.

The major CSR activities are detailed follows::

9.1 Health and hygiene:

- SJVN is providing free medical services through 14 Mobile Medical Units (MMUs) in the states of Himachal Pradesh, Uttrakhand, Bihar and Maharashtra. So far more than 11.50 lakh persons have been benefitted. Further, 03 new MMUs one each for HP Project, UP Project and Gujarat Project have been sanctioned. Financial support of Rs. 98.20 Lakh for running of 03 MMUs for one year in remote areas of district Hamirpur (HP) has been provided.
- Rs. 50.00 Lakh has been sanctioned to Dhanush Foundation, Buxar for running of 06 MMUs.
- SJVN has adopted aspirational district Chamba (HP) for carrying out theme-based CSR works and so far, an amount of Rs. 7.03 crore has been spent.
- Specialized/ multi-specialized medical camps in the area of ophthalmology, neurology etc. have been organized in district Chamba. Cataract operations are also being conducted.
- Financial assistance of Rs.14.18 Lakh out of sanctioned amount of Rs.42.54 Lakh has been provided to Distt. Red Cross Society, Shimla for providing Nutrition Kits to 709 patients of 10 blocks of Distt. Shimla.
- Financial assistance of Rs.387 Lakh has been sanctioned to Vishranti in VMRT, Palampur for construction of 100 bedded Senior Citizen Home. The work is under progress and so far Rs.250 Lakh has been released.

9.2 Education and Skill development programs:

The following programs have been under taken under the head:

- Short term (2-3 months) trainings to 250 candidates through HIMCON in the project's areas and training for 75 kins and dependents of army personnel.
- Training on latest farming/ seeding techniques in association with agricultural universities like CSK Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur.
- 25 candidates have been nominated for getting vocational trainings in Govt. ITIs. Besides the tuition fees, a stipend of Rs.2000/- per month is given to these sponsored students.
- SJVN is providing financial support of Rs. 1 Cr. each six ITIs of H.P. out of which work in 4 ITIs has been completed and in remaining ITIs, the work is under progress. So far Rs. 7.50 Cr. has been released to respective ITIs
- Pathology lab of MC Shimla has been re-established with financial implication of Rs.25.26 lakhs at Shimla. Funds are being paid in installments.
- Silver Jubilee Merit Scholarship scheme in the state of HP, Uttrakhand, Bihar and Arunachal Pradesh for 110 candidates has been implemented. So far 1894 candidates have been benefitted.

9.3 Sustainable Development:

- Water supply scheme at village Neether (HP) with total sanctioned financial implication of Rs. 800 Lakh is under progress which is at the completion stage.
- Water Irrigation Project of Rs 1300 Lakh is being implementing in the village Neerath, Distt. Shimla. So far 450 Lakh has been utilized.
- State Level Energy Conservation Painting Competition for Govt. school students organized in HP with tentative financial implication of Rs.35 Lakh.

9.4 Preservation & promotion of culture and sports:

- MOU has been signed with Shree Kedarnath Utkarsh Charitable Trust (SKUCT) for Rs.11.99 Cr. for development of Lake Front (Sheshnetra Lake) in Badrinath Township. The full amount has been released and the work is completed. Further MOU has also been signed with SKUCT for development of pilgrims accommodation at a cost of Rs. 10.00 Cr. So far funds of Rs. 4.00 Cr. has been

released and the work is under progress.

- SJVN sanctioned Rs. 5 crore in the year 2021 to Sardar Vallabbhai Patel Rashtriya Ekta Trust (SVPRET), Gandhinagar, Gujarat for integrated development of Kevadia, Gujarat for various CSR theme based projects. So far an amount of Rs.4.90 Crore has been released. Last installment will be released after receipt of completion certificate alongwith display board at the site.
- MoU with GoHP has been signed for development of following cultural Heritage sites;
- (i) Sapni Fort, Village Sapni, Sangla Valley, Kinnaur, (ii) Parshu Ram Temple Complex, Nirmand, Tehsil Anni, District Kullu, (iii) Kalka- Shimla heritage Railway. The work in Sapni Fort and Shree Parsuram Temple is under progress.
- Financial support of Rs. 25 Lakh to Shree Mahakali Deondar Temple, Chopal, Shimla (HP) has been provided for development of the temple. Further, Rs. 15 Lakh has been provided to HP Govt. for celebration of International Kullu Dussehra Festival, 2023 (HP). Rs. 10 Lakh has been provided for celebration of International Summer Festival-2023, Shimla.
- Financial assistance of Rs.8 Lakh has been provided for badminton Olympic held in Delhi.

9.5 SJVN Empowering Weaker Sections of Society:

SJVN is running "Women and Child Development scheme" under which the Below Poverty Line (BPL) women residing in Project Affected Areas of SJVN are extended for a financial benefit of Rs.10,000/- and in addition a gift pack worth Rs.1000/- consisting of nutritional food items, soaps and other hygiene related items is also given. So far 990 women have been benefitted.

- SJVN has sanctioned financial support of Rs. 8.28 Cr. to Department of Social Justice & Empowerment (SCs, STs & OBCs) HP, for construction of School–cum-Home at Dhalli, Shimla (HP) for speech, hearing and visually impaired special children. So far Rs. 6.66 Cr. has been released and work is at the completion Stage.

9.6 Assistance to the victims of natural disasters/ calamities/ pandemic contributions towards Relief Funds:

Financial support of Rs. 14 Lakh has been provided (Rs.7 Lakh each) to Dy. Commissioner, Mandi and Dy. Commissioner Kullu for rehabilitation work due to massive land slide occurred in those districts.

10. Rehabilitation and Resettlement in SJVN

SJVN, being conscious of its responsibilities towards society, is committed to execute and operate power projects in a socially responsible manner by adopting generous Resettlement & Rehabilitation measures for the benefits of project affected families (PAFs) and by investing in the socio-economic development of communities to continually minimize potential negative impacts as well as to establish the sustainable positive impact of projects on them.

Well before any project is taken up for execution, Social Impact Assessment (SIA) study is carried out to ensure that the potential socio-economic benefits accrued from the project outweigh the likely social costs and adverse social impact. Public consultation meetings with the stakeholders are held by the project authorities to make the local communities aware of developmental facilities to be created in the fields of health, education, sanitation, drinking water, approach roads and other community assets of the project and their benefits to the society. Subsequently, the R&R plan is devised based on conclusive findings derived from the socio-economic survey carried out by an independent expert agency. The R&R plan thus devised and approved essentially prescribes mitigation measures for reconstruction and regeneration of economies of

the PAFs. During the implementation stage of the R&R plan, regular monitoring of R&R activities is conducted through an external independent agency to ensure the timely extension of R&R benefits to the PAFs. Subsequently on completion and implementation of the R&R plan, social impact evaluation is carried out by an independent external agency to assess various tangible and intangible benefits accrued in the area of socio-economic development. To have constant interaction with local people, a Project Information Centre is set up at project level.

Ceremony for signing of Project Development Agreement of 669 MW Lower Arun Hydro Electric Project in Nepal on 01.06.2023.

Memorandum of Agreement (MoA) was signed between SJVN Limited and Government of Arunachal Pradesh for executing five hydro power projects of 5097 MW.

SJVN conferred with First prize of 'NTPC Rajbhasha shield 2023'

Hon'ble Minister of State for Power, Govt. of India Sh. Krishan Pal Gurjar, inaugurated a two-day International Symposium (02-03 Dec, 2023) on "Tunnelling" organized by SJVN at New Delhi.

Hon'ble Governor of Himachal Pradesh Sh. Shiv Pratap Shukla presided as Chief Guest of the State Level Painting Competition organized by SJVN Limited on 17.11.2023 for the students of the schools in Himachal Pradesh.

CHAPTER 22

THDC INDIA LTD.

Background

THDC India Limited is a leading profit making Public Sector Enterprise registered in July'1988 under the Companies Act, 1956. THDCIL was conferred 'Mini Ratna–Category-I status in Oct'2009 and up-graded to Schedule 'A' PSU in July'2010 by the Govt. of India.

The Equity of company was earlier shared between Govt. of India and GoUP. After Strategic Sale, equity in THDCIL is shared between NTPC Ltd. and Govt. of UP in a ratio of 74.5% and 25.5%. It is a subsidiary of NTPC Ltd.

The Authorized Share Capital of the Company is ₹ 4000 Cr and paid-up capital as on 31st Mar'2024 is ₹ 3665.88 Cr. THDCIL started earning profits from first year (2006-07) of commercial operation of its maiden project i.e. Tehri HPP (1000 MW) and THDCIL is a consistently profit-making company since then.

THDCIL was constituted with the sole objective to develop, operate & maintain the 2400 MW Tehri Hydro Power Complex (Tehri HPP-1000 MW, Tehri PSP-1000 MW and Koteshwar HEP-400 MW) and other Hydro projects. THDCIL has expanded its horizons and fully diversified in all types of conventional and non-conventional forms of energy.

Current Project Portfolio

1. Power Plants under Operation:

Presently, THDCIL has 06 Nos. Power Plants under operation with a total generation capacity of 1,587 MW including 1424 MW Hydro, 113 MW Wind and 50 MW Solar Power Generation.

S. N.	Name of Project	Installed Capacity	Year of Comm.
1.	Tehri Dam & Hydro Power Plant	1,000 MW	2006-07
2.	Koteshwar Hydro Electric Plant	400 MW	2011-12
3.	Patan Wind Power Plant	50 MW	2016-17
4.	Devbhumi Dwarka Wind Power Plant	63 MW	2016-17
5.	Dhukwan Small Hydro Plant	24 MW	2019-20
6.	Kasaragod Solar Power Plant	50 MW	2020-21

2. Power Projects under Construction:

Presently, THDCIL has 03 projects with a total installed capacity of 2,764 MW and one coal mine with a capacity 5.6 MTPA under construction.

S. N.	Name of Project	Installed Capacity	Location
1.	Tehri Pumped Storage Project	1,000 MW	Distt. Tehri Garhwal, Uttarakhand
2.	Vishnugad Pipalkoti Hydro Electric Project	444 MW	Distt. Chamoli Uttarakhand
3.	Khurja Super Thermal Power Project	1,320 MW	Distt Bulandshahar, Uttar Pradesh
4.	Amelia Coal Mine	5.6 MTPA	Distt. Singrauli, Madhya Pradesh

3. JV companies:

- **Development of 2000 MW Solar Parks in Uttar Pradesh through JV:**

  'TUSCO Ltd.', a joint venture between THDCIL and UPNEDA (a unit/agency of Govt. of U.P) was incorporated in September 2020 to develop 2000 MW of Ultra Mega Solar Power Parks across Uttar Pradesh. Accordingly, 600 MW park each in Jhansi and Lalitpur and 800 MW park in Chitrakoot are being developed.

- **Development of 10000 MW Solar Parks in Rajasthan Uttar Pradesh through JV:**

  'TREDCO Rajasthan Ltd.', a joint venture between THDCIL and RREC (Rajasthan Renewable Energy Corporation Limited) was incorporated in Mar'2023 for development of 10,000 MW Ultra Mega Renewable Energy Parks in the Rajasthan state. MNRE has conveyed In-principle approval for development of Bodana Solar Park of 1292 MW capacity.

PROGRESS OF ONGOING PROJECTS

Tehri Pump Storage Plant (PSP) (4X250 MW)

Based on the principle of recycling of water, 4 reversible Turbines of 250 MW each will convert the off-peak energy to peak Energy.

The first two units are targeted to be commissioned by Aug-24 and project is targeted to be commissioned by Dec-24.

Vishnugad Pipakoti HEP (4X111 MW)

Vishnugad Pipalkoti HEP is a run-of-the-river scheme on river Alaknanda in district Chamoli, Uttarakhand.

On completion, the project will make a power capacity addition of 444 MW to the Northern Region.

In Power house, EoT erection completed and assembly and installation of EM equipments is set to commence.

In Power house, EM work is likely to start shortly.

1st Unit is targeted to be completed by Mar-26.

Khurja STPP (2X660 MW)

The work at all fronts is progressing in full swing.Steam Blowing of Boiler-1 sucessfully completed and TG-1 is ready. Boiler-2 Hydro Test successfully conducted and TG-2 boxed-up.

Major components like Switchyard, Power Evacuation system, Chimney-1, Wagon Tippler-1, FOPH, Aux. Boiler, DM water Plant, CW system etc. are ready and other facilities like ESP, Cooling Tower, CHP, Ash Dyke, Railway siding etc. are in advance stage of completion.

Commissioning of Unit-1 is targeted by Oct-24 and commissioning of Unit-2 by Mar'25.

Amelia Coal Mine

a) To meet fuel requirement of the Khurja STPP, Ministry of Coal, GoI has issued Allotment Order of Amelia Coal Mine to THDCIL on 17th Jan-17.

b) Coal production started in Feb-23 against the schedule of Aug-23. Coal dispatch from the temporary railway siding at Deoragram Railway Station to NTPC plants began on 29.06.23, and around 12.55 lakh tons dispatched till Mar'24. Construction of coal conveyor system is in progress and Civil foundation work is underway.

OPERATIONAL PERFORMANCE:

Operational performance of THDCIL Plants is tabulated as under:

Financial Year	Total Generation (MU) [Cum Design Energy 4404 MU]
2018-19	4687
2019-20	4527
2020-21	4565
2021-22	4671
2022-23	4935
2023-24	4831

Cumulative Generation from all Operational Power Plants of THDCIL always exceeds the Cumulative Design Energy.

FINANCIAL PERFORMANCE:

The total Revenue from operation of THDCIL during the period 01.01.2023 to 31.03.2024 is Rs. 2406.84 Cr.

THDCIL has earned a total comprehensive income of Rs 703.52 Cr during the period 01.01.2023 to 31.03.2024.

The Net Worth of the company as on 31stMarch 2024 is Rs. 10546.68 Cr. as against Rs. 10428.78 Cr as on 31stMarch 2023.

Financial Performance of THDCIL :

(₹ in Cr.)

F.Y.	CAPEX Achieved	Revenue from Operation	Dividend Paid	MoU Rating
2018-19	1132.47	2449.26	423.12	Very Good
2019-20	1480.19	2,123.10	126.00	Very Good
2020-21	1990.13	1,796.01	707.75	Very Good
2021-22	3232.51	1,921.49	508.20	Excellent
2022-23	4615.02	1974.30	547.94	Under Evaluation
2023-24	5168.68	1967.24	471.44	-

During the period 01.01.2023 to 31.03.2024, THDCIL achieved a CAPEX of ₹ 6897.03 Cr. and Revnue of ₹ 2406.84 Cr. from Operations.

COMMERCIAL PERFORMANCE:

During the period 01.01.2023 to 31.03.2024, THDCIL raised the energy bills of Rs.2806.50 Cr and revenue of approx. Rs.3083.52 Cr has been realized from the beneficiaries.

Future Vision of the Company:

- **HEPs in Uttarakhand through JV:**

  'TUECO Ltd.' a joint venture between THDCIL and Uttarakhand Jal Vidyut Nigam Limited (UJVNL) was incorporated in Dec' 2023 to harness the untapped potential of Hydro Power Projects in Uttarakhand.

  Presently, works of EIA/EMP studies and DPR preparation for Mori Hanol Hydro Electric Project (63 MW) in Distt. Uttarkashi is in Progress by THDCIL-UJVNL Energy Company Limited (A JV Company of THDCIL and UJVN Ltd.).

- **Development of power projects in Karnataka:**

  Two MoUs have been signed by 'THDCIL' in Nov'2023 with Govt. of Karnataka [One MoU with 'KPCL' (Karnataka Power Corporation Ltd.) and other with 'KREDL' (Karnataka Renewable Energy Development Ltd.)], for accelerated development of various renewable energy resources viz. Pumped Storage Projects, Conventional Small Hydro Power Projects, Ground Mounted and Floating Solar Power Projects, Wind Energy and development of Green Hydrogen/Green Amonia Production Plants etc. in the state of Karnataka with a total estimated capacity of about 3270 MW.

  DPR preparation is in progress for 170 MW Ground mounted and Roof top Solar PV Plants in the premises of KPCL Plants and 100 MW Floating Solar PV Plant at Kadra Dam.

- **Hydro Electric Projects in Arunachal Pradesh:**

  Memorandum of Agreement (MoA) for the implementation of the 1200 MW Kalai-II HEP signed between GoAR and THDCIL in Dec' 2023. Transfer of various clearances is in progress. Remaining Hydro Projects with cumulative capacity of 5455.50 MW are being pursued for allotment.

- **Development of Pumped Storage Plants in Maharashtra & Chhattisgarh:**

  THDCIL has identified a total of 8 PSPs (6 in Maharashtra & 2 in Chhattisgarh) in these states and is pursuing with State Government for allotment of these projects.

- **Floating Solar Plants in Maharashtra & Chhattisgarh:**

  Maharashtra: Preparation of Feasibility Report (FR) for Floating Solar Projects on various reservoirs of Godavari Marathwada region is in process.

  Chhattisgarh: THDCIL is pursuing with State Government for allotment of Floating solar power projects and to sign an MoU to explore the possibility of developing Hybrid Projects comprising Floating Solar, Ground Mounted Solar and Wind Power.

- **Floating Solar Power Projects in Uttar Pradesh:**

  DPRs of three projects having total capacity of 464 MW have been prepared and being pursued with GoUP for allocation of these projects.

- **Development of Floating Solar Power Plant of 11 MW capacity on Raw Water Reservoir in Khurja STPP**

  Work for setting up 11 MWac/16MWp Floating Solar PV (FSPV) Plant on Raw Water Reservoir of Khurja STPP is in progress and completion is targeted by Feb'25.

- **Green Hydrogen Plant:**

  In line with objectives of the 'National Green Hydrogen Mission' launched by the Government of India, THDCIL has successfully implemented a pilot project of Green Hydrogen Plant (consisting of 300kW water electrolyser and 70 kW Hydrogen fuel cell) to demonstrate technologies associated with Green Hydrogen production, storage and energy generation at office complex, Rishikesh, Uttarakhand.

  THDCIL is now planning to establish a Green Hydrogen production and storage plant in the Chitrakoot district of the Bundelkhand region in Uttar Pradesh, utilizing 800 MW of ground-mounted Solar Power developed by THDCIL itself. The produced Green Hydrogen can either be used for electricity generation or can be stored and supplied to nearby industries that use Hydrogen in their industrial processes.

- **Hydro Kinetic Turbine (2x50 kW):**

  THDCIL is in process of installing an R&D project of 2 X 50 kW Hydro Kinetic Turbine at the downstream of Koteshwar HEP to generate power round the clock from the flow of water.

- **Projects in Chhattisgarh State:**

  THDCIL is exploring possibilities of development of Floating Solar projects (expected total installed capacity about 750 MW) in Chhattisgarh state.

- **Development of Floating Solar Power Plant of 11 MW capacity on Raw Water Reservoir in Khurja STPP- Award of work under progress.**

- **Green Hydrogen:**

  In line with National Green Hydrogen Mission THDCIL is installing a Green Hydrogen based Pilot Project with 300 kW capacity Electrolyser and 70 kW capacity fuel cell system. The erection and commissioning activities for the project is in full swing and project is expected to be commissioned shortly.

- **Pilot Project for Carbon capture:**

  THDCIL is also in process of implementing a Pilot Project for Carbon capture of 20 TPD capacity at Khurja STPP (2x660MW) with a cost-effective Carbon capture technology.

- **Global Aspiration:**

  a) THDCIL has prepared DPR of 2585 MW Sankosh HEP in Bhutan and decision on implementation of same has to be taken up by MEA.

  b) THDCIL is in talks with Kyrgyz Govt for identification and allocation of the hydro projects in Kyrgyzstan. The discussion are in progress for MoU with the concern authority of Kyrgyz Govt for signing of 1305 MW Suusamyr-Kokomeren HPP project.

CHAPTER 23

CENTRAL ELECTRICITY AUTHORITY (CEA)

1. Constitution of the CEA

The Central Electricity Authority (CEA) is a statutory organization constituted under Section 3(1) of the repealed Electricity (Supply) Act, 1948 and continued under Section 70 of the Electricity Act, 2003. It was established as a part –time body in the year 1951 and made a full- time body in the year 1975.

As per section 70(3) of the Electricity Act, 2003, the Authority shall consist of not more than 14 members, including its Chairperson of whom not more than 8 shall be full-time Members to be appointed by the Central Government. The CEA is headed by a Chairperson who, as the Chief Executive of the Authority, oversees largely the development of Power Sector in the country. A Secretary, appointed by the Authority with the approval of the Central Government under section 72 of Electricity Act 2003, assists the Chairperson in discharging CEA's statutory functions. The Secretary also assists him in all matters pertaining to administration and technical including Human Resource Development and Techno-Economic Appraisal and concurrence of power projects etc. Presently, there and six wings namely Planning, Hydro, Thermal, Grid Operation & Distribution, Economic&Commercial and Power System each headed by a Member of the Authority. Besides, there are also two CPES Cadre posts of Principal Chief Engineer (PCE) in the HA Grade. Under each Member, there are technical divisions, each headed by an officer of the rank of Chief Engineer. CEA has its Headquarters in New Delhi. In addition, CEA has offices located in various parts of the country. The CEA is responsible for overall power sector planning, coordination, according concurrence to hydro-electric schemes, promote & assist in timely completion of projects, specifying of technical standards, safety requirements, Grid Standards as well as conditions for installation of meters applicable to the Power Sector of the country. The CEA advises the Central Government on the National Electricity Policy and formulates the Perspective Plans for development of the electricity system. It also advises the Central and State Governments as well as the Electricity Regulatory Commissions on all technical matters relating to generation, transmission and distribution of electricity. It also has the mandate to collect, record and make public, data related to all segments of the electricity sector, carry out investigations and promote research.

2. Functions of CEA

The Functions and duties of the Authority are delineated under section 73 of the Electricity Act, 2003. Besides, the CEA has to discharge various other functions as well under Sections 3, 8, 34, 53, 55 and 177 of the Act. As per Section 73 of the Electricity Act, 2003, the Central Electricity Authority shall perform such functions and duties as the Central Government may prescribe or direct, and in particular to –

a. Advise the Central Government on the matters relating to National Electricity Policy, formulate short-term and perspective plans for development of the electricity system and coordinate the activities of the planning agencies for the optimal utilization of resources to subserve the interests of the national economy and to provide reliable and affordable electricity to all consumers;

b. Specify the technical standards for construction of electrical plants, electric lines and connectivity to the grid;

c. Specify the safety requirements for construction, operation and maintenance of electrical plants and electric lines;

d. Specify the grid standards for operation and maintenance of transmission lines;

e. Specify the conditions for installation of meters for transmission and supply of electricity;

f. Promote and assist in the timely completion of schemes and projects for improving and augmenting the electricity system

g. Promote measures for advancing the skills of persons engaged in electricity industry;

h. Advise Central Government on any matter on which its advice is sought or make recommendation to that Government on any matter if, in the opinion of the Authority, the recommendation would help in improving the generation, transmission, trading, distribution and utilization of electricity;

i. Collect and record the data concerning the generation, transmission, trading, distribution and utilization of electricity and carry out studies relating to cost, efficiency, competitiveness and such like matters;

j. Make public from time to time the information secured under this Act, and provide for the publication of reports and investigations;

k. Promote research in the matters affecting generation, transmission, distribution and trading of electricity;

l. Carry out, or cause to be carried out, any investigation for the purpose of generating or transmitting or distributing electricity

m. Advise any State Government, licensees or the generating companies on such matters which shall enable them to operate and maintain the electricity system under their ownership or control in an improved manner and where necessary, in

coordination with any other Government, licensee or the generating company-owing or having the control of another electricity system;

n. Advise the appropriate Government and the appropriate Commission on all technical matters relating to generation, transmission and distribution of electricity; and

o. Discharge such other functions as may be provided under this Act

In addition to above functions and duties, CEA has to perform the following functions in terms of the under-mentioned section of the Electricity Act, 2003:-

Section 3-National Electricity Policy and Plan

1. The Central Government shall, from time to time, prepare the National Electricity Policy and Tariff Policy, in consultation with the State Governments and the Authority for development of the Power System based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy;
2. The Central Government shall publish the National Electricity Policy and Tariff Policy from time to time;
3. The Central Government may, from time to time, in consultation with the State Governments and the Authority, review or revise the National Electricity Policy and the Tariff Policy referred to in sub-section(1).
4. The Authority shall prepare a National Electricity Plan in accordance with the National Electricity Policy and notify such plan once in five years;

   PROVIDED that the Authority while preparing the National Electricity Plan shall publish the draft National Electricity Plan and invite suggestion and objections thereon from licensees, generating companies and the public within such time as may be prescribed;

PROVIDED FURTHER that the Authority shall

   a. Notify the Plan after obtaining the approval of the Central Government;

   b. Revise the Plan incorporating therein directions, if any, given by the Central Government while granting approval under clause (a);

5. The Authority may review or revise the National Electricity plan in accordance with the National Electricity Policy.

Section 8-Hydro –Electricity Generation

1. Any generating company intending to set up a hydro generating station shall prepare and submit to the Authority for its concurrence, a scheme estimated to involve a capital expenditure exceeding such sum, as may be fixed by the Central Government, from time to time, by notification.
2. The Authority shall, before concurring in any scheme submitted to it under sub-section (1) have particular regard to, whether or not in its opinion:

   a) The proposed river-works will prejudice the prospects for the best ultimate development of the river or its tributaries for power generation, consistent with the requirements of drinking water, irrigation, navigation, flood control or other public purposes, and for this purpose the Authority shall satisfy itself, after consultation with the State Government, the Central Government, or such other agencies as it may deem appropriate, that an adequate study has been made of the optimum location of dams and other river-works;

   b) The proposed scheme meets, the norms regarding dam design and safety

3. Where a multi-purpose scheme for the development of any river in any region is in operation, the State Government and the Generating Company shall coordinate their activities with the activities of the persons responsible for such scheme in so far as they are interrelated.

