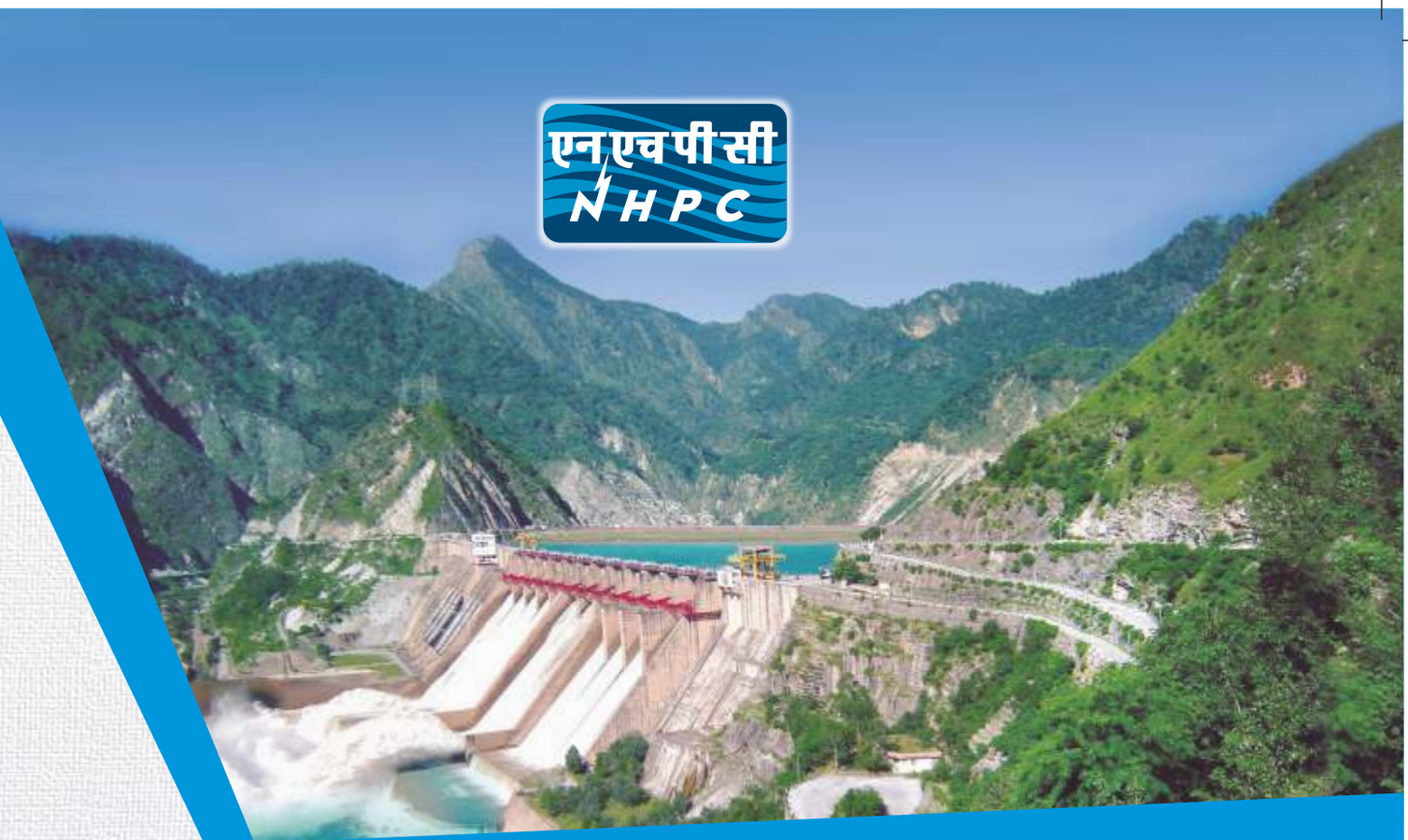
एनएचपीसी
NHPC



"Turning Challenges into OPPORTUNITIES"

NHPC Limited

(A Government of India Enterprise)

