सत्यमेव जयते

Ministry of Power

Government of India

www.powermin.nic.in

ANNUAL REPORT

2024-25

MAP OF INDIA

SHOWING

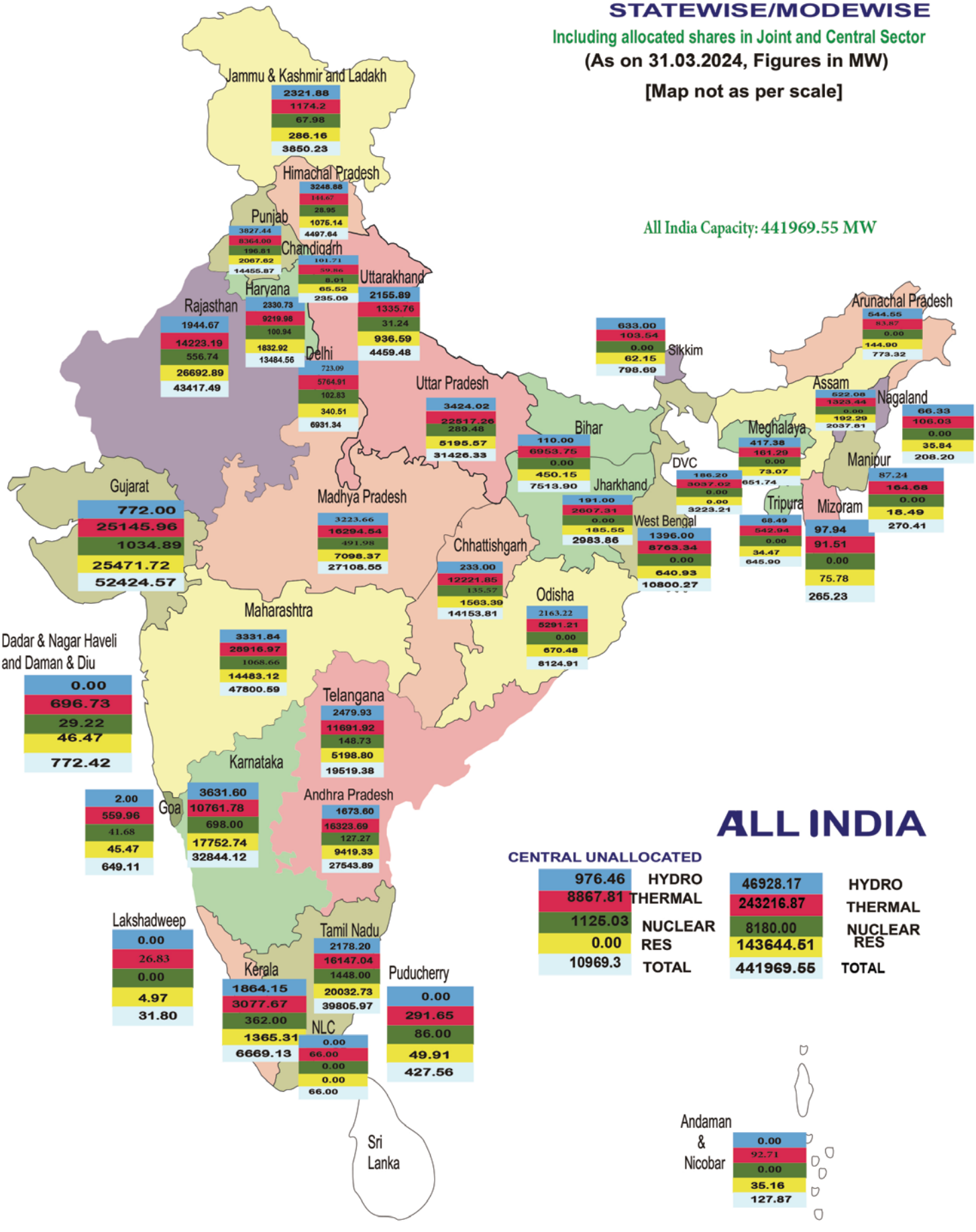
INSTALLED GENERATING CAPACITY
STATEWISE/MODEWISE

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	46928.17	HYDRO
8867.81	THERMAL	243216.87	THERMAL
1125.03	NUCLEAR	8180.00	NUCLEAR
0.00	RES	143644.51	RES
10969.3	TOTAL	441969.55	TOTAL

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CONTENTS

CHAPTER 01

PERFORMANCE HIGHLIGHTS

1. Robust Transformation of the Power Sector

During the current year 2024-25 (Upto December, 2024), peak shortage was 0.001% and the energy shortage was 0.1% as compared to 1.4% and 0.3% respectively during the corresponding period last year.

2. Enhanced Generation

The target of electricity generation from all sources (including RE) for the year 2024-25 was fixed as 1900 Billion Unit (BU). The actual generation from these sources during the year 2024-25 (Upto December, 2024) was 1378.418 BU as compared to generation of 1308.969 BU during the corresponding period last year representing a growth of 5.31%.

3. Transmission Augmentation

India is world's largest synchronous national grid by adding 2,00,168 circuit kilometres of transmission lines (of 220 kV & above voltage level) and 7,66,859 MVA of transformation capacity (of 220 kV & above voltage level) since April-2014 till December -2024 with Inter-Regional power transmission capacity of 1,18,740 MW, thus achieving "One Nation – One Grid – One Frequency".

4. Promoting Use of Biomass in Thermal Power Plants

Ministry of Power (MoP) established a SAMARTH (Sustainable Agrarian Mission on use of Agri Residue in Thermal Power Plant) Mission in July, 2021 to combat stubble burning and mitigate air pollution in India, with a primary focus on co-firing of biomass pellets in Thermal Power Plants (TPPs). As on 31.12.2024, 66 TPPs including 11 TPPs of National Capital Region (NCR) have started co-firing of biomass pellets and about 15.02 Lakh Metric Tons have been co-fired therein across the country. During the current year 2024-25 (up to December, 2024), co-firing has increased by 500% as compared to the corresponding period of last year. Further, with a view to promote and develop supply chain, benchmark prices for non-torrefied and torrefied biomass pellets have been issued by the MoP particularly for the TPPs in NCR in year 2024.

5. Coal Stock Position

- The receipt of domestic coal in the country has increased from 780.3 Million Tonnes (MT) during January-December, 2023 to about 819.9 MT during January-December, 2024, registering a growth of 5.1%. This growth is mainly contributed by 29.6% growth in receipt from captive coal mines during same period.
- With regular monitoring and follow up with coal companies and Railways, the coal stock at power plants has increased from about 35.0 MT in December, 2023 (sufficient for an average of 12 days at requirement of 85% PLF) to 45.2 MT as on 31.12.2024 (sufficient for an average of 16 days at requirement of 85% PLF). As a result, coal stock position in the country has become comfortable.
- The receipt of imported coal for blending purpose has reduced from 23.4 MT during January-December, 2023 to 18.8 MT during January-December, 2024. In view of adequate coal stock at the DCB plants, the advisory for import of coal for blending purpose has not been extended beyond 15th October, 2024.

6. Key Achievements in Hydro Power Sector

i. Central Financial Assistance towards equity participation by the State Governments for development of Hydro Electric Projects (HEPs) in North East Region (NER)

For harnessing the vast untapped hydro power potential of NER, the Government of India has approved the scheme of "Central Financial Assistance towards equity participation by the State Governments for the development of HEPs in NER" on 28.08.2024. Under this scheme, the grant towards equity portion of the State Governments of NER would be capped at 24% of the total project equity subject to a maximum of ₹ 750 crore per project. The scheme will be implemented during the period from FY 2024-25 to FY 2031-32, with a total financial outlay of ₹ 4136 crore. A cumulative hydro capacity of about 15 GW would be supported under this scheme.

ii. Modification of the Scheme on Budgetary Support for the Cost of Enabling Infrastructure for Hydro Electric Projects (HEPs)

For the faster development of HEPs and improvement of infrastructure in the remote project locations, the Government of India in September, 2024 approved the scheme of "Modification of the Scheme on Budgetary Support for the Cost of Enabling Infrastructure for HEPs", in which ambit of the Budgetary Support for cost of Enabling Infrastructure has been widened by including four more items apart from construction of roads and bridges i.e., the cost incurred for the construction of: (i) transmission line from power house to the nearest pooling point including upgradation of pooling substation of State/ Central Transmission Utility (ii) ropeways (iii) railway siding and (iv) communication infrastructure. The strengthening of existing roads/bridges leading to the project will also be eligible for central assistance under this scheme. Total outlay of the scheme is ₹ 12461 crores for the period from FY 2024-25 to FY 2031-32. A cumulative hydro capacity of approximately 31 GW, including 15 GW of PSP capacity, would be supported under the scheme.

iii. Investment approval for construction of Tato-I HEP and Heo HEP in Arunachal Pradesh

The Government of India on 25/11/2024 has granted investment approval of ₹ 1750 crore for construction of Tato-I HEP (186 MW) and ₹ 1939 crore for Heo HEP

(240 MW) in Shi Yomi District of Arunachal Pradesh. These Projects will be implemented through a Joint Venture Company between North Eastern Electric Power Corporation Ltd. (NEEPCO) and the Government of Arunachal Pradesh. Upon commissioning, these projects would cumulatively generate about 1802 MU per year. The state would be benefitted from 12% free power and another 1% towards Local Area Development Fund (LADF) besides significant infrastructure improvement and socio-economic development of the region.

iv. Govt. of India, on 26.07.2024, has approved Investment approval for Lower Arun HEP (669MW) in Nepal for an estimated cost of ₹ 5792 Crore at tariff of ₹ 4.99/- per kWh. The project will be implemented by SJVN Lower Arun Power Development Company Private Limited - a wholly owned subsidiary of SJVN Limited. The project will provide surplus power to India strengthening power availability in the country and will also strengthening economic linkages with Nepal. Keeping in view the aims and objectives of Atmanirbhar Bharat Abhiyan, the project shall provide opportunity for Indian contractors to participate in the construction of project besides importing construction materials and equipment from India to Nepal. The project shall provide employment opportunity to the citizens of the both countries. The project shall also improve the bilateral relations between the two countries.

v. Navratna status has been conferred to NHPC Ltd & SJVN Ltd, Central Public Sector Enterprises on 04.09.2024. After getting Navratna Status, there will be no monetary ceiling for capital expenditure. Moreover, the ceiling on equity investment to establish joint ventures and wholly owned subsidiaries in India and abroad shall be 15% of the net worth in one project limited to Rs 1000 Cr with overall ceiling in all projects put together shall be 30% of the net worth. Further, Managerial and commercial autonomy of NHPC and SJVNL shall be enhanced and will further help to achieve their business expansion plans and to help the country in achieving the goal of 500 GW of non-fossil energy capacity by 2030 and 'Net Zero' emission by 2070.

7. Key Achivements in Distribution

- Since FY 21, projects worth Rs. 1.31 Lakh Cr. for smart metering works and Rs. 1.48 Lakh Cr. for distribution infrastructure have been sanctioned under the Revamped Distribution Sector Scheme (RDSS), launched by Government of India for improving the reliability and quality of power supply in the country.
- Works amounting to Rs. 4,538 Cr. for grid electrification of 9,97,680 Households (HHs) including the HHs belonging to Particularly Vulnerable Tribal Group (PVTG) under Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) and tribal HHs under Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DA-JGUA) have been sanctioned under RDSS.
- There has been improvement in electricity supply to consumers. The average hours of supply have improved from 21.7 hours in rural areas in FY 23 to 22.6 hours in Q3 (Quarter-3) of FY 25, and from 23.3 hours to 23.4 hours in in urban area for the same period.
- The ACS-ARR Gap has reduced from Rs.0.63 per unit in FY 21 to Rs. 0.21 per unit in FY24, and the AT&C loss have come down from 21.91% to 16.73% in the same period. The reduction in losses would help in improving the services offered by the distribution utilities.
- During FY 25, distribution Infrastructure works amounting to Rs. 22,409 Cr. have been sanctioned which include
  a. Modernization and System Augmentation works amounting to Rs. 8,081 Cr.
  b. Feeder Segregation works amounting to Rs. 9,803 Cr. sanctioned for the States of Uttar Pradesh, Andhra Pradesh and Rajasthan so as to sanction all balance mixed load feeders with Agricultural load of more than 30% at the national.
  c. System strengthening works amounting to Rs. 3,023 Cr. for supporting solarisation of feeders and for facilitating day time power supply to farmers in the State of Maharashtra.
- The Ministry has constituted a Group of Ministers (GoM) headed by Minister of State for Power and New and Renewable Energy and comprising of Energy Ministers from States of Andhra Pradesh, Rajasthan, Tamil Nadu Madhya Pradesh, Maharashtra and Uttar Pradesh to address the concerns related to the accumulated debts and losses of the distribution utilities.
- As a result of effective implementation of the Electricity (Late Payment Surcharge and Related Matters) Rules, 2022, the legacy dues of Rs. 1,39,947 Crore as on 03.06.2022, have come down to Rs. 24,684 Crore as in December, 2024 and is anticipated to further come down to Rs 19,288 Cr by March, 2025.
- Electricity Distribution (Accounts and Additional Disclosure) Rules, 2024

8. Key Achievements in Energy Conservation

(i) 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. 57,000 crore annually and about 110 million ton of CO_2 emissions have been avoided. PAT cycle -VIII has been notified 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.

(ii) 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 phase and remaining 22 appliances are under voluntary phase. S&L program has led to savings of 81.64 BU and 18,419 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

(iii) Creation of India Carbon Market

The challenge of meeting future NDC goals makes it imperative that market measures are promoted to facilitate low carbon pathways of the economy. A robust carbon market mechanism will enable active participation of the public and private stakeholders in efforts towards low carbon pathways, in all potential sectors. To develop the carbon market, the necessary amendments were proposed in the Energy Conservation Act, 2001 (52 of 2001) in the year 2022. Thus, the regulatory framework for the Indian Carbon Market 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 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.

9. Conference of Power Ministers of States & UTs

The Conference of Power Ministers of North Eastern States including Sikkim was held on 9th July, 2024 at Guwahati, Assam. Shri Manohar Lal, the Union Minister of Power Chaired the conference. Power Ministers along with Principal Secretaries / Additional Chief Secretaries (Energy) of North Eastern States and Sikkim attended the conference.

During the Conference, detailed deliberations were held with focus on the development of Hydro Power Projects in the North Eastern region, North Eastern Region Power System Improvement Project (NERPSIP), Comprehensive Scheme for Arunachal Pradesh & Sikkim, RDSS, Power Sector Reforms, Ease of Living and overall development of Power Sector of the North Eastern region. Discussions were also held regarding various challenges and hurdles being faced by the Power Sector of North Eastern region. The States provided their inputs and suggestions on each of these pertinent issues.

The National Conference of Power Ministers of States and UTs was held on 12th November, 2024 at Delhi. Shri Manohar Lal, the Minister of Power Chaired the conference. Union Minister of State for Power, Chief Ministers/ Deputy CMs/ Power Ministers of States along with Principal Secretaries / Additional Chief Secretaries (Energy)/ MDs of Discoms of States and UTs attended the conference.

During the Conference, detailed deliberations were held with focus on Operational Performance & Financial Viability of DISCOMs, Review of RDSS and Smart Meters implementation Strategy, Rights of Electricity Consumers, Resource Adequacy, Storage Capacity Addition through PSPs and BESS, National Transmission Plan, Green Energy Corridor, Pending clearances by States, EV Charging Infrastructure, Indian Carbon Market and overall development of Power Sector.

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, posts of two Additional Secretaries, one Financial Adviser, and four Joint Secretaries are filled up.

Shri Srikant Nagulapalli, Additional Secretary, oversees Transmission including Power Grid Corporation of India Limited (PGCIL) & Grid Integration of Renewable Energy; Coordination Reforms and Restructuring; Regulatory Compliance Monitoring (RCM) & New & Renewable Energy (NRE); Electricity Act, 2003; Tariff Policy; Central Electricity Regulatory Commission (CERC); Joint Electricity Regulatory Commissions (JERCs); Appellate Tribunal for Electricity (APTEL); Standard Bidding Documents for Procurement of Power.

Shri Akash Tripathi, Additional Secretary, oversees the Policy & Planning; Training & Research including Central Power Research Institute (CPRI) & National Power Training Institute (NPTI); Power Projects Monitoring; All Tax related Matters; e-Samiksha; PRAGATI portal; Energy Conservation, Energy Transition & Electric Vehicle (EC,ET&EV); Hydro Power including NHPC Ltd., SJVN Ltd., NEEPCO Ltd., THDC India Ltd., Bhakra Beas Management Board (BBMB), Environment Management for Hydro Projects; Hydro Projects in SAARC countries; and G-20, International Cooperation (IC), Information Technology & Cyber Security (IT&CS) and Social Media.

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

Shri Piyush Singh, Joint Secretary looks after the work of Thermal Power, NTPC ltd; Damodar Valley Corporation (DVC); Ultra Mega Power Project; Fuel Supply Cell (FSC); Fuel Supply; Fuel Supply Agreements; ACQ Matters; Monitoring of Coal to Thermal Power Plants, Administration and department & Monitoring.

Shri Mohammad Afzal, Joint Secretary looks after the work of Hydro Power including NHPC Ltd., SJVN Ltd., NEEPCO Ltd., THDC India Ltd., Bhakra Beas Management Board (BBMB), Environment Management for Hydro Projects; Hydro Projects in SAARC countries; Parliament; Public Grievance; Right To Information (RTI); Reservation; Record.

Shri D. Sai Baba, Joint Secretary oversees Transmission including PGCIL & Grid Integration of Renewable Energy; Coordination and Vigilance & Security.

Shri Mahabir Prasad, Joint Secretory & Finance Advisor looks after finance, budget and Audit & Accounts of MOP.

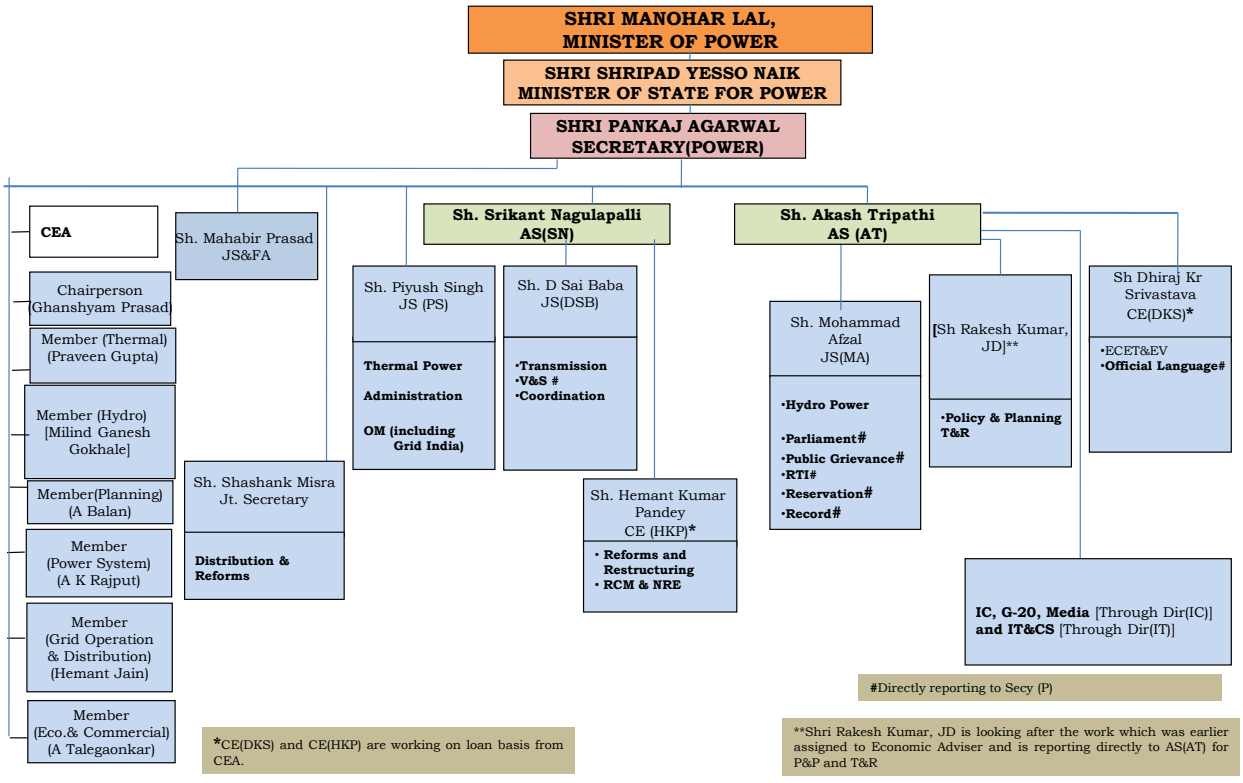
Shri Shashank Misra, Joint Secretary looks after Distribution & Reforms, Distribution and Utility Reforms & Special Intervention (UR&SI).

Two Chief Engineers **Shri Hemant Kumar Pandey CE (R&R), and Shri D.K. Srivastava CE (EC)** from Central Electricity Authority are taken on loan basis to assist the work relating Reforms and Restructuring; Regulatory Compliance Monitoring (RCM) & New & Renewable Energy (NRE); Electricity Act, 2003; Tariff Policy; Central Electricity Regulatory Commission (CERC); Joint Electricity Regulatory Commissions (JERCs); Appellate Tribunal for Electricity (APTEL); Standard Bidding Documents for Procurement of Power and Energy Conservation, Energy Transition & Electric Vehicle (EC,ET&EV); 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 Scheduled Castes (SCs), Scheduled Tribes (STs), Economically Weaker Section (EWS), Persons with Disabilities (PwDs), Other Backward Castes (OBC) and Ex-Servicemen categories in the Ministry including PSUs under its administrative control are dealt with by the Deputy Secretary/Director Level Officer who is also the Liaison Officer for SC/ST/PwD/EWS/Ex-Servicemen and another Director/ Deputy Secretary level officer is the Liaison officer for OBCs.

ORGANISATION STRUCTURE OF THE MINISTRY OF POWER



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.*

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

- **R&R [Through CE (HKP)]**
- **Transmission [Through JS (DSB)]**

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.*

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

P&P – Monitoring of National Infrastructure Pipeline (NIP) - M/o Power data & NIP Dashboard, Preparation of Five Year Vision Document, Work related to Power Sector Review by Hon'ble PM, Coordinating with PMO for PRAGATI Meetings, Monitoring realization of Asset Monetization targets, Monitoring of Power Projects - (a) Project Monitoring Group (PMG) Portal of DPIIT (b) Online Computer Monitoring System of MoSPI, Review of Delayed Power projects which are reflected on PMG / OCMS Portals, Monitoring E-Samiksha Portal of Cabinet Secretariat, Inputs for Economic Survey

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.*

Sh. Akash Tripathi
Additional Secretary

- **ECET&EV [Through CE (DKS)]**
- **Hydro [Through JS (MA)]**

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 (AT) is also looking after the work of IC, G-20 and Social Media through Dir (IC, G-20 and Social Media)

AS (AT) is also looking after the work of P&P and T&R through JD (P&P, T&R)

AS (AT) is also looking after the work of IT&CS through Dir (IT&CS)

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.*

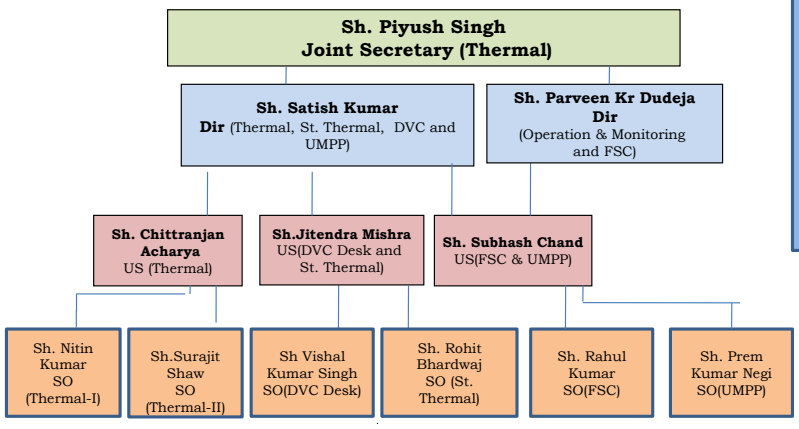
- **Sh. Pankaj Kumar Jha** US (Finance)
  - Sh. Hitesh Shokanda SO(Finance)
- **Sh. Naveen Chandra Joshi** US (Budget)
  - Sh. Virender Singh SO(Budget)

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.*

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.*

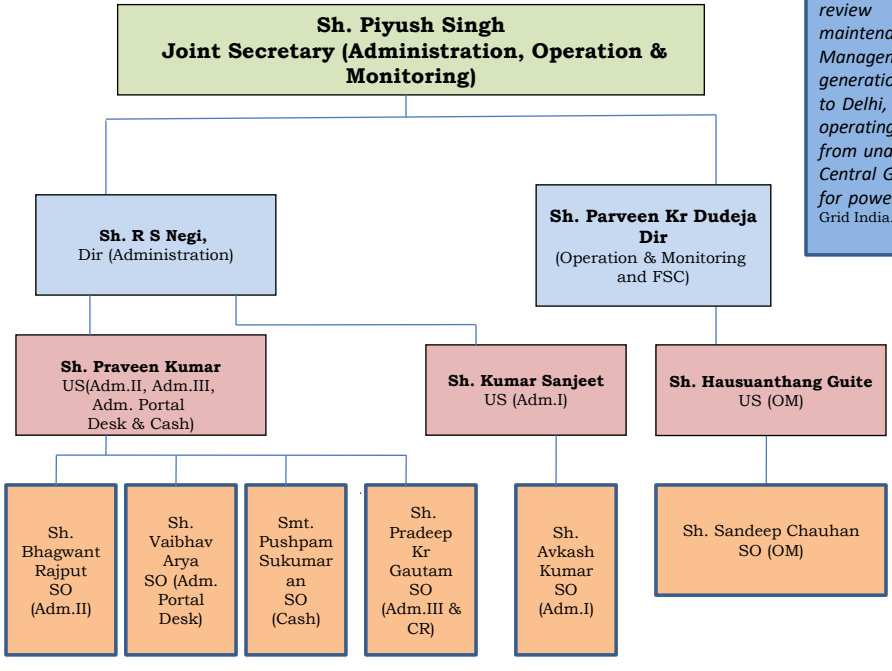
DVC- *Administrative & financial matters of DVC, Selection/ Appointment of Chairman/Members of DVC Board, part-time members of DVC Board. All DVC's project related issues/ concerns., Audit paras of DVC, VIP references, QPR of DVC.*



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.*

Adm.-I *– Cadre management of CPES and appointment of Chairperson/ Members in CEA*
Adm.-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*
Adm.-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.*

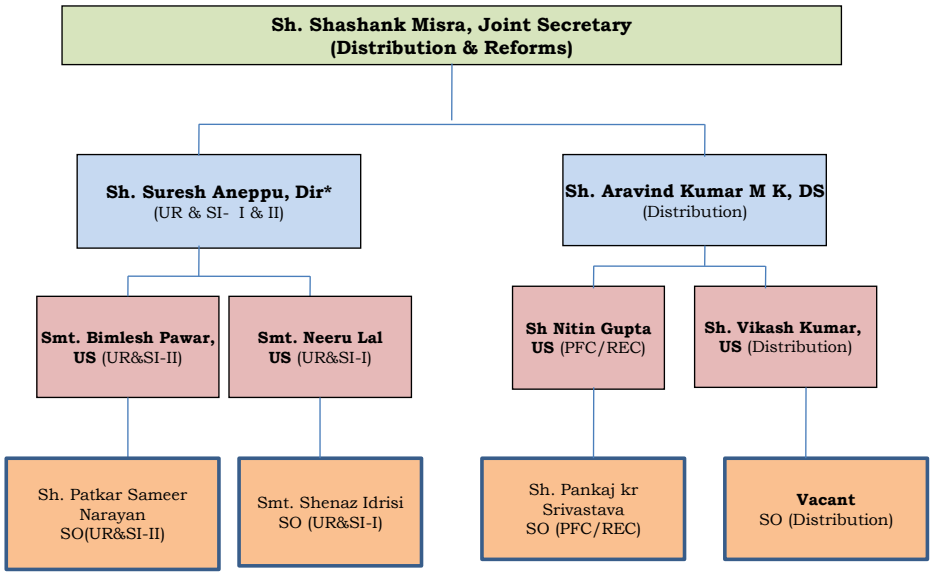


OM *– OM of regional Power grid, review of power supply maintenance, disaster Management., annual generation target, PSDF, power to Delhi, Coal import/supply for operating TPPs, power allocation from unallocated quota (15%) of Central Gen. Stations, Guidelines for power allocation,* POSOCO i.e. Grid India.

Distribution Section– *Administration of all schemes such as NEF, IPDS, DDUGJY, Saubhagya.*

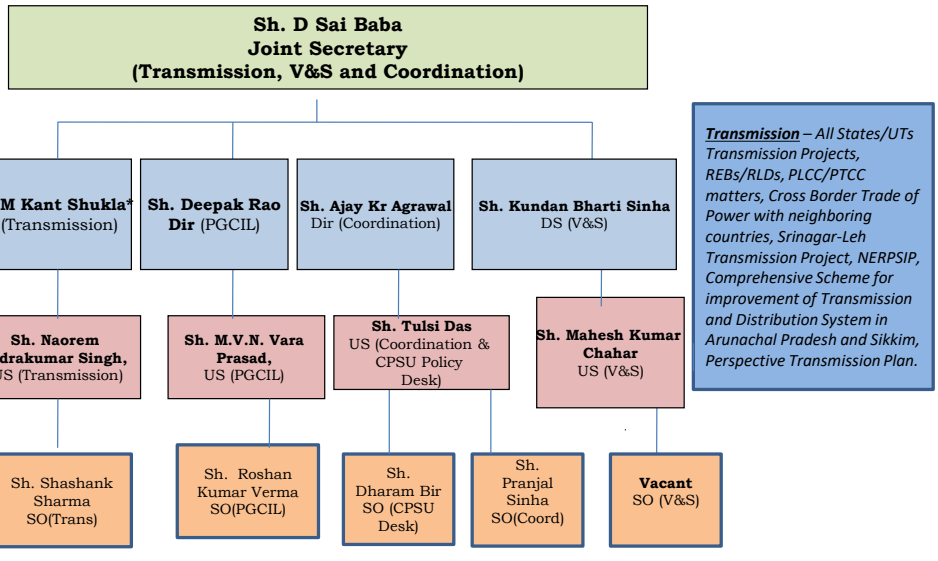
REC/PFC Section – *All administrative matters of REC/PFC.*

Utility Reforms & Special Intervention – *Formulation of Reforms linked scheme and any other new scheme. Utility Financial Matters, Utility Privatization, Power Sector Vision, National DISCOM.*



*On Loan Basis from CEA

Sh. Suresh Aneppu, Dir is also reporting to CE(HKP) for RCM



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).*

V&S – All Vigilance cases/issues of MoP employees and Board Level members of power sector PSU , maintenance of APARs, security of power projects.

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.*

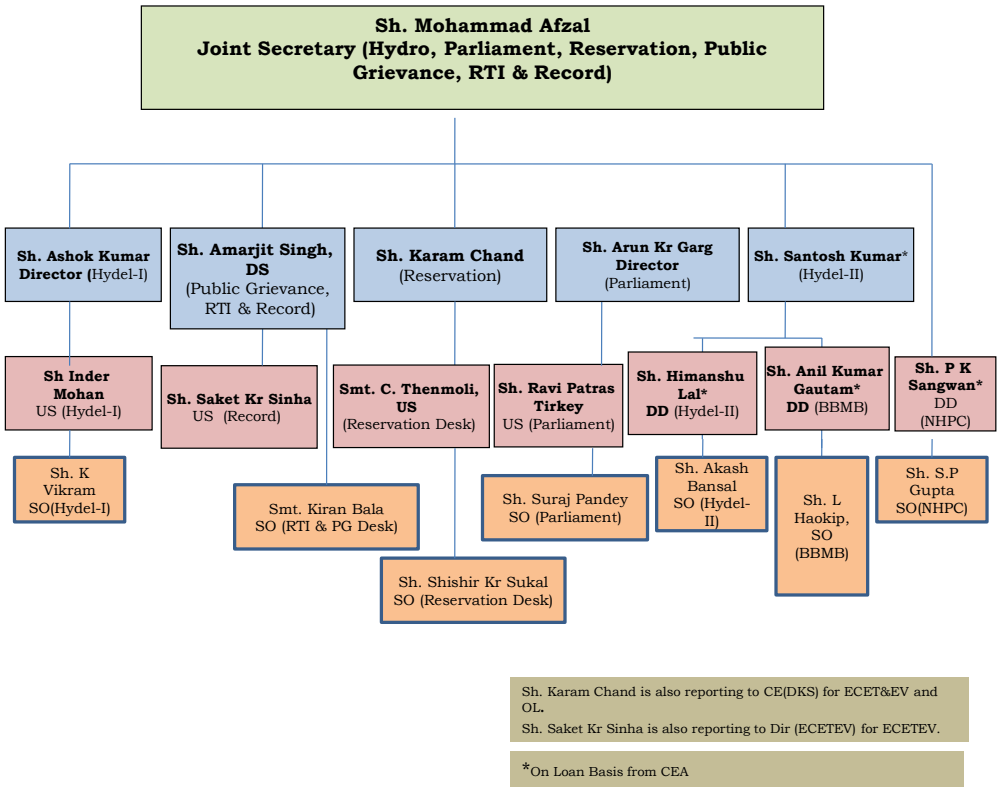
*On Loan Basis from CEA

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.*

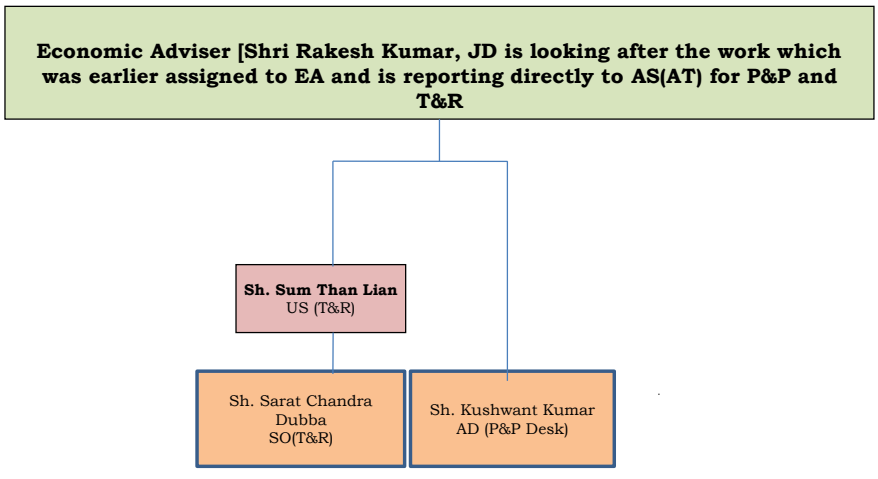


Sh. Karam Chand is also reporting to CE(DKS) for ECET&EV and OL.
Sh. Saket Kr Sinha is also reporting to Dir (ECETEV) for ECETEV.

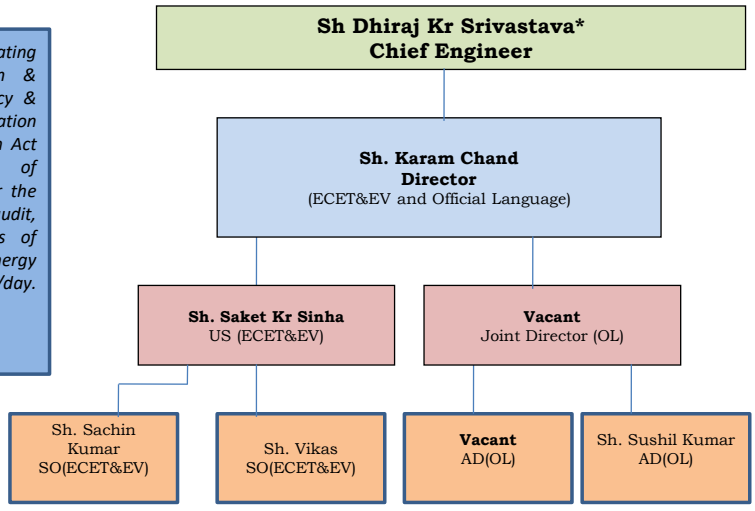
*On Loan Basis from CEA

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.*



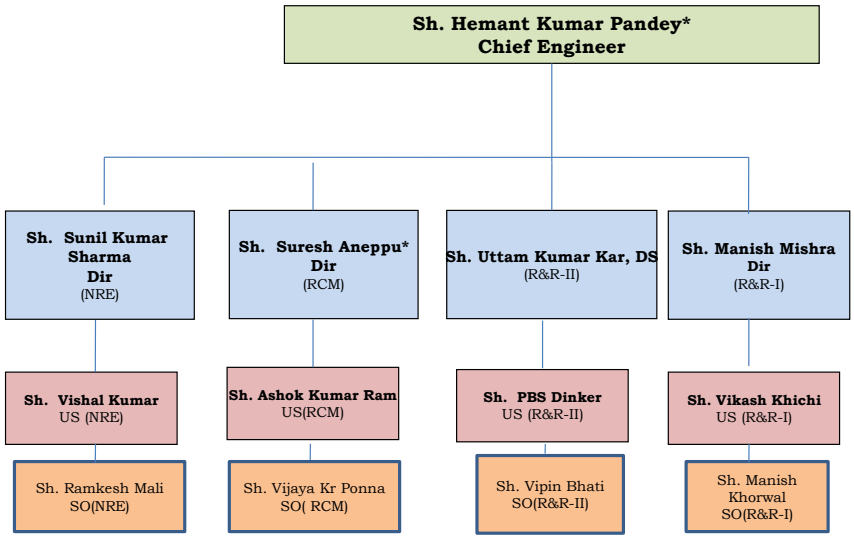
ECET&EV- *Matters relating to Energy Conservation & Energy Transition Policy & Planning, implementation of Energy Conservation Act & framing of rules/regulations under the Act etc., Energy audit, Administrative matters of BEE, National Energy Conservation Awards/day. All issues related to EV.*



*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

Sh Manish Mishra, Dir is also reporting directly to AS(AT) for IT&CS matters.

Sh. Suresh Aneppu, Dir is also reporting to JS(SM) for UR & SI- I & II

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 67.39% increase in generation capacity – from 276 GW in Mar'15 to 462 GW in Dec'24. Electricity generation also increased in tandem at a CAGR of 5.11%, enabling India to reduce its energy and peak deficit from 3.6% and 4.7% in 2014-15 to 0.3% and 1.4% in 2023-24 respectively. The Peak demand has grown at a CAGR of 5.66% during 2014-15 to 2023-24 while Energy Requirement has grown at a rate of 4.77% during 2014-15 to 2023-24. The peak demand 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 441970 MW as on 31.03.2024 to 462002 MW as on 31.12.2024. As on 31st December 2024, total installed capacity in the country is 462 GW.

Category	Installed Capacity (MW) As on 31.3.2024	% Share in Total Installed Capacity	Installed Capacity (MW) As on 31.12.2024	% Share in Total Installed Capacity	Increase (MW)	% Increase
Fossil Fuel Capacity						
Coal	210969.46	47.73	212349.50	45.96	1380.04	0.65
Lignite	6620.00	1.50	6620.00	1.43	0.00	0.00
Gas	25038.21	5.67	24818.21	5.37	-220.00	-0.88
Diesel	589.20	0.13	589.20	0.13	0.00	0.00
Total Fossil Fuel Capacity	**243216.87**	**55.03**	**244376.91**	**52.90**	**1160.04**	**0.48**
Non-Fossil Fuel Capacity						
Total RE (Including Hydro)	190572.68	43.12	209444.75	45.33	18872.08	9.90
Hydro	46928.17	10.62	46968.17	10.17	40.00	0.09
Wind, Solar & Other RE	143644.51	32.50	162476.58	35.17	18832.08	13.11
Wind	45886.51	10.38	48163.16	10.42	2276.65	4.96
Solar	81813.60	18.51	97864.72	21.18	16051.12	19.62
Small Hydro	5003.25	1.13	5100.55	1.10	97.31	1.94
Bio Power	10355.35	2.34	10728.21	2.32	372.86	3.60
Waste to Enegy	585.80	0.13	619.94	0.13	34.14	5.83
Nuclear	8180.00	1.85	8180.00	1.8	0.00	0.00
Total Non-Fossil Fuel Capacity	198752.68	44.97	217624.75	47.10	18872.08	9.50
Total Installed Capacity	**441969.55**	**100.00**	**462001.66**	**100.00**	**20032.11**	**4.53**

GROWTH IN GENERATION

The total electricity generation in the country increased from 1308.95 BU during FY 2023-24(April-December) to 1378.41 BU during FY 2024-25(April-December). Contribution of various fuel sources to the total generation is shown in the table below:

Growth in Generation during 2024-25(April-2024 to December 2024)

Category-wise :	Year 2023-24 (April-2023 to December-2023)		Year 2024-25 (April-2024 to December-2024) (**)		Growth (%)
	Generation (BU)	% of Total Generation	Generation (BU)	% of Total Generation	
• Generation from Fossil Fuel :					
Coal	932.26	71.22	964.89	70.00	3.50
Gas	23.90	1.83	26.51	1.92	10.92
Lignite	24.32	1.86	24.76	1.80	1.80
Diesel	0.30	0.02	0.33	0.02	10
Total (Fossil Fuel) :	980.78	74.93	1016.49	73.74	3.64
• Generation from Non-Fossil Fuel :					
Wind	69.82	5.33	67.71	4.91	(-) 3.02
Solar	84.32	6.44	101.45	7.36	20.32
BioPower & Others	18.34	1.40	19.10	1.39	4.14
Total : Solar, Wind, BioPower & Others	172.48	13.17	188.26	13.66	9.15
Hydro	114.76	8.77	125.44	9.10	9.30
Bhutan Import	4.67	0.36	5.23	0.38	11.99
Total RE Generation (Incl. Hydro)	291.91	22.30	318.93	23.14	9.26
Nuclear	36.26	2.77	42.99	3.12	18.56
Total (Non-Fossil Fuel) :	328.17	25.07	361.92	26.26	10.28
• Total Generation (Fossil Fuel & Non-Fossil Fuel) :					
Total Generation :	1308.95	100.00	1378.41	100.00	5.31

(**) Generation for the Month of December, 2024 is tentative in nature.

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 46.8% as on 30.11.2024 to around 64.4% by 2029-30. The share of fossil fuel-based capacity in the total installed capacity of the country as on 30.11.2024 is 53.2%, 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 23.7 % in 2023-24 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 31.12.2024, a capacity totaling to 29,480 MW is under various stages of construction comprising of 15,400 MW from Central sector, 10,880 MW from State sector and 3,200 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	6	4100	8	5840	0	0	14	9940
2025-26	5	3580	4	2920	0	0	9	6500
2026-27	0	0	2	1320	1	800	3	2120
2027-28	3	2120	0	0	2	1600	5	3720
2028-29	2	1600	0	0	1	800	3	2400
2029-30	5	4000	1	800	0	0	6	4800
Total	**21**	**15400**	**15**	**10880**	**4**	**3200**	**40**	**29480**

Further, contracts for 19,200 MW (Central- 9600 MW, Private- 9600 MW) thermal capacity have been awarded in FY 2024-25. Additionally, 36,320 MW (Central- 14,320 MW; State- 16,580 MW; Private- 5,420 MW) of coal and lignite-based candidate capacity has been identified which is at various stages of planning in the country.

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 21.96 GW (including Pump Storage Plants [PSP] of 7.97 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	160	0	**960**
2025-26	1370	350	390	**2110**
2026-27	3734	696	0	**4430**
2027-28	1250	1045.5	0	**2295.5**
2028-29	1022	300	0	**1322**
2031-32	2880	0	0	**2880**
Total	11056	2551.5	390	**13997.5**
Total	**11056**	**2551.5**	**390**	**13997.5**
Summary (PSP)				
	Central	**State**	**IPPs**	**Total**
2024-25	250	0	480	**730**
2025-26	750	500	720	**1970**
2028-29	0	1350	1920	**3270**
2029-30	0	2000	0	**2000**
Total	**1000**	**3850**	**3120**	**7970**

Nuclear generation capacity addition

Nuclear based capacity of 7300 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 31.12.2024, solar installed/pipeline capacity is 232.88 GW which comprises of installed capacity of 97.86 GW, under implementation of 84.19 GW and tendered capacity of 50.83 GW. As on 31.12.2024 Wind Installed/pipeline capacity is 74.96 GW, which comprises of installed capacity of 48.16 GW, under implementation of 26.20 GW and tendered capacity of 0.60 GW.

LIST OF POWER PLANTS COMMISSIONED DURING 2023-24

NAME OF PROJECT	SECTOR	STATE	DEVELOPER	CAPACITY (MW)
THERMAL PROJECTS				
North Karanpura STPP Unit-2	Central	Jharkhand	NTPC	660
Barh STPP, St-I, U-2	Central	Bihar	NTPC	660
Telangana STPP, St- I, U-1 and U2	Central	Telangana	NTPC	1600
Dr. Narla Tatarao TPS, St-V U-8	State	Andhra Pradesh	APGENCO	800
Kashipur CCPP, Ph-II	Private	Uttarakhand	SEPL	214
Jawaharpur STPS Unit-1	State	Uttar Pradesh	UPRVUNL	660
Obra-'C' TPS Unit-1	State	Uttar Pradesh	UPRVUNL	660
Shirpur TPP, U-2	Private	Maharashtra	JPL	150
			A. Total (Thermal)	**5404**

NAME OF PROJECT	SECTOR	STATE	DEVELOPER	CAPACITY (MW)
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 and Unit-4	Central	Gujarat	NPCIL	1400
			C. Total (Nuclear)	**1400**
			Total Commissioned (A+B+C)	**6864**

LIST OF POWER PLANTS COMMISSIONED DURING 2024-25 (As on 31.12.2024)

NAME OF PROJECT	SECTOR	STATE	DEVELOPER	CAPACITY (MW)
THERMAL PROJECTS				
Maa Durga Thermal Power Company Ltd. Unit-1 and Unit-2	Private	Odisha	MTPCL	60
Jawaharpur STPS Unit-2	State	Uttar Pradesh	UPRVUNL	660
Ghatampur TPP, U-1	Central	Uttar Pradesh	NUPPL	660
			A. Total (Thermal)	**1380**
HYDRO PROJECTS				
Thottiyar HEP Unit-1 and Unit-2	State	Kerala	KSEB	40
			B. Total (Hydro)	**40**
NUCLEAR PROJECTS				
			C. Total (Nuclear)	**0**
			Total Commissioned (A+B+C)	**1420**

CHAPTER 04

GENERATION & POWER SUPPLY POSITION

Generation:

The total electricity generation including generation from renewable sources in the country during the current year 2024-25 (Upto December, 2024) was 1378.418 BU as against the generation of 1308.969 BU during the corresponding period last year, showing a growth of 5.31%.

The actual electricity generation from Fossil Fuel Power Plants (Thermal) during 2024-25 (Upto December, 2024) has increased by 3.64% over same period last year. The actual electricity generation from Non-Fossil Fuel Power Plants during 2024-25 (Upto December, 2024) has also increased by 10.28% over corresponding period last year. Share of generation from Non-Fossil Fuel in total generation has been 26.3% during the current year 2024-25 (Upto December, 2024).

The total electricity generation in the country increased from 624.2 Billion Unit (BU) during 2005-06 to 1378.418 BU during the year 2024-25 (Upto December, 2024). 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
2024-25 (Upto Dec.)	1016.5	361.9	1378.4

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 2024-25 (Upto December 2024) was 69.01%. The sector-wise and overall PLF since beginning of 9th Plan was as under:

Year	Central	State	Private	Overall
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	67.7	69.1
2024-25 (Upto Dec.)	74.2	63.5	69.3	69.0

Power Supply Position:

During the year 2024-25 (Upto December 2024), peak shortage has been 0.001% and the energy shortage has been 0.1%.

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

Year	Energy Requirment (MU)	Energy Availability (MU)	Energy Shortage (MU)	Energy Shortage (%)
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	1511847	1504264	7583	0.5
2023-24	1626132	1622020	4112	0.3
2024-25 (Upto December, 2024)	1280111	1278772	1339	0.1

Year	Peak Demand (MW)	Peak Met (MW)	Peak Shortage (MW)	Peak Shortage (%)
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
2024-25 (Upto December, 2024)	249856	249854	2	0.001

CHAPTER 05

THERMAL POWER

1. Thermal Power Generation

Thermal power Generation capacity (Coal, Lignite and Natural Gas) has increased from 167 GW in 2014 to 244 GW upto 31.12.2024. Thermal power generation (Coal, Lignite and Natural Gas) is 1016 BU as on 31.12.2024

2. Thermal Capacity Addition

A total of 1380 MW of thermal Capacity has been commissioned in the current fiscal till 31-12-2024, and is under commercial operation. This comprises of Ghatampur TPP Unit -1 (660 MW), Jawaharpur TPP Unit -2 (660 MW) and additional capacity of 60 MW which comprises of Maa Durga Thermal Power Company Ltd., (Odisha)Unit-1 (30 MW) & Unit-2 (30MW).

3. Under-construction Thermal capacity

As on 31.12.2024, a capacity totalling to 29,480 MW is under various stages of construction comprising of 15,400 MW from Central sector, 10,880 MW from State sector and 3,200 MW from Private Sector. Out of these, 10,360 MW under construction by NTPC & its Subsidiaries / JVs, 3720 MW under construction by NLC & its JVs and 1320 MW under construction by subsidiary (STPL) of SJVNL in central sector.

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 notification 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 30.12.2024 has revised the timeline for installation of FGD in different categories of TPPs is as follows:

Category A: Within 10 km radius of NCR or cities having million plus population as per 2011 census of India. Completion timeline 31.12.2027.

Category B: Within 10 km radius of critically polluted areas or Non-Attainment cities as defined by CPCB. Completion timeline 31.12.2028.

Category C: Other than those included in category A and B. Completion timeline 31.12.2029.

For reduction of SO_2 emission, at present, Flue Gas Desulphurization (FGD) is being installed in 537 units out of which FGD installation has been completed in 49 units (25.60 GW). Further, Contract/LoA has been awarded for 211 units (91.80 GW). 180 units (59 GW) are under various stages of tendering and 97 units (27.7 GW) are in pre-tendering stage.

There are different FGD technologies available like Dry Sorbent Injection, Sea Water, Wet lime stone for controlling SO_2 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).

SUMMARY FGD

General Summary (MW)

S. No.	Sector	Total (MW)	CFBC	Retired	Balance (Total-(CFBC +Retired))	Claims SO_2 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	0	430	0	210	0	0	1610	1890	46320	16040	4640
2	State	67741.5	1075	0	1004	0	1647.5	10210	8310	15705	1760	28030	0	0
3	Private	76528	4101	1430	0	1370	6430	6395	7960	9220	12542	17530	9550	6950
	Total	211519.5	5926	1430	1434	1370	8287.5	16605	16270	26535	16192	91880	25590	11590

General summary (No. of Units)

S. No.	Sector	Total (MW)	CFBC	Retired	Balance (Total-(CFBC +Retired))	Claims SO_2 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	0	3	0	2	0	0	8	9	112	30	11
2	State	221	7	0	7	0	10	37	29	56	7	68	0	0
3	Private	211	42	6	0	2	24	16	19	21	31	31	19	15
	Total	600	53	6	10	2	36	53	48	85	47	211	49	26

5. Utilisation of ash:

Coal / Lignite based Thermal Power Generation has been the backbone of power capacity addition in the country. Indian coal is rather of high ash content of the order of 30-60 % compared to imported coal which usually have 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. In terms of the MoEF&CC Notification, 2021 read with its amendments dated 30.12.2022 & 01.01.2024, all the thermal power plants are primarily responsible to ensure cent percent utilization of ash generated by them in an eco-friendly manner. The Notification also lays such eco-friendly avenues for utilization of ash.