Section 34- Grid Standards

Every transmission licensee shall comply with such technical standards, of operation and maintenance of transmission lines, in accordance with the Grid Standards, as may be specified by the Authority.

Section53- Provision Relating to Safety and Electricity Supply

The Authority may, in consultation with the State Governments, Specify suitable measures for:-

a. Protecting the public (including the person engaged in the generation, transmission or distribution or trading) from dangers arising from the generation, transmission or distribution or trading of electricity, or use of electricity supplied or installation, maintenance or use of any electric line or electrical plant;

b. Eliminating or reducing the risks of personal injury to any person, or damage to property of any person or interference with use of such property;

c. Prohibiting the supply or transmission of Electricity except by means of a system which conforms to the specification as may be specified;

d. Giving a notice in the specified form to the appropriate Commission and the Electrical Inspector, of accidents and failures of supplies or transmission of electricity;

e. Keeping by a generating company or licensee the maps, plans and sections relating to supply or transmission of electricity;

f. Inspection of maps, plans and sections by any person

authorized by it or by Electrical Inspector or by any person on payment of specified fee;

g. Specifying action to be taken in relation to any electric line or electrical plant, or any electrical appliance under the control of a consumer for the purpose of eliminating or reducing the risk of personal injury or damage to property or interference with its use.

Section 55- Use etc. of meters

1) No licensee shall supply electricity, after the expiry of two years from the appointed date, except through installation of a correct meter in accordance with the regulations to be made in this behalf by the Authority;

Provided that the licensee may require the consumer to give him security for the price of meter and enter into an agreement for the hire thereof, unless the consumer elects to purchase a meter;

Provided further that the State Commission may, by notification, extend the said period of two years for a class or classes of persons or for such areas as may be specified in that notification.

2) for proper accounting and audit in the generation, transmission and distribution or trading of electricity, the Authority may direct the installation of meters, by a generating company or licensee at such stages of generation, transmission or distribution or trading of electricity and at such locations of generation, transmission or distribution or trading, as it may deem necessary.

3) If a person makes default in complying with the provisions contained in this section or the regulations made under subsection (1), the appropriate Commission may make such orders as it thinks fit for requiring the default to be made good by the generating company or licensee or by any officer of a company or other association or any other person who is responsible for its default

Section 177- Powers of the Authority to make Regulations.

1. The Authority may by notification, make regulations consistent with this Act and the rules generally to carry out the provisions of this Act.

2. In particular and without prejudice to the generality of the power conferred in sub-section(1), such regulations may provide for all or any of the following matters, namely:

   a. The Grid Standards under section-34.

   b. Suitable measures relating to safety and electricity supply under section-53;

   c. The installation and operation of meters under section 55;

   d. The rules of procedure for transaction of business under sub-section(9) of section-70;

   e. The technical standards for construction of electrical plants and electric lines and connectivity to the grid under clause (b) of section-73;

   f. The form and manner in which and the time at which the State Government and licensees shall furnish statistics, returns or other information under section-74

   g. Any other matter which is to be, or may be, specified;

3. All regulations made by the Authority under this Act shall be subject to the conditions of previous publication.

Framing and Amendments of the CEA Regulations under Section 177 of the Electricity Act, 2003:

The Central Electricity Authority has been vested with the powers to make Regulations under Section 177 of the Electricity Act, 2003. The status of the notification of principle regulations and their subsequent amendments since the enactment of the Electricity Act, 2003, is as under:

A. Notified Principal Regulations

The following are the principle regulations already been framed and notified by the Authority during previous years since the enactment of the Electricity Act, 2003:

Sl. No.	Regulation	Notified on
1	CEA (Installation & Operation of Meters), Regulations 2006	22.03.2006
2	Central Electricity Authority (Procedure for Transaction of Business) Regulations, 2006	22.8.2006
3	Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulation, 2007	09.03.2007
4	Central Electricity Authority (Furnishing of Statistics, Returns & Information) Regulation, 2007	19.04.2007
5	Central Electricity Authority (Grid Standards) Regulation, 2010	26.06.2010
6	Central Electricity Authority (Safety requirements for construction, operation and maintenance of electrical plants and electric lines) Regulations, 2011	14.02.2011
7	Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013	07.10.2013
8	Central Electricity Authority (Technical Standards for Communication Systems in Power Systems) Regulations, 2020	27.02.2020
9	Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022*	27.12.2022

Sl. No.	Regulation	Notified on
10	Central Electricity Authority (Flexible operation of thermal Generating Units) Regulations, 2023	25.01.2023
11	Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023**	08.06.2023

* This Regulation has replaced/repealed the Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010 notified in 2010.

** This Regulation has replaced/repealed the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010 notified in 2010

B. Notified/Proposed to be notified Amendments in the Principal Regulations:

The regulations are regularly reviewed and amended by the Authority as per the requirements of various stakeholders in the power sector including general public at large. The amendments notified/proposed to be notified by the Authority during previous years since the enactment of the Electricity Act, 2003 are as under:

Sl. No.	Regulation	Notified on
1	Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010—**1st Amendment**	26.06.2010
2	Central Electricity Authority (Technical Standards for Connectivity to the Grid) Amendment Regulations, 2013— **1st Amendment**	15.10.2013
3	Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2014---**2nd Amendment**	03.12.2014
4	Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Amendment Regulations, 2015—**1st Amendment**	07.04.2015
5	Central Electricity Authority (Technical Standards for Connectivity below 33 kV) (First amendment) Regulations, 2019— **1st Amendment**	08.02.2019
6	Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019—**2nd Amendment**	08.02.2019
7	3rd Amendment to the Central Electricity Authority (Installation and Operation of Meters) (Amendment) Regulations, 2019	23.12.2019
8	Central Electricity Authority (Installation and Operation of Meters) (Amendment) Regulations, 2022.	28.02.2022
9	Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) (Amendment) Regulations, 2022- **1st Amendment**	16.11.2022

Market Monitoring Cell, CEA:

A Dedicated Market Monitoring Cell has been in operation in CEA since April, 2019 for carrying out an in-depth analysis of variation of volume and price of electricity discovered under various types of contracts being executed through Power Exchanges under Short Term Power Market Segment. Market Monitoring Cell of Central Electricity Authority is preparing monthly and annual reports on power market transactions since April, 2019 and these reports are available on CEA's website.

CHAPTER 24

CENTRAL ELECTRICITY REGULATORY COMMISSION

1. INTRODUCTION

The Central Electricity Regulatory Commission (CERC), an independent statutory body with quasi-judicial powers, was constituted on 25th July, 1998 under the Electricity Regulatory Commissions Act, 1998 and has been continued under the Electricity Act, 2003. The Commission consists of a Chairperson, three full time Members and the Chairperson of the Central Electricity Authority as Ex-Officio Member.

2. FUNCTIONS OF CERC

As entrusted by Section 79 (I) of the Electricity Act, 2003, the Commission has the responsibility to discharge the following functions:

a. to regulate the tariff of generating companies owned or controlled by the Central Government;

b. to regulate the tariff of generating companies other than those owned or controlled by the Central Government specified in clause (a), if such generating companies enter into or otherwise have a composite scheme for generation and sale of electricity in more than one State;

c. to regulate the inter-State transmission of electricity;

d. to determine tariff for inter-State transmission of electricity;

e. to issue licenses to persons to function as transmission licensee and electricity trader with respect to their inter-State operations;

f. to adjudicate upon disputes involving generating companies or transmission licensee in regard to matters connected with clauses (a) to (d) above and to refer any dispute for arbitration;

g. to levy fees for the purposes of this Act;

h. to specify Grid Code having regard to Grid Standards;

i. to specify and enforce the standards with respect to quality, continuity and reliability of service by licensees;

j. to fix the trading margin in the inter-State trading of electricity, if considered necessary;

k. to discharge such other functions as may be assigned under this Act.

Section 79 (2) of the Electricity Act 2003 lays the onus on CERC to advise the Central Government on matters such as:

a. formulation of National Electricity Policy and Tariff Policy;

b. promotion of competition, efficiency and economy in the activities of the electricity industry;

c. promotion of investment in electricity industry

d. any other matter referred to the Central Commission by the Central Government

3. 3. MAJOR ACTIVITIES DURING THE YEAR 2023-24 (UPTO 31st March 2024)

A. Major Regulations Notified

a. **Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) (First Amendment) Regulations, 2023**

The Commission, on 01.04.2023, notified the Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) (First Amendment) Regulations, 2023. Certain provisions of these regulation were made effective from 05.04.2023 and remaining provision were made effective from 01.10.2023. The First Amendment to the GNA Regulation has been notified mainly to address the issue of squatting of Connectivity by generating stations and to provide the provisions for eligibility to apply for GNARE and T-GNARE for drawl of power from RE resources. The following provisions have been incorporated under the First amendment:

(i) Connectivity Applications by Renewable Power Project or Renewable Power Park Developer shall be made along with following additional documents:

a. Renewable Power Park Developer: Registered Title Deed as a proof of Ownership or lease rights or land use rights for 50% of the land required for the capacity for which Connectivity is sought or Bank Guarantee of Rs. 10 lakh/ MW in lieu of ownership or lease rights or land use rights of land for 50% of the land required for the capacity for which Connectivity is sought subject to provisions of Regulations 11A and 11B of these regulations.

b. Renewable Power Project - (a) Letter of Award (LOA) by, or Power Purchase Agreement (PPA) entered into with, a Renewable Energy Implementing Agency or a distribution licensee or an authorized agency on behalf of distribution licensee consequent to tariff based competitive bidding, as the case may be: Or (b) Registered Title Deed as a proof of Ownership or lease rights or land use rights for 50% of the land required for the capacity for which Connectivity is sought; Or (c) Bank Guarantee of Rs. 10 lakh/ MW in lieu of ownership or lease rights or land use rights of land for 50% of the land required for the capacity for which Connectivity is sought subject to provisions of Regulations 11A and 11B of these regulations.

c. Submission of document of 50% Land within 180 days of issuance of final grant of Connectivity for entities seeking Connectivity based on Bank Guarantee of Rs 10 Lakh/MW failing which Connectivity shall be revoked and Bank Guarantee shall be encashed.

(ii) Submission of documents of intermediate milestones by Renewable Power Project or Renewable Power Park Developer as follows:

a. Release of at least 10% of the project cost through equity within 12 months from final grant of Connectivity

b. Achieve Financial Closure within (a)12 months from the date of issuance of final grant of connectivity, if the start date of Connectivity is within 2 years from date of issuance of final grant of connectivity or (b) a period equivalent to 50% time period between issue of final grant of Connectivity and start date of Connectivity, if the start date of Connectivity is more than 2 years from date of issuance of final grant of connectivity

c. Achieve COD by SCOD (as extended by REIA) or within 6 months from SCOD (for projects based on Land).

d. Revocation of Connectivity and encashment of Conn BGs in case not achieving the Financial Closure or non -declaration of COD within the stipulated timeline.

(iii) The quantum of direct drawl by a state from an ISGS through intra-state transmission system shall be excluded from its GNA quantum based on the specified methodology.

(iv) Eligibility to apply for GNARE and T-GNARE ,for drawl of power from RE resources only, have been introduced.

(v) An entity having GNARE shall not be eligible to obtain GNA or T-GNA. Similarly, an entity having T-GNARE shall not be eligible to obtain GNA or T-GNA. However, it may convert its GNARE into GNA or T-GNARE into T-GNA, as the case may be.

(vi) An entity which is a GNA or T-GNA grantee shall not be eligible to obtain GNARE or T-GNARE. Such an entity may seek additional GNA or T-GNA for additional drawal requirement

(vii) Amendment in applicable charges for relinquishment of GNA granted, have been reduced to as 18 months charges in place of 24 months .

b. Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023.

CERC, on 29.05.2023, notified the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023. Indian Electricity Grid Code (IEGC) 2023 which was made effective from 01.10.2023 comprises of 10 Chapters and 7 Annexures and include various provisions regarding the roles, functions and responsibilities of the concerned statutory bodies, generating companies, licensees and any other person connected with the operation of the power systems within the statutory frameworks envisaged in the Act and the Rules and Notifications issued by the Central Government, COD, security of grid, reserves, scheduling, connecting new elements requirements, compensation for low load operation etc. The salient features of the codes of the IEGC 2023 are as follows:

1. **Resource Planning Code:** The Planning Code has been renamed as Resource Planning Code. A bottom up planning approach has been suggested which shall include demand forecasting, generation resource adequacy planning and transmission resource adequacy assessment required for secure grid operation.

2. **Connection Code:** Grant of connectivity to ISTS shall be governed by GNA Regulations. NLDC shall prepare a detailed procedure for first time energization and integration of new or modified power system element. NLDC, RLDC or SLDC as the case may be shall carry out joint system study prior to the first time energization of a power system element.

3. **Protection Code:** A new code has been introduced in the Grid Code covering protection protocol, protection settings and protection audit plan of electrical systems.

4. **Commissioning and Commercial Operation Code:** Documents and test reports have been sought from generating station as well as transmission licensee prior to declaration of COD. Trial run for renewable energy generating stations and ESS has been included in Grid Code.

5. **Operating Code:** The framework for reserves comprising of primary, secondary and tertiary reserves, Voltage Control Reserves and Black Start Reserves has been included. The reactive power compensation (both incentive and disincentive) has been introduced for generating stations also in addition to drawee entities as 5 paise/KVARh with escalation of 0.5paise/kVArh per year. Compensation for black start service has been introduced as actual injection @ 110 % of the normal rate of charges for deviation in accordance with DSM Regulations for the last block in which the grid was available.

6. **Scheduling and Despatch Code:** The scheduling procedure has been modified to align with the GNA regulations. The mechanism for Security Constrained Unit Commitment (SCUC) and Security Constraint Economic despatch (SCED) has been included in Grid Code.

7. **Cyber Security Code:** A new code has been included wherein all users shall conduct Cyber Security Audit as per the guidelines mentioned in the CEA (Cyber Security in Power Sector) Guidelines, 2021 and any such regulations issued by an appropriate authority, so as to support reliable operation of the grid.

8. **Monitoring and Compliance Code:** Two methodologies have been included to ensure compliance: self – audit and compliance audit. The monitoring agency for users shall be the concerned RLDC or SLDC on the basis of their respective control area. The monitoring agency for RLDC, NLDC, CTU and RPC shall be the Commission, and for STUs and SLDCs, shall be the concerned SERC.

c. Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023

The Electricity Act, 2003 (36 of 2003) came into force with effect from 10th June 2003 superseding the Electricity Act, 1910 (9 of 1910), the Electricity (Supply) Act, 1948 (54 of 1948) and the Electricity Regulatory Commission Act, 1998 (14 of 1998). Sub-section (1) of Section 92 of the Electricity Act, 2003 provides that the Central Electricity Regulatory Commission shall observe such rules of procedure in regard to the transaction of business at its meetings (including quorum at its meetings) as it may specify by regulations.

2. The Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 was specified under Section 55 of the Electricity Regulatory Commission Act, 1998. The said Regulation was saved in terms of clause (a) of sub-section (2) of Section 185 of the Electricity Act, 2003 and had been governing the conduct of business of the Central Electricity Regulatory Commission in the discharge of its functions under the Electricity Act, 2003.

3. In the meanwhile, a number of developments have taken place which necessitated revisiting the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999. The Information Technology Act, 2000, as enacted and amended from time to time provides for legal recognition for transactions carried out by means of electronic data exchange and other means of electronic communications and storage of information, to facilitate electronic filing of documents. The Commission has digitized the process of filing of pleadings before the Commission and introduced hearing through online mode. Further, there are judicial decisions with regard to the powers of the Electricity Regulatory Commissions to refer matters for the arbitration of disputes, applicability of the laws of limitation in case of disputes brought before the Commission, timeline for disposal of petitions including review petitions etc.

4. In the light of the above developments and experience gained by the Commission over the years, a necessity was felt to update the regulations on conduct of business of the Central Electricity Regulatory Commission for smooth discharge of its functions under the Electricity Act, 2003. Accordingly, Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023 has been specified by the Commission after following the due procedure. With the notification of Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023, the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 stand repealed.

d. Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) (Second Amendment) Regulations, 2023

The Commission, on 20.10.2023, notified Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) (Second Amendment) Regulations, 2023 which was made effective from 01.11.2023. The Second Amendment to the Sharing regulation has been notified to address the treatment of transmission charges in case of mismatch between the commissioning of transmission systems. The following provisions have been incorporated under the Second amendment:

a. Inter-State transmission licensee shall be paid 50% of Yearly Transmission Charges (YTC) for a period of six (6) months from date of deemed COD and in case actual power flow does not commence within a period of 6 months from date of deemed COD it shall be paid 100% of YTC from seventh (7th) month from RTDA account.

b. Defaulting inter-State Transmission Licensee shall pay 50% of YTC of its transmission system OR 50% of YTC of the transmission system which has achieved deemed COD, whichever is lower, till its delayed inter-State transmission system achieves COD, to RTDA account.

c. In case of inter-State transmission system under Tariff based Competitive Bidding, the first contract year shall commence from the date when such transmission licensee starts receiving 100% of YTC.

e. Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) (Third Amendment) Regulations, 2023

The Commission, on 26.10.2023, notified Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) (Third Amendment) Regulations, 2023 which was made effective from 27.10.2023. Third Amendment to the Sharing regulation has been notified for consideration of transmission charges of

inter-regional HVDC Transmission System under the National Component based on the capacity to carry reverse power flow.

f. **Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (Third Amendment) Regulations, 2023**

The Commission, on 15.12.2023, notified Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (Third Amendment) Regulations, 2023 which was made effective from 26.12.2023. The following provisions have been incorporated under the Third amendment:

i. In case of shut down of a transmission line due to shifting or modification of such transmission line or otherwise because of the Project(s) of NHAI, Railways, and Border Road Organization, such transmission elements under outage shall be entitled for deemed availability for such period for which DICs are not affected by the shutdown of the such transmission Line. Member Secretary, RPC may restrict the deemed availability period to that considered reasonable by him for the work involved.

ii. The outage period which can be excluded for the purpose of availability, for reasons beyond control of transmission licensee, shall be declared (i) for maximum up to one month by Member Secretary, RPC, (ii) beyond one month and up to three months after decision at RPC, and (iii) beyond three months by the Commission.

g. **Central Electricity Regulatory Commission (Cross Border Trade of Electricity) Regulations (First Amendment), 2023.**

The Commission while recognizing the need to enable SNA for recovery of reasonable charges from the cross-border entities located in the neighbouring countries, notified the Central Electricity Regulatory Commission (Cross Border Trade of Electricity) Regulations (First Amendment), 2023. The Regulations prescribe an SNA charge of 0.50 paisa (Half paisa)/kWh on the energy scheduled that the Settlement Nodal Agency may recover from the participating entities located in the neighbouring countries.

h. Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 for the tariff period from 1.4.2024 to 31.3.2029

The Commission, on 15.12.2023, notified the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024. These regulations shall remain in force for a period of five years from 1.4.2024 to 31.3.2029. These regulations shall apply to all cases where tariff for a generating station or a unit thereof and a transmission system or an element thereof is required to be determined by the Commission under section 62 of the Act read with section 79 thereof. Through these Tariff Regulations, 2024, the Commission has envisaged to maintain regulatory certainty and encourage investments on one hand, while promoting efficiency, encouraged development of hydro generation and flexibility in operations of generating stations, with an overarching objective of making 24x7 electricity available at a reasonable price to the end consumer. These regulations address the prevailing challenges of the sector, while maintaining regulatory certainty to the tariff setting approach.

B. Procedures

a. **Detailed Procedure for "Assessment of Quantum of Secondary & Tertiary Reserve Capacity, along with Information Exchange and Timelines" under Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023**

The Commission vide order dated 28.09.2023, approved the Detailed Procedure for "Assessment of Quantum of Secondary & Tertiary Reserve Capacity, along with Information Exchange and Timelines" under Regulation 30 (11)(k), 30(11)(a), 30(11)(q) and 30(12)(d) of Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023. The objective of this procedure is to lay down the roles of various entities and methodology for estimation of quantum of reserves for SRAS and TRAS to be followed by the Nodal Agency i.e. NLDC. Nodal Agency i.e. NLDC, in coordination with RLDCs and SLDCs, shall estimate the quantum of requirement of SRAS & TRAS on year ahead basis, three day ahead basis, day ahead basis and real-time basis as per the methodology specified in the Procedure.

b. Detailed Procedure for Allocation of Transmission Corridor for Scheduling of General Network Access and Temporary General Network Access under Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022

The Commission vide order dated 29.09.2023, approved 'Detailed Procedure for Allocation of Transmission Corridor for Scheduling of General Network Access and Temporary General Network Access under Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022. The objective of this procedure is to lay down the guidelines for allocation of the transmission corridor for scheduling of GNA and T-GNA transactions as per the provisions stipulated in GNA Regulations and the Central Electricity

Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023.

c. **Procedures/Guidelines on under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.**

- **Procedure on "Maintenance and testing of Communication System"**

  The Commission vide Order dated 19.01.2024, approved "Procedure on Maintenance and testing of Communication System" under Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017. The objective of this procedure is to lay down the different parameters and procedure for effective maintenance and testing of the Communication System deployed in Power Sector.

- **Procedure on "Centralized supervision for quick fault detection and restoration"**

  The Commission vide Order dated 19.01.2024, approved "Procedure on Centralized supervision for quick fault detection and restoration" under Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017. The objective of this procedure is to lay down the roles of various entities, procedure for centralized supervision of communication system, quick fault detection and its restoration, and mechanism for coordinated operation amongst the concerned users of the interconnected communication systems.

- **Guidelines on "Availability of Communication System"**

  The Commission vide Order dated 19.01.2024, approved "Guidelines on Availability of Communication System" under Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017. The objective of this Guidelines is to lay down the responsibilities of CTU, STU and the methodology for computation of availability of Communication System deployed in Power Sector.

- **Guidelines on "Interfacing Requirements"**

  The Commission vide Order dated 19.01.2024, approved "Guidelines on Interfacing Requirements" under Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017. The objective of this Guidelines is to lay down the interfacing requirements" in respect of terminal equipment, RTUs, SCADA, PMUs, Automatic Generation Control (AGC), Automatic Meter Reading (AMR) Advanced Metering Infrastructure (AMI), etc. and for data communication from the User's point to the respective control centre(s) based on technical standards issued by CEA, This Guidelines also provide the parameters to be telemetered from various sub-stations and generating stations with respect to various equipment.

C. Inter-State Trading License

By the end of 2023-24, there were 60 inter-state trading licensees. Out of these, about 39 licensees have undertaken either short-term or both short & long-term trading of electricity, while about 6 licensees have undertaken only long-term trading of electricity during 2023-24. These trading licensees undertake bilateral contracts for both buyers and sellers, separately for Round the Clock (RTC) period, peak period and other than RTC & Peak periods. The volume of electricity transacted through trading licensees under bilateral trade has increased from 26.72 BU in 2009-10 to 41.02 BU in 2023-24 .The Commission notified the CERC (Terms and Conditions for Renewable Energy Certificates in Renewable Energy Generation) Regulations, 2022 on 09.05.2022. Vide these Regulations, w.e.f. from 05.12.2023, the Commission approved the transactions of RECs bilaterally through the trading licensees, with a view to increase competition in the Renewable Energy market and reduce the transaction costs of RECs.

D. Power Exchange Business

Two power exchanges, namely Indian Energy Exchange Ltd. (IEX) and Power Exchange of India Ltd. (PXIL), established in 2008 and are in operation for 15 years. A third power exchange, namely Hindustan Power Exchange Ltd. (HPX) was granted approval to operate by the Commission through Order dated 27.06.2022. These Power Exchanges are functioning and providing trading platform for day-ahead market, term-ahead market, real-time market, Renewable Energy Certificates and Energy Saving Certificates. Volume of electricity transacted on power exchanges has grown from 7.19 BU in 2009-10 to 121.49 BU in 2023-24.

The Commission approved the introduction of High Price Day Ahead Market (HP-DAM) in the Integrated - Day Ahead Market (I-DAM) on 16.02.2023, for high-cost generators who have otherwise not been able to participate in the day-ahead market due to the existing price ceiling. Trading in the HP-DAM segment commenced from 10.03.2023.

