Ministry of Power
Central Electricity Authority

Hydro Policy for boosting Hydro Power Development

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Scheme of Presentation

- Hydropower Potential and Development Status
- Advantages of Hydropower
- Need for boosting development (reasons for slow growth)
- Hydro Power Policy, 2008 – Salient Features
- Fast Tracking Measures
- Policy Initiatives and other measures to boost Hydro
- Steps taken already to boost Hydro
- Way Forward – Suggested measures

Large Hydropower Development - Summary

Description	Conventional		Pumped Storage		Total
	Nos.	I.C. (MW)	Nos.	I.C. (MW)	I.C. (MW)
IDENTIFIED CAPACITY	**592**	**145320**	**63**	**96529.6**	**241849.60**
I - IN OPERATION	202	41778.9	8	4745.6	46524.5
II - UNDER CONSTRUCTION	33	11083.5	3	1580	12663.5
III - UNDER DEVELOPMENT					
i) Concurred/ to be taken up	28	21768	1	1000	22768
ii) Under Examination/	2	956	1	1200	2156
iii) Under S&I	14	4295	17	16770	21065
Sub-total (i-iii)	**44**	**27019**	**19**	**18970**	**45989**
Total (I + II + III)	**279**	**79881.4**	**30**	**25295.6**	**105177**

Large Hydro Potential and Development Status

STATE	Identified Potential (MW)	Developed (MW)	Under Dev. (MW)	Balance (MW)
H.P.	18,470	9,920	2290	6260
		53.11%	12.64%	33.89%
J&K	11567	3,360	2,560	5647
		29.05%	22.13%	48.82%
Uttarakhand	17,998	3,855	1,391	12,752
		21.42%	7.73%	70.85%
NE Region	62,604	4309	3,157	55,138
		6.88%	5.04%	88.07%
Other States	34,681	20,092	1,786	12,803
		57.93%	5.14%	36.91%
Total	145320	41,536	11,184	92,600
		28.58%	7.70%	63.72%

Advantages of Hydropower

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Renewable, Clean and Green Alternative

- No fossil fuel
- Negligible Green House Gas Emission
- No toxic bye-products
- Substitutes fossil fuels

Source of Power	GHG Emissions/kWh (Gram Equivalent CO_2)
Thermal – Coal	**957**
Thermal – Gas	422
RES – Solar	38
Hydro – Storage	**10**
RES – Wind	9
Nuclear	6
Hydro - RoR	**4**

Source: Hydro Quebec, Canada

Ancillary support to Grid – Fast Ramping Source

- Peaking and balancing Power
- Voltage and frequency regulation
- Flexibility in generation
- Black Start capability & spinning reserve

Environmental Sustainability

- No consumptive use of water
- Provides Drinking water, I&FC
- Increased River Flow in lean seasons
- Basin Study based planning (carrying capacity)
- CAT Plan & Compensatory Afforestation

Economic Sustainability

- High Tariffs only in initial years
- No geo-political risks or price rise risk
- Assured source of power
- Cheapest Power in long run (No Fuel, 150 yrs life (Bhakra–30 ps)

Social Sustainability

- Improves living condition, income, employment & infrastructure
- Adequate R&R package, LADF etc
- Increased Agriculture Productivity (Hirakud & Bhakra Dam – Green Revolution)

*Water Security and Flood Control

Need for boosting development (reasons for slow growth)

- Delays in Environmental and Forest Clearances
- Land acquisition issues and R&R issues resulting in Local agitation/ Law & Order problems
- Contractual issues
- Lack of adequate infrastructure/ roads and bridges
- Funding Constraints
- Geological uncertainties/ surprises
- Court Cases
- Power evacuation issues
- Free Power and Water Cess
- Monetization of Intangible Benefits not yet started

Hydro Power Policy- 2008

- **Dispensation from tariff based bidding** available to the Public Sector regarding exemption also extended to private sector hydroelectric projects
- **Transparent procedure for awarding potential sites to private sector**. RFQ stage - financial strength (net worth), experience, past track record in delivering projects on time and within estimated costs, turnover in relation to the project size etc. To invite bids from short-listed developers on single quantifiable parameter e.g. free power > 12% or equity participation or upfront payment etc.
- Obligatory for developer to go through **International Competitive Bidding** process for award of contract for supply of equipment and construction of the project either through a turnkey or through well-defined packages.
- **Expenditure incurred for getting site allotted** not to be allowed as a part of the project cost for determining tariff by Regulatory Commission.
- Provision of **12% free power to the host state government with an additional 1% for Local Area Development**. (Free power beyond 13% to be met by developers from their own resources and not pass through tariff)

Hydro Power Policy- 2008

- Provision of **Merchant sales** of up to a maximum of 40% of the saleable energy. Delays of every 6 months in the commissioning date would result in reduction of merchant sales by 5%.
- 1% free power for **LADF** (host state also to provide matching 1% from their share of 12% free power). LADF to provide regular stream of revenue for income generation and welfare schemes, creation of additional infrastructure and common facilities etc. on a sustained and continued basis over the life of project. **Proposed operation** - Standing committee headed by district magistrate level officer to be designated by the State Government, male & female representatives of PAP and project head.
- **100 units/ month** to be provided to each PAF for 10 years from COD
- **Resettlement and Rehabilitation package** to be more liberal than the National Resettlement and Rehabilitation Policy, 2007
- Project authorities to bear State Govts' share of 10% of the **RGGVY** within certain radius/surface distance of the Power House/ Dam.

