

NATIONAL ELECTRICITY PLAN (Draft)

Generation Vol- I

[In fulfilment of CEA's obligation under section (4) of the Electricity Act 2003]



Government of India
Ministry of Power
Central Electricity Authority
September, 2022



National Electricity Plan

(Volume I)

Generation

[In fulfilment of CEA's obligation under
Section 3(4) of the Electricity Act 2003]

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Ministry of Power
Central Electricity Authority



September, 2022

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ACRONYMS

ACRONYMS	EXPANSION
AC	Alternating Current
ACC	Air Cooled Condensers
ACQ	Annual Contracted Quantity
AGDSM	Agricultural Demand Side Management
AHEC	Alternate Hydro Energy Centre
AHP	Ash Handling Plant
APC	Auxiliary Power Consumption
APDRP	Accelerated Power Development and Reforms Programme
APM	Administered Price Mechanism
AT&C	Aggregate Technical and Commercial
BAU	Business As Usual
BCD	Basic Custom Duty
Bcum, BCM, Bm ³	Billion cubic metre
BEE	Bureau of Energy Efficiency
BHEL	Bharat Heavy Electricals Ltd.
BIS	Bureau of Indian Standards
BLY	Bachat Lamp Yojna
BoP	Balance of Payment/Balance of Plant
BESS	Battery Energy Storage System
BPL	Below Poverty Line
BT	Billion Tonnes
BTG	Boiler Turbine Generator
BU	Billion Units
BWR	Boiling Water Reactor
CAD	Computer-Aided Design
CAES	Compressed Air Energy Storage
CAGR	Compounded Annual Growth Rate
CBIP	Central Board of Irrigation & Power
CBM	Coal Bed Methane
CCEA	Cabinet Committee on Economic Affairs
CCGT	Combined Cycle Gas Turbine
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CED	Chandigarh Electricity Department
CERC	Central Electricity Regulatory Commission
CFBC	Circulating Fluidized Bed Combustion
CFD	Computational Fluid Dynamics
CFL	Compact Fluorescent Lamp
CFFP	Central Forge & Foundry Plant
CHP	Combined heat and power
CIL	Coal India Limited

ACRONYMS	EXPANSION
CIMFR	Central Institute of Mining and Fuel Research
CII	Confederation of Indian Industry
CIL	Coal India Ltd.
CLA	Central Loan Assistance
COD	Date of Commercial Operation
CO	Carbon mono oxide
CO₂	Carbon di oxide
COP 26	Conference of the Parties 26
CPP	Captive Power Plant
CPRI	Central Power Research Institute
CPSU	Central Public Sector Undertaking
Crs	Crores
CRGO	Cold Rolled Grain Oriented
CRNGO	Cold Rolled Non Grain Oriented
CS	Central Sector
CSIR	Council for Scientific and Industrial Research
CSP	Concentrated solar power
CST	Central Sales Tax
CT	Cooling Tower
CTO	Consent To Operate
CUF	Capacity Utilization Factor
DAE	Department of Atomic Energy
DBFOT	Design-Build-Finance-Operate-Transfer
DBFOO	Design, Build, Finance, Own, and Operate
DC	Designated Consumers
DDG	Decentralised Distributed Generation
DDUGJY	Deen Dayal Upadhyaya Gram Jyoti Yojana
DEEP	Discovery of Efficient Electricity Price
DELP	Domestic Efficient Lighting Programme
DFC	Dedicated Freight Corridor
DGH	Director General Hydro Carbon
DG	Diesel Generating
DISCOM	Distribution Company
DPR	Detailed Project Report
DR	Demand Response
DSM	Demand Side Management
DST	Department of Science & Technology
DVC	Damodar Valley Corporation
DVR	Dynamic Voltage Restorer
EA 2003	Electricity Act 2003
EC	Energy Conservation
EC Act	Energy Conservation Act
ECBC	Energy Conservation Building Code

ACRONYMS	EXPANSION
EE	Energy Efficiency
EEFP	Energy Efficiency Financing Platform
EESL	Energy Efficiency Services Limited
EEZ	Exclusive Economic Zone
EGoM	Empowered Group of Ministers
EIA	Environmental Impact Assessment
ELCOMA	Electric Lamp and Component Manufacturers' Association of India
EMU	Electrical Multiple Units
ENS	Energy Not Served
EPC	Engineering Procurement Contract
EPS	Electric Power Survey
EPSC	Electric Power Survey Committee
ERDA	Electric Research & Development Association
ESCos	Energy Service Company or Energy Savings Company
ESCert	Energy Saving Certificate
ESP	Electro Static Precipitator
EU	European Union
EV	Electric Vehicles
FAUP	Fly Ash Utilisation Programme
FBC	Fluidised Bed Combustion
FEEED	Framework for Energy Efficient Economic Development
FESS	Fly wheels energy storage system
FGD	Flue-gas desulfurization
FICCI	Federation of Indian Chambers of Commerce & Industry
FO	Forced Outage
FOR	Forum of Regulators
FRP	Fibre-Reinforced Plastic
FSA	Fuel Supply Agreement
GAIL	Gas Authority of India Limited
GBI	Generation Based Incentive
GCV	Gross Calorific Value
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Green Energy Fund
GHAVP	Gorakpur Haryana Anu Vidyut Pariyojana
GHG	Green House Gas
GIS	Geographic Information System
GPS	Geographic Positioning System
GR	General Review
GSPC	Gujarat State Petroleum Corporation
GT	Gas Turbine
GTAM	Green Term Ahead Market
GW	Giga Watt