Vide Orders dated 24.07.2023, 21.09.2023 and 16.10.2023, the Commission approved introduction of High Price Term Ahead Market (HP-TAM) and High Price Contingency contracts on the three power exchanges, with the view of increasing competition, provide more avenues to eligible sellers who have not been able to participate in TAM and Contingency contracts due to the existing price ceiling, and create a level playing field across different market segments.

In the interest of grid security and for market development, the Commission vide Order dated 28.04.2023 accorded approval for introducing Tertiary Ancillary Service (TRAS) in the power exchanges in accordance with the Central Electricity Regulatory

Commission (Ancillary Services) Regulations 2022.

E. Power Market Monitoring

A well-functioning electricity market requires an effective market monitoring process. As part of the electricity market monitoring process, the Central Electricity Regulatory Commission (CERC) has been preparing the following reports.

a. **Monthly report on short-term transactions of electricity in India with the objective:**

i. To observe the trends in volume and price of the short-term transactions (contract period of less than one year) of electricity,

ii. To analyse competition among the market players, and

iii. To disseminate all relevant market information.

B. **Annual Report on the Short-term Power Market in India:** CERC publishes the 'Report on Short-term Power Market in India' every year. The report mainly analyses the trends in short-term transactions of electricity, analysis of open access consumers on power exchanges, major sellers and buyers of electricity through trading licensees and power exchanges, effects of congestion on volume of electricity traded through exchanges, trading margins charged by trading licensees, cross border trade of electricity, trading of Renewable Energy Certificates on Power exchanges and tariff of long term sources of power for various distribution companies. As per the 'Report on Short-term Power Market in India: 2022-23", the volume of short-term transaction of electricity was 194.35 BU in 2022-23.

C. During late March 2022, significantly high prices were discovered at the power exchanges due to unprecedented high demand without commensurate increase in supply. The Commission felt the need to intervene to protect the consumers and the market's credibility. Vide Order dated 01.04.2022, the Commission directed the power exchanges to re-design the software so that members can submit their bids in the price range of Rs.0/kWh to Rs.12/kWh in DAM and RTM initially, which was later extended to all other market segments.

With due regard to the prevalent demand and supply scenario, and taking cognizance of the fact that the fuel prices, the Commission found it expedient to review the above price ceiling from time to time. Based on the review, vide Order dated 31.03.2023, the Commission directed the power exchanges to re-design the software so that members can submit their bids in the price range of (a) Rs.0/kWh to Rs.10/kWh for all contracts, viz., DAM (including GDAM), RTM, Intra-day, Day Ahead Contingency and Term-Ahead (including GTAM); and (b) Rs.0/kWh to Rs.20/kWh in the HP-DAM segment.

F. Draft Regulations / Discussion Papers

i. Draft Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024, dated 17.2.2024

ii. Draft Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) (Second Amendment) Regulations, 2024, dated 16.2.2024

iii. Draft Central Electricity Regulatory Commission (Recruitment, Control and Service conditions of Staff) (Sixth Amendment) Regulations, 2024, dated 03.01.2024

iv. Draft Central Electricity Regulatory Commission (Procedure, Terms and Conditions for grant of Transmission Licence and other related matters) Regulations, 2023, dated 03.01.2024

v. Staff Paper on "Grid Security Charge" published on 25.09.2023

vi. Staff Paper on " Market Coupling" published on 21.08.2023

vii. Staff Paper on "Review of Composite Index used for Computing the Escalation Rate for Imported Coal for Bid Evaluation and Payment" published on 09.06.2023

viii. Approach Paper on Terms and Conditions of Tariff for the period commencing from 1st April, 2024 published on 26.05.2023

JOINT ELECTRICITY REGULATORY COMMISSION

(FOR UT OF J&K AND UT OF LADAKH)

Pursuant to Jammu and Kashmir Reorganization Act, 2019 Central Government in exercise of the powers conferred under Section 83 of the Electricity Act, 2003 (36 of 2003) constituted a new Joint Electricity Regulatory Commission for the UT of J&K and UT of Ladakh vide S.O. 1984(E) dated 18.06.2020. Further, the Central Government appointed Shri Lokesh Dutt Jha (Chairman), Shri Mohammad Rafi Andrabi (Member Finance) and Shri Ajay Gupta (Member Technical) in the Commission on 17.08.2020 and they assumed the charge on 28.08.2020. Accordingly, Joint Electricity Regulatory Commission for J&K and Ladakh started its functioning w.e.f. 28-08-2020 in the erstwhile J&K SERC building located at Panama Chowk, Jammu provided by Power Development Department of UT of J&K.

As per the Electricity Act, 2003 the Commission is mandated to carry out the following functions in respect of territories under its jurisdiction:-

1. Under section 86(1) of the Electricity Act, 2003 commission is mandate to carry out below mentioned functions:-

(a) Determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case maybe, with in the State:

Provided that where open access has been permitted to a category of consumers under section 42, the State Commission shall determine only the wheeling charges and surcharge thereon, if any, for the said category of consumers;

(b) Regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State;

(c) Facilitate intra-state transmission and wheeling of electricity;

(d) Issue licenses to persons seeking to act as transmission licensees, distribution licensees and electricity traders with respect to their operations within the Union Territories;

(e) Promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;

(f) Adjudicate upon the disputes between the licensees, and generating companies and to refer any dispute for arbitration;

(g) Levy fee for the purposes specified under this Act;

(h) Specify State Grid Code consistent with the Indian Electricity Grid Code (IEGC) specified by Central Electricity Regulatory Commission;

(i) Specify or enforce standards with respect to quality, continuity and reliability of service by licensees;

(j) Fix the trading margin in the intra-State trading of electricity, if considered, necessary;

(k) Discharge such other functions as maybe assigned to it under this Act.

2. As per Section 86(2) of the Act, the Commission shall advise the State/ Union Territory Government on all or any of the following matters, namely:-

(a) Promotion of competition, efficiency and economy in activities of the electricity industry;

(b) Promotion of investment in electricity industry;

(c) Reorganization and restructuring of electricity industry in the State/UTs.

(d) Matters concerning generation, transmission, distribution and trading of electricity or any other matter referred to the Joint Commission by the Government.

3. In terms of Section 86(3), the Commission shall ensure transparency while exercising its powers and discharging its functions.

4. As per section 86(4), in discharge of its functions the commission is guided by the Electricity Act, 2003, the National Electricity Policy, National Electricity Plan and Tariff Policy.

5. Notification of Regulations

The erstwhile Jammu & Kashmir State Electricity Regulatory Commission (J&K SERC) constituted under J&K Electricity Act 2010 was carrying out regulatory functions in respect of erstwhile State of Jammu and Kashmir. The J&K Electricity Act 2010 has now been repealed and Electricity Act 2003 has been made applicable to the newly formed Union Territory of Jammu & Kashmir and Union Territory of Ladakh.

Hence, in exercise of the powers conferred by Section 62 (Determination of tariff), Section 86 (Functions of State Commission) and Section 92 (Proceedings of Appropriate Commission) read with Section 181(Powers of State Commissions to make regulations) of the Electricity Act,

2003 (Act 36 of 2003) and all powers enabling it in that behalf, the Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and UT of Ladakh is in the process of framing various regulations and it was deemed necessary to have in place regulations for regulating the work of different Power Utilities in the Union Territories of J&K and Ladakh.

In order to run day to day of the commission vide "JERC for UT of J&K and UT of Ladakh (Adoption of various Regulations of JERC for the state of Goa and UTs) Regulations, 2021 notified on 04-08-2021" this Commission adopted the Regulations of the JERC for the state of Goa and UTs with amendments up to date for one year or till replacement of corresponding regulation framed by this Commission.

However, Institutional Consultant has been hired by the commission for framing our own regulations and 11 regulations have been notified till 31st March, 2023 (however 16 regulations have been notified till date) out of which following 7 regulations have been notified during the Financial Year 2022-23:-

1. Joint Electricity Regulatory Commission for Union Territories Jammu & Kashmir and Ladakh (Renewable Purchase Obligation, its Compliance and REC framework Implementation) Regulations, 2022.
2. Joint Electricity Regulatory Commission for Jammu & Kashmir and Ladakh (Constitution of Advisory Committee for UT of J&K and UT of Ladakh) Regulations, 2022.
3. Joint Electricity Regulatory Commission for J&K and Ladakh (Conduct of Business) Regulations, 2022.
4. Joint Electricity Regulatory Commission for UT of J&K and UT of Ladakh (Fees, Fines and Charges) Regulations, 2023.
5. Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Electricity Supply Code) Regulations, 2023.
6. Joint Electricity Regulatory Commission for UT of Jammu & Kashmir and UT of Ladakh (Procedure, Terms & Conditions for Grant of Transmission and Distribution Licence and other Related Matters) Regulations, 2023.
7. Joint Electricity Regulatory Commission for UT of Jammu & Kashmir and UT of Ladakh (Consumer Grievances Redressal Forum, Electricity Ombudsman and Consumer Advocacy) Regulations, 2023.

Important Regulations issued during 01-01-2023 to 31-03-2023;

I. JERC J&K and Ladakh (Fees, Fines and Charges) Regulations, 2023 (Published in Govt. Gazette vide No. 34 dated 17-01-2023)

II. JERC J&K and Ladakh (Electricity Supply Code) Regulations, 2023 (Published in Govt. Gazette vide No. 165 dated 15-03-2023)

III. JERC J&K and Ladakh (Procedure, Terms & Conditions for Grant of Transmission and Distribution Licence and other Related Matters) Regulations, 2023 (Published in Govt. Gazette Vide No. 168 dated 15-03-2023).

IV. JERC J&K and Ladakh (Consumer Grievances Redressal Forum, Electricity Ombudsman and Consumer Advocacy) Regulations, 2023 (Published in Govt. Gazette Vide No. 181 dated 23-03- 2023).

1. Important Regulations issued during the Year 2023-24;

Sl. No.	Date of Publication	Notification number	Subject
1.	25-04-2023	269	Joint Electricity Regulatory Commission for UT of Jammu & Kashmir and UT of Ladakh (Appointment of Consultants) Regulations, 2023.
2.	25-04-2023	268	JERC for the UT of Jammu & Kashmir and the UT of Ladakh (Electricity Trading) Regulations, 2023.
3.	12-06-2023	375	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and UT of Ladakh (Grid Interactive Renewable Energy system and its related matters) Regulations, 2023.
4.	12-06-2023	376	Joint Electricity Regulatory Commission for the UT of J&K and the UT of Ladakh (Standard of Performance for the Distribution Licensee) Regulations, 2023.
5.	09-11-2023	756	Joint Electricity Regulatory Commission for the UT of J&K and the UT of Ladakh " (Guidelines for Load Forecasts, Resources Plans, and Power Procurement Process) Regulations, 2023.

Sl. No.	Date of Publication	Notification number	Subject
6.	10-11-2023	757	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Terms and Conditions for Determination of Multi Year Generation, Transmission, Distribution Tariff), Regulations, 2023
7.	23-11-2023	775	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Procedure for filing Appeal before the Appellate Authority) Regulations, 2023.
8.	08-12-2023	821	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Compliance Audit), Regulation, 2023
9.	11-12-2023	828	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Transmission Performance Standards) Regulations, 2023.
10.	11-12-2023	829	Joint Electricity Regulatory Commission for the UT of Jammu and Kashmir and the UT of Ladakh (Demand Side Management) Regulations, 2023.
11.	11-12-2023	827	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Distribution Code) Regulations, 2023.
12.	12-12-2023	830	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (State Grid Code) Regulations, 2023.
13.	28-02-2024	126	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Treatment of Income from Other Business of Transmission Licensees and Distribution Licensees) Regulations, 2024.
14.	28-02-2024	128	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Jammu & Kashmir and the UT of Ladakh (Smart Grid) Regulation 2024
15.	28-02-2024	122	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Micro-Grid Renewable Energy Generation and Supply) Regulations, 2024
16.	28-02-2024	123	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Green Energy Open Access), Regulations, 2024.
17.	28-02-2024	127	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Licensee's Power to Recover Expenditure incurred in providing supply and other miscellaneous charges) Regulations, 2024.
18.	28-02-2024	129	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Deviation Settlement Mechanism and other Related Matters) Regulations, 2024.
19.	28-02-2024	125	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Renewable Purchase Obligation & its Compliance) Regulations, 2024.
20.	28-02-2024	124	Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Grant of Connectivity and Open Access in Intra-State Transmission & Distribution and related matters) Regulations, 2024.
21.	28-02-2024	130	Joint. Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Terms and Conditions for Tariff Determination for grid-interactive Renewable Energy Sources) Regulations, 2024.

2. Important Orders issued by Commission during the year 2023-24.

Sl. No.	Date of Publication	Notification number	Subject
1.	15-06-2023	JERC/06 of 2023 dated 15-06-2023	JKPCL V/S SECI 100 PIW of Power. (Admission order issued by the Commission).
2.	16-06-2023	JERC/07 of 2023 dated 07-08-2023	JKPCL & NHPC for procurement of 300 NW OF Solar. (Final order Issued by the commission).
3.	07-08-2023	JERC/08 of 2033 dated 06-09-2023	JKPCL v/s SECI 100 MW of Power. (FinaI order issued by the Commission).
4.	06-09-2023	JERC/09 of 2023 dated 06-09-2023	JERC v/s JKEDA & LREDA. (Sub-Noto Order issued by the Commission).
5.	10-10-2023	JERC/10 of 2023 dated 10-10-2023	Approval of Business Plan for FY 2023 to FY 2025-26, consideration of True up of FY 2017-18 to FY 2021-22, APR for FY 2022-23, APR for FY 2023-24 to FY 2025-26 and approval of Triff for FY 2023-24 of Hydroelectric of JKPDCL(Final Tariff order issued by the Commission on 10-10-2023).
6.	10-10-2023	JERC/11 of 2023 Dated 10-10-2023	Approval of Business Plan for FY 2023-24 to FY 2025-26, MYT for FY 2023-24 to FY 2025-26 and Transmission Tariff for FY 203-24 of JKPTCL. (Final Tariff order issued by the Commission).
7.	10-10-2023	JERC/12 of 2023 Dated 10-10-2023	Approval of Business Plan for the control period of FY 2023-24 to FY 2025-26. Approval of True up for FY 2019-20, FY 2020-21, FY 2021-22, APR for FY 2022-23 and APR and Retail Tariff for FY 2023-24 of LPDD. (Final Tariff order issued by the Commission on 10-10-2023)
8.	24-11-2023	.JERC/13 of 2023 Dated 24-11-2023	Approval of Business Plan & MYT for the period from FY 2023-24 to FY 2025-26 & APR for FY 2023-24 to FY 2025-26 and retail supply Tariff Determination for FY 2023-24 in respect of JPDCL & KPDCL (Summary of tariff Order).
9.	30-11-2023	JERC/14 of 2023 dated 30-11-2023	Approval of Business Ran & MYT for the period from FY 2023-24 to FY 2025-26 & ARR for FY 2023-24 to FY 2025-26 and retail supply Tariff Determination for FY 2023-24 in respect of JPDCL & KPDCL (Final tariff Order).
10.	14-12-2023	JERC/15 of 2023 dated 14-12-2023	Corrigendum to Tariff Order No. JERC/13 of 2023 dated 24-11-2023 issue in respect of Petition No. JERC/08 of 2023 & JERC/09 of 2023. (Corrigendum Order Issued by the Commission).

Joint Electricity Regulatory Commission (For the State of Goa & Union Territories)

In exercise of the powers conferred by Section 83 of the Electricity Act, 2003, the Central Government constituted a two-member (including Chairperson) Joint Electricity Regulatory Commission for all Union Territories except Delhi to be known as 'Joint Electricity Regulatory Commission for Union Territories' with Headquarter at Delhi as notified vide notification no. 23/52/2003 – R&R dated 2nd May, 2005. Later with the joining of the State of Goa, the Commission came to be known as 'Joint Electricity Regulatory Commission for the State of Goa and Union Territories' as notified vide notification no. 23/52/2003 – R&R (Vol. II) on 30th May, 2008. The Joint Electricity Regulatory Commission for the State of Goa and Union Territories started functioning with effect from August 2008. The office of the Commission is presently located at a rented premises in the district town of Gurgaon, Haryana.

1. As per the Electricity Act, 2003, the Commission is vested with the responsibility of discharging the following functions in respect of the territories under its jurisdiction:

a) Determine the tariff for generation, supply, transmission, and wheeling of electricity, wholesale, bulk or retail, as the case may be;

b) Regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for the purchase of power for distribution and supply within the State/ Union Territories;

c) Facilitate intra-state transmission and wheeling of electricity;

d) Issue licenses to persons seeking to act as transmission licensees, distribution licensees and electricity traders with respect to their operations within the State/ Union Territories;

e) Promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person and also specify guidelines for purchase of electricity from such sources uptoa minimum percentage of the total consumption of electricity in the area of a distribution licensee;

f) Adjudicate upon the disputes between the licensees and generating companies and to refer any dispute for arbitration;

g) Levy fee for the purposes specified under this Act;

h) Specify State Grid Code consistent with the Indian Electricity Grid Code (IEGC) specified by the Central Electricity Regulatory Commission;

i) Specify or enforce standards with respect to quality, continuity, and reliability of service by licensees;

j) Fix the trading margin in the intra-State trading of electricity, if considered necessary;

k) Approval of Power Purchase Agreements, and

l) Discharge such other functions as may be assigned to it under the Act.

2. The Commission shall advise the State/ Union Territory Government on all or any of the following matters, namely:-

a) promotion of competition, efficiency, and economy in activities of the electricity industry;

b) promotion of investment in the electricity industry;

c) reorganization and restructuring of the electricity industry in the State/ UTs

d) matters concerning the generation, transmission, distribution, and trading of electricity or any other matter referred to the Joint Commission by that Government.

2.1 The Commission shall ensure transparency while exercising its powers and discharging its functions.

2.2 In the discharge of its functions, the Joint Commission shall be guided by the Electricity Act, 2003, the National Electricity Policy, National Electricity Plan, and Tariff Policy.

3. Notification/Amendment of Regulations

The following Regulations have been notified/amended in the FY 2023-24 keeping in view the latest developments in the power sector: -

1. JERC (Terms & Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2019-Extension of Control period notified on 25.07.2023.
2. JERC (Appointment of Consultants) (Second Amendment) Regulations, 2023 notified on 03.08.2023.
3. JERC (Generation, Transmission & Distribution Multi Year Tariff) , First Amendment Regulations, 2023 notified on 22.08.2023.

4. Annual Revenue Requirement and Tariff determination for FY 2023-24

During the year, the Commission issued Tariff Orders comprising truing up for previous years, Annual Performance Review for FY 2022-23 and revision of Annual Revenue Requirement (ARR), and determination of tariff for the generation, transmission and distribution utilities under its jurisdiction for FY 2023-24.

All Tariff Orders were issued within time frame except for DNHDDPDCL. The delay in issue of Tariff Order of DNHDDPDCL due to delay in filing of tariff petition by DNHDDPDCL. DNHDDPDCL had initially submitted tariff petition for MYT control period, however, the MYT control period was not effective from FY 2023-24 and therefore, the Commission directed DNHDDPDCL to submit the revised petition for ARR and tariff determination for FY 2023-24, resulting into delay in issuance of Tariff Order for FY 2023-24.

The details of the Tariff Orders issued are as under: -

S. No	State/UT	Date of Order
1	Andaman & Nicobar Islands	28.03.2023
2	Lakshadweep	28.03.2023
3	Puducherry Power Corporation Limited	28.03.2023
4	Daman & Diu (Transmission)	30.03.2023
5	Dadra & Nagar Haveli and Daman & Diu(Transmission)	30.03.2023
6	DNHDD Power Corporation Limited	30.03.2023
7	Goa	30.03.2023

8	Puducherry	30.03.2023
9	Chandigarh	30.03.2023
10	DNHDD Power Distribution Corporation Limited	01-08-2023

5. Major Targets likely to be achieved upto 31st March 2024

During the FY 2023-24, the tariff petitions comprising of true up of previous years, Annual Performance Review for FY 2023-24 and revision of Annual Revenue Requirement and determination of tariff for FY 2024-25 have been received from the generation, transmission and distribution utilities under the jurisdiction of Commission.

The tariff orders for FY 2024-25 for the utilities could not be issued on or before 31.03.2024 due to imposition of Model Code of Conduct.

CHAPTER 25

APPELLATE TRIBUNAL FOR ELECTRICITY (APTEL)

1. The Appellate Tribunal for Electricity (APTEL) has been set up under the provisions of the Electricity Act., 2003 (Section 110) and was established on 13th May, 2005. The Tribunal started functioning w.e.f. 21st July, 2005. Presently, the Tribunal is located at 7th Floor, Core-4, SCOPE Complex, Lodhi Road, New Delhi-110003.

2. APTEL is headed by a Chairperson who is a retired Judge of Hon'ble Supreme Court or a retired Chief Justice of a High Court. In addition to the Chairperson, APTEL has one Judicial Member, two Technical Members Electricity and one Technical Member P&NG. Hon'ble Mr. Justice Ramesh Ranganathan former Hon'ble Chief Justice of High Court of Uttarakhand is the Chairperson of the Tribunal. Shri Sandesh Kumar Sharma is the Technical Members (Electricity) and Shri Ashutosh Karnatak is the Technical Member (P&NG) of this Tribunal. Smt. Seema Gupta is the Technical Member (Electricity) of this Tribunal w.e.f. 09.10.2023. Shri Virender Bhat former District Judge of Delhi is the Judicial Member of this Tribunal w.e.f. 21.11.2023.

3. Besides Electricity matters, The Tribunal has also been conferred jurisdiction under the Petroleum and Natural Gas Regulatory Board Act, 2006 to hear appeals against the orders/decisions of the Petroleum and Natural Gas Regulatory Board set up under the Act.

4. Currently, Ms. Madhulika Choudhary, District and Sessions Judge of Uttar Pradesh Higher Judicial Services is Head of the Department as Registrar of the Tribunal w.e.f. 27.04.2021.

5. APTEL hears and disposes of appeals filed against the orders of the Central Electricity Regulatory Commission, State Electricity Regulatory Commissions, Joint Commissions and Adjudicating Officers. Subsequent to the setting up of APTEL, the appeals on the subject pending in the High Courts of all States were also transferred to this tribunal.

6. Any person aggrieved by an order made by an adjudicating officer under the Electricity Act, 2003 (except under section 127) or an order made by the Appropriate Commission under this Act may prefer an appeal to the Appellate Tribunal for Electricity. Any person appealing against the order of the adjudicating officer levying any penalty shall, while filing the appeal, deposit the fee as prescribed by Appellate Tribunal for Electricity. Every appeal shall be filed within a period of 45 days from the date on which a copy of the order made by the adjudicating officer or the Appropriate Commission is received by the aggrieved person (Section 111).

7. Proceedings are conducted in two Courts, each Court consisting of one Judicial Member and a Technical Member.

8. As on 31st March, 2024, 4080 appeals/petitions/matters etc. have been filed. Out of which, 4355 Appeals/Petitions have been disposed of Number of pending matters as on 31.03.2024 is 3709 including Appeals, Interim Applications, Original Petitions, Review Petitions, Revision Petitions, Execution Petitions & Contempt Petitions etc.

9. The website of the Tribunal (www.aptel.gov.in) is providing easy access to the daily cases lists and judgments/orders & notifications.

CHAPTER 26

DAMODAR VALLEY CORPORATION (DVC)

INTRODUCTION:

DVC presently is a Statutory Body under the Ministry of Power. It is a major integrated power utility in the Eastern Region of the country, playing a key role in the unified development of the Damodar Valley basin. The main functions of DVC are generation, transmission and distribution of electricity. Its subsidiary activities are flood control, irrigation, soil conservation & afforestation, industrial, economic and other development of the Damodar Valley area.

GENERATION PERFORMANCE:

Performance of Thermal Units (6540 MW) & Hydel Units (147.2 MW):

DVC Units	FY 2022-23 (Apr'22 to Mar'23)	FY 23-24		
		CEA Target	MOP MOU Target	Achieved (Apr'23- Mar'24)
Thermal Generation (MU)	43085	43700	43500	44128
HydelGeneration (MU)	239	286	300	76.81
Thermal PLF	74.23	76.07	75.72	180

* Actual hydel generation is lower than CEA/MOU target due to low rainfall in upper region of Damodar Valley Area.