Policy Initiatives taken to give push to Hydro

Recent Policy Measures of March, 2019

i. Declaring Large Hydropower Projects as Renewable Energy Source

ii. Hydro Purchase Obligations as a separate entity within Non-Solar Renewable Purchase Obligations (HPO Trajectory notified on 29.01.2021)

iii. Tariff rationalization measures for bringing down hydropower tariff

iv. Budgetary Support for Flood Moderation/ Storage Hydro Electric Projects (guidelines notified on 28.09.2021)

v. Budgetary support to cost of Enabling Infrastructure (roads/ bridges) (guidelines notified on 28.09.2021)

Other Recent Measures taken

- ISTS charges for PSPs-waiver/ levied gradually (notified in June 2021)
- Bundling of Hydro Power with cheaper RE (notified in Nov., 2021)
- Dispute Avoidance Mechanism through appointment of Independent Engineer – Panel notified
- Conciliation Committee for Dispute Resolution constituted
- IT based monitoring of hydro Projects – Task force established
- Guidelines for reducing incidence of Time & Cost Overrun issued
- Monetizing of Intangible Hydro Benefits like Spinning Reserve, Ramping Support, Reactive Power Support, Black Start Capability, Peaking supply/ Avoiding RE curtailment, and Emission Reduction etc. - Viability of Hydro Tariff – Committee constituted

Other Recent Measures taken

- Identified CPSUs for developing about 32 GW capacity in NER (Basin-wise)
- Development of Pump Storage – CPSUs identified for projects in States
- Efforts initiated for inclusion of Transmission System upto Pooling Station in support for Enabling Infrastructure
- Grant towards Equity Participation of States
- On the advice of Government, hydro rich States like J&K, H.P. have deferred/ staggered free power, allotted projects for longer period of 70 years etc.

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H.E. schemes identified for allotment to CPSUs

- **MoP on 22.12.2021 identified States to be developed by CPSUs as under:**

State	CPSU
Uttarakhand	THDC
Himachal Pradesh	SJVN
UT of J&K and Ladakh	NHPC except Ujh HEP by NEEPCO

- **Arunachal Pradesh**

CPSU	Nos.	IC (MW)
NEEPCO (Kameng, Tawang, Siang tributaries)	7	4988
NHPC (Dibang HEP and Subansiri Basin)	3	6680
JV of NHPC & NEEPCO (Siang Main Stem)	2	12700
SJVN (Dibang basin except Dibang HEP)	5	5097
THDC (Lohit)	2	2950
Total	**29**	**32415**

- **Evaluation Committee has been Constituted**

Suggestions Specific to PSPs being mooted

- Increasing involvement of CPSUs in development of PSPs (17 PSPs -16770 MW presently at S&I Stage)
- Promote development of PSPs on existing Hydro Schemes by CPSUs as well as **off the River PSPs**
- Faster EC and FC in time bound manner, **Separate category of EC for off the River PSPs**
- Data collection for EMP to be limited to One Season (as for Thermal)
- EC and DPR Concurrence to be Concurrent Processes
- **VGF funding** for PSPs
- **Free Power Exemption**
- **Faster clearance** (No financial appraisal especially for off the river PSPs in Private Sector)

Way Forward – Suggested Measures

Policy Measures

- **Increasing involvement of CPSUs** in Hydro and PSPs Development
- **Monetization of Intangible Benefits** of Hydro e.g. fast ramping and black start capabilities, reactive power management etc.
- **Stricter enforcement of RPO/ HPO Regime** (HEC mechanism by CERC)
- **Rationalization of Tariff** (Peak and Off-Peak)
- **Allocating risk and responsibility with States** - Indexing free power with time lost in resolution of Law and Order & Land Acquisition issues by State
- **Equity participation by State** - Grant by Govt. for different types of projects
- **Reviving Private Investment** through PPP route and VGF Support
- Involving Stakeholders-**Equity participation of PAF** (dividend on equity - differential treatment for owners/ affected people)
- **Skill Development of Locals and their Employment** in hydro projects

Way Forward – Suggested Measures

Policy Measures

- **Market competitiveness:** Certain % of Hydro through medium/long-term PPAs while some % through exchange market
- Risk Reduction Perspective in Power by increasing emphasis on other sources like Hydro having low share
- Development of Hydro on UMPP route
- Non Discriminating Policy between technology options
- **ISTS charge waiver for PSPs beyond 2025**

Measures By States

- Free Power initial waiver/reduction/staggering
- Allotment of stalled Hydro Projects to CPSUs
- Waiver of upfront premium for projects to be developed by CPSUs
- Support in Land Acquisition and R&R and Law and Order

Way Forward – Suggested Measures

Fiscal and Financial Measures

- Fiscal support for stressed hydro projects in the form of equity by Central Govt. to State Govt./ through CPSUs. Option to avail either Return on Equity or Free Power but not both at least for initial 12 years.
- Availability of loans for longer duration of 18 to 25 years and reduction of interest rate during operational period through re-financing.
- Parity/Reduction of GST for Hydro Projects
- Extension of Tax Holidays for initial 12 years of Operation

Developer related

- Reduction in RoE, Rationalizing O&M & Higher Debt Equity ratio
- Refinancing of Loan after CoD of the project

Way Forward – Suggested Measures

General

- **Estimation of design energy** on 75% dependable year basis rather than 90% dependable basis
- **Basin-wise development** of Projects to facilitate ease of evacuation
- **Support for DPR Preparation** (Central Govt. Funding)
- Development of Ancillary Service Market
- Differential incentives for different type of Hydro projects
- Preserve existing capacity by greater thrust on Hydro R&M

THANK YOU