The ash generation and utilization data is maintained at a centralized coal ash portal maintained by the CPCB. The recorded ash data from the 298 TPPs at the portal suggest that pan India there has been overall above 95% utilization of ash during the last FY 2023-24 as under:

Ash utilisation during Year 2023-24

No. of Thermal Power Stations which have furnished the data	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

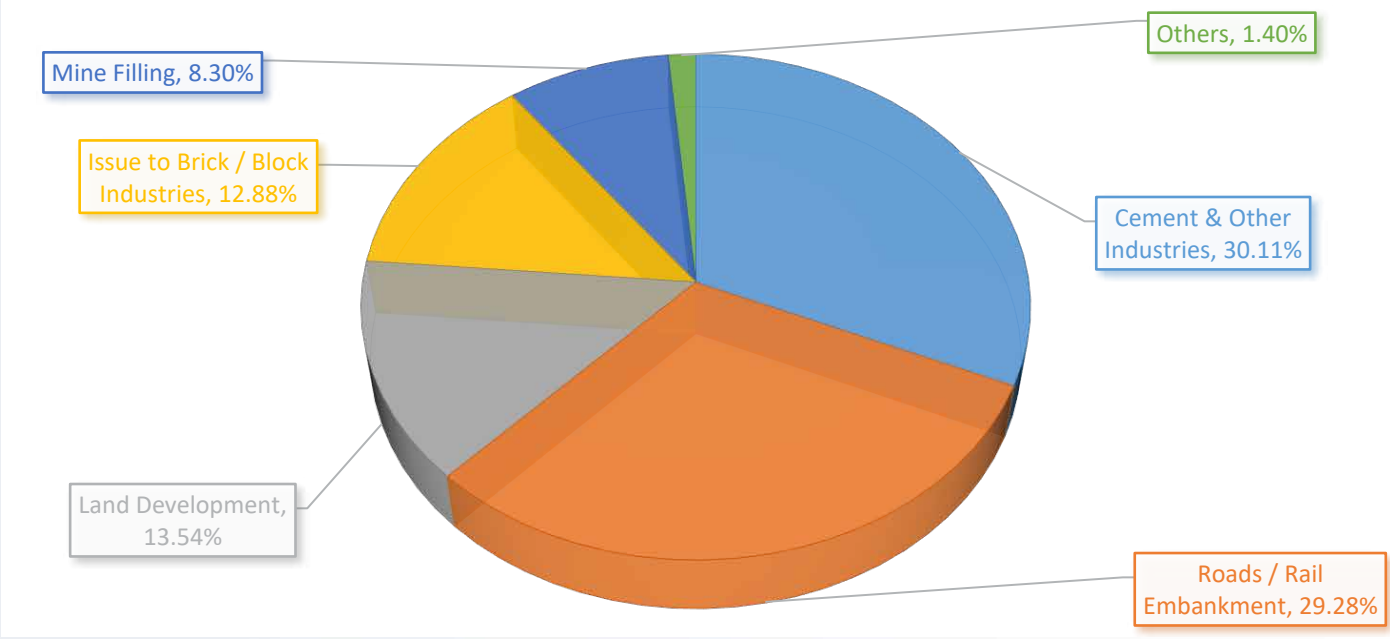
Source: Drawn from the CPCB Coal Ash Portal on 12.4.2024

The avenue wise utilisation of ash for the FY 2023-24 is given below:

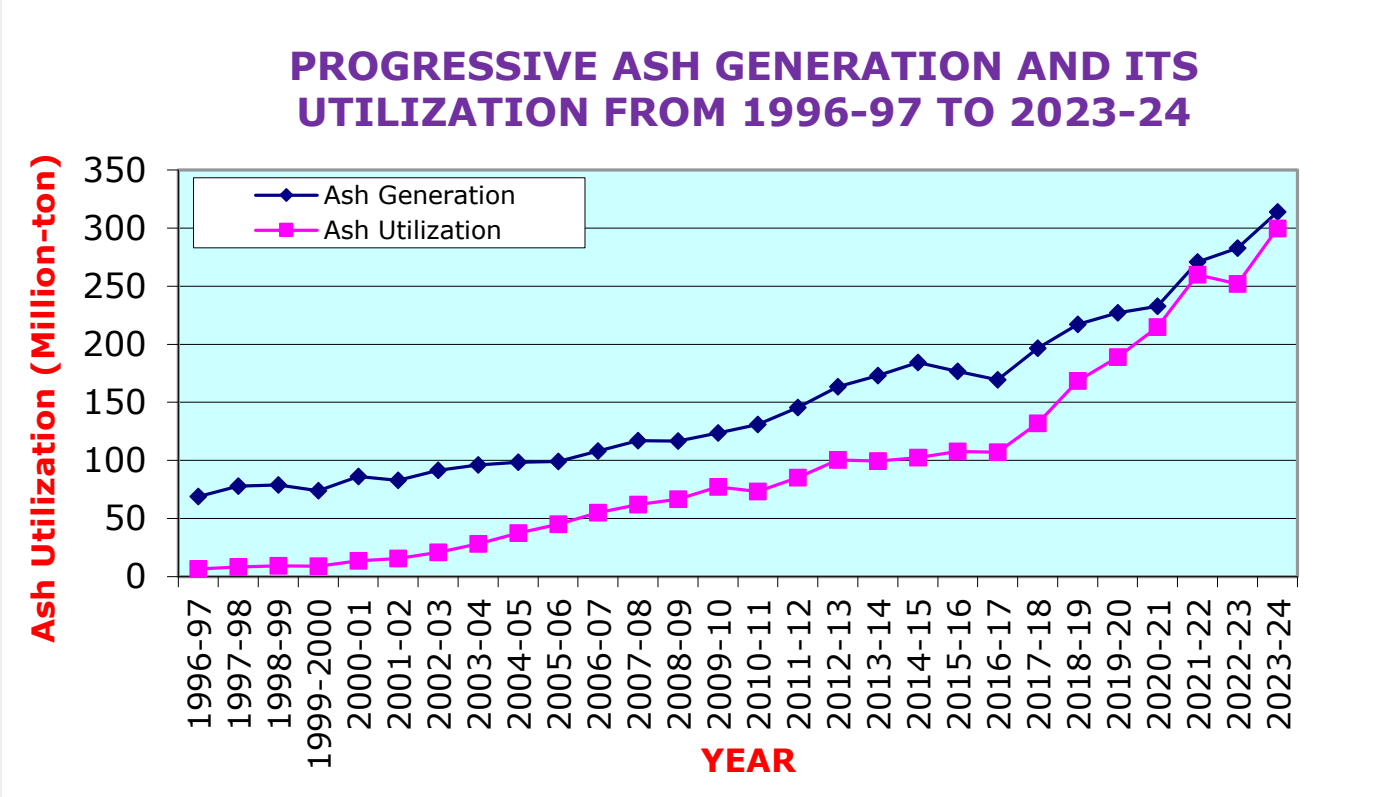
Avenue	Utilisation of Ash	
	(LMT)	(%)
Cement & Other Industries	945.05	30.11
Roads / Rail Embankment	919.07	29.28
Land Development	425.04	13.54
Issue to Brick / Block Industries	404.18	12.88
Mine Filling	260.56	8.30
Others	43.97	1.40

Source: Drawn from the CPCB Coal Ash Portal on 12.4.2024

Avenue-wise Ash Utilisation for FY 2023-24



Progressive utilisation of Ash since 1996-97 till 2023-24 is shown as under:



Source: CPCB Coal Ash Portal & earlier CEA data

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.

The development of Hydro Power and the Hydro Pumped Storage projects is of paramount importance for achieving above goals. Hydro Power 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: (31.12.2024)

Installed Capacity – Sector-wise

Sector	Total	
	No.	MW
Central	43	15742.72
State	148	27294.45
Private	22	3931
Total	213*	46968.17

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	2193.52	19	7263.0	6	1725.00	9	4561.2	0	0	43	15742.72
State	15	892.15	52	7750.0	32	6487.30	43	7569.4	7	4595.6	148	27294.45
Private	5	892.00	13	2592.0	3	297.00	0	0.0	1	150.0	22	3931.00
Total	**29**	**3977.67**	**84**	**17605.0**	**41**	**8509.30**	**52**	**12130.6**	**8**	**4745.6**	**213***	**46968.17**

* - Total No. of HE Stations are 213 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	2024-25*
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%)	125.44 (102.89%)

*As on 31st December, 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
10	2024-25*	-	40	-	40
Grand Total		**1720**	**2666**	**1147**	**5533**

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	2029-30	2031-32	Total
Capacity Under Construction (MW)	1690	4080	4430	2295	4592	2000	2880	21967

- 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, 60 MW in 2023-24 and 40 MW in 2024-25 (Upto 31.12.2024).
- Capacity under construction (Above 25 MW) – 20047.5 MW
  - Hydro Electric Projects- 13397.5 MW
  - Pumped Storage projects (PSP) – 6050 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 67 no. of hydro schemes with an aggregate Installed capacity of around 56.80 GW (including 31 no. of Pumped Storage Schemes of 44.12 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.

ix) Govt. of India on 11.09.2024 has approved the modified scheme of budgetary support towards enabling infrastructure for hydroelectric projects wherein the ambit of enabling infrastructure has been widened to include the following apart from Roads/ Bridges:

a. Transmission line from power house to the nearest pooling point, including upgradation of pooling substations of State or Central Transmission Utility,

b. Ropeways,

c. Railway sidings,

d. Communication Infrastructure.

Further, the limits for the scheme were revised as follows;

e. Rs. 1 crore per MW for projects upto 200 MW.

f. Rs. 200 crore plus Rs. 0.75 crore per MW exceeding 200 MW for projects above 200 MW.

x) The Govt. of India vide OM dated 08.10.24 has approved the Central Financial Assistance (CFA) to the State Governments of NER towards their equity participation for development of Hydro Electric Projects in the North Eastern Region (NER) through Joint Venture (JV) Collaboration between State entities and Central Public Sector Undertakings. This scheme has an outlay of ₹ 4136 crore to be implemented from FY 2024-25 to FY 2031-32. A cumulative hydro capacity of about 15000 MW would be supported under the scheme.

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 Dec'24, Independent Engineers (IEs) has been appointed for 109 disputes across 60 packages from 26 under construction hydro projects (20 hydro projects and 6 other than hydro projects), out of which 55 disputes have been resolved by IEs while 07 disputes dropped and 01 returned.

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 Dec'24, 20 numbers of disputes has been allocated to CCIE, out of which 15 disputes have also been resolved by CCIE while two disputes have been backed out from the resolution Process and in one case proceedings have been completed but dispute is unresolved.

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:

- Ministry of Power has notified Guidelines to promote development of Pumped Storage Projects in the country on 10th April, 2023. Keeping in view the immense utility of the PSPs in grid stabilization as well as meeting the peaking power demand, guidelines have been formulated to promote PSPs and set the direction of its development. The Ministry seeks to promote the development of PSPs across the country with proactive support of the State Governments.
- CEA has also published revised Guidelines for Formulation and Concurrence of DPR of PSPs. Under the revised guidelines, the timeline for concurrence of DPR has been reduced from 90 days to 50 days for all type of PSPs.
- 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.
- Waiver of ISTS charges on the transmission of power has been 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.

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 persistent efforts of the Government in this regard. List of such hydro projects is as under:

a. Subansiri Lower (2000 MW) of NHPC in Arunachal Pradesh was stalled since 2011. Works restarted after NGT case was dismissed on 31.07.2019. 05 Units of Subansiri Lower Project are planned to be commissioned during 2025-26 and balance 3 units during 2026-27.

b. 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.

c. 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.

d. 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.

e. In UT of Jammu & Kashmir, one new hydro project namely Kwar (540 MW) came under construction in the year 2023-24 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. Out of these 13 HE Projects, 2 HE Projects namely Heo & Tato-I have been accorded investment approval. 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 for execution of viable projects, required from the perspective of maintaining a stable grid and providing power at the time of the day when required, 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	14203	70728
2024-25 (Till Dec-2024)	5960	46325

Performance (Calendar year 2024)

i. Progress made in respect of addition in Transmission lines (of 220 kV & above), Transformation capacity (of 220 kV & above) and Inter-Regional capacity during the current calendar year (up to 31-12-2024):

	Target during the current year (as on 31-12-2024)	Capacity added during the current year (as on 31-12-2024)	% achievement
Transmission Lines (in ckm)	14,360	11,116	77.41
Transformation Capacity (in MVA)	86,610	78,717	90.89

Also, Interregional capacity of 2,200 MW has been added during the current calendar year (as on 31-12-2024).

Target for the Period Jan – 2025 to March-2025 are as below:

Month	**Transmission lines** (in ckm)	**Transformation Capacity** (in MVA)
Jan-2025	608	5775
Feb-2025	448	17965
Mar-2025	2477	17790

ii. The following reports/guidelines have been issued during the current year for facilitating RoW compensation and RoW corridor optimization:

Name of the Report	Issue date	Brief Details
Report of the Committee for calculation of reduction of Right-of- Way (RoW) width through technological options	24-09-2024	A committee was constituted for calculation of reduction of Right-of-Way (RoW) width through technological options. The committee defined RoW for (i) ACSR conductor with Pole structure (ii) High Temperature Low sag (HTLS) conductor with Pole structure (iii) High Temperature Low sag (HTLS) conductor with conventional type towers (Lattice Towers).
Revised guidelines for payment of compensation in regard to Right of Way (RoW) for transmission lines	14-06-2024	Revised guidelines for payment of compensation in regard to Right of Way (RoW) for transmission lines have been issued for- **Tower Base Compensation:** Compensation for the tower base area shall be 200% of the land value. The tower base area shall be the area enclosed by the four legs of the tower at ground level, plus an additional one (1) meter extension on each side. **RoW Corridor Compensation:** The compensation amount for Right-of-Way Corridor shall be 30% of the land value. States/UTs may decide higher rate depending on the area and urgency of the work. Presently, Rajasthan, Haryana, Delhi and Karnataka have adopted this revised RoW guidelines.

Major Projects commissioned in 2024-25 (till Dec-2024):

Following important EHV lines have been commissioned:

a. 765 kV D/C, Fatehgarh II- Bhadla II transmission line (2nd) (405 ckm) implemented by M/s POWERGRID, commissioned in August' 2024.

b. 400 kV D/C, Gadag PS- Narendra (New) transmission line (187 ckm) implemented by M/S Renew Transmission Venture Private Limited, commissioned in September' 2024.

c. 400 kV D/C, Padghe (PG) – Kharghar transmission line (140 ckm) implemented by M/s Sterlite Power Transmission Limited, commissioned in September' 2024.

d. 400 kV D/C, Sikar II - Neemrana transmission line (270 ckm) implemented by M/s POWERGRID commissioned in October' 2024.

e. 765 kV D/C, Sikar II - Aligarh transmission Line (513 ckm) implemented by M/s POWERGRID in October' 2024.

f. 400 kV D/C, Bongaigaon (POWERGRID) - Nangalbibra transmission line (246 ckm), implemented by M/S Sterlite Power Transmission Limited, commissioned in October' 2024.

g. 765 kV D/C, Bhadla II - Sikar II Transmission line (618 ckm), implemented by M/s. POWERGRID in December' 2024.

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

Continuing to take leadership role in climate change, 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. 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 209.4 GW as on 31st December, 2024. Therefore, about 290.6 GW of RE capacity and associated transmission system needs to be added by 2030. ISTS network for evacuation of power from about 161.9 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. Transmission system has already been planned for additional 19.3 GW hydro capacity likely by 2030. For balance RE capacity of about 85 GW, the planned transmission system would be taken up for implementation in a phased manner commensurate with the RE Capacity.

National Electricity Plan (Volume-II: Transmission)

Planning of Transmission System is a continuous process of identification of transmission system addition requirements and their timing. The National Electricity Plan (Transmission) is a roadmap for ensuring the development of a reliable, efficient, and sustainable transmission network across the country. It aligns with the national electricity needs, facilitates integration of diverse power sources, and supports energy security.

a. The Nation Electricity Plan (Transmission) covering the detailed transmission plan for the period from 2023-32 has been prepared by CEA in consultation with various Stakeholders. The same was launched by the Hon'ble Minster of Power on 14th October 2024.

b. As per the plan, transmission system has been planned for about 590 GW generation capacity addition planned during 2023-32 [Thermal: 73 GW; Hydro (including PSP): 52 GW; Nuclear: 13 GW; Wind: 124 GW; Solar: 330 GW]. Transmission system has been planned for achieving over 500 GW of Renewable Energy installed capacity by the year 2030 and over 600 GW of Renewable Energy installed capacity by the year 2032. Transmission system has also been planned for delivery of power to the Green Hydrogen/Green Ammonia Manufacturing hubs at coastal locations like Mundra, Kandla, Gopalpur, Paradeep, Tuticorin, Vizag etc.

c. As per the National Electricity Plan, over 1.91 lakh ckm of transmission lines and 1274 GVA of transformation capacity is planned to be added during the ten year period from 2022-23 to 2031-32 (at 220 kV and above voltage level). In addition, 33 GW of HVDC bi-pole links are also planned. The inter-regional transmission capacity is planned to increase to 143 GW by the year 2027 and further to 168 GW by the year 2032, from the present level of 119 GW.

d. The Plan also covers Cross border interconnections with Nepal, Bhutan, Myanmar, Bangladesh, Sri Lanka as well as probable interconnections with Saudi Arabia, UAE etc.

e. The transmission plan highlights new technology options in transmission sector like Hybrid Substations, Monopole Structures, Insulated Cross Arms, Dynamic Line Rating, High Performance Conductors, Upgradation of maximum operating voltage to 1200 kV AC as well as skill development in Transmission Sector.

f. With several transmission schemes under construction, under bidding and under planning, the National Electricity Plan (Transmission) provides visibility of the investment opportunity of over INR 9,15,000 Crores in Transmission Sector.

CHAPTER 08

DISTRIBUTION

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 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

Under NSGM, two (2) projects worth Rs.116.01 Cr. viz. one in Chandigarh (Subdivision No. 5) and one integrated project for 6-towns in Rajasthan for a total of 1.8 lakh consumers has been completed. Till the closure of the scheme, more than 1.69 lakh smart meters were installed under these two projects.

Training and Capacity Building

NSGM undertook training and capacity building programs for officials of Utilities/DISCOMs involved in implementation of Smart Grids with 100% funding support. Smart Grid/Smart Distribution training programs has been conducted at SGKC, wherein engineering professionals from different Indian DISCOMs were trained.

2. Prime Minister Development Package

Government of India approved a Special Assistance Package in 2016 under the Prime Minister Development Package (PMDP) for improvement in Power distribution systems for the Union Territories of J&K and Ladakh.

Under the package, distribution infrastructure and smart metering works worth of Rs.2889 Cr have been undertaken and funds to the tune of Rs. 2187 cr have been released by the Ministry till now. The projects are slated to be completed by 31st March 2025. Details of the physical infrastructure works executed till date is as below:

Power Sub Station (in nos)	66 & 33 KV ines (in cKms)	Distribution Transformers (in nos)	HT Feeders (in cKms)	LT Feeders (in CKms
205	997	8508	2824	7719

3. Revamped Distribution Sector Scheme (RDSS)

Government of India launched Revamped Distribution Sector Scheme (RDSS) with the objective of improving the quality and reliability of power supply to consumers through a financially sustainable and operationally efficient distribution sector. The salient features of the scheme are as under:

(a) An outlay of Rs. 3 03,758 Cr. and estimated Gross Budgetary Support (GBS) from Central Government of Rs. 97,631 Cr..

(b) Aims to reduce the Aggregate Technical and Commercial (AT&C) losses to pan-India levels of 12-15% and the Average Cost of Supply and Average Revenue Realized (ACS-ARR) Gap to zero by the end of the scheme period.

(c) Duration of 5 years (FY 2021-22 to FY 2025-26).

(d) Two major components:

- Part 'A'– Prepaid Smart Metering & System Metering and upgradation of the Distribution Infrastructure
- Part 'B' – Training & Capacity Building and other Enabling Activities.

(e) Financial assistance is being provided to the Distribution Utilities eligible under scheme for upgradation of distribution infrastructure & smart metering works. Various works sanctioned under RDSS for improvement in power distribution network and strengthening of infrastructure for ensuring uninterrupted power supply across the country are as below:

- Installation of New/Upgradation of existing Distribution Transformers and sub-stations.

- Feeder bifurcation and segregation works
- Replacement of old bare conductors with Low Tension Aerial Bunched (LT AB) cables
- Re-conductoring of High Tension (HT) & Low Tension (LT) lines etc.

(f) Smart Metering works have been sanctioned for System viz. Feeders and Distribution Transformers, and for consumers. Smart prepaid meters have been taken up for consumers wherein the advisories have been issued for prioritizing installation in Government establishments, Industrial and Commercial consumers and high load consumers. Further, based on successful demonstration for these categories of consumers, the meters have been proposed to be rolled out of remaining category of consumers. Further, for smooth rollout of consumers, advisories have also been issued for offering rebate to prepaid smart meter consumers and that the cost of meters shall not be passed on to the consumers because the cost of meter would be recovered as a result of improvement in the losses due to improved billing and collection efficiency and because of power purchase cost optimization.

Modernization works including Supervisory Control and Data Acquisition (SCADA), Data Management System (DMS), IT/ OT, Enterprise Resource Planning (ERP), GIS enabled applications, Advanced Distribution Management Systems (ADMS) etc. to make to make distributions systems smarter.

So far, Projects worth Rs. 1.31 Lakh Cr. for smart metering works and Rs. 1.48 Lakh Cr. for distribution infrastructure have been sanctioned for improving the reliability and quality of power supply in the country. State/ UT-wise details of works sanctioned under RDSS are given below:

Details of works sanctioned under RDSS

States/Discoms	Sanctioned Cost			Sanctioned GBS		
	Smart Metering Works	Loss Reduction Works	Total	Smart Metering Works	Loss Reduction Works	Total
Andaman & Nicobar Islands	54	462	516	12	416	428
Andhra Pradesh	4,128	10,687	14,814	815	6,412	7,227
Arunachal Pradesh	184	1,042	1,226	54	938	992
Assam	4,050	3,395	7,444	1,052	3,055	4,107
Bihar	2,021	8,406	10,427	412	5,044	5,456
Chhattisgarh	4,105	3,964	8,070	804	2,379	3,183
Delhi	13	324	337	2	194	196
Goa	469	247	716	95	148	243
Gujarat	10,642	6,089	16,731	1,885	3,653	5,538
Haryana	0	6,797	6,797	0	4,078	4,078
Himachal Pradesh	1,788	2,327	4,115	466	2,094	2,560
Jammu & Kashmir	1,064	4,771	5,835	272	4,294	4,566
Jharkhand	858	3,344	4,202	191	2,006	2,197
Karnataka	0	34	34	0	21	21
Kerala	8,231	3,011	11,243	1,413	1,807	3,220
Ladakh	0	876	876	0	788	788
Madhya Pradesh	8,911	9,384	18,295	1,504	5,631	7,134
Maharashtra	15,215	17,209	32,424	2,840	10,326	13,165
Manipur	121	615	737	38	554	592
Meghalaya	310	1,232	1,542	86	1,109	1,195
Mizoram	182	319	500	61	287	348
Nagaland	208	461	668	60	415	474
Puducherry	251	84	335	56	51	107
Punjab	5,769	3,873	9,642	960	2,324	3,284

Rajasthan	9,715	17,427	27,142	1,686	10,456	12,142
Sikkim	97	416	514	30	375	405
Tamil Nadu	19,235	9,568	28,803	3,398	5,741	9,139
Telangana	0	120	120	0	72	72
Tripura	319	598	917	80	538	619
Uttar Pradesh	18,956	21,612	40,568	3,501	12,967	16,468
Uttarakhand	1,106	1,717	2,823	310	1,545	1,855
West Bengal	12,670	7,223	19,893	2,089	4,334	6,423
Grand Total	**1,30,671**	**1,47,635**	**2,78,306**	**24,173**	**94,050**	**1,18,224**

Household Electrification: Further, Government of India is supporting electrification of all Households (HHs) left out during Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA), under the ongoing scheme of RDSS. In addition, all identified HHs belonging to Particularly Vulnerable Tribal Group (PVTG) under Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) and tribal HHs under Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DA-JGUA) are being sanctioned for on-grid electricity connection under RDSS, as per the Scheme guidelines. Till date, works amounting to Rs. 4,538 Cr. have been sanctioned for grid electrification of 9,97,680 HHs. The State-wise details are given below:

Household Electrification sanctioned under RDSS (Addl HHs + VVP + PVTG)

S. No.	Name of State	Sanctioned Outlay (Rs. Crores)	Sanctioned GBS (Rs. Crores)	Total Households Sanctioned (Nos.)
A.	**Addl. HHs Sanctioned under RDSS**			
1	Rajasthan	459.18	275.51	1,90,959
2	Meghalaya	435.70	392.13	50,501
3	Mizoram	79.90	71.91	15,167
4	Nagaland	69.55	62.59	10,004
5	Uttar Pradesh	931.04	558.62	2,51,487
6	Andhra Pradesh	49.24	29.55	15,475
7	Jharkhand	7.47	4.48	872
8	Jammu & Kashmir	77.10	69.39	10,730
9	Bihar	300.26	180.16	42,584
10	Assam	785.55	706.99	1,27,111
11	Arunachal Pradesh	47.11	42.40	6,506
12	Manipur	214.44	193.00	36,972
13	Chhattisgarh	316.51	189.90	63,161
	Total (A)	**3,773.04**	**2,776.64**	**8,21,529**
B.	**Electrification works sanctioned under RDSS in Vibrant Village Programme (VVP)**			
1	Himachal Pradesh*	6.08	5.47	-
2	Arunachal Pradesh	20.18	18.16	1,683
3	Uttarakhand	13.08	11.77	1,154
	Total (B)	**39.34**	**35.41**	**2,837**
C.	**Electrification of PVTG Households through Grid Connectivity under PM-JANMAN**			
C1	**Sanctioned under RDSS**			
1	Andhra Pradesh	88.71	53.23	25,054
2	Bihar	0.28	0.17	51
3	Chhattisgarh	38.17	22.90	7,077
4	Jharkhand	74.13	44.47	12,442

5	Madhya Pradesh	143.39	86.02	29,290
6	Maharashtra	26.61	15.96	8,556
7	Rajasthan	40.34	24.20	17,633
8	Karnataka	3.77	2.26	1,615
9	Kerala	0.86	0.52	345
10	Tamil Nadu	29.89	17.94	10,673
11	Telangana	6.79	4.07	3,884
12	Tripura	61.52	55.37	11,664
13	Uttarakhand	0.60	0.54	669
14	Uttar Pradesh	1.10	0.66	316
	Sub Total (C1)	**516.15**	**328.31**	**1,29,269**
D.	**Electrification of DA-JGUA**			
D1	**Sanctioned Households**			
1	Chhattisgarh	11.98	7.19	2,550
2	Maharashtra	2.07	1.24	480
3	Tripura	40.69	36.62	7,677
4	Karnataka	30.53	18.32	3,682
5	Arunachal Pradesh	8.20	7.38	1,938
6	Telangana	110.73	66.44	26,525
	SubTotal (D1)	**204.20**	**137.19**	**42,852**
D2	**Sanctioned Public Places**			
1	Tripura	2.31	2.08	512
2	Arunachal Pradesh	0.04	0.03	9
3	Telangana	2.90	1.74	672
	SubTotal (D2)	**5.25**	**3.86**	**1,193**
	Total (D=D1+D2)	**209.45**	**141.05**	**44,045**
	GrandTotal (A+B+C+D)	**4,537.99**	**3,281.39**	**9,97,680**

Major Achievements under RDSS:

i Electrification works amounting to Rs. 4,538 Cr. for 9.97 Lakh un-electrified Households left out during SAUBHAGYA including electrification of Particularly Vulnerable Tribal Group household under Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) and Tribal Households identified under Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DA-JGUA).

ii There has been improvement in electricity supply to consumers and the average hours of supply have improved from 21.7 hours in rural areas in FY 23 to 22.6 hours in Q3 (Quarter-3) of FY 25 (Q3), and from 23.3 hours to 23.4 hours in in urban area for the same period.

iii During FY 25, the Distribution Infrastructure works sanctioned under the scheme have gained pace and the overall physical progress has increased to 21.51%.

In FY 2025, Distribution Infrastructure works amounting to Rs. 22,409 Cr. have been sanctioned which include

a. Modernization and System Augmentation works amounting to Rs. 8,081 Cr.

b. Feeder Segregation works amounting to Rs. 9,803 Cr. in States of Uttar Pradesh, Andhra Pradesh and Rajasthan to sanction all balance mixed load feeders with Agricultural load of more than 30%.

c. System Strengthening works amounting to Rs. 3,023 Cr. for supporting solarisation of feeders and for facilitating day time power supply to farmers in the State of Maharashtra.

CHAPTER 09

POWER SECTOR REFORMS

1. Amendments in Electricity (Rights of Consumers) Rules, 2020

Introduced to empower electricity consumers, this framework lays down their rights and provides mechanisms to enforce them. The rules ensure timely access to services such as new connections, grievance redressal, and billing transparency while facilitating rooftop solar adoption and electric vehicle (EV) integration. Key amendments introduced in February, 2024 include:

a) Simplifying rooftop solar installation processes with exemptions from technical feasibility study for systems up to 10 kW.

b) Allowing separate connections for EV charging stations to promote clean mobility.

c) Reducing timelines for new connections: 3 days in metros, 7 days in municipal areas, and 15 days in rural regions (30 days for hilly terrain).

d) Mandating consumer rights for separate metering and billing in residential colonies, enhancing transparency and fairness.

e) Introducing mandatory check meters to verify consumption in case of complaints.

These measures improve transparency, reduce delays, and make electricity services more consumer-centric.

2. Amendments in Electricity (Late Payment Surcharge) Rules, 2022

To address mounting dues of distribution companies (DISCOMs) and strengthen financial discipline, the Late Payment Surcharge (LPS) Rules, 2022, were introduced. The rules allow DISCOMs to clear legacy dues through a maximum of 48 Equated Monthly Instalments (EMIs). Timely payments prevent additional LPS accruals, and delays in installments trigger a surcharge on the entire outstanding amount. As of December, 2024, DISCOMs had paid ₹1,15,263 crore out of the ₹1,39,947 crore legacy dues, along with payment of current dues, in general.

Amendments in February, 2024 further ensure reliable power supply amid growing demand. These rules stabilize DISCOM finances, reduce interest burdens, and improve payment discipline, enhancing overall power sector viability.

3. Amendments in Electricity Rules, 2005

The Electricity (Amendment) Rules, 2024 bring reforms to rationalise open access charges empowering bulk consumers to get electricity at cheaper cost from alternate sources available anywhere in the country.

Provisions have been introduced to ensure no gaps between the Annual Revenue Requirement and estimated revenue from Annual tariff allowed by State Commissions ensuring to financial position of distribution licensees.

Large consumers and ESS developers can now establish and maintain dedicated transmission lines without license resulting in industrial growth.

4. Electricity Distribution (Accounts and Additional Disclosure) Rules, 2024

The Ministry notified the Electricity Distribution (Accounts and Additional Disclosure) Rules, 2024 in October 2024 to ensure uniformity in the preparation of accounts by utilities across states. These rules aim to enhance transparency in accounts through uniform provisioning and the disclosure of additional information.

5. Viability Gap Funding (VGF) for BESS:

Union Cabinet has approved VGF scheme on 6th September 2023 for the development of 4,000 MWh of BESS capacity, with a budget of Rs 3,760 Cr. Subsequently, considering the decline in the battery prices, it was decided to support a higher BESS capacity of around 12,000 MWh within the sanctioned scheme budget.

Three (3) components have been launched under the VGF scheme. First component of 1000 MWh BESS capacity with Rs 46 lakh/MWh as VGF (total VGF is Rs 460 Cr) is being implemented by NVVN through Market Mechanism.

CPSE component targets a capacity of 5000 MWh to be developed through NTPC, NHPC and SJVN with a VGF of Rs 27 lakh/MWh (total VGF is Rs 1,350 Cr).

Besides the above, for enhancing the integration of variable renewable energy sources within the States, BESS capacity of 6000 MWh under State component is planned in 8 States viz Rajasthan, Tamil Nadu, Karnataka, Gujarat, Maharashtra, Telangana, Bihar and Kerala, providing VGF of Rs 27 lakh/MWh (total VGF is Rs 1,620 Cr).

6. Improving Financial Viability

The financial health of Distribution Utilities is crucial for the stability and growth of the power sector. Addressing issues related to operational inefficiencies, accumulated debt, and inadequate revenue realization is key to ensuring their long-term viability. The total accumulated losses for the Distribution Utilities as in FY24 is to the tune of Rs. 6,92,269 Cr. The ACS-ARR Gap has indeed reduced from Rs.0.63 per unit in FY 21 to Rs. 0.21 per unit in FY24, and the AT&C loss have come down from 21.91% to 16.73% in the same period. The key challenges to reducing the accumulated loss and accumulated debt for the distribution utilities are as below:

a. Non-Cost Reflective Tariff

b. Delays in payment of State Government Subsidies and Government department dues.

c. Mounting Accumulated debt on account of cost of supply being not realised due to disallowances by regulator.

The Financial Performance of Distribution Utilities during the years FY 21 to FY 24 is as below:

National Level Figures	FY 21	FY 22	FY 23	FY 24*
Borrowings / Total Outstanding Debt (Rs. Crore)	5,76,112	6,14,853	6,84,379	7,53,257
Accumulated (Losses)/Surplus as per Balance Sheet (Rs. Crore)	(5,45,418)	(5,84,071)	(6,47,913)	(6,92,269)
ACS-ARR Gap (Rs./unit)	0.63	0.10	0.46	0.21
Billing Efficiency (%)	84.17	86.13	87.00	86.72
Collection Efficiency (%)	92.77	97.27	97.27	95.86
AT&C Losses (%)	21.91	16.23	15.37	16.73

* Provisional

The following measures have been taken to improve viability of Discoms:

- Implementation of prepaid smart metering for electricity consumers with government establishments and government offices taken on priority.
- Rules for cost-reflective tariffs and timely payment of subsidies.
- Mandatory energy accounting and auditing for all Distribution Utilities.
- Reform conditions stipulated in RDSS and scheme for additional borrowing space to the extent of 0.5% of Gross State Domestic Product (GSDP).
- Revision of prudential norms for lending by Power Finance Corporation Ltd and REC Ltd.
- Rules for Fuel and Power Purchase Cost Adjustment (FPPCA) for timely realization of cost of power.
- Late Payment Surcharge Rules so as to arrest mounting surcharges on legacy dues.

The State and the Regulators should ensure effective implementation of these rules so as to address the issues of accumulated losses and debts.

7. Constitution of Group of Ministers for addressing issues related to Viability of Distribution Utilities

The Ministry has constituted a Group of Ministers (GoM) on 24 Jan 2025 to address the concerns related to the accumulated debts and losses of the distribution utilities. The group will focus on: (i) the current and future financial sustainability of DISCOMs, (ii) meeting the investment needs of the sector in light of growing power demand and efforts to improve services, and (iii) ensuring reasonable returns on such investments. The GoM headed by Minister of State for Power and New and Renewable Energy has Energy Ministers from States of Andhra Pradesh, Rajasthan, Tamil Nadu, Madhya Pradesh, and Maharashtra as the Members with Uttar Pradesh as the Member Convenor. The Terms of Reference (ToR) for the GoM are as under:

i. Analyze debt scenario in key States

ii. Identify parameters that need to be monitored to ensure borrowings are productive

iii. Identify States that are in urgent need for liquidity support and design a fiscal discipline program to enable them to avoid a debt trap.

iv. Recommend guidelines for investment plan with respect to capital expenditure targeted at overall improvement – ensure adequate technical and financial due-diligence, equity investment by State Government, suitable mechanism for realization through tariff.

v. Suggest measures for improvement in the overall health of the distribution sector to attract further investment from private participants in the value chain

The 1st meeting of the GoM was held on 30th January 2025 and the GoM is expected to submit its report by 30th April, 2025.

8. Smart Meter Data Analytics

Ministry of Power (MoP) has taken initiatives for adoption of advanced technologies like Artificial Intelligence/ Machine Learning (AI/ML), Block chain, etc. for strengthening of the distribution sector. Using these technologies, real-time data from smart meters can be leveraged for reducing losses, preventing energy theft, improving complaint management system and predictive asset

management, etc. Under RDSS, special emphasis has been laid on leveraging advanced technologies to analyze smart metering data through IT/OT devices to enhance operating efficiency & financial sustainability of DISCOMs.

With the intent of promoting the use of advanced technologies for enhancing the reliability and efficiency of the power distribution sector, Powerthon Phase-I was launched on 7th Feb 2022. A total of 275 applications were received, and after a thorough screening process, 7 Technology Solutions Providers (TSPs) were selected. Out of these 7 TSPs, top 3 solutions are scaling up their operations across 6 Distribution Utilities.

To further bring in new technologies in the power distribution sector and to give opportunity to start-ups, Phase-2 of the Powerthon initiative was launched in 2024. In this phase, in addition to nurturing and incubating various solutions developed by TSPs using advanced technologies, support will also be provided to TSPs for ideation and conceptualization. This support to early stage TSPs will include resources, mentorship, and networking opportunities to help them turn their concepts into viable, market-ready technological solutions. Some of the proposed areas of solutions are:

i. Demand/Load Forecasting/Power Purchase Optimization
ii. Demand Side Management
iii. Improve Power Quality
iv. Digital Twin
v. Asset Management
vi. Renewable Energy Integration in Distribution System

The key challenges that Powerthon would address are:

- Non-availability of data to solution providers for offering customised solutions.
- The issue of engagement with start-ups

CHAPTER 10

ENERGY CONSERVATION

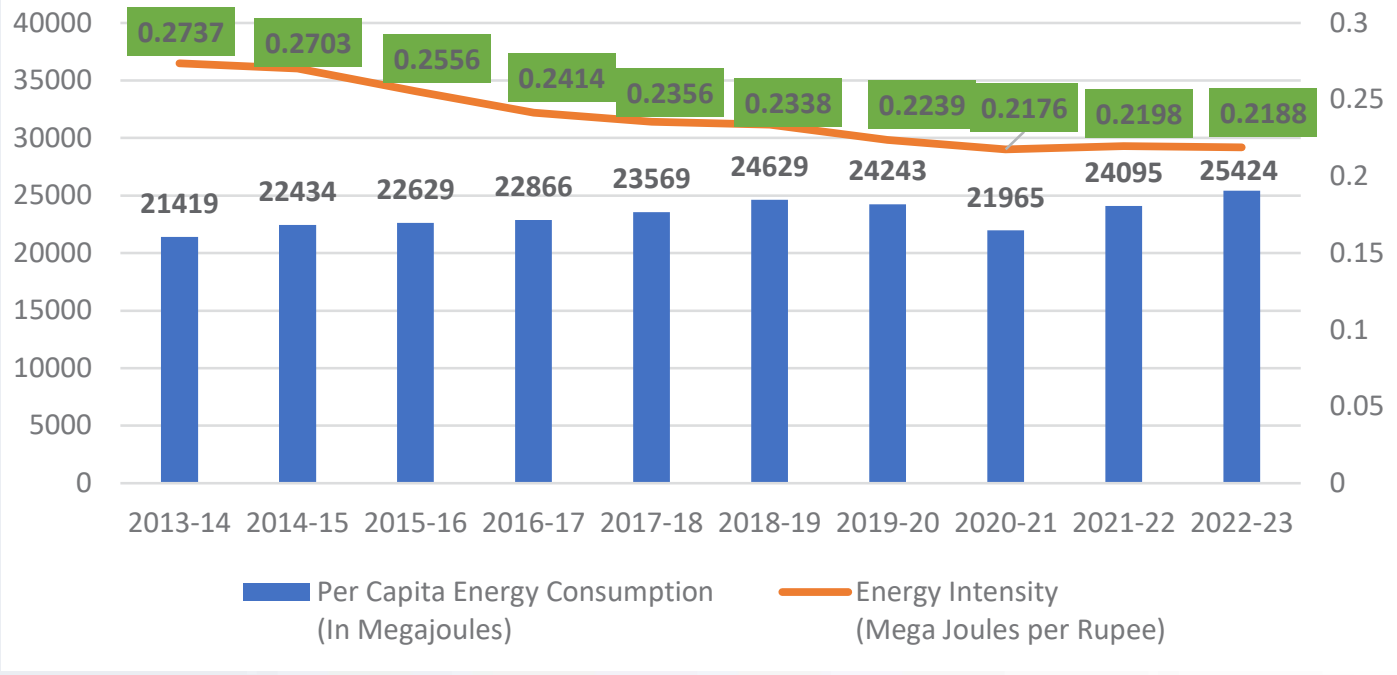
India has been witnessing a significant rise in the demand for energy across all the sectors with rapid increase in access, affordability and urbanization. India's development path focusses on the need for rapid economic growth which is an essential precondition to poverty eradication and improved standards 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 in its Nationally Determined Contributions (NDCs) has committed that it will reduce the emission intensity of its GDP by 33% to 35% by 2030 from 2005 level.

In the 26th session of the Conference of the Parties (COP-26) at Glasgow, UK, India submitted that its non-fossil energy capacity will reach 500 GW by 2030, and that it will reduce its total projected carbon emissions by one billion tonnes by 2030. It also submitted that by 2030, India will reduce the carbon intensity of its economy to less than 45 per cent, and by 2070, India will achieve the target of net zero emissions.

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

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

I. 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 emission reduction in energy intensive industries and it is designed on the concept of reduction in Specific Energy Consumption (SEC) i.e. energy used per unit of production. 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.

PAT Cycle- I

PAT in its first cycle was implemented 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 allocated to 478 Designated Consumers (DCs), based on their current Specific Energy Consumption (SEC) levels compared to their sub-sector peers so that units with greater energy efficiency or lower SEC were assigned smaller reduction targets, while less energy-efficient units with higher SEC were given higher targets. The overall SEC reduction targets for PAT Cycle-I has aimed to secure 4.05% target reduction in the total energy consumption of these industries and establishments totalling to an energy savings of 6.686 Million Tonne of Oil Equivalent (MTOE). Units which were able to achieve SEC levels lower than their targets received energy savings certificates (ESCerts) for their excess savings.

PAT Cycle-I completed in March, 2015 after which the scrutiny of the Performance Assessment Documents (PADs) submitted by the DCs was carried out by State Designated Agencies (SDAs) and BEE. Implementation of PAT cycle –I resulted in energy saving of 8.67 MTOE translating into avoiding of about 31 million tonne of CO2 emissions.

Trading of ESCerts:

Ministry of Power had issued about 38.25 lakh ESCerts to 306 DCs for excess energy saving and 110 DCs of PAT cycle were entitled to purchase about 14.25 lakh ESCerts to meet their shortfall against their energy saving targets under PAT Cycle-I. 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.

PAT Cycle-II

"Deepening" – identification of new DCs in existing sectors and "Widening" –inclusion of new sectors, were 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. The Widening study resulted into notification of three new sectors namely Refineries, Railways and DISCOMs under the 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 on 1st April, 2016 and completed on 31st March 2019. Implementation of PAT cycle -II has resulted into total energy savings of 14.08 (MTOE) surpassing the target of 13.63 MTOE. This corresponds to an avoidance of approximately 68 million tons of CO_2 emissions.

Trading of ESCerts: Ministry of Power issued about 57.38 lakh ESCerts to 349 DCs and 193 DCs have been entitled to purchase 37.06 lakh ESCerts under PAT cycle –II. Business of around 329 Cr INR took place in 40 sessions where 20.18 lakh ESCerts were traded for compliance under PAT Cycle-II.

PAT Cycle III

The Parliamentary Standing Committee on Energy, Executive Committee on Climate Change under the Prime Minister's Office (PMO) and Group of Secretaries recommended notifying DCs under PAT scheme annually for accelerated coverage. Thus, the PAT scheme was implemented on a rolling cycle basis where new DCs/sectors are notified every year. Since this decision was taken to put the PAT scheme under the rolling cycle from PAT-II onwards. PAT Cycle-III, notified for FY 2017-20, targeted a total of 116 Designated Consumers across six sectors: Thermal Power Plants, Cement, Aluminium, Pulp & Paper, Iron & Steel, and Textile. The implementation of PAT Cycle-III resulted in energy savings of 1.594 MTOE, exceeding the target of 1.06 MTOE which led to a reduction of 5.59 million tonnes of CO_2 emissions.

Trading of ESCerts: Ministry of Power issued about 7.44 lakh ESCerts to 75 DCs and 20 DCs have been entitled to purchase 1.13 lakh ESCerts under PAT cycle –III. The respective cycle trading commenced on April 9, 2024, and a total of 13 trading sessions were held for PAT Cycle-III, during which 0.50 lakh ESCerts were complied resulting into a business of about INR 11 crores.

PAT Cycle IV

The fourth cycle of PAT was notified for 109 DCs with a total energy consumption reduction target of 0.701 million tonnes of oil equivalent. 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 completed in FY22. The energy savings of about 0.7508 MTOE is achieved against the target of 0.701 Million TOE.

PAT Cycle V

PAT cycle –V commenced with effect from 1st April 2019 and completed on 31st March 2022. 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.

PAT Cycle VI

PAT Cycle-VI 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 & Paper and Textiles have been notified. With the implementation of PAT cycle –VI, it is expected to achieve a total energy savings of 1.277 MTOE. The saving is being assessed by Bureau.

PAT Cycle VII

PAT cycle –VII was notified for the period 2022-23 to 2024-25 wherein 707 DCs have been notified with overall energy saving target of 8.485 MTOE in the following nine sectors, i.e. Aluminium, Cement, Chlor-Alkali, Iron and Steel, Pulp & Paper, Textiles, Thermal power plant, DISCOM and Railways.

PAT Cycle VIII

PAT cycle -VIII has been notified 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.

By the end of PAT Cycle-V, the scheme has successfully delivered cumulative energy savings of about 25.77 MTOE, surpassing the target of 22.63 MTOE. This achievement corresponds to the reduction of approximately 110 million tonnes of CO_2 emissions.

II. Awards & Painting Competition

(a) National Level Painting Competition

BEE with support from CPSUs organized a State Level Painting Competition 2024 across the country. Approximately 90 lacs school children participated from 1,23,700 schools. The paintings at National level were evaluated by the Jury for two groups separately i.e. Group A (5th to 7th Standard) and Group B (8th to 10th Standard). The 1st, 2nd, 3rd and 10 appreciation prize winners of each group were felicitated in an award function organized on Energy Conservation Day, 14th December 2024, in which the Hon'ble Vice President of India was the Chief Guest.

Group photograph of National Painting Competition Awardees with Hon'ble Vice President of India (14.12.2024)

(b) National Energy Conservation Award - 2024

National Energy Conservation Award is a flagship programme of Ministry of Power. Bureau of Energy Efficiency under guidance of Ministry of Power operationalize the award process and the award event. These awards are given to organizations who have done exemplary work in Energy Conservation and Energy Efficiency (i.e either growth of energy consumption is reduced in physical terms or energy intensity in a specific product or process is reduced without affecting output).

For the award process, applications were invited online through the NECA portal (www.neca.beeindia.gov.in). The application submission started from the release of advertisement on public newspapers (i.e from 21 st September, 2024). The last date of receiving applications on the NECA portal was 7th November, 2024. The total applications received across Industry, Transport, Building, Institutions, Appliances and Innovation Award for professional categories were 752.

The award function was held on 14.12.2024 at Vigyan Bhawan and Hon'ble Vice President of India graced the event as the chief guest and distributed the prizes.

Group photograph of NECA Awardees with Hon'ble Vice President of India (14.12.2024)

III. 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 2024, 38 appliances are covered under the ambit of Standards and Labeling program. Out of which, 16 appliances are under mandatory phase and remaining 22 appliances are under voluntary phase. List of 38 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

- The existing energy performance standards for Room Air Conditioners (RAC), Ceiling fan and Refrigerators (FFR/DCR) have been upgraded by 1- star with effect from 1st January 2026 onwards and the amendment notification has been issued.
- The energy performance standards for Colour Television has been upgraded by 1-star with effect from 1st January 2025 onwards.
- The energy performance standards for Distribution Transformer has been extended for further one year till 31st December 2025.
- The check testing and market surveillance activity has been initiated through State Designated Agencies during FY 2024-25.
- Till December, 2024, 3662 brands and 29328 models were registered under S&L program.

IV. Energy Conservation and Sustainable Building Code (ECSBC)

The Energy Conservation Act, 2001 provides the framework for publishing Energy Conservation Building Code (ECBC). In view of the amendment to Energy Conservation Act in December 2022, ECBC is revised to Energy Efficiency Building Code (ECSBC) for the inclusion of sustainability features. ECSBC means the code which provides norms and standards for energy efficiency and its conservation, use of renewable energy and other green building requirements for a building. These Building energy codes have been adopted as a regulatory measure for ushering energy efficiency in the building sector.

A. Commercial Building sector

The Energy Conservation and Sustainable Building Code (ECSBC) & EcoNiwas Samhita sets minimum energy performance standards for new buildings having a connected load of 100 kW or more, or contract demand of 120 kVA or more for commercial and residential respectively. Updated Energy Conservation and Sustainable Building codes for Commercial and Residential buildings are launched in Sep 2024, as the step towards promoting energy efficiency and Sustainability in building Sector. While the Central Government has powers under the EC Act to publish ECSBC, the State Governments have the flexibility to modify the code to suit local or regional needs and notify them.

As on Dec, 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

State	No. of buildings approved by ULBs
Andhra Pradesh	786
Haryana	100
Kerala	57
Punjab	552
Telangana	738
Uttar Pradesh	201
Uttarakhand	12
Total	**2446**

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

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. 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 Dec, 2024 700 No., applications received, 402 No. buildings have been rated under various categories. 298 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 Dec 2024, 237 No. applications received, 75 No. buildings have been rated and 162 No. applications are under process.

Manuals developed for Energy Efficient Retrofit of Existing Buildings in Different Climatic Zones of India. These manuals will address the existing buildings where there are significant opportunities for the energy performance to be dramatically improved.

B. Residential Building sector

Eco Niwas Samhita (ENS) 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. Updated ENS-2024 includes sustainability features also, 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.

V. 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 but also defer high investments in generation, transmission and distribution network.

a. Energy Efficiency in Cold Chain Sector

Bureau of Energy Efficiency signed MoU with National Centre for Cold Chain Development (NCCD), Ministry of Agriculture & Farmers Welfare on 2nd July, 2024. The MoU focusses on co-operation in the field of Energy Efficiency for Cold Chain applications.

Voluntary Labeling program for Refrigerant Compressors used in Cold Chain applications initiated by Bureau of Energy Efficiency during the month of August, 2024.

b. 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 have participated across 4 zones i.e., North, North-east, South, and West zone. BEE is supporting 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 two years till FY 2025-26.

Major Achievements of the DSM programme Phase – III (2023-25) are as follows;

1. Out of 33 DISCOMs, BEE has signed tripartite MoUs with 29 DISCOMs.
2. BEE deployed 56 manpower (technical experts and financial experts) at 29 DISCOMs.
3. Out of 132 DSM measures, 116 measures already identified and BEE has already approved the same and it is going to be implemented across 29 DISCOMs.
4. Launch ceremony conducted for identified DSM measures in 12 DISCOMs.

Along with DSM measures, BEE has already initiated research cum mapping study on 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.

VI. 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.

(a) Energy and Resource Mapping

BEE had completed the energy and resource mapping studies in 8 sectors initially (Forging, Foundry, Steel Re-Rolling, Paper, Pharma, Glass and Refractory, Chemicals, Bricks). In the current year BEE has completed the energy and resource mapping studies for 3 sectors for developing technology-policy roadmaps for Textile, Leather and Food Processing sectors. In this study, more than 150 energy audits have been conducted outreaching more than 15 clusters, technology compendiums have been prepared to facilitate the sectors.

(b) Scaling-Up of EE/RE implementation

As a way forward to the energy & resource mapping study, 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.

(c) 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. 20 URJA Mitras have been empaneled. More than 636 consultations with SMEs, about 170 walk through audits and 47 detailed energy audits and 2 Development of Project cases have been conducted.