Energy Conservation -

DVC has been making continuous efforts to induct modern practices in Energy Management System for sustainable improvement in availability of power with lower consumption of coal, oil, water and auxiliary power along with improvement in efficiency & heat rate. The following practices are followed for efficient energy management in DVC power plants:

- Replacement of existing tube lights /CFL with LED at different office buildings in different field formations.
- Introduction of energy efficient equipment like Variable Frequency Drive (VFD) is under progress. Installation of VFD in 3 nos. Seal Air Fans of each Unit of MTPS U#1,2 &3 (total 09 nos.) completed. VFD installed in one no. CEP at MTPS U#1. Installation of VFD in 7 nos. CEPs of MTPS U#1-4 to be completed by Dec 24.
- Replacement of CT fans with Energy-Efficient FRP blade assembly are in progress in MTPS U#1-4 and CTPS U#7-8. NIT to be floated for procurement of FRP blades for MTPS U#5 and MTPS U#6 and also indent placed for CT fans shaft replacement with carbon fibre for MTPS U#6.
- Energy efficient coating on pump internal in CW and ACW pump during OH are in progress.
- Timely replacement & servicing of BFP recirculation valves is carried out to save energy.
- Energy Efficient fans are being procured and will be installed in phases starting with employee quarters at all locations
- Analysis of different efficiency parameters like Boiler Efficiency, Turbine cycle Heat Rate, HP Heater performance etc. are regularly done and deficit areas are addressed accordingly.
- Necessary measures are regularly taken for combustion optimization, improvement of condenser vacuum, reduction of unburnt carbon, reduction of air leakage from ducts & expansion joints in line with improved O&M practices to optimize system efficiency and Aux. Power Consumption.
- Condenser cleaning is being carried out in the respective Overhauling of the unit.
- Energy Audit carried out in thermal power stations of DVC in FY 21-22 by External Agencies as per the guidelines of Bureau of Energy Efficiency (BEE). 76% of Recommendations are implemented accordingly.
- Technical audit in thermal units is carried out from time to time by expert team of DVC and deficit areas are addressed. Recently Technical Audit of all thermal and hydel stations have been completed during the period June'23- Aug'23.

NOTABLE MAJOR ACHIEVEMENTS:

Commercial:

- Collection efficiency was more than 100% throughout the year.
- Outstanding dues under liquidation using LPSC Rules 2022 issued by MoP. Current dues also being realized through implementation of the scheme.

Operational:

- DVC TPSs were ranked consistently amongst the "Top Ten Central Sector TPSs in the country" in terms of monthly

PLF. During FY 2023-24 DVC TPSs ranked 20 times in the "Top Ten Central Sector TPSs in the country".

- Remarkable improvement observed in achieving Plant Load Factor (PLF). Achieved thermal PLF (%) in FY 2023-24 is 76.81 % whereas it was 72.24 % during the same period of the previous year. All India thermal PLF (%) is 68.06 % during Apr-Dec'23 (source CEA).
- Total generation achieved by DVC thermal generating units in FY 2023-24 is 44128 MU. Whereas it was 31935 MU during the same period of the previous year.
- FGD at Mejia TPS U#7 (500 MW)and U#8 (500 MW) Koderma TPS U#1 (500 MW), Bokaro 'A' TPS U#1(500 MW), Durgapur Steel TPS U#1 (500 MW) and Raghunathpur TPS U#1(600MW) has been commissioned.
- MTPS U#7&8 has achieved the ''CEE 3rd National Energy Efficiency Award 2023" in 'Operational Excellence' Public Sector, "National Energy Efficient Plant" of the Year Award.
- DSTPS has achieved the ''CEE 3rd National Energy Efficiency Award 2023" in 'Optimization Excellence' Public Sector, "Best Plant Load Factor" Award of the Year.

Fuel Management:

- Total coal received in DVC TPSs in FY'23-24 is 29.90 MMT (7613 no. rakes).

Capex:

- DVC has achieved 88 % of FY 2023-24 Capex target (i.e. Rs. 2371 Cr. out of Rs. 2708 Cr.).

Renewable Energy:

- 10 MW Ground Mounted Solar PV Plant at KTPS has been commissioned and COD declared on 30.03.2024.
- Contract awarded for setting up of 30 MW cumulative capacity of Floating Solar PV Plant at Reservoirs of KTPS (6MW), RTPS (10MW) and MTPS (14MW) and is under installation.
- Contract awarded for setting up of 8 MW Ground Mounted Solar PV Plant at Panchet and is under installation.
- 8 MW Ground Mounted Solar PV Plant at Konar, Jharkhand under tendering stage.
- 05 nos. of EV-CCS (Electric Vehicle – Captive Charging Stations installed at five stations of DVC (RTPS, MTPS, KTPS, DSTPS and DVC HQ, Kolkata).
- 989 MW Solar Parks approved under UMREPPs Schemes of MNRE, GOI (755MW Solar Parks in Phase-I & 234MW Solar Parks in Phase-II): Out of 755MW(Ph-1), Order for 310MW Solar Plants [260MW Floating Solar and 50MW Ground Solar] has been awarded. NOA has been issued. Project will be implemented by JV between DVC & NTPC GEL.

Capacity Addition Programme and Achievement-

Various MoP approved/ consented projects at various stages of development:

- Raghunathpur TPS Ph-II (2x660 MW) (revived)
- Koderma TPS Ph-II (2X800 MW)
- Durgapur TPS (1X800 MW)
- Chandrapura TPS (1X800 MW)
- Pump Storage Hydro Generating Station Lugu Pahar (1500 MW)
- Pump Storage Hydro Generating Station Panchet (1000 MW)
- Re-purposing of De-Commissioned Thermal Station of DVC at DVC Bokaro TPS (being carried out jointly with World Bank under "JUST Transition" initiatives)

Transmission & Distribution (T&D) System:

T&D network of DVC is spread over DVC command area and beyond. It comprises of 36 nos. of EHV Sub-stations, 12 nos. of 33 kV Receiving Sub-stations and 12 nos. Switchyards at the Generating Stations. These are connected through 7080 CKM (Circuit Kilometres) of EHV transmission lines and 11898 MVA of transformers at various voltage levels and 1542 CKM of 33 & 11 KV transmission lines for power distribution.

Renovation and augmentation of age-old control and protection system including related infrastructure of 10 nos. 220 kV substations utilising Power System Development Fund (PSDF) has been completed. Replacement of conductors of old Extra High Voltage (EHV) transmission lines with HTLS & higher rating conventional conductor (2946 CKM) and upgradation of further transformation capacity as well as extension of various substations (11 nos. sub-stations & 3 nos. Power House Switchyard) have been taken up to enhance the system stability as well as to take care of growth in power demand. Transformation capacity of 140 MVA has already been added between Apr'2023 and Mar'2024

Retail Distribution:

Since its inception DVC is engaged in retail supply of electricity to consumers connected at 33 KV and above voltage levels in the DVC command area. In 2022, DVC has entered in Primary Distribution to provide 11 KV power by creating 33/11 KV infrastructure at Kumardhubi, Koderma and BIADA. Detailed Project Report (DPR) has been prepared to develop 11 KV infrastructure at 39 locations to provide power to around 1500 consumers with total envisaged capacity of 975 MVA.

Containerized Substation (E-House) has been considered at 12 locations to minimize the land requirement as well as time for setting up the infrastructure.

Also as a pilot project, detailed survey done in Giridih district of Jharkhand for LT (400 V) supply.

Relay & Instrument Testing Laboratory:

DVC's Relay & Instrument Testing Laboratory under Central Testing Circle (CTC), Maithon has three state of art laboratories. Its meter testing laboratory is NABL accredited in accordance with the international standard ISO/IEC 17025:2017 in the field of electro testing and calibration since last eight years. Insulating Oil testing lab also accredited as per international standard ISO/IEC 17025:2017 on 15/07/2022. It provides testing and commissioning services across DVC establishments and to various other industries/utilities in the region as well.

Communication System:

Separate network for IT applications using another fibre in our OPGW network and separate communication equipment at all the power houses as well as sub-stations have been established. Thus, a major compliance of cyber security to have fibre level separation of IT & OT network has been achieved.

Renovation & Modernization (R&M) Of Power Stations:

- Renovation, Modernization & Up gradation (RM&U) of Panchet Hydel U#1 (40 MW): LOA issued for upgradation of the unit from 40 MW to 46 MW. Completion: 2 years from date of LOA
- Renovation and Modernization (R&M) of Maithon Hydel U#1&3 (2X20 MW): Consultant engaged for RLA study, Preparation of DPR and Technical specification. RLA study of Unit #1 & 3 has been completed. Concurrence of CEA on the DPR has been obtained and DVC Board accorded approval for R&M work. NIT issued & Bid evaluation is under process.
- Renovation and Modernization (R&M) of Tilaiya Hydel U#1&2 (2X2 MW): RLA study has been completed.

Pollution Control Measures & Compliance of New Environmental Norms:

- Installation of De-NOx System: De-NOx burners successfully installed at 10 units out of 14 units during overhauling of the respective units.
- Installation of Flue Gas De-Sulpharisation (FGD): FGDs at 6 thermal units commissioned and 3 thermal units are under advanced stage of commissioning.

Ash Utilization:

DVC is putting more emphasis on utilization of Fly Ash. Dry Fly Ash (DFA) is sold to cement manufacturers and various traders. DFA is also supplied to brick and block manufacturers. DFA utilization from April'2023 to Mar'2024 is 40.40 LMT. Pond ash from DVC is utilized for filling of abandoned mines, low lying areas, construction of roads (mainly in NHAI projects) etc. in compliance of guidelines issued by MoEF & CC. Total ash utilization by DVC is 139.75 LMT, nearly 108.46% of total ash produced (from Apr'2023 to Mar'2024).

Mining Activities:

Tubed Coal Mine: Tubed coal mine, having mineable reserve of 130 million tonne and peak coal production capacity of 6 million tonnes annually, has been allotted to end use projects Mejia TPS Unit # 7 & 8 and Chandrapura TPS Unit # 8.

- Date of Operation: 24-01-2023.
- Production till Mar'2024: - 1.52 MMT
- Despatched till Mar'2024: - 1.31 MMT

NON-POWER ACTIVITIES OF DVC:

Flood Control & Developmental activities in Water Resources Management:

Out of originally planned seven storage reservoirs in the Damodar Basin, construction of 04 (four) multi-purpose Dams at Tilaiya (Feb'1953), Konar (Oct'1955), Maithon (Sep'1957) and Panchet (Nov'1959) was completed in first stage. Flood reserve capacity achieved was only 1.047-million-acre feet, which has further reduced to 0.95-million-acre feet due to progressive siltation as per the latest capacity survey reports. However, even with partial implementation of the scheme, DVC, over the years, has been able to fulfil its primary objective of flood control in the lower valley to a great extent. Further, by judicious operation of reservoirs, all the committed requirements in Damodar Valley area like irrigation, municipal & industrial water supply are fully met, thus achieving efficient water resources management.

Irrigation water supply:

Operation and maintenance of Durgapur Barrage and Irrigation System was transferred to Govt. of West Bengal in the year 1964 on agency basis but, its ownership still rests with DVC. DVC releases water for irrigation from Maithon & Panchet reservoirs as per the advice of Member Secretary, Damodar Valley DVC at present supplies water to about 171 agencies (95 nos. in State of Jharkhand and 76 nos.in West Bengal) for M&I purpose.

Municipal & Industrial (M&I) water supply:

DVC at present supplies water to about 175 agencies (99 nos. in State of Jharkhand and 76 nos.in West Bengal) for M&I purpose.

ECO-CONSERVATION, AFFORESTATION & SOIL CONSERVATION

Annual Progress Report (2023-24)

Sl. No.	Evaluation Criteria	Unit	Annual Target	Annual Achievement
01	Fisheries		Excellent	
i)	Spawn production at Maithon	Lakh	700	974.4
ii)	Fingerlings production		30	30
iii)	Pisciculture in water bodies	Nos.	20	20
iv)	Distribution of spawn/fingerlings to the villagers as CSR activity	Nos.	1200	1200
02	**Soil Conservation**			
i)	Renovation of water bodies	Nos.	120	Nil
ii)	Construction of WHS	Nos.	35	Nil
iii)	Turfing Work of the Old Water Harvesting Structures & RWB	Nos.	155	155
iv)	Hydrological and sediment monitoring stations. (No.)	HMS	4	4
v)	Soil testing of farm land with fertilizer recommendation	No. of samples	1600	1600

Areas of Operation for Soil Conversation works:

Jharkhand: Hazaribagh, Chatra, Giridih, Dhanbad, Bokaro, Jamtara, Koderma, Ramgarh & Deoghar districts

West Bengal: Part of Purulia district

The turfing work of 155 nos. of old Renovated Water Bodies (RWBs) and new Water Harvesting Structures (WHSs) were completed during the Monsoon period. During the transplanting season, these RWBs and WHSs proved to be lifeline for paddy cultivation as this year monsoon got delayed at the time of transplanting of paddy.

The Soil Conservation Deptt. of DVC successfully organized 45 days training course on Soil and Water Conservation for the district agriculture officers of the state of Chhattisgarh in November' 2023 on Soil & Water Conservation Engineering.

CORPORATE SOCIAL RESPONSIBILITY OF DVC

Rs 13.85 crore have been allocated for the FY 2023-24, out of which 11.38 crore expenditure done in FY 23-24. The works taken up are infrastructural development like drinking water, village connectivity roads etc. Simultaneously socio-economic development works such as health programs, promotion of education programs, capacity building of the needy community towards self-employment, agriculture and Pisciculture development etc.is being carried out as ongoing programs. We have successfully implemented smart classes in our village schools. The promotion of solar energy in rural lives are being carried out by installing solar streetlight. Solar energy based drinking water facilities are being implemented in our CSR operational area.

CBIP Award

PM Viswakarma Organized by DVC

EV Charging Facilities in DVC Command

Painting Competition organized by DVC

Roof Top Solar DVC

CHAPTER 27

BHAKRA BEAS MANAGEMENT BOARD

INTRODUCTION

Bhakra Management Board (BMB) was constituted under Section 79 of the Punjab Re-Organization Act, 1966 for the administration, maintenance and operation of Bhakra Nangal Project with effect from 1st October, 1967. The Beas Project Works, after its completion, were transferred by the Government of India from Beas Construction Board (BCB) to BMB as per Section 80 of the Act and Bhakra Management Board was renamed as Bhakra Beas Management Board (BBMB) with effect from 15.5.1976.

Bhakra Beas Management Board is responsible for the administration, operation & maintenance of Bhakra Nangal Project, Beas Satluj Link Project & Beas Dam including Power Houses and a network of transmission lines & grid sub-stations. The functions of Bhakra Beas Management Board are:

- Administration, Operation & Maintenance of Bhakra-Beas Projects.
- The regulation of the supply of water from Bhakra-Beas Projects to the States of Punjab, Haryana and Rajasthan.
- The regulation of the supply of power generated at Bhakra-Beas Projects.
- Any other function as the Central Government may assign after consultation with the Governments of States of Haryana, Punjab & Rajasthan.
- The Govt. of India in the year 2022 has entrusted additional functions of starting new renewable hydro projects within the geographic limits of partner states.
- Ministry of Power has assigned the work of construction and execution of 2X21 MW Baggi Power House to BBMB vide letter No.5-4/1/2019-BBMB dated 22nd October, 2019.

The works being managed by BBMB are broadly grouped as three large multipurpose projects viz. Bhakra Nangal Project, Beas Project Unit-I (BSL Project) and Beas Project Unit-II (Beas Dam).

- The Bhakra Nangal project comprises the Bhakra Dam, Bhakra Left Bank & Bhakra Right Bank Power Houses, Nangal Dam, Nangal Hydel Channel, Ganguwal & Kotla Power Houses and associated transmission system. Bhakra Dam, the majestic monument across the river Satluj, is a high straight gravity concrete Dam rising 225.55 meters above the deepest foundation and spanning the gorge over 518.16 meter length at the top. The Gobind Sagar Lake created by the Dam has 168.35 square kilometer area and a gross storage capacity of 9621 million cubic meters. The two power houses, one on the Left Bank and the other on the Right Bank, have a combined installed capacity of 1415 MW. The Ganguwal and Kotla Power Houses fed from Nangal Hydel Channel have an installed capacity of 153.73 MW.
- The Beas Project Unit – I (BSL Project) diverts Beas Water into the Satluj Basin, rushing from a height of 320 meters and generating power at Dehar Power House having an installed capacity of 990 MW. This project comprises a diversion dam at Pandoh, 13.1 Km long Pandoh-Baggi Tunnel, 11.8 Km long Sundernagar Hydel Channel, Balancing Reservoir at Sundernagar, 12.35 Km long Sundernagar-Satluj Tunnel, 125 meter High Surge Shaft and 990 MW Dehar Power House.
- The Beas Dam at Pong is earth-fill (earth core, gravel shell) dam 132.6 meter high with a gross storage capacity of 8579 million cubic meters. The 396 MW Pong Power House is located in the stilling basin downstream of penstock tunnels.

TOTAL INSTALLED CAPACITY

The total installed generating capacity of the BBMB Power Houses is as detailed below:-

Power House	Installed Capacity	Mega Watt
Bhakra (Right Bank)	5x157	785
Bhakra (Left Bank)	5x126	630
Ganguwal	1x27.99+2x24.20	76.39
Kotla	1x28.94+2x24.20	77.34
Dehar	6x165	990
Pong	6x66	396
Total Installed Capacity		**2954.73**

Total installed capacity of Roof Top Solar Power Plants of BBMB is as under:-

Location	Capacity (kWp)
Jalandhar	125
Jamalpur	130
Narela	20
Delhi	80
Jagadhari	70
Panipat	285.19
Kurukshetra	113.93
Bhiwani	283.24
Hisar	49.50
Chandigarh	175
Ganguwal	100
Nangal	950
Talwara	790

Location	Capacity (kWp)
Sangrur	60
Dhulkote	94.13
Samaypur	49.91
Total Installed Capacity	**3375.90**

GENERATION AND TRANSMISSION SYSTEM:

The generation from the BBMB Power Houses for the Financial Year 2023-24 is 11645 MUs against the target of 9700 MUs i.e. 20.05% higher than the target.

The Power Generation from Roof Top Solar during the Financial Year 2023-24 is 3.006 MUs.

The Power generation at BBMB Power Houses is being evacuated through BBMB Power evacuation system running into 3704.71 Ckt. Km length of 400 KV, 220 kV, 132 kV and 66 kV transmission lines and 24 Sub-stations. The Bhakra Beas Management Board power evacuation system operates in an integrated manner in the Northern Grid with its transmission network spread over the States of Himachal Pradesh, Punjab, Haryana and Delhi. The system is interconnected with transmission system of PGCIL and the states of Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir, Uttar Pradesh, Rajasthan, Chandigarh and Delhi. The availability of transmission system during the Financial Year 2023-24 has been 99.65%.

IRRIGATION

At the time of partition of India, about 80% of the irrigated area of pre-partition Punjab went to Pakistan leaving India with very meagre irrigation resources. The mighty Bhakra-Nangal and Beas Projects changed the scenario and turned Northern India into Granary of the Nation. The Bhakra Nangal and Beas Projects have not only brought Green Revolution in the States of Punjab, Haryana and Rajasthan, but also White Revolution by way of record production of milk. The States of Punjab, Haryana and Rajasthan are being supplied about 28 million acre feet of water every year.

RENOVATION, MODERNISATION AND UPRATING & LIFE EXTENSION (RMU & LE)

To augment its installed capacity, BBMB has embarked upon the novel route of Renovation, Modernization, Uprating & Life Extension (RMU &LE) of its existing power houses. This RM&U Programme has not only added 90 MW in last ten years of low-cost hydro power generation capacity without any incremental environmental cost or R&R issues, but has also given a fresh lease of life to its hydro generating units.

Month	Unit No	Uprated Capacity
July-13	No.2 of Bhakra Left Bank	108 MW to 126 MW
Oct-13	No.5 of Bhakra Left Bank	108 MW to 126 MW
Aug-15	No.4 of Bhakra Left Bank	108 MW to 126 MW
Dec-21	No.3 of Bhakra Left Bank	108 MW to 126 MW
Sept-23	No.1 of Bhakra Left Bank	108 MW to 126 MW

BBMB Board in 237th Board Meeting has accorded in principal approval to carry out Renovation, Modernization, Uprating & Life Extension (RMU & LE) of Pong power House from (6x66 MW) 396 MW to (6x75 MW) 450 MW. Process of getting various approvals has been initiated. BBMB has appointed M/s WAPCOS as Consultant for proving the Consultancy for RMU & LE work. DPR stands submitted to CEA and same is under consideration.

AUTOMATION OF 220KV SUB STATIONS

BBMB has taken a significant step in automation of Substations in its Transmission System. Fully automated 220 kV Sub Station at Barnala with remote operation from 220 kV Sub Station at Sangrur (40 km from Barnala) has been commissioned in October 2018 at a cost of Rs. 1.7 Crore. The Sub Station is now unmanned and no staff is deployed in shift duty.

After the successful completion of the automation of 220kV GSS BBMB Barnala, BBMB has also successfully completed the automation of 220kV substation Hisar, Charkhi-Dadri, Ballabgarh and Samaypur along with their remote operation from Remote Control Center (RCC) Chandigarh and RCC Bhiwani through M/s Siemens Ltd at the cost of Rs. 12.69 crores in the month May, 2023. The benefits include reduced O&M cost, increased system reliability, reduced downtime, remote monitoring of operations etc.

The technical aspects regarding finalizing proposal for Automation of substation under Panipat Circle BBMB in the Second Phase is under review.

SOLAR POWER PLANTS

Floating Solar Plant: BBMB has been setting up 15MW Floating Solar project at Nangal Dam reservoir near village Neilla Distt. Bilaspur, HP. SJVN Green Energy Limited (SGEL) has been awarded the project on BOO basis for 25 years at a levelized tariff of ₹3.26/unit. PPA, Water and Land Lease agreement has been signed with the firm. Work Order has been issued for erection of 33/66kV transmission line from 33kV Gantry of floating solar substation to 66kV Bay at Bhakra Left bank switchyard through 33kV underground and overhead line, 33/66kV transformer and 66kV underground cable.

Ground Mounted Solar plants:

a) BBMB is into the process of execution of Ground mounted solar power plants of 18 MWp on BOO basis at a levelized tariff of ₹ 2.63/unit at its project stations. PPA has been signed between BBMB and M/s SJVN Green Energy Limited (SGEL) on dated 08.09.2023 and works awarded.

b) In addition to this, BBMB is going for execution of 11.5 MWp Ground mounted solar plants on CAPEX mode at its sub stations. Letter of Intent has been issued on dated 14.11.2023.

Above projects are scheduled to be executed in Financial Year 2024-25.

NATIONAL HYDROLOGY PROJECT

MOWR, Govt. of India in association with World Bank has initiated, National Hydrology Project (NHP) in India to carry forward the work and objectives of Hydrology Project Phase-II under the NHP. To this effect, BBMB has been allocated Rs. 25.00 Crore for strengthening and expansion of existing Data Acquisition system (DAS), development of alternate models and technology enhancement along with capacity building in the organization to achieve better results.

Bhakra Beas Management Board (BBMB) has set up Earth Receiving Station (ERS) at Chandigarh for inflow flood forecasting (i.e. short term 3 days and medium term 7 to 10 days) for optimum utilization of Bhakra and Pong Reservoirs and Canal Network. BBMB has been the 'first mover' in the country under the World Bank funded Hydrology Phase-II project. Under this project, 87 no. Real Time Data Acquisition stations comprising Automatic Rain Gauge Stations, Automatic Full Climate Stations, Snow Water Equivalent, Water Level Recorders etc. and 10 No. Automatic Stage Recorder at Contact Points of Partner states have been installed in the catchment of River Sutlej and Beas by using state of the art technology. In addition to this, 6 No. Meteorological stations have also been co-opted with IMD. The schematic arrangement of Real Time Decision Acquisition System involves real time transmission of Hydro meteorological data through INSAT-3D at 1 hour interval to Earth Receiving Station at Chandigarh.

The existing RTDAS Network is being upgraded through two no. contracts. While one contract involving installation of 21 nos. RTDAS stations, is in advance stage of execution, the execution of other contract for installation of 37 nos. stations shall start in near future.

Real Time Data is processed using Rainfall Runoff Model, Hydro Dynamic Model, Flood Model and Water Allocation of MIKE software. The outcome/ scenario generation is further shared on NHP Dashboard.

PAYMENTS TO MSEs

Public Procurement Policy for MSEs Order, 2012 has been notified under section 11 of MSMED Act, 2006. The Policy is effective from 1st April 2012 (Gazette notification on 26th March 2012). The objective of Policy is promotion and development of Micro and Small Enterprises by supporting them in marketing of products produced and services rendered by them. However, the policy rests upon core principle of competitiveness, adhering to sound procurement practices and execution of supplies in accordance with a system which is fair, equitable, transparent, competitive and cost effective.

BBMB has adopted the Public Procurement Policy for MSEs Order, 2012, and amendments thereto. GeM and CPPP e-portals are being used in BBMB to ensure transparency in the procurement process of goods and services from MSEs.

Details of procurement of goods and services (Made Through GeM) including MSE entrepreneurs/ MSEs owned by SC/ST entrepreneurs/ MSEs owned by Female entrepreneurs only is attached as Annexure-A.

Also under Vivad se Vishwas-I Scheme for providing relief to MSMEs, no claim is pending in respect of BBMB.

