

Staff Paper

on

**Development of Intra-State Transmission
System through
Tariff Based Competitive Bidding
in the State of Himachal Pradesh**



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**Himachal Pradesh Electricity Regulatory Commission
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1. INTRODUCTION

The Transmission System in Himachal Pradesh comprises of a network of transmission lines and substations at the 66 kV and above levels. Electricity demand in the State of Himachal Pradesh is increasing due to growth & urbanization. Himachal Pradesh is blessed with abundant water resources, thus having total hydro potential of all these river basins in the State as 24,587 MW. Himachal Pradesh is targeting 10,000 MW renewable capacity addition by 2030 which brings focus on prioritizing the early completion of under construction Projects, bringing under clearance Projects to construction stage and allocation of balance unallocated Projects. It is also obligatory to provide Evacuation System for all Projects above 100 MW and Transmission System availability, beyond inter-connection point for Projects below 100 MW capacity.

The Transmission System needs to be capable to cater to the present and futuristic load and generation requirements reliably. Accordingly, a robust network of Transmission lines and Substations is to be established to cater to the load requirements. There is also need to maintain the Power Quality, Network Reliability and integrate Power system at the Regional level.

For development of Transmission system in a cost efficient manner, there is need to adopt best practices and ensure competition amongst the participants. The competition will bring new technology/innovation, achieve reduction in Tariff and aim to complete projects in timely manner. Accordingly, an Approach Paper for Development of Intra-State Transmission System (STS) through Tariff Based Competitive Bidding (TBCB) process is introduced for seeking stakeholders' suggestions/comments.

2. BACKGROUND OF HIMACHAL PRADESH STATE TRANSMISSION SYSTEM

The Electricity Act, 2003 was enacted by the Parliament of India on June 10, 2003, which mandated separate licenses for transmission and distribution activities. In exercise of powers conferred under sub-section 4 of Section 131 of the Act, the State Government has notified Himachal Pradesh Power Transmission Corporation Limited (HPPTCL), the Government owned Company as the State Transmission Utility (STU) to cater to the requirement of the transmission system, coordinated planning & execution of Transmission system (66 kV & Above) and *was entrusted with the following work / business:*

- a) All new works of construction of Sub-Stations of 66 kV and above.
- b) All new works of laying/construction of transmission lines of 66 kV and above.
- c) Formulation, updating, execution of Transmission Master Plan for the state for strengthening of Transmission network and evacuation of power including new works under schemes already submitted by the Himachal Pradesh State Electricity Board Ltd. (HPSEBL) under this plan to the Financial Institutions for funding and where loan agreements have not yet been signed.
- d) All matters relating to planning and co-ordinations of the transmission related issues with CTU, CEA, Ministry of Power, State Government and HPSEBL.
- e) Planning and co-ordination with the IPPs/CPSUs/ State PSUs/Other Departments or organizations or agencies of the Central Government and State Government, HPSEBL and HPPCL with regard to all transmission related issues.

The Transmission System of Himachal Pradesh comprising 66 KV and above, is managed and operated by HPSEBL and HPPTCL. The Transmission network of Himachal Pradesh (66 KV and above) comprises of 3288.37 circuit km of transmission lines and 7462.7 MVA substation transformation capacity of Intra State Transmission system, 4705.38 circuit km of transmission lines and 3780 MVA substation transformation capacity of Inter State Transmission system and 842 circuit km of transmission lines of BBMB Transmission system. This

network also supports the evacuation of installed Hydro power in State besides meeting the requirements of distribution sector.

3. REGULATORY PROVISIONS

- a) The Electricity Act, 2003 is the basic framework for Electric supply industry in India, with the objective as follows:

“An Act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalisation of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies ...”

- b) Further, the State Commission has been vested with the responsibility to determine the Tariff for Generation, Supply, Transmission under Section 86 of the Electricity Act, as follows.

“Section 86. (Functions of State Commission)

(1) The State Commission shall discharge the following functions, namely: -

(a) determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the State...”

As regards to Determination of Tariff by bidding process, Section 63 of the Act provides regulatory provisions for adoption of the Tariff determined through transparent process of bidding, as follows:

“Section 63. (Determination of tariff by bidding process):

Notwithstanding anything contained in section 62, the Appropriate Commission shall adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.”

- c) The Central Government notified the revised National Electricity Policy vide resolution no. 23/40/2004-R&R (Vol-II) dated 12/02/2005 in accordance with section 3 of the Electricity Act 2003. The Guideline 5.3.10 and 5.8.9 of the *National Electricity Policy, 2005* encourages private investment and their partnership in Transmission sector to meet the need of rapidly growing sector are as follows:

“5.3.10 Special mechanisms would be created to encourage

private investment in transmission sector so that sufficient investments are made for achieving the objective of demand to be fully met by 2012.”

“5.8.9 Role of private participation in generation, transmission and distribution would become increasingly critical in view of the rapidly growing investment needs of the sector. The Central Government and the State Governments need to develop workable and successful models for public private partnership. This would also enable leveraging private investment with the public sector finances. Mechanisms for continuous dialogue with industry for streamlining procedures for encouraging private participation in power sector need to be put in place.”