ACRONYMS	EXPANSION
H2FC	Hydrogen Fuel Gas
HBJ	Hazira-Bijapur-Jagdishpur (pipeline)
HCSD	High Concentration Slurry Deposit
HFO	Heavy Fuel Oil
HEP	Hydro Electric Project
HELP	Hydrocarbon Exploration and Licensing Policy
HHV	Higher Heating Valve
HLEC	High-Level Empowered Committee
HoG	Head on Generation
HPO	Hydro Purchase Obligation
HRD	Human Resource Development
HSD	High Speed Diesel
HT	High Tension
HVDS	High Voltage Distribution System
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
HVJ	Hazira-Vijaipur-Jagdishpur
IAEA	International Atomic Energy Agency
IC	Installed Capacity
ICAR	Indian Council for Agricultural Research
ID	Induced Draft
IEA	International Energy Agency
IEP	Integrated Energy Policy
IEEMA	Indian Electrical and Electronics Manufacturers Association
IGCAR	Indira Gandhi Centre for Atomic Research
IGCC	Integrated Gasification Combined Cycle
IISC	Indian Institute of Science
IIT	Indian Institute of Technology
IMTF	Inter-Ministerial Task Force
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IPDS	Integrated Power Development Scheme
IPP	Independent Power Producer
IR	Indian Railway
IRP	Integrated Resource Planning
ISA	International Solar Alliance
ITI	Industrial Training Institutes
IS	Indian Standard
ISCC	Integrated Solar Combined Cycle
ISO	International Standard Organisation
IT	Information Technology
JMVP	Jalmarg Vikas Project
JVs	Joint Ventures

ACRONYMS	EXPANSION
KAPP	Kakrapar Atomic Power Plant
kCal	kilo Calorie
kgoe	Kilogram of oil equivalent
KGD6	Krishna Godavari Dhirubhai 6
KKNPP	Kudankulam Nuclear Power Project
kW	kilo Watt
kWh	kilo Watt hour
LCAC	Light Commercial Air Conditioners
LE	Life Extension
LEP/LE	Life Extension Programme
LED	Light Emitting Diode
LF	Load Factor
LIDAR	Light Detection and Ranging
LNG	Liquefied Natural Gas
LOA	Letter of Award
LOLP	Loss of Load Probability
LP	Linear Programming
LSHS	Low Sulphur Heavy Stock
LT	Low Tension
LWR	Light Water Reactor
Mcm	Million cubic metre
MCP	Market Clearing Price
MEMU	Mainline Electrical Multiple Unit
MII	Make in India Initiative
MMPA	Million Metric Tonnes Per Annum
MMSCMD	Million Metric Standard Cubic Metre per Day
MNRE	Ministry of New & Renewable Energy
MNP	Minimum Need Programme
MOC	Ministry of Coal
MoEF&CC	Ministry of Environment ,Forest & Climate Change
MoP	Ministry of Power
MoP&NG	Ministry of Petroleum and Natural Gas
MoRTH	Ministry of Road Transport and Highways
MoU	Memorandum of Understanding
MPA	Major Port Authority
MuDSM	Municipality Demand Side Management
MT	Million Tonne
MTEE	Market Transformation for Energy Efficiency
MToe	Million Tonnes Oil equivalent
MU	Million Units
M&V	Monitoring & Verification
MW	Mega Watt
NAPCC	National Action Plan on Climate Change

ACRONYMS	EXPANSION
NAPS	Narora Atomic Power Station
NCDP	New Coal Distribution Policy
NDCs	Nationally Determined Contributions
NDT	Non Dispatchable Technologies
NECA	National Energy Conservation Awards
NEERMAN	National Energy Efficiency Roadmap for Movement towards Affordable & Natural Habitat
NEF	National Electricity Fund
NEP	National Electricity Plan
NELP	New Exploration Licensing Policy
NETRA	NTPC Energy Technology Research Alliance
NHDP	National Highway Development Project
NHM	National Hydrogen Energy Mission
NHPC	National Hydroelectric Power Corporation
NISE	National Institute of Solar Energy
NIWE	National Institute of Wind Energy
NLC	Neyveli Lignite Corporation Limited
NMDC	National Mineral Development Corporation
NMEEE	National Mission for Enhanced Energy Efficiency
NML	National Metallurgical Laboratory
NO_x	Oxides of Nitrogen
NPP	National Perspective Plan
NPCIL	Nuclear Power Corporation of India Ltd.
NPTI	National Power Training Institute
NPMU	National Smart Grid Mission Project Management Unit
NSGM	National Smart Grid Mission
NSM	National Solar Mission
NTPC	National Thermal Power Corporation
NW	National Waterway
OCGT	Open Cycle Gas Turbine
O&M	Operation & Maintenance
ODC	Over Dimension Consignment/ Over Dimension Cargo
OHE	Over Head Equipment
OSOWOG	One Sun One World One Grid
OWC	Over Weight Cargo
PAP	Project Affected People
PAT	Perform Achieve & Trade
PC	Pulverized Coal
PCRA	Petroleum Conservation Research Association
PDC	Project Development Cell
PFA	Power For All
PFBC	Pressurised Fluidized Bed Combustion
PFC	Power Finance Corporation