Financial Year	Total value of goods and services procured (including MSEs entrepreneurs) during the year	Total value of goods and services procured from MSEs (including MSEs owned by SC/ST entrepreneurs) during the year		Total value of goods and services procured from MSEs owned by SC/ ST entrepreneurs only during the Year		Total value of goods and services procured from only MSEs owned by Female entrepreneurs only during the year.	
	INR (crore)	INR (crore)	%age	INR (crore)	%age	INR (crore)	%age
2023-24 (upto 31.03.2024)	38.29	21.98	57.40	0.19	0.51	4.06	10.63

PROJECT UNDER EXECUTION

2X21 MW Baggi HEP:

Ministry of Power has allocated the execution of Baggi Project to BBMB and in this regard, DPR of Baggi HEP was approved on 01.10.2022. Contract agreement was signed with Consultant- M/s Energy Infratech Pvt. Ltd. on 09.11.2022. EPC NIT for Package I- Civil and H&M works, Package 2- E&M and Transmission line works was floated on central e-procurement portal on 23.11.2023 and 24.11.2023 respectively. Same has been cancelled due to administrative reasons, retendering is under process. Further matter has been taken up with GoHP regarding signing of IA with original terms & conditions of PIA.

UPCOMING ASSIGNMENTS

Pumped Storage Projects

BBMB has self-identified 8 no. of potential PSP sites with calculated capacity of 13000 MW (approx.) after conducting feasibility study. For further preparation of DPR of these projects & for checking the viability of these projects, Govt. of Himachal Pradesh has been requested to allocate the identified sites to BBMB. List of self-identified PSP sites is as under: -

PSP Sites at Bhakra Dam:

S. No	Name of Site	Calculated Power Potential (MW)
i.	Lehri, Distt. Bilaspur, HP	841
ii.	Raipur/Dober Uparla, Distt. Una, HP	1500
iii.	Majra, Distt. Hamirpur, HP	662
iv.	Chhakmoh, Distt. Hamirpur, HP	1400

PSP sites at Pong Dam:

S. No	Name of Site	Calculated Power Potential (MW)
i.	Garial, Distt. Kangra, HP	2800
ii.	Balwal, Distt. Kangra, HP	2500
iii.	Chaplah, Distt. Kangra, HP	900
iv.	Dodrah, Distt. Kangra, HP	2500

BBMB Board in 244th meeting has approved preparation of DPR for all the eight PSP sites identified by BBMB on the periphery of Bhakra & Pong Dam reservoirs. In first phase, BBMB has taken up most lucrative site i.e. Dobar Uparla, District: Una (HP). Tender to carry out the work of preparation of Detailed Project Report (DPR) for Pumped Storage Hydro Electric Project of 1500 MW (6x250 MW) at village Dobar Uparla, District: Una (HP) has been opened and stands approved by Purchase committee of BBMB. Work Order for DPR preparation shall awarded after the allotment of same to BBMB by Govt. of Himachal Pradesh.

PSP Site at Bhakra Dam (Raipur/Dober Uparla, Distt. Una, HP):

- Feasibility Study at Bhakra Dam has been got conducted from M/s WAPCOS.
- As per feasibility study Village Raipur Distt. Una is considered to be most promising site on the basis of Techno-commercial viability, lesser length of Water Conductor System.
- Proposed install capacity is 1500 MW (6x250 MW)
- As per BBMB Board decision, DPR of aforesaid Pumped Storage Project is to be prepared. A&A amounting to Rs. 9.85 Cr has been accorded by competent authority for preparation of DPR.
- The formal allotment of aforesaid self-identified PSP site by GoHP in favor of BBMB is still Pending.
- Upper Reservoir: Max water level: 750m, MDDL-700m, Gross storage capacity-19.3 MCM and Live storage - 14.4 MCM {Lower Reservoir is existing with FRL-512.07m, MDDL-445.62m, Gross capacity-7.04BCM & Live storage-5.65BCM}
- Upper Dam: Concrete Gravity Dam, Height: 100m (from bed level), Width: 10 m, Length at top: 500m, Top of Dam EL 752m.
- Total estimated project cost: Rs 6510 Crore (excluding IDC of Rs 668.59 Cr)
- Total Construction Period: 4 ½ years (excluding 1 yr of pre-construction)

CHAPTER 28

BUREAU OF ENERGY EFFICIENCY

The Government of India enacted the Energy Conservation Act 2001, and for implementing various provisions in the EC Act, Bureau of Energy Efficiency (BEE) was operationalised with effect from 1st March 2002. The EC Act provides a legal framework for energy efficiency initiatives in the country. The Act has mandatory and promotional initiatives which broadly relates to Designated Consumers, Standards and Labeling programme for equipment and appliances and Energy Conservation Building Codes (ECBC) for new commercial buildings. The Bureau is spearheading the task of improving the energy efficiency in various sectors of the economy through regulatory and promotional mechanism. Bureau of Energy Efficiency co-ordinates with designated consumers, designated agencies and other organizations recognizes, identifies and utilizes the existing resources and infrastructure, in performing the functions assigned to it under the EC Act.

The Vision of Bureau of Energy Efficiency (BEE): To improve Energy Intensity of Indian Economy thereby contributing towards sustainable development of country.

The Mission of BEE is to develop policy and strategies with a thrust on self-regulation and market principles, within the overall framework of the Energy Conservation Act (EC Act), 2001 with the primary objective of reducing energy intensity of the Indian economy. This will be achieved with active participation of all stakeholders, resulting in accelerated and sustained adoption of energy efficiency in all sectors.

The primary objective of BEE is to reduce energy intensity in the Indian economy. In order to translate the objectives into result-oriented action, the broad strategies of BEE include:

- To develop policies and programmes on efficient use of energy and its conservation with the involvement of stakeholders.
- To plan, manage and implement energy conservation programmes as envisaged in the EC Act.
- To assume leadership and provide policy framework and direction to national energy efficiency and conservation efforts and programmes.
- To demonstrate energy efficiency delivery mechanisms, as envisaged in the EC Act, through Private-Public Partnership (PPP).
- To establish systems and procedures to measure, monitor and verify energy efficien¬cy results in individual sectors as well as at the national level.
- To leverage multi-lateral, bi-lateral and private sector support in implementation of programmes and projects on efficient use of energy and its conservation.
- To promote awareness of energy savings and energy conservation.

Functions of BEE

BEE co-ordinates with designated consumers, designated agencies and other organizations; recognizes, identifies and utilizes the existing resources and infrastructure, in performing the functions assigned to it under the Energy Conservation Act. The EC Act provides for regulatory and pro¬motional functions which are assigned to the organisation.

Regulatory functions

The major regulatory functions of BEE include:

- Develop minimum energy performance standards for equipment and appliances under Standards and Labelling
- Develop minimum energy performance standards for Commercial Buildings
- Develop Energy Consumption Norms for Designated Consumers
- Certify energy managers and energy auditors.
- Accreditation of energy auditors.
- Manner and periodicity of mandatory energy audits.

Promotional functions

The major promotional functions of BEE include:

- Create awareness and disseminate information on energy efficiency and conservation.
- Arrange and organize training of person¬nel and specialists in the techniques for effi¬cient use of energy and its conservation.
- Strengthen consultancy services in the field of Energy Efficiency.
- Promote research and development.
- Develop testing and certification proce¬dures and promote testing facilities.
- Formulate and facilitate implementation of pilot projects and demonstration projects.
- Promote use of energy efficient process¬es, equipment, devices and systems.
- Take steps to encourage preferential treatment for use of energy efficient equipment or appliances.
- Promote innovative financing of energy efficiency projects.
- Give financial assistance to institutions for promoting efficient use of energy and its conservation.
- Prepare educational curriculum on effi¬cient use of energy and its conservation.
- Implement international co-operation programmes relating to efficient use of energy and its conservation

PROJECTS AND PROGRAMMES

Bureau of Energy Efficiency has already launched the following

voluntary and mandatory Schemes for promoting Energy Efficiency in India, the details of which have been given in Chapter 10 relating to Energy Conservation:

1. National Level Painting Competition
2. National Energy Conservation Award
3. National Energy Efficiency Innovation Awards (NEEIA)
4. Standards and Labelling (S&L) Scheme
5. Energy Conservation Building Code (ECBC)
6. Enhancing efficiency in industries – Implementation of Perform Achieve and Trade (PAT)
7. Demand Side Management (DSM)
8. Energy Efficiency in Small and Medium Enterprises (SMEs)
9. Improving Energy Efficiency in Transport Sector
10. Energy Accounting in DISCOMS
11. Strengthening of State Designated Agencies (SDA) To Promote Efficient Use of Energy and its Conservation.
12. Revision of National Mission on Enhanced Energy Efficiency (NMEEE) - ROSHANEE
13. Indian Carbon Market

CHAPTER 29

CENTRAL POWER RESEARCH INSTITUTE

Background

The Central Power Research Institute (CPRI) established by the Government of India in 1960 was re-organised into an Autonomous Society in 1978 to function as a National Power Research Organization and to serve as a National Testing and Certification Authority for the purpose of certification of rating and performance to ensure availability of equipment of adequate quality for the use under conditions prevalent in Indian Power Systems. The affairs of the Society are managed by Governing Council with Secretary to the Government of India, Ministry of Power as its President. The Governing Council has representation from various Ministries of Government of India, Power Utilities, Manufacturers, Academic Institutions etc.

The Institute has its Head Office and major laboratories at Bengaluru. The Institute has its Units at Bhopal, Hyderabad, Koradi, Noida & Kolkata. Establishment of new unit at Nashik & Raipur is under progress.

The core activities of the Institute are:

» Research & Development

» Testing & Certification

» Consultancy

» Customised Training Programmes

» Vendor Analysis

» Third Party Inspection Services

Accreditations:

» Accredited as per ISO/IEC 17025:2017

» Accredited as per ISO/IEC 17065: 2012

» Member of Short Circuit Testing Liaison (STL) Group

» Corporate Member in DLMS UA (Device Language Message Specification User Association) and UCA IUG (Utility Communication Architecture International User Group)

» ISO 9001:2015 Certification for Research and Consultancy activities

» Accredited by INMETRO, Brazil for Distribution Transformers

» Association with Underwriters Laboratories (UL) for testing of LV equipment

Important Events:

1) CPRI signed a MoU for research and academic collaboration with IIT Mandi, on 09th September 2023. The scope of the MOU covers collaborative R&D, academic interaction leading to higher qualifications and other programs to benefit students and staff of both the organizations.

2) Mission Life Style for Awareness (LiFE) Programme – 2023

LiFE Mission programmes were conducted by CPRI during 01st to 30th June 2023. The programme was inaugurated by Director General, CPRI by unveiling the banner of the programme on 01st June 2023 and handed over newly bought bicycles for the use of inside campus of CPRI.

3) "Meri Maati Mera Desh" Campaign

As part of nationwide "Azadi Ka Amrit Mahotsav" to commemorate 75 years of India's Independence, CPRI celebrated the "Meri Maati Mera Desh" campaign initiated by the Government of India. Various events were conducted. A "Mitti Collection Programme" was held at Shivapura Satyagraha Memorial Site on 18th August 2023 and Vidhurashwatha village on 19th August 2023 with participation of 15 young and senior officers from CPRI.

4) CPRI proudly achieved the First place in the "Government Gardens" category at the Independence Day Flower Show 2023, organized by the Department of Horticulture, Government of Karnataka.

5) Progress of the on-going R&D Project titled "Research and development on biomass properties/characteristics" (taken up under SAMARTH mission) under execution at Punjab Agricultural University (PAU), Ludhiana, Punjab was reviewed through on-site visit by the SG-1 members, on 26th September 2023.

6) Progress of the following three on-going R&D Projects taken up under SAMARTH mission and under execution at SSS-NIBE, Kapurthala, Punjab was reviewed through on-site visit by the SG-1 members, on 27th September 2023.

   a. Composition analysis of different types of pellets/ briquettes received from unknown sources.

   b. Complete heating and emission analysis of raw biomass and pellets during combustion.

c. Complete Ash Analysis of biomass pellets and co-combusted fuels.

7) Progress of four on-going R&D Projects taken up by NTPC-NETRA under SAMARTH mission was reviewed through on-site visit by the SG-1 members on 16th October 2023.

8) Parliamentary Standing Committee on Energy (2023-24) visited CPRI, Bengaluru on 04th November 2023.

Important Consultancy Activities:

- Condition Monitoring/ Diagnostic tests (RLA Studies) on Transformers for M/s. NALCO, CPP, Angul, Odisha
- Corrosion mapping of boiler water wall tubes of Unit No. 2 for M/s. NTPC Limited, Farakka Super Thermal Power Station, Farakka, West Bengal
- Oxide scale thickness measurement in Re-heater, Final Super heater, Platen super heater tubes of 250 MW Boiler, Unit No. 8 for M/s. HPGCL, Panipat Thermal Power Station (PTPS), Haryana
- Metallurgical Analysis of Failed Water wall Tube, Unit No.8 for M/s. MSPGCL, Koradi Thermal Power Station, Maharashtra
- Third party Protection Audit for 765/400 kV Bhuj-II substation for M/s. PGCIL, Bhuj-II, Gujarat
- Soil Resistivity Measurement of Sunni Dam Hydro Electric Project for M/s. SJVNL, Shimla
- Condition Assessment of RCC Structure of TG Deck, Unit No. 5 for M/s. MSPGCL, Chandrapur Super Thermal Power Station, Urja Nagar, Maharashtra
- Vetting/Checking the Pile Foundation Design calculations & Drawings of 132kV DC Type "DC (150-30O)_23M BXA" Tension Monopole for M/s. Bihar State Power Transmission Corporation Limited (BSPTCL)
- Residual Life assessment of 210MW Boiler Unit No. 2 at Khaperkheda Thermal Power Station for M/s. MSPGCL, KhTPS, Khaperkheda
- Lightning over Voltage Studies and Earthing Evaluation studies in 220/400KV (GIS) and Power Transformers of NNTPS for M/s. NLC India Ltd., NNTPS, Neyveli

Important Conference/Webinars/Training Programmes organized:

Webinar on "High Voltage Testing & Measurement Techniques"

Webinar on "High Voltage Testing & Measurement Techniques" was organized by STDS, CPRI, Bhopal through online, on 24th January 2023.

- **One-day National Workshop on "Development of DLMS/ COSEM Testing Tool for Smart Energy Meter"**

  One-day National Workshop on "Development of DLMS/ COSEM Testing Tool for Smart Energy Meter" was organized by Metering & Utility Automation Division (MUAD), CPRI, Bengaluru on 24th February 2023.

- **National Conference on High Voltage Engineering and Technology (HVET 2023)**

  "National Conference on High Voltage Engineering and Technology"- (HVET 2023), was organised by UHVRL, CPRI, Hyderabad, on 17th March 2023.

- **Workshop on "Condition Assessment of RCC Foundation of Boiler Auxiliaries ID Fan, FD Fan, PA Fan, and Bowl mills"**

  Workshop on "Condition Assessment of RCC Foundation of Boiler Auxiliaries ID Fan, FD Fan, PA Fan, and Bowl mills" was organized by TRC, CPRI, Nagpur for M/s. NTPC Limited, Singrauli Super Thermal Power Station, Singrauli on 11th May 2023.

- **Webinar on "Advanced Metering Infrastructure Systems and Technologies"**

  Webinar on "Advanced Metering Infrastructure Systems and Technologies" was organized by SGRL, CPRI, Bengaluru on 08th June 2023.

- **Awareness Programme on PCB dechlorination work for the Engineers of M/s. KSEB, Pallivasal Power House, Idukki**

  Awareness Programme on PCB dechlorination work for

the Engineers of M/s. KSEB, Pallivasal Power House, Idukki was organized by DMD, CPRI, Bengaluru on 16th July 2023.

- **Webinar on "Dielectric Testing of Instrument & Power Transformer"**

  `Webinar on "Dielectric Testing of Instrument & Power Transformer" was organized by HVD, CPRI, Bengaluru on 17th November 2023.

Research & Development (R&D) related activities:

CPRI is the Coordinating Nodal Agency for selection, initiation, execution, review of Research and Development schemes in India under Ministry of Power (MoP). CPRI has been entrusted with the responsibility of administering the R&D Schemes of MoP, as detailed below:

i. R&D Under National Perspective Plan (NPP) Scheme

a. Projects by IITs, IISc., NITs, Industries & CPRI

b. Project under Uchhatar Avishkar Yojana-I (UAY-I)

c. Project under Impacting Research Innovation and Technology-I (IMPRINT-I)

ii. Research Scheme on Power (RSoP)

iii. In-house Research & Development Scheme (IHRD)

Sponsored Projects by other Ministry/ Department/ Institutions/ Organizations etc. are also taken up by CPRI officials.

iv. Mission on Advanced and High-Impact Research (MAHIR)

The Ministry of Power and the Ministry of New and Renewable Energy have jointly launched a National Mission on 07th, June 2023 to identify emerging technologies in the power sector and develop them indigenously, at scale, for deployment within and outside India. The National Mission, titled "Mission on Advanced and High-Impact Research (MAHIR)" aims to facilitate indigenous research, development and demonstration of the latest and emerging technologies in the power sector. By identifying emerging technologies and taking them to the implementation stage, the Mission seeks to leverage them as the main fuel for future economic growth and thus make India a manufacturing hub of the world. Central Power Research Institute (CPRI) will be the coordinating agency for this Mission.

v. National Mission on use of Biomass in coal based thermal power plants (SAMARTH)

Test Conducted for Overseas Customer

The Ministry of Power has set up the National Mission on use of Biomass in coal based thermal power plants (SAMARTH) to address the issue of air pollution due to farm stubble burning and to reduce carbon footprints of thermal power generation. The SAMARTH Mission aims to increase the level of co-firing from present 5% to higher levels to have a larger share of carbon neutral power generation from the thermal power plants.

CPRI is the nodal agency for coordinating all the projects under SAMARTH mission and DG-CPRI is the Chairman of Subgroup-1(SG-1) of the SAMARTH mission.

- Type testing of 1X340 Sq.mm, Cu / SC/ XLPE/ SC/ SCWBT/ CUW + CUT/ NCWBT/ PVC(AT) 19/33 kV XLPE cable and 3CX150 Sq.mm, CU / SC/ XLPE/ SC/ SLWBT/ CUW+CUT/ PVC/PVC/OSTA/ NCWBT/ PVC (AT) Cable as per IEC 60502-2-2014 was carried out at Cables & Diagnostic Divisions, CPRI, Bengaluru for M/s. Gulf Cable & Multi Industries Co., Jordan.
- Ability to withstand Dynamic Effects of Short Circuit & Temperature Rise tests on 250kVA 33000/415V Three Phase Distribution Transformer and Temperature-Rise Test alone on 550kVA 33kV Three Phase Earthing Transformer as per IEC 60076 - 5: 2006 & IEC 60076-2: 2011 respectively were carried out at Short Circuit Laboratory, CPRI, Bengaluru for M/s. LTL Transformers (PVT) Ltd., Sri Lanka
- Ability to withstand the dynamic effects of short circuit test on 10/14MVA, 33/11.55kV, 3-Phase, Power Transformer was carried out at Switchgear Testing & Development Station, CPRI, Bhopal for M/s. Confidence Infrastructure Limited, Bangladesh.
- Ability to withstand dynamic effects of short circuit test as per IEEE C57.12.90-2021 on 75kVA, 19.92/0.24(2*120)kV Single phase Transformer was carried out at Switchgear Testing & Development Station, CPRI, Bhopal for M/s. First Phillic INC, Philippines.
- Type test on 1 X 2500 Sq.mm, Copper Conductor, XLPE insulated 220 kV Cables as per IS 7098 Part-3 was carried out at Cables & Diagnostic Division, CPRI, Bengaluru for M/s. Phelps Dodge International Thailand Limited, Thailand.
- Power Frequency withstand test (Wet) on 6.35 /11kV,3Ph XLPE Conductor was carried out at High Voltage Division, CPRI, Bengaluru for M/s. REPL (Malaysia) BHD, Malaysia.
- Verification of short circuit withstand strength test at 50kA for 1.0 s with 105 kA peak on main bus bars, at 30 kA for 1.0 s with 63 kA peak on neutral bus bar were carried out on 415V 4000A Indoor LT Panel as per IEC 61439-1: 2011 & IEC 61439-2:2011 at Short Circuit Laboratory, CPRI, Bengaluru for M/s. NG Electro Power Pvt. Ltd., Nepal.
- Type test of 6.35/11 kV, 3CX240 Sq.mm, Al/XLPE/CWS/ PVC/SWA/PE Cable as per IEC 60502 (Part-2)/2014 was carried out at Cables & Diagnostics Division, CPRI, Bengaluru for M/s. Dubai Cable Company, Dubai
- Routine test prior to Ability to withstand the dynamic effects of short circuit test of 5000kVA, 33/11kV, 3-phase, Power Transformer was carried our at Switchgear Testing & Development Station, CPRI – Bhopal for M/s. LTL Transformers Pvt. Ltd., Sri Lanka

Visit of overseas Team to CPRI

- Mr. Nipun Nanayakkara & Mr. Kushan Kandambi, M/s. LTL Transformers Pvt. Ltd., Srilanka visited STDS, CPRI, Bhopal for witnessing of tests on 33kV, 800A for 30 sec. Oil Immersed Earthing Transformer on 09th & 13th March 2023.
- Mr. Kashiram Bhattarai, Engineer from M/s. NG Electro Power Pvt. Ltd., Nepal visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing of tests on 415V 4000A Indoor LT Panel on 22nd August 2023.
- Mr. Rmal Sabah, Assistant Engineer and Mr. Raju Ahmed, Sub- Assistant Engineer from M/s. PGCB Ltd, Bangladesh visited High Voltage Division, CPRI, Bengaluru for witnessing of Radio Interference Voltage Test on 11kV Porcelain Disc Insulator for M/s. Aditya Insulators, Rishra on 24th November 2023.
- Mr. Fabio and Mr. Carlo from M/s. ABB S.p.A Bergamo, Italy visited Switchgear Testing & Development Station, CPRI, Bhopal for Witnessing of Test sequence-II, III & IV conducted on 415V, 630A, FP MCCB's (Electrical & Thermal Magnetic) for M/s. ABB India Ltd., ELSP Division, Bengaluru on 17th January 2024.
- Visit of officials from M/s. Mitsubishi Electric, Japan visited Switchgear Testing & Development, CPRI, Bhopal for Technical discussion regarding MV Panels type testing facilities on 16th February 2024.
- Mr. Mahmood Alsaegh from M/s. EWA, Bahrain visited Switchgear Testing & Development, CPRI, Bhopal for witnessing of Discussion regarding testing on 29th January 2024.

Important projects under implementation:

- Establishment of Regional Testing Laboratory at Raipur, Chhattisgarh
- Regional Testing Laboratory at Nashik, Maharashtra, Comprising of test facility for Transformer, Energy Meter and Insulating Oil
- Upgradation of High Power Laboratory from 2500 MVA to 7500 MVA at CPRI, Bengaluru
- Temperature Rise Test facility (40 kA) at CPRI, Bengaluru
- Establishment of Cyber Security and Smart Meter Test Facilities at Bhopal, Hyderabad, Noida, Raipur and Nashik.
- Setting up of 10/350 μs Impulse Current Test Facility at Bangalore

CHAPTER 30

NATIONAL POWER TRAINING INSTITUTE

National Power Training Institute (NPTI), an ISO 9001 & ISO 14001 organization under Ministry of Power, Govt. of India is a National Apex body for Training and Human Resources Development in Power Sector with its Corporate Office at Faridabad. NPTI had been providing its dedicated service for more than five decades. NPTI has trained over 4,70,000 Power Professionals in regular Programs over more than 5 decades. NPTI is the world's leading integrated power training institute. NPTI is the only institute of its kind with a wide geographical spread and covering a wide gamut of academic and training programs in Power Sector. NPTI has been recognized as Cadre training Institute for officers of CEA / Utilities. NPTI's committed faculty is providing excellent training in the Power Sector, which is the most important sector among various infrastructure sectors. A number of training programs for national as-well-as transnational customers have been conducted. These programs have increased the availability of Generation, Transmission & Distribution Systems and decreased Aggregate Technical & Commercial Losses. NPTI has been recognized as Training, Assessment & Certification body by Ministry of Skill Development through Gazette Notification for DDU-GKY.