(d) Initiatives implemented through Bi-Lateral Program

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.
- Benchmarking Tool was developed.
- ISO 50001 Training
- Strengthening of EMC in selected SDAs

VII. 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 States designating Renewable Energy Development Agency, 11 States designating Electricity Distribution Company (DISCOM), 5 States designating Electrical Inspectorate and 2 States designating Power Department as their SDA. Besides, 2 States viz. Andhra Pradesh and Kerala have established Standalone SDA that are working exclusively in the field of energy efficiency and energy conservation at State level.

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.

30 SDAs have completed implementation of EE measures as pilot projects in total 211 Government Hospitals across the country.

35 States/UTs have formulated their respective State Energy Efficiency Action Plan (SEEAP). Uttar Pradesh is under process of developing their respective SEEAP.

BEE has prepared State Energy Efficiency Index 2024 (SEEI 2024) 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 2024 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.

31 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, Mizoram, Nagaland, 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.

VIII. Improving Energy Efficiency in Transport Sector

The Ministry of Power, issued average fuel consumption standards for passenger cars on 23rd April 2015. The phase 1 of fuel consumption standards were implemented from April'2017 till March'2022 and phase 2 of standards are under implementation 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.

IX. Renewable Consumption Obligation (RCO)

Amendment of the Energy Conservation Act in December 2022, marked a significant step towards aligning India's energy policies with its commitments toward sustainable development and renewable energy adoption. This amendment empowered the Central Government to specify minimum share of non-fossil energy usage. Accordingly, Ministry of Power (MoP) through Gazette Notification dated 20th Oct'2023, specified the minimum share of consumption of non-fossil sources (renewable energy) by designated consumers in respect of electricity distribution licensee (DISCOMs) and other designated consumers who are open access consumers (OA) or Captive Power Plants (CPPs).

The notification came into force from the 1st day of April 2024 and BEE has been entrusted with the responsibility of maintaining data and ensuring compliance of renewable energy utilization by the designated consumer(s) and submit report to the Central Government. Accordingly, BEE is currently in the process of developing a compliance mechanism including Renewable Consumption Obligations (RCO) rules (under EC Act) formerly designated as RPO (under Electricity Act).

In this regard, series of consultation workshops have been organized with various stakeholders; at Delhi on 21st June 2024 for all SERC/JERC, at Visakhapatnam on 23rd September 2024 and at Jaipur on 28th Nov 2024, for DISCOMs & Designated Consumers with CPP. Additionally, more such consultation workshops have been planned for the stakeholder spectrum across various regions in the coming months.

Further, for monitoring the progress of RE utilization and overseeing the compliance in accordance with the above Gazette notification, BEE is in the process of developing an online portal wherein the details submitted can be monitored.

X. 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.

The Carbon Credit Trading Scheme (CCTS) has been notified by the Central Government on 28th June 2023 and amendment notification in December 2023 under the powers conferred by clause (w) of section 14 of the Energy Conservation

(Amendment) Act, 2022. The Carbon Credit Trading Scheme includes overarching framework for the functioning of Indian Carbon Market and required details related to the issuance, trading, roles and responsibilities of stakeholders towards operationalization of the scheme.

The scheme defines two mechanisms namely, compliance mechanism and offset mechanism. In the compliance mechanism, the obligated entities shall comply with the prescribed Green House Gas emission reduction norms in each compliance cycle of Carbon Credit Trading Scheme. In the offset mechanism, the non-obligated entities can register their projects for Green House Gas emission reduction or removal or avoidance for issuance of Carbon Credit Certificates.

The Central Government have 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 Co-Chairmanship of Secretary, Ministry of Power and Secretary, Ministry of Environment, Forest and Climate Change.

As part of implementation of the scheme, Bureau of Energy Efficiency has published the "Detailed Procedure For The Compliance Mechanism" and the "Accreditation Procedure and Eligibility Criteria for Accredited Carbon Verification Agencies". Bureau of Energy Efficiency has also published the list of sectors under the offset mechanism of Carbon Credit Trading Scheme.

XI. Estimated Impact of Energy Efficiency Measures for the year 2023-24:

- Total Electrical energy savings 321.39 BUs annually.
- Thermal energy savings of 25.96 Million Tonnes of oil equivalent.
- Total energy savings of 53.60 Million Tonnes of oil equivalent i.e., 6 % of the total primary energy supply of the country.
- Total energy savings amounted to monetary savings worth INR 200212.84 crores.
- The total equivalent reduction in CO_2 emissions is around 321.06 Million Tonnes annually.

XII. Activities under International Cooperation

Bureau of Energy Efficiency signed MoU with Department of Energy, Ministry of Energy and Natural Resources, Royal Government of Bhutan on 13th March, 2024. The MoU focusses on co-operation in the field of Energy Efficiency and Energy Conservation Measures.

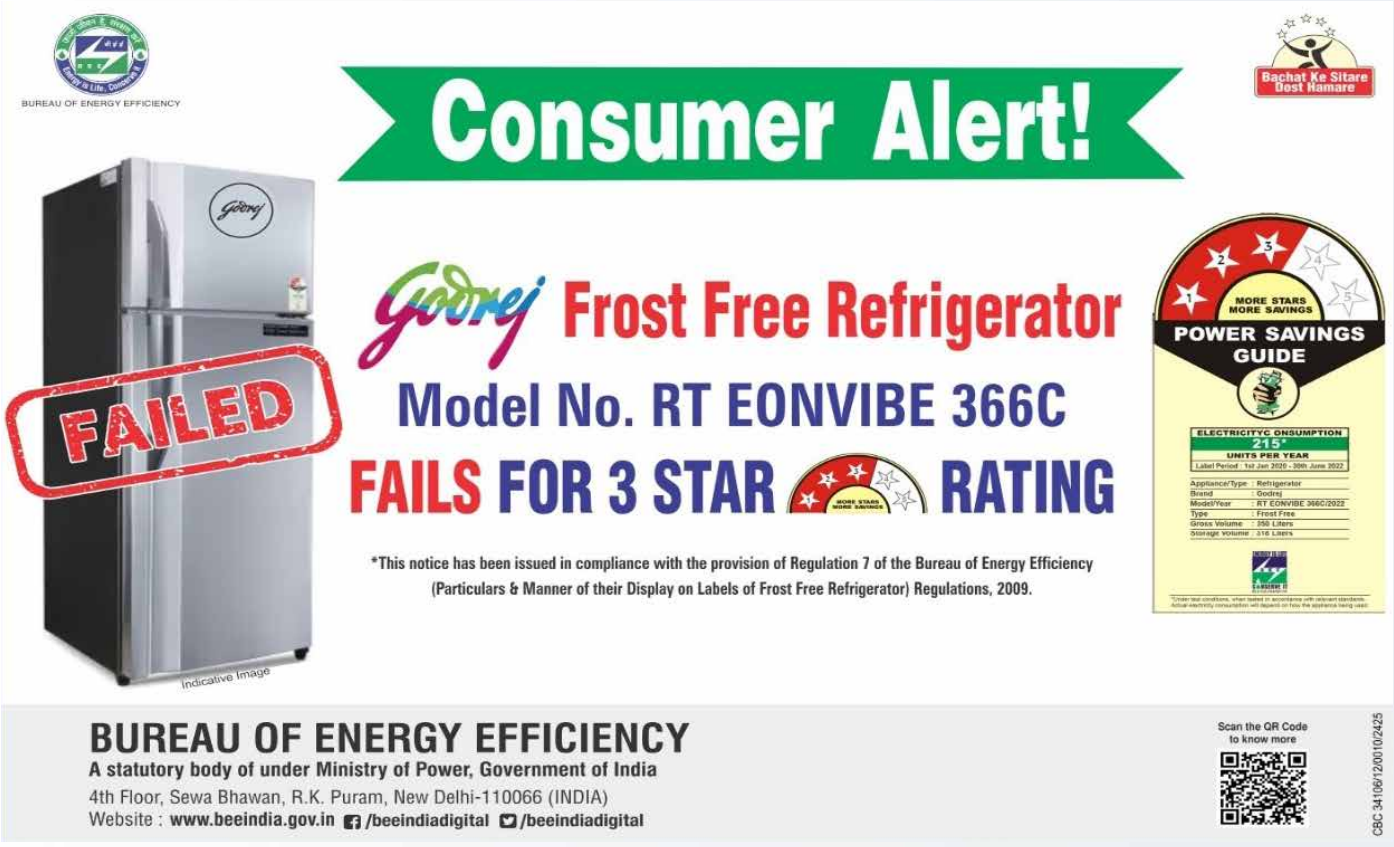
The Union Cabinet approved India's entry into elite global Energy Efficiency Hub on 4th October, 2024.

XIII. Activities under Awareness and Outreach

Bureau of Energy Efficiency (BEE) launched various campaigns to raise awareness about energy conservation among the public. According to the guidelines laid down by the Ministry of Information and Broadcasting, media campaigns through electronic, outdoor and print media were carried out through the Directorate of Advertising & Visual Publicity (DAVP) and the National Film Development Corporation of India (NFDC). In order to create awareness about Energy Conservation and spread it among masses for wider coverage, BEE has undertaken several activities in Print, Electronic, Social, and Outdoor Media, which are listed as given below:

A. Print Media:

BEE has been releasing advertisements in Newspapers to spread awareness and educate people about star rating of electric appliances. This helps in educating people more about the labels and their use. Also, BEE has been releasing recruitment ads, notice ads, check testing ads etc. in various newspapers. In addition to this, advertisements were also released pan India for announcing National Energy Conservation Awards (NECA) under the categories of Industry, Institution, Appliance, Building, Transport etc. Recognizing and rewarding industries, institutions, appliances, buildings, and transportation that demonstrate exceptional energy conservation practices encourages others to follow the suit.



B. Outdoor Media:

Exhibition: BEE's stall at various exhibition and events exhibited information and achievement about its schemes such as ECBC, ENS, Shunya Labelling, PAT etc. through its creatively designed display panels.

(i) Smart Cities India Expo, 2024, New Delhi

(ii) Pratigya Exhibition 2024, Bhiwani, Haryana

(iii) 43rd India International Trade Fare, New Delhi

C. 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

BEE has been posting a wide range of creatives and videos on its social media platforms. Offering diverse content helped attract and engage a broader audience. Top performing posts (based on likes, comments, and shares) and their content/themes are as follows:

List of some of the campaigns run by BEE on social media:

- #CoolSmarter, #SavePower
- #Ecooking
- #Swachchta Campaign
- #VigilanceAwareness
- #GoElectric, #GoGreen
- #ChooseLiFE, #MissionLiFE
- #NECA2024
- #NationalPaintingCompetition2024

D. Campaigns

(i) Swachhta Pakhwada 16th - 31st May, 2024): A Step Towards a Cleaner Future

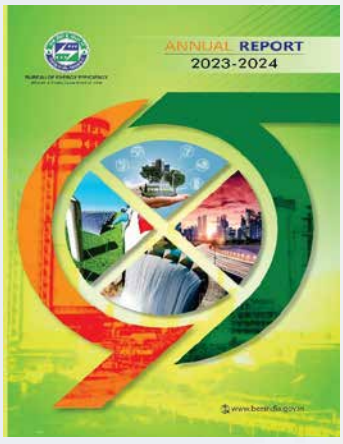
In alignment with the nationwide cleanliness campaign, the Bureau of Energy Efficiency (BEE) actively observed Swachhta Pakhwada from 16th - 31st May,2024, reinforcing its commitment to a cleaner and healthier environment and emphasized the importance of cleanliness in our surroundings and workplaces. Banners and standees highlighted the campaign's theme were prominently displayed at the Bureau's office premises to create greater awareness and inspire action among employees and visitors.

Swachhta Pakhwada 2024 campaign activities were posted on social media including BEE's cleanliness drive at office premises and informational content about cleanliness, to spread the message of Swachhta and encouraged active community participation, fostering a collective effort towards maintaining cleanliness by distributing dustbins at Rajkiya Sarvodaya Vidyalaya, Sector 6, and Jose Marti Sarvodaya Vidyalaya, Sector 12, R.K. Puram, New Delhi, on 29th May 2024.

(ii) Swachh Bharat Diwas (Swachhta Hi Seva Campaign 17th September – 2nd October, 2024)

The Bureau of Energy Efficiency actively participated in the Swachhta Hi Seva Campaign. The campaign was celebrated with a robust social media initiative, aimed at spreading awareness about the importance of cleanliness and sustainable practices. Engaging posts, impactful visuals, and community-oriented messages were shared across platforms, inspiring citizens to adopt clean and green lifestyles. The campaign highlighted the interconnectedness of energy efficiency and cleanliness, promoting the vision of a sustainable and prosperous India.

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.



Annual Report (2023-24)

22nd issue of BEE Line Newsletter

Bachat Ke Sitare-an in-house Operation Hindi magazine

Guidelines for Installation and Operation of Electric Vehicle Charging Infrastructure

CHAPTER 11

FACILITATING ELECTRIC MOBILITY

Ministry of Power launched a nationwide "Go Electric" Campaign on 19th February 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 205 nos. of webinars, 119 nos. of EV roadshows / EV Rally and 179 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 31st December 2024.

Electric mobility will not take off unless Public EV charging stations are put up in adequate numbers. In order to facilitate setting up of charging infrastructure, Ministry of Power issued "Guidelines for Installation and Operation of Electric Vehicle Charging Infrastructure-2024" on 17th September 2024.

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)	• 27 State Governments have nominated SNAs for their respective States. • 28 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 2028. • The cost of supply by DISCOM to a public charging station will be 0.7 times of Average Cost of Supply (ACoS) during solar hours and 1.3 times during non-solar hours. Solar hours mean 9 AM to 4 PM and non-solar hours mean the remaining period of the day. • Each EV charging station must have separate metering arrangements to accurately record consumption and apply the appropriate tariff. • Distribution Licensee may provide sub metering for EV charger, behind-the-meter of an existing HT connection
Service Charges to EV Owners	• Specifies 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 made by it in setting up the PCS. The guidelines specify a ceiling of Rs 3.0 per unit and Rs 4.0 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 11.0 per unit and Rs 13.0 per unit of electricity used for DC Fast charging of EVs at PCS during the solar and non-solar hours respectively.
Charging Station Network	• Prescribe at least one Charging Station should be available in a grid of 1 km X 1 km in the Urban areas and at every 20 km on Highway/Expressways/Roads. • For long-range EVs and heavy-duty vehicles like buses and trucks, a fast-charging station will be located every 100 km on each side of the designated expressways, highways and major roads • Owners can use their existing electricity connection to charge their EVs at home.
Low Tension (LT) connection	• Specify appropriate Electricity Regulatory Commission to pre-specify connection charges up to 150 kW as per rule 4 (13) of Electricity (Rights of Consumers) Rules, 2020 as amended from time to time. Distribution Licensee must provide Low Tension (LT) connection up to 150 kW for charging stations provided, application for a separate LT electricity connection is made for EV charging station.
Land at concessional rates for installation of PCS	• Encourage Government/Public entities to offer land for installation of PCS at a subsidized rate to Government/Public entity. This will be a revenue-sharing model where the land-owning agency receives Re. 1 per kWh of electricity used for charging at the station, to be paid quarterly. • The Revenue Sharing Model may also be adopted by the public Landowning agency for providing the land to a private entity for installation of Public Charging Stations on bidding basis with floor price of Re. 1 per kWh

Issue	Provisions in Guidelines and Standards
Open Access	• Owner of the Public Charging Station/ E-Bus depots may also choose to obtain electricity through open access within 15 days of submission of a complete application by paying a surcharge (not exceeding 20% of the tariff applicable to the category of the consumers seeking open access as per Tariff Policy 2016), transmission charges and wheeling charges.
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	• The Bureau of Energy Efficiency (BEE) to create National online database of all public charging stations across India. • BEE, in collaboration with State Nodal Agencies (SNAs), will maintain a database of public charging stations nationwide. • This portal is available at evyatra.beeindia.gov.in/. There are 25,202 PCS mapped on EV Yatra portal on 31.12.2024.
Renewable energy based Public Charging stations	• The cost of supply by DISCOM to a public charging station (PCS) will be 0.7 times of Average Cost of Supply (ACoS) during solar hours and 1.3 times during non-solar hours. Solar hours mean 9 AM to 4 PM and non-solar hours mean the remaining period of the day. • Solar carport is a dual purpose, stand-alone structure that provides shelter for vehicles, whilst generating clean, renewable energy from the sun for use on-site including electric vehicle charging
Fast Charging for Long-Range and Heavy-Duty EVs	• A fast-charging station with at least two EV chargers having minimum capacity of 240 kW each for Long-range EVs and Heavy-Duty Vehicles like buses and trucks, is to be located at every 100 km on each side of the designated expressways, highways and major roads. These stations will be situated within or near existing public charging stations.
Charging at Office/ Commercial buildings/ Residence	• Building/Office owner can request for a separate metered connection from Distribution Licensee with a dedicated EV charging tariff. • Building/Office owner may use their existing electricity connections to charge EVs at the workplace/homes. • Domestic electricity rates will apply to charging EVs at home. • Wherever EV charging station requires more power than the current sanctioned load, the Building/ Office owner will apply to the distribution licensee for seeking increase in the sanction load.
Community Charging for Residents	• Resident Welfare Association, Group Housing Society, an owner of a flat, house in an Association, any other consumer within a GHS, can request for a separate metered connection from Distribution Licensee with a dedicated EV charging tariff. • Residents can install private Charging stations in their designated parking spaces. • GHS will apply to the distribution licensee for seeking increase in the sanctioned load for community EV charging stations

These guidelines were complemented by additional provisions for battery swapping as an alternative method of powering electric vehicles. The Ministry of Power issued comprehensive guidelines for Installation and Operation of Battery Swapping and Charging Stations, with key objectives of promoting battery swapping as an alternate powering method, developing "Battery as a Service" business model, and establishing a robust battery swapping ecosystem.

The guidelines introduce the concept of Battery to Grid (B2G), a system where swappable batteries from electric vehicles (EVs) or Battery Swapping Stations (BSS) can not only store energy for use but also supply electricity back to the power grid when needed. The battery swapping ecosystem encompasses a network of infrastructure and services enabling quick and efficient exchange of swappable EV batteries. This comprehensive approach ensures multiple options for EV users, combining both traditional charging infrastructure and innovative battery swapping solutions to accelerate the adoption of electric mobility in the country.

CHAPTER 12

INTERNATIONAL COOPERATION

The International Cooperation (IC) Division works towards enhancing cooperation with various countries in the Power Sector. In the last one year, active progress has been made for strengthening bilateral cooperation with Bangladesh, Bhutan, Nepal, Sri Lanka, Myanmar, Australia, Denmark, Germany, Japan, UAE, UK, USA and Saudi Arabia. Multilateral engagements under the umbrellas of G20, BRICS, Clean Energy Ministerial (CEM) and International Energy Agency (IEA) 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 four years are as under:

	Import (MU) by India				Export (MU) by India			
Year	Bhutan	Bangladesh	Nepal	Myanmar	Bhutan	Bangladesh	Nepal	Myanmar
2023-24	5730	0	1725	0	1868	8394	1850	8.78
2022-23	7253	0	1385	0	522	8581	1552	9.80
2021-22	7995	0	179	0	322	7327	2127	8.81
2020-21	9381	0	5	0	219	7555	1870	9.24

Planning of Transmission System is a continuous process of identification of transmission system addition requirements and their timing. In this regard, the National Electricity Plan (Transmission) covering the detailed transmission plan for the period from 2023-32 has been prepared by CEA and same was launched by the Hon'ble Minster of Power on 14th October 2024. The Plan covers enhancing cross border interconnections with Nepal, Bhutan, Myanmar, Bangladesh, Sri Lanka as well as probable interconnections with Saudi Arabia, UAE etc. In the field of electricity Interconnection, the country wise details are summarized 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 12 GW are at various stages of planning in Nepal with Indian Co-operation viz. Pancheshwar Multipurpose Project (5040 MW) Lower Arun HEP,(669MW),Sapta Kosi Multipurpose Project (3300MW),Arun-4HEP (490MW), West Seti HEP (750MW), Seti River-6HEP (450MW),Phukot Karnali Project(480MW) and Upper Karnali HEP (900 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 last meeting of the JWG and JSC was held on 3rd January and 5th January, 2024 in Nepal.

1. India and Nepal signed a long term agreement on 04.01.2024 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.
2. Power is being exported to Nepal through 11 kV, 33 kV, 132 kV voltage level transmission lines and Dhalkebar (Nepal) – Muzaffarpur (India) 400 kV D/C line. Under Mahakali Treaty, 70 MU of energy per annum is being supplied to Nepal, free of cost, from Tanakpur Hydro Electric Project. Earlier, most of the power was supplied through bilateral contracts. However, w.e.f. 18th April 2021, Nepal is also buying power from Indian Power Exchange(s) in Day Ahead Market. Nepal is also exporting power to India w.e.f 3rd November, 2021 through power exchange(s).
3. In order to facilitate reliable transfer of power between the two countries a second high capacity 400 kV Gorakhpur (India) – New Butwal (Nepal) D/c (Quad) line is under implementation. For evacuating power from Arun-3 (900MW) HEP in Nepal and other hydro projects in vicinity in future, Arun-3 HEP (Nepal) – Dhalkebar (Nepal) – Sitamarhi (India) 400 kV D/c (Quad) line is also under implementation.
4. Dododhara (Nepal) - Bareilly (New) (India) 400 kV (Quad) D/c line and Inaruwa (Nepal) - Purnea (New) (India) 400 kV D/c (Quad) line were also agreed for implementation. Further, 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.
5. National Vidyut Vyapar Nigam (NVVN), the nodal agency for cross-border power trading, facilitates power import/

export with Nepal bilaterally and via power exchanges. Nepal began buying power from the exchange in April 2021 and selling in November 2021. NVVN and Nepal Electricity Authority (NEA) have a Settlement Nodal Agency agreement (signed October 5, 2020). Through December 2024, NVVN traded 673 MUs bilaterally and 2052 MUs (provisional) via power exchange for Nepal.

INDIA – BHUTAN

An agreement for 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.

2. India and Bhutan already have existing arrangements mainly for import of about 4290 MW power from Tala HEP (1020 MW), Chukha HEP (336 MW), Kurichu HEP (60 MW), Mangdhechu HEP (720 MW) and upcoming Punatsangchu-I (1200 MW) and Punatsangchu-II (1020 MW) in Bhutan to India through various EHV lines upto 400 kV level.

   Power from these HEPs in Bhutan along with other hydro project in Sikkim and NER can be transferred to other parts of India through high capacity multi terminal ±800 kV,6000 MW Biswanath Chariali– Alipurduar – Agra HVDC bipole line. Approvals have also been granted for import of power from non-IG HEPs in Bhutan (Basochhu HEP & Nikachhu HEP) through Indian power exchanges(s). Bhutan is also importing power from India through Power Exchange(s) in winter months. Deviation Settlement Mechanism (DSM) between India and Bhutan have been implemented w.e.f. 01.05.2024.

3. 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.

Two (2) projects are presently under construction:

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

4. 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	311
Mangdechhu	720	489.5	
Dagachu	126	JV of Tata & Bhutan. Power being sold through trader.	
Total	**2262MW**	**1636.5 MW**	**311 MW**

The total hydro power projects expected to be commissioned in Bhutan by 2025, 2030 and 2040 conditions are 10000MW, 14000MW and 23500MW respectively. The corresponding demand of Bhutan is expected to be about 800MW, 1400MW and 3000MW respectively.

5. 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**	

6. 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.

7. NVVN signed an agreement with DGPC, Bhutan, on December 13, 2022, to act as the Settlement Nodal Agency (SNA) for grid operation charges and power trading from the Punatsangchhu-II HEP (1020 MW).

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 22nd meeting of the JWG/JSC was held on 19th and 20th July, 2024 at Udaipur India.

1. A high capacity interconnection between India & Bangladesh exist through Baharampur (India) – Bheramara (Bangladesh) 2x400 kV D/c line along with 2x500 MW HVDC back-to-back terminal at Bheramara, which facilitates transfer of power of the order of 1000 MW to Bangladesh. Additional radial interconnection from Surajmaninagar in Tripura (India) to Comilla in Bangladesh has been implemented for 160 MW power transfer to Bangladesh. Thus, total power transfer capacity between the two countries is about 1160 MW.

2. For synchronous interconnection and additional power transfer between the two countries, Katihar (India) – Parbotipur (Bangladesh) – Bornagar (India) 765 kV D/c line has been agreed for implementation. In the 22nd

meeting of JWG/JSC held on 19th -20th July 2024, it was agreed that Indian and Bangladesh portion of the Katihar - Parbotipur - Bornagar link can be implemented by the entities of the respective country with targeted completion by 2028. Joint Committee (JC) to finalise the modalities for determination of the transmission charges of the project and its recovery.

3. Bangladesh India Friendship Power Company Limited (BIFPCL), (a 50:50 Joint Venture company of NTPC and Bangladesh Power Development Board (BPDB), Bangladesh), was formed to undertake the development, implementation, operation and maintenance of project in Bangladesh on a build, own and operate basis. BIFPCL has set up Maitree Super Thermal Power Project (2X660 MW),a coal-based power project at Khulna, Bangladesh. The project was jointly inaugurated by Prime Ministers of both the countries on 1st November 2023.Both units of the plant have now been 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. The project has been financed by EXIM bank of India.

4. The Godda Thermal Power Plant, developed by Adani Power (Jharkhand) Limited, is a landmark project in India's growing role as a regional energy supplier. This 1,600 MW (2x800 MW) Ultra-supercritical power plant, located in Godda district of Jharkhand, is the first thermal power project in India dedicated exclusively to cross-border electricity supply. The project supplies its entire electricity to Bangladesh under a long-term Power Purchase Agreement executed on 5th November 2017. Through this project, India has established itself as a dependable energy supplier for South Asia.

5. NTPC's subsidiary, NVVN, has a 25-year agreement to supply 250 MW to Bangladesh's BPDB since 2013. NVVN also has agreements to supply up to 192 MW via the Tripura-Cumilla link, extended until March 2026.

6. In 2018, NVVN secured a 15-year contract to supply 300 MW of continuous power to BPDB, starting in September 2018. A formal settlement agreement is pending.

7. NVVN is India's designated agency for cross-border power trading and settlement with neighboring countries (Bangladesh, Bhutan, Nepal, Myanmar). A trilateral agreement was signed in October 2024 for Nepal to supply 40 MW to Bangladesh via NVVN.

8. NVVN provisionally supplied 3672 MUs of power to Bangladesh up to December 31, 2024, in the current financial year.

INDIA – SRI LANKA

1. 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. Detailed Project Report (DPR) for the India- Sri Lanka Grid Interconnection, i.e, between New Madurai (India) and Mannar (Sri Lanka) 1000 MW VSC HVDC Bipole line, has been agreed and implementation modalities are under discussion.

2. Trincomalee Power Company Limited (TPCL), a 50:50 joint venture between NTPC Ltd and Ceylon Electricity Board (CEB), is developing a 50 MW solar PV power project in Sampur, Sri Lanka, with potential expansion to 120 MW. TPCL obtained environmental clearance in June 2023 and an on-grid renewable energy permit in July 2023 for the initial 50 MW phase.

3. Joint Venture and Shareholders' agreements were signed on 11.03.2022, and initial equity infused in TPCL. Feasibility Report of the Project was jointly finalized with CEB and PPA signing is envisaged soon.

INDIA – MYANMAR

1. 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.

2. About 3 MW power is being supplied to Tamu (Myanmar) from Moreh (Manipur) through 11 kV line between the two countries.

3. India – Myanmar high capacity interconnection through Imphal - Tamu 400kV D/C cross-border interconnection between India and Myanmar with 500 MW HVDC back-to-back terminal at Tamu for drawl of power by Myanmar has been agreed and implementation modalities are under discussion.

4. The 6th JWG and 5th JSC was held on 5th September 2024 and 6th September 2024 at Naypyidaw, Mayanmar.

COOPERATION WITH OTHER COUNTRIES

AUSTRALIA

1. 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, 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

1. 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 India on 9th - 10th December 2024. Discussions of progress and future activities as well as extension of the existing MoU under the Indo-Danish Partnership Programme were held during the meeting.

4. An MoU between Ministry of Power and the Danish Ministry of Climate, Energy and Utilities has been further extended for a further period of 5 years from 2025 - 2029.

GERMANY

1. 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 and grid infrastructure; technical cooperation on energy efficiency in industry; and promotion of innovations leading to an integrated energy transition.

JAPAN

1. 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), M/o 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. 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.

5. Recently, the India-Japan Joint Working Group meeting on electricity and energy conservation was held through VC mode on 30.01.2025.

United Arab Emirates (UAE)

1. 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. An MoU was signed on 13th February, 2024. A high level meeting between Secretary (Power) and H.E. Eng. Sharif Alolama, Under Secretary for Energy and Petroleum Affairs, UAE was held on 26.03.2024 wherein it was decided to constitute a Joint Technical Team (JTT) on Electrical inter-connections. The JTT has been established and the 1st meeting of the JTT was held on 11th June, 2024.

UNITED KINGDOM

1. 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). The Cooperation between India and UK in Power Sector is carried on through two programs – Power Sector Reforms and ASPIRE (Accelerating Smart Power & Renewable Energy).

3. The last meeting of the JWG on Power, co-chaired by Sh.Akash Tripathi, Additional Secretary(IC), Ministry of Power, Govt. of India; and by Ms.Marina Skrinar, International Net Zero, Energy & Trade, Department of Energy Security and Net Zero, Govt. of UK, was held on 31st January 2025 in hybrid mode. The JWG took an overview of achievements in the power sector since last JWG and agreed on continued support and expanding the cooperation in the areas of power distribution, sector reforms, industrial energy efficiency and de-carbonization, and electric mobility while exploring new opportunities in the emerging fields such as energy storage, green data centers, and offshore wind and renewable energy.

4. The Fourth India-UK Energy Dialogue held was held on 10th February 2025 in New Delhi. The Dialogue was co-chaired by Shri Manohar Lal, Hon'ble Minister of Power and Housing and Urban Affairs and Rt. Hon Ed Miliband, Secretary for Energy Security and Net Zero for United Kingdom. The Ministers were pleased to announce the launch of Phase-2 of the India-UK bilateral Accelerating Smart Power & Renewable Energy in India (ASPIRE) programme. To support this, they announced the continuation of the Power Sector Reforms programme under the UK Partnering for Accelerating Climate Change (UKPACT). Additionally, a new taskforce has been proposed between the UK's Office of Gas and Electricity Markets (OFGEM) and India's Central Electricity Regulatory Commission (CERC) to support renewable energy integration and grid transformation in India. Ministers also recognize further collaboration on global energy initiatives such as GGI-OSOWOG, ISA and the Hydrogen Breakthrough.

5. The Power Sector Reform (PSR) programme supports CEA and CERC in catalyzing policy, regulatory and market reforms and is coordinated by 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. Under the ASPIRE programme, collaboration on areas such as smart meters, electricity distribution reforms, industrial energy efficiency and decarbonisation, electric mobility are being carried out. The programme mainly focuses on the following themes:

- Theme 1: Electricity distribution sector.
- Theme 2: Industrial energy efficiency and decarbonisation
- Theme 3: Electric Mobility

UNITED STATES OF AMERICA

1. 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. One of the outcomes of the joint statement issued during Hon'ble Prime Minister's visit to the US in June 2023 was to advance cooperation in the area of energy storage. To that effect, an "Energy Storage Task Force" (ESTF) has been established under the Power and Energy Efficiency Pillar of the strategic partnership with an aim to facilitate the 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.

4. The last meeting of the US-India Strategic Clean Energy Partnership was held in US in September 2024 wherein areas like energy storage, grid resilience and strengthening of market monitoring and surveillance capabilities, super energy-efficient cooling and advancing on next gen super-efficient ACs, deployment of electric vehicle charging infrastructure, promoting emerging technologies such as CCUS and hydrogen for industrial decarbonization, etc were proposed to be explored for future collaboration. The Ministers welcomed the launch of ESTF and reiterated their commitment on advancing cooperation in the area of energy storage.

5. A new initiative to accelerate the expansion of safe and secure clean energy supply chains through U.S. and Indian manufacturing of clean energy technologies and components has been announced during Hon'ble PM's visit to the US in September 2024. $1 billion of multilateral financing is proposed to be unlocked to support projects across the clean energy value chain for renewable energy, energy storage, power grid and transmission technologies, high efficiency cooling systems, zero emission vehicles, and other emerging clean technologies.

Saudi Arabia

1. 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, a 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:

i. 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.

ii. Formulating a timetable for implementation in stages, in accordance with the outcomes of the study.

iii. Collaborating with organizations/ companies that are specialized in the field of electrical interconnection and Green/ Clean hydrogen.

iv. 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.

v. Establishing secure, reliable and resilient supply chains of materials used in green/ clean hydrogen and the renewable energy sector.

vi. 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.

4. Four meetings of the Joint Technical Team (JTT) for electrical interconnections and one meeting each of JTT on Green/ Clean Hydrogen and JTT Supply Chains have been held so far.

MULTILATERAL COOPERATION:

BRICS

1. The 9th BRICS Energy Ministers' Meeting chaired by Russia on September 26, 2024, emphasized universal access to affordable, reliable, sustainable energy (SDG7). India's delegation, led by Sh. Shripad Yesso Naik, along with senior officials of Ministry of New and Renewable Energy, CEA and BEE, participated virtually. The Ministers stressed the need for secure, predictable energy supply and demand to support planning, investments, and sustainable growth. They acknowledged the global energy transition slowdown due to financial and technological challenges, calling for collaboration among governments, the private sector, and financial institutions to achieve a fair transition aligned with common but differentiated responsibilities and respective capabilities (CBDR-RC) principles.

2. Ministers also highlighted the importance of efficient use of all energy sources and technologies, including but not limited to renewable energy, biofuels, hydropower, fossil fuels, carbon abatement and removal technologies, nuclear power and hydrogen produced from zero or low emission technologies in fostering a just and inclusive energy transition. Skill development and a work stream within BRICS ERCP were encouraged to support this goal. The Ministers reiterated the importance of BRICS dialogue in advancing member interests and addressing global energy challenges.

G20

1. Under Brazil's G20 Presidency in 2024, with India as a member of the troika, the Ministry of Power, supported by the Ministries of New and Renewable Energy, Petroleum and Natural Gas, Environment, Forest and Climate Change, and other organizations, led negotiations for the Energy Transitions Working Group (ETWG) under the Sherpa Track. Seven ETWG meetings were held, culminating in the Energy Transitions Ministerial Meeting (ETMM) on October 4, 2024. The Indian delegation was led by Sh. Pankaj Agarwal, Secretary, Ministry of Power.

2. India successfully advanced the G20 New Delhi Leaders Declaration (NDLD) outcomes, advocating for global efforts to triple renewable energy capacity and double the annual rate of energy efficiency improvements by 2030. It also emphasized scaling up energy storage technologies like batteries and pump storage hydro. India supported Brazil's endorsement of the "G20 Principles for Just and Inclusive Energy Transitions," emphasizing timely resource mobilization and affordable financing for developing countries.

3. The G20 Energy Ministers underscored the importance of maintaining uninterrupted energy flows from diverse sources, suppliers, and routes to ensure energy security and market stability. They highlighted the role of critical minerals and raw materials in energy transitions and called for reliable, diversified, sustainable, and responsible supply chains. India welcomed Brazil's proposal to establish the Global Coalition for Energy Planning (GCEP) and encouraged South Africa to build on this initiative during its 2025 Presidency.

CLEAN ENERGY MINISTERIAL (CEM)

1. 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 member 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.

2. The Clean Energy Ministerial (CEM) work program is organized into six cross-cutting themes across the clean energy spectrum: Power, Transport, Industry, Buildings, Cross-Sectoral, and Enabling Environment, encompassing 24 work streams. India, a founding member of the CEM, hosted the Ministerial meeting in 2013. India's participation in the CEM has been significant, with membership in 13 out of the 24 work streams and co-leadership in 7 initiatives.

3. The Indian delegation led by Shri Pankaj Agarwal, Secretary, Ministry of Power participated in the CEM 15/ MI-9 Ministerial held in Foz do Lguacu, Brazil from 30

Sept - 04 Oct, 2024. The major announcements made by India during the meeting are mentioned below:

- Endorsement of a Joint Ministerial Statement, reaffirming India's commitment to work collaboratively through CEM for advancing the clean energy goals.
- Joining two new work streams that were launched during the Ministerial:

i. European Commission's Proposal on Sustainable Lifestyles and Clean Energy Access.

ii. United States' proposal on the "Gt by 2030" Campaign: A Unified Effort to Scale up Carbon Management Solutions.

- Continuation of its voluntary contribution to the CEM Secretariat for Phase IV (July 2025-June 2028) of EUR 3,00,000 i.e EUR 1,00,000 per year.

International Energy Agency

1. 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 with Secretary, Power and Secretary, PNG as co-chairs has been constituted to discuss the future steps for India's membership to IEA.

BIMSTEC

1. 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.
2. The Govt. of India has two MoU's/ MoA with the BIMSTEC Member Countries :
   - Memorandum of Association (MoA) for establishing the BIMSTEC Energy Centre signed in 2011.
   - MoU on Establishment of BIMSTEC Grid Interconnection signed during 4th BIMSTEC Summit held in Kathamandu in 2018.
3. 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 to discuss the following agendas - BIMSTEC Master Study Plan, BIMSTEC Policy for Trade, Exchange of Electricity and Tariff Mechanism, BIMSTEC Policy for Transmission of Electricity, Rules of Procedure for BIMSTEC Energy Centre (BEC).
4. The signing of Host Country Agreement between India and the BIMSTEC Secretariat for establishing the BIMSTEC Energy Centre (BEC) on 8th November 2024 marks a significant achievement for advancing the energy cooperation in the region in the areas of trade, transmission, interconnections and tariffs.

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 ₹5111.33 crore with estimated completion time of December 2018. The cost was subsequently revised to ₹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), ₹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 ₹4754.42 crore with estimated completion time of December 2018. The cost has been subsequently revised to ₹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), ₹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 ₹ 6285.33 crore with the scheduled commissioning of the project in September, 2010. The design energy is 7421.59 GWh. The anticipated cost of the project is ₹ 21248 crore 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 94.5% overall physical progress achieved till 31.12.2024.

05 Units of Subansiri Lower Project are planned to be commissioned during 2025-26 and balance 3 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 ₹ 3283.08 Crore. 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 ₹ 5748.04 crore (Jul'18 PL), which includes Bid amount of ₹ 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 64.71% overall physical progress achieved till 31.12.2024. The project is likely to be commissioned by 2027-28.

(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 ₹ 726.16 Crore with the design energy is 513 GWh. The revised cost of the project as vetted by CEA is ₹ 943.20.60 crore 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 82.5% overall physical progress achieved till 31.12.2024.

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 82.5% overall physical progress achieved till 31.12.2024.

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 projects 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 crore, 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 Crore 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 crore 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 240 MW each.

About 13.75% overall physical progress achieved till 31.12.2024.

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 ₹ 1115.91 crore with the schedule commissioning in 2023-24. The revised cost of the project is ₹ 1847.07 crore with likely commissioning in 2025-26 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 31.12.2024 about 84.7% physical progress achieved. The project is likely to be commissioned by 2025-26.

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 ₹ 408.50 Crore with the scheduled commissioning of the project in June, 2012. The design energy is 244.10 GWh. The revised cost of the project is ₹ 746.01 crore 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 ₹ 496.44 Crore with the scheduled 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 ₹ 1833.05 Crore with the scheduled commissioning of the project in July, 2015. The design energy is 1147.82 GWh. The revised cost of the project is ₹ 2615.00 crore 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. Presently, all construction works are held up due to non-accessibility to the project site. The permanent bridge over Mantam Lake for accessibility to Dam site is being constructed by Roads and Bridges Department Govt. of Sikkim which is likely to be completed by 2026. The Financial Institutes are awaiting for completion of bridge, thereafter the process of financing the project can start.

The project is likely to be commissioned 5 years after restart of works.

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

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 PLANNING BY NEEPCO:

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. 2 HE Projects namely Heo & Tato-I have been accorded investment approval.

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, on 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 May '26 and as on 31.12.2024, 94.5% of Physical work is completed. 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.	STATE	PROJECT	ANNUAL DESIGN ENERGY (MU)	REMARKS
1	Sikkim	Teesta-IV	520	FC (St-II) is pending for want of Compliance under FRA 2006.
2	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. DPR is currently under appraisal in CEA.

S. No.	STATE	PROJECT	ANNUAL DESIGN ENERGY (MU)	REMARKS
3	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 currently under appraisal in CEA.
4	Arunachal Pradesh	Upper Siang	10000	MoJS entrusted NHPC for preparation of PFR and DPR of Upper Siang Multipurpose Storage Project. Accordingly, S&I works are being undertaken by NHPC.
Total			**13845**	

PROSPECTIVE PROJECTS TO BE TAKEN OVER BY NHPC

S. No.	STATE	PROJECT	INSTALLED CAPACITY (MW)*	REMARKS
1.	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.
TOTAL			16025	

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

THDC India Limited has entered into a Memorandum of Agreement (MoA) with Government of Arunachal Pradesh on 30 December 2023 to jointly develop the 1200 MW Kalai-II Hydroelectric Project situated in the Lohit River basin.

The Project is currently undergoing Pre-Construction activities including land acquisition activities. Process of Environmental Clearance (EC) and Forest Clearance (FC) are in progress. A Social Impact Assessment (SIA) study has been initiated as part of the land acquisition process.

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 December 2024, the Government of India holds 51.10% equity.

To align with the organization's evolving priorities and strategic objectives, NTPC has recently revised its Mission and Vision Statement. The new statements are:

VISION

'To be the World's Leading Power Company, accelerating India's growth and energy transition.'

MISSION

'Provide Reliable Power and energy transition Solutions in an Economical, Efficient and Environment friendly manner, driven by Innovation and Agility'.

New Core Values of NTPC are as below:

- Integrity,
- Customer Focus & Agility
- Organizational Pride,
- Mutual Respect and Trust,
- Innovation and learning
- 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 372nd globally and 10th largest Indian company in the Forbes Global 2000 List for 2024. NTPC has also been ranked 14th in the Fortune India 500 Companies (2024).

2. OPERATIONAL PERFORMANCE HIGHLIGHTS

2.1 Generation details of NTPC standalone and NTPC group for the Calendar Year 2024 are as below.

Parameter		1.01.2024 - 31.03.2024	1.01.2024 - 31.12.2024
Gen (BUs)	NTPC	93.39	370.98
	NTPC Group	107.48	434.33
PLF % (Coal)	NTPC	79.77	77.08
	NTPC Group	78.15	76.12

2.2 As on 31st Dec 2024, the installed capacity of NTPC group is 76,598 MW (including 17,430 MW under JVs & Subsidiaries which also includes 1320 MW in Bangladesh). Details of NTPC's installed capacity are placed at Annexure-I.

Total capacity of 2304 MW was added during the period Jan '2024 to Mar '2024. Additionally 640 MW (NTPC 90MW & NGEL+NREL 550MW) of Solar capacity has been commissioned in the current fiscal year till Dec 2024 and is under commercial operation.

During FY24-25, NTPC group achieved the fastest ever 300 BUs generation in a year in 252 days.

3. COMMERCIAL PERFORMANCE

3.1. Billing and Realization: NTPC has realized 100% of revenue against energy bills raised during FY25, till 31st December 2024. As part of the payment security mechanism, Letter of Credit (LC) for the amount equal to 105% of the average monthly billing is being maintained by most of the beneficiaries.

3.2. Customer Relationship Management: CRM is one of the key initiatives undertaken to strengthen the relationship with customers. Under CRM, regular structured interactions with customers take place for getting feedbacks from the customers and understanding their expectations. NTPC offers training programs to the representatives of beneficiary companies by conducting dedicated workshops for DISCOM officials. NTPC also offers training programs for DISCOM officials through Power Management Institute (PMI) of NTPC.

3.3. Participation in Power Market: NTPC has been offering un-requisitioned Surplus Power (URS) of beneficiaries for sale in power market as per (Late Payment Surcharge and Related Matters) Rules 2024 provisions. Details of Power sold during the calendar year is as below.

Parameter	1.01.2024-31.03.2024	1.01.2024-31.12.2024
Power Sold (BUs)	1.02	5.27

NTPC sold Power in the Power Exchange through sale of URS power, surrendered gas power, RE power in the Day Ahead Market (DAM & GDAM) and Real Time Market (RTM). The gains from this sale have been shared with the beneficiaries in line with provisions under the Tariff Policy/ CERC Regulation.

3.4. Security Constrained Economic Dispatch (SCED): NTPC stations are participating in the Security Constrained Economic Dispatch (SCED) mechanism, which was introduced on pilot basis by CERC in 2019. It has now been made part of IEGC 2023 for stations connected to ISTS, which are willing to participate.

4. FINANCIAL PERFORMANCE

NTPC has been maintaining sound financial performance and audit of accounts is being done on annual basis. As per the limited review of quarterly accounts by Audit, during April- September 2024, NTPC recorded a total income of INR 86,298 Cr (Rupees Eighty Six Thousand Two Hundred and Ninety Eight Crore) and Net Profit After Tax of INR 9,160 Cr (Rupees Nine Thousand One Hundred and Sixty Crore), as compared to total income of INR 81,199 Cr (Rupees Eighty One Thousand One Hundred and Ninety Nine Crore) and net Profit After Tax of INR 7,951 Cr (Rupees Seven Thousand Nine Hundred Fifty One Crore) during the period April-September 2023.

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 Roadmap to achieve 60 GW of renewable power capacity by 2032.

5.1. Capacity Addition Program: As on 31st Dec 2024, construction work is in progress for 30,162 MW capacity (including JVs and 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), Bangladesh), has set up a coal-based power plant of 1,320 MW (2x660 MW) capacity.

SRI LANKA

Trincomalee Power Company Limited (TPCL), (a 50:50 JV between NTPC Ltd and Ceylon Electricity Board (CEB), Sri Lanka) is developing a 50 MW (extendable to 120 MW) solar PV power project at Sampoor, Sri Lanka.

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. NGEL has been listed on BSE and NSE on 27.11.2024.

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 Dec 2024 is given below:

I. NTPC Group Projects:

a) NTPC Group has already commissioned 4171 MW of RE projects under EPC mode (NTPC: 503 MW, JV/Subsidiary: 3668 MW), and 5273 MW of Solar projects under Developer Mode.

b) NTPC has won 13302 MW RE projects, so far, under Competitive Bidding (TBCB).

c) In addition, 10.33 GW RE capacity is under implementation by NTPC Group while another 14.41 GW is under tendering.

II. Development of UMREPPs:

The largest Solar Park of 4.75 GW under Ultra Mega Renewable Energy Power Park (UMREPP) scheme has been sanctioned by MNRE to NTPC REL at Khavda, Gujarat, out of which, 3305 MW capacity is under execution, while 1445 MW capacity is under tendering. Another Solar Park of 630 MW capacity at Barethi is also under tendering.

III. Projects under Developer Mode:

a) 5273 MW under operation and 726 MW under implementation.

b) As per MNRE bidding trajectory target for NTPC as a Renewable Energy Implementing Agency (REIA) was 15 GW per year. In FY25 till Dec 2024, NTPC has issued tender with total capacity of 11200 MW under MNRE trajectory.

IV. Green Hydrogen Initiatives:

a) Green Hydrogen Mobility Project at Leh, Ladakh comprises 1.7 MW Solar capacity, 80 kg/Day hydrogen generation with dispenser unit and 5 FCEV buses was completed on 07.11.2024.

b) Green Hydrogen Mobility Project at Gr. Noida is under construction.

c) India's first Green H2-PNG blending project commissioned at NTPC Kawas on 02.01.2023; Subsequently, PNGRB allowed 8% v/v blending on 03.11.2023 after operation and testing.

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

Hon'ble Prime Minister Shri Narendra Modi laid the foundation stone for the state-of-the-art NTPC Green Energy Limited Green Hydrogen Hub Project at

Pudimadaka near Visakhapatnam on 8th Jan 2025.

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) NTPC Green Energy Ltd. (NGEL) has formed JV with Indian Oil under the name "Indian Oil 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.

c) NTPC REL has won 500 MW RE-RTC capacity, subsequently won another 200 MW RE-RTC in the tenders floated by REMCL.

5.5. Nuclear Power

Govt of India has approved ASHVINI (Joint venture of NPCIL and NTPC with equity participation of 51:49 respectively) to build, own and operate nuclear power project in India, and transfer of Mahi Banswara Rajasthan Atomic Power Project (4 X 700MW) from NPCIL to ASHVINI (JV of NPCIL & NTPC) on 13.09.2024.

Govt. of India has accorded approval for setting up of a wholly owned nuclear subsidiary company of NTPC on 11.09.2024. Subsidiary company NTPC Parmanu Urga Nigam Limited has been incorporated on 07.01.2025. NTPC is approaching different states for possible allocation of sites for assessment of feasibility to set up nuclear power plant with the support of Ministry of Power.

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, NTPC Group has undertaken development of nine coal blocks. NTPC has been allocated 6 coal blocks (Pakri-Barwadih, Chatti-Bariatu, Kerandari, Dulanga, Talaipalli, and Badam) by the Ministry of Coal. Further, two coal blocks have been allocated to NTPC's subsidiaries (PVUNL/Banhardih and THDC/Amelia).

Further, NTPC's mining subsidiary NML has won commercial coal block North Dhadu (Eastern Part) under competitive bidding.

Out of these nine coal Mines, six mines - Pakri-Barwadih, Dulanga, Talaipalli, Chatti-Bariatu, Kerandari and Amelia (THDC) - are under production and from Badam, coal production is expected to start from Jun '25. Other mines (Banhardih & North Dhadu (Eastern part) are under development. Details of coal production during the calendar year are as below.

Parameter	1.01.2024-31.03.2024	1.01.2024-31.12.2024
NTPC Group Coal Production (MMT)	9.84	43.26

During the current financial year NTPC, registered a growth of ~23% over the same period of 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. Business Transfer Agreement (BTA) was signed between NTPC & NML on 17.08.2023. Deed of Adherence signed between NTPC, NML & MoC on 27.09.2023. NML has received Amended Allotment orders for all coal mines from MoC in favor of NML. Transfer of Assets and Clearances from NTPC to NML are under progress.

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.

As on 31.12.2024, 114 Nos of Domestic Consultancy assignments with an award value of INR 1388 Crores are under various stages of execution. During the current calendar year (up to 31.12.2024), NTPC Consultancy has secured 32 (Thirty-Two) Nos of work/ job orders worth Rs. 179 Crores (Excluding Taxes).

Power trading

NTPC's 100% wholly owned subsidiary, NTPC Vidyut Vyapar Nigam Limited (NVVN), is involved in power trading. Details of the power traded during the calendar year are as follows.

Parameter	1.01.2024-31.03.2024	1.01.2024-31.12.2024
Power traded (BUs)	9.89	41.563

For the 31.673 BU (provisional) traded in the current financial year, till 31st Dec 2024, includes 4.05 BUs traded under solar & thermal bundled power, 8.19 BU under bilateral trade, 0.491 BU under Power Banking, 12.20 BU through Power Exchange and 6.397 BU traded under Cross Border Power Trading (including power transacted for NEA in Power exchange).

6. TECHNOLOGY INITIATIVES

Various technology initiatives have been taken by NTPC for:

a) **Demonstration of Methanol Firing in Kayamkulam Gas Turbine (GT):** Methanol firing in existing gas turbines can help in utilization of existing gas assets, contribute to a circular carbon economy, reduce emissions, and help in facilitating integration of RE into the grid. Feasibility study is completed for methanol firing in Kayamkulam GT and contract has been awarded for demonstration of methanol firing.

b) **20% torrefied biomass co-firing:** In a first of its kind initiative, NTPC has successfully demonstrated co-firing of 20% torrefied biomass at NTPC Tanda Unit#4. This may go a long way in decarbonizing existing coal fired fleet and achieving the Net Zero Emission targets.

c) **R&D works for Sea Water Electrolysis:** NTPC along with CSIR is undertaking studies for development of technologies for direct sea water electrolysis in existing AEM (Anion Exchange Membrane) Electrolyzer. After the experiments in CSIR Laboratory, demonstration in one of the modules of Pilot AEM hydrogen generation plant at NTPC Dadri is planned.

d) **Fuel Cell Exhaust Recovery System:** Hydrogen generation through electrolysis consumes a significant amount of water. For optimizing the water requirements in fuel cell based micro grids, collection of fuel cell exhaust, which is in the form of water vapor (and gases) has been demonstrated in Pilot Hydrogen generation plant installed by NTPC. This has been achieved using an air-cooled condenser specifically designed to manage such exhaust.

e) **Electrolyzer/fuel cell simulation models:** NTPC in collaboration with Schneider Electric has developed software/ simulation models for Pilot AEM Hydrogen generation plant. Further, works are being planned for validation of the developed software/simulation models with different experiments and extension of developed software for other Electrolyzer technologies. The software/ simulation model shall help in optimization of design/operational parameters & cost, and selection of suitable Electrolyzer technology for commercial hydrogen plants.

f) **Other Energy Transition Initiatives for which studies are being carried out include the following:**

- Proof of Concept for DG replacement with BESS
- Installation of Electric Crematorium using Solar PV and BESS
- Renovation and modernization of legacy control systems including HMI to improve the reliability, availability and strengthening of cyber security posture.