- d) The Central Government notified the revised Tariff Policy vide ref no. 23/2/2005-R&R (Vol-IX) dated 28/01/2016 in accordance with Section 3 of the Electricity Act 2003. *Guideline 5.3 of the Tariff Policy* states that development of Intra-State Transmission System shall be executed through competitive bidding route provided for the projects costing above a Threshold Limit, which shall be decided by the State Commission.

“5.3 The tariff of all new generation and transmission projects of company owned or controlled by the Central Government shall continue to be determined on the basis of competitive bidding as per the Tariff Policy notified on 6 January, 2006 unless otherwise specified by the Central Government on case to case basis. Further, intra-state transmission projects shall be developed by State Government through competitive bidding process for projects costing above a threshold limit which shall be decided by the SERCs.”

- e) The Ministry of Power, Government of India in its Guidelines dated 15/03/2021 recommended adoption of TBCB for Intra State Transmission projects in the larger interest of consumers. This reduces the burden on Government finances and scarce Government fund can be spared for other priority sectors. Also, it encourages use of advanced technology for improving cost and efficiency. Relevant Clause of MoP, GoI guidelines are as follows:

“6. In line with provisions of the Tariff Policy 2016, generally inter-state transmission systems are developed through competitive bidding only, except for certain categories of transmission system as specified in the Tariff Policy 2016. With adoption of Tariff Based Competitive Bidding for development of transmission system, following key benefits have been observed:

- i) *Lower Tariff compared to Cost Plus: With large number of*

bidders participating in development of a transmission project, discovered tariff for a transmission project can be lower than cost-plus tariff by about 30-40%.

- ii) Less burden on government finances: It will attract private investments for development of projects and scarce government fund can be spared for other priority sectors.*
- iii) Risk sharing: It encourage risk sharing with private sector. Innovative Technology: It encourages use of advanced technology for improving cost and efficiency.”*

f) The Ministry of Power, Government of India in its Guidelines dated 10/08/2021 by which it has encouraged competition in development of Intra-State Transmission System Projects by introducing Tariff based through e-reverse bidding for Transmission Services. The projects shall be awarded on Build, Own, Operate and Transfer (BOOT) mode, as follows.

“17. The selection of developer for identified projects would be through tariff based competitive bidding through e-reverse bidding for transmission services according to the guidelines issued by the Ministry of Power under section 63 of the Electricity Act, 2003. The projects shall be awarded on Build, Own, Operate and Transfer mode.

...

21. As far as intra State projects are concerned the State Governments may adopt these guidelines and may constitute similar committees for facilitation of transmission projects within the State. The States also have the option to use Viability Gap Funding (VGF) based Model Transmission Agreement (MTA) document of erstwhile Planning Commission for development of transmission system in their States under Public Private Partnership (PPP) mode.”

In view of above, there are adequate regulatory provisions that enable the State Commission to initiate process of introducing Tariff based Competitive Bidding in Intra State Transmission Projects with a threshold limit to be decided.

4. NEED FOR TBCB IN INTRA-STATE TRANSMISSION SYSTEM OF HIMACHAL PRADESH

a) The Ministry of Power, Government of India in its Guidelines

dated 15/03/2021 observed that the discovered Tariff for Transmission project can be lower than cost-plus Tariff by about 30-40% with the participation of larger number of bidders.

- b) State Transmission Utility (STU) i.e. HPPTCL and HPSEBL are managing entire Transmission system in Himachal Pradesh and HPPTCL is managing execution of new projects on cost plus basis. The Transmission system availability is more than 99% and transmission loss is about 0.75%. The Transmission system availability factor and Transmission losses for various states is mentioned as follows:

Table-1: Transmission system availability factor and Transmission losses for various State Utilities for FY 2019-20

DISCOM	Availability (%)	Transmission Losses (%)
Himachal Pradesh Power Transmission Corporation Limited (HPPTCL)	99.00	0.75
Delhi Transco Limited (DTL)	98.95	0.90
Haryana Vidyut Prasaran Nigam Limited(HVPLN)	99.85	2.06
Punjab State Transmission Corporation Limited(PSTCL)	99.97	2.69
Utter Pradesh Power Transmission Corporation Limited (UPTCL)	99.47	3.43
Bihar State Power Transmission Company Limited (BSPTCL)	99.51	3.66

The Transmission Tariff for HPPTCL system is in the range of 3-11 paise per unit and further, the Transmission Tariff for Utility in other states are as follows:

Table-2: Transmission Tariff for various State Utilities FY 2020-21

Transmission Company	ARR	Energy Despatched	Transmission Tariff
	Rs. Crore	MU	Rs./ kWh
Delhi Transco Limited (DTL)	956	29,130	0.33
Maharashtra State Electricity Transmission Company Limited (MSETCL)	6,790	1,65,557	0.41
Gujarat Energy Transmission Corporation Limited (GETCO)	4,115	98,474	0.42
Bihar State Power Transmission Company Limited (BSPTCL)	1,015	30,386	0.33
Haryana Vidyut Prasaran Nigam Limited(HVPLN)	1,434	53,973	0.27

Himachal Pradesh geography is not comparable to various

States as analyzed like Haryana, Punjab, Uttar Pradesh and Bihar, however, the availability of Transmission system, Transmission tariff can be further improved.