NPTI operates on an all India basis with manpower strength of 148 including 79 officers through its Eleven Institutes in different zones of the country as per details below:

A. Northern Region

1. NPTI Corporate Office, Faridabad
2. NPTI (Northern Region), Badarpur, New Delhi
3. NPTI (Hydro Power Training Centre), Nangal

B. Southern Region

4. NPTI (Power System Training Institute), Bengaluru
5. NPTI (Hot Line Training Centre), Bengaluru
6. NPTI (Southern Region), Neyveli
7. NPTI, Alappuzha

C. Eastern & North Eastern Region

8. NPTI (Eastern Region), Durgapur
9. NPTI (North Eastern Region), Guwahati

D. Western Region

10. NPTI (Western Region), Nagpur

E. North- Central Region

11. NPTI, Shivpuri

Manpower Training and Academic Programs

NPTI conducts the following industry interfaced academic programs with the objective to create a pool of committed and competent professionals equipped with appropriate technical skills to steer the Indian Power Sector:

- Two Year Master in Business Administration (MBA)
- One Year Post Graduate Diploma Course (PGDC) in Power Plant Engineering
- One Year Post Graduate Diploma Course (PGDC) in Renewable Energy & Grid Interface Technologies
- One Year Post Graduate Diploma Course (PGDC) in
- Smart Grid Technologies
- One Year Post Graduate Diploma Course (PGDC) in Power Management
- One Year Post Diploma Course (PDC) in Power Plant Engineering
- Nine Months Post Graduate Diploma Course (PGDC) in Hydro Power Plant Engg.
- Simulator Training Programs in Thermal, CCGT, Hydro & Load Despatch

In addition to the above, several long-term, medium-term and short-term training programs in the areas of Thermal, Hydro, Transmission & Distribution, Management and Regulatory affairs etc. are being conducted in the various Institutes of NPTI.

Customized training programs for various Power Utilities are also organized round the year. NPTI also conducts various training programs to ensure availability of properly trained personnel covering the syllabus as per Indian Electricity Rules.

NPTI has also been catering to the Training Needs of Power Sector Organizations viz., NHPC, GRID-INDIA, CEA, CESC, DPL, DVC, ECIL, FACT, GAIL, HINDALCO, HPGCL, IFFCO, IOCL, IREDA, KPCL, KRIBHCO, MPPGCL, NALCO, NEEPCO, NFL, NHPC, NLC, JUVNL, NTPC, OHPC, OPGCL, POWERGRID, RRVUNL, SAIL, THDC, UPRVUN, ACC, AEC, APGENCO, BBMB, BHEL, BSES, etc.

Power Training Simulators

NPTI has a 500 MW Thermal Power Plant Training Simulator at Faridabad Institute and 210 MW Thermal Power Plant Training Simulator at Nagpur & Badarpur Institutes for imparting specialized skills to operation personnel across the country. A 430 MW (2x143 MW Gas Turbines and 1x144 MW Steam Turbine) Full Scope Combined Cycle Gas Turbine Replica Simulator commissioned at NPTI Corporate Office, Faridabad is utilised for training CCGT operation personnel. A High-fidelity Load Dispatch Operator Training Simulator replicating the National Grid is also being used to impart training to System Operators at PSTI, Bengaluru. Training is also imparted to Hydro Operation Personnel on the 250 MW Hydro Simulator commissioned at HPTC, Nangal.

Six (6) Multi-functional training Simulators have been established replicating the real-time operation of 210 MW, 500 MW, 800 MW & 9F GE Combined Cycle Power Plant, 250 MW Hydro, SCADA & Smart Grid together with Smart Power Flow Controllers in an Integrated framework of System comprising Thermal, Hydro, Gas along with Renewables at Faridabad, Durgapur, Bengaluru, Nagpur, Alapuzzha and Shivpuri and training is being imparted.

A 800 MW Supercritical Thermal Simulator has also been commissioned in NPTI, Corporate Office, Faridabad and training is being imparted to Utilities.

Hot Line Training Centre

A facility has been created at NPTI's Hot Line Training Centre, Bengaluru for Live Line Maintenance of Transmission Lines upto 400 kV which enables trained personnel to attend to maintenance requirements without power interruptions. Facilities for water washing of sub-station equipments are also available. This institute is one of its kind in the Asian sub continent.

Placement

Students of Post Graduate Diploma Course and Post Diploma Courses are finding placement in reputed companies like ACB Limited, HPPL, Vedanta Resource Ltd., JSW Energy, IERS, Kreate Energy, MotWane, Utility Powertech Ltd. etc.

Achievements during 1st April 23 to 31st March 2024

NPTI provided training to 15141 trainees for total trainee-weeks of 43105 till 31.03.2023.

Other Important Activities

Training for IAS Officers

NPTI Successfully conducted two days workshop from 24th - 25th May 2023 on Energy Module in LBSNAA Mussoorie as part of the 17th Round of Phase-IV : Mid Career Training Program for IAS officers. This program was attended by 67 participants.

NPTI Successfully conducted five days workshop from 24th - 28th July 2023 on Energy Sector in LBSNAA Mussoorie for officers working in power sector which was sponsored by Ministry of Power. This program was attended by 54 participants.

Mandatory Foundation Program

In order to provide 360 degree overview of the Power Sector and to develop camaraderie with colleagues and batch mates across the organizations, NPTI has conducted training for Thirteen batches of 1450 participants from NTPC, NHPC, POWERGRID, PFC, GRID-INDIA,THDC,DVC,REC,CPRI.

National Mission on use of Biomass in Thermal Power Plants

Under the aegis of Mission SAMARTH, NPTI has conducted 09 Awareness programs for Farmers, Pellet manufacturer and professionals from Thermal Power Plants and also site visit was conducted. So far more than 30 Programs have been conducted.

Training and Certification Programs on Cyber Security

NPTI has certified more than 2000 Power Professionals from various Power Sector Organizations in its Basic Level & Intermediate Training & Certification program.

Revamped Distribution Sector Scheme (RDSS) Programs

NPTI has been engaged by Ministry of Power for the capacity building of State DISCOMs under RDSS for Smart Meter Implementation and SCADA Systems. Under the RDSS NPTI has conducted programs on Introduction to AMI & role of AMI in reducing AT&C losses, AMI System Design & Program Management, IT Communication Technology in Smart Metering and SCADA, IT/OT Technologies and DMS & OMS System covering 7664 participants. So far more than 237 Programs have been conducted.

System Operator Certification Examination

NPTI's Power System Training Institute (PSTI) has been conducting Certification of Power System Operators since 2011. Training Courses at NPTI, Corporate Office, Faridabad and Power System Training Institute (PSTI), Bengaluru equip the System operators with necessary inputs to take up the System Operation Certification Exam.

Basic Level On-Line System Operator Certification exams are being conducted since November 2011 every year at various centres across the country. A total of 2358 System Operators were certified against for the Basic Level Certification Examinations. Specialist courses on 'Regulatory Framework in Power Sector', 'Power System Reliability', 'Renewable Energy Sources and Grid Integration', 'Power System Logistics' and 'Power Market Specialist' are being conducted both at Corporate Office, Faridabad and PSTI, Bengaluru. Examinations on all the specialist level subjects are being conducted. On-Line examinations for Specialist Level Certification have been conducted. As many as 466 System Operators were certified.

Induction Training

NPTI has been providing induction training to fresh Graduate Engineers/Executives from various Power Sector Organizations: GRID-INDIA, NHPC, MSETCL, WBSETCL etc.

International Training

03 Week Training Program on "Substation Design for Tanzania Electric Supply Company Ltd. (TANESCO), Tanzania" was conducted. One-week International Training Program on "Bearing Maintenance and Lubrication" for Druk Green Power Corporation Limited Bhutan was conducted for senior executives from DGPCL Bhutan

Other Important Activities

- 4 Weeks Training Program on "Switchyard Maintenance using LLMT" for GETCO, KPTCL was conducted.
- 5 Weeks Training Program on "O&M of Hydro Power Plant" is being conducting for GET, DVC.
- 8 Weeks Training Program on "O&M of Thermal Power Plant" for JEs and AEs of RRVUNL Batch IX & X was conducted
- One Week Training Program on "250 MW Hydro Simulator" & "SCADA, SMART GRID T&D Simulator" conducted.
- 3 days Training Program for the Managers from PFC was conducted.
- 2-Weeks orientation Training Program on "Thermal, Hydro, Sub-station (Electrical) for newly promoted M-1 Technical Executives of DVC was conducted.
- Two days TPP sector focused training program for Accredited Energy Auditors (AEA's), Energy Auditors (EA's) and SDA officials.

- 'Advance Industrial Technology Demonstration Centre' was inaugurated by Shri Krishan Pal Gurjar, Hon'ble Minister of State for Power and Heavy Industries on 26.06.2023 at NPTI (NR) Badarpur.
- 01 week Training Program on "Advanced Metering System, MES" was conducted.
- 02 days Training Program on 'Energy Efficiency Technology Initiatives in Cement Industry Sector' was conducted for Cement Industry and Textile Industry under the aegis of BEE.
- 05 days Refresher Training Program on "Overview of Power Sector with latest Technologies Hydro & Renewable" for Junior Engineers of SJVN Ltd. was conducted.
- One Week Mid-career Training Program for Dy. Directors & Directors was conducted for CEA Officials.

Consultancy Services

NPTI has been appointed as Project Management Agency (PMA)/Consultant to PuVNNL, TCIL and the work is in progress. Third Party Inspection Works for DTL (Delhi TRANSCO), JVVNL, Jaipur, DVVNL, Agra, KESCO, Kanpur, PVVNL, Merrut and UHBVN, Panchkula is in progress. NPTI is doing TPIA works for Jal Jeevan Mission in the state of Tripura. Field Inspection works of DVVNL, Agra and UHBVN, Panchkula is in progress. NPTI is also doing DT Study of North Eastern States under BEE. NPTI is also executing works for GPR survey of UG utilities for Lucknow smart city and REC package-2 as TPQMA (Third Party Quality Monitoring Agency) for 05 States/UT.

MOU

MOU has also been signed with IIT Kanpur, BSES Rajdhani Power Ltd., BSES Yamuna Power Ltd., IIT Roorkee, BEE, IRITM, MPSDP and Sant Shiromani Ravidas Global Skills Park, Bhopal NEEPCO, PTC India.

Shri Krishan Pal, Hon'ble Minister of State for Power, Shri Ajay Tewari, Additional Secretary and Shri Jithesh John, Economic Adviser, Ministry of Power attended the Foundation Day of NPTI

Shri Krishan Pal, Hon'ble Minister of State for Power and Shri Ajay Tewari, Additional Secretary laying Foundation of the National SCADA Resource Centre (N.S.R.C) at NPTI, Faridabad

CHAPTER 31

'PUBLIC GRIEVANCE'

Public Grievance (PG) Cell of the Ministry is entrusted with the responsibility of redressal of public grievances. In pursuance of this. a link of CPGRAM/PG online portal of Department of Administrative Reforms & Public Grievances (DAR&PG) has been provided on the website of Ministry of Power. All grievance petitions received in the Ministry are examined and forwarded to the concerned Division/Organisation for their redressal. As per the guidelines of DAR&PG, the grievances are normally to be redressed ravishing a month.

Name of the Organization	From 01.01.2023 to 31.03.2023			From 01.04.2023 to 31.12.2023			From 01.01.2024 to 31.03.2024			Activities during 01 .01.2023 to 31.03.2024
	No. of grievances received	No. of grievance disposed off	Balance Grievance	No. of grievances received	No. of grievance disposed off	Balance Grievance	No. of grievances received	No. of grievance disposed off	Balance Grievance	
Ministt-of Power	1208	1024	184	3478	3209	269	1371	1153	218	Monitoring of rievances pending rnore than 3 days is being done for timely disposal within the prescribed time linrir of 30 davs

CHAPTER 32

RIGHT TO INFORMATION ACT, 2005

The Ministry of Power and all its PSUs and other organizations are linked with RTI MIS online portal of DOPT for processing of RTI applications/First Appeals. Under the RTI Act, 2005, the Ministry of Power has designated Under Secretaries/Section Officers as CPIOs and the Directors/Deputy Secretaries as First Appellate authorities, During the year 2023 the Ministry received 1737 RTI applications and 85 Appeals. Out of which 1662 RTI applications and 72 RTI appeals disposed of by the concerned CP|Os/Appellate Authorities. Not even a single Second Appeal received by Central lnformation Commission in the year 2023. As required under Section 4(1) (b) of the RTI Act, 2005, proactive/suo muto disclosures are uploaded on the RTI portal of the Ministry. The Annual Return for the period 2022-23 has been uploaded on Central information Commission website as required u/s 25(3) of the RTI Act 2005

The Status of RTI Application & Appeals for the period from 01-01-2023 to 31-03-2023.

Applications received	Applications disposed off	First Appeal received	First Appeal disposed off	Second appeal received from CIC	Second appeal disposed off by CIC	Whether suo moto disclosures are uploaded on company website
397	363	24	15	0	0	Yes

The Status of RTI Application & Appeals for the period from 01-04-2023 to 31-12-2023.

Applications received	Applications disposed off	First Appeal received	First Appeal disposed off	Second appeal received from CIC	Second appeal disposed off by CIC	Whether suo moto disclosures are uploaded on company website
1340	1299	61	57	0	0	Yes

The Status of RTI Application & Appeals for the period from 01-01-2024 to 31-03-2024.

Applications received	Applications disposed off	First Appeal received	First Appeal disposed off	Second appeal received from CIC	Second appeal disposed off	Whether suo moto disclosures are uploaded on company website
380	336	19	13	0	0	Yes

CHAPTER 33.1

OFFICIAL LANGUAGE IMPLEMENTATION

The Ministry of Power is a very important office of the Government of India. There are various autonomous bodies, statutory bodies, public sector undertakings and joint ventures under the control of the Ministry of Power. The Official Language Section of the Ministry has conducted various types of translation of Government letters, official language inspections, Hindi workshops, Hindi fortnight etc. during the financial year 2023-24. It has also assisted the Public Sector Undertakings in organizing Hindi fortnight. Officers of various sections of the Ministry have participated in the prestigious "All India Official Language Conference" organized by the Department of Official Language, Ministry of Home Affairs at Pune (Maharashtra).

The Official Language Section has ensured compliance of the Official Languages Act, 1963 and Official Language Rules, 1976 in the Ministry and the offices under its control. The Section has performed exceptionally well by translating more than 5000 pages. Many a times, officers and employees have to perform their work even after office hours, especially during the Parliamentary sessions.

This year, the 2nd Sub-Committee of the Parliamentary Official Language Committee conducted the Official Language Inspection in the Ministry of Power on 22.06.2023 and inspected 62 offices of various PSUs under the control of the Ministry of Power. The Official Language Section of the Ministry has conducted Official Language Inspection of 17 offices across the country during this period.

This year, a meeting of the Hindi Advisory Committee was held at New Delhi on 17.08.2023 under the Chairmanship of Hon'ble Minister of Power and New & Renewable Energy, Shri R.K. Singh. During the year, 29 offices were notified under Rule 10(4) of the Official Language Rules, 1976. The Official Language Section has organized two workshops in which about 95 officers have received training to work in Hindi.

The section organized 'Hindi Pakhwada' from 14th to 28th September, 2023. To promote Hindi in the functioning of the Ministry, Administrative Vocabulary Competition, Hindi Dictation Competition, Slogan Writing Competition, Hindi Note-taking and Drafting Competition, Painting Competition, Quiz Competition, Hindi Essay Writing Competition, Hindi Debate Competition, Hindi Self-composed Poem Recitation Competition were organized during this period. More than two hundred out of about three hundred personnel of the Ministry participated in these competitions. In these competitions, the winners were awarded first (prize amount- Rs. 4000), second (prize amount- Rs. 3500), third (prize amount- Rs. 2500) and incentive prizes (prize amount- Rs. 2000).

The Official Language Section has also done some important work like motivating officers to learn Hindi and sending them for training under the Hindi Teaching Scheme. Under this scheme, 04 officers/employees have been sent for Hindi training.

The Official Language Section reviews the quarterly progress report regarding progressive use of Hindi of all the organizations under the control of the Ministry every quarter and sends the review report for taking follow up action on the review.

CHAPTER 33.2

VIGILANCE ACTIVITIES/DISCIPLINARY CASES

Vigilance wing of Ministry of Power deals with the complaint against officers/officials of the Ministry of Power and Board level officers of the PSUs and other organizations under administrative control of the Ministry. All the complaints received in the section are registered in the Ministry/ Section through E-office system. After examining the complaints relating to Board level officers of PSUs, reports are submitted to relevant agencies i.e. CVC /PMO/Cabinet Secretariat /DOPT, as the case may be. Further, complaints received from CVC under CVC Act/PIDPI are handled on priority basis, and reported to CVC within the specified period. Pending complaint cases are also monitored on regular basis.

2. The "Vigilance Awareness Week 2023" was observed in Ministry of Power between 30th October 2023 to 5th November, 2023. This year the theme for the Vigilance Awareness Week was "Say no to corruption; commit to the Nation". During the week, banners/posters of Vigilance Awareness Week alongwith slogans on vigilance theme were displayed at all the entrance and other prominent places of the Shram Shakti Bhavan/Nirman Bhavan, New Delhi. The occasion, started with a pledge taking ceremony, where an integrity pledge to maintain integrity and transparency in all spheres of work was administered to the Officers and Staff of the Ministry by Secretary, Ministry of Power on 30th October, 2023.

3. During the Vigilance Awareness Week, Essay & Debate Competitions for the employees of the Ministry were organized on 1st November 2023 & 2nd November, 2023 respectively. Painting Competition for the children of employees of the Ministry was also organized on 3rd November, 2023. The topic for Essay was "The Role of Civil Society in the Fight against corruption" and the topic for Debate was "Is e-Governance sufficient to curb Corruption". The painting competition theme was "Corruption"

4. In the scenario of constant security threats to assets of Power Sector units under Ministry of Power, the compliance to the security instructions/advisories received from various agencies from time to time were also ensured through appropriate communications to the concerned authorities for prompt necessary action.

Painting Competition for the children of employees of the Ministry held on 03.11.2023

Essay Competition for the employees of the Ministry of Power held on 01.11.2023

CHAPTER 33.3

ACTIVITIES RELATING TO WOMEN EMPLOYEES

There are 46 women employees in the Ministry of Power. The representation of women employees at various levels in the Ministry of Power as on 31.03.2024 is indicated below:

Group	Total Employees (as on 31.03.2024)	No. of Women Employees	Percentage of overall staff strength
A	71	13	18.30
B	151	20	13.24
C	42	10	23.80
C(MTS)	42	03	07.14
TOTAL	**306**	**46**	**15.03**

Employment of women in various grades in the Ministry of Power is dependent upon the nominations received from DOP&T and the recruiting agencies such as the Union Public Service Commission, Staff Selection Commission etc.

A Complaints Committee exists in the Ministry of Power to look into the complaints of sexual harassment made by the women employees of the Ministry. The Committee is currently chaired by Under Secretary Level Officer

CHAPTER 33.4

PERSONS WITH DISABILITIES (PWD's)

Ministry of Power provides reservation for the Persons with Disabilities in appointments in accordance with the instructions issued by Government from time to time. The implementation of the reservation policy for Persons with Disabilities in the Ministry and various organisations under its administrative control is monitored by Director (SC/ST) of the Ministry.

2. The representation of Persons with Disabilities in the Ministry as on 31.03.2024 is as under :

Group	Total Employees (as on 31.03.2024)	Persons with Disabilities Employees				Percentage of Persons with Disabilities employees
		VD	HD	OD	Total	
A	71	0	0	1	1	1.40
B	151	0	0	0	0	0
C	42	0	0	1	1	2.38
C (MTS)	42	1	0	2	3	7.14
TOTAL	**306**	**1**	**0**	**4**	**5**	**1.63**

VD – Visually Disabled (Handicapped), HD – Hearing Disabled (Handicapped), OD – Orthopedically Disabled (Handicapped)

CHAPTER 33.5

RECREATIONAL ACTIVITIES

Recreation Club, Ministry of Power strives to promote recreational and cultural activities among the employees of the Ministry which help in rejuvenating both body and mind of the employees. This leads to increased productivity at the workplace.

The Ministry gives significant importance to the physical andmental well-being of its employees. The Recreation Club encourages the employees of the Ministry to actively participate in sports activities which helps in inculcating team spirit and helps the employees to lead an active and healthy life.

During the year 2023-24 the employees of the Ministry participated in various Inter-CPSU sporting events organized by the Power Sports Control Board (PSCB) and managed to won various medals in many sports such as Carrom, Bridge, Chess etc.

Team MoP – Carrom team with Hon'ble Minister of State for Power after securing various Medals in Carrom Tournament held at Rishikesh organized by THDC India Ltd.

Team MoP – Carrom team with Hon'ble Minister of Power after securing various Medals in Carrom Tournament held at Rishikesh organized by THDC India Ltd.

Team MoP- Bridge has secured Gold Medal in Inter CPSU Bridge Tournament held at Shillong organized by NEEPCO Ltd.

Ms Chanchal, ASO secured Silver Medal in Inter CPSUs Chess Tournament held at Lucknow organized by REC Limited.

CHAPTER 33.6

WELFARE OF SCHEDULED CASTES, SCHEDULED TRIBES AND OTHER BACKWARD CLASSES.

A Reservation Cell has been functioning in the Ministry since the early nineties under the direct control of the Director/DS (SC/ST), who is also the Liaison Officer for Scheduled Castes and Scheduled Tribes. Reservation Cell assists the Liaison Officers for SCs/STs & OBCs. The Cell monitors the implementation of reservation policies of the Government of India in respect of Scheduled Castes, Scheduled Tribes, Other Backward Classes, Persons with Disabilities, Minority Community, Ex-Servicemen and Economically Weaker Section in the Ministry, as well as Autonomous Bodies/CPSUs under the administrative control of the Ministry of Power.

2. The total strength of employees and representation of Scheduled Castes, Scheduled Tribes and Other Backward Classes in the Ministry of Power as on 31.03.2024 is indicated below:

Group	Total number of Employees (as on 01.01.202)	Representation					
		SCs	SCs %	STs	STs %	OBCs	OBCs %
Group A	71	22	30.98	2	2.81	2	2.81
Group B	151	46	30.46	6	3.97	31	20.52
Group C	42	7	16.66	2	4.76	8	19.04
Group C (MTS)	42	20	47.61	1	2.38	9	21.42
TOTAL	306	95	30.71	11	3.59	50	16.33

3. With respect to welfare of the Minorities, the schemes, as recommended by the Government for the welfare of the Minorities from time to time, are implemented, from time to time.

CHAPTER 34

E-GOVERNANCE / IT INITIATIVES

i. Cyber Security Initiative

The Government identifies power sector as one of the critical infrastructure of the country and an important area to promote sustainable development using high end automation. Cyber Security Guidelines were issued on 7.10.2021 under the provision of Section 3(10) on Cyber Security in the "Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019" to create a cyber secure eco system for power sector.

Cyber Security Guidelines are applicable to all power sector entities including System Integrators, Equipment Manufacturers, Suppliers/Vendors, Service Providers, IT Hardware and Software OEMs for protection of Control Systems for System Operation and Operation Management, Communication System and Secondary Automation and Tele control technologies.

ii. eGovernance Initiative

eOffice System is functional in Ministry of Power since 2015 as part of Government of India's eGovernance initiative. Presently, the latest Ver 7.3.9 of eOffice System is being used for speedy processing of eFiles and bringing more transparency in the system. Approximately 96% of the files in the Ministry were processed in electronic mode using eFile System during the period January, 2023-March 2024.

iii. Social Media

The Ministry of Power has been actively engaging with the citizens through various social media platforms with an audience of 216K on Facebook, 606K on X, 22.6K on Instagram and 301.3K on PublicApp. Videos are also being actively posted on the Youtube channel. 872 Tweets, 621 Infographics/videos on Facebook/Instagram were also posted during the period 01.01.2023 to 31.03.2024 for disseminating the achievements and activities carried out by the Ministry.