7. NTPC ENERGY TECHNOLOGY RESEARCH ALLIANCE (NETRA)

NETRA is a Department of Scientific and Industrial Research (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. NETRA filed 04 (four) patents and 07 (seven) Copyrights in the calendar year 2024. It works broadly in following two verticals, with a focus on applied research delivering "either process and/or product or plant for scientific solution" as the product, i.e., Technology Projects and Advance Scientific Services.

- **Technology Projects**

(i) **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.

a) 10 TPD Flue Gas CO2 to Methanol Plant at NTPC, Vindhyachal.

b) 10 TPD Flue Gas CO2 to Ethanol Plant (Gen-4) at NTPC, Pudimadaka.

c) 1800 TPA Flue Gas CO2 to SAF Plant at Pudimadaka.

d) 150 TPD Flue Gas CO2 to Green Urea Plant at NTPC Rihand

e) CO2 Storage assessment at NTPC Pakri Barwadih (Collaborative project with IITB).

(ii) **Green Hydrogen:** Presently, NETRA is working on following projects in this domain.

a) 1 TPD Plasma Oxy gasification-based Hydrogen Plant at NETRA.

b) 1 TPD Green Hydrogen generation from Sea Water at NTPC Simhadri.

(iii) Energy Storage: Presently, NETRA is working on following projects in this domain.

a) 3 MWhr /600 kW Vanadium Redox Flow Battery (VRFB) Storage at NETRA.

b) 160 MWHr / 20 MW CO2 based Closed Brayton Cycle Energy Storage System at Kudgi.

c) 140 TR Solar Thermal & TES based Space Conditioning System at NTPC Dadri Hospital.

(iv) Waste to Energy: NETRA is working on a 10 TPD Torrefied Biomass Pellet Production plant.

(v) Ash Technologies: NETRA is undertaking a Fly Ash based FALG Aggregate Plant at NTPC-Korba with capacity 30,000 M3/Yr.

(iv) 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 coverage of inaccessible/ unreachable zones/ space.
- Electrical Lab: In-situ Assessment of Generators, Transformers, Reactors & Switchyards
- Chemistry – Coal & Combustion Analysis, Corrosion Analysis, Resin Analysis, Dissolved Gas Analysis, Wear Debris & Lube Oil Analysis, Water Analysis and Formulation of COC (cycle of concentration) Chemicals for Water Management and Improvement in 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: Efficient and Sustained operation is need of hour to remain competitive which is further reinforced due to large-scale penetration of renewal power. 'Center for Power Efficiency and Environmental Protection' (CenPEEP), was set up to reduce Greenhouse Gas (GHG) emissions through efficiency improvement measures. CenPEEP is constantly working for improvement of efficiency and reliability through introduction of new technologies and practices. On-line performance monitoring tools on Digital Platform (PI vision/Advanced Data Analytics) are used for identifying the performance gaps and planning suitable improvement actions. Implementation of identified action plans during unit overhauls and opportunity shutdowns are closely monitored for its effectiveness. Performance Optimization at part loads due to flexibilization has been identified as a thrust area including optimization of number of running auxiliaries, sliding pressure operation, excess air optimization, combustion 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. A dedicated group CEETEM – Centre for Energy Efficient Technology & Energy Management, conducts regular Energy audits to identify potential improvement areas and implementation of actions.

- During Calendar Year 2024, Mandatory Energy Audits (MEA) have been conducted at 14 (fourteen). During Q4 FY25, MEAs have been planned at 04 more stations.
- In addition, energy audits at 30 (thirty) NTPC townships have been carried out.
- During Calendar Year 2024, water balance audit has been completed at 08 (eight) stations. During Q4 FY25, 3 more audits have been planned.

8.3. Environment Management:

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#12 & 13 (2X500 MW), Dadri Unit#5 & 6 (2X490 MW), Unchahar Unit#1 & 2 (2X210 MW) and Unit#6 (500 MW), Simhadri Unit#1 & 4 (2X500 MW), Khargone Unit#1 & 2 (2X660 MW), Jhajjar Unit#1 & 2 (2x500 MW), Solapur Unit#1 & 2 (2X660

MW), Lara Unit#1 (800MW), Telangana Unit#1 & 2 (2x800MW), Kudgi Unit#2 (800MW), Sipat Unit#3 (660 MW), Darlipalli Unit#1 & 2 (2X800MW), Meja Unit#1 & 2 (2X660 MW)and Tanda Unit#5 & 6 (2X660 MW), and Dry Sorbent Injection (DSI) in Dadri (4X210MW). Construction works of FGD at various stations and projects (~52 GW) are in progress and at some stations it is in advanced stages of completion.

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 planted more than 39 million trees since inception. 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 other for Municipal Solid Waste to Charcoal/Torrefaction Plant projects at various locations in India.

8.4. Corporate Social Responsibility (CSR)

With a view to have a better connect with stakeholders, NTPC 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 actively supporting healthcare development across India by aiding prominent institutions such as the National Cancer Institute in Nagpur, AIIMS Patna, AIIMS Bhubaneshwar, King George's Medical University in Lucknow, and King George Hospital in Visakhapatnam. Additionally, NTPC has extended its support to Chinmaya Mission Hospital and various district hospitals in Nagaland by facilitating infrastructure development and installing advanced medical equipment. As part of its commitment to enhancing medical services, NTPC has also provided ambulances in Uttarakhand and Bihar. Furthermore, NTPC has pledged to establish a Tele-Recording Room at AIIMS, New Delhi, underscoring its dedication to strengthening healthcare infrastructure nation wide.
- **Cancer Screening Program:** Collaboration with the Government of Bihar & Assam and Tata Memorial Cancer Hospital involves NTPC's support for a Cancer Screening Program in four districts of Bihar and one district of Assam.
- **Rehabilitation Centre:** NTPC has supported the establishment of the Integrated Muscular Dystrophy Rehabilitation Centre "Manav Mandir" in Solan, Himachal Pradesh.
- **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.
- Mobile Health Clinics & Health Camps 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.

Community Outreach:

- NTPC is addressing the concerning prevalence of Sickle Cell Disease within the Tribal and Scheduled Caste community in the village of Bargaon, Dindori District of Madhya Pradesh, through strategic initiatives aimed at improvement and intervention.
- NTPC has organized medical camps and providing eye care and awareness training via Self Help Groups in Paschim Medinipur and Hooghly districts, to support the health and well-being of disadvantaged communities.
- NTPC has committed to identify and Treat children with heart disease from underprivileged families in Dadri, UP through Child Heart Foundation.

- NTPC has committed to support to Vivekananda Medical Trust, Vishakhapatnam for Construction of Vivekananda Research Center in Visakhapatnam.
- NTPC has committed to support Akshaya Patra Foundation in setting up a centralized kitchen facility to provide mid-day meals to school children in government schools in Jammu and Samba.

Water & Sanitation

- NTPC has revived MSW Plant at Varanasi and is supporting solid waste management in thirteen villages of Haryana.
- 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 has committed to provide Menstrual Hygiene Management Workshops among rural girls and women of Jaipur for improved access to sanitation services, raising awareness on menstrual hygiene and related health issues, and promoting safe disposal of menstrual waste. NTPC has installed sanitary napkin vending machines at various locations along with Incinerators for the safe disposal of used napkins.
- NTPC has committed to provide Solid and Liquid Waste Management training and capacity building, bridging knowledge gaps, and incorporating local wisdom to achieve and sustain 100% defecation-free status in Rajasthan.
- NTPC has committed to establish solar crematorium using Scheffler disc technology in the vicinity of NTPC Faridabad to provide a greener alternative to traditional cremation methods, thereby reducing the carbon footprint and promoting the use of renewable energy sources.
- NTPC has taken initiatives of rejuvenation, restoration, revitalization, and cleaning of Ponds located in the vicinity of many of its Plants with an objective 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 532 girl students admitted to different NTPC Township Schools. In the year 2024, NTPC Foundation conducted GEM workshops at 42 NTPC business Units with participation of 2705 girls. 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 as a part of its Policy on Improving Learning Outcomes & Quality of Education for children studying in Government Schools of its project-affected villages has established Smart Classes and has taken many initiatives in various Government schools located in the vicinity of its Plants and Stations.

Community Infrastructure

- 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 infrastructure at Machilipatnam, A.P., Chaltlang, Mizoram, Samal Stadium, Odisha
- NTPC is supporting for the Rural Electrification in the District of Mandsaur, MP. NTPC has supported for the installation of LED based Solar Street Lights across India.
- NTPC is supporting Sustainable Irrigation Systems and Agriculture Improvement Program in Nandurbar, Maharashtra. providing financial support to Rambhau Mhalgi Prabodhini, Mumbai, for the installation of Solar Photovoltaic (PV) system.
- NTPC has committed to support for addressing challenges of land degradation, water scarcity, stagnant crop yield while strengthening environmental services and regenerating landscapes to transform smallholder agri-food systems in Peddapalli district, Telangana.

Supporting Sports

- NTPC provides support to Archery sport in India with an objective of scouting for talent in remote parts of India to showcase their talent and elevate India's reputation in the field of Archery. 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.

- From November 2018 to June 2024, the Indian archers have won 255 medals comprising of 110 Gold, 79 Silver and 66 Bronze medals in various international Archery tournaments. In 2024, Indian archers demonstrated remarkable success on the international stage, securing a total of 48 medals at across various prestigious tournaments like Asia Cup, Para Archery World Ranking Tournament and World Cup. Their success continued at the Paris Paralympics, where they won two (02) medals, including one (01) Gold and one (01) Bronze.
- NTPC has supported for conducting rural sports & tournaments for various Government School located near the vicinity of NTPC stations and projects.

Women Empowerment & Reducing inequalities.

- NTPC also provides various training courses to women from various villages located in its project vicinity. Some of the prominent activities are.
- Supporting the construction of Mata Hausabai Bandhu Athawale Old Age Home in Mevali Village, District Fatehpur, Uttar Pradesh.
- Support to Udyan Care at Jaipur, Rajasthan for the higher education and rehabilitation of orphan and abandoned girls.
- Training Programs and handholding support to establish Women entrepreneurial units at five strategically chosen NTPC locations.
- Commitment to contribute to GoI Lakhpati Didi scheme by grooming 5000 women farmers in Singrauli District, Madhya Pradesh.
- Support Shree Bajrang Foundation Sanstha in Jaipur to empower women through skill development for the garment industry and facilitate income generation by creating Self Help Groups.

Support for Physically Challenged Persons

NTPC takes up activities like inclusive education & vocational training benefitting PCPs all across NTPC locations.

- NTPC is supporting the National Institute for the Empowerment of Persons with Intellectual Disabilities by setting up various facilities.
- NTPC has committed for installation of Roof-Top Solar at Swami Vivekanand National Institute of Rehabilitation Training and Research (SVNIRTAR), Odisha.
- NTPC Foundation has established Disability Rehabilitation Centers (DRC) in collaboration with National Institute of Locomotor Disabilities (NILD) under Ministry of Social Justice and Empowerment GoI, at various NTPC stations benefitting physically challenged persons from adjoining villages with Surgical corrections, serving aids & appliances.

Skill Development

In line with GoI Directives, NTPC is committed to implement the Prime Minister Internship Program in its stations and projects. NTPC has supported the GoI "Skill India Mission" in collaboration with NSDC for various employment linked skill development programs for 30,000 rural youth including 8000 youth of J&K. NTPC makes youth entrepreneurial, enterprising, and employable by providing them with training in Electrical Repairing, Retail Sales, Mobile Repairing, Data Entry, Motor Rewinding, Welding, Car Driving including obtaining LMV driving license, Computer Training, Machine Operator and Plastic Processing, Machine Operator and Injection Molding etc.

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 Kedarnath town, Uttarakhand and its surrounding areas devastated during the natural calamity.

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

- NTPC has been conferred with the prestigious "Sport star Ace Award-2024" in the category "Best PSU for promotion of Sports" for contributing significantly to Archery Sports in the country.
- NTPC has been conferred with "Excellence in Corporate Social Responsibility" award at prestigious 18th CII-ITC Sustainability Awards organized on 19th of March,2024 at New Delhi.NTPC has been conferred with UN Women India WEPs Award in the category "Community Engagement and Partnerships" for its flagship initiative 'Girl Empowerment Mission 'on 29th November,2024.
- NTPC has been conferred with the prestigious GREEN WORLD AWARDS in CSR Category with Bronze Medal on 25th March 2024 at NOVA ODESSA, STATE of SAO PAOLO, BRAZIL.NTPC has been conferred with the CSR Award in the 12th National CSR Summit 2024 in the category "Swatch Bharat (Sanitation and Hygiene on 25th October 2024 at India International Centre, New Delhi.
- NTPC has been conferred with the prestigious 10th PSU Awards by Governance Now in the category "Corporate Social Responsibility Commitment (Overall)" on 22nd March 2024 at Delhi.

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. NTPC revised its R&R Policy to incorporate the R&R entitlements as per The RFCT LARR Act, 2013.

NTPC takes measures for R&R 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 is implemented in a time bound and on implementation, a Social Impact Evaluation (SIE) is conducted to know the efficacy of R&R Plan implementation. R&R Community Development activities are being implemented under the approved R&R Plans at the new Greenfield / Brownfield Thermal projects at Darlipali, Telangana, Lara, North-Karanpura, 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.

9. CORPORATE GOVERNANCE

As a responsible corporate entity, NTPC is dedicated to upholding strong corporate practices grounded in integrity, transparency, fairness, professionalism, and accountability. This commitment helps build trust among our stakeholders and sets the foundation for long-term success. NTPC strongly believes that effective corporate governance is essential for fostering and maintaining investor confidence. We are focused on achieving our performance objectives while upholding ethical standards and good governance. NTPC continuously works towards adopting emerging best practices in corporate governance, with the goal of achieving higher standards. We provide oversight and guidance to management in strategy execution, risk management, and the fulfillment of our defined goals and objectives. The company adheres to the highest recognized corporate governance standards and continuously benchmarks itself against these practices to meet stakeholder expectations. NTPC is compliant with the applicable provisions of the SEBI (Listing Obligations & Disclosure Requirements) Regulations, the Companies Act, 2013, and the Guidelines on Corporate Governance for Central Public Sector Enterprises issued by the Department of Public Enterprises, Ministry of Heavy Industries and Public Enterprises, Government of India, with the exception of the requirement concerning the specified number of Independent Directors (as the Independent Directors completed their designated tenure on 11.11.2024). NTPC is pursuing with Ministry of Power for appointment of requisite number of independent directors on the Board of NTPC Limited to comply with Regulation 17(1) of SEBI (LODR) Regulations, 2015.

10. SAFETY

Safety is a part of NTPC's core values. NTPC has comprehensive safety policy with commitment of striving for zero incident through a systematic approach. It is based on principle of:

- Ensuring identification of hazards
- Fulfilling capability building needs and ensuring right skill set
- Working with well thought procedures and rules
- Considering workplace safety as the over-riding criteria for taking decisions
- Taking accountability before putting people to work and
- Ensuring legal and other compliances.

NTPC safety policy is supported by a comprehensive Safety Framework and directives & guidance notes. Safety Framework of NTPC is a guidance document to the various functions and roles inside the organization. NTPC has a 3-tier structure for Occupational Health and Safety management, at Stations/ Projects, at Regional Head Quarters and at Corporate Centre. Corporate Safety Department is headed by the Executive Director (Safety) and is responsible for making Guidelines/ Procedures/Standards, their review and implementation. Business Unit Heads of all NTPC stations review the safety performance of their respective stations monthly on a well-defined template.

In Calendar Year 2024, Occupational Health & Safety Auditors' Training conducted by NOSA, South Africa was imparted to 22 executives. Training for NEBOSH IGC (UK) was imparted to 46 executives. In FY25 till Dec 2024, apart from various other safety trainings, a centrally designed, customized safety training has been organized for leadership level to middle management level and for the lower management level employees of stations / project.

CLIMS (Contract Labour Information Management System) has been implemented for gate pass system for contract workers in all NTPC plants/ projects. Training and medical examination of contract workers are mandatory. External Safety Audits are conducted by reputed third parties as per IS 14489 and to conform to statutory requirement as applicable.

Cross-functional safety task forces are functional at projects/ stations to monitor deviations & non compliances. "Safety Evaluation Matrix" was rolled out during FY24 for operating stations. It is a continuous and transparent process for internal benchmarking of safety systems among peer stations. Effective engineering controls and emergency plans have been developed to handle emergency situations. Mock drills are regularly conducted at all NTPC plants, in association with agencies like NDRF, SDRF and district administrations. NTPC has established NTPC Disaster Management Cell for augmenting the disaster management capacity.

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, FICCI etc. 18 Stations of NTPC received International Safety Award 2024 from British Safety Council. Most of the NTPC stations are ISO-45001 certified which is a testimony of its adherence to international safety standards.

11. RISK MANAGEMENT

Risk management scenario has become challenging with increasing regulatory compliance and emerging business risks. 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 taken/ 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).

12. BUSINESS EXCELLENCE(BE)

NTPC has developed and implemented its bespoke model 'NTPC Business Excellence Model', demonstrating its unwavering commitment to business excellence. The NTPC BE Model is intricately designed, placing significant emphasis on planning, strategic prowess, safety, and key areas of paramount importance such as stakeholder engagement, digitization, employee well-being, and learning & development. Our thermal stations undergo a comprehensive BE Assessment, aiming to identify opportunities to enhance stakeholder engagement, streamline critical processes, and nurture leadership potential.

In FY25 till Dec 2024, assessments have been completed at 14 stations, with the remaining thirteen stations scheduled for assessment by 31st Jan 2025. Demonstrating its leadership in business excellence, NTPC Vindhyachal and NTPC Talcher-Kaniha received the coveted Platinum Recognition at the CII-EXIM Bank Awards for Business Excellence 2024.

Aligned with ISO standards, NTPC stations have adopted "Integrated Management System and Total Quality Management (TQM). To foster knowledge sharing and overcome business challenges, initiatives such as 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 "Spark" from NTPC-Talcher-Kaniha won Gold Recognition at the International QCC Convention 2024 held in Sri Lanka.

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 16,382 as on 31st Dec 2024 (excluding employees on sabbatical).

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 2024, 979 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. Total aggregate training man-days (in all formats) for the period is 147421, and the average man-days for employees in all formats for the period is 13.74 man-days. During the year, NTPC has logged a total of 32,343 man-days for Future Skill Courses, GPI learn modules and e-learning portal (E-guru) till Dec '24.

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.563 executives have been covered under Samarth training in 2024.

- Need based training based on assessment of pre-identified managerial competencies, in the Competency, Potential and Value (CPV) assessment undertaken for them. 764 Executives have been covered under such Competency Development programs in 2024 and 113 employees were trained under 10X leadership program, Women Leadership program in which 33 were trained. 433 employees were trained under planned interventions during 2024.
- IOSH 103 and NEBOSH 45 employees have completed safety certification courses.
- The first batch of the Long-Term Safety Certification Program for O&M and Construction leaders began in Dec '24, with 33 employees participating.
- Training on Safety Audit and Investigation of Incident Report for HOPs, Head of O&M, Projects total 5 programs was conducted covering 144 Senior Executives.
- 63 employees completed the ESG Certificate course.
- Project Management Level C & D certification was completed by 18 & 17 employees respectively.
- Training programmes in Finance include Certification program in Financial Modelling & Valuation Analysis, Program for CFOs, Power BI, Finance for Ideathon participants, Financial Concurrence, and Corporate Finance - 223 Participants
- Certification programmes in emerging technologies include Certification program in Energy Modelling, Carbon Trading & Market, Net Zero for NTPC, Electricity (Power) Market, Floating Solar PV Tech, Green Hydrogen & Green Chemicals, Small Modular Reactors - 474 Participants
- Around 528 executives have been given Simulator training in 2024.
- National Learning Week was celebrated from 19th Oct -25th Oct 2024, with 536 employees completing at least 4 hours of learning each, for a total of 3030 hours of learning spent by our employees over this period.
- Currently, 478 interns are undergoing one-year internship program under the Prime Minister Internship Scheme, which began in December 2024.

During 2024, Executive trainees (ETs) from Engineering (764 ETs), Civil (78) ACT (21 ACTs), HR (04 ETs), Finance (27 ETs) and Mining (62 ETs) are undergoing one year induction training program.

Access to new age digital courses like AI, IoT, Block Chain etc. on the NASSCOM-MeITY FutureSkills platform has been provided to all executives. Total 16 number of executives had completed Future-Skills courses in Artificial Intelligence and Internet of Things (IoT). Future skills Courses were conducted covering 345 participants. With a view to leverage Virtual Reality (VR) immersive technology for learning, 700 minutes VR content has been developed and Train the Trainer programs have been delivered to facilitate leveraging of VR for training.

Yoga, pranayama, meditation, and other disciplines are all part of a comprehensive approach to holistic well-being. Additionally, the 24/7 online Employee Assistance Program (EAP), known as Snehal, will be available to all employees and their families until 2024. Throughout the year, the program provided over 544 counselling sessions, which were divided into the following categories: 16 online, 408 telephone, 118 video, and 2 chat sessions.

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 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.

14.2. 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.

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 2024-25 are as under:

1. NTPC received the first prize at the 5th National Water Awards 2023, from Hon'ble President of India, Smt. Droupadi Murmu at Vigyan Bhawan.
2. NTPC secured 372nd rank in Forbes' Global 2000 List 2024 for world's largest companies.
3. NTPC has been recognized as one of the "World's Best Employers 2024" in the Forbes World's Best Employers 2024 List.
4. NTPC featured in the TIME World's Best Companies 2024, presented by TIME & Statista.
5. NTPC was conferred as 1st Runner-Up in the 2024 UN Women India WEPs Award in the category "Community Engagement & Partnerships" for its flagship CSR Project "Girl Empowerment Mission".
6. NTPC has been conferred with six Brandon Hall Group Excellence Awards (4 Gold, 1 Silver, 1 Bronze) by the US based Brandon Hall Group.
7. NTPC was conferred with the Swachhta Pakhwada 2024 Award for taking up cleanliness drive across its locations and neighboring communities.
8. NTPC bagged 4 Awards in the "PSE Category" at SHRM HR Excellence Awards 2024.
9. NTPC Mining Limited's Pakri-Barwadih coal mining project was honored with the 3rd Prize in the 'Large Opencast Coal Mine' category at the 1st Pan India Level Mine Safety Award (MSA-2024).
10. NTPC has received the Digital Champions Award during PSE Summit 2024 at Jaipur for Robotic Process Automation (RPA) implementation in Commercial Billing Process.
11. NTPC received the Organizational Excellence Award at the Project Managers Global Summit 2024, organized by PMA India (Indian member of IPMA).
12. NTPC has been recognized as one of the "Most Preferred Workplace of 2024-25" in the 4th edition of "Most Preferred Workplaces" by Team Marksmen.
13. NTPC Coal Mines at Talaipalli and Dulanga Won 5-Star Ratings for FY22-23 at the Annual Star Rating of Coal Mines award ceremony 2024.
14. NTPC secured the 3rd rank globally at the ATD BEST Award 2024, the highest ranking among all Indian companies.
15. The Internal Audit team of NTPC has been conferred with the 'Internal Auditor of the Year' award at the 5th edition of Audit and Risk Summit & Awards 2024, conceptualized and curated by UBS Forums.

LIST OF NTPC COMMISSIONED STATIONS / PROJECTS (as on 31.12.2024)

Annexure-I

I. COAL BASED STATIONS

S N	Station	State	Capacity (MW)
1	Barauni	Bihar	500
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 Ph-1	Telangana	1600
	Total (Coal)		**53,850**

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	Gujarat	656
6	Kawas	Gujarat	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	Dadri Solar	Uttar Pradesh	5
2	Andaman Solar	Andaman and Nicobar	5
3	Ramagundam Solar	Telangana	10
4	Talcher Kaniha Solar	Odisha	10
5	Unchahar Solar	Uttar Pradesh	10
6	Faridabad Solar	Haryana	5

7	Singrauli Solar	Madhya Pradesh	15
8	Auraiya Solar	Uttar Pradesh	20
9	Kayamkulam(F)Solar	Kerala	92
10	Ramagundam(F)Solar	Telangana	100
11	Kawas Solar	Gujarat	56
12	Simhadri (F)Solar	Andhra Pradesh	25
13	Auraiya (F) Solar	Uttar Pradesh	20
14	Solapur Solar	Maharashtra	10
15	Gandhar Solar	Gujarat	20
16	Anta	Rajasthan	90
17	Singrauli Small Hydro	Madhya Pradesh	8
	Total (Renewable)		**501**
	Total NTPC		**59,168**

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	160
6	Meja (MUNPL)	Uttar Pradesh	1,320
7	Jhabua (JPL)	Madhya Pradesh	600
8	Nabinagar (BRBCL)	Bihar	1000
9	Maitree (BIFPCL)	Bangladesh	1320
	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

S N	STATIONS	State	Capacity (MW)
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	Dev Bhumi Dwarka Wind (THDC)	Gujarat	63
4	Kasaragod Solar (THDC)	Kerala	50
5	Tripura Solar (NEEPCO)	Tripura	5
	NGEL		
1	Rajgarh solar	Madhya Pradesh	50
2	Ananthapur solar	Andhra Pradesh	250
3	Bhadla solar	Rajasthan	260
4	Mandsaur solar	Madhya Pradesh	250
5	Bilhaur-1 solar	Uttar Pradesh	140
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	281.68
11	Ettayapuram solar	Tamil Nadu	230
12	Devikot solar	Rajasthan	240
13	Nokhra solar	Rajasthan	300
14	Chattargarh Solar	Rajasthan	150
15	Ayodhya Solar (Pt-1)	Uttar Pradesh	40
16	Bhainsara	Rajasthan	160
17	Shahjapur	Madhya Pradesh	105
18	Radhanpur Solar	Gujarat	60
19	Mesanka	Gujarat	30
20	Sadla (GUVNL)	Gujarat	37.5
21	Dayapar wind	Gujarat	50
22	Rojmal Wind	Gujarat	50
23	Rajgarh solar	Madhya Pradesh	50
	Total (Renewable)		**3667.18**
	Total (Under JVs & Subsidiaries)		**17,430.18**
	GRAND TOTAL (I+II+III+IV+V)		**76,598.18**

DETAILS OF ONGOING PROJECTS

Annexure-II

S N	Project	Type	State	Capacity (MW)
1.	Lara -II (800 X 2)	Coal	Chhattisgarh	1600
2.	Darlipali (800 X 1)	Coal	Odisha	800
3.	Talcher-III (660 X 2)	Coal	Odisha	1320
4.	Barh-I U#3	Coal	Bihar	660
5.	North Karanpura Unit-3	Coal	Jharkhand	660

S N	Project	Type	State	Capacity (MW)
6.	Singrauli-III (800 X 2)	Coal	Uttar Pradesh	1600
7.	SIPAT -III	Coal	Chhattisgarh	800
8.	Nabinagar-II (800X3)	Coal	Bihar	2400
9.	Gadarwara -II (800 X 2)	Coal	Madhya Pradesh	1600
10.	Telangana St-II (800 X 3)	Coal	Telangana	2400
11.	Rihand Solar	Solar	Uttar Pradesh	20
12.	Nokh	Solar	Rajasthan	735
13.	SIPAT -Floating solar	Solar	Chhattisgarh	26
14.	Solapur Solar	Solar	Maharashtra	13
15.	Ramagundam (Ground+Floating Solar)	Solar	Telangana	176
16.	Lata Tapovan (57X3)	HYDRO	Uttarakhand	171
17.	Rammam (3X 40)	HYDRO	West Bengal	120
18.	Tapovan Vishnugad (130 X 4)	HYDRO	Uttarakhand	520
			TOTAL	15621
JV and Subsidiaries				
19.	KHURJA (THDC) (660 X 2)	COAL	Uttar Pradesh	1320
20.	Patratu (PUVNL) (800 X 2)	COAL	Jharkhand	2400
21.	Tehri PSS THDC (250 X 4)	HYDRO	Uttarakhand	1000
22.	Vishnugadh-Pipalkoti THDC (111 X 4)	HYDRO	Uttarakhand	444
23	Shimbhu Ki Burj-II (CPSU - I) Solar	Solar	Rajasthan	18.32
24	Bhensada Solar	Solar	Rajasthan	160
25	Kankachiyala, Rupakheda, Sadla Solar	Solar	Gujarat	162.5
26	Limbdi (60)	Solar	Gujarat	60
27	Shajapur Solar	Solar	Madhya Pradesh	220
28	Nakhatrana Solar	Solar	Gujarat	300
29	Khavda-I Solar	Solar	Gujarat	1255
30	Khavda-II Solar	Solar	Gujarat	1200
31	Khavda-III (Part of Hybrid: Dayapar-III) Solar	Solar	Gujarat	300
32	Bhuj Solar	Solar	Gujarat	600
33	Tilaiya (Part of GVREL) Floating Solar	Solar	Jharkhand	155
34	Panchet (Part of GVREL) Floating Solar	Solar	Jharkhand	75
35	Panchet-II (Part of GVREL) Ground+ Floating Solar	Solar	Jharkhand	80
36	Bikaner-I (NEEPCO)	Solar	Rajasthan	300
37	NSPCL Bhilai Floating solar	Solar	Chattisgarh	15
38	Bikaner-II (Kalasar-I)	Solar	Rajasthan	250
39	Bikaner-II (Kalasar-II)	Solar	Rajasthan	250
40	Bhadla-II	Solar	Rajasthan	500
41	Khurja Floating Solar	Solar	Uttar Pradesh	11
42	Khavda VI	Solar	Gujarat	225
43	Khavda VIII	Solar	Gujarat	275
44	Khavda VII	Solar	Gujarat	275
45	Khavda-V Solar	Solar	Gujarat	200
46	Dayapar-I (Wind)	Wind	Gujarat	100

S N	Project	Type	State	Capacity (MW)
47	Dayapar-II (Wind)	Wind	Gujarat	200
48	Dayapar-III (Wind)	Wind	Gujarat	150
49	Jamjodhpur (Wind)	Wind	Gujarat	630
50	Taralakatti & Halligudi (Wind)	Wind	Karnataka	874
51	Vanki (Wind)	Wind	Gujarat	180
52	Kalyanpur (Wind)	Wind	Gujarat	356
	Total			**14,540.82**
	Grand Total			**30,161.82**

NTPC Group – Joint Ventures and Subsidiaries

Annexure-III

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 of 1104 MW (coal-based) 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 Compa-ny 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 Lim-ited - 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-1 & construction activities are under progress. Banhardih coal block has been allocated to PVUNL for captive use and is also being developed.
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. NTPC & U.P. Rajya Vidyut Utpadan Nigam Limited (UPRVUNL) have signed a Supplementary Joint Venture Agreement –I & II (SJVA) for establishment of units at Obra-D (2x800 MW), Anpara-E (2x800 MW) while SJVA –III for Meja (3X800MW) is under approval.

SI. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
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 were commissioned in May 2009. Subsequently, LNG business was separated under new JV by name Konkan LNG Limited (KLL). On 31.12.2020, NTPC 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) on 23 February 2021, for purchase of GAIL's share (25.51%) in Ratnagiri Gas and Power Pvt. Ltd. (RGPPL). With this transaction, NTPC shareholding in RGPPL is 86.49%.
8	Trincomalee Power Company Limited (TPCL) (26.09.2011)	• NTPC-50% • CEB Sri Lanka-50%	Trincomalee Power Company Limited (TPCL), (a 50:50 JV between NTPC Ltd and Ceylon Electricity Board (CEB), Sri Lanka) is developing a 50 MW (extendable to 120 MW) solar PV power project at Sampoor, Sri Lanka. TPCL secured environmental clearance from the Central Environment Authority (CEA) for the 50 MW (Phase-I) project in June '23. Sri Lanka Sustainable Energy Authority (SLSEA) issued an On-grid renewable Energy Permit to TPCL in July '23. Post series of meetings including JWG in Feb'24 and negotiations thereafter to resolve concerns in the project agreements, TPCL submitted the techno-commercial bid to CEB in July'24. While, the bid was being evaluated by a Cabinet Approved Negotiation Committee (CANC), Sri Lankan Presidential elections and Parliamentary elections were declared. Post elections, new CANC has been constituted. This CANC will be inviting TPCL soon and subsequently submit its recommendations to GoSL for approval. PPA signing is envisaged, post approval of the CANC recommendations by GoSL.

SI. No.	Name of the JV/Subsidiary Co. (Incorporated on)	Equity Holding as on 31st March 2024	Area (s) of Operation/Status
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 between NTPC Ltd. and Nuclear Power Corporation of India Ltd. (NPCIL) was incorporated 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. On 13.09.2024, GoI approved transfer of Mahi Banswara Rajasthan Atomic Power Project (MBRAPP 4X700 MW) from NPCIL to ASHVINI and shall now be executed by ASHVINI.
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 2,775MW capacity under various stages of construction.
12	Northeastern Electric Power Corporation Limited (NEEPCO) (02.04.1976)	NTPC-100%	NEEPCO is a Mini-Ratna Category-I CPSE, primarily engaged in the business of generation and sale of electricity in the north-eastern region of India. NTPC has acquired 100% GOI equity stake in NEEPCO on 27.03.2020. With this acquisition, NEEPCO has become a wholly owned subsidiary of NTPC. NEEPCO operates 6 Hydro, 3 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 1x600 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 07.04.2022 for pursuing green/ sustainable energy business. 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. Stake sale of NGEL through IPO completed in Nov '24.
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 01.04.2015, 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 01.11.2002, 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 and Coal India Ltd. for undertaking the development, operation & maintenance of Brahmini and Chichro Patsimal coal blocks in Jharkhand and integrated coal-based power plants. MoC vide its communication dated 14.06.2011, de-allocated the 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.

SI. 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 high-voltage transformers and associated equipment. Due to changes in the business environment, NTPC Board has accorded in-principal approval for the 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.
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 Ltd, 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 India Ltd (GEPIL)- 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 India Ltd. 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- 12.5% • NHPC- 12.5% • PGCIL- 50% • DVC- 12.5% • CPRI- 12.5%	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.

Sl. 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- 39.25% • PGCIL- 39.25% • PFC- 11.38% • REC- 10.11%	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)

Hon'ble Prime Minister Shri Narendra Modi laid the foundation stone for the state-of-the-art NTPC Green Energy Limited Green Hydrogen Hub Project at Pudimadaka near Visakhapatnam on 8th Jan 2025, virtually from Visakhapatnam in the presence of Shri S Abdul Nazeer, Hon'ble Governor of Andhra Pradesh, Shri N Chandrababu Naidu, Hon'ble Chief Minister of Andhra Pradesh and other dignitaries.

Joint Inauguration of First Trilateral Power Transaction - From Nepal to Bangladesh Through Indian Grid on 15th Nov 2024.

Hon'ble Minister of Power, Housing & Urban Affairs Shri Manohar Lal visited NTPC pavilion at the India International Trade Fair (IITF 2024), in the presence of Shri Pankaj Agarwal, Secretary (Power), Shri Gurdeep Singh, CMD NTPC and CMDs of Power CPSEs, on 24th Nov 2024.

Shri Manohar Lal, Hon'ble Union Minister of Power and Housing & Urban Affairs released NTPC's 50 Year Coffee Table Book in the presence of Shri Pankaj Agarwal, Secretary (Power), Shri Gurdeep Singh, CMD (NTPC) and Shri R K Chaudhary, CMD (NHPC) on 9th Nov 2024.

Hon'ble Minister of State for Power and New & Renewable Energy, Shri Shripad Yesso Naik visited Ministry of Power and NTPC pavilions at IITF 2024 on 26th Nov 2024.

CHAPTER 15

POWER GRID CORPORATION OF INDIA LIMITED (POWER GRID)

POWERGRID: OVERVIEW

Power Grid Corporation of India Limited (POWERGRID) 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 December 2024, POWERGRID has 63 wholly owned subsidiaries and 12 Joint Ventures.

POWERGRID is mainly engaged in the business of transmission of power through its (765/400/220/132kV) Extra High Voltage AC and (±800/±500/±320 kV) Extra High Voltage DC transmission network. The company has diversified into telecom business by leveraging its Pan India transmission network through stringing of optical ground wire(OPGW). POWERGRID has provided/providing consultancy services to domestic and international clients by leveraging its capability and experience in the field of power transmission, sub transmission, distribution management, load dispatch & communication etc. POWERGRID is also involved in cross border interconnections with Bangladesh, Bhutan and Nepal.

The Company, being one of the largest transmission utilities in the world, is playing a strategic role in the development of Indian power sector and is key contributor in evacuation of renewable energy.

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.

1. HIGHLIGHTS DURING THE YEAR

- Rated "Excellent" for MoU 2023-24.
- Ranked 1st among service sector CPSEs in terms of Net Profit and Dividend Declaration and 2nd in terms of Gross block, Net worth and Contribution to Central Exchequer.
- Green loan agreement with Sumitomo Mitsui Banking Corporation (SMBC) for developing transmission systems for evacuation of renewable energy and integrating to the national grid.
- Secured first HVDC project (±800kV Khavda – Nagpur HVDC) under TBCB.
- Received ISO 55001 Asset Management Certification.
- Patent granted for 'System and Method for Health Assessment of Transformers/Reactors for POWERGRID Asset Life Management System (PALMS)'.
- Developed Substation Inspection Robot, in association with IIT Kanpur at Kanpur Substation.
- Developed Mobile Application in-house to monitor Asset Management KPIs on real time basis.
- Developed Intelligent Inspection in POWERGRID (I2P) module that utilizes QR codes for inspection of substation equipment.
- Awarded Anti-Bribery Management System (ABMS) IS/ ISO 37001 certification by Bureau of Indian Standards (BIS)
- Computer Security Incidence Response Team (CSIRT-Power) was established by POWERGRID in record time under 100 days agenda of MoP.
- NABL accreditation received for POWERGRID Advanced Research and Technology Centre (PARTeC) Labs viz, WAMS, Protection Automation & Control and Material Science.
- POWERGRID, as Project Management Consultant (PMC), completed the prestigious Grid Expansion Reinforcement Project (GERP) in Uganda.
- Female employees are actively engaged in resolving Right-of-Way (RoW) challenges through dedicated RoW cells.
- Designated four substations as 'Pink Substations,' which are led by a female employee.
- Established Skill Development Centres at Malda and Banka with the aim of training 1,500 youth to become skilled workforce in "Transmission line Tower Erection and Stringing".

2. PROJECT IMPLEMENTATION

During Calendar Year 2024, POWERGRID added 3,063 circuit km of Extra High Voltage transmission lines, 4 new substations and 28,600 MVA transformation capacity.

Major Transmission lines Commissioned include 765kV D/c Fatehgarh II- Bhadla II, 765 kV D/c Bhadla II - Sikar II, 765kV D/c Sikar II- Aligarh, 400kV D/c Sikar II - Neemrana,400kV D/c RIL (Oil Refinery) GIS-JamKhabaliya (GIS) PS, 400 kV Neemuch PS – Chhittorgarh (PG) D/C , 400kV Neemuch PS-Mandsaur S/s D/c. The substations that were commissioned are 765/400kV Sikar-II,400/220 kV Neemuch PS,400kV Mohanlalganj, 400/220 kV Navi Mumbai GIS.

During the FY 2024-25, Capital Expenditure (CAPEX) of ₹ 17,140 crore has been incurred till 31st December 2024 for implementation of various projects and anticipated to achieve CAPEX target for FY 2024-25.

POWERGRID emerged successful bidder under Tariff-Based Competitive Bidding (TBCB) in 21 ISTS projects with a total annual tariff of ₹ 9,148 crore, during the Calendar Year 24. POWERGRID has secured the prestigious ±800 kV, 6000 MW KPS2-Nagpur HVDC Project, marking the first-ever HVDC project tendered through TBCB.

POWERGRID is the implementing agency for the approved project on Green Energy Corridor (GEC) Phase-II – Inter-State Transmission System (ISTS) for 13 GW Renewable Energy Project in Ladakh. Work under the ±350kV, 5000MW Pang-Kaithal VSC HVDC Project, located at the high-altitude Pang terminal station, where basic infrastructure development is under process. To address environmental challenges, powergrid

has launched a weather acclimatization program with DIPAS-DRDO and planned mountaineering training with the Jawahar Institute of Mountaineering. Additionally, Powergrid has completed detailed assessments for strengthening road and bridge infrastructure, in collaboration with BRO and MoRTH, for the route from Srinagar to Pang.

3. OPERATIONAL PERFORMANCE

As on 31st December 2024, POWERGRID operates a transmission network of around 1,79,594 circuit kilometers (ckm) of transmission lines and a power transformation capacity of around 5,46,461Mega Volt Amperes (MVA) with 280 substations spread across the country.

POWERGRID's operational performance in FY 2024-25 showcased exceptional reliability, strategic foresight, and a commitment to cutting-edge technology. Our transmission network achieved 99.81% availability with tripping per line reduced to 0.24.

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 31stDecember 2024, POWERGRID is operating all its 280 sub-stations remotely through control centers.

Figure 1: Restoration of 400 kV D/c Kishenpur -New Wanpoh Transmission Line

(400kV Kishenpur New Wanpoh Ckt-1 **(Figure 1)** tripped on 18.02.24 due to heavy snowfall and extremely strong winds. The location of the fault came out to be in Banihal and Qazigund section of Pir Panjal range. The section has a rugged and treacherous terrain with an altitude of 10,000 ft above sea level and is prone to land-slides and avalanches and mostly remains cut-off during winter season owing to heavy snowfall of about 6-7 ft and is accessible only after April. POWERGRID mobilized men and materials equipped with necessary winter gear and the team patrolled towers from 19.02.24 to 20.02.24 along with local manpower who are aware of the terrain and route in snowy conditions despite low visibility, land slide chance and hypothermia. Finally, after trekking for 08 hrs, the team reached the fault location and started the restoration works with proper safety. The work involved clearing snow from the towers and discs first and the installation of T-clamps for jumpering of the damaged B-phase jumper. Finally, after 04 attempts and about 30 hrs of trek for four days and braving all difficulties and dangers, POWERGRID team was able to restore 400kV Kishenpur New Wanpoh-1 line successfully on 20.02.24.)

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. The model is now being trained on processing images captured by drones.
- 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 recognizes that continuous innovation is crucial for effective asset management. To this end, the company has undertaken two pilot projects below:

» Dynamic Line Loading (DLL) project on the 400 kV Tuticorin-Madurai transmission line. DLL leverages smart grid technology to optimize power flow by dynamically adjusting line capacity based on real-time weather conditions, such as temperature, solar radiation, and wind speed.

- E-vegetation Management pilot project in the North Eastern Region. This project aims to develop a sophisticated software tool utilizing AI/ML techniques to assist in managing vegetation growth along six critical transmission lines spanning a total of 625 km. By analyzing satellite imagery, historical data, and meteorological inputs, the tool will provide predictive insights on vegetation growth, enabling proactive maintenance planning.

4. FINANCIAL PERFORMANCE

During FY 2024-25, till September 2024 POWERGRID recorded total income of ₹ 23,126 crore and Profit After Tax

(PAT) of ₹ 7,517 crore on consolidated basis. Gross Fixed Assets of the company are ₹ 2,78,983 crore, on consolidated basis.

POWERGRID has consistently returned value to shareholders through regular dividend distributions. The total dividend paid during the FY 2023-24 was ₹ 11.25 per share. For FY 2024-25, 1st Interim Dividend of Rs. 4.50/- per share was paid.

5. COMMERCIAL PERFORMANCE

During the FY 2024-25, till 31st December,2024 POWERGRID has realized ₹ 28,404/- crore (101.48 %) including previous outstanding, against the ₹ 27,989/- 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 ₹ 2,438 crore. Balance amount of ₹ 265 crore out of ₹ 2,438 crore is being liquidated through instalments by 2 Discoms viz TANGEDCO and UPPCL, in accordance with LPS Rules 2022 notification by MoP on June 03, 2022.

6. TRANSMISSION SYSTEMS FOR RENEWABLE ENERGY EVACUATION

POWERGRID has also undertaken implementation of Renewable Energy (RE) schemes like, Green Energy Corridors, evacuation schemes for Ultra Mega Solar Power Parks etc. to ensure transmission of power from upcoming RE power projects in resource rich States viz. Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Karnataka, Andhra Pradesh, Tamil Nadu, Himachal Pradesh, Ladakh area and others, to load centers across the country. POWERGRID has installed a number of state-of-the art Static Synchronous Compensators (STATCOMs) in the 400 kV grid to improve the grid reliability and voltage stability limit for smooth RE integration.

Some of the major renewable energy evacuation projects implemented during CY 2024 include Inter Fatehgarh II- Bhadla II, Bhadla II - Sikar II, Sikar II- Aligarh, Sikar II - Neemrana, Neemuch REZ.

Further, POWERGRID is also executing Green Energy Corridor Phase-II and Transmission Scheme for evacuation of power from RE Sources in various locations of Rajasthan, Gujarat & Andhra Pradesh. POWERGRID is facilitating more than 110 GW of renewable energy evacuation from across various states.

During CY 2024, Hon'ble Prime Minister, Shri Narendra Modi laid Foundation stone& inaugurated (Figure 2&3) transmission projects for evacuation of RE power from various sources at Rajasthan, Khavda and Kurnool.

Figure 2:Hon'ble Prime Minister laid Foundation stone & inaugurated transmission infrastructure to evacuate RE from various sources in Rajasthan in February & December 2024.

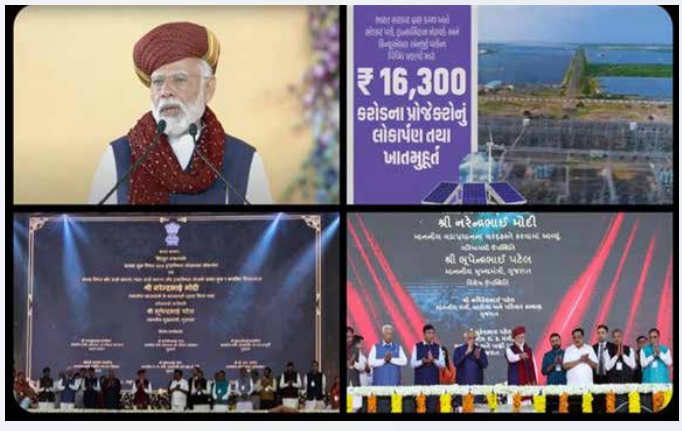


Figure 3:Hon'ble Prime Minister laid Foundation stone & inaugurated transmission infrastructure to evacuate RE from various sources in Rajasthan, Khavda, Kurnool in February 2024.

7. SUSTAINABILITY INITIATIVES

POWERGRID as a responsible business organization, has been taking up several initiatives in sustainability. 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 / hybrid / EVs in place of traditional vehicles.

POWERGRID has publicly disclosed several Environment, Social and Governance (ESG) targets which include Net Carbon Zero by 2047, 50% of renewable energy consumption by 2025, net Water Positive by 2030, Zero waste to landfill by 2023 and Achieve and maintain Zero fatalities every year.

The organization is actively pursuing green energy initiatives. A pilot project to replace 132kV Circuit Breakers with environmentally friendly Green Gas at Imphal Substation is under progress. Further, POWERGRID is developing a green hydrogen project at Neemrana substation which shall reduce CO_2 emissions by 360 tonnes annually, and a pilot project in Nagda for green hydrogen in mobility.

Powergrig is adopting Green Tariffs at our establishments in such states that offer the facility. Green Tariff applications have been

submitted for 166 of its establishments. In addition, installation of 11.5 MWp Rooftop Solar PV systems is completed and about 24.5 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 scheduled to be commissioned by March'25. These initiatives contribute towards achieving 50% of our overall energy consumption through renewable sources by 2025.

POWERGRID has also contributed to MoEFCC's Green Credit Program, supporting afforestation across 279 hectares on 21 land parcels in Gujarat. This investment will help expand India's forest cover.

8. RESEARCH & DEVELOPMENT

POWERGRID has taken up several initiatives towards technological innovation and collaboration. POWERGRID has been granted a patent for 'System and method for health assessment of transformers/reactors', based on the in-house developed PALMS application for transformer and reactor health monitoring.

Developed an indigenous robot for automated substation inspections in collaboration with IIT-Kanpur (Figure 4). Equipped with advanced sensors (IRIS control cameras, IR thermal sensors, LiDAR, Fire Alarms) and an autonomous navigation platform, this system enhances 24/7 monitoring capabilities, ensuring continuous and reliable substation operations.

Figure 4: Robot for automated substation inspections

Successfully developed and deployed an indigenous 400kV Emergency Restoration System (ERS), significantly improving grid resilience and operational efficiency.

POWERGRID has conducted electromagnetic field studies under HVDC lines and signed a 10-year 'Master Agreement' with the Electric Power Research Institute, USA, marking a major step in international technical research collaboration.

POWERGRID is procuring a SF6-free circuit breaker to promote sustainability, a 400kV mobile GIS bay for disaster management and insulated compact buckets for advanced hotline maintenance.

An MoU was signed with National Remote Sensing Centre (NRSC), ISRO to develop a cutting-edge Spatial Decision Support System for managing transmission towers. This initiative will leverage geospatial data and advanced analytics to enhance risk assessment and mitigation for various natural disasters, including floods, landslides, and forest fires.

At CIGRE session 2024, Paris, POWERGRID was a key participant at The India Pavilion, showcasing India's significant advancements and leadership in the power sector. POWERGRID actively contributed by presenting 42 technical papers and participating in various technical sessions, group discussions, and workshops.

NABL accreditation was received for POWERGRID Advanced Research and Technology Centre (PARTeC) Labs viz, WAMS, Protection Automation & Control and Material Science.

9. SAFETY

POWERGRID has achieved 411 Safe Days in O&M and achieved 258 Safe Days in construction. This shows strong resolve of POWERGRID towards providing safe working conditions while achieving its Construction and O&M targets. To further enhance safety, new initiatives have been introduced, including the JAGRAN near-miss reporting and reward scheme, along with virtual site inspections and daily shutdown activity monitoring.

10. CYBER SECURITY

POWERGRID has made significant strides in enhancing cyber security framework. During FY25, upto Dec 2024, POWERGRID reported zero cyber-security incidents. The Information Security Advisory Board (ISAB) was formed and Information Security Policy v5.0, aligned with ISO 27001:2022 standards were released. POWERGRID has signed Memorandum of Association with IISc Bangalore for setting up and operation of Centre for Excellence in Cyber Security.

Computer Security Incident Response Team of Indian Power Sector (CSIRT- Power) has been established in record time by POWERGRID under 100 days agenda of Ministry of Power. CSIRT- Power will function as an extended arm to Indian Computer Emergency response Team (CERT-In) and would help the utilities in cyber incident handling and to ensure better cyber security preparedness in the power sector.

11. OTHER BUSINESS

11.1. TELECOM

POWERGRID Teleservices Limited (PowerTel), a wholly owned subsidiary of POWERGRID is the only Telecom Service Provider in the country having pan India overhead Optic fiber network using Optical Ground Wire on power transmission lines. The telecom network spans over 100,000 kilometers, with Points of Presence at more than 3000 locations maintaining the backbone availability of 100%.

PowerTel's licenses include National Long-Distance (NLD), Internet Service Provider Category-A (ISP-A) and Infrastructure Provider-I (IP-I) registration.