94.2 MW Tanakpur Power Station
(Uttarakhand) - Barrage

NHPC

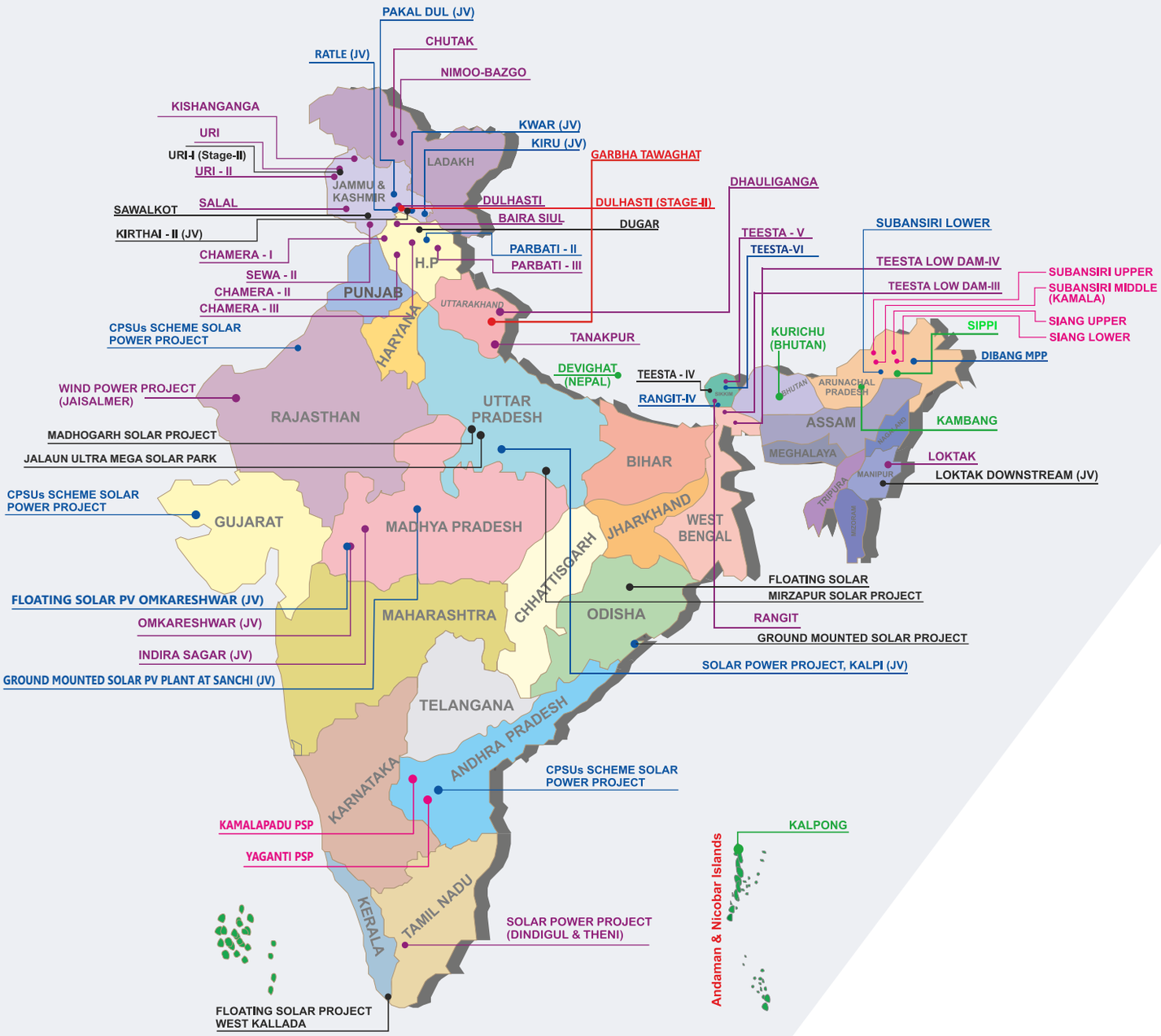
THE POWER BEHIND HYDROPOWER

NHPC Limited, was established in 1975. NHPC is a Schedule 'A' Enterprise of the Government of India with 'MINI RATNA' status.

With an authorized share capital of ₹ 15000 crore and total investment base of ₹ 78089 crore (as on 31.12.2023), NHPC is ranked as a premier organization in India for development of hydropower.

The technical & engineering proficiency and experience of NHPC place it in a leading position in the field of hydropower development in India and neighbouring countries.

FOOTPRINTS OF NHPC



- OPERATING POWER STATIONS
- PROJECTS COMPLETED ON DEPOSIT/TURNKEY BASIS
- PROJECTS UNDER CONSTRUCTION
- PROJECTS UNDER SURVEY & INVESTIGATION
- PROJECT UNDER CLEARANCE
- NEW PROJECTS FOR POSSIBLE ALLOTMENT

NHPC - AN OVERVIEW

Year of Establishment	1975
Authorized Share Capital	₹15000 crore
Power Stations in Operation	**26 (7144.20 MW)#** 22 (5551.2 MW)-NHPC 3 (1528 MW)-NHDC (JV)* 1 (65 MW)-BSUL (JV)**
Power Stations Commissioned on Deposit/Turnkey Basis - Completed outside India - Completed within India	5 (89.35 MW) 2 (74.10 MW) 3 (15.25 MW)
Projects under Construction	14 (10402.70 MW)
Projects under Survey and Investigation stage	5 (4750 MW)
Projects under Clearances	14 (5047 MW)
New Projects Recent Allotment/ Possible Allotment	9 (19800 MW)
New Initiatives by NHPC	10 (11430 MW)