ACRONYMS	EXPANSION
PGCIL	Power Grid Corporation of India Limited
PHWR	Pressurised Heavy Water Reactor
PIE	Partnership In Excellence
PIB	Public Investment Board
PLF	Plant Load Factor
PLI	Performance Linked Incentive
PLL	Phase-locked loop
PMC	Project Management Consultants
PMGY	Pradhan Mantri Gramodaya Yojna
PMP	Phased Manufacturing Programme
PM KUSUM	Pradhan Mantri Kisan Urja Suraksha Evam Utthan Mahabhiyan
PPMP	Power Project Monitoring Panel
PPP	Public Private partnership
PRGF	Partial Risk Guarantee Fund
PRSF	Partial Risk Sharing Facility
POSO	Power System Operation Corporation
PPA	Power Purchase Agreement
PPM	Parts Per Million
PRGFEE	Partial Risk Guarantee Fund for Energy Efficiency
PS	Private Sector
PSA	Power Supply Agreement
PSC	Production Sharing Contract
PSDF	Power System Development Fund
PSP	Pump Storage Plant
PV	Photovoltaic
PSS	Pumped Storage Schemes
PSU	Public Sector Undertaking.
R&D	Research & Development
R&M	Renovation & Modernisation
R-APDRP	Restructured Accelerated Power Development and Reforms Programme
RAPS	Rajasthan Atomic Power Station
REB	Regional Electricity Board
REC	Rural Electrification Corporation
RECTPCL	REC Transmission Projects Limited
RES	Renewable Energy Sources
RFP	Request for Proposal
RFQ	Request for Quotation
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
RGTEL	Reliance Gas Transportation Infrastructure Ltd
RHE	Rural Household Electrification
RLA	Residual Life Assesment
RLDC	Regional Load Dispatch Centre
RLNG	Regasified Liquefied Natural Gas

ACRONYMS	EXPANSION
RM	Reserve Margin
ROM	Run Of Mines
ROR	Run Of River
ROSHANEE	Roadmap of Sustainable and Holistic Approach to National Energy Efficiency
ROW	Right Of Way
RPCs	Regional Power Committees
RPO	Renewable Purchase Obligation
RSOP	Research Schemes on Power
R&M	Renovation & Modernisation
R&R	Rehabilitation & Resettlement
RTC	Round the Clock
SAARC	South Asian Association for Regional Corporation
SBDs	Standard Bidding Documents
SCADA	Supervisory Control and Data Acquisition
SCCL	Singareni Collieries Company Limited
SCR	Selective Control Reduction
SDAs	State Designated Agencies
SDL	State Development Loan
SEAD	Super-Efficient Appliance Development
SEB	State Electricity Board
SEC	Specific Energy Consumption
SECI	Solar Energy Corporation of India
SEEP	Super-Efficient Equipment Program
SERC	State Electricity Regulatory Commission
SIDHIEE	Simplified Digital Hands-on Information on Energy Efficiency
SJVNL	Satluj Jal Vidyut Nigam Limited
SLC(LT)	Standing Linkage Committee (Long-Term)
SLDC	State Load Dispatch Centre
SDL	Statutory Liquidity Ratio
S&L	Standard & Labelling
SMEs	Small & Medium Enterprises
SOG	Sanctioned & Ongoing
SO _x	Oxides of Sulphur
SPM	Suspended Particulate Matter
SS	State Sector
SSTS	Solid State Transfer Switches
STPP	Super Thermal Power Plant
STPS	Super Thermal Power Station
STUs	State Transmission Utilities
SWHS	Solar Water Heater System
T&D	Transmission & Distribution
TERI	The Energy Research Institute
TG	Turbine Generator

ACRONYMS	EXPANSION
TIFAC	Technology Information Forecasting & Assessment Council
TOD	Time Of The Day
TOR	Terms of Reference
TOU	Time of Use
TPES	Total Primary Energy Supply
TPP	Thermal Power Plant
TPS	Thermal Power Station
UAVs	Unmanned Aerial Vehicles
UDAY	Ujwal DISCOM Assurance Yojana
UHD	Ultra High Definition
ULB	Urban Local Bodies
UJALA	Unnat Jyoti by Affordable LED for All
UMPP	Ultra Mega Power Project
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNNATEE	Unlocking National Energy Efficiency Potential
USC	Ultra Super Critical
UT	Union Territory
VAT	Value Added Tax
VCFEE	Venture Capital Fund for Energy Efficiency
VRE	Variable Renewable Energy
WTE	Waste to Energy