During the year, PowerTel received the first order to provide International connectivity to Bhutan (10 Gbps connectivity). Further, the first order has been received from one of the major OTTs to provide connectivity on 400G interface. MoU has also been signed with Govt of Meghalaya for strengthening of telecom connectivity in the state. Works on establishment of data centre at Manesar are under progress.

11.2. CONSULTANCY

11.2.1. DOMESTIC CONSULTANCY

Under domestic consultancy, POWERGRID is actively involved in executing transmission line projects and associated works across various regions in India. The company is providing consultancy services to government utilities for infrastructure development, including diversion and modification works of existing transmission lines. POWERGRID is assisting the National Highways and Infrastructure Development Corporation (NHIDCL) in powering Zojila tunnel, Indian Railways with the electrification of non-electrified railway tracks of Central Railway, East Central Railway, South Western Railway, and South East Central Railway. Some of major activities during the year include:

- POWERGRID has entered a Memorandum of Understanding (MoU) with Rajasthan Rajya Vidyut Prasaran Nigam (RVPNL) to establish a joint venture company. MoU has been signed to incorporate a Joint Venture Company (JV) for development of intra state transmission system in the state of Rajasthan with an equity participation of 74% by POWERGRID and 26% by RVPNL. The proposed JV company shall undertake projects worth upto ₹ 10,000 crore in a phased manner.
- MoU with Hindalco for LILO of both circuits of 400kV D/c Vindhyachal PS – Sasan line at Hindalco switchyard on Build Own Operate and Maintain (BOOM) basis.
- MoU with ONGC, marking a significant step forward in our efforts to pursue commercial green hydrogen ventures through strategic collaborations.

11.2.2. INTERNATIONAL CONSULTANCY

POWERGRID has continued to make significant strides in its international operations. Powergrid successfully commissioned the 132kV Gulu-Olwiyo transmission line along with associated 132 kV bays at Gulu and Olwiyo S/s in Uganda as part of the prestigious Grid Expansion Reinforcement Project (GERP) (Figure 6).

POWERGRID secured a Consultancy contract for project management and supervision of the procurement, design and construction of transmission system infrastructures under Tanzania – Zambia Transmission Interconnector Project (TAZA) to Tanzania Electric Supply Company Limited (TANESCO).POWERGRID has been selected as the preferred bidder for developing and implementing an operating and maintenance strategy for the Temane Transmission Project in Mozambique. This marks the addition of Mozambique as its 24th country in its global footprint. POWERGRID has secured a contract to provide training to officials of the Power Grid Company of Bangladesh (PGCB) on crucial aspects of project, contract, and finance management.

Figure 6: Hon'ble President of Uganda, Mr Yoweri Kaguta Museveni dedicated (Nebbi and Arua substations), where POWERGRID served as the Project Management Consultant, integrating West Nile region with Ugandan National Grid.

In Nepal, the company received accolades for its contributions to key projects. The Director (Personnel) received a certificate of appreciation from the Hon'ble Prime Minister of Nepal during the inauguration of the 220 kV Matatirtha Substation, a crucial component of the SASEC PSC Project where POWERGRID serves as a consultant. POWERGRID is taking up Route Survey, Planning & Study for a 400 kV Transmission line for the Seti River - 6 Project in Nepal.

12. CORPORATE SOCIAL RESPONSIBILITY

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.

Major CSR projects taken up during FY 25 are mentioned below:

- Established Skill Development Centres at Malda and Banka. The Skill Development Centres will provide training to unemployed youth in "Transmission line Tower Erection and Stringing".
- POWERGRID Vishram Sadan at RIMS, Ranchi (Figure 7)and AIIMS Bilaspur.
- Participation in "Namami Gange" - an integrated river conservation mission.
- Improving Rural Livelihood through farmer-centric Integrated Watershed Management at Jaipatna Block, Kalahandi district Odisha.

Figure 7: Hon'ble Minister of Power inaugurated POWERGRID Vishram Sadan at RIMS, Ranchi

13. LEVERAGING HUMAN CAPITAL TO ACHIEVE EXCELLENCE

Capacity building of Power Sector

Leveraging the capabilities of our workforce, POWERGRID has taken the following initiatives in capacity development for the power sector:

- Under Prime Minister Internship Scheme (PMIS), POWERGRID has engaged 517 candidates. Till 31st December 2024 a total of 4034 offers have been issued.
- Total 884 apprentices have been engaged in 16 different Trades at more than 300 locations all over India.
- Capacity Building and Institutional Strengthening program under the North Eastern Region Power System Improvement Project (CBIS-NERPSIP) to enhance the capabilities of State Power Utilities in six States: Assam, Meghalaya, Mizoram, Manipur, Nagaland, and Tripura and Capacity Building under Comprehensive Scheme in 2 states: Arunachal Pradesh and Sikkim.
- An MoU has been signed with the Power Sector Skill Council (PSSC) to offer skill development training to 6,000 candidates for the implementation of Smart Metering under the Government of India's RDSS initiative across India. As of 31stDecember2024, 245 candidates are undergoing training.
- Skill development centers have been established at Malda and Banka with the aim of training 1,500 youth to become skilled workforce in power transmission line construction.

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 professionals in line with core values of the company in an equitable, collaborative, healthy, safe environment. As on 31st December2024, the employee strength of the Company stood at 8,981 which is exclusive of the employees on contract.

Several significant HR policy initiatives were implemented during the year to enhance employee well-being and motivation. POWERGRID has been conducting Organization Climate Surveys across regions to better understand and address employee concerns, with a focus on enhancing engagement and satisfaction.

Pink substations of POWERGRID (Figure 8) are operated and headed by women employees in line with our commitment towards Women Empowerment. The inauguration of the Pink Substations — including the 400/220 kV GIS Substations at Yelahanka, Tughlakabad, 400/220/33 kV Mariani AIS Substation, and the 220/66 kV Chandigarh Process Bus-based Digital GIS Substation — marks a significant milestone in our journey towards gender equality.

Figure 8: Pink Substation -Yelahanka GIS

Human Resource Development

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, a total of 496 training programs conducted at PAL specifically for employees. In addition to this, 61 training programs have been executed for external power utilities, encompassing both domestic and international participants.

Through "SANDARSHIKA", a portal for Mentoring and Coaching of employees, more than 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.
- 3rd batch of 15 employees sponsored for M.Tech program in POWER System and reliability by NIT Jalandhar.

Inhouse e-learning modules:

POWERGRID's in-house developed Learning Management System (LMS), PRAGYAN, serves as a comprehensive digital knowledge hub, offering a vast array of educational resources designed to enhance both technical and behavioral skills. The system features 191 e-learning modules and 30 micro-learning videos, covering a diverse range of topics that cater to the developmental needs of employees at various levels. These resources provide flexible, self-paced learning opportunities, ensuring that employees have access to the latest industry knowledge and skills at their convenience.

14. RECRUITMENT

POWERGRID is undertaking direct recruitment in Mission Mode as per the directives of Government of India for engineering graduates, diploma engineers and other professionals. The data for vacancies is being uploaded regularly on Vacancy Status Portal of DoPT. The appointment letters are being issued to candidates during Rozgar melas.

15. PROMOTION OF MSMEs

POWERGRID is consistently taking special measures for the development and enhancement of participation and engagement of MSEs in POWERGRID. In a proactive effort to boost procurement from SC/ST and women MSEs, POWERGRID has introduced a distinct approach i.e. 'Exclusive Tenders' for SC/ST and women MSEs where in only SC/ST and women MSEs are eligible to participate in the tenders for certain Goods and Services.

POWERGRID in FY 2024-25, upto December 2024, has organized 12 Vendor Development Programs (VDP) including 6Special VDP for SC/ST & Women owned Micro & Small Enterprises.

POWERGRID also got successfully registered on 4th TReDS Platform C2treds during FY25,thereby completing its registration on all the 4 TReDS Platforms (RXIL,M1xchange, Invoicemart, and C2 treds).

16. 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.

17. VIVAD SE VISHWAS SCHEMES

POWERGRID has settled all 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 due 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.

POWERGRID has settled all claims received on GeM portal under Vivad Se Vishwas II (Contractual Disputes) wherein payment of ₹ 35.83 crore was done to settle the cases as received under this scheme. This scheme focused on resolving long-standing contractual disputes and to clear the backlog of old litigation cases to promote Government's aim of ease of doing business.

18. DISTRIBUTION REFORMS

POWERGRID, through its subsidiary POWERGRID Energy Services Ltd (PESL), is actively contributing to various Government of India initiatives aimed at strengthening the nation's power sector in the areas of smart metering and distribution management systems. PESL has commenced the project of deploying 70 lakh smart meters in two DISCOMs of Gujarat, with 2.20 lakh currently in operation. PESL is also implementing distribution infrastructure projects under RDSS scheme in Jammu & Kashmir and Ladakh. Works under PMDP scheme are nearing completion.

PESL is actively supporting the PM Surya Ghar Yojana by promoting the adoption of rooftop solar PV systems in residential and government buildings, including our own facilities.

19. 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 441 elements out of 446 elements and Under Comprehensive Scheme for Strengthening of Transmission and Distribution System in Arunachal Pradesh and Sikkim 182 elements out of 294 elements have been completed till December 2024 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.

20. AWARDS AND ACCOLADES

- "Platts Global Energy Award 2023" in "Corporate Impact - Targeted Programme" category.
- Recognised as "Best Organisations for Women 2024" by Economic Times.
- "Most efficient & Profitable Maharatna of the Year (non-manufacturing)" by Dalal Street Investment Journal.
- CMD, POWERGRID was conferred with "Economic Times Energy Leadership Award 2024" for "Significant contribution in Energy Sector".
- "SHRM India HR Excellence Award 2024" in the category of Excellence in Learning and Development.
- "ATD BEST Award 2024" by Association for Talent Development (ATD), USA in Training and Development.
- "Brandon Hall Group Excellence Award" by Brandon Hall Group, USA in the category of Best in Learning and Development.
- CSR contribution as Highest donor to National Mission of Clean Ganga.
- Director (Finance), POWERGRID has been conferred with prestigious role model recognition by Shri Shripad Yesso Naik, Hon'ble Union Minister of State for Power at CMA Achiever's meet: Vision 2030.
- Director (Personnel), POWERGRID has been conferred with "CHRO PRIDE Award" 24th National Management Summit- 2024 for his exemplary contributionto the field of HR.
- Director (Operations), POWERGRID conferred with "Sustainability Leader of the Year 2024" award by Global Energy & Environment Foundation (GEEF) at "Global Sustainability Awards 2024".

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). GoI incorporated PFC 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 and a Maharatna Central Public Sector Entity (CPSE) under the administrative control of the Ministry of Power (MoP), with majority ownership by the GoI. As of September 30, 2024, the government holds a 55.99% stake in PFC. PFC group is the largest CPSE in terms of balance sheet size. PFC is also the largest Infrastructure Finance Company and largest NBFC in India on a consolidated basis.

PFC is the leading NBFC, specialising in assisting the country's power sector. PFC plays a strategic role in the initiatives of the GoI for the development of the 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), Liquidity Infusion Scheme (LIS), Late Payment Surcharge Scheme (LPS), serving as the Bid Process Coordinator for Independent Transmission Projects (ITPs) and facilitating privatisation of distribution sector in Union Territories (UTs).

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 modernisation projects through various forms of fund-based & non-fund based assistance, including long-term project finance, short-term loans, debt refinancing schemes etc.;
- Various fee-based technical advisory and consultancy services for power sector projects through 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 the 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 include State power utilities, Central power sector utilities, power departments, private power sector utilities (including Independent Power Producers), and joint sector power utilities.

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 RDSS, IPDS (including R-APDRP subsumed), UMPPs, LIS, and LPS, serving as the Bid Process Coordinator for ITPs, and facilitating the privatisation of the distribution sector in UTs.

1.4. Subsidiaries and Joint Ventures

IIn March 2019, PFC acquired a majority stake (52.63%) in Rural Electrification Corporation (REC) from GoI, and REC became a subsidiary of PFC. PFC has wholly owned subsidiaries, PFC Consulting Limited and PFC Projects Limited, for consultancy services and bidding in lenders' backed resolution plans. PFC is also a promoter and equity shareholder in Energy Efficiency Services Limited (EESL) and PTC India Limited. Further, the company has also set up a subsidiary in GIFT City, Gujarat, in the name of PFC Infra Finance IFSC Ltd. (PIFIL), 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. PFC IFSC subsidiary is the first company in power and infra lending space in IFSC GIFT City.

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. 18 Lakh crore and disbursed loans of more than Rs. 11 Lakh crore to the power and allied sectors. As of 30.09.2024, PFC had an outstanding loan book of Rs 4.93 lakh crore, supporting about 230 GW

of installed capacity in the power sector.

In the past decade, PFC has consciously adapted its business model to increase the renewable energy business by integrating climate risk into its appraisal, lending and pricing strategies. As a result, PFC's renewable assets have grown at a CAGR of over 30 per cent during the period, and today, PFC has the largest renewable loan book in the country, amounting to more than Rs 53,000 crore. The total capacity supported by PFC towards Clean Energy Space as of 31.12.2024 is 79.2 GW with a cumulative sanction of Rs.3,37,000 crore and disbursement of Rs.1,30,000 crore.

1.6. Expansion and Diversification Strategy

Embracing the motto, **'Nayi Soch Nayi Raahein'** – PFC is boldly moving into new directions, shaping the future through innovative ideas and forward-looking perspectives. With the Memorandum of Association amendment, PFC's lending capabilities have been extended to encompass the broader infrastructure and logistics sectors, focusing on e-vehicle fleets, charging infrastructure, roads, ports, metro rail, smart cities, and other large infrastructure projects. PFC has provided cumulative sanction of Rs. 83,701 crore and disbursement of Rs. 10,777 crore as of 31.12.2024 for various infrastructure projects

2. PFC's Strengths

2.1. Memorandum of Understanding (MoU) with Govt. of India

PFC has signed MoUs with the Government of India since 1993-94 and has consistently been rated 'Excellent' based on MoU targets concerning 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 the 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. These include 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 low defaults and enhance profitability.

2.7. ISO Certification

PFC holds ISO certifications, which indicate adherence to high standards in 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. For the Half-year ended September 30, 2024, the net profit was Rs. 8,088 Cr. Stage III Assets are Rs: 3,529 Crores, less than 1% of the total loan book as of 30.09.2024

PFC's financial performance for the last 2 years based on Ind AS Financials are as follows:

(₹ in crore)

Particulars	2021-22	2022-23	Upto 31-12-2024
Profit before tax	14,171	17,626	15,071.06
Profit after tax	11,605	14,367	12,243.24
Dividend (Interim + final)	3,498	4,455	3,383.00

4. Awards & Accolades

PFC is ranked 36th Largest Company in the Fortune 500 India Companies in 2024. PFC was selected as India's "Leading Infrastructure Finance Company" at the BFSI & Fin Tech Summit 2024 by Dun & Bradstreet and was honoured with the prestigious CSR Award (Corporate Responsibility Champion Winner) in the non-Fossil Fuel Business category at the Outlook Planet Sustainability Summit & Awards 2024. The company was presented with ASSOCHAM's prestigious Corporate Bond Market 2024 Award in the CB-Private Placement Category at the 7th National Summit & Awards, Corporate Bond Market 2024. PFC has been awarded the prestigious "Swachhta Pakhwada Award 2024" for its exemplary performance under Swachh Bharat Abhiyaan.

5. Operational Highlights

PFC sanctioned loans totalling approximately Rs. 2,56,830 Crore from April 2024 to December 2024, with disbursements of 1,00,281 crore. As of September 30, 2023, the loan assets stand at Rs. 4,93,363 Crore.

6. Resource Mobilization:

From 01.01.2024 to 31.12.2024, PFC mobilised Rs. 60,170 crores domestically, with notable sources including Rs. 36,048 Crores from taxable bonds, Rs. 2,278 Crores from 54EC Bonds, and Rs. 21,844 Crores from rupee term loans. Further, from 01.01.2024 to 31.12.2024, PFC raised foreign currency equivalent to USD 2799 million (Rs.

23,322 crores) from the international market.

7. New Business Initiatives:

PFC has modified the MoA to fund Non-power infrastructure sectors. PFC has provided financial assistance to projects such as metro rail, petroleum refining, desalination plants, bioethanol manufacturing and nuclear energy. PFC is focused on maintaining a 25% market share in India's renewable capacity and exploring funding opportunities in clean technologies. The 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 the Government, PFC has formulated a policy for providing financial assistance to State DISCOMs to clear Outstanding Dues of Suppliers.

Non-Capex Loan Processing Unit (NCLPU)

Non-Capex Loan Processing Unit (NCLPU) provides financial assistance to Power Utilities (Gencos, Transcos, DISCOMs, etc.) by sanctioning loans for their working capital requirements. NCLPU is committed to providing financial assistance to the utilities to cater to their needs and achieve the corporation's goal of assisting the development of the power sector. NCLPU has sanctioned loans for an amount of Rs. 28,125 crore and disbursed loans amounting to Rs. 53,359 crore in the period from 01.04.2024 to 31.12.2024 in the form of Medium Term Loans (MTL), Short Term Loans (STL), Revolving Bill Payment Facility (RBPF), etc.

All of the loans sanctioned by NCLPU are backed by adequate Payment security mechanisms and Securities in the form of Escrow accounts, Government Guarantees, Charges on assets, etc., resulting in the building of a strong performing asset base for the Corporation. NCLPU has extended loans to DISCOMs towards payment of power purchase dues and transmission charges of generating companies, transmission licensees and electricity trading licensees in the form of Revolving Bill Payment Facility (RBPF) in which the borrowers have the flexibility to draw the loan, repay, and draw again based on their requirement towards payment of dues towards suppliers. It has improved liquidity in the power sector as the bills of Gencos and electricity suppliers have been cleared in time by the borrowers, resulting in the overall development of the power sector.

8. Risk Management:

PFC has an integrated risk management framework which identifies the risk(s) impacting PFC and appropriate measures to mitigate the same. In line with RBI's directions, PFC has appointed a Chief Risk Officer (CRO) to implement the Risk Management Framework. The Board Level Risk Management Committee (BLRMC), comprising of Board level members, is periodically apprised of the status of the key risks associated with the business. PFC also has an Asset Liability Management Committee (ALCO) headed by the Director (Finance) to monitor the liquidity and interest rate risk. The Asset Liability Management framework includes periodic analysis of the long-term liquidity profile of asset receipts and debt service obligations.

9. Institutional Development of Borrowers:

The Ministry of Power has nominated the PFC as the nodal agency for coordinating the activities relating to the integrated rating of power distribution utilities annually, including the appointment of independent agencies for the rating. So far, twelve Annual Integrated Ratings have been approved by the Ministry of Power, with the last rating, the twelfth Annual Integrated Ratings, carried out by McKinsey & Co. Inc. covering 66 power distribution utilities, including sState & private sector DISCOMs and State power departments, having been released in March 2024. The thirteenth Integrated Rating exercise for the rating year FY 2023-24 is in progress.

For funding purposes, PFC classifies State power generation and transmission utilities into A++, A+, A, B, C, and non-responsive categories. The categorisation is based on the evaluation of the utility's performance against specific parameters covering operational & financial performance. In the case of distribution utilities, PFC adopts the Integrated Ratings notified by the Ministry of Power annually by aligning such ratings with PFC's existing standard categories of A+, A, B, C and non-responsive. For entities in default, category 'D' is assigned. The categorisation for the State Sector Borrowers in the Logistics and Non-Power Infrastructure Sector is arrived at on a case-to-case basis.

As on 31st December 2024, 174 utilities (including 66 utilities as per the 12th IR exercise) were categorised with 18 as 'A++', 43 as "A+", 46 as "A", 34 as "B", 31 as "C", 0 as "D" and 2 as "Non-Responsive".

Further, PFC has published 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 the utility, state, and national levels.

10. Memorandum of Understanding (MoU) with Govt. of India:

For FY 2024-25, a MoU has been signed between PFC and the Ministry of Power.

11. Human Resource Management and Training:

The company has implemented effective human resource acquisition and maintenance functions. The attrition rate from 1st April 2024 to 31st December 2024 is less than 1%. As of 31st December 2024, 18 Nos. of In-house training programs were organised by PFC for its employees. A total of 1381 man-days were achieved through conducting

various in-house programs and sponsoring PFC employees to the programs organised by other training agencies.

MoP has entrusted PFC with training and capacity building under RDSS. Through 338 training programs held under RDSS, over 10,302 DISCOM officials across India have been trained on various aspects of power distribution.

12. Corporate Social Responsibility (CSR):

Through its CSR initiative, PFC implements various environmental sustainability activities, such as healthcare, education, sports, sanitation, drinking water, skill development, livelihood, etc. During the FY 2024-25, PFC earmarked a budget of Rs. 257.71 crore, i.e. 2% of its average profit before tax for the last three immediate preceding financial years. PFC has sanctioned CSR projects worth Rs.185.84 crore under CSR activities during FY2024-25 (till 31st Dec 2024).

13. PFC Consulting Ltd (PFCCL):

PFC Consulting Ltd (PFCCL) is a wholly owned subsidiary of Power Finance Corporation Limited that provides 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 and PAN India.

14. Government of India Initiatives:

The Government of India has designated PFC as the nodal agency for implementing the 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 scheme aims 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 Government grants, and the balance will be counterpart funding from PFC and its subsidiary REC or the State's equity for infrastructure works.

PFC is discharging all roles and responsibilities assigned as the nodal agency for the smooth operationalisation of the RDSS scheme, including regular review & monitoring of the progress of the scheme, evaluation of DISCOMs, analysis of tariff orders and regulatory developments, monitoring compliance of Addl. Prudential Norms (APN) issued by MoP; monitoring compliance of corporate governance guidelines issued by MoP; Analysis of energy sales data and quarterly accounts of the DISCOMs besides supporting Capacity building/ skill development of DISCOMs' employees

PFC through RDSS is also supporting other GOI schemes like PMJANMAN, DA-JGUA to improve the socio-economic conditions of tribal communities across the nation by electrification of identified households; vibrant village programme; ensuring measures for Ease of Living w.r.t. Electricity; ensuring compliance for PM-Suryaghar Yojana from DISCOMs; Implementation of Smart Distribution Network projects etc. The ramification of these activities is not only limited to the contours of the RDSS Scheme but echoes across the entire value chain of the country's Power Sector.

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 by generating daily exception reports to address defaulting DISCOMs/PDs. This initiative has significantly improved the recovery of outstanding dues.

Additionally, the government is privatising Power Departments/Utilities in Union Territories (UTs) under the Aatma Nirbhar Bharat Abhiyan, with PFCCL providing transaction advisory services.

The Government of India launched an initiative to develop coal-based Ultra Mega Power Projects (UMPPs), each with a capacity of 4,000 MW. MoP identified 17 UMPPs for which 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 7 UMPPs are closed. The country is transitioning from fossil to non-fossil fuel, so MoP deliberated that the UMPPs may be closed. PFC has initiated the process of closure for the remaining 6 UMPPs.

PFCCL is also a Bid Process Coordinator for developing Independent Transmission Projects (ITPs). So far, 62 ITPs have been transferred to successful bidders.

Further, MoP has entrusted PFCCL to conduct the bidding process for the 3rd, 4th, 5th & 6th rounds of coal auction under para B (ii) of the SHAKTI Scheme. PFCCL successfully conducted the 3rd, 4th, 5th & 6th rounds 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 the Scheme Steering Committee in selecting the Proposer for the pilot project.

Shri Manohar Lal, Hon'ble Union Minister (Power and Housing & Urban Affairs), Shri Shripad Yesso Naik, Hon'ble Minister of State (Power and New & Renewable Energy), Smt. Parminder Chopra, CMD, along with Shri Rajiv Ranjan Jha, Director (Projects),

A woman beneficiary from a rural tribe from Uttarakhand with her Free Electricity Connection certificate under RDSS as part of PM JANMAN Scheme #Har Ghar Tak Bijli

CHAPTER 17

REC LTD.

1. REC Limited (REC) is a premier financial institution for development of Power & Infrastructure Sector in the Country. REC was incorporated as a Company under the Companies Act, 1956 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.

   As a *'Maharatna'* CPSE and a leading NBFC, REC is playing an integral role in contributing to country's energy transition goals by continuing as government's strategic partner to finance entire Power-Infrastructure sector comprising Generation, Transmission, Distribution, Renewable Energy and new clean technologies and also by capitalising on the new thrust areas by the government which includes upcoming renewable energy projects (solar, wind, hybrid, hydro); pumped and battery energy storage, e-mobility / charging infrastructure, smart metering, green hydrogen/ ammonia etc. Further, REC has also diversified into the Non-Power Infrastructure sector comprising Roads & Expressways, Metro, Airports, IT infrastructure, Social and Commercial Infrastructure, Ports, etc.

   The Registered Office of REC is located at New Delhi and its Corporate Office is in Gurugram, Haryana with Regional Offices in 21 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 the fields of Smart metering, Distribution Infrastructure Projects, TBCB and Transmission Projects and Consultancy etc.

   REC continues to play a key strategic role in the flagship schemes of the Government for the power sector. REC has been 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 in the country 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. REC has also been made the nodal agency, along with PFC, for the Revamped Distribution Sector Scheme (RDSS). In the past, REC has been associated as nodal agency for Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGAYA), Deen Dayal Upadhaya Gram Jyoti Yojana (DDUGJY) and National Electricity Fund (NEF) Scheme.

2. Highlights of Performance (during 2023-24)

2.1 The highlights of performance of REC Limited for the financial year 2023-24 are given below: -

(₹ in crore)

Particulars	Amount
Loans Sanctioned	3,58,816.34
Disbursements	1,61,462.28
Recoveries (including interest)	1,31,041.76
Resource Mobilization	1,46,747.00
Profit before Tax	17,780.64
Profit after Tax	14,019.21
Net Worth (as on March 31, 2024)	68,783.15
Dividend (Interim + Final)	4,213.16
Business per employee*	570.18

*(Business per employee = Disbursements + Recoveries / No. of Employees as on 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 financial year 2023-24 was rated as "Excellent".

2.3 Share Capital:

As on March 31, 2024, the authorized share capital of the Company was ₹ 5,000 crore, consisting of 500 crore equity shares of ₹ 10/- each. The issued and paid-up Share Capital of the Company was ₹ 2,633.22 crore, consisting of 2,63,32,24,000 equity shares of ₹ 10/- each. Further, PFC, a Government of India undertaking, held 52.63% of the paid-up equity share capital of the Company as on December 31, 2024, comprising of 1,38,59,93,662 equity shares of ₹ 10/- each and the balance 47.37% paid-up equity share capital was held by public shareholders.

2.4 Mobilization of Funds:

The total market Borrowing Programme of the Company for the financial year 2024-25 is projected as ₹ 1,60,000 crore and against the same the Company has mobilized ₹ 1,18,224.56 crore up to December 31, 2024 and the anticipated mobilization of funds for remaining part of the year is ₹ 41,775.44 crore.

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. Sanctions & Disbursements:

For the period from January 1, 2024 to December 31, 2024, REC has sanctioned and disbursed ₹ 3,04,969.00 crore and ₹ 1,85,020.63 crore, respectively. Anticipated targets of sanction and disbursement for the period from January 1, 2025 to March 31, 2025, are ₹ 94,552.45 crore and₹ 55,000 crore, respectively.

4. Sanctions under National Electricity Fund:

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. financial year 2012-13 up to financial year 2027-28 and 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 was 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 released ₹ 2,468.38 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 December 31, 2024. For the year 2024-25, the Budget Estimates (BE) approved by the Ministry of Power was amounting to ₹ 199 crore and against the said targeted BE, the achievement for release of subsidy from January 1, 2024 to December 31, 2024 and anticipated target from January 1, 2025 to March 31, 2025 to the State DISCOMS are ₹ 72.29 and ₹ 192.98 respectively.

5. Project Monitoring

REC has implemented a comprehensive framework for project monitoring which adheres to the highest standard of risk management and oversight. Project monitoring guideline - 2023 approved by Board of Directors forms the foundation of monitoring framework. It takes into consideration the risk associated with the projects and lays down monitoring procedures accordingly.

In the financial year 2024-25, 264 nos. of projects with sanction amount of ₹ 3,15,342 crore have been identified for monitoring by REC in the current financial year. Against the target, 192 nos. of projects have been monitored till December 31, 2024, having sanctioned loan of ₹ 2,63,059.40 crore.

6. Awards:

During the period from January to December 2024, REC has been honoured with various awards including the prestigious SCOPE Excellence Award in Special Institutional Category (Digitalization) from Hon'ble Vice President of India; Best Green Bond - Corporate Award at the Asset Triple A Awards for Sustainable Finance; Presented with the Innovative Technology Development Award at IIT Madras CSR Summit: 'Building India 2047: Technology for Better Tomorrow'; SKOCH ESG Award 2024 in Renewable Energy Financing Category; Sustainability Champion – Editor's Choice Award at the Outlook Planet Sustainability Summit and Awards; Assocham 'Best Contribution of CSR in Challenging Aspirational Districts especially for Divyangjan' Award; 'Technology Excellence Award for Generative AI Implementation' under 'Impactful Public Sector IT Intervention' category by Elets in collaboration with the MeitY Start-up Hub, GoI; 'Bharat Electricity- Powering India Award' by Powergen India as the best Nodal Agency of the Year; 'Excellence in Green Financing Award' by Network 18 - Green Ribbon Champions 2024 award; Golden Peacock Award for Excellence in Corporate Governance for the year 2024 by the Institute of Directors (IOD); Excellence in Financial Reporting and Corporate Governance Disclosure by South Asian Federation of Accountants (SAFA); 'Adam Smith Awards ASIA 2024' in Best Funding Solution category by Treasury Today Group; 'Best Corporate Film' award during the 8th National Media Conclave (NMC) 2024.

7. SubsidiaryCompany-RECPowerDevelopment 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 14001:2015 (Environmental Management System), ISO 45001:2018 (Occupational Health & Safety) certified company.

RECPDCL is providing value-added consultancy services in distribution sector. Further, RECPDCL is implementing Advance Metering Infrastructure (AMI) projects under RDSS & other schemes as Project Implementing Agency (PIA). RECPDCL is also providing services as PIA for urban distribution infrastructure works in Jammu & Kashmir and Ladakh under PMDP scheme.

The National Feeder Monitoring System (NFMS) is a flagship initiative of the Government of India, led by RECPDCL, to revolutionize the management of power distribution across the nation. This state-of-the-art, cloud-based platform sets new standards in transparency, operational efficiency, and grid reliability by enabling real-time monitoring of 33/22/11 kV outgoing feeders. Of the targeted 2.5 lakh feeders, 1.94 lakh feeders have already

been integrated into the system, marking significant progress. This achievement reflects the active participation from 62 DISCOMs across 25 States/UTs, with daily data transmission enabling timely analysis and intervention.

RECPDCL is also acting as Bid Process Coordinator for selection of developer as Transmission Service Provider through Tariff Based Competitive Bidding Process. During the period from January 1, 2024 to December 31, 2024, the bid process of 22 Inter-State and 2 Intra-State transmission projects have been completed. Further, the bid process of 14 Inter-State and 1 Intra-State transmission project are under progress and expected to conclude in FY 2024-25 and bidding process of 1 Inter-State and 1 Intra-State transmission project will be initiated in this financial year 2024-25 and expected to be concluded in FY 2025-26.

RECPDCL continued to do profitable business in the financial year 2024-25 and earned total revenue of ₹ 219.72 crore and profit before tax of ₹ 132.15 crore till September 30, 2024. The financial data as on December 31, 2024 is under finalization and are subject to approval of the Board of Directors.

8. PM-Surya Ghar: Muft Bijli Yojana:

PM Surya Ghar: Muft Bijli Yojana is being implemented by the Government of India to increase the share of solar rooftop capacity and empower residential households to generate their own electricity. The scheme has a financial outlay of ₹ 75,021 crore, including ₹ 65,700 crore as Central Financial Assistance (CFA) for residential consumers and incentives for DISCOMs, development of Model Solar Villages in each district, capacity building, awareness campaigns, and outreach programs.

The scheme also ensures saturation of Government buildings at both Central and State levels. It is being implemented on a first-come, first-served basis, promoting the adoption of solar energy in the residential sector.

Further, a national portal (https://pmsuryaghar.gov.in) has been developed for this purpose, through which, the households can apply for subsidy and will be able to select a suitable vendor for installing rooftop solar. Households will be able to access collateral-free low-interest loan products of around 7% at present for installation of residential RTS systems up to 3 kW.

Key objectives of the scheme are:

- To achieve 1 crore rooftop solar system (RTS) installation in residential sector.
- To help provide free/low-cost electricity to 1 crore households up to 300 units of electricity per month by installation of rooftop solar.
- To produce renewable electricity of 1,000 billion units through the capacity installed under the scheme, which will result in reduction of 720 million ton of CO2eq emission during the 25 years of lifetime for rooftop solar projects.
- To develop the required enabling ecosystem for rooftop solar projects, including regulatory support, manufacturing facilities, supply chain, vendor network, operation & maintenance facilities, etc., in the country.
- To boost local economy and employment generation along with enhanced energy security.
- To aid in achievement of India's commitment for green climate through its NDCs (Nationally Determined Contributions) at UNFCCC by installation of 30 GW of solar capacity through rooftop solar by 2026-27.

The scheme provides a CFA of 60% of system cost for 2 kW systems and 40% of additional system cost for systems between 2 to 3 kW capacity. The CFA will be capped at 3 kW. REC Limited has been designated as the National Programme Implementation Agency (NPIA) and the Central Nodal Agency (CNA) for PM - Surya Ghar: Muft Bijli Yojana. REC is diligently overseeing the progress of vendor registration, customer registration, application processing, RTS installation and disbursal of subsidy to the consumers. This scheme is anticipated to play a pivotal role in the nation's energy transition while aiding households in reducing their electricity bills.

Progress under the scheme:

The progress of the scheme as on December 31, 2024 is tabulated below:

Consumer Registrations (in nos.)	1,56,85,252
RTS Applications (in nos.)	33,58,743
RTS Plants Installed (in nos.)	5,95,346
Solar Generation Capacity Added (in MW)	2,262 MW
Subsidy Released to consumers (in nos.)	4,76,539
Subsidy Released to consumers (in Rs)	3,704.91 crore
Vendors Registered (in nos.)	11,456

Under PM Surya Ghar Muft Bijli Yojana, as of December 31, 2024, Central Financial Assistance (CFA) have been released to 4,76,539 beneficiaries amounting to ₹ 3,704.91 crore in 34 States/UT.

9. 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. REC Limited was designated as the Nodal Agency for operationalization of DDUGJY and the scheme (including RE) has been completed and closed on March 31, 2022.

10. 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. Scheme had an outlay of ₹ 16,320 crore including Gross Budgetary Support of ₹ 12,320 crore. The SAUBHAGYA scheme has been completed & closed on March 31, 2022.

11. Revamped Distribution Sector Scheme (RDSS):

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 July 20, 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 and 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.

The objectives of the scheme inter-alia include improving the quality, reliability and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector, reducing the AT&C losses to pan-India levels of 12-15% by 2024-25, and reducing the ACS-ARR gap to zero by 2024-25.

Cumulative Achievement under RDSS (as on December 31, 2024):

The proposal of 19 states out of 19 States/UTs under REC have been approved by the monitoring committee and Sanction letters are issued to the corresponding DISCOMs.

Smart Metering Works:

As of December 31, 2024, smart metering works had sanctions of 11,08,03,768 consumer with 35,37,391 system metering. Out of this, 6,36,69,908 consumer having 30,98,338 system metering were awarded. Presently, smart metering of 56,07,029 consumer having 1,95,882 system meters were successfully installed.

Loss Reduction Works:

As of December 31, 2024, the loss reduction works across 19 states/UTs have shown notable progress. The sanctioned cost for these works, excluding the Project Management Agency (PMA) component, stands at ₹ 81,053.87 crore, while the actual awarded cost is ₹ 62,905.03 crore. The sanctioned cost corresponding to the awarded works (excluding PMA) total ₹ 61,777.28 crore. The physical progress, as reported on the portal, reflects 23.05% completion in relation to the sanctioned works. Additionally, the total funds amounting to ₹ 11,533.66 crore released for the loss reduction initiatives.

Achievement during January 1, 2024 to December 31, 2024 under RDSS:

The proposals of REC states/UTs i.e. Andaman & Nicobar Islands (ANI), Arunachal Pradesh, Assam, Ladakh, Rajasthan and Uttar Pradesh were approved by Monitoring Committee, overall ~₹ 53 crore sanctioned under Smart metering works (ANI) and ~₹ 2,200 crore sanctioned under distribution infra works (additional household works and loss reduction).

12. Renewable Energy Projects:

During the Financial Year 2024-25 (upto December 31, 2024) under the renewable energy, REC has sanctioned loan assistance of ₹ 79,414 crore to 70 projects which includes private and state sector projects of various technologies i.e. Solar (installed capacity 7,861 MW), Wind (installed capacity 1,598 MW), Hybrid (installed capacity 2,160 MW), Module Manufacturing, Wind Turbine Manufacturing, Large Hydro (installed capacity 1,093 MW), Pumped Storage Project (installed capacity 480 MW), Battery Manufacturing, Solar Park Infra etc.

13. North Eastern States:

During the period from January 1, 2024 to December 31, 2024, loan assistance of ₹ 3,089.18 crore has been sanctioned to NE States. Further, an amount of ₹ 355.21 crore was disbursed to North Eastern States during the period January 1,2024 to December 31, 2024.

14. International Cooperation and Development (IC&D):

REC has been extensively engaging with multiple Multilateral Banks (MBDs) for raising Official development assistance. In the past we have raised funds from Japan International Cooperation Agency (JICA) under two line of credits (JPY 16,949.38 million and JPY 11,809.48 million, respectively) which has been fully repaid.

REC has long association with KfW Development Bank and total seven (7) lines of credit has been executed since 2007. Among those, three (3) lines of credit are fully repaid/closed and four (4) lines of credit are open.

15. Training Activities at REC Institute of Power Management and Training, Hyderabad (RECIPMT):

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.

Under National Regular Programmes, RECIPMT has

organised Classroom Programmes of 4 days duration for the executives of various power sector utilities on different topics and total 1224 training man days were delivered covering a total 306 participants.

REC has been sponsoring training programs for the benefit of customers/clientele organisations i.e. 3 days Classroom Trainings on “Electrical Safety”, “Best Practices in Power Utilities”, "Change Management, Leadership and Team Building" and 2 days Webinar Training Programme on “Techno-Commercial improvement of DISCOM's”. These training programmes aim at capacity building and improvement in the performance of the organisations.

Based on the specific requirements of the Power Utilities, customised training programmes are designed with specific objectives for such utilities, which are inducting new manpower, adopting new technologies or implementing new software. RECIPMT organises tailor-made training programs catering to their specific requirements.

From January 1, 2024 to December 31 2024, RECIPMT has trained 5,769 Executives of various power utilities including REC employees and achieved a total of 17,262 training man-days. Further, anticipated targets to be achieved from January 1, 2025 to March 31, 2025 is to train 1,733 Executives for 5,262 Man-days.

16. Corporate Social Responsibility (CSR):

In line with the applicable provisions of the Companies Act, 2013 and Rules made thereunder, the Board approved CSR budget of ₹ 249.86 crore for the ¬ financial year 2023-24. Against the same, the Company has spent ₹ 255.01 crore during the year (including excess spent of ₹ 7.70 crore carried forward from previous year). Further, the Board of Directors, REC, has approved budgetary allocation of ₹ 288.48 crore for CSR activities for the financial year 2024-25. In pursuance of the Policy, REC has undertaken various Sustainable projects under Corporate Social Responsibility initiatives in the area of Health care & Nutrition, Education, Environment & sustainability, Rural development & Sports. Further, REC is expected to incur all the CSR expenditure allocated for financial year 2024-25 by the year end.

Shri Pankaj Agarwal, Secretary (Power) lights the lamp on the occasion of All India Rajbhasha Conference of the Ministry of Power in the presence of Hon'ble Minister of State for Power and New & Renewable Energy Shri Shripad Yesso Naik as well as Shri Vivek Kumar Dewangan, CMD - REC, and other dignitaries of REC.

Shri Manohar Lal, Minister of Power and Housing & Urban Affairs lights the lamp and inaugurated National Feeder Monitoring System (NFMS) Control Centre on REC Limited's 55th Foundation Day on July 25, 2024 in the presence of Shri Shripad Yesso Naik, Minister of State for Power and New & Renewable Energy, Shri Vivek Kumar Dewangan, CMD - REC, and other dignitaries of REC.

CHAPTER 18

NHPC LTD.

NHPC was incorporated on November 7, 1975 as a private limited company under the name "National Hydroelectric Power Corporation Private Ltd". The company 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 Navratna company with 67.40 % ownership of Government of India. With an Authorized share capital of ₹ 15,000 crore and an investment base of over ₹ 81,658 crore (as on 30.09.2024), 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 Govt. 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.
- Strategic Partnership with other CPSEs/ Organization
- Expansion in Hydro and other Renewable energy sources in foreign country to have a Global footprint.

PROJECT PORTFOLIO

Description	Numbers	Capacity in (MW)
Power stations under operation	**28**	**7232.90**
- On its own	22	5551.20
Hydro	20	5451.2
Other RE (Solar & Wind)	2	100

- In Joint Venture	6	1681.70
Hydro	2	1520
Solar	4	161.70
Projects under construction	**16**	**10804.00**
- On its own	10	7170
Hydro	3	5680
Solar	7	1490
- In Joint Venture	6	3634
Projects under Clearances / Approval	**9**	**4291**
- On its own	5	3216
Hydro	4	3116
Solar	1	100
- In Joint Venture	4	1075
Projects under S&I	**10**	**9715**
- On its own	7	7275
Hydro	6	5475
PSP	1	1800
- In Joint Venture	3	2440
PSP	3	2440
PUMP STORAGE	08 nos.	9450 MW
New Initiatives	**16**	**27214**
Hydro	3	14524
Pumped Storage Plant	13	12690
Grand Total (MW)		**59256.90**

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 (01.08.2000)	NHPC : Govt of Madhya Pradesh 51:49	Indira Sagar (1000 MW) Madhya Pradesh Commissioned in 2005
		Omkareshwar (520 MW) Madhya Pradesh Commissioned in 2007
Loktak Downstream HECL (23.10.2009)	NHPC : Govt. of Manipur 74:26	Loktak Downstream H.E. Project, (66 MW) Manipur
Bundelkhand Saur Urja Ltd. (JV) (02.02.2015)	NHPC : UPNEDA 74:26	Solar Project (65 MW) Kalpi Commissioned in 2024 Mirzapur SPP (100 MW) Madhogarh SPP (45 MW) Jalaun Solar Park (1200 MW)
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. (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. (01.06.2021)	NHPC : JKSPDC 51:49	Ratle HE Project (850 MW)UT of Jammu & Kashmir
Chenab Valley Power Projects Limited (CVPPL) (13.06.2011)	NHPC : JKSPDCL 51:49	PakalDul (1000 MW),Kiru (624 MW), Kwar (540 MW)Kirthai-II (930 MW)UT of Jammu & Kashmir
NHPC Renewable Energy Limited (NHPC REL)	Wholly owned subsidiary of NHPC 100	Set up as a dedicated vertical of NHPC for development of Renewable Energy, Small Hydro and Green Hydrogen Projects
NHPTL PVT. LTD. (22.05.2009)	NHPC : NTPC: VC: CPRI 12.5 % each PGCIL : 50%	For Constructing High Voltage Transformer Lab & Medium Voltage Transformer upto 765 KVA in Madhya Pradesh

FINANCIAL PERFORMANCE

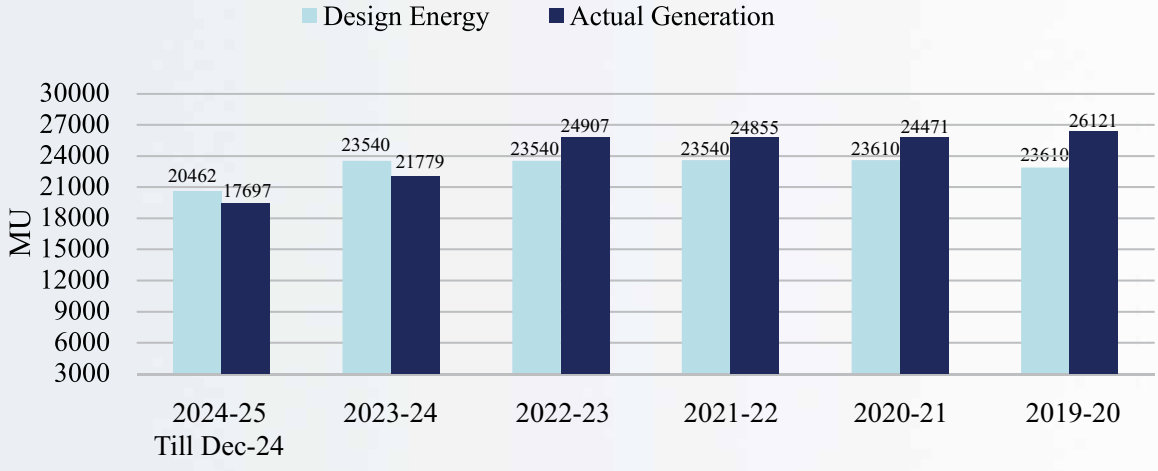
During the financial year 2023-24, NHPC achieved revenue from operations of ₹ 8405 crore and earned a Profit After Tax (PAT) of ₹ 3744.00 crore as against ₹ 3834 crore and ₹ 3538 crore for FY 2022-23 and FY 2021-22 respectively. The total dividend payout during the year 2023-24 is ₹ 1858.33 crore. As on 31.12.2024, Paid up Capital of NHPC is ₹ 10,045.03 crore.

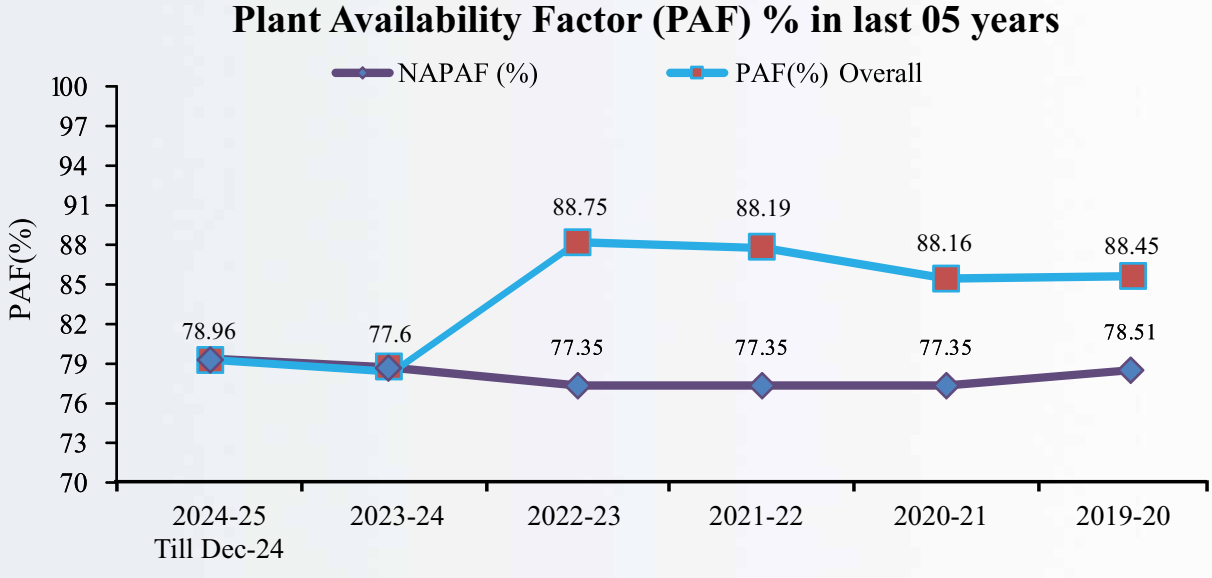
OPERATIONAL PERFORMANCE

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 w.r.t. NAPAF during last five year and current year are as under:

PARTICULARS		2024-25 (Till Dec-24)	2023-24	2022-23	2021-22	2020-21	2019-20
GENERATION	Design Energy (MU)	20462	23540	23540	23540	23610	23610
	ACTUAL (MU)	17697	21779	24907	24855	24471	26121
PAF (Plant Availability Factor)	NAPAF (%)	79.22	77.35	77.35	77.35	77.35	77.35
	ACTUAL (%)	78.96	77.60	88.75	88.19	85.76	85.45





RECENT HIGHLIGHTS

- MoU was signed on 3rd January 2024 between NHPC and Gujarat Power Corporation Limited for proposed investment of ₹ 4,000 crore in Kuppa Pumped Storage Project (750 MW), Chhota Udaipur, Gujarat.
- The Hon'ble Vice President of India Shri Jagdeep Dhankhar presented SCOPE's 'Commendation Certificate' to NHPC on 18th January 2024 in the category of 'Effective Implementation of RTI Act'.
- NHPC achieved a significant milestone with the foundation stone laying ceremony of the 300 MW Solar Power Plant by Hon'ble Prime Minister Shri Narendra Modi located at Karnisar-Bhatiyan, Tehsil Poogal (Bikaner), Rajasthan, under the Government of India's CPSU Scheme, Phase-II, Tranche-III, with total investment of over Rs. 1732 Crore, on 16 Feb 2024.
- The Hon'ble Prime Minister of India, Shri Narendra Modi laid foundation stone of NHPC's 2880 MW Dibang Multipurpose Project in Arunachal Pradesh, on 9thMarch 2024.
- The Hon'ble Prime Minister of India, Shri Narendra Modi inaugurated 380 MW Solar Project in Jaisalmer District, Rajasthan under REIA scheme on 04th March 2024.
- Commencement of commercial operation of the 8 MW Solar Power Project in Sanchi, Madhya Pradesh, spearheaded by NHDC, was successfully attained on 29th March 2024.
- COD has been declared for full capacity of 65 MW Kalpi Solar Project being developed by NHPC's subsidiary BSUL during the month of March.
- On 13thMay 2024, an MOU has been signed between NHPC and Rastriya Prasaran Grid Company Limited (RPGCL), Nepal for Grid connectivity for West Seti HE Project in Kathmandu (Nepal).
- NHPC was honoured with 'The Economic Times HR World Future Ready Organization Award 2024' on 23rdMay 2024.
- NHPC has been conferred with the 'NAVRATNA' status on 30.08.2024.
- 88 MW Floating Solar PV Power Project at Omkareshwar Reservoir was commissioned on 10.10.2024.
- NHPC successfully commissioned the Dam Toe Power House (2.4 MW) of Kishanganga HE Projecton 19.11.2024. The Project is located in the remote Gurez Valley of Jammu & Kashmir.

45 MW Nimmo Bazgo, UT of Ladakh

690 MW Salal, UT of J&K

540 MW Chamera Power Station Stage-I, Himachal Pradesh

SUBANSIRI LOWER H.E. PROJECT (DAM VIEW)

CHAMERA-I POWER STATION (540 MW) – DAM VIEW

CHAPTER 19

NORTH EASTERN ELECTRIC POWER CORPORATION (NEEPCO) LTD.

North Eastern Electric Power Corporation Ltd. (NEEPCO), a Schedule 'A' Mini-Ratna (Category – I) CPSE was set up on 2nd April, 1976. Since inception, NEEPCO was a wholly owned Government of India Enterprise and the President of India and its nominees held 100% (Hundred Percent) equity shares of the Company. The authorized share capital of NEEPCO is ₹ 5000 Cr. 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.

NEEPCO's total installed capacity is 2057 MW, out of which 1525 MW is in Hydro, 527 MW in Thermal 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 BASED		
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:

Generation of hydro power stations in last 6 years

Year	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Generation (in MU)	3125	3156	3882	4685	5202	4798

The generation from NEEPCO's Power Stations during January 2024 to December 2024 is 8148 MU. Plant Availability Factor (PAF) for Hydro Power Stations and Gas based Power Stations during this period is 86.11% and 65.72 % respectively.

The projected generation from Hydro and Gas based Stations from January 2025 to March 2025 is expected to be 550 MU and 691 MU respectively, while the generation from the solar station is expected to be around 2 MU.