POWER STATIONS IN OPERATION

Power Station	UT / State	Capacity (MW)	
		Own Projects	In JV
Baira Siul	H.P.	180	
Loktak	Manipur	105	
Salal	J & K	690	
Tanakpur	Uttarakhand	94.2	
Chamera-I	H.P.	540	
Uri-I	J & K	480	
Rangit	Sikkim	60	
Chamera-II	H.P.	300	
Dhauliganga	Uttarakhand	280	
Dulhasti	J & K	390	
Teesta-V	Sikkim	510	
Sewa-II	J & K	120	
Chamera-III	H.P.	231	
Chutak	Ladakh	44	
Teesta Low Dam-III	West Bengal	132	
Nimoo-Bazgo	Ladakh	45	
Uri-II	J & K	240	
Parbati-III	H.P.	520	
Teesta Low Dam-IV	West Bengal	160	
Kishanganga	J & K	330	
Wind Power Project in Jaisalmer	Rajasthan	50	
Tamil Nadu Solar Project	Tamil Nadu	50	
Indirasagar*	M.P.		1000
Omkareshwar*	M.P.		520
Sanchi SPP*	M.P.		08
Kalpi SPP**	Uttar Pradesh		65
	TOTAL	**5551.2**	**1593**
	GRAND TOTAL	**7144.2 MW**	

In addition to above, NHPC has also added 3129.70 kWp rooftop solar power plants.
* Joint venture between NHPC and Govt. of Madhya Pradesh.
** Joint venture between NHPC and Govt. of Uttar Pradesh. Project fully commissioned on 29.03.2024.

POWER STATIONS COMMISSIONED ON DEPOSIT/TURNKEY BASIS

Power Station	UT/ State/ Country	Capacity (MW)
Abroad		
Devighat	Nepal	14.10
Kurichu	Bhutan	60.00
India		
Kalpong	Andaman & Nicobar Islands	5.25
Sippi	Ar. Pradesh	4.00
Kambang	Ar. Pradesh	6.00
	TOTAL	**89.35**

PROJECTS UNDER CONSTRUCTION

Project	UT/ State	Capacity (MW)		Project Cost (In Cr.)
		Own	In JV/ Subsidiary	
Hydro				
Parbati-II	H.P.	800		11063.50
Subansiri Lower	Ar. Pradesh	2000		21247.54
Dibang Multipurpose Project	Ar. Pradesh	2880		31876.39
Teesta-VI (wholly owned subsidiary)	Sikkim		500	5748.04
Pakal Dul	J & K		1000	8112.12
Kiru	J & K		624	4287.59
Ratle	J & K		850	5281.94
Kwar	J & K		540	4526.12
Rangit-IV	Sikkim		120	938.29
Solar				
1000 MW CPSUs scheme Solar PV Project(s)				
600 MW	Gujarat	600		4295.63
300 MW	Rajasthan	300		1731.57
100 MW	Andhra Pradesh	100		577.20
Floating Solar PV, Unit-D (In the Reservoir of Omkareshwar Project)	M.P.		88	589.16
Ground mounted SPP in Central University of Rajasthan, Ajmer	Rajasthan		0.70	4.59
	TOTAL	**6680**	**3722.70**	**100279.70**
	GRAND TOTAL	**10402.70**		

2000 MW Subansiri Lower HEP (Assam/Arunachal Pradesh) - Dam

PROJECTS UNDER SURVEY & INVESTIGATION

Project	UT/ State	Installed Capacity (MW)	Remark
Hydro- Own			
Garba Tawaghat	Uttarakhand	630	
Dulhasti Stage-II	J&K	260	
Kamala HEP	Ar. Pradesh	1720	MOA signed between Govt. of Arunachal Pradesh and NHPC Ltd. on 12.08.2023
Subansiri Upper	Ar. Pradesh	1500	
Pump Storage Project - JV			
Indirasagar Omkareshwar PSP (On Stream)	Madhya Pradesh	640	
	TOTAL	**4750**	

PROJECTS UNDER CLEARANCES

Project	UT/ State/ Country	Installed Capacity (MW)	Clearance Pending
Standalone NHPC			
A- Hydro			
Teesta-IV	Sikkim	520	FC-II, PIB & CCEA
Sawalkot	J&K	1856	Defence, FC-I & II, EC, PIB & CCEA
Dugar	H.P.	500	FC-I & II, EC, PIB & CCEA
Uri-I Stage-II	J&K	240	FC-I & II, EC, PIB & CCEA
B- Solar			
Floating Solar Power Project, West Kallad	Kerala	50	PPA
200 MW Grid connected Solar PV Projects (600 MW Solar Park at Khavda) Stage-I	Gujarat	200	Finalization of Tender
200 MW Grid connected Solar PV Projects (600 MW Solar Park at Khavda) Stage-III	Gujarat	200	Finalization of Tender
Ground Mounted Solar Project	Odisha	40	Finalization of Tender
Projects in Joint Venture			
A- Hydro			
Kirthai-II	J&K	930	IWT, FC-I & II, EC, PIB & CCEA
Loktak D/S	Manipur (LDHCL, a JV Company with Govt. of Manipur)	66	PIB & CCEA
B- Solar			
Floating Solar Odisha (300 MW out of 500 MW) JV with GEDCOL	Odisha	300	Formation of JVC, PPA, PIB & CCEA
Mirzapur Solar Project (BSUL-JV with UPNEDA)	Uttar Pradesh	100	PPA, PIB
Madhogarh Solar Project (BSUL-JV with UPNEDA)	Uttar Pradesh	45	PPA, PIB
C- Solar Park			
Jalaun Ultra Mega Solar Park 1200 MW (BSUL-JV with UPNEDA)	Uttar Pradesh	–	PIB
	GRAND TOTAL	**5047**	