CHAPTER 35

ALL INDIA INSTALLED CAPACITY (IN MW) OF POWER STATIONS

(As on 31.03.2024)

State	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Northern Region	State	18985.00	250.00	2878.90	0.00	22113.90	0.00	6008.25	747.70	6755.95	28869.85
	Private	22624.33	1080.00	772.00	0.00	24476.33	0.00	3241.00	37366.22	40607.22	65083.55
	Central	15341.62	250.00	2344.06	0.00	17935.68	1620.00	11580.51	379.00	11959.51	31515.19
	Sub-Total	**56950.95**	**1580.00**	**5994.96**	**0.00**	**64525.91**	**1620.00**	**20829.76**	**38492.92**	**59322.68**	**125468.59**
Western Region	State	21290.00	900.00	2849.82	0.00	25039.82	0.00	5446.50	602.23	6048.73	31088.55
	Private	31762.17	500.00	4676.00	0.00	36938.17	0.00	481.00	47440.01	47921.01	84859.18
	Central	21610.42	0.00	3280.67	0.00	24891.09	3240.00	1635.00	666.30	2301.30	30432.39
	Sub-Total	**74662.59**	**1400.00**	**10806.49**	**0.00**	**86869.08**	**3240.00**	**7562.50**	**48708.54**	**56271.04**	**146380.12**
Southern Region	State	22192.50	0.00	791.98	159.96	23144.44	0.00	11827.48	633.08	12460.56	35605.00
	Private	13572.50	250.00	5340.24	273.70	19436.45	0.00	0.00	52643.84	52643.84	72080.29
	Central	14129.40	3390.00	359.58	0.00	17878.98	3320.00	0.00	541.90	541.90	21740.88
	Sub-Total	**49894.40**	**3640.00**	**6491.80**	**433.66**	**60459.86**	**3320.00**	**11827.48**	**53818.82**	**65646.30**	**129426.16**
Eastern Region	State	6970.00	0.00	80.00	0.00	7050.00	0.00	3550.22	278.11	3828.33	10878.33
	Private	5553.00	0.00	0.00	0.00	5553.00	0.00	209.00	1721.15	1930.15	7483.15
	Central	15989.50	0.00	0.00	0.00	15989.50	0.00	1005.20	10.00	1015.20	17004.70
	Sub-Total	**28512.50**	**0.00**	**80.00**	**0.00**	**28592.50**	**0.00**	**4764.42**	**2009.26**	**6773.68**	**35366.18**
North Eastern Region	State	0.00	0.00	411.36	36.00	447.36	0.00	422.00	268.75	690.75	1138.10
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	276.09	276.09	276.09
	Central	949.02	0.00	1253.60	0.00	2202.62	0.00	1522.01	30.00	1552.01	3754.63
	Sub-Total	**949.02**	**0.00**	**1664.96**	**36.00**	**2649.98**	**0.00**	**1944.01**	**574.84**	**2518.85**	**5168.82**
Islands	State	0.00	0.00	0.00	84.35	84.35	0.00	0.00	5.25	5.25	89.60
	Private	0.00	0.00	0.00	35.19	35.19	0.00	0.00	29.78	29.78	64.97
	Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.10	5.10	5.10
	Sub-Total	**0.00**	**0.00**	**0.00**	**119.54**	**119.54**	**0.00**	**0.00**	**40.13**	**40.13**	**159.67**
ALL INDIA	State	69437.50	1150.00	7012.06	280.31	77879.87	0.00	27254.45	2535.11	29789.56	107669.43
	Private	73512.00	1830.00	10788.24	308.89	86439.14	0.00	3931.00	139477.09	143408.09	229847.23
	Central	68019.96	3640.00	7237.91	0.00	78897.87	8180.00	15742.72	1632.30	17375.02	104452.89
	Sub-Total	**210969.46**	**6620.00**	**25038.21**	**589.20**	**243216.87**	**8180.00**	**46928.17**	**143644.51**	**190572.68**	**441969.55**

Figures at decimal may not tally due to rounding off

Abbreviation:- SHP=Small Hydro Project (≤ 25 MW), BP=Biomass Power, U&I=Urban & Industrial Waste Power, RES=Renewable Energy Sources

Note : -1. RES include SHP, BP, U&I, Solar and Wind Energy. Installed capacity in respect of RES (MNRE) as on 31.03.202 4 (As per latest information available with MNRE)

***Break up of RES all India as on 31.03.2024 is given below (in MW) :**

"Small Hydro Power"	Wind Power	Bio-Power		Solar Power$	Total Capacity
		BM Power/Cogen.	Waste to Energy#		
5003.25	45886.51	10355.35	585.8	81813.60	143644.51

#: Includes Waste to Energy and Waste to Energy (Off-grid)

$: Includes Ground Mounted Solar, Rooftop Solar, Hybrid Solar Comp. and Off-grid Solar/ KUSUM

A.	Capacity Added during	March, 2024		700 MW
		Nuclear		700 MW
B.	Capacity Retired during	March, 2024		0 MW
C.	Net Conv. Capacity Added during	March, 2024	A-B	700 MW
D.	Net RES Capacity Added during	March, 2024		7074.42 MW
E.	Net Capacity Added during	March, 2024	C+D	7774.42 MW

* Off-grid RES Capacity has been included from July-2021 onwards

Sector wise breakup of RES capacity as shown is provisional.

Allocation from central sector stations has been updated till 29.02.2024.

Share from private sector generating stations has been updated as per latest information available.

NPCIL's Kakrapar Atomic Power Project Unit-4 of 700 MW has been commissioned on 31.03.2024.

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/ UTS LOCATED IN NORTHERN REGION

INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES

(As on 31.03.2024)

State	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Delhi	State	0.00	0.00	1800.40	0.00	1800.40	0.00	0.00	0.00	0.00	1800.40
	Private	878.22	0.00	108.00	0.00	986.22	0.00	0.00	340.51	340.51	1326.73
	Central	2771.28	0.00	207.01	0.00	2978.29	102.83	723.09	0.00	723.09	3804.21
	Sub-Total	**3649.50**	**0.00**	**2115.41**	**0.00**	**5764.91**	**102.83**	**723.09**	**340.51**	**1063.60**	**6931.34**
Haryana	State	2510.00	0.00	150.00	0.00	2660.00	0.00	200.00	69.30	269.30	2929.30
	Private	4561.78	0.00	0.00	0.00	4561.78	0.00	539.00	1758.62	2297.62	6859.40
	Central	1566.61	0.00	431.59	0.00	1998.20	100.94	1591.73	5.00	1596.73	3695.86
	Sub-Total	**8638.39**	**0.00**	**581.59**	**0.00**	**9219.98**	**100.94**	**2330.73**	**1832.92**	**4163.65**	**13484.56**
Himachal Pradesh	State	0.00	0.00	0.00	0.00	0.00	0.00	805.60	256.61	1062.21	1062.21
	Private	0.00	0.00	0.00	0.00	0.00	0.00	1219.40	818.53	2037.93	2037.93
	Central	144.67	0.00	0.00	0.00	144.67	28.95	1223.88	0.00	1223.88	1397.50
	Sub-Total	**144.67**	**0.00**	**0.00**	**0.00**	**144.67**	**28.95**	**3248.88**	**1075.14**	**4324.02**	**4497.64**
"Jammu & Kashmir and Ladakh"	State	0.00	0.00	175.00	0.00	175.00	0.00	1230.00	148.67	1378.67	1553.67
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	137.49	137.49	137.49
	Central	870.13	0.00	129.07	0.00	999.21	67.98	1091.88	0.00	1091.88	2159.07
	Sub-Total	**870.13**	**0.00**	**304.07**	**0.00**	**1174.21**	**67.98**	**2321.88**	**286.16**	**2608.04**	**3850.23**
Punjab	State	1760.00	0.00	150.00	0.00	1910.00	0.00	1243.40	127.80	1371.20	3281.20
	Private	5014.00	0.00	0.00	0.00	5014.00	0.00	288.00	1939.82	2227.82	7241.82
	Central	1440.00	0.00	0.00	0.00	1440.00	196.81	2296.04	0.00	2296.04	3932.85
	Sub-Total	**8214.00**	**0.00**	**150.00**	**0.00**	**8364.00**	**196.81**	**3827.44**	**2067.62**	**5895.06**	**14455.87**
Rajasthan	State	7580.00	250.00	603.50	0.00	8433.50	0.00	433.00	23.85	456.85	8890.35
	Private	3257.00	1080.00	0.00	0.00	4337.00	0.00	104.00	26325.04	26429.04	30766.04
	Central	1031.56	250.00	171.13	0.00	1452.69	556.74	1407.67	344.00	1751.67	3761.10
	Sub-Total	**11868.56**	**1580.00**	**774.63**	**0.00**	**14223.19**	**556.74**	**1944.67**	**26692.89**	**28637.56**	**43417.49**
Uttar Pradesh	State	7135.00	0.00	0.00	0.00	7135.00	0.00	724.10	49.10	773.20	7908.20
	Private	8814.33	0.00	0.00	0.00	8814.33	0.00	842.40	5116.47	5958.87	14773.20
	Central	5538.42	0.00	1029.51	0.00	6567.93	289.48	1857.52	30.00	1887.52	8744.93
	Sub-Total	**21487.75**	**0.00**	**1029.51**	**0.00**	**22517.26**	**289.48**	**3424.02**	**5195.57**	**8619.59**	**31426.33**
Uttarakhand	State	0.00	0.00	0.00	0.00	0.00	0.00	1372.15	72.37	1444.52	1444.52
	Private	99.00	0.00	664.00	0.00	763.00	0.00	248.20	864.22	1112.42	1875.42
	Central	503.10	0.00	69.66	0.00	572.76	31.24	535.54	0.00	535.54	1139.54
	Sub-Total	602.10	0.00	733.66	0.00	1335.76	31.24	2155.89	936.59	3092.48	4459.48
Chandigarh	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.52	65.52	65.52
	Central	44.83	0.00	15.03	0.00	59.86	8.01	101.71	0.00	101.71	169.57
	Sub-Total	44.83	0.00	15.03	0.00	59.86	8.01	101.71	65.52	167.23	235.09
Central - Unallocated		1431.03	0.00	291.05	0.00	1722.08	237.03	751.45	0.00	751.45	2710.57
Total (Northern Region)	State	18985.00	250.00	2878.90	0.00	22113.90	0.00	6008.25	747.70	6755.95	28869.85
	Private	22624.33	1080.00	772.00	0.00	24476.33	0.00	3241.00	37366.22	40607.22	65083.55
	Central	15341.62	250.00	2344.06	0.00	17935.68	1620.00	11580.51	379.00	11959.51	31515.19
	Grand Total	**56950.95**	**1580.00**	**5994.96**	**0.00**	**64525.91**	**1620.00**	**20829.76**	**38492.92**	**59322.68**	**125468.59**

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/ UTS LOCATED IN WESTERN REGION

INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES

(As on 31.03.2024)

State	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Goa	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05
	Private	0.00	0.00	48.00	0.00	48.00	0.00	0.00	45.42	45.42	93.42
	Central	492.29	0.00	19.67	0.00	511.96	41.68	2.00	0.00	2.00	555.64
	Sub-Total	**492.29**	**0.00**	**67.67**	**0.00**	**559.96**	**41.68**	**2.00**	**45.47**	**47.47**	**649.11**
Gujarat	State	4510.00	900.00	2177.82	0.00	7587.82	0.00	772.00	95.04	867.04	8454.86
	Private	7144.67	500.00	3985.00	0.00	11629.67	0.00	0.00	25133.38	25133.38	36763.05
	Central	5504.47	0.00	424.00	0.00	5928.47	1034.89	0.00	243.30	243.30	7206.66
	Sub-Total	**17159.14**	**1400.00**	**6586.82**	**0.00**	**25145.96**	**1034.89**	**772.00**	**25471.72**	**26243.72**	**52424.57**
Madhya Pradesh	State	5400.00	0.00	0.00	0.00	5400.00	0.00	1703.66	107.96	1811.62	7211.62
	Private	5744.00	0.00	75.00	0.00	5819.00	0.00	0.00	6690.41	6690.41	12509.41
	Central	4818.54	0.00	257.00	0.00	5075.54	491.98	1520.00	300.00	1820.00	7387.52
	Sub-Total	15962.54	0.00	332.00	0.00	16294.54	491.98	3223.66	7098.37	10322.03	27108.55
Chhattisgarh	State	1840.00	0.00	0.00	0.00	1840.00	0.00	120.00	11.05	131.05	1971.05
	Private	7667.50	0.00	0.00	0.00	7667.50	0.00	0.00	1552.34	1552.34	9219.84
	Central	2714.35	0.00	0.00	0.00	2714.35	135.57	113.00	0.00	113.00	2962.92
	Sub-Total	**12221.85**	**0.00**	**0.00**	**0.00**	**12221.85**	**135.57**	**233.00**	**1563.39**	**1796.39**	**14153.81**
Maharashtra	State	9540.00	0.00	672.00	0.00	10212.00	0.00	2850.84	388.13	3238.97	13450.97
	Private	11006.00	0.00	568.00	0.00	11574.00	0.00	481.00	13971.99	14452.99	26026.99
	Central	4858.24	0.00	2272.73	0.00	7130.97	1068.66	0.00	123.00	123.00	8322.63
	Sub-Total	**25404.24**	**0.00**	**3512.73**	**0.00**	**28916.97**	**1068.66**	**3331.84**	**14483.12**	**17814.96**	**47800.59**
Dadra & Nagar Naveli	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Private	200.00	0.00	0.00	0.00	200.00	0.00	0.00	46.47	46.47	246.47
	Central	387.05	0.00	109.68	0.00	496.73	29.22	0.00	0.00	0.00	525.95
	Sub-Total	**587.05**	**0.00**	**109.68**	**0.00**	**696.73**	**29.22**	**0.00**	**46.47**	**46.47**	**772.42**
Central - Unallocated		2835.49	0.00	197.59	0.00	3033.08	438.00	0.00	0.00	0.00	3471.08
Total (Western Region)	State	21290.00	900.00	2849.82	0.00	25039.82	0.00	5446.50	602.23	6048.73	31088.55
	Private	31762.17	500.00	4676.00	0.00	36938.17	0.00	481.00	47440.01	47921.01	84859.18
	Central	21610.42	0.00	3280.67	0.00	24891.09	3240.00	1635.00	666.30	2301.30	30432.39
	Grand Total	**74662.59**	**1400.00**	**10806.49**	**0.00**	**86869.08**	**3240.00**	**7562.50**	**48708.54**	**56271.04**	**146380.12**

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/ UTS LOCATED IN SOUTHERN REGION

INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES

(As on 31.03.2024)

State	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Andhra Pradesh	State	6610.00	0.00	235.40	0.00	6845.40	0.00	1673.60	57.38	1730.98	8576.38
	Private	3873.88	0.00	3831.32	36.80	7742.00	0.00	0.00	9111.95	9111.95	16853.96
	Central	1546.95	189.34	0.00	0.00	1736.29	127.27	0.00	250.00	250.00	2113.56
	Sub-Total	**12030.83**	**189.34**	**4066.72**	**36.80**	**16323.69**	**127.27**	**1673.60**	**9419.33**	**11092.93**	**27543.89**
Telangana	State	6242.50	0.00	0.00	0.00	6242.50	0.00	2479.93	41.22	2521.15	8763.65
	Private	1389.45	0.00	831.82	0.00	2221.27	0.00	0.00	5147.58	5147.58	7368.85
	Central	3166.85	61.30	0.00	0.00	3228.15	148.73	0.00	10.00	10.00	3386.88
	Sub-Total	**10798.80**	**61.30**	**831.82**	**0.00**	**11691.92**	**148.73**	**2479.93**	**5198.80**	**7678.73**	**19519.38**
Karnataka	State	5020.00	0.00	0.00	0.00	5020.00	0.00	3631.60	193.89	3825.49	8845.49
	Private	2050.00	0.00	0.00	25.20	2075.20	0.00	0.00	17558.86	17558.86	19634.06
	Central	3180.16	486.42	0.00	0.00	3666.58	698.00	0.00	0.00	0.00	4364.58
	Sub-Total	**10250.16**	**486.42**	**0.00**	**25.20**	**10761.78**	**698.00**	**3631.60**	**17752.74**	**21384.34**	**32844.12**
Kerala	State	0.00	0.00	0.00	159.96	159.96	0.00	1864.15	217.90	2082.05	2242.01
	Private	832.50	0.00	174.00	0.00	1006.50	0.00	0.00	1097.41	1097.41	2103.91
	Central	1226.30	325.33	359.58	0.00	1911.21	362.00	0.00	50.00	50.00	2323.21
	Sub-Total	**2058.80**	**325.33**	**533.58**	**159.96**	**3077.67**	**362.00**	**1864.15**	**1365.31**	**3229.46**	**6669.13**
Tamil Nadu	State	4320.00	0.00	524.08	0.00	4844.08	0.00	2178.20	122.70	2300.90	7144.98
	Private	5426.67	250.00	503.10	211.70	6391.47	0.00	0.00	19678.13	19678.13	26069.60
	Central	3202.33	1709.16	0.00	0.00	4911.49	1448.00	0.00	231.90	231.90	6591.39
	Sub-Total	**12949.00**	**1959.16**	**1027.18**	**211.70**	**16147.04**	**1448.00**	**2178.20**	**20032.73**	**22210.93**	**39805.97**
NLC	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Central	0.00	66.00	0.00	0.00	66.00	0.00	0.00	0.00	0.00	66.00
	Sub-Total	**0.00**	**66.00**	**0.00**	**0.00**	**66.00**	**0.00**	**0.00**	**0.00**	**0.00**	**66.00**
Puducherry	State	0.00	0.00	32.50	0.00	32.50	0.00	0.00	0.00	0.00	32.50
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.91	49.91	49.91
	Central	140.80	118.35	0.00	0.00	259.15	86.00	0.00	0.00	0.00	345.15
	Sub-Total	**140.80**	**118.35**	**32.50**	**0.00**	**291.65**	**86.00**	**0.00**	**49.91**	**49.91**	**427.56**
Central - Unallocated		1666.00	434.10	0.00	0.00	2100.10	450.00	0.00	0.00	0.00	2550.10
Total (Southern Region)	State	22192.50	0.00	791.98	159.96	23144.44	0.00	11827.48	633.08	12460.56	35605.00
	Private	13572.50	250.00	5340.24	273.70	19436.45	0.00	0.00	52643.84	52643.84	72080.29
	Central	14129.40	3390.00	359.58	0.00	17878.98	3320.00	0.00	541.90	541.90	21740.88
	Grand Total	**49894.40**	**3640.00**	**6491.80**	**433.66**	**60459.86**	**3320.00**	**11827.48**	**53818.82**	**65646.30**	**129426.16**

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/ UTS LOCATED IN EASTERN REGION

INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES

(As on 31.03.2024)

State	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Bihar	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.70	70.70	70.70
	Private	700.00	0.00	0.00	0.00	700.00	0.00	0.00	379.45	379.45	1079.45
	Central	6253.75	0.00	0.00	0.00	6253.75	0.00	110.00	0.00	110.00	6363.75
	Sub-Total	**6953.75**	**0.00**	**0.00**	**0.00**	**6953.75**	**0.00**	**110.00**	**450.15**	**560.15**	**7513.90**
Jharkhand	State	420.00	0.00	0.00	0.00	420.00	0.00	130.00	4.05	134.05	554.05
	Private	580.00	0.00	0.00	0.00	580.00	0.00	0.00	181.50	181.50	761.50
	Central	1607.31	0.00	0.00	0.00	1607.31	0.00	61.00	0.00	61.00	1668.31
	Sub-Total	**2607.31**	**0.00**	**0.00**	**0.00**	**2607.31**	**0.00**	**191.00**	**185.55**	**376.55**	**2983.86**
West Bengal	State	4810.00	0.00	80.00	0.00	4890.00	0.00	986.00	121.95	1107.95	5997.95
	Private	2437.00	0.00	0.00	0.00	2437.00	0.00	0.00	518.98	518.98	2955.98
	Central	1436.34	0.00	0.00	0.00	1436.34	0.00	410.00	0.00	410.00	1846.34
	Sub-Total	**8683.34**	**0.00**	**80.00**	**0.00**	**8763.34**	**0.00**	**1396.00**	**640.93**	**2036.93**	**10800.27**
DVC	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Private	150.00	0.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	150.00
	Central	2887.02	0.00	0.00	0.00	2887.02	0.00	186.20	0.00	186.20	3073.21
	Sub-Total	**3037.02**	**0.00**	**0.00**	**0.00**	**3037.02**	**0.00**	**186.20**	**0.00**	**186.20**	**3223.21**
Odisha	State	1740.00	0.00	0.00	0.00	1740.00	0.00	2074.22	26.30	2100.52	3840.52
	Private	1686.00	0.00	0.00	0.00	1686.00	0.00	0.00	634.18	634.18	2320.18
	Central	1865.21	0.00	0.00	0.00	1865.21	0.00	89.00	10.00	99.00	1964.21
	Sub-Total	**5291.21**	**0.00**	**0.00**	**0.00**	**5291.21**	**0.00**	**2163.22**	**670.48**	**2833.70**	**8124.91**
Sikkim	State	0.00	0.00	0.00	0.00	0.00	0.00	360.00	55.11	415.11	415.11
	Private	0.00	0.00	0.00	0.00	0.00	0.00	209.00	7.04	216.04	216.04
	Central	103.54	0.00	0.00	0.00	103.54	0.00	64.00	0.00	64.00	167.54
	Sub-Total	**103.54**	**0.00**	**0.00**	**0.00**	**103.54**	**0.00**	**633.00**	**62.15**	**695.15**	**798.69**
Central - Unallocated		1836.33	0.00	0.00	0.00	1836.33	0.00	85.01	0.00	85.01	1921.34
Total (Eastern Region)	State	6970.00	0.00	80.00	0.00	7050.00	0.00	3550.22	278.11	3828.33	10878.33
	Private	5553.00	0.00	0.00	0.00	5553.00	0.00	209.00	1721.15	1930.15	7483.15
	Central	15989.50	0.00	0.00	0.00	15989.50	0.00	1005.20	10.00	1015.20	17004.70
	Grand Total	**28512.50**	**0.00**	**80.00**	**0.00**	**28592.50**	**0.00**	**4764.42**	**2009.26**	**6773.68**	**35366.18**

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/ UTS LOCATED IN NORTH-EASTERN REGION

INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES

(As on 31.03.2024)

State	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Assam	State	0.00	0.00	306.36	0.00	306.36	0.00	100.00	5.01	105.01	411.37
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	162.28	162.28	162.28
	Central	581.52	0.00	435.56	0.00	1017.08	0.00	422.08	25.00	447.08	1464.16
	Sub-Total	**581.52**	**0.00**	**741.92**	**0.00**	**1323.44**	**0.00**	**522.08**	**192.29**	**714.37**	**2037.81**
Arunachal Pradesh	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	109.11	109.11	109.11
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.79	35.79	35.79
	Central	37.05	0.00	46.82	0.00	83.87	0.00	544.55	0.00	544.55	628.42
	Sub-Total	**37.05**	**0.00**	**46.82**	**0.00**	**83.87**	**0.00**	**544.55**	**144.90**	**689.45**	**773.32**
Meghalaya	State	0.00	0.00	0.00	0.00	0.00	0.00	322.00	55.03	377.03	377.03
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.04	18.04	18.04
	Central	51.60	0.00	109.69	0.00	161.29	0.00	95.38	0.00	95.38	256.67
	Sub-Total	**51.60**	**0.00**	**109.69**	**0.00**	**161.29**	**0.00**	**417.38**	**73.07**	**490.45**	**651.74**
Tripura	State	0.00	0.00	105.00	0.00	105.00	0.00	0.00	16.01	16.01	121.01
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.46	13.46	13.46
	Central	56.00	0.00	381.94	0.00	437.94	0.00	68.49	5.00	73.49	511.43
	Sub-Total	**56.00**	**0.00**	**486.94**	**0.00**	**542.94**	**0.00**	**68.49**	**34.47**	**102.96**	**645.90**
Manipur	State	0.00	0.00	0.00	36.00	36.00	0.00	0.00	5.45	5.45	41.45
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.04	13.04	13.04
	Central	47.10	0.00	81.58	0.00	128.68	0.00	87.24	0.00	87.24	215.92
	Sub-Total	**47.10**	**0.00**	**81.58**	**36.00**	**164.68**	**0.00**	**87.24**	**18.49**	**105.73**	**270.41**
Nagaland	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.67	32.67	32.67
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.17	3.17	3.17
	Central	32.10	0.00	73.93	0.00	106.03	0.00	66.33	0.00	66.33	172.36
	Sub-Total	**32.10**	**0.00**	**73.93**	**0.00**	**106.03**	**0.00**	**66.33**	**35.84**	**102.17**	**208.20**
Mizoram	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.47	45.47	45.47
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.31	30.31	30.31
	Central	31.05	0.00	60.46	0.00	91.51	0.00	97.94	0.00	97.94	189.45
	Sub-Total	**31.05**	**0.00**	**60.46**	**0.00**	**91.51**	**0.00**	**97.94**	**75.78**	**173.72**	**265.23**
Central - Unallocated		112.60	0.00	63.62	0.00	176.22	0.00	140.00	0.00	140.00	316.22
Total (North-Eastern Region)	State	0.00	0.00	411.36	36.00	447.36	0.00	422.00	268.75	690.75	1138.10
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	276.09	276.09	276.09
	Central	949.02	0.00	1253.60	0.00	2202.62	0.00	1522.01	30.00	1552.01	3754.63
	Grand Total	**949.02**	**0.00**	**1664.96**	**36.00**	**2649.98**	**0.00**	**1944.01**	**574.84**	**2518.85**	**5168.82**

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/ UTS LOCATED IN ISLANDS

INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES

(As on 31.03.2024)

State	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Andaman & Nicobar	State	0.00	0.00	0.00	57.52	57.52	0.00	0.00	5.25	5.25	62.77
	Private	0.00	0.00	0.00	35.19	35.19	0.00	0.00	24.81	24.81	60.00
	Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.10	5.10	5.10
	Sub-Total	**0.00**	**0.00**	**0.00**	**92.71**	**92.71**	**0.00**	**0.00**	**35.16**	**35.16**	**127.87**
Lakshadweep	State	0.00	0.00	0.00	26.83	26.83	0.00	0.00	0.00	0.00	26.83
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.97	4.97	4.97
	Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-Total	**0.00**	**0.00**	**0.00**	**26.83**	**26.83**	**0.00**	**0.00**	**4.97**	**4.97**	**31.80**
Total (Islands)	State	0.00	0.00	0.00	84.35	84.35	0.00	0.00	5.25	5.25	89.60
	Private	0.00	0.00	0.00	35.19	35.19	0.00	0.00	29.78	29.78	64.97
	Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.10	5.10	5.10
	Grand Total	**0.00**	**0.00**	**0.00**	**119.54**	**119.54**	**0.00**	**0.00**	**40.13**	**40.13**	**159.67**

List of Projects commissioned during FY 2023-24:

1. KAKRAPARA APS Unit-3 (700 MW)
2. BARH I Unit-2 (660 MW)
3. KASHIPUR CCPP Ph-II (214 MW)
4. TELANGANA STPP PH-1 Unit-1 (800 MW)
5. Naitwar Mori HEP Unit-1 (30MW)
6. Naitwar Mori HEP Unit-2 (30MW)
7. Dr. N. Tata Rao TPS Unit-8 (800 MW)
8. Shirpur TPP Unit-2 (150 MW)
9. OPG Power Generation Private Limited Station Unit-1 (77 MW),2 (77 MW),3 (80 MW) & 4 (180 MW) (Existing Station shown first time in IC ending 31.01.2024)
10. Bhakra Left HPS Unit-1 (Uprated from 108 MW to 126 MW)
11. OBRA-C STPP Unit-1 (660 MW)
12. JAWAHARPUR STPP Unit 1 (660 MW)
13. TELANGANA STPP PH-1 Unit 2 (800 MW)
14. NORTH KARANPURA STPP Unit 2 (660 MW)
15. Kakrapar Atomic Power Project Unit-4 (700 MW)

CHAPTER 36

OFFICE OF THE CHIEF CONTROLLER OF ACCOUNTS

The Secretary (Power) is the Chief Accounting Authority of the Ministry. The office of Chief Controller of Accounts functions under overall supervision of Financial Adviser. The office is headed by the Chief Controller of Accounts with one Controller of Accounts, one Assistant Controller of Accounts and Seven Pay & Account Officers responsible for making all the payments, expenditure control & banking arrangements, Internal Audit and accounting of all the receipts/payments. Out of these, one Pay & Accounts office is stationed in Bengaluru. The Principal Accounts Office is responsible for consolidation of monthly Accounts of all the Pay & Accounts Offices and submission of monthly accounts of the Ministry to Controller General of Accounts (CGA), Department of Expenditure, Ministry of Finance, preparation of Appropriation Accounts, Statement of Central Transactions (SCT) and Finance Accounts on annual basis for submission to the CGA. It is also responsible for the compilation of various data and generation of reports for submission to Ministry of Power, Ministry of Finance, and CGA etc.