Financial:

Considering actual expenditure/income upto September 2024 & estimated income/expenditure for the period from October 2024 to March 2025, the revenue from operations for Financial Year 2024-25 is expected to be ₹ 3971.14 Crs. Total expected income during this period is ₹ 4004.95 Crs and a Profit After Tax of ₹ 451.60 Crs.

All the figures are provisional.

FUTURE VISION OF NEEPCO:

Hydro Projects:

NEEPCO aspires to achieve a 30 GW installed capacity with transition towards renewable energy in the next 12 Years with 14 GW addition from Hydro Sources (including PSP), 13 GW from Solar installations and 3 GW in BESS block.

In the hydro sector with 2.2 GW under development phase, NEEPCO's endeavor on timely commissioning of the projects enduring all unique challenges of the NER will be of prime focus.

Status of the future Projects:

Hydro Projects:

The Government of India identified several stalled hydroelectric projects in Arunachal Pradesh for potential development by CPSEs.

17 (seventeen) stalled hydro projects with combined installed capacity of 4988 MW located in 4 basins in the State of Arunachal Pradesh were indicated for possible development by NEEPCO.

After evaluating the opportunities, the Corporation selected 5(five) projects with promising prospects and having a total installed capacity of 2626 MW for initial development.

Accordingly, in August 2023, NEEPCO signed Memorandum of Agreements with the Government of Arunachal Pradesh for Tato – II HEP (700 MW), Tato – I HEP (186 MW), Heo HEP (240 MW), Naying HEP (1000 MW) and Hirong HEP (500 MW).

The investment approval and FC-II obtained for Tato-I and Heo HEP. Draft land award under Section 23 of RFCTLARR act 2013 issued by the DC Shi Yomi district on 16.12.2024. For Tato-II, land handed over to NEEPCO by District Authority. NOC received from Ministry of Defence for Tato-I, Tato-II and Heo HEP. Construction activities of these projects are likely to commence by the end of this financial year 2024-25.

For Naying HEP, Environment and Forest Clearance and Land Acquisition process are in progress while review and revision of Detailed Project Report considering e-flow stipulation is in progress for Hirong HEP.

Earlier, NEEPCO had signed MoA for development of Kurung HEP (320 MW) in Arunachal Pradesh. DPR for the project is under preparation and EIA and EMP Study is in progress.

Solar Project:

The 300 MW Solar PV (Phase-I) Project in Bikaner, Rajasthan for which work has already been awarded Land acquisition and basic engineering is under progress.

300 MW Solar PV (Phase-II) Project anywhere in India for which tender is being finalized by NGEL for EPC contract.

Process for bidding against 400 MW Solar PV (Phase-III) Project anywhere in India is being taken up by NGEL.

Pump Storage Projects:

Exploring for possibility of developing one PSP of 800 MW in Wah Umiam basin, Meghalaya is going on and accordingly, PFR preparation for the project completed by NEEPCO. PFR has been concurred by IIT Roorkee. Finalization of Tender for preparation of DPR in respect of the project is in progress.

Further, PFR study under progress by NEEPCO for Wah Umsong PSP, Laitlum (1500 MW), Meghalaya. Tender floated for topographical survey works.

NEEPCO is also exploring possibilities of development of Floating Solar Projects in Assam, Mizoram, Meghalaya and Uttar Pradesh. Tender for EPC contract is under preparation for 40 MWp Kopili FSP.

Roof top Solar:

NEEPCO has been assigned the responsibility for Rooftop Solar (RTS) implementation of Residential and Government buildings in states of Meghalaya, Mizoram & Tripura under PM Surya Ghar Muft Bijli Yojana. According to GoI, target date for 100% solarization of government building is December 2025.

GREEN HYDROGEN:

NEEPCO has taken up an R&D study through IIT Guwahati for "Development of low cost sustainable and efficient electro-catalyst and proton exchange membrane for electrolyser assembly for producing Green Hydrogen."

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 earned 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.

OTHER ACTIVITIES:

R&M of Kopili PS and Khandong PS: Renovation and Modernization (R&M) works of 200 MW Kopili Power Station has been completed and COD of all the four units (4x50 MW) have been declared. The 50 MW Khandong Power Station is also under R&M& LE. with scheduled completion by July 2025.

CHAPTER 20

GRID CONTROLLER OF INDIA LIMITED (GRID-INDIA)

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. The responsibilities of power system operation extend to safeguarding the overall reliability, security, economy, and efficiency of the power system.

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 the year 2024 (Up to December) are as follows:

Particulars	2024 (till Dec)	Highest ever
All India Energy Met (BU)	1685	5224 MU on 02nd September 2023
All India Highest Demand Met (GW)	250.1	240.0 GW on 01st September 2023
All India Hydro Generation (BU)	156	877 MU on 30th August 2022
All India Thermal Generation (Coal & Lignite) (BU)	1255	3835 MU on 29th March 2024
All India Wind Generation (BU)	79	611 MU on 02nd August 2023
All India Solar Generation (BU)	125	398 MU on 8th March 2024
Energy facilitated through inter-regional exchange (BU)	259 *	-
Cross border interchange (Export) (MU)	18492	45.8 MU on 30th June 2023
Cross border interchange (Import) (MU)	14116	26.4 MU on 17th September 2023
Energy approved through Short Term Open Access (BU)	163.5	15.9 MU on 12th May 2023

* Data of Inter-regional energy exchange for Dec'24 is provisional.

Achievements

Frequency Profile

During the year 2024 (till December), Frequency remained within Indian Electricity Grid Code (IEGC) band of 49.90-50.05 Hz for 77.80% of time. Frequency remained within the IEGC band for highest 90.46% of time on 08th June 2024 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 December 2024, a total of 61 plants with installed capacity of ≈ 69.40 GW form part of the SCED optimization. As on December 2024, the cumulative reduction (savings) in total production costs / variable charges due to SCED generators is approx. ₹ 4000 Crore (exc. Heat compensation).

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.

Automatic Generation Control has been adopted as an Ancillary Service in CERC Ancillary Service Regulations, 2022. Since 5th December 2022, with the operationalization of SRAS, secondary frequency control through AGC has been formalized as an Ancillary Service in the Indian power system. Presently, a total of 74 power plants with an installed capacity of approx. 72.7 GW have been successfully wired under AGC and are continuously operating round the clock under SRAS, whenever available. GRID-INDIA has been continuously taking initiatives in expanding the ambit of generators under AGC. A pilot on solar AGC is under implementation with Devikot solar power plant (180 MW), located in Jaisalmer district of Rajasthan. AGC is ensuring more efficient and automatic frequency control during high renewable energy penetration periods. 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 regulations introduced Tertiary Reserve Ancillary Service (TRAS). Reserves under TRAS would be procured through power exchanges in Day Ahead Ancillary Market and Real Time Ancillary market. The detailed procedure for TRAS has been notified on 18th April 2023. Provisions pertaining to TRAS in the aforesaid Regulations have been implemented w.e.f. 1st June 2023. TRAS provisions have also been included in the Indian Electricity Grid Code (IEGC), 2023 which came into effect from 1st October 2023.

During the year 2024 (up to December 2024), the total TRAS-Up quantum cleared in DAM was 7.33 MU, while the total TRAS-Up quantum cleared in RTM was 30.64 MU.

During the year 2024 (up to December 2024), the total TRAS-Down quantum cleared in DAM was 23.88 MU, while the total TRAS-Down quantum cleared in RTM was 4.39 MU. The total TRAS-Down quantum dispatched was 21.81 MU, while the total TRAS-Up quantum dispatched was 14.98 MU.

In addition, 5564.82 MU TRAS-Shortfall Up and 9169.51 MU TRAS Shortfall Down have been dispatched.

National Open Access Registry (NOAR)

National Open Access Registry (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 11% 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 December 2024, 3094 no. of users are registered on NOAR platform. 14437 no. of Open Access transactions with a cumulative energy quantum of 46344.36 MU were approved through NOAR during the FY 2024-25 (up to December 2024).

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. As on 31st December 2024, 308 no. of users are registered on GOAR platform. 38607 no. of Green Energy Open Access applications with a cumulative energy quantum of 20201.64 MU were approved through GOAR from November'22 to December'24. During the FY 2024-25, the maximum daily schedule volume through GOAR is 41.75 MU on 2nd September, 2024. The portal may be accessed at https://greenopenaccess.in/.

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 December 2024, ≈ 120 GW of renewable (73 GW Solar and 47 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 63 GW (Wind ~ 24.7 GW& Solar ~ 48.3 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.

As of 31st December 2024, the REC Mechanism has seen significant participation, with 1,180 projects totalling 6,951 MW and 16 Distribution Licensees (DISCOMs) registered. RE Generators from 23 States are actively involved in the REC Mechanism, leading to the issuance of 16.45 Crore RECs. The market has witnessed robust trading activity, with obligated entities buying 10.97 Crore RECs, resulting in transactions valued at over ₹ 12,068 Crore (including Bilateral RECs Trade Value of 129 Crore). Additionally, 36.99 Lakh RECs have been self-retained by RE Generators. This highlights the growing success and adoption of the REC Mechanism in promoting renewable energy generation and meeting renewable purchase obligations.

During the year 2024 (till Dec'24), total 48 RE projects with the capacity of 1,110 MW from 10 states and 2 Distribution Licensee (DISCOM) were registered. A total of 4.45 Crore RECs were issued to RE Generators and DISCOMs. In the year 2024 (till Dec'24), 2.39 Crore RECs worth ₹ 462.8 Crore were traded through Power Exchanges and 18.8 Lakh RECs worth ₹ 46.4 Crore were traded through Electricity Traders. Further, 5.67 Lakh RECs have been self-retained by the RE Generators for RPO compliance. During the year 2024 (till Dec'24), 223 new Buyers were registered with Power Exchanges and 104 new Buyers were registered with traders. As of 31st December 2024, 4.75 Crore RECs are in the inventory.

Uniform Renewable Energy Tariff Mechanism

The Ministry of Power (MoP), vide Electricity (Amendment) Rules, 2022, introduced the Uniform Renewable Energy Tariff Mechanism (URET) to assure stable and consistent tariff rates for the purchase of renewable power. This mechanism encourages DISCOMs to sign power purchase agreements (PPAs) without the future risk of inconsistent tariffs. MoP has notified GRID-INDIA as the implementing agency for this scheme, responsible for preparing the procedure for URET, calculating monthly uniform tariffs, issuing monthly account statements for intermediary procurers, and ensuring transparency by publishing this information on its website within the specified timelines. Further, the Ministry of Power approved the procedure for the implementation of URET on 25th October 2023, with a revision on 23rd April 2024. The revised procedure includes the notification of the start date for the 'Solar Power Central Pool' and the 'Solar-Wind Hybrid Central Pool' as 15th February 2024. Consequently, the capacity under Solar/ Solar-Wind Hybrid for which bid/Request for Selection (RfS) notice is published on or after 15th February 2024, will be part of the respective Central Pool, provided other eligibility conditions are fulfilled. The MoP has also notified NTPC, NHPC, SECI and SJVN as the Intermediary Procurers for this mechanism. To implement this scheme and streamline the process, GRID-INDIA has undertaken the development of a web portal

Carbon Credit Trading Scheme, 2023

The Ministry of Power (MoP) has notified the Carbon Credit Trading Scheme (CCTS), 2023, on 28th June 2023, under the Energy Conservation Act, 2001. This notification establishes the framework for the Carbon Credit Trading Scheme in India, aiming to promote reduction of greenhouse gas emissions through the trading of carbon credit certificates. GRID-INDIA will serve as the registry for the Indian carbon market. Its functions include the registration of obligated and non-obligated entities, maintaining secure databases, recording transactions, sharing records with the power exchange and BEE, and establishing linkages with other national or international registries. 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.

High Price Day Ahead Market (HP-DAM)

Ministry of Power has launched HP-DAM and HP-TAM 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 the year 2024 (up to December 2024), under HP-DAM total of 2.30 MU was cleared in Power Exchanges and under HP-TAM total of 497.82 MU was cleared in Power Exchanges.

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).

The Ministry of Power notified the Energy Conservation Amendment Rules, 2022 on 30th August 2022, introducing a floor price for ESCerts to encourage more participation. This price is set at ten percent of the cost of one metric tonne of oil equivalent (Mtoe) of energy consumed. Therefore, the floor prices for PAT Cycle-II and Cycle-III comes out to be Rs. 1840 and Rs. 2165, respectively.

The trading session for PAT Cycle-II resumed on 14th February 2023. A total of 18.86 Lakh ESCerts were transacted across forty trading sessions of PAT Cycle-II. A total of 13 Trading sessions has been conducted from 09th Apr 2024 wherein a total of 1,83,827 ESCerts were transacted.

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 National Electricity Plan 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.

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

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 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, IEGC 2023 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 in 2024, the Cyclone Remal and Dana affected the coastal area of West Bengal and Odisha. All the critical substations were monitored continuously, and generators were advised to be in absorption mode. Necessary guidelines were issued to States to ensure smooth and secured grid operation during this period.

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)

- 4rd LDC Excellence Award ceremony was hosted on 14th December 2024. NERLDC, SLDC-Telangana, SLDC-Himachal Pradesh and SLDC-Mizoram were awardees in RLDCs, Large SLDCs, Medium SLDCs and emerging SLDCs categories respectively.
- 2 A two days' workshop on "Use of State Estimation in Power System Grid Operations" was organized under FOLD for SLDCs & RLDC at NLDC, New Delhi.
- Leadership Development Program - Power Lead at ISB Hyderabad for senior SLDC officials.
- Regulatory and Policy Framework in the Indian Power Sector: Load Despatchers' Perspective in association with the Centre for Energy Regulation, IIT Kanpur.
- Power System Simulator for Engineering (PSSE) training three locations (Delhi, Kolkata and Mumbai) in association with Siemens.
- Multiple programs on Power Operation, Market Operation, Regulatory Affairs, Cybersecurity, and Renewable Energy Integration conducted in collaboration with NPTI.

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 the FY 2024-25, an amount of Rs.165 lakhs has been allocated towards taking up CSR activities. Following activities are under implementation, under CSR, during the FY 2024-25:


- Promoting research and studies in the field related to Power Systems in the engineering institutions to encourage excellence in the area.
- To distribute the ambulance by centrally procuring ambulance at Corporate Centre for delivery to Government hospitals/PHC preferably located at aspirational districts.
- Repair and cleaning work at the designated CTU (Cleanliness Target Unit) i.e. MCD Primary Girls School, Delhi under Swachch Bharat Abhiyan/ Contribution to Swachh Bharat Kosh.
- 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 Background

SJVN Limited, a Navratna, 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) with an aim 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 01.04.2024 was Rs. 125.40/- and Rs. 49280 crore respectively.

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 hydro power, SJVN has ventured into thermal power, wind power, solar power, power transmission and power trading. SJVN has commissioned 50 MW Gujrai Solar Power Project in Uttar Pradesh in Feb, 2024, 100 MW Raghanesda Solar Power Project in Gujarat in April, 2024 and 90 MW Omkareshwar Floating Solar Power Project in Madhya Pradesh in Oct, 2024.

During FY 2024-25 NJHPS, RHPS and NMHPS have generated 6830 MUs, 1905 MUs and 287 MUs respectively up to 31.12.2024. From all other projects, 592 MUs energy has been generated cumulatively up to 31.12.2024 during FY 2024-25.

Presently, SJVN has a total portfolio of ninety-two power projects having 66,207 MW total capacity and three transmission lines of 340 km. Out of this 2,467 MW (12 power projects) and two transmission lines of 123 km are under operation, 4836 MW (16 power projects) and one transmission line of 217 km are under construction, 19 projects totaling 9,167 MW are under Pre-construction Stage, 22 projects including 7 PSPs totaling 17,211 MW are under Survey & Investigation and 23 projects including 5 PSPs totaling 32,527 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
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 2024-25

The Progress made during the year 2024-25 up to 31.12.2024 is as under:

Description	Actual Achievement up to 31.12.24 during the FY24-25	Gross generation during the period 01.01.24 -31.03.24 (Previous FY)	Total projected gross energy generation up to the end of Mar 25	MoU targets for FY 2024-25
Hydro Power (MUs)	9023	774	9797	9245
Wind Power (MUs)	113	21	133	143
Solar Power (MUs)	479	88	687	769
Total	9615	883	10,617	10157

3.0 Achievements and Awards

- Commissioning of 50 MW Gujrai Solar Power Project in Feb, 2024.
- Commissioning of 100 MW Raghanesda Solar Power Project in April, 2024.
- Commissioning of 90 MW Omkareshwar Floating Solar Power Project in Oct, 2024.
- Investment approval of 669 MW Lower HEP by Public Investment Board.
- SJVN is conferred with Navratna status by GOI on 30.08.2024.
- SJVN Limited awarded with First Prize in the prestigious Swachhta Pakhwada Awards 2024 by MoP, GoI for its outstanding performance during the nationwide program "Swachhta Pakhwada 2024"
- SJVN's renewable arm, SJVN Green Energy Limited conferred with 'Diamond Award for Utility Scale Company of Year in PSU Category' in Rajasthan Annual Solar Awards 2024.
- SJVN Limited honored with Gold Award at 16th Exceed CSR Awards 2024 for outstanding achievements in Corporate Social Responsibility in Power (inclusive of Renewables) Sector category.

- SJVN conferred with 'Achievement Award for Creating Social Development & Impact' and 'CIDC Partners in Progress Trophy' during 15th CIDC Vishwakarma Awards.
- SJVN inaugurated India's first Multi-purpose (Combined Heat & Power) Green Hydrogen Pilot Project of 25kW fuel cell capacity at 1500 MW Nathpa Jhakri Hydro Power Station in Himachal Pradesh.
- SJVN honored as Best Workplace in the Energy, Oil and Gas Sector by Great Place to Work™, India.
- SJVN received a Letter of Intent from Government of Mizoram for allotment of 2400 MW Darzo Lui Pumped Storage Project through MOU route on nomination basis.
- SJVN and Rajasthan Renewable Energy Corporation Limited signed an MoU for development of 5GW PSP and 2GW FSP projects in the State.
- SJVN signed two landmark Memorandums of Understandings with Government of Maharashtra for development of Pumped Storage Projects (PSPs) and Floating Solar Projects (FSPs) in the state of Maharashtra.

4.0 Financial Parameters of SJVN

The financial performance of SJVN for the last five financial years is as under: (Rs. in 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 ninety-two 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	Naitwar Mori HPS	Uttarakhand (U.K.)	60
4	Khirvire Wind PP	Maharashtra	47.6
5	Charanka Solar PP	Gujarat	5.6
6	Sadla Wind PP	Gujarat	50
7	Solar PV PP at NJHPS	H.P.	1.3
8	Parasan Solar PP	Uttar Pradesh (U.P.)	75
9	Gurhah Solar PP	U.P.	75
10	Gujrai Solar PP	U.P.	50
11	Raghanesda Solar PP	Gujarat	100
12	Omkareshwar FSP	MP	90
13	400 kV Transmission Line (CPTC-JV-26% share)	Sursand (Nepal border) to Muzaffarpur (Bihar)	86 km
14	Mori Snail Transmission Line	Uttarakhand / HP	37 km
	Sub-Total		2466.50 + 123 km T/L
S. N.	**Project**	**Location**	**Capacity (MW)**
Projects under construction			
15	Arun - 3 HEP	Nepal	900
16	Luhri HEP Stage-1	HP	210
17	Dhaulasidh HEP	HP	66
18	Sunni Dam HEP	HP	382
19	Buxar Thermal PP	Bihar	1320
20	Bagodara Solar Power Project	Gujarat	70
21	CPSU Scheme: Bikaner Solar Power Project (SPP)	Rajasthan	1000
22	PSPCL Solar PP	Punjab	100
23	BBMB Floating Solar PP	H.P	15

24	BBMB Ground Mounted SPP	H.P+Punjab	18
25	GUVNL Phase-XIII Solar Power Project	Gujarat	100
26	GUVNL Phase-XIV Solar Power Project	Gujarat	260
27	GUVNL Phase-XVII Khavda SPP	Gujarat	200
28	Jamui SPP (Phase-I)	Bihar	75
29	Dhubri Solar PP (APDCL)	Assam	70
30	Sonitpur Solar PP (APDCL)	Assam	50
31	Arun-3 Transmission Line	Nepal	217 km
	Sub-Total		4836 MW + 217 km T/L (1 Nos.)
S. N.	**Project**	**Location**	**Capacity (MW)**
Projects under pre-construction			
32	Lower Arun HEP	Nepal	669
33	Jakhol Sankri HEP	Uttarakhand	44
34	Etalin HEP	Arunachal Pradesh	3097
35	Attunli HEP	Arunachal Pradesh	680
36	Banka SPP	Bihar	75
37	Jamui SPP (Phase-II)	Bihar	50
38	MSEDCL Solar PP (Phase-VII)	Maharashtra	200
39	MSEDCL Solar PP (Phase-IX)	Maharashtra	200
40	GUVNL Phase-V WPP	Gujarat	100
41	Wind P P from SECI (Tranche XIII)	Anywhere in India	100
42	Wind Power Project from SECI (Tranche-XIV)	Anywhere in India	200
43	Solar PP from PSPCL	Punjab	200
44	Solar PP from PSPCL	Anywhere in India	1000
45	Solar Power Project (APDCL)	Assam	200
46	RUVNL Solar PP	Rajasthan	100
47	GUVNL Phase-XXII Solar Power Project	Gujarat	200
48	GUVNL Phase-XXI Khavda Solar Park	Gujarat	500
49	GUVNL Phase-XXIII Khavda Solar Park	Gujarat	200
50	Solar Projects in Maharashtra under Mukhya Mantri Saur Krushi Vahini Yojana 2.0	Maharashtra	1352
	Sub-Total	-	9167
S. N.	**Project**	**Location**	**Capacity (MW)**
Projects under survey & investigation			
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	Choo Small HEP	HP	3.5
60	Tindi Small	HP	4.4
61	Emini HEP	Arunachal Pradesh	500
62	Amulin HEP	Arunachal Pradesh	420
63	Mihumdon HEP	Arunachal Pradesh	400
64	Upper Karnali HEP	Nepal	900
65	Unit 3 at Buxar TPP	Bihar	800
	Sub-Total		5490.90
S. N.	**Project**	**Location**	**Capacity (MW)**
Pump Storage Projects (PSPs)			
66	Daizo Lui PSP	Mizoram	2400
67	Kolmondapada PSP	Maharashtra	800
68	Sidgarh PSP	Maharashtra	1500
69	Chornai PSP	Maharashtra	2000
70	Baitarni PSP	Maharashtra	1800
71	Jalvara PSP	Maharashtra	2220
72	Hathidah Durgawati PSP	Bihar	1000
	Sub-Total		11720

Other projects:

Apart from these, MoP identified nine more projects totaling to 1507 MW capacity in Dibang Basin in Arunachal Pradesh for allocation to SJVN. Also projects of 31020 MW are under allotment stages for which MoUs has already been signed with different state Government.

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.

SJVN is actively contributing towards the "#Ek pedh maa ke naam and #Plant4Mother" campaign, launched by Hon'ble Prime Minister on World Environment Day 2024. Under the campaign, a total of 3286 saplings have been planted up to the month of October 2024 and monthly targets have been assigned to various projects to contribute in achieving the campaign's ambitious target of planting 140 crore saplings by March, 2025.

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.

The CSR & Sustainability Budget Plan for FY 2024-25 of SJVN has been approved with a budget outlay of Rs.32.00 Cr. against the statutory requirement of only Rs.28.33 Cr. considering the need to uplift and support the vulnerable groups of society. As on 31.12.2024, budget of Rs. 19.06 crore has been utilized.

The major CSR activities are detailed below:

9.1 Health and hygiene:

- SJVN is providing free medical services through 16 Mobile Medical Units (MMUs) in the states of Himachal Pradesh, Uttrakhand, Uttar Pradesh, Bihar, Gujarat and Maharashtra. So far more than Rs. 15.00 lakh persons have been benefitted.
- Financial support of Rs. 24.57 lakh released out of total sanctioned amount of Rs. 98.20 Lakh for running of 03 MMUs for one year in remote areas of district Hamirpur, Mandi of Himachal Pradesh.
- SJVN has adopted aspirational district Chamba (HP) for carrying out theme-based CSR works and so far, an amount of Rs. 8.54 crore has been spent. Further, in FY 2024-25, SJVN has sanctioned Rs. 4.76 Crore for implementing the project on reducing malnutrition in children of Distt. Chamba, out of which Rs 1.27 Crore has been released.
- SJVN has observed 'Swachhta Hi Sewa' and 'Swachhta Pakhwara' in which the message on Swachhta was disseminated amongst the masses and amount of Rs.30.00 Lakh has been spent on various swachhta campaign related activities.
- Financial support of Rs.29.82 Lakh was provided for construction of public toilets at Choudhary Adda, Old Bus Stand at Rampur Bushahar, Distt. Shimla (HP).
- 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 TB patients of 10 blocks of Distt. Shimla.
- Financial support of Rs.80.00 Lakh released for establishment of world class water sport academy at Tihri, Uttarakhand in association with THDC.
- Financial support of Rs.175.99 Lakh out of total sanctioned amount of Rs.219.99 Lakh provided to Sai Nursing Institute, Goa for construction of building.
- Financial assistance of Rs. 370 Lakh has been released against the sanctioned amount of Rs. 387 Lakh for construction of Senior Citizen Home "Vishranti" at VMRI Palampur, Distt. Kangra (HP).
- Financial support of Rs. 14.00 Lakh has been provided for running, setting up of a Dental Clinic, Physiotherapy Centre & X-ray facility in Project Hospital, Bayal for locals in FY 2024-2025. Out of the total sanctioned amount,

Rs. 7.31 lakh has been released. So far 22,463 persons have benefited.

9.2 Education and Skill development programs:

The following programs have been carried out under the head:

- Training on latest farming/ seeding techniques, organic farming and promotion millets conducted through Him Natural and Organic Farming Society Rampur benefitting 111 local farmers.
- 29 candidates have been nominated for getting vocational training in Govt. ITIs. Besides the tuition fees, a stipend of Rs.2000/- per month are being paid to these sponsored students.
- SJVN is providing financial support of Rs. 1 crore each to five Govt. ITIs of H.P. out of which work in 3 ITIs has been completed and in remaining ITIs the work is under progress. So far Rs.5 crore has been released to respective ITIs.
- Silver Jubilee Merit Scholarship scheme in the state of HP, Uttrakhand, Bihar and Arunachal Pradesh for 110 candidates has been implemented. So far 1995 candidates have been benefitted.
- Financial support of Rs.27.00 Lakh provided to RKMV, Shimla for establishment of Conference Hall, out of total sanctioned amount Rs.30.00 Lakh.
- Financial support of Rs. 75.00 Lakh out of total sanctioned amount of Rs.100.00 Lakh provided to Jan Kalyan Shiksha Samiti, New Delhi for construction of 1st floor of girls hostel.
- Financial support of Rs. 22.17 Lakh out of the total sanctioned amount of Rs.26.88 Lakh provided to GP, Ponda, Nichar Distt. Kinnaur HP for extension of playground at GHS, Kango.
- Financial support of Rs. 36.26 Lakh out of the total sanctioned amount of Rs. 40.29 Lakh provided to the School Management Committee, Saraswati Vidya Mandir, Jangla for Construction of 1st & 2nd floor over the already existing ground floor of Saraswati Vidya Mandir Jangla, Tehsil, Chirgaon, Distt,. Shimla (HP).

9.3 Sustainable Development:

- Water supply scheme at village Neether (HP) with financial implication of Rs.800 Lakh.
- Water Irrigation Project of Rs.1393.94 Lakh is being implementing in the village Neerath, Distt. Shimla. So far 650 Lakh has been utilized.
- Drinking water supply scheme is being implemented at a cost of Rs. 16.38 Lakh in project area of NMHPS from Pattigaad to Bainol out of which Rs.13.11 Lakh has been spent.
- Financial support of Rs.79.88 Lakh was provided for installation of 500 solar lights in Siddharthnagar (UP), out of total sanctioned amount of Rs.99.85 lakh.
- Financial assistance of Rs 17.10 Lakhs provided for procurement of 01 solar vehicle charging station at Baga Sarahan to promote Eco Tourism in Anni Forest Division.
- Installation of (03) Nos. High Mast Light of the project affected areas of Buxar Thermal Project places such as Akhouipur Gola and Mahadeva Ghat/Shamshaan Ghat & Yadav M at Chausa.

9.4 Preservation & promotion of culture and sports:

- MOU has been signed with Shree Badrinath Utthan Charitable Trust (UK) for Rs.11.99 crore towards Lake Front Development (Sheshnetra Lake). The work has been completed at a cost of Rs.1165 Lakh.
- Further, MOU has been signed with Shree Kedarnath Utthan Charitable Trust (UK) for providing financial support of Rs.1000 lakh for Pilgrim Accommodation Block at Kedarnath Dham. So far Rs.600 Lakh has been released.
- Financial support of Rs.10.00 Lakh provided for construction of Shiv Mandir at Kadharan, Shimla.
- Financial support of Rs.13.98 Lakhs released against the sanctioned amount of Rs.34.96 Lakh for renovation of Ashutosh Shiv Temple in New Shimla.
- 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. Renovation of Shri Parshuram Temple complex, Tehsil Nirmand, Distt. Kullu (HP) has been completed at a cost of Rs. 29.12 Lakh.
- Financial support of Rs. 25 Lakh to Shree Mahakali Deondar Temple, Chopal, Rs.15 Lakh for celebration of International Kullu Dussehra Festival-2024.
- Financial support of Rs. 30.26 Lakhs released against the sanctioned amount of Rs. 43.22 Lakhs for development of tourist facilitation centre at Rukslang in Kinnaur, H.P.
- Financial support of Rs. 44.06 Lakh has been extended for construction of Satsang Bhawan at Dhaulasidh Temple in Hamirpur (HP).
- Financial support of Rs. 9.76 Lakh has been released against the sanctioned amount of Rs. 42.60 Lakhs for construction of Dhaulasidh Temple in Hamirpur, (HP).
- Financial support of Rs. 5.00 Lakhs released against sanctioned amount of Rs.10 Lakh for development of Gym and sports equipment in Sports and Cultural Club, Sandhol (HP).

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.2,000/- of nutritional food items, soaps and other hygiene related items is also given. So far 1158 women have been benefited.

- SJVN has sanctioned financial support of Rs.8.28 crore to Department of Social Justice & Empowerment (SCs, STs & OBCs) to the Govt. of HP for construction of School-cum-Home for speech, hearing and visually impaired special children at Dhalli, Shimla (HP). Payments are released in installments. So far Rs. 6.66 crore has been released.

9.6 Assistance to the victims of natural disasters/ calamities/ pandemic contributions towards Relief Funds:

Financial support of Rs.1.12 Lakh for purchase of 68 No. blankets distributed to the victims of flash flood at village Samej of GP, Sargha & Sarpara, Kedas of GP Twar, Bagipul of GP, Sarahan, Kanrad of GP, Kushwa and village Pokhni, Aachwa, Nardi of Gram Panchayat Gadej, which occurred during mid night of 31.07.2024.

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, 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.

Memorandum of Agreement (MoA) was signed between SJVN Limited and Government of Maharashtra for executing five Pumped Storage Projects of total capacity of 8100 MW and one 505 MW Floating Solar Project at Lower Wardha Dam in Maharashtra.

Courtesy meet with Hon'ble Minister of Power, Sh. Manohar Lal, Secretary Power, Sh. Pankaj Agarwal and Joint Secretary (Hydro), Sh. Mohammad Afzal on momentous occasion of SJVN Limited having been granted prestigious Navratna status.

Sh. Tarun Kapoor, Advisor to the Prime Minister, Govt. of India, visited SJVN Pavilion at 4th Global #REINVEST2024 in Gujarat.

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 20.11.2024 for the students of the schools in Himachal Pradesh.

Shri Mohammad Afzal, Joint Secretary, Ministry of Power, Government of India with SJVN CMD Shri Raj Kumar Chaudhary and Director (Personnel) Shri Ajay Kumar Sharma visited SJVN's 1500 MW Nathpa Jhakri Hydro Power Station and Corporate Headquarters in Shimla.

CHAPTER 22

THDC INDIA LTD.

Background

THDC India Limited is a Mini Ratna schedule "A" Public Sector Enterprise registered in July'1988 under the Companies Act, 1956.

The Equity of company was earlier shared between Govt. of India and Govt. of Uttar Pradesh. After Strategic Sale in March, 2020, equity in THDCIL is shared between NTPC Ltd. and Govt. of UP in a ratio of 74.5% and 25.5%.

The Authorized Share Capital of the Company is ₹ 4000 Cr and paid-up capital as on 31st Dec '2024 is ₹ 3665.88 Cr. THDCIL is a profit-making company since 2006-07 with the commercial operation of its maiden project i.e. Tehri HPP (1000 MW).

THDCIL was constituted with the sole objective to develop, operate & maintain the 2400 MW Tehri Hydro Power Complex, and other Hydro projects in Uttrakhand. However, THDCIL hasnow expanded its horizons and has fully diversified in all types of conventional and non-conventional forms of energy.

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 at office complex, Rishikesh, Uttarakhand.

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 in Distt. Tehri, Uttarakhand	1,000 MW	2006-07
2.	Koteshwar Hydro Electric Plant in Distt. Tehri, Uttarakhand	400 MW	2011-12
3.	Patan Wind Power Plant, Distt. Patan, Gujarat	50 MW	2016-17
4.	Devbhumi Dwarka Wind Power Plant, Distt. Devbhumi Dwarka, Gujarat	63 MW	2016-17
5.	Dhukwan Small Hydro Plant in Jhansi, Uttar Pradesh	24 MW	2019-20
6.	Kasaragod Solar Power Plant, Distt. Kasaragod, Kerela	50 MW	2020-21

THDCIL also has one coal mine with a capacity 5.6 MTPA under operation (Amelia Coal Mine, Madhya Pradesh).

2. Power Projects under Construction:

Presently, THDCIL has 04 under construction projects with a total installed capacity of 2,775 MW.

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.	Floating Solar Power Plant on Raw Water Reservoir in Khurja STPP.	11 MW	Distt. Bulandshahr, Uttar Pradesh

3. Joint Venture (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 by TUSCO.

- **Development of 10000 MW Solar Parks in Rajasthan through JV:**

  'TREDCO Rajasthan Ltd.', a joint venture between THDCIL and RRECL (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.

- **HEPs in Uttarakhand through JV:**

  THDCIL-UJVNL Energy Company Limited (TUECO Ltd.), a joint venture between THDCIL and UJVN Ltd. was incorporated in Dec '2023 for the development of potential HEPs and PSPs in the State of Uttarakhand.

PROGRESS OF ONGOING PROJECTS

Tehri Pump Storage Plant (PSP) (4X250 MW)

Tehri PSP (Pumped Storage Plant) is an under construction hydroelectric power generation project located in Tehri district of Uttarakhand state in India. It is the first pumped storage plant in the country by the Central Sector and has a capacity of 1,000 MW, with four units of 250 MW each.

Synchronization of Unit-1 of 250 MW to the Grid in Generator mode achieved on 19.11.2024. Unit commissioning is targeted by the end of March '25.

Cold commissioning activities of Unit-2 of 250 MW completed on 25.11.2024 and Unit commissioning is targeted by end of Mar '25. Commissioning of balance two units of 250 MW each is targeted by Jun '25.

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.

Dam excavation work is in advanced stage and concreting work is in progress. HRT construction by both TBM and DBM is in progress. In Power House, erection of Draft Tube Liner in U-1 & 2 completed. Casting of columns and beams for crane beam is in progress.

Project is targeted to be commissioned during 2026-27.

Khurja STPP (2X660 MW)

Unit-1 successfully synchronized with National Grid on 28.10.24 on coal and full load operation achieved on 04.12.24. COD is targeted during Jan-25. Unit-2 boiler hydro test successfully conducted and Boiler Light up & steam blowing is targeted by mid of Feb-25. Unit-2 commissioning is targeted by Mar-25.

Common components like Switchyard, Power Evacuation system, Aux. Boiler, FOPH, Wagon Tippler, SR-1, DM water Plant, CW system, Ash Dyke, CHP, Railway Siding, FGD, AHP etc. are ready for COD of Unit-1; other facilities like Chimney, Cooling Tower, ESP, balance works of FGD, AHP etc. for Unit-2 are at various stages of completion.

Amelia Coal Mine

To meet fuel requirement of the Khurja STPP, Ministry of Coal, GoI has issued Allotment Order of Amelia Coal Mine to THDCIL in Jan '17. Coal production from the Mine started in Feb-2023 against the schedule of Aug-2023.

Since end user plant of Aemila Coal Mine i.e. Khurja STPP is under final stage of commissioning, the produced coal is being supplied to various power plants of NTPC.

OPERATIONAL PERFORMANCE:

Operational performance of THDCIL Plants in reference to Cummulative Design Energy of 4404 MU 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

During the period 01.01.2024 to 31.03.2024, THDCIL achieved generationof 1041.87MU. Further, during FY 2024-25, THDCIL has generated 3784 MU upto December, 2024 and expected generation from 06 operational plants during the period 01.01.2025 to 31.03.2025 is 921 MU.

Cumulative Generation from all Operational Power Plants of THDCIL always exceeds the Cumulative Design Energy of the Power Plants.

FINANCIAL PERFORMANCE:

Revenue from operation of THDCIL during the period 01.01.2024 to 31.12.2024 is ₹ 2108.26 crore and expected revenue from operation of during the period 01.01.2025 to 31.03.2025 is ₹595.91 crore.

Financial Performance of THDCIL during last 05 years:

(₹ in Cr.)

F.Y.	CAPEX Achieved	Revenue from Operation	Dividend Paid	MoU Rating
2019-20	1480.19	2123.10	126.00	Very Good
2020-21	1990.13	1796.01	707.75	Very Good
2021-22	3232.51	1921.49	508.20	Excellent
2022-23	4615.02	1974.30	547.94	Very Good
2023-24	5168.69	1967.24	471.44	Very Good
2023-24	5168.68	1967.24	471.44	-

During the period 01.01.2024 to 31.03.2024, THDCIL achieved a CAPEX of ₹1644.38 crore. During FY 2024-25, THDCIL has achieved Capex of ₹3648.71 upto December, 2024 and expected CAPEX for the period 01.01.2025 to 31.03.2025 is ₹ 2165.63 crore.

Future Vision of the Company:

- ### Power Projects in Karnataka:

  THDCIL has signed MoUs with Karnataka Power Corporation Limited (KPCL) and Karnataka Renewable Energy Development Limited (KREDL) on 09.11.23 for a diverse range of renewable energy projects including Varahi PSP of 1500 MW. Implementation of 100.1 MWac / 135.2 MWp Ground Mounted Solar PV Project in the Premises of KPCL Thermal Plants has been taken up. Work of DPR preparation for 100 MW Floating Solar PV Plant at Kadra Dam is in advance stage.

- ### Power Projects in Arunachal Pradesh:

  Memorandum of Agreement (MoA) for the implementation of the 1200 MW Kalai-II Hydro Electric Project in the Anjaw District of Arunachal Pradesh has

been signed between GoAR (Govt. of Arunachal Pradesh) and THDCIL in December, 2023.

In addition to above, THDCIL is also pursuing for development of 03 Hydro Electric Projects in the Lohit Basin totaling to around 2700 MW in Arunachal Pradesh.

- **Power Projects in Maharashtra:**

THDCIL has signed a Memorandum of Understanding (MoU) with Water Resources Department, Govt. of Maharashtra (GoMWRD) on 03.09.2024, for S&I and preparation of DPR and further establishment of 06 Nos. PSPs having total capacity of 6790 MW.

THDCIL has also signed a Memorandum of Understanding (MoU) with MREL, Maharashtra on 26.09.2024 for the development of self-identified PSPs and other RE projects in Maharashtra State under a Joint Venture with MREL.

- **Projects in Chhattisgarh State:**

THDCIL is actively pursuing 2 PSPs namely, Rouni PSP (2100 MW) and Dangari PSP (1400 MW) both located in Jashpur District, Chhattisgarh for development through a JV mode.

- **Projects in Rajasthan State:**

THDCIL has signed MoU with Govt. of Rajasthan on 29.09.2024 for Bisanpura PSP (800 MW) in Bundi District, Rajasthan and Rampura PSP (800 MW) in Tonk District, Rajasthan with intent to establish these projects. PFR is under preparation for these projects.

- **Floating Solar Power Projects/ PSP in Uttar Pradesh (Through TUSCO Ltd.):**

After completion of PFR, DPRs of three projects having total capacity of 464 MW have been prepared and being pursued with GoUP for allocation of these projects.

In addition, THDCIL is also developing 1200 MW PSP in Sonbhadra District through its JV company TUSCO limited. In-principle Approval has been received from Government of Uttar Pradesh.

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 (Flexible operation of thermal Generating Units) Regulations, 2023	25.01.2023

B. Notified Amendmentsin 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

C. Repealed Reguletions:

The following regulations have been repealed:

Sl. No.	Regulation	Repealed with effect from
1	Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010	27.12.2022
2	Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010	08.06.2023

D. Proposed Principal/Amendment Regulations:

During 2024-25, the following regulation / amendments have been proposed:

Sl. No.	Regulation	Principal/ Amendment
1	Central Electricity Authority (Cyber Security in Power Sector) Regulations, 2025	Proposed Principal Regulation
2	CEA (Procedure of Transaction of Business) (**1st Amendment**) Regulations, 2025	Proposed Amendment

Draft Amendment to Central Electricity Authority (Installation and Operation of Meters) Regulations is being taken up for facilitating metering arrangement for Green Energy Open Access consumers at LT level as per notified Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 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. MAJOR ACTIVITIES DURING THE YEAR 2024-25 (UPTO 31 December 2024)

A. Major Regulations Notified

a. Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024.

The Commission notified the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 on 12.06.2024 which became effective from 01.07.2024. The Control Period of the Regulations will be from 01.07.2024 to 31.03.2027. The main objective of the Regulation is to specify terms and conditions for determining the tariff of the grid interactive power projects based on Renewable Energy (RE) sources, and are covered under Section 62 read with Section 79 of the Act, through transparent and participative process.

i. The generic tariff will be determined by the CERC on an annual basis for the Small hydro project, Biomass power project with Rankine cycle technology, Non-fossil fuel based co-generation project, Biomass gasifier based power project, Biogas based power project and Refuse Derived Fuel based Municipal Solid Waste power projects

ii. The generic tariff will be determined on a levelized basis, considering the year of commissioning of the project, for the tariff period of the project. For RE projects having a single part tariff with two components, the fixed cost component will be determined on a levelized basis considering the year of commissioning of the project while the fuel cost component will be determined on a year of operation basis in the Tariff Order to be issued by the Commission.

iii. The Financial parameters for the RE projects under the RE Tariff Regulations, 2024 are as follows:

(a) **Debt: Equity Ratio** is considered at 70:30. For project specific tariff, equity in excess of 30% will be treated as normative loan and where equity actually deployed is less than 30% of the capital cost, the actual equity will be considered.

(b) **Return on Equity (RoE):** The normative RoE of 14% for RE projects (except small hydro projects) and 15% for small hydro projects.

(c) **Loan Terms:** 15-year loan tenure, with interest rates based on the average State Bank of India MCLR (1-year tenor) for the last 6 months, plus 200 basis points.

(d) **Depreciation:** 4.67% per annum for the first 15 years, with remaining depreciation spread over the project's useful life.

(e) **Interest Rate on Working Capital:** Based on the average SBI MCLR (1-year tenor) for the last 6 months, plus 325 basis points.

(f) **O&M Expenses:** Normative O&M expenses for the first year of the control period, with a 5.25% annual escalation.

iv. The RE Tariff Regulations, 2024 also specifies Technology Specific Parameters such as Capacity Utilization Factor/Plant Load factor, Auxiliary Consumption, Fuel related parameters such as calorific value, Station Heat Rate and State wise Fuel Cost.

b. Central Electricity Regulatory Commission (Procedure, Terms and Conditions for grant of Transmission Licence and other related matters) Regulations, 2024.

The Commission issued the Central Electricity Regulatory Commission (Procedure, Terms and Conditions for grant of Transmission Licence and other related matters) Regulations, 2023 on 23.05.2024.Following are the key features of the Regulations:

i. The timelines involved in multiple steps in the grant of the licence have been reduced for expeditious disposal of Transmission licence petitions.

ii. A licensee which has been granted licence for development of the Transmission system through TBCB, on allotment of any other Transmission System through TBCB in Project mode (but not in SPV mode) may seek amendment in its existing Licence to include the additional Transmission System. Similarly, a licensee which has been granted Licence for development of the Transmission system in RTM mode, after allotment of any other project may seek amendment in its existing Licence to add the additional Transmission System.

iii. A distribution license or a bulk consumer is not required to seek licence for developing, maintaining and operating the transmission line for connecting its system with the inter State transmission system.

iv. The licence of a transmission licensee covered under Section 62 of the Act, on completion of 25 years from the date of issuance of the licence, shall stand automatically renewed for another period of 25 years at a time. However, the licensee may seek renewal of the license for a period less than 25 years by making an application before the Commission.

v. Further, the transmission licensee covered under Section 63 of the Act for renewal of licence beyond 25 years shall make an application before the Commission, two years before the expiry of the initial period of licence.

vi. For transmission projects developed under competitive bidding guidelines issued by the MoP vide letter dated 13.04.2006, the tariff for the extended period which was not quoted under bidding, shall be decided by the Commission.

vii. The Projects being developed under competitive bidding guidelines issued by the MoP vide letter dated 10.08.2021, shall be governed in terms of the said guidelines

viii. In case the transmission elements of a licensee under TBCB are required to be modified or reconfigured due to the transmission plan of CTU, the additional financial implications for the same, shall be borne by the licensee to whom the modification or reconfiguration work is assigned, without affecting the transmission charges of the original licensee.

c. Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State transmission System) (Second Amendment) Regulations, 2024.

The Commission issued the Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) (Second Amendment) Regulations, 2024 on 19.06.2024. Following are the salient features of the GNA Second Amendment Regulations, 2024:

i. Definition of Renewable Energy Implementing Agency or REIA has been incorporated.

ii. Amendments in respect of the Connectivity Application

a. Scrutiny of application for grant of Connectivity or grant of GNA

b. State Government Order for allotment of land accompanied with Advance Possession letter in the name of Applicant of Connectivity have been included as a valid document against land use rights.

c. Application for grant of Connectivity based on the submission of Bank Guarantee in lieu of the land document - Bank Guarantee of Rs. 10 lakh/ MW shall be applicable for seeking Connectivity up to the capacity of 1000MW and Bank Guarantee of Rs. 100 Crore plus Rs. 5 lakh/MW shall be applicable for seeking Connectivity for capacity over and above 1000MW.

d. The timeline for intimation of in-principle grant of Connectivity by the Nodal Agency has been increased by 30 days.

iii. Submission of documents of intermediate milestones by the Applicant

a. Timeline to submit land documents for applicants under Bank Guarantee route has been increased as within 18 months of issuance of an in-principle grant

of Connectivity or within 12 months of issuance of a final grant of Connectivity, whichever is earlier.

b. Financial closure has to be achieved by the applicant latest by 6 months prior to the scheduled date of a commercial operation or start date of Connectivity of such applicant, whichever is later.

c. In case the Connectivity grantee fails to achieve the financial closure within the stipulated time, the BG submitted in lieu of land shall be encashed.

iv. Conversion of Connectivity from LoA route (under clause (xi)(a) of Regulation 5.8) to Land route (under clause (xi)(b) of Regulation 5.8) or Land BG route (under clause (xi)(c) of Regulation 5.8)

d. Central Electricity Regulatory Commission (Fees and Charges of Regional Load Despatch Centre and other related matters) Regulations, 2024.

The Central Electricity Regulatory Commission (Fees and Charges of Regional Load Despatch Centre and other related matters) Regulations, 2024 were issued on 12.07.2024. The RLDC Fee and Charges Regulations, 2024, mainly has the following parts:

i. **Capital Expenditure (CAPEX):** The RLDCs and NLDC will formulate the plan for capital expenditure (CAPEX plan) for the creation of new assets during the control period duly approved by the Board of Directors of Grid-India. The Commission will allow the CAPEX after prudence check.

ii. **Annual LDC Charges:** There are six components of Annual Load Despatch Centre (LDC) Charges, i.e. return on equity, Interest on loan capital, Depreciation, Operation & maintenance (O&M) expenses, Human Resources expenses and Interest on working capital (IOWC).

iii. **Registration of users:** The user of the RLDC/ NLDC shall have to do registration with RLDC or NLDC, as applicable by paying the applicable registration fee.

iv. **Recovery of Fees and Charges:** The Annual LDC charges shall levied equitably among the following three categories of users in the ratio 1/3 :1/3: 1/3:

a. Inter-State transmission licensees based on the circuit kilometers (ckt- km) of the lines and MVA capacity of substation owned by inter-State transmission licensees.

b. Regional entity generating station, regional entity captive generating plant, and regional entity standalone storage system based on the installed capacity and Sellers and SNA (for the purpose of injection into the Indian grid) based on the GNA granted to such entities.

c. Distribution licensees, regional entity bulk consumers, SNA (for the purpose of a drawl from the Indian grid), and buyers based on the GNA granted to such entities.

v. **Load Despatch Centre Development Fund (LDCD Fund):** The provision of LDCD Fund, as under the RLDC Fee and Charges Regulations, 2019, has been continued under the RLDC Fee and Charges Regulations, 2024 with certain changes.

vi. **Performance Linked Incentive (PLI):** The provision of PLI was introduced in the RLDC fees and Charges Regulations to cater to the PRP requirements of Grid-India under DPE Guidelines. The earlier provision of incentive @15% of Annual LDC charges for an aggregate performance level of 90% have been changed as @12% of Annual LDC charges, with an increase of 1% for every 5% increase of performance above 90% and a reduction of 1% on pro-rata basis for every 3% decrease in performance level below 90%.

vii. **Incentive for acquiring Certification:** The earlier provision for granting incentive for acquiring the Certification to the employees of RLDCs and NLDC has been continued with certain changes for acquiring as well as on renewing of such certification. However, there shall be One time incentive for acquiring the Certification to the employees of RLDCs and NLDC as well as on renewing of such certification, in place of giving monthly incentive (as was in RLDC Fee and Charges Regulations, 2019).

viii. **Key Performance Indicators (KPI) for determination of PLI:** The performance of the RLDC and NLDC are being assessed based on the achievement of the target against the KPI and accordingly the PLI is allowed. Following five KPI parameters have been provisioned for the evaluation of the performance of the LDCs for the year 2024-25, those being Ensuring Grid Reliability, Regulatory Compliance and Stakeholder's satisfaction, Internal processes, Grid Operation and Market functions and Learning & growth.

ix. **Late payment surcharge:** Provision for late payment surcharge has been included referring to the MoP-LPS Rules.

x. **Payment Security Mechanism (PSM):** To ensure payment discipline regulation of the scheduling of supply of electricity to the defaulting entity has been included under the RLDC Fee and Charges Regulations 2024.

e. Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2024.