NEW INITIATIVES BY NHPC

Project	County/ UT/ State	Installed Capacity (MW)	Remarks
Hydro Projects in Nepal (Identified By NHPC JV Mode)			
Phukot Karnali Project (Inception report submitted on 30.08.2023)	Nepal	480	MoU between NHPC and VUCL exchanged on 01.06.2023 for development of Phukot Karnali Project
Hydro Projects in Nepal (For Prep of DPR)			
West Seti	Nepal	750	
SR 6	Nepal	450	
Pumped Storage Plants (PSP)			
Tekwa – 2 (Off Stream) (PFR submitted on 31.01.2023)	Madhya Pradesh	800	PFR submitted by NHPC to CEA on 10.02.2023.
Satpura-2 (Off Stream) (PFR Completed)	Madhya Pradesh	1500	PFR submitted by NHPC to CEA on 03.04.2024.
MoU Signed with Govt. of Maharashtra			
Kengadi	Maharashtra	600	MoU signed with Deptt. of Energy Govt. of Maharashtra on 06.06.2023
Jalond	Maharashtra	2400	
Kalu	Maharashtra	1150	
Savitri	Maharashtra	1800	
Indicated by MOP to DVC (Proposed through JV of NHPC & DVC)			
Lugupahar	Jharkhand	1500	
	GRAND TOTAL	**11430**	

NEW PROJECTS RECENT ALLOTMENT/POSSIBLE ALLOTMENT

Project	UT/ State	Installed Capacity (MW)	Remarks
A) Hydro (Indicated By MOP)			
Siang Lower	Ar. Pradesh	2700	
Siang Upper MPP (PFR submitted on 30.12.22)	Ar. Pradesh	11200	
B) Pump Storage Plants			
Kamlapadu	Andhra Pradesh	950	MoU signed between NHPC and APGENCO for implementation of projects in Joint Venture mode on 23.08.2023
Yaganti	Andhra Pradesh	1000	
Longtharai PSP	Tripura	800	Tripura Power Generation Limited vide its Letter dated 20.12.2023 has conveyed the allotment of 04 nos. Pumped Storage Projects to NHPC Limited by the Government of Tripura for detailed Survey & Investigation Works and their subsequent Implementation based on their techno-commercial viability.
Sunitipur PSP	Tripura	800	
Shantipur PSP	Tripura	800	
Sakhan PSP	Tripura	800	
Kuppa PSP	Gujarat	750	MoU has been signed between NHPC & Govt. of Gujarat on 3rd January 2024 for development of 750 MW Pump Storage Project in Kuppa Village, Gujarat
	GRAND TOTAL	**19800**	

SUBSIDIARY / JOINT VENTURES

- **NHDC Limited** - JV with Govt. of Madhya Pradesh.
- **Chenab Valley Power Projects (P) Limited** - JV with JKSPDC in UT of J&K.
- **Ratle Hydroelectric Power Corporation Limited -** Incorporated with NHPC & JKSPDC holding equity share of 51% & 49% respectively. The JVC will implement 850 MW Ratle HEP in UT of J&K.
- **Lanco Teesta Hydro Power Limited** - Wholly owned subsidiary of NHPC for Teesta-VI HEP (500 MW) in Sikkim.
- **Jal Power Corporation Limited-**Wholly owned subsidiary of NHPC for Rangit-IV HEP (120MW) in Sikkim.
- **NHPC Renewable Energy Limited (NREL) -** Wholly owned subsidiary of NHPC for development of Renewable Energy, Small Hydro and Green Hydrogen based business.
- **Bundelkhand Saur Urja Limited** - JV with UPNEDA
- **Loktak Downstream Hydroelectric Corporation Limited** - JV with Govt. of Manipur
- **National High Power Test Laboratory Pvt. Limited** - JV with NTPC, PGCIL, CPRI and DVC.
- **Proposed JV in Odisha -** with Green Energy Development Corporation of Odisha Ltd. (GEDCOL) with NHPC & GEDCOL holding equity share of 74% & 26% for development of 500 MW Floating Solar Power Projects on different water bodies in Odisha.