The Office of Chief Controller of Accounts also bring out an annual accounting booklet called Accounts at a Glance which contains details of total transactions (Receipts, Expenditure, Investments and Loans) of the Ministry and its various organizations. It gives a brief overview of accounting trends. The office is also responsible for preparing the Receipt Budget of the Ministry.

Internal Audit Wing

Internal Audit's scope of work is comprehensive and considers all aspects of the organization, both financial and non-financial, with an emphasis on constructive improvement. It is management's responsibility to prepare the financial statements, whilst the auditor's opinion adds credibility to the financial statements; it is no guarantee of future viability, or of management's efficiency or effectiveness. Internal Audit uses its comprehensive knowledge of accounting procedure and provides additional resources and analysis as a decision-making tool for management.

The Internal Audit conducts audit of grantee institutions, various schemes operating in electric field, like, Power System Development Fund (PSDF) and Transmission Line Scheme and RDSS (Components of erstwhile schemes like, DDUGJY, IPDS and PMDP schemes have been subsumed under RDSS Scheme) along with compliance audit of various PAOs, CDDOs and NCDDOs. This Wing advises DDOs and Grantee Institutions for correct implementation of rules and maintenance of records. As per direction of CGA, one scheme has to be selected from concerned ministry for risk based audit. In this reference RDSS scheme has been selected for Risk-based audit which is to be conducted by Internal Audit Wing in current financial year.

Performance of the Internal Audit Wing, during the year 2023-24 is as under (as on 31.03.2024):

No. of Units		Opening Balance as on 1.4.2023 (Outstanding Paras)	No. of Paras Raised	No. of Paras Settled	Total No. of Paras Outstanding
Audit Target	Audit Done				
30	5*	672	66	221	517

* Internal audit was suspended on advice of O/o CGA till settlement of large no. of old outstanding paras.

AUDIT OBSERVATIONS

The Organization-wise Break-up of outstanding Audit Observation & Inspection Reports issued up-to 31/03/2024 is as under:-

SI.No	Name of organization/Office	No. of Inspection Reports Issued during 2023-24	No. of Paras Outstanding (Including old Paras)
01	Ministry of Power	0	46
02	Central Electrical Authority	02	139
03	Appellate Tribunal for Electricity	0	05
04	Grantee Institutions	04	114
05	Special Audits	0	110
06	RGGVY/DDUGJY Scheme	01	22
07	R-APDRP Scheme	0	29
08	Pay & Accounts Offices	01	38
09	PSDF Scheme	02	09
10	Transmission Line	02	05
	Total	**12**	**517**

STATUS OF OUTSTANDING PARA AS ON 31st MARCH 2024						
SI.No	**Office**	**Opening Balance as on 1.4.2023**	**Para Added**	**Total**	**Para Settled**	**Closing Balance as on 31.03.24**
Ministry of Power						
1	MoP USGAD	55	0	55	28	27
2	MoP (FTE/OE)	19	0	19	0	19
	Total of MoP	**74**	**0**	**74**	**28**	**46**
Central Electricity Authority						
1	CEA (HQ)	60	02	62	18	44
2	RPSO, MUMBAI	12	0	12	10	02
3	RPSO, DELHI	5	0	5	0	5
4	RPSO, KOLKATA	0	6	6	0	6
5	RPSO, BENGALURU	8	0	8	7	1
6	RIO, MUMBAI	0	0	0	0	0
7	RIO, N.DELHI	6	0	6	0	6
8	RIO, KOLKATA	7	3	10	10	0
9	RIO, CHENNAI	7	0	7	1	6
10	RIO, SHILONG	2	0	2	0	2
11	NRPC, N.DELHI	11	0	11	0	11
12	WRPC, MUMBAI	8	7	15	6	9
13	SRPC, BANGALORE	9	0	9	0	9
14	ERPC, KOLKATA	20	0	20	4	16
15	NERPC, SHILONG	8	0	8	8	0
16	DEPARTMENTAL CANTEEN	22	0	22	0	22
	Total of CEA	**185**	**18**	**203**	**64**	**139**
Appellate Tribunals For Electricity						
1	ATE (APTEL)	11	0	11	06	05
GRANTEE INSTITUTIONS						
1	BBMB, NANGAL	4	0	4	0	4
2	JERC, GURGAON	3	3	6	1	5
3	NPTI, FARIDABAD	32	0	32	7	25
4	CPRI, BANGALORE	20	15	35	16	19
5	FOR, DELHI	15	03	18	13	05
6	BEE, N.DELHI	30	05	35	24	11
7	CERC, N.DELHI	37	03	40	0	40
8	CPRI, UHVRL Hyderabad	13	0	13	11	02
9	CPRI Bhopal	12	4	16	13	03
	Total of Grantee	**166**	**33**	**199**	**85**	**114**
SPECIAL AUDITS						
1	REC (AG& SP) &RGGVY	5	0	5	0	5

2	BEE (BLY)	1	0	1	0	1
3	BEE (NMEEE)	5	0	5	0	5
4	BBMB (CHANDIGARH)	10	0	10	0	10
5	THDC	16	0	16	11	05
6	NEEPCO SHILONG	9	0	9	0	9
7	PFC (HQ) New Delhi	7	0	7	0	7
8	LOHARINAG PALA	1	0	1	0	1
9	NHPC FARIDABAD	10	0	10	0	10
10	BTPS	30	0	30	0	30
11	NLDC	10	0	10	0	10
12	REC (HQ) New Delhi (DDUGJY & Saubhagya)	30	0	30	0	30
13	NEF (REC) New Delhi	6	0	6	0	6
	Total of Special Audits	**121**	**0**	**121**	**11**	**110**

OFFICE OF CHIEF CONTROLLER OF ACCOUNTS						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	Pr.AO ADMIN	12	0	12	10	02
2	Pr. AO A/c	08	0	08	0	08
3	PAO (Sectt.)	10	0	10	0	10
4	PAO (BMCC)	04	0	04	0	04
5	PAO (CEA), N.DELHI	07	04	11	03	08
6	PAO(CEA), BENGALURU	06	07	13	04	09
	Total of O/o CHIEF CONTROLLER OF ACCOUNTS	**47**	**11**	**58**	**17**	**41**

RGGVY/DDUGJY						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	RGGVY/DDUGJY	25	0	25	03	22
2	Saubhagya	2	1	3	0	3
	Total	**27**	**1**	**28**	**3**	**25**

RAPDRP SCHEME						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	RAPDRP/IPDS	30	0	30	01	29
	Total	**30**	**0**	**30**	**01**	**29**

PSDF SCHEME						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	PSDF	07	02	09	0	09

	Total	**07**	**02**	**09**	**0**	**09**

Transmission Line SCHEME						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	Transmission Line (PGCIL- J&K, A.P and Sikkim)	04	01	05	0	05
	Total	**04**	**01**	**05**	**0**	**05**

Consolidated Report of Outstanding Paras (as on 31-03-2024)

Opening Balance as on 01.04.2023

Compliance and Special Audit	604
RGGVY/DDUGJY Scheme (Units)	27
R-APDRP	30
PSDF	7
Transmission Line	4
Total	**672**

Added between 01.04.2023 to 31.03.2024

Compliance and Special Audit	62
RGGVY/DDUGJY Scheme (Units)	1
R-APDRP	0
PSDF	2
Transmission Line	1
Total	**66**

Dropped between 01.04.2022 to 31.03.2024

Compliance and Special Audit	217
RGGVY/DDUGJY Scheme (Units)	3
R-APDRP	1
PSDF	0
Transmission Line	0
Total	**221**

Closing balance as on 31.03.2024

Compliance and Special Audit	449
RGGVY/DDUGJY Scheme (Units)	25
R-APDRP	29
PSDF	9
Transmission Line	5
Total	**517**

Abbreviations used in the Report and their Full Form:

S No.	Abbreviation	Full Form
1.	MoP	Ministry of Power
2.	PAO	Pay & Accounts Office
3.	Pr. AO	Principal Accounts office
4.	US (GAD)	Under Secretary, General Administrative Division
5.	FTE/OE	Foreign Travel Expenses/Office Expenses
6.	CEA	Central Electricity Authority
7.	RPSO	Regional Power Survey Office
8.	RIO	Regional Inspectorial Organisation
9.	NRPC	Northern Regional Power Committee
10.	WRPC	Western Regional Power Committee
11.	ERPC	Eastern Regional Power Committee
12.	SRPC	Southern Regional Power Committee
13.	NERPC	North Eastern Regional Power Committee
14.	ATE	Appellate Tribunal for Electricity
15.	JERC	Joint Electricity Regulatory Commission
16.	NPTI	National Power Training Institute
17.	CPRI	Central Power Research Institute
18.	UHVRL	Ultra High Voltage Research Laboratrory
19.	BEE	Bureau of Energy Efficiency
20.	CERC	Central Electricity Regulatory Commission
21.	FOR	Forum of Regulators
22.	NLDC	National Load Despatch Centre
23.	REC	Rural Electrification Corporation
24.	PFC	Power Finance Corporation
25.	NEEPCO	North Eastern Eletric Power Corporaton
26.	THDC	Tehri Hydro Development Corporation
27.	PGCIL	Power Grid Corporation of India Limited
28.	NHPC	National Hydroelectric Power Corporation
29.	RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
30.	DDUGJY	Deendayal Upadhyaya Gram Jyoti Yojana
31.	R-APDRP	Restructured Accelerated Power Development and Reforms Programme
32.	IPDS	Integrated Power Development Scheme
33.	PSDF	Power System Development Fund
34.	NEF	National Electricity Fund
35.	BLY	Bachat Lamp Yojana
36.	NMEEE	National Mission for Enhanced Energy Efficiency
37.	AG & SP	Accelerated Generation & Supply Program
38.	BBMB	Bhakra Beas Management Board
39.	BTPS	Badarpur Thermal Power Station

CHAPTER 37

AUDIT OBSERVATIONS OF C&AG

The status of C&AG Audit paras for the year 2023-24

The Ministry of Power has constituted a Standing Audit Committee (SAC) under the chairmanship of the Secretary (Power) as a Nodal Agency to monitor and review the submission of ATNs on C&AG's audit paras and to take remedial measures. The Standing Audit Committee conducts meeting twice a year. As part of this, the office of the CCA has been nominated as the Nodal Office to coordinate within the Ministry as well as the Monitoring Cell in order to assist Financial Advisor. The 38th SAC meeting was held on 19.10.2023 under the chairmanship of the Secretary to review the status of outstanding C&AG paragraphs of the Ministry of Power.

The status of audit reports till 31.03.2024 are given in the table below.

Para Type	As on 01.4.2023	Report/ Paras added during the year 2023-24	Report/Paras settled during the year 2023-24	Closing Balance Col. (ii +iii)-Col. (iv)
(i)	(ii)	(iii)	(iv)	(v)
Commercial	20	1	6	15
Civil	2	2	1	3
Total	**22**	**3**	**7**	**18**

In the financial year 2023-24, three reports with Report no 01/2023 (Civil-Compliance Audit Observation), Report no 21/2023 (Financial Audit) and Report no 25/2023 (Civil-Central Autonomous Bodies) have been laid in Parliament.

The salient paras of the above reports are as follows.

Report no. 01/2023

Para No. 1.4: Budget and Expenditure (Budget)

The comparative position of budget and expenditure during the reporting period 2020-21 and 2019-20 BE: ₹22284.79 crore & ₹22900.29 crore Expenditure: ₹14940.49 crore & ₹21135.10 crore Unspent Budget: ₹7344.30 crore (32.96%) & ₹1765.19 crore (7.71%).

Para No. 1.6: Delay in submission of accounts by Central Autonomous Bodies (NPTI, BEE, and JERC)

Table of the House and Rule 237 of GFR had recommended that every Autonomous Body (AB) should finalize/prepare its accounts within a period of three months after close of the accounting year (Financial Year) and make them available for audit. However, the following Agencies of Ministry of Power has not complied with Rule 237 of GFR and the recommendation.

(a) NPTI:

(i) In the FY 2019-20 submission dates is 05/04/2021 but delayed by 9 months.

(ii) In the FY 2020-21 submission dates is 07/01/2022 but delayed by 6 months.

(b) BEE:

(i) In the FY 2019-20 submission dates is 23/07/2021 but delayed by 1 month.

(ii) In the FY 2020-21 submission dates is 28/07/2020 but delayed by 1 month.

(c) JERC:

(i) In the FY 2019-20 submission dates is 13/07/2021 but delayed by 4 months.

(ii) In the FY 2020-21 submission dates is 15/10/2020 but delayed by 13 days.

Para No. 1.7: Delay in presentation of audited accounts of CABs before Parliament (NPTI, BEE, CREC, and JERC)

Table of House in its first recommendation report (1975-76) also recommended that the audited accounts of Autonomous bodies be laid before Parliament within nine months of the close of the financial year i.e., by 31 December of the subsequent financial year. However the following Agencies of MoP has not complied with the report for FY 2019-20 and 2020-21.

(a) NPTI:

In the FY 2019-20 delayed by 15 months.

In the FY 2020-21 delayed by 7 months.

(b) BEE:

In the FY 2019-20 delayed by 3 months.

In the FY 2020-21 delayed by 1 month.

(c) CERC:

In the FY 2019-20 delayed by 3 months.

(d)JERC:

In the FY 2019-20 delayed by 3 months.

In the FY 2020-21 delayed by 3 months.

Para No. 1.8: Results of certification of audit (NPTI, BEE, CERC, and JERC)

Separate Audit Reports for CABs audited under Sections 19(2) and 20(1) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971, are appended to the certified final accounts that are to be tabled by respective Ministries in the Parliament. Some of the significant observations in respect of MoP are issued on financial statements of CABs for the year 2020-21 is given below:

(a) NPTI has not accounted for gratuity and other retirement benefits on the basis of actuarial valuation.

(b) Significant Observations on the Accounts of Central Autonomous Bodies for the year 2020-21: BEE & CERC.

(c) Central Autonomous Bodies where Internal Audit was not conducted during the year 2020-21: BEE, CERC & JERC.

Report no. 21/2023

Para No. 3.3.1: Mismatch in information of equity share and percentage of holdings (PGCIL and NTPC)

No. of equity share for PGCIL as per statement 11 is 268,58,72,408 whereas according to PGCIL's annual report it is 358,11,63,210.

No. of equity share for NTPC as per statement 11 is 399,67,26,967 whereas according to NTPC's annual report it is 495,53,46,251.

Para No. 3.3.3: Accounting of Bonus Shares (PGCIL)

Audit scrutiny of records/information relating to Power Grid Corporation of India Ltd. revealed that bonus shares declared during the year 2021-22 by the PGCIL were not depicted in the UGFA.

Para No. 3.8.2.2: Booking under Minor Head 800-Other Expenditure (Pr. Accounts)

Detailed scrutiny of Other Expenditure revealed that use of Minor Head 800 for expenditure was done in Ministry of Power. This amount is less than 50 percent of the budget allotted yet it is a significant amount which is ₹4,127.49 crore.

Para No. 3.9: Cumulative difference between the cash balances of RBI and UGFA (Pr. Accounts)

Difference in closing balance between Statement 13 and RBI for Ministry of Power is ₹ 89.47 crore (Debit).

Para No. 4.2.2: Analysis of Savings-Segment Wise (Pr. Accounts)

Audit examined the Grants/Appropriations having significant savings.

For Ministry of Power:

(i) Grant under head-78 in Revenue Voted was ₹ 20093.08 crore and saving was ₹ 669.31 crore.

(ii) Grant under head-78 in Capital Voted was ₹4458.31 crore and saving was ₹564.20 crore.

Para No. 4.2.2.2: Other significant savings at minor-head/ sub-head level (Pr. Accounts)

Scrutiny of Civil Grants/Appropriations revealed of significant savings in Grants/Appropriations i.e., savings of more than 25 per cent of allocations subject to a minimum of ₹100 crore.

For Ministry of Power under grant head 78 total saving was ₹ 712.54 crore under three different sub heads.

Para No. 4.6: Non-surrender and surrender of savings on last day of the financial year (Pr. Accounts)

According to Rule 62(2) of GFR, 2017 MoF stipulated (March 202219) a deadline of 21 March 2022 for Ministries/Departments for intimating to it all surrenders of savings under each unit of Appropriation.

For Ministry of Power:

Amount surrendered on last day: ₹ 1233.44 crore

Amount not surrendered: ₹ 0.07 Crore

Report No. 25/2023

Para No. 1.9: Delay in presentation of audited accounts to the Parliament (BEE, JERC, NPTI)

The Annual Report and Audited Accounts of the CABs are to be laid on the table of the

Parliament by 31st December. Despite issuing of SARs to CABs by 31 December, SARs on

the accounts CABs for year 2020-21 and 2021-22 were not presented before Parliament as on 31 December 2021 and 31 December 2022 respectively.

BEE: Audited accounts have not been presented to the Parliament for the Financial Year 2020-21 (as of 31 December 2021).

JERC: Audited accounts have not been presented to the Parliament for the Financial Year 2020-21 (as of 31 December 2021).

NPTI: Audited accounts have not been presented to the Parliament for the Financial Year 2021-22 (as of 31 December 2022).

Para No. 1.12: Deficiencies in Internal Controls Mechanism in Central Autonomous Bodies (BEE, JERC, NPTI)

Some of the important internal control deficiencies noticed during financial audit

Central Autonomous Bodies for the years 2021-22.

BEE: Internal Audit not conducted & physical verification of inventory was not conducted.

JERC: Internal Audit not conducted & physical verification of inventory was not conducted.

NPTI: Physical verification of fixed assets not conducted.

Para No. 1.13: Common deficiencies noticed in the accounts of Central Autonomous Bodies (BEE, JERC, NPTI)

Central Autonomous Bodies named above were accounting for grants on realization/cash basis instead of accrual basis which was inconsistent with the common format of accounts prescribed by the Ministry of Finance as well as Ministry of Education.

ENERGY EFFICIENCY SERVICES LIMITED
A JV of PSUs under the Ministry of Power

MINISTRY OF POWER

Convergence Energy Services Limited

#10SAAL BEMISAAL

National Electric Mobility Dashboard

Environment Friendly

1964 EV
Deployed/Under Deployment

7.99 M Litres
Savings in fuel consumption

21,420.17 t CO_2
Reduction in Carbon dioxide emissions

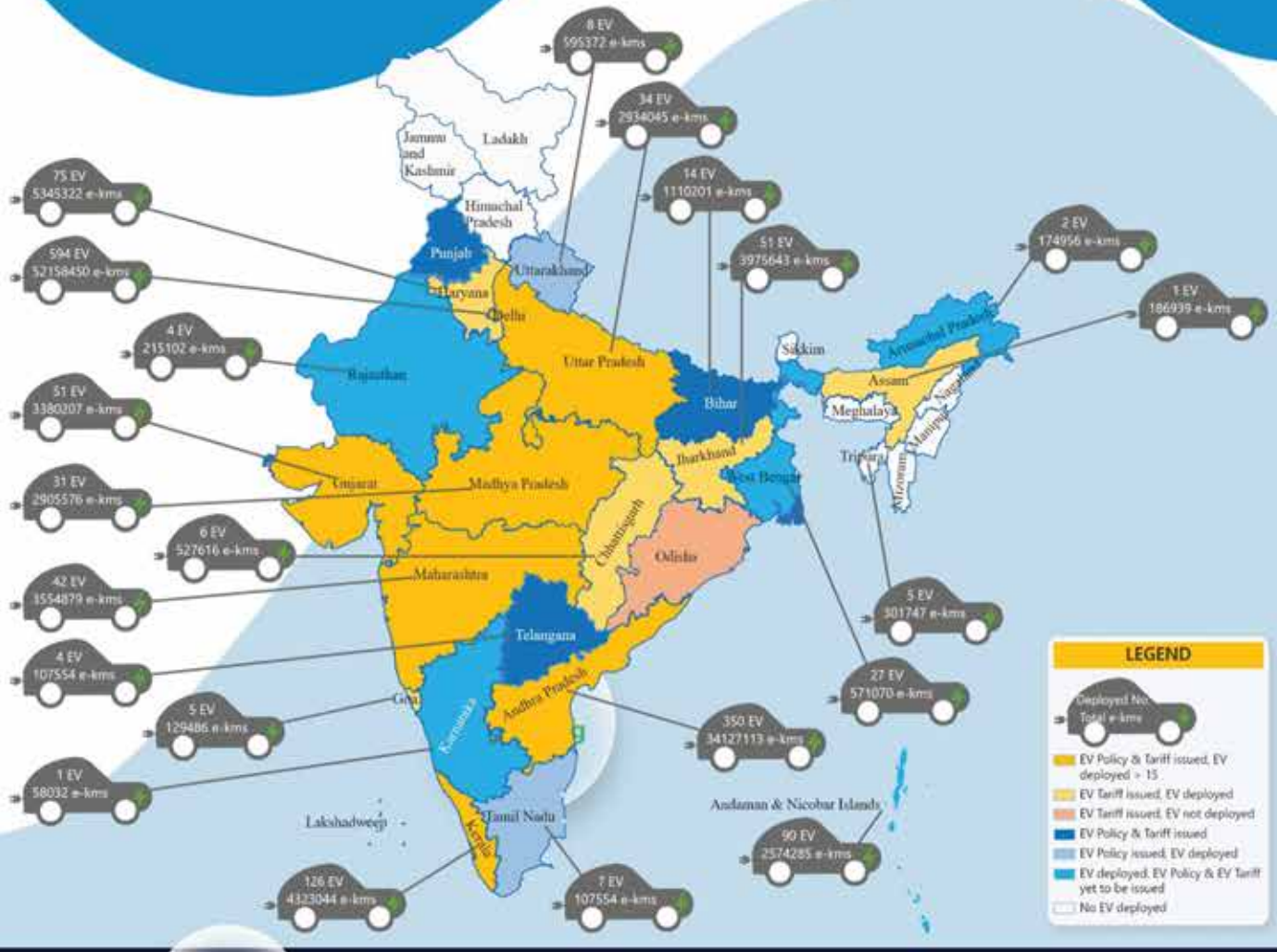
2,997.23 kg
Reduction in particulate matter emission

679.37 M INR
Monetary saving on fuel

Total e-Kilometer Covered

11988900 1

Zero Tailpipe Emission



Enhanced Energy Security

सत्यमेव जयते

Ministry of Power

Government of India

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