The Commission notified the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2024 on 05.08.2024. The objective of these regulations is to provide a commercial mechanism to ensure that grid users do


not deviate from and adhere to their schedule of drawal and injection of electricity in the interest of security and stability of the grid. The regulations will be applicable for all grid-connected regional entities and other entities engaged in the inter-state sale and purchase of electricity.

i. These Regulations provide charges for deviation for the grid connected entities such as general sellers, run-of-river hydro generating stations, wind and solar generating stations, etc. Charges for deviation will be receivable for over injection by a seller or under drawl by a buyer, while payable for under injection by a seller or over drawl by a buyer. For Buyers, the deviation charges are graded within the operative frequency band i.e. 49.90 Hz to 50.05 Hz. For General Sellers, a dead band of 49.97 Hz to 50.03 Hz is provided to factor in deviation due to governor action, and then the deviation charges are graded within the operative frequency band i.e. 49.90 Hz to 50.05 Hz. However, beyond the operative band, the deviation charges are kept flat irrespective of frequency. Further, graded deviation charges are limited to the initial volume limit of respective buyers and sellers, beyond which the charges are proposed in such a way that any further deviation will be discouraged to promote participation of such entities in the Ancillary Services Mechanism instead of relying on the grid.

ii. These Regulations have also specified treatment of deviation for the Energy Storage system (ESS) for both, standalone as well as co-located with WS Sellers. The Deviation charges applicable to a Standalone Energy Storage System are equivalent to those for a general seller, while for a standalone PSP system, during charging mode, it will be treated at par with WS Seller for the period from commencement of the regulations till 31.03.2026.

iii. For ESS co-located with WS seller at the same interconnection point, ESS will be treated at par with WS seller during the period solar or wind or hybrid generating station is injecting power, while for the period when only ESS component is injecting or ESS is drawing power from the grid, it will be treated at par with a standalone ESS system.

iv. The 'Deviation' formula is defined for the for WS seller such that till 31.03.2026, deviation in a time block for WS sellers shall be computed as 'Deviation-WS seller (DWS) (in %) = 100 x [(Actual Injection in MWh) – (Scheduled generation in MWh)] / [(Available Capacity)]', and for the period from 01.04.2026 onwards, Deviation-WS seller (DWS) (in %) = 100 x [(Actual Injection in MWh) – (Scheduled generation in MWh)] / [(X% of Available Capacity) + (100 - X) % of Scheduled Generation): Provided 'X' will be stipulated by the Commission through separate order(s) after public consultation.

v. The Normal Rate of Charges for deviation has been specified as highest of (i) weighted average ACP of I-DAM, or (ii) weighted average ACP of RTM or (iii) sum of 1/3[weighted average ACP of I-DAM], 1/3 [weighted average ACP of RTM], 1/3 [Ancillary Service Charge (in paise/kWh) computed based on the total quantum of Ancillary Services (SRAS UP and TRAS UP) deployed and the net charges payable to the Ancillary Service Providers for all the Regions].

vi. Further, if there is a shortfall in the Deviation and Ancillary Service Pool Account of one region, any surplus funds in the DSM accounts of other regions will be used for settlement of payments. However, if the surplus in other regions is not sufficient, the remaining balance amount will be collected from the drawee Designated ISTS Customers (DICs). Until March 31, 2026, this collection will be based on their drawl at the regional periphery and their GNA, with equal weightage of (50:50). From April 1, 2026, it will be based on the shortfall of reserves allocated by NLDC to these DICs, following a detailed procedure approved by the Commission.

f. Central Electricity Regulatory Commission (Indian Electricity Grid Code) (First Amendment) Regulations, 2024.

The Commission notified the Central Electricity Regulatory Commission (Indian Electricity Grid Code) (First Amendment) Regulations, 2024, on 23.10.2024. The following provisions have been incorporated under the first amendment to the Grid Code:

i. In case of Pumped Storage Plant, if it is not possible to demonstrate the design capabilities up to the rated water drawing levels due to insufficient reservoir levels, the COD may be declared after demonstrating the capabilities at available water drawing levels subject to the condition that the same shall be demonstrated immediately when the sufficient reservoir level is available after COD.

ii. The generating station, whose tariff is determined under Section 62 of the Act, may sell its un-requisitioned surplus power in the Day Ahead Market without the consent of the beneficiary.

iii. Generating station (other than lignite, gas based thermal generating station, and hydro generating station) or ESS shall be allowed a maximum of 4 revisions of Declared Capacity and schedule per day subject to a maximum of 60 revisions during a month, due to reasons such as a partial outage or any other technical reason.

iv. The generating station based on lignite, gas, or hydro generating station shall be allowed 6 revisions of Declared Capacity and schedule in a day subject to a maximum of 120 revisions during a month, due to reasons such as partial outage of the unit or any other technical reason.

v. On declaration of commercial operation date, scheduling of the generating station or unit thereof, shall start from 0000 hours of D+2 (where D is the date when a generating station intimates the commercial operation of the generating station or unit thereof)" or the commercial operation date declared by the generating station or unit thereof, whichever is later.

vi. Injection of infirm power shall not exceed 45 days from the date of first-time energization and integration (FTC) approval for REGS and ESS (except Hydro PSP ESS).

vii. The thermal generating stations whose tariffs are determined under Section 62 of the Act by the Commission, shall be compensated for part load operation as per the provisions of applicable Tariff Regulations.

viii. The downward revision of schedules by the buyers for 'D' day, after 1430 hrs on 'D-1' day in the generating station is permissible only for beneficiaries which have scheduled above their respective share of minimum turndown level in the generating station subject to the condition that the downward revision by such beneficiaries shall be permissible limited to a quantum such that overall schedule of the generating station is at least at Minimum turndown level.

ix. In case a regional entity generating station, whose tariff is determined under Section 62 of the Act, schedules below minimum turndown level (MTL) for Off- Peak hours of the day when schedules are above minimum turndown level for Peak hours of the day shall be adjusted through SCED with payment of differential amount by the entity which caused schedule below MTL.

g. Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) (First Amendment) Regulations, 2024.

The Central Electricity Regulatory Commission notified the CERC (Deviation Settlement and Related Matters) (First Amendment) Regulations, 2024 on 17.12.2024 which became effective from 23.12.2024.

i. In the Amended Regulations, the definition of 'Available Capacity' (AvC) for wind and solar (WS) sellers is clarified to be limited to the quantum of connectivity granted, ensuring that power evacuation does not exceed the granted connectivity. Additionally, the definitions of 'contract rate' and 'reference charge rate' is updated to include sale of power through open access to a third party, which was previously excluded.

ii. The Amended Regulation also specifies that charges for the injection of infirm power will be zero unless scheduled after a trial run. Additional provision is added wherein the charges for deviation of scheduled infirm power by way of over injection will be zero when system frequency exceeds 50.05Hz.

B. Inter-State Trading License

By the end of 2023-24, there were 60 inter-state trading licensees. 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[1]. During the FY 2024-25 (up to September 2024), the total volume of electricity transacted through trading licensees is 21.83 BU (provisional).

C. 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 by the Commission through Order dated 27th June 2022 and commenced its operations on 6th July 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 significantly from 7.19 BU in 2009-10 to 121.49 BU in 2023-24. During the FY 2024-25 (up to September 2024), the total volume of electricity transacted through Power Exchanges is 70.55 BU (provisional).

The Commission, vide Order dated 6th February 2024 in Petition No. 1/SM/2024, decided to implement a Shadow Pilot on Power System and Cost Optimization through Market Coupling. The Commission, inter-alia, directed Grid-India as under:

(i) Develop the necessary software as required for running the shadow pilot for coupling of RTM of the three power exchanges as well as coupling of RTM & SCED, and for coupling of DAM of the three power exchanges.

(ii) Implement the shadow pilot of coupling (a) RTM of the three power exchanges (b) RTM and SCED and (c) DAM of the three power exchanges, for a period of four months after the development of the necessary software.

[1] With change in the regime on implementation of GNA Regulations from 1st October 2023, the volume here is not strictly comparable to the volumes in previous years.

The Commission, vide Order dated 23rd May 2024 in Petition No. 3/SM/2024, decided to increase the block bid limit to 400 MW in the Day-Ahead Market for thermal generators only. The directions are aimed to provide a facilitative framework for the large thermal power plants to enhance their participation in the market so as to meet the increasing demand.

D. Power Market Monitoring

A well-functioning electricity market requires an effective market monitoring process. As part of the electricity market monitoring, the Central Electricity Regulatory Commission (CERC) has been regularly publishing 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.

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, and trading of Renewable Energy Certificates on Power exchanges. As per the 'Report on Short-term Power Market in India: 2023-24', the volume of short-term transaction of electricity was 218.22 BU in 2023-24.

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 1st April 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 31st March 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.

d. The Commission, vide Suo Moto Order(Petition No. 2/SM/2024) dated 21st February 2024, took a number of measures to ensure probity and transparency in market operation. The Commission issued directions to the power exchanges for immediate discontinuation of manual entry of bids, cancellation of bids after-market hours, entry of bids after-market hours, and extension of market hours. Power exchanges were also directed to build a robust system with end-to-end encryption of data from the trading workstation of the respective member/clients to the trading platform of the power exchange to ensure that the entire trail of the bidding session starting from bid submission till the end of bidding session is encrypted.

E. Draft Regulations/Discussion Papers

i. Draft Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) (Third Amendment) Regulations, 2024 published on 31.07.2024.

ii. Draft Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (First Amendment) Regulations, 2024 published on 02.08.2024.

iii. Draft Central Electricity Regulatory Commission (Conduct of Business) (First Amendment) Regulations, 2024 published on 27.08.2024.

iv. Draft Central Electricity Regulatory Commission (Appointment of Consultants) (Fifth Amendment) Regulations, 2024 published on 27.08.2024.

v. Draft Central Electricity Regulatory Commission (Sharing of inter State Transmission Charges and Losses) (Fourth Amendment) Regulations, 2024 published on 09.10.2024.

vi. Draft Central Electricity Regulatory Commission (Terms and Conditions for Purchase and Sale of Carbon Credit Certificates) Regulations, 2024 published on 13.11.2024.

vii. Draft Central Electricity Regulatory Commission (Terms and Conditions for Purchase and Sale of Carbon Credit Certificates) Regulations, 2024 published on 13.12.2024.

viii. Staff Paper on "Regulatory Oversight on Bidding Behaviour in Power Exchanges"- published on 4.05.2024.

ix. Staff Paper on "Methodology for Transition from Six-Monthly Escalation Rates to Monthly Escalation Rates for Imported Coal"- published on 24.05.2024.

x. Staff Paper on modifications in the GNA Regulations- published on 09.10.2024.

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. Sh. Ajay Gupta (Member Technical) and Sh. Lokesh Dutt Jha (Chairman) retired from the commission on 26.02.2024 and 29-06-2024, respectively.

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 mandated to carry out below mentioned functions: -

(a) To 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) To 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) To facilitate intra-state transmission and wheeling of electricity;

(d) To 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) To 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) To adjudicate upon the disputes between the licensees, and generating companies and to refer any dispute for arbitration;

(g) To levy fee for the purposes specified under this Act;

(h) To specify State Grid Code consistent with the Indian Electricity Grid Code (IEGC) specified by Central Electricity Regulatory Commission;

(i) To specify or enforce standards with respect to quality, continuity and reliability of service by licensees;

(j) To fix the trading margin in the intra-State trading of electricity, if considered, necessary;

(k) To 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.

Accordingly, Institutional Consultant has been hired by the commission for framing our own regulations and 28 regulations have been notified till date.

Important Regulations issued during 01-01-2024 to 31-12-2024;

I. 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 (Published in Govt. Gazette vide No. 126 dated 28-02-2024)

II. 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 (Published in Govt. Gazette Vide No. 128 dated 28-02-2024).

III. Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Micro-Grid Renewable Energy Generation and Supply) Regulations, 2024 (Published in Govt. Gazette vide No. 122 dated 28-02-2024).

IV. Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Green Energy Open Access), Regulations, 2024 (Published in Govt. Gazette vide No. 123 dated 28-02-2024).

V. 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 (Published in Govt. Gazette vide No. 127 dated 28-02-2024).

VI. Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Deviation Settlement Mechanism and other Related Matters) Regulations, 2024 (Published in Govt. Gazette vide No. 129 dated 28-02-2024).

VII. Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and the UT of Ladakh (Renewable Purchase Obligation & its Compliance) Regulations, 2024 (Published in Govt. Gazette vide No. 125 dated 28-02-2024).

VIII. 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 (Published in Govt. Gazette vide No. 124 dated 28-02-2024).

IX. 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 (Published in Govt. Gazette vide No. 130 dated 28-02-2024).

X. Joint Electricity Regulatory Commission for the UT of J&K and UT of Ladakh, (Recruitment, Control and Service Conditions of Officers and Staff) Regulations, 2024. (Published in Govt. Gazette vide No. 998 dated 19-12-2024).

Amendment of Regulations

The following regulations have been notified/amended in the financial year 2024-25 (upto 31-12-2024).

1. Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and UT of Ladakh (Grid Interactive Renewable Energy System and its related matters) (First Amendment) Regulations, 2024 (Published in Govt. Gazette vide No. 513 dated 11-07-2024).

2. Joint Electricity Regulatory Commission for the UT of Jammu & Kashmir and UT of Ladakh (Electricity Supply Code) (First Amendment) Regulations, 2024 (Published in Govt. Gazette vide No. 552 dated 24-07-2024)

6. Important Orders issued by Commission during the year 2024-25 (i.e. from 01-01-2024 to 31-12-2024)

Sl. No.	Date of Publication	Notification number	Subject
1.	03-04-2024	JERC/16 of 2024 Dated 03-04-2024	Petition filed by LPDD for approval of True up for FY 2019-20, FY 2020-21, FY 2021-22 & FY 2022-23, APR for FY 2023-24 and ARR and Tariff for FY 2024-25. (Admission Order issued by the Commission)
2.	24-04-2024	JERC/01 of 2024 Dated 24-04-2024	Petition filed by JKPDCL for approval of true-up for the FY 2022-23, annual performance review for the FY 2023-24, annual revenue requirement & determination of tariff for FY 2024-25. (Admission Order issued by the Commission)

Sl. No.	Date of Publication	Notification number	Subject
3.	24-04-2024	JERC/02 of 2024 Dated 24-04-2024	Petition filed by JKPTCL for approval of Annual Performance Review of FY 2023-24, Aggregate Revenue Requirement of FY 2024-25 and Tariff proposal for FY 2024-25. (Admission Order issued by the Commission)
4.	29-05-2024	JERC/03 of 2024 Dated 29-05-2024	Petition for Adoption/Approval of Tariff discovered as per Section 63 of the Electricity Act, 2003 read with Joint Electricity Regulatory Commission, Jammu & Kashmir and UT of Ladakh (Conduct of Business) Regulations, 2022 for approval of power purchase agreements already executed/ to be executed by JKPCL for procurement of power from thermal generating stations. (Admission Order issued by the Commission)
5.	26-06-2024	JERC/04 of 2024 Dated 26-06-2024	Petition filed by JKPTCL for approval of Annual Performance Review of FY 2023-24, Aggregate Revenue Requirement of FY 2024-25 and Tariff proposal for FY 2024-25. (Final Order issued by the Commission)
6.	27-06-2024	JERC/05 of 2024 Dated 27-06-2024	Petition for Adoption/Approval of Tariff discovered as per Section 63 of the Electricity Act, 2003 read with Joint Electricity Regulatory Commission, Jammu & Kashmir and UT of Ladakh (Conduct of Business) Regulations, 2022 for approval of power purchase agreements already executed/ to be executed by JKPCL for procurement of power from thermal generating stations. (Final Order issued by the Commission)
7.	27-06-2024	JERC/06 of 2024 Dated 27-06-2024	Petition filed by LPDD for approval of True up for FY 2019-20, FY 2020-21, FY 2021-22 & FY 2022-23, APR for FY 2023-24 and ARR and Tariff for FY 2024-25. (Final Order issued by the Commission)
8.	28-06-2024	JERC/07 of 2024 Dated 28-06-2024	Petition filed by JKPDCL for approval of true-up for the FY 2022-23, annual performance review for the FY 2023-24, annual revenue requirement & determination of tariff for FY 2024-25. (Final Tariff Order issued by the Commission)
9.	04-10-2024	JERC/08 of 2024 Dated 03-04-2024	Petition for approval of True-up for the FY 2021-22, and FY 2022-23, for the Ladakh Power Development Department, UT Ladakh. (Final Order issued by the Commission)
10.	27-11-2024	JERC/09 of 2024 Dated 27-11-2024	Petition filed by LPDD for approval of New Connection Charges in electrified areas upto a load of 150 KW. (Final Order issued by the Commission)
11.	11-12-2024	JERC/10 of 2024 Dated 12-12-2024	Petition under Section 27 of the Energy Conservation Act, 2001 for adjudication of the penalty under section 26 of the Energy Conservation Act, 2001 by the Adjudicating Officer and for directions to Ladakh Power Development Department to make payment of penalty as adjudicated by the Adjudicating Officer. (Final Order issued by the Commission)

7. Major targets likely to be achieved up to 31st March 2025.

i. This Commission is under the process of publication of Joint Electricity Regulatory Commission for UT of J&K and UT of Ladakh (Framework for Resource Adequacy) Regulations, 2024.

ii. Issuing of tariff orders of all the utilities under the jurisdiction of this commission for the year 2025-26.

iii. To make the consumer grievance redressal system fully functional in both UTs viz UT of J&K and UT of Ladakh.

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 upto a 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.

The Joint Electricity Regulatory Commission is committed to fulfill its mandate for creating an efficient and economically viable electricity system in the State of Goa & the Union Territories, balancing the interests of all stakeholders while fulfilling its primary responsibility to ensure the reliable supply of power at affordable rates and shall be guided by the principles of transparency, accountability, equitability, and participation in the discharge of its functions, to safeguard the interests of the licensees and generating companies in the State of Goa & Union Territories and to give a fair deal to consumers at the same time.

2.3 To achieve the above, the Commission aims to:

a) Promote competition, efficiency, and economy in the activities of the Electricity Industry within the State of Goa & Union Territories;

b) Regulate effectively the power purchase and procurement process of the distribution licensees for the sale, distribution, and supply of electricity within the State of Goa & Union Territories;

c) Encourage cogeneration and use of energy generated from Renewable Sources;

d) Ensure Consumer satisfaction and create a mechanism to redress complaints immediately;

e) Introduce open access & reduce the cross-subsidy;

f) Improve access to information for all Stakeholders.

3. Notification/Amendment of Regulations

The following Regulations have been notified/amended in the FY 2024-25 (upto 31.12.2024) keeping in view the latest developments in the power sector: -

1. JERC (Standard of Performance for Distribution Licensees) (First Amendment) Regulations, 2024 notified on 27.05.2024.
2. JERC (Procurement of Renewable Energy) (Fifth Amendment) Regulations, 2024 notified on 28.05.2024.
3. JERC (Solar PV Grid Interactive System based on Net Metering & Gross Metering) (First Amendment) Regulations, 2024 notified on 01.08.2024.
4. JERC (Electricity Supply Code) (Third Amendment) Regulations, 2024 notified on 02.08.2024.
5. JERC (Connectivity and Open Access in Intra-State Transmission and Distribution) (Third Amendment) Regulations, 2024 notified on 13.08.2024.
6. JERC (Consumer Grievances Redressal Forum and Ombudsman) Regulations, 2024 notified on 16.08.2024.
7. JERC (Generation, Transmission and Distribution Multi Year Tariff) Regulations, 2024 notified on 15.10.2024
8. JERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 notified on 24.10.2024
9. JERC (Medical Facility) Regulations, 2024 notified on 12.11.2024.

4. Annual Revenue Requirement and Tariff determination for FY 2024-25

During the year, the Commission issued Tariff Orders comprising truing up for previous years, Annual Performance Review for FY 2023-24 and revision of Annual Revenue Requirement (ARR), and determination of tariff for the generation, transmission and distribution utilities under its jurisdiction for FY 2024-25.

Due to the imposition of Model Code of Conduct in regards to Lok Sabha Elections, all tariff orders were issued in the month of June except for EWEDC. The delay in issue of Tariff Order of EWEDC was due to delayed in filing of tariff petition by EWEDC

The details of the Tariff Orders issued for FY are as under: -

S. No	State/UT	Date of Order
1	Lakshadweep	10.06.2024
2	Puducherry Power Corporation Limited	10.06.2024
3	Electricity Department Daman & Diu (Transmission)	10.06.2024
4	Dadra & Nagar Haveli and Daman & Diu (Transmission)	10.06.2024
5	DNHDD Power Corporation Limited	11.06.2024
6	Puducherry	12.06.2024
7	Andaman & Nicobar Islands	13.06.2024
8	Goa	13.06.2024
9	DNHDD Power Distribution Corporation Limited	13.06.2024
10	Chandigarh	25.07.2024

5. Other Hearings/Orders

The following petitions were admitted and disposed of by the Hon'ble Commission from 01.01.2024 to 31.12.2024: -

Petition no.	Subject Matter of the Petition	Petitioner/(s)	Respondent(s)	Date of Latest/Last Hearing	Date of Final Order/ Latest Interim Order
120/2024	Miscellaneous application Petition in compliance to Hon'ble Commission order dated 1st August, 2023 in Case No. 89/2022 for Review of ARR of ARR of FY 2022- 23 based on revised estimates and determination of ARR & Tariff for FY 2023-24 for the Distribution Business of Dadra & Nagar Haveli and Daman & Diu	DNHDDPDCL	DNHDDPCL	18.04.2024	22.05.2024
121/2024	Miscellaneous application Petition in compliance to Hon'ble Commission order dated 1st August, 2023 in Case No. 89/2022 for Review of ARR of ARR of FY 2022- 23 based on revised estimates and determination of ARR & Tariff for FY 2023-24 for the Distribution Business of Dadra & Nagar Haveli and Daman & Diu	DNHDDPDCL	DNHDDPCL R-1 DNH Transmission Division R-2 Electricity Department, DD R-3	18.04.2024 & 20.08.2024	
125/2024	Tariff Petition for True-up of FY 2021-23, APR of FY 2024-25.	ED, Chandigarh		21.06.2024	25.07.2024
127/2024	Review Petition under section 94 (1) (1) of the electricity act, 2003 seeking review of the order dated 11/06/2024 of truing up for the financial year 2022-23, conducting annual performance review for the year 2023-24 and approving the annual revenue requirement and transmission tariff for the year 2024-25.	DNHDDPCL		23.10.2024 & 13.11.2024	10.12.2024
126/2024	Petition Under Section 94 (1) of the Electricity Act seeking review of the order dated 22.05.2024 passed in Petition No. 120 of 2024	DNHDDPCL	22.10.2024 & 17.12.2024		

6. Major Targets likely to be achieved up to 31st March 2025

Generation, Transmission, and Distribution Business Plan Orders and ARR/Tariff Orders (Ten in numbers) for control period of FY 2025-26 to FY 2029-30 are likely to be issued for all the six distribution utilities under the jurisdiction of JERC namely Andaman & Nicobar Islands, Chandigarh, DNHDD Power Distribution Corporation Limited, Puducherry, Lakshadweep and the State of Goa, one Generation Company namely Puducherry Power Corporation Limited (PPCL) and three Transmission utilities of UT of Dadra & Nagar Haveli and Daman & Diu. Business Plan Petitions for PPCL, Goa, DNHDDPDCL and Lakshadweep have been received.

7. The Commission on its own motion amending/ notifying the following regulations/guidelines/orders:

(i) JERC (Framework for Resource Adequacy), Regulations 2024.

(ii) JERC(For inquiry to be conducted by Adjudicating Officer), Regulations, 2024.

(iii) JERC (Retail Supply Tariff Structure), Guidelines, 2024.

CHAPTER 25

APPELLATE TRIBUNAL FOR ELECTRICITY (APTEL)

Physical and Financial Progress

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. 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. It also hears appeals against the adjudicating officer or the Central Government or the State Government or any other Authority under the Energy Conservation Act, 2001.

3. 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.

4. 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 Member (Electricity) and Shri Ashutosh Karnatak is the Technical Member (P&NG) upto 21.05.2024 of this Tribunal. Smt. Seema Gupta is the Technical Member (Electricity) of this Tribunal and Shri Virender Bhat former District Judge of Delhi is the Judicial Member of this Tribunal.

5. Currently, Shri Chander Mohan, Delhi Higher Judicial Services, Additional District Judge of High Court of Delhi is Head of the Department as Registrar of the Tribunal w.e.f. 27.04.2024.

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 20th December, 2024, 7748 appeals/petitions/ matters etc. have been filed. Out of which, 5121 Appeals/ Petitions have been disposed of. Number of pending matters as on 31.12.2024 is 2627 including Appeals, Interim Applications, Original Petitions, Review Petitions, Revision Petitions, Execution Petitions & Contempt Petitions etc.

9. APTEL is keeping pace with changing technological requirements through IT capacity building and has been successful in disposing of a large number of matters, thus expediting justice.

10. 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 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 2023-24 (Apr'23 to Mar'24)	FY 24-25				
		FY 2024-25 (till Dec'24)	Expected Gen/PLF (Jan'25- Mar'25)	Expected Generation/PLF	CEA Target	MOP MOU Target
Thermal Generation (MU)	44128	32525	11675	44200	43700	44200
Hydel Generation (MU)	180	246	10	256	286	250
Thermal PLF (%)	76.81	75.35	82.6	77.15	76.27	77.15

Energy Conservation Efforts

DVC has been making continuous efforts to modernize its Energy Management Systems, focusing on sustainable power generation with lower resource consumption. Notable initiatives include:

- Lighting Upgrades: Replacement of tube lights and CFLs with LED lights across office buildings and field formations.
- Variable Frequency Drives (VFDs): Installed in 9 Seal Air Fans at MTPS Units #1-3 and in Condensate Extraction Pumps (CEPs) at MTPS #1. Expansion continues in other units.
- Cooling Tower (CT) Fans: Upgrading to energy-efficient FRP blade assemblies at MTPS Units #1-4 and CTPS Units #7-8, with procurement in progress for MTPS Unit #6.
- Pump Efficiency Coatings: Application of energy-efficient coatings on CW and ACW pump internals during overhauls.
- Valve Optimization: Timely replacement and servicing of BFP recirculation valves to minimize energy loss.
- Efficient Fans: Procured and phased installation of energy-efficient fans, beginning with employee quarters.
- Performance Monitoring: Regular analysis of parameters like Boiler Efficiency, Turbine Heat Rate, and HP Heater performance, addressing efficiency gaps promptly.
- Operational Enhancements: Combustion optimization, improved condenser vacuum, and air leakage reduction ensure optimal system efficiency and auxiliary power consumption.
- Condenser Maintenance: Periodic cleaning during unit overhauls to maintain efficiency.
- Energy Audits: Conducted by STEAG as per Bureau of Energy Efficiency (BEE) guidelines for FY 2024-25.
- Technical Audits: Completed for all thermal and hydel stations, addressing identified deficiencies.

NOTABLE MAJOR ACHIEVEMENTS:

Commercial:

- Collection efficiency was more than 100% during April to December 2024.
- Outstanding dues under liquidation using LPSC Rules 2022 issued by MoP. Current dues are also being realized through the scheme's implementation.
- Long term cross border power supply to Bangladesh -300 MW since long.

Operational:

- **FGD Commissioning:** Successfully declared Operation (ODe) for Flue Gas Desulphurization (FGD) systems at MTPS Units #7 & #8, KTPS Unit #1, DSTPS Units #1 & #2, RTPS Units #1 & #2, and BTPS A.
- **Awards and Recognitions:**
  - DSTPS:
    - CII National Award for Excellence in Energy Management (September 2024).
    - CEE National Award for "Best National Ash Handling Plant" (2024).
  - RTPS:
    - Best National Water Efficient Unit.
    - Zero Liquid Discharge (ZLD) Compliance Award at the CEE 3rd National Power-Gen Water Awards 2025.

- KTPS: Best National Efficient Sewage Treatment Plant Award at the CEE 3rd National Power-Gen Water Awards 2025.
- MTPS: Recognized for:
  - National Water Efficient Unit (Coal 250-500 MW Category).
  - National Efficient Water Recycling and Reuse Practices.

- Automation: Implementing Automatic Generation Control (AGC) for MTPS Units #7 & #8, DSTPS Units #1 & #2, and KTPS Units #1 & #2 to be operated from NLDC, enabling Secondary Reserve Ancillary Service (SRAS). Purchase orders have been placed, with implementation underway.

Fuel Management:

- Total coal received in DVC TPSs in FY'24-25 (till Dec'24) is 21.07 MMT (5719 no. rakes).
- 1st time successful procurement of 05 LMT domestic coal from open source for DVC-MTPS was done, which give immense support during monsoon season for coal stock building and uninterrupted power generation at MTPS, Mejia.
- Executed MOU with NLCIL for supply of 20LMT coal from NLCIL Talabira II & III OCP mines to DVC TPPs. Lifting of coal started from 29-11-2024.
- Approx. 2.4 MMT coal received from DVC Tubed coal mines till Dec-24. It helped in building coal stock as well as sustained power generation.

Capex:

- DVC has achieved 56 % of FY 2024-25 Capex target (i.e. Rs. 1813 Cr. out of Rs. 3262 Cr.) up to December 2024 and expected to achieve 100% target by March 2025.

Renewable Energy:

- 10 MW Ground Mounted Solar PV Plant at KTPS has been commissioned and COD on 01.03.2024.
- 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.
- Contract awarded for setting up of 8 MW Ground Mounted Solar PV Plant at Konar and is under installation.
- LOI issued for implementation of cumulative capacity of 10MWp Rooftop Solar (RTS) on DVC's own buildings within DVC command area under PM Surya Ghar MBY scheme.
- NIT issued for setting up of 10 MW Floating Solar Project at DVC CTPS Raw Water Reservoir.
- NIT issued for Setting up of 234 MW Floating Solar Project (Phase-II) at DVC Maithon Dam Reservoir approved under UMREPP scheme of MNRE.
- 05 nos. of EV-CCS (Electric Vehicle – Captive Charging Stations installed at five stations of DVC (RTPS, MTPS, KTPS, DSTPS and DVC HQ, Kolkata).
- 755MW Solar Parks & Project (Phase-I) approved by MNRE under UMREPPs Scheme (Implemented through JV Company i.e. M/S GVREL formed between DVC & NTPC GEL). Out of 755MW(Ph-1), NOA issued for setting up of 310MW Solar Parks & Projects [260MW Floating Solar and 50MW Ground Solar] and is under award execution. NIT issued for development of parks (Power Evacuation infrastructure) for balance capacity of 445MW.

Capacity Addition Programme and Achievement-

Various MoP approved/ consented projects at various stages of development:

- Raghunathpur TPS Ph-II (2x660 MW): STG Package revived with BHEL. Balance packages under finalization.
- Koderma TPS Ph-II (2X800 MW): NOA issued to BHEL
- Durgapur TPS (1X800 MW): Document under preparation for tendering.
- Chandrapura TPS (2X800 MW): Project under Approval Stage
- Pump Storage Hydro Generating Station Lugu Pahar (1500 MW): Under DPR stage.
- Pump Storage Hydro Generating Station Panchet (1000 MW): JV with Govt. of West Bengal under progress.

Transmission & Distribution (T&D)

- **Network Overview:** The T&D network spans across the DVC command area and beyond, comprising:
  - 36 substations, 12 receiving stations (33 kV), and 12 switchyards at generating stations.
  - 7118 CKM of EHV transmission lines.
  - 12009 MVA of transformers at multiple voltage levels.
  - 1551 CKM of 33 & 11 kV transmission lines for power distribution.
- **Renovation & Modernization:**
  - Completed renovation and augmentation of control and protection systems at 10 substations (220 kV) using Power System Development Fund (PSDF).
  - Replaced 2946 CKM of old transmission line conductors with HTLS and higher-rated conventional conductors.
  - Renovated and modernized 11 substations and 3

powerhouse switchyards to enhance system stability and meet growing power demand.

- **Capacity Expansion:**
  - Added 110 MVA of transformation capacity.
  - Commissioned 220 kV GIS infrastructure at RTPS.
  - Completed a 34 CKM 220 kV transmission line between April and December 2024.

Retail Distribution:

- Since inception, DVC has supplied electricity to consumers at 33 kV and higher voltage levels within its command area.
- Expanded into primary distribution in 2022 with 33/11 kV infrastructure at Kumardhubi, Koderma, and BIADA, providing 11 kV power to 38 consumers.
- Innovative Infrastructure:
  - Introduced containerized substations (E-Houses) at 12 locations to reduce land requirements and streamline setup.
  - Successfully commissioned four E-Houses, including one at Dhanbad (January 3, 2025).
  - Additional E-Houses at Biada and Deoli are set for commissioning by January 2025, with three more to follow by March 2025.
- Extensive T&D network with 36 substations and 7118 CKM of EHV lines.
- Added 110 MVA transformation capacity and commissioned 220 KV GIS infrastructure at RTPS.
- Introduced containerized substations (E-Houses) for space efficiency.

Relay & Instrument Testing Laboratory:

- DVC's Relay & Instrument Testing Laboratory, located under the Central Testing Circle (CTC), Maithon, comprises three state-of-the-art laboratories:
  - Meter Testing Laboratory: NABL accredited in accordance with ISO/IEC 17025:2017 for Electro Testing (ET) calibration and meter testing, operational for over a decade.
  - Insulating Oil Testing Laboratory: Accredited under ISO/IEC 17025:2017 since 15/07/2022, offering testing and commissioning services across DVC establishments and external utilities.
- The department coordinates the protection relay systems of DVC's powerhouses and performs testing and commissioning for major electrical installations.

Communication System:

- Infrastructure Provider (IP) Registration: DVC received Infrastructure Provider Category-I (IP) registration (Certificate No. 1571/2024) from the Department of Telecommunications (DoT) on 30.07.2024. This allows leasing/selling assets such as dark fibers, right of way, duct space, and towers to licensed telecom service providers under Section 4 of the Indian Telegraph Act, 1885.
- High-Capacity Backbone & Access Network: DVC is developing a high-capacity backbone and access network to cover all substations and powerhouses in the valley using advanced DWDM/OTN/MPLS-TP/IP-MPLS equipment from non-PRC OEMs. This network will serve as a transport backbone for the IP Network cloud.

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. Tendering done but cancelled due to high bid price. Under re-tendering stage.
- **Renovation and Modernization (R&M) of Tilaiya Hydel U#1&2 (2X2 MW):** RLA study has been completed. Under DPR stage.

Pollution Control Measures & Compliance of New Environmental Norms:

- **Installation of De-NOx System:**
  - Out of Fourteen units, De-NOx installed in eleven units till date (MTPS#6,7&8, BTPS A, CTPS#7, DSTPS#1&2, KTPS#1&2, RTPS#1&2).
  - De-NOx installation at CTPS U#8 and MTPS U#5 are under progress and balance MTPS U#4 shall be done during scheduled shutdown in FY:25-26.
- **Installation of Flue Gas De-Sulphurization (FGD):**

DVC had successfully commissioned Flue Gas De-Sulphurization (FGD) systems in 07 (seven) Units till date, out of which 05(five) units have been commissioned in FY 2024-25 upto Dec'24. The details are as follows:

- MTPS U#7: ODE declared on 26.01.24
- MTPS U#8: ODE declared on 29.03.24
- DSTPS U#1: ODE declared on 01.04.24.
- RTPS U#1: ODE declared on 21.04.24.
- BTPS A: ODE declared on 22.06.24.
- KTPS U#1: ODE declared on 02.07.24.
- RTPS U#2: ODE declared on 14.12.24.

FGD installation work of 02(two) nos. 500 MW units (DSTPS U#2, KTPS U#2) are at advance stage and expected to be completed by March'25. Also, FGD installation work of 06(six) nos. below 500 MW units at MTPS 1 to 6 are expected to be completed in FY 25-26.

Ash Utilization:

DVC is putting more emphasis on utilization of Fly Ash. Dry Fly Ash (DFA) is sold to cement manufacturers, brick and block manufacturers and various traders. DFA utilization from April' 2024 to December'2024 is Approx. 31.38 LMT. Pond ash from DVC is utilized for construction of roads (mainly in NHAI projects), filling of abandoned mines, low lying areas, etc. in compliance of guidelines issued by MoEF & CC. Total ash utilization by DVC is 96.27 LMT, 95.95 % of total ash produced (from April'2024 to December'2024).

Projection for January 2025 to March 2025:

Total ash utilization approx. 49.50 LMT (145 % of total Ash generation from January 2025 to March 2025). DFA utilization approx. 11.0 LMT for Jan'2025 to March'2025.

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 Dec'2024: - 2.784 MMT
- Dispatched till Dec'2024: - 2.438 MMT
- Expected Production from Jan'25 to Mar'25: - 1.216 MMT
- Expected Dispatched from Jan'25 to Mar'25: - 1.762 MMT

Non-Power Activities of DVC:

Flood Control and Developmental Activities in Water Resources Management

- Of the originally planned seven storage reservoirs in the Damodar Basin, construction of four multipurpose dams was completed in the first stage:
  - Tilaiya (February 1953)
  - Konar (October 1955)
  - Maithon (September 1957)
  - Panchet (November 1959)
- The initial flood reserve capacity of 1.047 million acre-feet has reduced to 0.95 million acre-feet due to progressive siltation, as per the latest capacity survey reports.
- Despite partial implementation, DVC has successfully met its primary objective of flood control in the lower valley.
- Through judicious reservoir operations, DVC fully meets irrigation, municipal, and industrial water supply commitments in the Damodar Valley, ensuring efficient water resource management.

Irrigation Water Supply

- Operation and maintenance of the Durgapur Barrage and Irrigation System were transferred to the Government of West Bengal in 1964 on an agency basis, while ownership remains with DVC.
- Irrigation water is released from Maithon and Panchet reservoirs based on indents placed by the Government of West Bengal for Kharif and Rabi cultivation, as advised by the Member Secretary of the Damodar Valley Reservoir Regulation Committee.

Municipal and Industrial (M&I) Water Supply

- DVC has agreements with 156 agencies (84 in Jharkhand and 72 in West Bengal) for M&I raw water supply from its river system.
- An additional 22 agencies (15 in Jharkhand and 7 in West Bengal) have been allocated M&I raw water supply, with agreements currently in process.

ECO-CONSERVATION, AFFORESTATION & SOIL CONSERVATION:

Sl. No.	Evaluation Criteria	Unit	Annual Target	Actual Performance					
01	Fisheries		Excellent	Q1	Q2	Q3	Accumulative Achievement	Expected/ Achieved Annual Achievement	Remarks
i)	Spawn production at Maithon & MTPS	Lakh	700	53.2	966.0	00	1019.2	1019.2	
ii)	Fingerlings production		40	Nil	20	07	27	40	
iii)	Pisciculture in water bodies	Nos.	20	Nil	01	14	15	20	
iv)	Distribution of spawn/ Fingerlings to the villagers as CSR activity	Nos.	1200	Nil	1361	18	1379	1379	

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 Dept. of DVC successfully organized 45 days training course on Soil and Water Conservation for the district agriculture officers of the state of Chhattisgarh on Soil & Water Conservation Engineering.

CORPORATE SOCIAL RESPONSIBILITY (CSR):

DVC's CSR initiatives primarily target communities residing within a 10 km radius of its projects, aiming to enhance their quality of life through an integrated development approach.

- **Budget Allocation and Expenditure:**
  - ₹ 12.14 crore allocated for FY 2024-25.
  - ₹ 4.26 crore utilized by December 2024, with the remaining amount earmarked for ongoing works.
- **Key Community-Based Activities:**
  - Capacity building for livelihoods, health, education, women empowerment, and sports promotion.
  - Development of community-based infrastructure to improve the standard of living.
- **Drinking Water Facilities:**
  - Provision of community drinking water wells.
  - Introduction of solar-powered systems for drawing and distributing water from deep bore wells.
- **Sanitation and Infrastructure Development:**
  - Installation of toilets with round-the-clock water supply in schools.
  - Construction of bathing ghats, burning ghats, pond embankments, and village drainage systems.
- **Lighting Solutions:**
  - Solar streetlights and high-mast lights installed across village roads in operational areas.
- **Educational Initiatives:**
  - Installation of smart classrooms in government schools within DVC's operational area.
  - Free admission and education for students in DVC-run schools as per the organization's CSR policy.

Hon'ble Union Minister of Power and Housing and Urban Affairs, Shri Manohar Lal, during his maiden visit to Damodar Valley Corporation (DVC) headquarters.

Chairman, DVC meeting Shri Manohar Lal, Hon'ble Minister of Housing and Urban affairs and Minister of Power

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 15.05.1976.

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 & 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 kilometre 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 capacity of the BBMB Power Plants is as detailed below:

Power House	No. of machine X Capacity of machine (MW)	Installed Capacity (MW)
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 Roof Top Solar Power Plants installed capacity (MWp)		**3.375**
Grand Total Installed Capacity		**2958.105**

GENERATION AND TRANSMISSION SYSTEM:

The generation from the BBMB Power Houses for the year 2024-25 (upto 31.12.2024) is 9064.30 Million Units against the target of 7812 Million Units ie. 16.03 % higher than the target.

The Power Generation from Roof Top Solar during the year 2024-25 upto 31st December, 2024 is 1.93 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 year 2024-25 upto 31.12.2024 has been 99.64%.

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.

SOLAR POWER PLANTS

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 08.09.2023. Erection of transmission line is under process and is likely to be commissioned in the FY 2025-26.

b) BBMB is going for execution of cumulative 11.5 MW (AC) Ground mounted solar plants on CAPEX mode at BBMB Bhiwani & Hisar sub-station. Letter of Award has been issued to M/s BVG India Ltd. on dated 22.01.2024. Detailed design & engineering is in progress and projects are likely to be commissioned by FY 2025-26.

In addition to this, Installation of new proposed Roof Top Solar Power Plant of 4.737 MW capacity on Residential/Non-Residential Buildings of BBMB under CAPEX Mode through NVVN is under process. Project is likely to be commissioned by June, 2025.

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.

Details of procurement of goods and services in 2024-25 upto 31.12.2024 (Made Through GeM)

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	INR	%age	INR	%age	INR	%age
2024-25 (upto 31.12.2024)	567723659	307155272	54.10	1887161	0.33	32120311	5.65

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 from DoE, Govt. of H.P. on 01.10.2022. Contract agreement was signed with Consultant- M/s Energy Infratech Pvt. Ltd. on 09.11.2022. Further, due to change in free power royalty in Swaran Jayanti Policy of Hydro Projects on dated 12.12.2023 and revision dated 30.09.2024, the work of execution of Baggi HEP has been kept on hold as per deliberations held in BBMB Board meetings wherein it was decided that BBMB should wait for the outcome of bilateral meeting to be held between MoP, Govt. of India and Govt. of H.P. for similar matter of SJVNL Hydro projects.

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 had approved preparation of DPR for all the eight PSP sites identified by BBMB on the periphery of Bhakra & Pong Dam reservoirs.

10 MW Pandoh Hydro Electric Project on River Beas, Distt. Mandi, (H.P.)

The NIT for Selection of Consultant for Preparation of Detailed Project Report & obtaining all statutory clearances required for the execution of 10 MW (2 x 5 MW) Pandoh Hydro Electric Project has been floated on GeM Portal on 06.03.2024. The Bid evaluation process has been completed. Based on Technical and Financial evaluation of bid, the Tender Evaluation Committee has recommended the award of the contract in favor of M/s Energy Infratech Private limited being the first successful bidder in tender evaluation. The case regarding constitution of FLPC committee for approval of award of work is under progress. The Pre-Implementation Agreement (PIA) has not been signed with Govt. of H.P., so far. After approval from FLPC and formal allotment of site in favor of BBMB and signing of PIA with Govt. of HP is done, the work order shall be issued in favor of consultant.

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 operationalized 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 and Sustainable Building Codes (ECSBC) 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.

1.1 The Mission

The mission of the Bureau of Energy Efficiency (BEE) is to develop policies and strategies with a thrust on self- regulation and market principles, within the overall framework of the Energy Conservation Act, 2001 (EC Act). The primary objective is to aim for reducing energy intensity of the Indian economy. This would be achieved with active participation of all stake holders, resulting in accelerated and sustained adoption of energy efficiency in all potential sectors of the Indian economy.

1.2 The Objectives of BEE and its Role

Objectives of BEE

- 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 initiatives 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 Public-Private Partnership (PPP).
- To establish systems and procedures to measure, monitor and verify energy efficiency results in individual sectors as well as at the national level.
- To leverage multi-lateral, bi-lateral and private sector support in the implementation of programmes and projects on efficient use of energy and its conservation.
- To promote awareness of energy savings and energy conservation among targeted groups of consumers.

Role of BEE

BEE coordinates with Designated Agencies, Potential Consumers and other organizations working in the field of energy conservation/efficiency to recognize and utilize the existing resources and infrastructure in performing the functions assigned to the Bureau under the Energy Conservation Act.

The Act provides regulatory mandate for: Standards & Labeling of equipment and appliances; formulation of Energy Conservation Building Code for commercial buildings; and energy consumption norms for energy intensive industries.

The EC Act was amended in 2010 to incorporate few additional provisions required to better equip BEE to manage ever evolving sphere of energy efficiency in the country. The main amendments made to the original Act are given below:

- The Central Government may issue the energy savings certificate to the designated consumer whose energy consumption is less than the prescribed norms and standards in accordance with the procedure as may be prescribed.
- The designated consumer whose energy consumption is more than the prescribed norms and standards shall be entitled to purchase the energy savings certificate to comply with the prescribed norms and standards.
- The Central Government may, in consultation with the Bureau, prescribe the value of per metric ton of oil equivalent of energy consumed.
- Commercial buildings which are having a connected load of 100 kW or contract demand of 120 kVA and above brought under the purview of ECBC under EC Act.

Further, Energy Conservation (Amendment) Act, 2022 passed in both the houses of Parliament and got assent of the President of India on 19th December, 2022. The main amendments made to the original Act are given below:

- Non-fossil Source usage norms (Hydrogen/ Renewable)
- Framework for Carbon Markets
- Buildings Sector
  - Inclusion of Large Residential Buildings
  - Enhanced scope of Building Code to include renewables, and green building requirements
- Strengthening Implementation
  - Rationalizing Penalty Provisions
  - Functions of State Electricity Regulatory Commissions

Promotional Role

The Promotional Role of BEE primarily includes:

- Create awareness and disseminate information on energy efficiency and conservation among masses.
- Arrange and organize training of personnel and specialists in the techniques for efficient use of energy.
- Strengthen consultancy services in the field of Energy Efficiency.
- Promote research and development.
- Develop testing and certification procedures and promote testing facilities.
- Formulate and facilitate implementation of pilot projects and demonstration projects.
- Promote use of energy efficient processes, 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 efficient use of energy and its conservation.
- Implement international co-operation programmes relating to efficient use of energy and its conservation.

1.3 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. Enhancing efficiency in industries – Implementation of Perform Achieve and Trade (PAT)
2. National Level Painting Competition
3. National Energy Conservation Award
4. National Energy Efficiency Innovation Awards (NEEIA)
5. Standards and Labelling (S&L) Scheme
6. Energy Conservation and Sustainable Building Code (ECSBC)
7. Demand Side Management (DSM)
8. Energy Efficiency in Small and Medium Enterprises (SMEs)
9. Strengthening of State Designated Agencies (SDA) To Promote Efficient Use of Energy and its Conservation.
10. Improving Energy Efficiency in Transport Sector
11. Energy Accounting in DISCOMS
12. National Mission on Enhanced Energy Efficiency (NMEEE)
13. Indian Carbon Market

2. Energy Efficiency Services Limited (EESL):

Introduction:

Energy Efficiency Services Limited (EESL), a Joint Venture of four Public Sector Units, namely NTPC Limited, Power Grid Corporation of India Limited (PGCIL), Power Finance Corporation (PFC) and REC Limited and started business in 2010 to facilitate implementation of energy efficiency and climate change projects under National Mission for Enhanced Energy Efficiency (NMEEE).

EESL is working towards mainstreaming energy efficiency and is implementing the world's largest energy efficiency portfolio. Driven by the mission of Enabling More, EESL aims to create market access for efficient and future ready transformative solutions that create a win-win situation for every stakeholder. It has pioneered innovative business approaches to successfully roll-out large-scale programs that allow for incentive alignment across the value chain and rapidly drive transformative impact.

EESL has been able to make significant contributions in the fields of LED lighting through its flagship programme like Unnat Jyoti by Affordable LEDs for ALL (UJALA) and Street Light National Programme (SLNP). Under UJALA programme, 36.87 crore LED bulbs, 72.19 lakh LED Tube lights and 23.59 lakh Energy efficient fans have been distributed by EESL across India. This has resulted in estimated energy savings of 48.4 billion kWh per year with avoided peak demand of 9,789 MW, GHG emission reduction of 39.22 million ton CO_2 per year. Under SLNP programme, EESL has installed over 1.31 crore LED street lights in ULBs and Gram Panchayats across India. This has resulted in estimated energy savings of 8.9 billion kWh per year with avoided peak demand of 1,471 MW, GHG emission reduction of 6.08 million ton CO_2 per year

EESL's Achievements in FY 24-25:

1. **Street Light National Programme (SLNP):** In FY'2024-25, EESL has installed over **52797 LED street lights** in Urban Local Bodies (ULBs) and Gram Panchayats across India. This has resulted in estimated energy savings of **35.46 Million kWh per year.**
2. **Smart Meter National Programme:** EESL with its JV IntelliSmart is currently doing Implementation of Smart Metering Program in Uttar Pradesh, Delhi, Haryana, Bihar, Rajasthan and Andaman to significantly improve the billing and collection efficiencies of Distribution Companies (DISCOMs).

   In FY'2024-25, EESL has **installed over 1.96 lakhs smart meters** under this programme.
3. **Solar based EV Charging Station (Solar Carports)**

   Solar carport is a dual purpose, stand-alone structure that provides shelter for vehicles, whilst generating clean, renewable energy from the sun for use on-site including electric vehicle charging. Solar carports can be installed independently or integrated with grid. Solar carport with Battery Storage can be charged with solar energy and store energy onsite. This stored energy can subsequently

be utilized to charge electric vehicles, providing an independent and sustainable alternative to traditional grid-dependent charging.

Commissioned Solar Carports :

1. The Hon'ble Prime Minister Shri. Narendra Modi inaugurated the Solar Carport installed by CESL at the Statue of Unity (SoU) in Kevadia, Gujarat on 30th October, 2024.

This carport has a solar capacity of 50 kWp with 200 kWh battery energy storage system with features like app-based monitoring and state of the art look. The carport offers a range of charging options, including 60 kW CCS II fast chargers, AC001 chargers, and Type II AC chargers, catering to diverse EV needs.

CHAPTER 29

CENTRAL POWER RESEARCH INSTITUTE

Back ground

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 units at Nashik& Raipur is under progress.

The core activities of the Institute are:

» Research & Development

» Testing & Certification

» Consultancy

» Customized 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

» Association with Underwriters Laboratories (UL) for testing of LV equipment

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

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.

14th & 15th Meetings of the Technical Committee on Hydro Research was organized on 14th February 2024 and 8th July 2024. 15th, 16th& 17th Meetings of the Technical Committee on Thermal Research were organized on 15th February 2024, 8th May 2024 and 3rd December 2024 respectively. 16th & 17th Meetings of the Technical Committee on Grid, Distribution and Energy Conservation were organized on 26th February 2024 and 25-26 June 2024 respectively. 15th, 16th & 17th Meetings of the Technical Committee on Transmission Research were organized on 28-29 February 2024, 29th May 2024 and 6th December 2024 respectively.

The 29th & 30th Meetings of the Standing Committee on R&D (SCRD) were organized on 14th March 2024 and 19th December 2024 respectively under the chairmanship of Chairperson, CEA.

iv. Mission on Advanced and High-Impact Research (MAHIR)

The National Mission on Advanced and High-Impact Research (MAHIR) has been launched 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) has been designated as coordinating agency for this Mission.

v. National Mission on use of Biomass in coal based thermal power plants (SAMARTH)

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.

9th, 10th and 12th Meetings of the Sub-Group-1 (R&D on biomass properties/characteristics) under National Mission on use of Biomass in coal fired Thermal Power Plants were organized on 10th January 2024, 26th March 2024 and 27-28 November 2024.

11th Meeting of the Sub-Group-1 (R&D on biomass properties/characteristics) under National Mission on use of Biomass in coal fired Thermal Power Plants was organized on 12-13 August 2024 in physical mode at NTPC, NETRA, Greater Noida.

CPRI officials attended the 6th & 7th Executive Committee Meeting of SAMARTH National Biomass Mission Chaired by Member Thermal, CEA held on 11th January 2024 and 23rd July 2024 through Video Conference mode.

Signing of MoA between CPRI and MPIDCL

2) CPRI and MANIT- Bhopal inked a Memorandum of Understanding for research and academic collaboration, on 06th June 2024. The MoU signing Ceremony was held in CPRI, Bhopal Campus in the presence of Director General - CPRI, Director - MANIT Bhopal and senior faculty members/ officials from MANIT, Bhopal and CPRI.

Signing of MoU between CPRI and MANIT Bhopal

3) CPRI and BHEL signed an MOU for collaborative Research and Development works of mutual interest on 28th November 2024 at CPRI, Bangalore in the presence of Shri Jai Prakash Srivastava, Director (E R&D), BHEL and Shri B.A Sawale, Director General, CPRI along with senior officials from both the organisations. Shri Rajesh Kohli, Chairman & Managing Director, HMT graced the occasion.