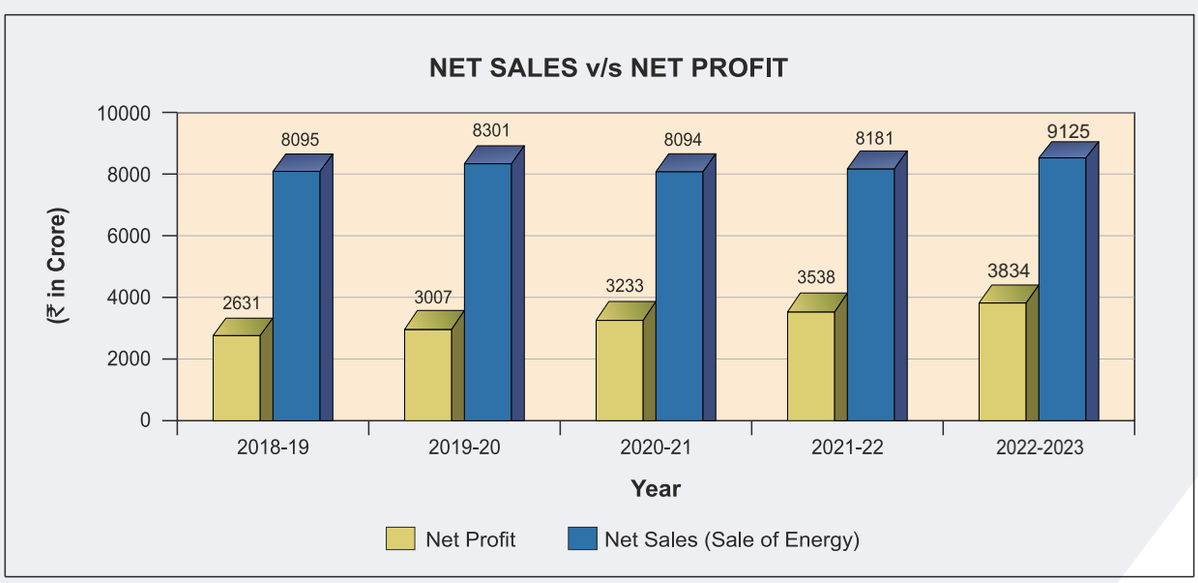
1000 MW Indira Sagar Power Station (Madhya Pradesh)-Dam

FINANCIAL HIGHLIGHTS

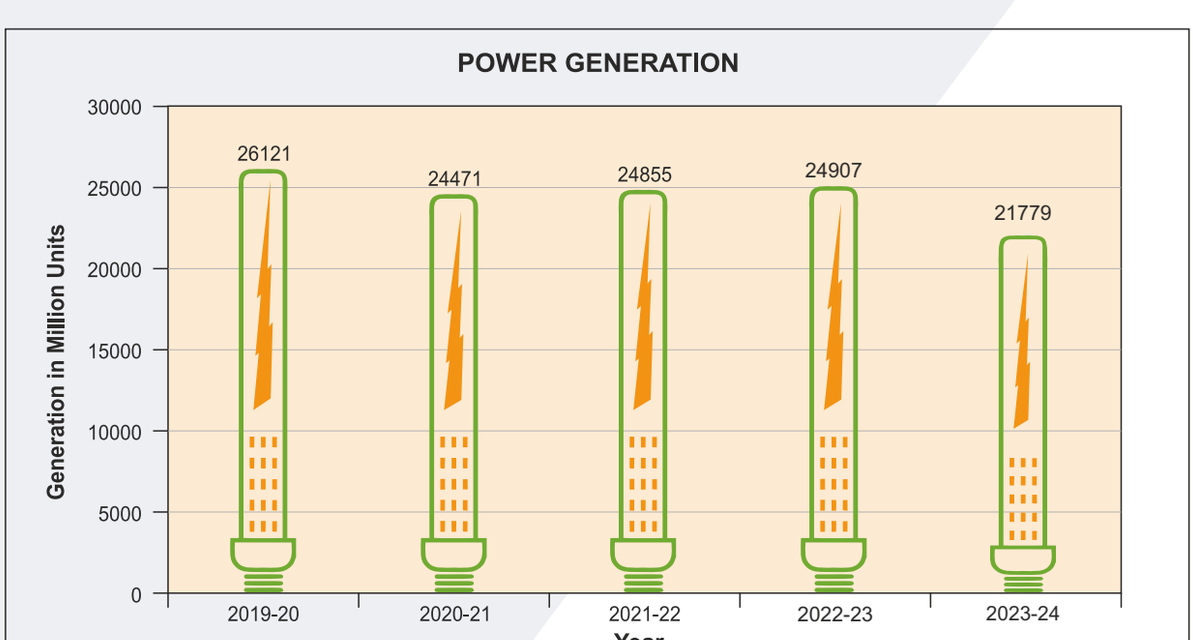
HIGHEST EVER CAPEX ACHIEVED
₹ 8652.32 crore
(2023-24)

"Started power generation in 1982 with a turnover of ₹ 24 crore and net profit of ₹ 7.68 crore."