Signing of MoU between CPRI and BHEL

4) CPRI signed an MoU for research collaboration with KPCL, on 18th December 2024 at KPCL Office, Bangalore.

Accreditation:

Smart Grid Research Laboratory (SGRL), CPRI, Bengaluru received accreditation for IEC 61850 Edition 2 with Amendment 1 (Edition 2.1) from UCA International Users Group. This is the first and only laboratory in the country to receive accreditation for the latest edition of IEC 61850 (Edition 2.1). With this, the laboratory can take up conformance testing for IEC 61850 Edition 2 with Amendment 1 (Edition 2.1).

BIMSTEC:

1. Shri CSR Ram, Joint Secretary (BIMSTEC & SAARC), Ministry of External Affairs, Government of India, visited CPRI Bengaluru on 22nd March 2024, for inspection of the newly created BIMSTEC Energy Centre (BEC) Office Building, at the renovated and refurbished Swayambhu Hall Building, along with Shri Kumar, Executive Director, Grid India (POSOCO), Bengaluru.
2. His Excellency Indra Mani Pandey, Secretary General, BIMSTEC visited BIMSTEC Energy Centre (BEC) in CPRI on 09th May 2024.

Shri Ajay Tiwari, Additional Secretary (MoP) and Shri A. K Rajput, Member-Power Systems, Shri S. P Kumar, Executive Director, SRLDC, Grid India, Bengaluru and other dignitaries visited CPRI, Bengaluru in connection with the BIMSTEC Energy Centre in CPRI on 09th May 2024.

Visit of His Excellency Indra Mani Pandey, Secretary General – BIMSTEC, Shri Ajay Tiwari, Additional Secretary (MoP),

DG-CPRI attended 50th Short-Circuit Testing Liaison (STL) Management Committee Meeting in Trondheim, Norway

AWARD

Director General, CPRI received International Electrotechnical Commission (IEC) AWARD for year - 2023 for his extraordinary technical contribution in development of IEC standards.

DG-CPRI receiving IEC Award 2023 from the Vice President of IEC on World Standards Day 2024 held at New Delhi

Important Consultancy Activities:

- Diagnostic tests on 40 MVA, 132/33 kV Power Transformer for M/s. Northern Coalfields Limited, Singrauli
- Residual Life Assessment of 210MW Boiler Unit No. 2 at Khaperkheda Thermal Power Station for M/s. MSPGCL, KhTPS, Khaperkheda
- Metallurgical analysis of Economiser Tube Coil No.83, Tube No. 02 for M/s. MPPGCL, Shree Singaji Thermal Power Station (SSTPS), Khandwa, Dongalia
- Corrosion Mapping of Water Wall Tubes in Unit No. 4, 500MW Boiler for M/s. NTPC Ltd., Simhadri, Andhra Pradesh
- Third party Protection Audit of Switchyard for M/s. Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (RVUNL), Chhabra Thermal Power Plant, Rajasthan
- Soil Resistivity and Earth Resistance measurement for M/s. Bharath Traders, Neyveli
- Energy Audit of Panyor Lower Hydro Power Station (3X135 MW) for M/s. NEEPCO Ltd., Arunachal Pradesh
- Condition Monitoring (Mechanical studies) of Hydro Turbine Machines and other components of Tehri&Koteshwar Hydro Electric Projects for M/s. THDCIL, Uttarakhand

Important Conference/Webinars/Training Programmes organized:

- **National Conference - "ARCON2024" with the theme "Internal Arc – Causes and Effects: A Panoramic View"**

  National Conference - "ARCON2024" with the theme "Internal Arc – Causes and Effects: A Panoramic View"was organized at CPRI, Bengaluru by High Power Laboratory, Short Circuit Laboratory – CPRI, Bengaluru and Switchgear Testing & Development Station, CPRI-Bhopal, on 18th & 19th January 2024.

- **National Conference on "Smart Grid, Smart Meter, Communication Technologies and Cyber Security"**

  National Conference on "Smart Grid, Smart Meter, Communication Technologies and Cyber Security" was organized at CPRI, Bengaluru by Smart Grid Research Laboratory and Metering & Utility Automation Division, CPRI, Bengaluru on 14th & 15th February 2024.

- **12th International Conference on Power Cables - CABLETECH 2024**

  12th International Conference on Power Cables - CABLETECH 2024 was organized at CPRI, Bengaluru by Cables & Diagnostics Division, CPRI, Bengaluru on 13th & 14th June 2024.

- **Webinar on "Latest IEC 61869:2023- Key Changes, Interpretations & Test Methodologies of Instrument transformers"**

Webinar on "Latest IEC 61869:2023- Key Changes, Interpretations & Test Methodologies of Instrument transformers"was organized by Switchgear Testing & Development Station, CPRI, Bhopal on 31st July 2024.

- **Webinar on "Latest Trends in Cyber Security in Power sector"**

  Webinar on "Latest Trends in Cyber Security in Power sector"was organized by Smart Grid Research Laboratory, CPRI, Bengaluru on 08th August 2024.

Participation in Exhibitions

1) DistribuElec Exhibition

The Institute participated in DistribuElec Exhibition organised by IEEMA during 16th to 18th January 2024 at Bombay Exhibition Centre, Mumbai. Hon'ble Union Cabinet Minister for Power, Shri Raj Kumar Singh inaugurated the Exhibition on 16th January 2024. CPRI displayed its facilities and expertise in a Stall during the exhibition.

2) Exhibition as part of National Conference on "Smart Grid, Smart Meter, Communication Technologies and Cyber Security"

CPRI organzied an Exhibition as part of two days National Conference on "Smart Grid, Smart Meter, Communication Technologies and Cyber Security" conducted by Smart Grid Research Laboratory and Metering & Utility Automation Division of CPRI, Bengaluru.

- Inauguration : Shri B. A Sawale, Director General, CPRI
- Venue: CPRI, Bengaluru
- Dates: 14th to 16th February 2024

CPRI's stall at the exhibition showcased state-of-the-art test facilities and other activities.

3) EL Asia 2024 Exhibition

The Institute participated in EL Asia 2024 Exhibition organised by Triune Exhibitors, Bengaluru on 24th May 2024 at Bangalore International Exhibition Centre (BIEC), Bengaluru. Shri R. Sudhir Kumar, Additional Director, CPRI, Bengaluru inaugurated the event.

CPRI's stall at the exhibition showcased state-of-the-art test facilities and other activities.

4) Exhibition as part of the 12th International Conference on Power Cables CABLETECH 2024

CPRI organzied an Exhibition as part of the 12th International Conference on Power Cables CABLETECH 2024 conducted by Cables & Diagnostics Division, CPRI, Bengaluru.

- Inauguration: Shri B. A Sawale, Director General, CPRI
- Venue: CPRI, Bengaluru
- Dates: 13th & 14th June 2024

CPRI's stall at the exhibition showcased state-of-the-art test facilities and other activities. The conference delegates from various organizations, utilities and manufacturers visited the stall and enquired about test facilities of CPRI.

Tests conducted for Overseas Customers

Overseas customers from Sri Lanka, Saudi Arabia, Bangladesh, Thailand, China, Sweden, UAE, Qatar, Nigeria, Egypt, Nepal, Canada, Malaysia, Kenya, Bahrain, Vietnam, etc., have utilized the services of CPRI and some of the prominent tests conducted are as follows:

- IEC 61850 Conformance testing on Energy Meters (Prometer 100 & Prometer 540)was carried out at Smart Grid Research Laboratory, CPRI, Bengaluru for M/s. Secure Meters (Sweden) AB, Sweden.
- Type Test on 19/33 kV, 3X300 Sq.mm, CU/XLPE/SCT/PE/DSTA/PE Cable as per IEC 60502-2-2014 was carried out at Cables & Diagnostics Division, CPRI, Bengaluru for M/s. Doha Cables, Qatar.
- Ability to withstand the dynamic effects of short circuit test on 2500kVA, 11/0.415kV, Three Phase Distribution Transformerwas carried out at Switchgear Testing & Development Station, CPRI, Bhopal for M/s.Basic Power Engineering Ltd., Bangladesh.
- Short time current test on 36kV Single Pole Neutral Disconnector was carried out at High Power Laboratory, CPRI, Bengaluru for M/s.Any Ohm, Malaysia.
- Fire Resistance and Circuit Integrity tests on 2 Core X 1.5 Sq.mm, Copper Conductor, Silicon Rubber Insulated, Overall Shielded, LSZH Sheathed 300/500 V Cable and 4 Core X 4.0 Sq.mm, Copper Conductor, Silicon Rubber Insulated, Overall Shielded, LSZH Sheathed 300/500 V Cables were carried out at Cables & Diagnostic Division, CPRI, Bengaluru for M/s.Asharqiyah Cables Company for Industry, Saudi Arabia.
- Temperature Rise Test on 800/5A LV Current Transformers was carried out at Switchgear Testing & Development Station, CPRI, Bhopal for M/s. Energia Industrial Sdn. Bhd., Malaysia.
- Dynamic and thermal Short Circuit tests on 1250 kVA, 11/0.415 kV Distribution Transformer were carried out at High Power Laboratory, CPRI, Bengaluru for M/s. Automation Engineering, Bangladesh.

Visit of overseas Team to CPRI

- 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., Bengaluru on 17th January 2024.
- Mr. Sevigny Richard, Test Specialist from M/s. Hydro

Quebec, Canada visited Ultra High Voltage Research Laboratory, CPRI, Hyderabad for witnessing of tests on 765 kV, 4000 A Current Transformer for M/s. Hitachi Energy India Ltd., Vadodara from 22nd to 26th April 2024.

- Mr. Luai Al Nakawai and Mr. OmairJuma Mohammed Khalifa Al Ameemi from M/s. AADC, Abu Dhabi& Mr. Arif Abdul Samad Shaikh from M/s. DHAFIR, Abu Dhabi visited Electrical Appliances Technology Division, CPRI, Bengaluru for witnessing of IP 54 category 2 test on 400A LV service cabinet for M/s. Novateur Electrical & Digital, Haryana on 25th & 26th July 2024.

Important projects under implementation:

- Establishment of Regional Testing Laboratory at Raipur, Chhattisgarh
- Common Test Facility (CTF) at Manufacturing Zone, Narmadapuram
- 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
- 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 has been providing its dedicated service for more than five decades. NPTI has trained over 4,80,000 Power Professionals in regular Programs for 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's committed faculty is providing excellent training in the Power Sector in the areas like Thermal, Hydro, Transmission & Distribution, Management and Regulatory affairs etc. which enhance the availability of Generation, Transmission & Distribution Systems and reduce AT&C (Aggregate Technical & Commercial) Losses. A number of training programs for national as-well-as transnational customers have been conducted.

NPTI operates on an all India basis with manpower strength of 134 including 76 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 Power Distribution & Emerging Technologies
- 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, SCADA & 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

A 800 MW Supercritical Thermal Simulator has also been commissioned in NPTI, Corporate Office, Faridabad and training is being imparted to Utilities.

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 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 Despatch 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.

Hot Line Training Centre

NPTI is having specialized facilities at Hot Line Training Centre, Bengaluru for Live Line Maintenance of Transmission Lines upto 400 kV using BHM (Bare Hand Method) & HSM (Hot Stick Method) 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. So far NPTI, HLTC has trained more than 6000 Power Professionals from Transmission Organizations such as POWERGRID, KPTCL, TANTRANSCO, MSETCL, GETCO etc.

Placement

Students of MBA (Power Management), Post Graduate Diploma Course and Post Diploma Courses are finding placement in reputed companies like ABPS Infra, IEX, INDIGRID, WISE, Vedanta Resource Ltd., JSW Energy, GMR, GVK, JITPL, L&T Nabha Power, LANCO, Bajaj Energy etc.

Achievements during 1st April 24 to 31st December 2024

NPTI provided training to 13,851 trainees for total trainee-weeks of 33,722 till 31.12.2024.

Other Important Activities

Training Programs under PM Surya Ghar: Muft Bijli Yojana

The Ministry of New and Renewable Energy, Govt. of India has recently launched the ambitious Pradhan Mantri Surya Ghar Muft Bijli Yojana (PMSGMBY) to install solar PV on One Crore households in India. This scheme demands institutional capacity, human resources and skilled professionals at various levels of Distribution Utility.

NPTI has been engaged by the MNRE and REC as the training agency for conducting training of DISCOM officials all across India under PMSGMBY. So far 117 training programs have been conducted by NPTI for the 4087 DISCOM officials across India.

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 1031 participants from NTPC, NHPC, POWERGRID, PFC, GRID-INDIA,THDC,DVC, CPRI, SJVNL, NEEPCO, MNRE.

National Mission on use of Biomass in Thermal Power Plants

Under the aegis of Mission SAMARTH, NPTI has conducted Awareness programs for Farmers, Pellet manufacturers and professionals from Thermal Power Plants and also site visit was conducted. So far more than 50 Programs have been conducted.

Training and Certification Programs on Cyber Security

NPTI has trained & certified so far more than 2600 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 7973 participants. So far more than 259 Programs have been conducted. Under Phase-II for Junior Management Level officials, so far 45 Programs have been conducted covering 1307 participants.

Power 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 2497 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.

Power System Operator Training Program

NPTI is also conducting specially designed training programs for Power System Operators on Basic level & Specialist Program. So far 2273 System Operators has been trained in Basic Level and 859 in Specialist Programs.

Induction Training

NPTI has been providing induction training to fresh Graduate Engineers/Executives from various Power Sector Organizations: APGCL, CEA, DVC, NHPC, BPSCL etc.

International Training

Five-week International Training Program on "Live line Maintenance Technique using HSM" for Ceylon Electricity Board, Sri Lanka was conducted.

Other Important Activities

- One Week Capacity Building Programme on "Solar PV Power Plant & Grid Integration conducted for various utilities.
- Two Days Training Programme for APGCL officials on Cyber Hygiene conducted for APGCL.
- One week Training Program on Electrical Safety for Mines conducted for Coal India Limited.
- 3 days program on Operational Safety and Disaster Management conducted for APCPDCL.
- Management Development Program (MDP) on Business Intelligence, Data Visualization & Dashboarding & Data Mining conducted for various utilities.
- 800 & 500 MW Simulator Training conducted for UPRVUNL.
- 03 days Training Program on Thermal Power Plant

Efficiency & Performance Monitoring for GMDC Ltd.

- Six days on-site training program on CEA (Measures relating to Safety & Electric Supply) Regulation – 2023 for NMDC Ltd.
- Onsite Inspection of Washing vehicle for East Coast Railway, Paradeep
- Grid Connected Rooftop Solar under "PM Surya Ghar Muft Bijli Yojana (PMSGMBY) for various utilities.
- 250 MW Hydro Power Simulator Training conducted for DVC Officials.
- 01 Week Short Term Training Program on Condition Based Monitoring of Substation for NER Power Utilities.
- 01 Week Short Term Training Program on Electrical Safety & Inspection of Electrical Installations, Accidents Prevention & Recent Trends conducted for SCCL.
- 03 days Short Term Training Program on Renewable Energy: Economics, Policy and Regulation conducted for New Manglore Port Trust.

Consultancy Services

NPTI has been appointed as Project Management Agency (PMA)/Consultant to PuVVNL, TCIL and the work is in progress. Third Party Inspection Works for DTL (Delhi TRANSCO), JVVNL, Jaipur, DVVNL, Agra, KESCO, Kanpur, PVVNL, Meerut and UHBVN, Panchkula is in progress. Field Inspection works of DVVNL, MVVNL, PuVVNL, PVVNL, KESCO 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. NPTI has appointed as Third-Party Testing Agency for testing of repaired 100 KVA and Higher Rating Distribution Transformers. NPTI is also conducting study of Power Factor for MPPTCL.

MOU

MOU has also been signed with REC, IIT Kanpur, IIITDM-Kancheepuram, BEE, CPWD, DVC, NEEPCO and PTC India.

25th Batch of 3 Weeks Mandatory Foundation Program Inaugurated by Shri Ghanshyam Prasad, Chairperson, Central Electricity Authority in the presence of Dr. Tripta Thakur, Director General, NPTI and Shri N.R. Halder, Director (Training), NPTI.

CHAPTER 31

'PUBLIC GRIEVANCE'

Public Grievance 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 (DPR&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/Organizations for their redressal. As per the guidelines of DAR&PG, the grievances are to be redressed within a period of 21 days.

The Status of Public Grievance Applications: -

Name of the Organization	From 01.01.2024 to 31.03.2024			From 01.04.2024 to 31.12.2024			Activities during 01.01.2024 to 31.12.2024
	No. of grievances received	No. of grievance disposed off	Balance Grievance	No. of grievances received	No. of grievance disposed off	Balance Grievance	
Ministry of Power	1373	1152	221	4127 (3906+221)	3954	173	Monitoring of Grievances pending more than 21 days is being done for timely disposal within the prescribed time limit of **21 days.**

CHAPTER 32

RIGHT TO INFORMATION ACT, 2005

Ministry of Power and all its PSUs and subordinate organizations are linked '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 Directors/Deputy Secretaries as First Appellate Authorities. The Annual Return for the period 2024-25 (upto Sep-2024) has been uploaded on Central Information Commission website as required u/s 25(3) of the RTI Act, 2005.

The status of RTI applications and Appeals in the period of 01.01.2024 to 31.12.2024.

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
1719	1697	79	74	5	1	Yes (upto Sep-2024)

CHAPTER 33.1

OFFICIAL LANGUAGE IMPLEMENTATION

Brief Description: The Ministry of Power plays a crucial role in the Government of India, overseeing the nation's energy policies, regulations, and initiatives. Under its jurisdiction, there are various autonomous bodies, statutory organizations, public sector undertakings (PSUs), and joint ventures that contribute to the development and management of the power sector. So far as the Official Language Division at the ministry level is concerned, it has left no stone unturned in achieving best of its targets during the financial year 2024-25. On the occasion of Hindi Day, the OL Division prepared and published the appeal of the Hon'ble Minister of Power and Minister of State for Power and distributed it to all officers and all offices. It has translated various types of official papers, conducted OL Inspections, organized Hindi workshops, Hindi Pakhwada etc. It has assisted the PSUs in organizing Hindi Pakhwadas. For the first time, the Official Language Division successfully organized the All India Official Language Conference of Official Language Officers of the offices under the control of the Ministry of Power. The biannual publication of the Ministry of Power's magazine 'Vidyut Pravah' was re-started. Officers 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 Bharat Mandapam, New Delhi. The Division has regularly monitored the Hindi working in the PSUs through Quarterly Progress Report. Thus, the OL Division of Ministry has achieved beyond expectations and is quite prompt to envisage the future challenges.

1. Translation work: The Ministry ensured compliance of the Official Language Act, 1963 and the Official Language Rules, 1976 in the Ministry and offices under its administrative control by its official language section. Performing distinguishably, the section has translated more than 5500 pages.The official papers include a variety of official documents in addition to the day to day work.

2. Inspection of offices: The OL division conducts inspection of 25% of subordinate offices of ministry annually. This year as well the division has conducted the stipulated number of inspections and has led the offices in being inspected by Parliamentary Sub-Committee. This year, the Second Sub-Committee of the Parliamentary Official Language Committee inspected 29 offices of various PSUs under the administrative control of the Ministry of Power regarding implementation of the Official Language Policy. The Official Language Division of the Ministry has inspected 42 offices across the country during this period.

3. Workshop: During the same period, 30 offices were notified under Rule 10(4) of the Official Language Rules, 1976. The OL Division has conducted 2 workshops in which 32 officers have received training on working in Hindi. After the training, the officers were unhesitant and confident in working in Hindi.

4. Hindi Pakhwada: The OL Division organized 'Hindi Pakhwada' from 14th to 28th September, 2024. About 78 personnel of the ministry participated in various competitions organized during the fortnight to promote Hindi in office work. 5 competitions like Hindi Self-Composed Poem Recitation Competition, Hindi Dictation Competition, Hindi Noting & Drafting Competition, Rajbhasha Knowledge Competition, Hindi Essay Writing Competition were organized. In these competitions, the winners were awarded first (prize amount- Rs. 5000), second (prize amount- Rs. 4000), third (prize amount- Rs. 3000) and incentive prizes (prize amount- Rs. 2500).

5. All India Official Language Conference: An All India Official Language Conference of Official Language Officers of the offices under the control of the Ministry was organized under the aegis of the Ministry. The conference was presided over by Hon'ble Minister of State for Power and New & Renewable Energy, Shri Shripad Yesso Naik and was attended by senior officials of the Ministry of Power as well as senior officials of all PSUs. The conference started with lighting of the lamp by all the dignitaries followed by Saraswati Vandana by the team of OL Division, Ministry of Power. A video prepared by POWERGRID regarding the functioning of all the offices under the control of the Ministry of Power was screened.

In various sessions of the conference, Dr. Jaiprakash Kardam, Former Director, Official Language Department, Dr. Gangasahay Meena, Associate Professor, Jawaharlal Nehru University, Dr. Puran Chand Tandon, Former Professor, Delhi University and renowned Hindi activist Dr. Virendra Kumar Yadav delivered lectures. In the closing session of the conference, a mesmerising cultural presentation was performed by the Song and Drama Division. During the conference, anchoring was carried out by Mr. Amitabh Singh, Manager, NHPC and Ms. Smriti Patwardhan, Assistant Manager, PFC. A total of 300 officers, including 150 Official Language Officers from offices under the control of the Ministry of Power located all over India, participated in the conference.

6. Magazine: The OL Division started re-publishing the magazine *'Vidyut Pravah'* of the Ministry of Power. It included articles, travelogues, stories and poems written by the officers of various offices under the control of the MoP. The OL Division distributed the magazine free of cost to almost all the ministries of the Government of India, all the senior officers of the Ministry of Power, all the sections and all the offices under its control.

7. Training: At the Ministry level, the OL division has also done some important works like nominating officers/employees for training under Hindi Teaching Scheme and Shorthand/Typing Training Scheme. To avail the benefits of the scheme, 08 officers/employees have been sent for Hindi Language Teaching and 06 officers/employees have been sent for Shorthand/Typing Training.

8. The OL Division demands quarterly progress reports from the public sector undertakings regarding the progressive use of Hindi in government work. The reports received by the OL Division are properly reviewed and all the concerned subordinate offices are requested to take follow-up action on the review. During this year also, the OL Division conducted a timely review of the received quarterly reports from the offices under its control.

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, 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.

The **"Vigilance Awareness Week 2024"** was observed in Ministry of Power between 28th October 2024 to 3rd November, 2024. This year the theme for the Vigilance Awareness Week was **"Culture of Integrity for Nation's Prosperity".** During the week, banners/posters of Vigilance Awareness Week along with 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 28th October, 2024.

During the Vigilance Awareness Week, Essay & Debate Competitions for the employees of the Ministry were organized on 29th October 2024. The topic for Essay was **"The Role of whistleblowers in exposing corruption"** and the topic for Debate was **"Is transparency in government enough to prevent corruption".**

Pledge taking ceremony held on 28.10.2024 in Ministry of Power

Essay Competition for the employees of the Ministry of Power held on 29.10.2024

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.

CHAPTER 33.3

ACTIVITIES RELATING TO WOMEN EMPLOYEES

There are 53 women employees in the Ministry of Power. The representation of women employees at various levels in the Ministry of Power as on 10.01.2025 is indicated below :

Group	Total Employees (as on 10.01.2025)	No. of Women Employees	Percentage of overall staff strength
A	78	16	20.51
B	131	18	13.74
C	60	16	26.67
C(MTS)	35	3	8.57
Total	**304**	**53**	**17.43**

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 (PWDs)

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.

The representation of Persons with Disabilities in the Ministry as on 10.01.2025 is as under:

Group	Total Employees (as on 10.01.2025)	Persons with Disabilities Employees				Percentage of Persons with Disabilities employees
		VD	HD	OD	Total	
A	78	0	0	1	1	1.28
B	131	0	0	0	0	0.00
C	60	0	0	1	1	1.67
C (MTS)	35	1	0	2	3	8.57
Total	**304**	**1**	**0**	**4**	**5**	**1.64**

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 and mental 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 2024-25, 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 Power & Housing and Urban Affairs after securing various Medals in Carrom Tournament Organized by THDC Ltd. in Tehri.

Ms. Chanchal, ASO secured Bronze Medal in Inter CPSU Chess Tournament organized by NEEPCO Ltd. in Shillong.

Team MoP- Bridge has secured Silver Medal in Inter CPSU Bridge Tournament organized by PFC Ltd. in New Delhi.

Further, During the year 2024-25, Players from Ministry of Power Team have also secured Gold Medals in Inter-Ministry Yoga and Table Tennis Tournaments organized by Central Civil Services Sports and Cultural Board, DoPT.

Additionally, a new Recreation Club was opened for the employees of the Ministry of Power with Indoor games facilities like Table Tennis, Carrom, Chess, Bridge etc. An Intra-Ministry Table Tennis Tournament was also organized by the Managing Committee of the Recreation Club, Ministry of Power for the employees of the Ministry in Sept., 2024.

CHAPTER 33.6

WELFARE OF SC/ST/OBCS/MINORITIES

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.

The total strength of employees and representation of Scheduled Castes, Scheduled Tribes and Other Backward Classes in the Ministry of Power as on 10.01.2025 is indicated below:

Group	Total number of Employees (as on 10.01.2025)	Representation					
		SCs	SCs %	STs	STs %	OBCs	OBCs %
Group A	78	25	32.05	3	3.85	5	6.41
Group B	131	43	32.82	8	6.11	31	23.66
Group C	60	13	21.67	1	1.67	18	30.00
Group C (MTS)	35	15	42.86	1	2.86	9	25.71
TOTAL	304	96	31.58	13	4.28	63	20.72

With respect to welfare of the Minorities, the schemes, as recommended by the Government for the welfare of the Minorities are implemented from time to time.

CHAPTER 34

E-GOVERNANCE / IT INITIATIVES

i. Cyber Security Initiative – CSIRT-Power

Hon'ble Union Minister of Power Shri Manohar Lal inaugurated the COMPUTER SECURITY INCIDENT RESPONSE TEAM – POWER (CSIRT–POWER) facility on 23rd September, 2024. In response to potential cyber threats, the Ministry of Power, following the National Cyber Security Policy and in collaboration with CERT-In, initiated the creation of a specialized Computer Security Incident Response Team for the power sector (CSIRT-Power). Equipped with advanced infrastructure, cutting-edge cybersecurity tools, and dedicated team of experts, CSIRT-Power is now well-prepared to tackle emerging threats, establishing a strong cybersecurity framework, and implementing crucial measures to enhance overall preparedness and resilience.

ii. eGovernance Initiative

The e-Office system in the Ministry of Power has been functional since April 7th, 2015 as part of Government of India's eGovernance initiative. Presently, the latest Ver 7.3.9 of e-Office System is being used with improved pdf viewing, enhanced Note-to-Correspondence Referencing and improved user experience. The system allows users to create and manage electronic files and documents within a streamlined workflow, making it easy to view, search, share, and publish them efficiently. Approximately 4670 e-Files were created or processed within the Ministry during the year.

iii. Capacity Building Initiatives

Customized cybersecurity training programs for power sector officials have been designed in collaboration with reputed institutions such as IIT-Kanpur, Rashtriya Raksha University, to bolster the sector's defense against cyber threats. Approximately 186 professionals from various power sector organizations have attended these programs and multiple batches of professionals are presently participating in these programs. Additionally, the Ministry conducted cybersecurity awareness sessions for more than 100 officials at MoP, promoting adherence to established best practices.

CHAPTER 35

REGION-WISE INSTALLED CAPACITY (IN MW) OF POWER STATIONS

(As on 31.12.2024)

Region	Ownership / Sector	Mode wise breakup									Grand Total
		Thermal					Nuclear	Renewable			
		Coal	Lignite	Gas	Diesel	Total		Hydro	RES* (MNRE)	Total	
Northern Region	State	20185.00	250.00	2878.90	0.00	23313.90	0.00	6008.25	816.50	6824.75	30138.65
	Private	22084.33	1080.00	772.00	0.00	23936.33	0.00	3241.00	43707.21	46948.21	70884.54
	Central	15589.82	250.00	2344.06	0.00	18183.88	1620.00	11580.51	379.00	11959.51	31763.39
	Sub-Total	**57859.15**	**1580.00**	**5994.96**	**0.00**	**65434.11**	**1620.00**	**20829.76**	**44902.71**	**65732.47**	**132786.58**
Western Region	State	21290.00	900.00	2849.82	0.00	25039.82	0.00	5446.50	619.23	6065.73	31105.55
	Private	31762.17	500.00	4676.00	0.00	36938.17	0.00	481.00	55652.03	56133.03	93071.20
	Central	21610.47	0.00	3280.67	0.00	24891.14	3240.00	1635.00	666.30	2301.30	30432.44
	Sub-Total	**74662.64**	**1400.00**	**10806.49**	**0.00**	**86869.13**	**3240.00**	**7562.50**	**56937.56**	**64500.06**	**154609.19**
Southern Region	State	22192.50	0.00	791.98	159.96	23144.44	0.00	11867.48	637.08	12504.56	35649.00
	Private	13572.50	250.00	5120.24	273.70	19216.45	0.00	0.00	56435.96	56435.96	75652.41
	Central	13827.04	3390.00	359.58	0.00	17576.62	3320.00	0.00	541.90	541.90	21438.52
	Sub-Total	**49592.04**	**3640.00**	**6271.80**	**433.66**	**59937.50**	**3320.00**	**11867.48**	**57614.94**	**69482.42**	**132739.92**
Eastern Region	State	6970.00	0.00	80.00	0.00	7050.00	0.00	3550.22	278.11	3828.33	10878.33
	Private	5613.00	0.00	0.00	0.00	5613.00	0.00	209.00	2074.83	2283.83	7896.83
	Central	16291.86	0.00	0.00	0.00	16291.86	0.00	1005.20	10.00	1015.20	17307.06
	Sub-Total	**28874.86**	**0.00**	**80.00**	**0.00**	**28954.86**	**0.00**	**4764.42**	**2362.94**	**7127.36**	**36082.22**
North Eastern Region	State	0.00	0.00	411.36	36.00	447.36	0.00	422.00	276.25	698.25	1145.61
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	312.05	312.05	312.05
	Central	1360.82	0.00	1253.60	0.00	2614.42	0.00	1522.01	30.00	1552.01	4166.43
	Sub-Total	**1360.82**	**0.00**	**1664.96**	**36.00**	**3061.78**	**0.00**	**1944.01**	**618.30**	**2562.31**	**5624.09**
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	70637.50	1150.00	7012.06	280.31	79079.87	0.00	27294.45	2632.42	29926.87	109006.74
	Private	73032.00	1830.00	10568.24	308.89	85739.14	0.00	3931.00	158211.86	162142.86	247882.00
	Central	68680.00	3640.00	7237.91	0.00	79557.91	8180.00	15742.72	1632.30	17375.02	105112.93
	Sub-Total	**212349.50**	**6620.00**	**24818.21**	**589.20**	**244376.91**	**8180.00**	**46968.17**	**162476.58**	**209444.75**	**462001.66**

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 31.12.2024 (As per latest information available with MNRE)

***Break up of RES all India as on 31.12.2024 is given below (in MW) :**

"Small Hydro Power"	Wind Power	Bio-Power		Solar Power$	Total Capacity
		BM Power/Cogen.	Waste to Energy#		
5100.55	48163.16	10728.21	619.94	97864.72	162476.58

#: 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	December, 2024		1320 MW
B.	Capacity Retired during	December, 2024		0 MW
C.	Net Conv. Capacity Added during	December, 2024	A-B	1320 MW
D.	Net RES Capacity Added during	December, 2024		3924.17 MW
E.	Net Capacity Added during	December, 2024	C+D	5244.17 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 30.11.2024.

Share from private sector generating stations has been updated as per latest information available.

NUPPL's Ghatampur TPP Unit-1 of 660 MW has been commissioned on 03.12.2024.

UPRVUNL's JAWAHARPUR STPP Unit-2 of 660 MW has been commissioned on 23.12.2024.

Table I

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 31.12.2024)

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	378.90	378.90	1365.12
	Central	2771.27	0.00	207.01	0.00	2978.29	102.83	723.09	0.00	723.09	3804.21
	Sub-Total	**3649.49**	**0.00**	**2115.41**	**0.00**	**5764.91**	**102.83**	**723.09**	**378.90**	**1101.99**	**6969.73**
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	2278.78	2817.78	7379.56
	Central	1566.60	0.00	431.59	0.00	1998.19	100.94	1591.73	5.00	1596.73	3695.86
	Sub-Total	**8638.38**	**0.00**	**581.59**	**0.00**	**9219.97**	**100.94**	**2330.73**	**2353.08**	**4683.81**	**14004.72**
Himachal Pradesh	State	0.00	0.00	0.00	0.00	0.00	0.00	805.60	287.61	1093.21	1093.21
	Private	0.00	0.00	0.00	0.00	0.00	0.00	1219.40	885.81	2105.21	2105.21
	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**	**1173.42**	**4422.30**	**4595.92**
"Jammu & Kashmir and Ladakh"	State	0.00	0.00	175.00	0.00	175.00	0.00	1230.00	171.47	1401.47	1576.47
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	146.41	146.41	146.41
	Central	577.14	0.00	129.07	0.00	706.22	67.98	1091.88	0.00	1091.88	1866.08
	Sub-Total	**577.14**	**0.00**	**304.07**	**0.00**	**881.22**	**67.98**	**2321.88**	**317.88**	**2639.76**	**3588.96**
Punjab	State	2300.00	0.00	150.00	0.00	2450.00	0.00	1243.40	127.80	1371.20	3821.20
	Private	4474.00	0.00	0.00	0.00	4474.00	0.00	288.00	2002.60	2290.60	6764.60
	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**	**2130.40**	**5957.84**	**14518.65**
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	31467.53	31571.53	35908.53
	Central	1031.56	250.00	171.13	0.00	1452.68	556.74	1407.67	344.00	1751.67	3761.09
	Sub-Total	**11868.56**	**1580.00**	**774.63**	**0.00**	**14223.18**	**556.74**	**1944.67**	**31835.38**	**33780.05**	**48559.97**
Uttar Pradesh	State	7795.00	0.00	0.00	0.00	7795.00	0.00	724.10	49.10	773.20	8568.20
	Private	8814.33	0.00	0.00	0.00	8814.33	0.00	842.40	5588.37	6430.77	15245.10
	Central	6034.18	0.00	1029.51	0.00	7063.69	289.48	1857.52	30.00	1887.52	9240.68
	Sub-Total	**22643.51**	**0.00**	**1029.51**	**0.00**	**23673.02**	**289.48**	**3424.02**	**5667.47**	**9091.49**	**33053.98**
Uttarakhand	State	0.00	0.00	0.00	0.00	0.00	0.00	1372.15	87.37	1459.52	1459.52
	Private	99.00	0.00	664.00	0.00	763.00	0.00	248.20	881.76	1129.96	1892.96
	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	969.13	3125.02	4492.02
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	77.05	77.05	77.05
	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	77.05	178.76	246.62
Central - Unallocated		1476.47	0.00	291.05	0.00	1767.52	237.03	751.45	0.00	751.45	2756.01
Total (Northern Region)	State	20185.00	250.00	2878.90	0.00	23313.90	0.00	6008.25	816.50	6824.75	30138.65
	Private	22084.33	1080.00	772.00	0.00	23936.33	0.00	3241.00	43707.21	46948.21	70884.54
	Central	15589.82	250.00	2344.06	0.00	18183.88	1620.00	11580.51	379.00	11959.51	31763.39
	Grand Total	**57859.15**	**1580.00**	**5994.96**	**0.00**	**65434.11**	**1620.00**	**20829.76**	**44902.71**	**65732.47**	**132786.58**

Table II

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 31.12.2024)

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	54.50	54.50	102.50
	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**	**54.55**	**56.55**	**658.19**
Gujarat	State	4510.00	900.00	2177.82	0.00	7587.82	0.00	772.00	110.04	882.04	8469.86
	Private	7144.67	500.00	3985.00	0.00	11629.67	0.00	0.00	29139.45	29139.45	40769.12
	Central	5504.44	0.00	424.00	0.00	5928.44	1034.89	0.00	243.30	243.30	7206.63
	Sub-Total	**17159.11**	**1400.00**	**6586.82**	**0.00**	**25145.93**	**1034.89**	**772.00**	**29492.79**	**30264.79**	**56445.61**
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	7668.98	7668.98	13487.98
	Central	4818.59	0.00	257.00	0.00	5075.59	491.98	1520.00	300.00	1820.00	7387.57
	Sub-Total	15962.59	0.00	332.00	0.00	16294.59	491.98	3223.66	8076.94	11300.60	28087.17
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	1676.29	1676.29	9343.79
	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**	**1687.34**	**1920.34**	**14277.76**
Maharashtra	State	9540.00	0.00	672.00	0.00	10212.00	0.00	2850.84	390.13	3240.97	13452.97
	Private	11006.00	0.00	568.00	0.00	11574.00	0.00	481.00	17060.94	17541.94	29115.94
	Central	4858.29	0.00	2272.73	0.00	7131.02	1068.66	0.00	123.00	123.00	8322.68
	Sub-Total	**25404.29**	**0.00**	**3512.73**	**0.00**	**28917.02**	**1068.66**	**3331.84**	**17574.07**	**20905.91**	**50891.59**
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	51.87	51.87	251.87
	Central	387.07	0.00	109.68	0.00	496.75	29.22	0.00	0.00	0.00	525.97
	Sub-Total	**587.07**	**0.00**	**109.68**	**0.00**	**696.75**	**29.22**	**0.00**	**51.87**	**51.87**	**777.84**
Central - Unallocated		2835.45	0.00	197.59	0.00	3033.04	438.00	0.00	0.00	0.00	3471.04
Total (Western Region)	State	21290.00	900.00	2849.82	0.00	25039.82	0.00	5446.50	619.23	6065.73	31105.55
	Private	31762.17	500.00	4676.00	0.00	36938.17	0.00	481.00	55652.03	56133.03	93071.20
	Central	21610.47	0.00	3280.67	0.00	24891.14	3240.00	1635.00	666.30	2301.30	30432.44
	Grand Total	**74662.64**	**1400.00**	**10806.49**	**0.00**	**86869.13**	**3240.00**	**7562.50**	**56937.56**	**64500.06**	**154609.19**

Table III

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 31.12.2024)

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	3611.32	36.80	7522.00	0.00	0.00	9257.24	9257.24	16779.25
	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**	**3846.72**	**36.80**	**16103.69**	**127.27**	**1673.60**	**9564.62**	**11238.22**	**27469.18**
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	5231.52	5231.52	7452.79
	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**	**5282.74**	**7762.67**	**19603.32**
Karnataka	State	5020.00	0.00	0.00	0.00	5020.00	0.00	3631.60	197.89	3829.49	8849.49
	Private	2050.00	0.00	0.00	25.20	2075.20	0.00	0.00	18715.04	18715.04	20790.24
	Central	2877.80	486.42	0.00	0.00	3364.22	698.00	0.00	0.00	0.00	4062.22
	Sub-Total	**9947.80**	**486.42**	**0.00**	**25.20**	**10459.42**	**698.00**	**3631.60**	**18912.92**	**22544.52**	**33701.94**
Kerala	State	0.00	0.00	0.00	159.96	159.96	0.00	1904.15	217.90	2122.05	2282.01
	Private	832.50	0.00	174.00	0.00	1006.50	0.00	0.00	1388.28	1388.28	2394.78
	Central	1403.32	325.33	359.58	0.00	2088.23	362.00	0.00	50.00	50.00	2500.23
	Sub-Total	**2235.82**	**325.33**	**533.58**	**159.96**	**3254.69**	**362.00**	**1904.15**	**1656.18**	**3560.33**	**7177.02**
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	21790.62	21790.62	28182.09
	Central	3025.32	1709.16	0.00	0.00	4734.48	1448.00	0.00	231.90	231.90	6414.38
	Sub-Total	**12771.99**	**1959.16**	**1027.18**	**211.70**	**15970.03**	**1448.00**	**2178.20**	**22145.22**	**24323.42**	**41741.45**
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	53.26	53.26	53.26
	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**	**53.26**	**53.26**	**430.91**
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	11867.48	637.08	12504.56	35649.00
	Private	13572.50	250.00	5120.24	273.70	19216.45	0.00	0.00	56435.96	56435.96	75652.41
	Central	13827.04	3390.00	359.58	0.00	17576.62	3320.00	0.00	541.90	541.90	21438.52
	Grand Total	**49592.04**	**3640.00**	**6271.80**	**433.66**	**59937.50**	**3320.00**	**11867.48**	**57614.94**	**69482.42**	**132739.92**

Table IV

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 31.12.2024)

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	457.26	457.26	1157.26
	Central	6583.11	0.00	0.00	0.00	6583.11	0.00	110.00	0.00	110.00	6693.11
	Sub-Total	**7283.11**	**0.00**	**0.00**	**0.00**	**7283.11**	**0.00**	**110.00**	**527.96**	**637.96**	**7921.07**
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	220.01	220.01	800.01
	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**	**224.06**	**415.06**	**3022.37**
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	635.53	635.53	3072.53
	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**	**757.48**	**2153.48**	**10916.82**
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	1746.00	0.00	0.00	0.00	1746.00	0.00	0.00	754.47	754.47	2500.47
	Central	1865.21	0.00	0.00	0.00	1865.21	0.00	89.00	10.00	99.00	1964.21
	Sub-Total	**5351.21**	**0.00**	**0.00**	**0.00**	**5351.21**	**0.00**	**2163.22**	**790.77**	**2953.99**	**8305.20**
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	7.56	216.56	216.56
	Central	76.54	0.00	0.00	0.00	76.54	0.00	64.00	0.00	64.00	140.54
	Sub-Total	**76.54**	**0.00**	**0.00**	**0.00**	**76.54**	**0.00**	**633.00**	**62.67**	**695.67**	**772.21**
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	5613.00	0.00	0.00	0.00	5613.00	0.00	209.00	2074.83	2283.83	7896.83
	Central	16291.86	0.00	0.00	0.00	16291.86	0.00	1005.20	10.00	1015.20	17307.06
	Grand Total	**28874.86**	**0.00**	**80.00**	**0.00**	**28954.86**	**0.00**	**4764.42**	**2362.94**	**7127.36**	**36082.22**

Table V

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 31.12.2024)

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	191.54	191.54	191.54
	Central	993.32	0.00	435.56	0.00	1428.88	0.00	422.08	25.00	447.08	1875.96
	Sub-Total	**993.32**	**0.00**	**741.92**	**0.00**	**1735.24**	**0.00**	**522.08**	**221.55**	**743.63**	**2478.87**
Arunachal Pradesh	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	116.61	116.61	116.61
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.85	38.85	38.85
	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**	**155.46**	**700.01**	**783.88**
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	18.08	18.08	18.08
	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**	**73.11**	**490.49**	**651.78**
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	16.23	16.23	16.23
	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**	**37.24**	**105.73**	**648.67**
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	13.79	13.79	13.79
	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**	**19.24**	**106.48**	**271.16**
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	30.39	30.39	30.39
	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**	**75.86**	**173.80**	**265.31**
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	276.25	698.25	1145.61
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	312.05	312.05	312.05
	Central	1360.82	0.00	1253.60	0.00	2614.42	0.00	1522.01	30.00	1552.01	4166.43
	Grand Total	**1360.82**	**0.00**	**1664.96**	**36.00**	**3061.78**	**0.00**	**1944.01**	**618.30**	**2562.31**	**5624.09**

Table VI

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/ UTS LOCATED IN ISLANDS

INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES

(As on 31.12.2024)

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 2024-25:

1. MTPCL's Maadurga Thermal Power Company Ltd. Project Unit-1 of 30 MW has been commissioned on 19.08.2024.
2. MTPCL's Maadurga Thermal Power Company Ltd. Project Unit-2 of 30 MW has been commissioned on 23.09.2024.
3. KSEB's Thottiyar HEP Unit-1 of 10 MW has been commissioned on 10.07.2024.
4. KSEB's Thottiyar HEP Unit-2 of 30 MW has been commissioned on 30.09.2024.
5. NUPPL's Ghatampur TPP Unit-1 of 660 MW has been commissioned on 03.12.2024.
6. UPRVUNL's JAWAHARPUR STPP Unit-2 of 660 MW has been commissioned on 23.12.2024.

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 brings 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 Controller General of Accounts, Risk Based Audit for Revamped Distribution Sector Scheme also been carried out in current financial year.

Performance of the Internal Audit Wing, during the year 2024-25 is as under (as on 31.12.2024):

No. of Units		Opening Balance as on 01.04.2024 (Outstanding Paras)	No. of Paras Raised	No. of Paras Settled	Total No. of Paras Outstanding
Audit Target	Audit Done				
32	10	517	34	16	535

AUDIT OBSERVATIONS

The Organization-wise Break-up of outstanding Audit Observation & Inspection Reports issued up-to 31/12/2024 is as under:-

SI.No	Name of organization/Office	No. of Inspection Reports Issued during 2024-25	No. of Paras Outstanding (Including old Paras)
01	Ministry of Power	01	39
02	Central Electrical Authority	03	138
03	Appellate Tribunal for Electricity	00	05
04	Grantee Institutions	00	114
05	Special Audits	00	84
06	RGGVY/DDUGJY/Saubhgya Scheme	00	55
07	R-APDRP Scheme	00	32
08	Pay & Accounts Offices	00	33
09	PSDF Scheme	02	24
10	Transmission Line	02	05
11	RDSS Scheme	01	06
	Total	**9**	**535**

STATUS OF OUTSTANDING PARA AS ON 31.12.2024						
SI.No	**Office**	**Opening Balance as on 01.04.2024**	**Para Added**	**Total**	**Para Settled**	**Closing Balance as on 31.12.2024**
Ministry of Power						
1	MoP USGAD	3	36	39	0	39
	Total of MoP					**39**
Central Electricity Authority						
1	CEA (HQ)	44	0	44	0	44
2	RPSO, MUMBAI	2	0	2	0	2
3	RPSO, DELHI	5	0	5	0	5
4	RPSO, KOLKATA	0	6	6	0	6
5	RPSO, BENGALURU	1	0	1	0	1
6	RIO, MUMBAI	0	0	0	0	0
7	RIO, N.DELHI	6	0	6	0	6
8	RIO, KOLKATA	0	0	0	0	0
9	RIO, CHENNAI	6	0	6	0	6
10	RIO, SHILONG	0	5	5	0	5
11	NRPC, N.DELHI	11	0	11	4	7
12	WRPC, MUMBAI	9	0	9	6	3
13	SRPC, BANGALORE	9	0	9	0	9
14	ERPC, KOLKATA	16	0	16	0	16
15	NERPC, SHILONG	0	0	0	0	0
16	DEPTT. of CANTEEN	22	6	28	0	28
	Total of CEA	**131**	**17**	**148**	**10**	**138**
Appellate Tribunals For Electricity						
1	ATE (APTEL)	5		5		5
GRANTEE INSTITUTIONS						
1	BBMB, NANGAL	4	0	4	0	4
2	JERC, GURGAON	5	0	5	0	5
3	NPTI, FARIDABAD	32	0	32	7	25
4	CPRI, BANGALORE	4	15	19	0	19
5	FOR, DELHI	5	0	5	0	5
6	BEE, N.DELHI	14	5	19	8	11
7	CERC, N.DELHI	40	0	40	0	40
8	CPRI, UHVRL Hyderabad	2	0	2	0	2
9	CPRI Bhopal	3	0	3	0	3
	Total of Grantee	**109**	**20**	**129**	**15**	**114**
SPECIAL AUDITS						
1	MoP (FTE/OE)	19	0	19	0	19
2	REC (AG & SP) & RGGVY	5	0	5	0	5

3	BEE (BLY)	1	0	1	0	1
4	BEE (NMEEE)	11	0	11	0	11
5	BBMB (CHANDIGARH)	10	0	10	0	10
6	THDC	5	0	5	0	5
7	NEEPCO SHILONG	10	0	10	0	10
8	LOHARINAG PALA	9	0	9	0	9
9	NHPC FARIDABAD	7	0	7	0	7
10	BTPS	1	0	1	0	1
11	NEF (REC) New Delhi	6	0	6	0	6
Total of Special Audits		84	0	84	0	84

OFFICE OF CHIEF CONTROLLER OF ACCOUNTS						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	Pr.AO ADMIN	2	0	2	0	2
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	04	04	08	03	05
6	PAO(CEA), BENGALURU	09	0	09	05	04
Total of O/o CHIEF CONTROLLER OF ACCOUNTS		**37**	**4**	**41**	**8**	**33**

RGGVY/DDUGJY						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	REC (HQ) New Delhi (DDUGJY & Saubhagya)	22	0	22	0	22
2	RGGVY/DDUGJY	22	0	22	0	22
3	Saubhagya	11	0	11	0	11
	Total	**55**	**0**	**55**	**0**	**55**

RAPDRP SCHEME						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	PFC (HQ) New Delhi	05	0	05	02	03
2	RAPDRP/IPDS	29	0	29	00	29
	Total	**34**	**0**	**34**	**02**	**32**

PSDF SCHEME						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	NLDC	10	05	15	0	15
2	PSDF	09	00	09	0	09
	Total	**19**	**0**	**24**	**0**	**24**

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**

RDSS Scheme						
SI.No	**Office**	**Opening Balance**	**Added**	**Total**	**Dropped**	**Closing Balance**
1	REC, HQ	0	06	06	0	06
	Total		**06**	**06**	**0**	**06**

Consolidated Report of Outstanding Paras (as on 31.12.2024)

Opening Balance as on 01.04.2024

Compliance and Special Audit	404
RGGVY/DDUGJY Scheme (Units)	55
R-APDRP	34
PSDF	19
Transmission Line	5
Total	**517**

Added between 01.04.2024 to 31.12.2024

Compliance and Special Audit	23
RGGVY/DDUGJY Scheme (Units)	00
R-APDRP	00
PSDF	05
Transmission Line	00
RDSS	06
Total	**34**

Dropped between 01.04.2024 to 31.12.2024

Compliance and Special Audit	14
RGGVY/DDUGJY Scheme (Units)	00
R-APDRP	02
PSDF	00
Transmission Line	00
Total	**16**

Closing balance as on 31.12.2024

Compliance and Special Audit	413
RGGVY/DDUGJY Scheme (Units)	55
R-APDRP	32
PSDF	24
Transmission Line	5
RDSS	06
Total	**535**

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

THE STATUS OF C&AG AUDIT PARAS FOR THE YEAR 2024-25

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. 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 39th SAC meeting was held on 07.06.2024 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 31.12.2024 is given in the table below.

Para Type	As on 01.1.2024	Report/Paras added during 01.01.2024 to 31.12.2024	Report/Paras settled during 01.01.2024 to 31.12.2024	Closing Balance-Col. (ii +iii)-Col. (iv)
(i)	(ii)	(iii)	(iv)	(v)
Commercial	16	1	5	12
Civil	3	1	1	3
Total	**19**	**2**	**6**	**15**

In the year 2024-25 from date 01.01.2024 to 31.12.2024, two reports with Report No. 25/2023 (Civil-Central Autonomous Bodies) & Report No. 12/2024 (Commercial-Compliance Audit Observation) have been laid in Parliament.

The salient paragraphs of the newly added reports are as follows.

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 of 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.

Report no. 12/2024

Para No. 3.1: Avoidable expenditure of ₹ 112.63 crore towards payment of additional deviation charges and penalties for non-maintenance of Grid discipline (DVC).

Damodar Valley Corporation incurred an avoidable expenditure of ₹ 112.63 crore towards additional deviation charges for over drawal of power when the Grid frequency was below 49.85 Hertz and penalties for sustained violation of committed schedule for injection of power in the grid.

Para No. 3.2: Loss due to non-recovery of electricity charges from a private party (DVC).

Damodar Valley Corporation failed to recover its outstanding electricity charges of ₹ 12.95 crore from a private party due to non-adherence to the terms of the agreement.

Para No. 3.3: Undue benefit of ₹ 7.60 crore to ineligible consumers by extending incentives on water charges (DVC).

Damodar Valley Corporation extended incentives of ₹ 7.60 crore towards Zero Liquid/Effluent Discharge on water charges bills to ineligible consumers.

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