"Listed on Indian bourses - BSE & NSE w.e.f. 1st September 2009 after successfully concluding its IPO worth over ₹ 6000 crore."



POWER GENERATION



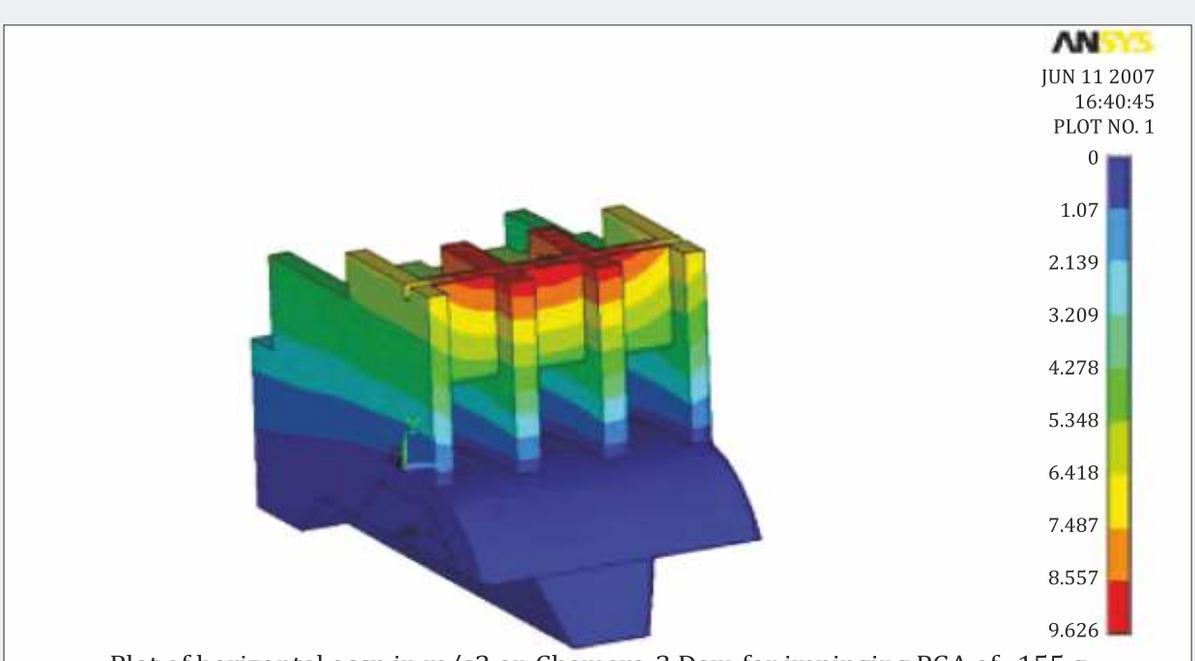
NHPC's CAPABILITIES

- Planning, Investigation, Design & Engineering and Execution of
- Hydroelectric Projects from concept to commissioning.
- Operation, Maintenance Renovation and Modernization & Dam safety evaluation.
- Development of Solar and Wind Power projects.
- Real time monitoring and alert generation by master control room as early warning system for hydropower developers.

DESIGN & ENGINEERING

Design & Engineering is a major thrust area for NHPC. Its Design division is well equipped with modern design tools and a well trained manpower which handles the planning and design of all components associated with hydropower projects from concept to commissioning including trouble shooting during construction as well as O&M stages of projects.

NHPC has gathered vast experience in construction of underground structures in the complex Himalayan geology which is used for evolving constructable designs for its own projects as well as for consultancy assignments relating to Design & Engineering of hydro-projects in India & abroad.



Plot of horizontal accn in m/s2 on Chamera-3 Dam for impinging PGA of .155 g

EXPERTISE IN RCC DAM CONSTRUCTION

Roller Compacted Concrete (RCC) *uses construction process, which combines the economical and rapid placing techniques used for fill dams with the strength and durability of concrete.*

160 MW TEESTA LOW DAM-IV POWER STATION, WEST BENGAL

First Roller Compacted Concrete (RCC) dam by NHPC and is only the third of its kind in India.

MAJOR FEATURES OF RCC DAM
160 MW Teesta Low Dam-IV Power Station, West Bengal

Height of Dam (from deepest foundation)	45 m
Total volume of concrete in dam	170000 cum

160 MW Teesta Low Dam-IV Power Station (West Bengal)

GEOLOGICAL AND GEOTECHNICAL CAPABILITIES

NHPC has been pioneering in development of engineering geological and geotechnical appraisal for civil structures related to hydropower/pump storage projects

Complete rockmass characterization for design of all civil structures of hydropower /pump storage projects is the forte of engineering geologists in NHPC

Capability to explore entire spectrum of geological, geophysical, geotechnical and construction material investigations.

Fully-equipped Geotechnical lab to carry out laboratory rock mechanics test.

First lab of NHPC having prestigious ISO/IEC-17025:2017 accreditation from National Accreditation Board for Testing and Collaboration Laboratories (NABL)

Sophisticated remote sensing lab with capabilities to generate topographic survey maps from satellite imageries for optimization of layout in inaccessible areas

Geological Studies

- To plan, investigate and monitor the Geological and Geotechnical, aspects of hydropower/Pump strorage projects in an efficient and scientific manner including preparation of feasibility and detailed project reports(DPR) in accordance with the regulations laid down by the Govt. of India.
- To provide geological recommendations to avoid or to minimize the threat of geological uncertainties (fault, thrust, thick shear zone, poor rockmass condition, high ingress of ground water, rock bursting, squeezing ground condition) in surface and underground space being faced during construction of various civil structures (Dam, Head Race Tunnel (HRT), Powerhouse (surface or underground).
- Timely aquisition of progressive geological and geotechnical data for optimization of layout and modification in rock support system/change in design layout during investigation stage & construction stage respectively.

Construction Materials Studies

- Capability to conduct in-house field survey, in-situ / laboratory tests and advice on the availability of suitable construction materials studies in terms of quality and quantity vis-a-vis the project requirements and to assess the techno-economic viability of the project.

Geophysical Studies

- Expertise in geophysical studies for investigation, construction and post construction stages
- Geophysical techniques like Seismic Refraction/Reflection, Resistivity Imaging, liquefaction potential assessment techniques.
- Application of advanced geophysical techniques like High Resolution Seismic Tomography and Resistivity Imaging for investigations in complex geological terrains.
- Tunnel Seismic Prediction for assessment of geological conditions ahead of tunnel face is available only with NHPC in India.

Seismological Studies:

- NHPC has permanent seismological observatories at two of its projects.
- A **Real Time Seismic Data Centre** has been established in NHPC for online seismic monitoring of all power stations covering entire Himalayas. **NHPC is the only Power utility in the country to have such data centre**.
- Handling of specialized seismological studies like Micro Earthquake/Local Earthquake Tomography/MT survey for dams having more than 100m height
- Development of mitigation plan w.r.t. Reservoir Triggered Seismicity in the Himalayas.

SURVEY & INVESTIGATION CAPABILITIES

Investigation is an intrinsic aspect of hydropower project during all stages of its development. NHPC is equipped with various state-of-art technologies/instruments and capable of undertaking various investigations.

Topographical Survey

- Expertise in carrying out all kinds of survey works required during planning, construction and maintenance of Engineering Projects.
- Capable of producing topographical maps, DEM\DTM from data acquired by conventional as well as photogrammetry and remote sensing techniques.
- Latest survey equipments such as GNSS System , Reflector less Total Station,Long Range 3D Terrestrial Laser Scannerand Latest Softwares.
- More than 50,000 Hectare survey has been carried by Conventional Method.
- Maps of more than 35 projects has been developed by photogrammetry and remote

Early Warning System

To minimize damages from floods in the upper Himalayan region, NHPC has developed a Central Control Room and Command Stations for Early Warning System (EWS) catering to hydropower projects of NHPC as well as of other entities. EWS is equipped with automatic instruments (AWLR and) telemetry) and has strategic tie-ups with different expert agencies (IMD, CWC, DGRE, NRSC and NGRI).

Exploratory Drilling

- Equipped with the latest technologies and expert drilling crew for carrying out exploratory drilling works in difficult terrain and remote areas
- More than 40000 meters of drilling/ works completed.
- Expertise in carrying out exploratory core drilling works in river beds.
- Latest Swedish Diamec drilling rigs for doing fast core drilling.

CONSTRUCTING INDIA'S LARGEST HYDROPOWER PROJECT

2880 MW DIBANG MULTIPURPOSE PROJECT

Situated on river Dibang in Lower Dibang Valley District of Arunachal Pradesh, the 2880 MW Dibang Multipurpose Project is being implemented by NHPC. The Project is expected to generate 11,223 MUs (Million Units) of electricity. After construction, the Project will be one of the biggest projects in terms of power generation in India. The Project has been conceived as a Reservoir Scheme for flood moderation and lean season peaking.

Major Features

Height of Concrete Gravity Dam from deepest foundation - 278 m (One of the highest dams in India/Asia)
Total volume of Concrete in Dam - 190 lakh cum (approx.)
Large gross storage at MWL (EL 538.00 m) - 3510 MCM

2880 MW Dibang Multipurpose Project Site - Arunachal Pradesh

CONSULTANCY & BUSINESS DEVELOPMENT

NHPC is providing consultancy in the various fields of hydropower viz. river basin studies, survey works, design & engineering, reservoir sedimentation studies, hydraulic transient studies, geological studies, geo-technical studies, contract management, construction management, equipment planning, underground construction, testing, commissioning, operation & maintenance and renovation, modernization & updating of hydropower stations etc. to leading organizations globally. Major consultancy assignments are from Central and State Government agencies in India and neighboring countries like Bhutan, Myanmar, Tajikistan and Ethiopia.

720 MW Mangdechhu Hydroelectric Project - Dam (Bhutan)

GLOBAL INITIATIVES

NHPC plans to continue expanding its international operations and help in harnessing the hydro potential available internationally by leveraging its existing relationship and goodwill earned through past consultancy assignments.

Bhutan
- *Chamkharchhu-I Hydroelectric Project*
- *Kuri Gongri Basin Projects*
- *Mangdechhu Hydroelectric Project*

Tajikistan
Varzob Hydroelectric Project

Nigeria
Shiroro Hydroelectric Power Station

Ethiopia
Ethiopia Electric Power Company

Nepal
- *West Seti Hydroelectric Project*
- *SR-6 Hydroelectric Project*
- *Phukot Karnali Project*

Myanmar
- *Tamanthi Hydroelectric Project*
- *Shwezaye Hydroelectric Project*

510 MW Teesta-V Power Station
(Sikkim) - Power House

BUSINESS INITIATIVES

- Memorandum of Understanding signed between NHPC and Vidhyut Utpadan Company Limited (VUCL), Nepal for development of Phukot Karnali Hydro Electric Project (480 MW) in Nepal.
- Memorandum of Understanding signed between NHPC and Department of Energy, Govt. of Maharashtra on 06.06.2023 for the development of Pumped Storage Schemes and other Renewable Energy Source Projects in State of Maharashtra.
- MOU has been signed on 08.08.2022 between NHPC and Investment Board of Nepal for development of West Seti (750 MW) and SR 6 (450 MW) Projects in Nepal.
- MOU signed between NHPC & NTPC on 10.08.2021 for jointly identifying/ exploring/ pursing the prospective projects in Power Sector overseas.
- MOU has been signed on 23.06.2023 between NHPC and Govt. of Odisha for development of PSP and RE Projects in the state of Odisha.
- MOA signed between Government of Arunachal Pradesh and NHPC on 12.08.2023 for implementation of two Hydro Projects aggregating to 3800 MW (Kamla HEP- 1800MW and Subansiri Upper HEP- 2000MW) in the state of Arunachal Pradesh.
- NHPC and Rajasthan Renewable Energy Corporation Limited (RRECL) signed a Letter of Intent (LOI) for development of 10000 MW Renewable Energy (RE) Projects/ Parks in the state of Rajasthan.
- Promoter's agreement signed between NHPC and Green Energy Development Corporation of Odisha Ltd. (GEDCOL) for development of 500 MW Floating Solar Power Projects in different water bodies in Odisha.
- Government of Tripura has allotted 04 numbers of PSP sites to NHPC for detailed Survey & Investigation Works and their subsequent Implementation based on their techno-commercial viability.
- An MOU has been signed between NHPC and ONGC on 15.12.2023 for Cooperation in exploration and development of Pumped Hydro Storage and other Renewable Projects.

STRATEGIC DIVERSIFICATION IN RENEWABLES

Achievements

- Bundelkhand Saur Urja Limited (BSUL), a JV has been promoted for development of Solar Power in Uttar Pradesh. 65 MW Kalpi Solar Power Project being implemented by BSUL was fully commissioned on 29.03.2024
- 50 MW Solar Project in Tamil Nadu has been commissioned on 23.03.2018
- NHPC's first Wind Power Project of 50 MW capacity at Jaisalmer, Rajasthan was successfully commissioned on 30.09.2016
- 320 MW Solar Power Project located in district Bikaner, Rajasthan, awarded by NHPC Limited "as an Intermediary Procurer", has been successfully commissioned on 10.12.2022

50 MW Solar PV Project (Tamil Nadu)

Upcoming Projects

- 40 MW Solar Power Project in Ganjam, Odisha under Solar Park Scheme
- 1000 MW capacity under CPSU scheme has been awarded to NHPC by IREDA & further NHPC has awarded EPC contract on 12.05.2022 for 1000 MW
- 4680 MW Solar Power Projects in Developer mode awarded to selected developers through tariff based competitive bidding Project under implementation
- 1200 MW Solar Park Development in Jalaun (UP) through BSUL
- 500 MW Floating Solar Projects in Odisha under UMREPP (300 MW in Phase-I) in JV mode with GEDCOL
- Floating Solar PV, Unit-D (In the Reservoir of Omkareshwar Project) by NHDC, a subsidiary of NHPC Limited
- 50 MW floating Solar Power Project in Kerala

50 MW Wind Power Project, Jaisalmer (Rajasthan)

44 MW Chutak Power Station (UT of Jammu & Kashmir)- Dam

390 MW Dulhasti Power Station (UT of Jammu & Kashmir)- Dam

स्वच्छ भारत
एक कदम स्वच्छता की ओर

एनएचपीसी
NHPC

NHPC Limited

(A Government of India Enterprise)

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