- c) **Risk Analysis for TBCB in Intra-State Transmission System**
 In the Regulated Tariff Mechanism (RTM) route, the State Transmission Utility has the provision of passing cost escalation owing to construction delay, any other operational factor as way of increased Tariff in ARR. In TBCB route based projects, risk such as scheduled delay, over run of cost etc. is to the account of developer except Force Majeure events.

Hence, the major risks on a Transmission Project are borne by Utility under RTM route where as such risks are borne by the developer under TBCB route.

Table-3: Risk Matrix for projects under RTM & TBCB route

Project Parameters	RTM	TBCB
Innovation in design	Medium Risk Sharing: Both Utility & Developer	High Risk Sharing: 100% Developer
Construction cost risk with Govt.	High Risk Sharing: 100% Utility	Low Risk Sharing: 100% Developer
Construction schedule risk with Govt.	High Risk Sharing: 100% Utility	Low Risk Sharing: 100% Developer
Lifecycle cost risk with Govt.	High Risk Sharing: 100% Utility	Low Risk Sharing: 100% Developer
Project Parameters	RTM	TBCB
Operating performance risk	High Risk Sharing: 100% Utility	Low Risk Sharing: 100% Developer
Financing risk with Govt.	High Risk Sharing: 100% Utility	Low Risk Sharing: 100% Developer
Summary Assessment	Weak Model for large and mid-sized capital intensive projects	Strong model for large and mid-sized projects

Source: UERC Consultation Paper on TBCB

- d) **Major Transmission projects executed in last 5 years**
 The summary of Major Transmission projects executed in last 5 years in Himachal Pradesh, are as follows:

Table-4: Major Transmission projects executed in last 5 years in Himachal Pradesh			
Sr. No.	Name of Scheme	Commissioning date of scheme	Approved cost (Rs. Crore)
1	220/66/22 kV, Sub Station at Bhoktoo	22-03-2017	32
2	400/220/66 kV, Sub Station at Wangtoo	29-09-2019	363
3	220/400 kV, 1x315 MVA Sub Station at Pragati Nagar	01-11-2020	161
4	33/132 kV Sub Station at Pandoh	24-08-2019	36
5	33/132 kV, Sub Station at Chambhi	28-08-2019	45
6	LILO of both circuits of 400 kV Jhakri-Abdullapur D/C Line at Gumma and 220 kV D/C TL from Hatkoti to Gumma	31-10-2020 & 02-11-2020	105
7	66kV Switching Substation Urni	26-09-2020	27
8	33/220/400 KV Lahal Substation	25-11-2020	280
9	220kV Charor-Banala TL	24-07-2019	57
10	220kV Lahal Budhil TL	07-07-2020	6
11	132kV LILO Kangra-Dehra TL at Chambhi	06-08-2020	21
12	132/33kV Addl. Pandoh SS	08-10-2020	20
13	400/220kV Addl. Gumma SS	05-02-2021	44
14	220kV Snail-Hatkoti TL	02-11-2020	26
15	220/33kV Karian Sub Station	12-05-2018	52
16	220/33kV Phojal Sub Station	05-06-2016	72
17	220kV Karian-Rajera TL	12-05-2018	11
18	220kV LILO Phojal- Patlikuhal TL	05-06-2016	17
19	220kV Kashang-Bhaba TL	01-06-2016	87
20	220 kV D/C line (Twin MOOSE) from Bajoli Holi HEP to 400/220 kV Lahal GISS	Line charged	69.41
21	220 kV D/C transmission line from Mazra to Karian	Construction completed	36.59

Source- As per data Submitted by HPPTCL

Considering the nature of work and its approved cost in the last three years, the average and maximum project cost for the above schemes are 74.66 crore and 363 crore respectively.

e) Demand Forecast of Himachal Pradesh as per CEA Report

The Peak demand and capacity addition of hydro projects in the state is as under:

Table-5: Forecasted Peak Electricity Demand of Himachal Pradesh (MW)

Particular	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27
Peak Electricity Demand-MW	2023	2124	2230	2342	2459	2582

Source-CEA report

Table-6: Peak Electricity Demand of Himachal Pradesh (MUs)

Particular	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025- 26	FY 2026-27
Electricity Demand-MUs	11821	12412	13033	13685	14369	15087

Source-CEA

Table-7: Forecasted capacity addition of Hydro Power Plants in Himachal Pradesh (MW)

Particular	FY 2020-22	FY 2022-24	FY 2024-28	FY 2028-30
Electricity Generation -MW	337.44	1862.60	2209.26	5764.65

Source – Directorate of Energy, HP

f) **Asset capitalization projects for Himachal Pradesh till FY 2024**

The project execution pace severely suffered in the last 2 years due to the ongoing pandemic. There is V-shaped recovery in the electricity demand and Peak Demand touched 2030 MW on 7th January 2022 at 9:45 AM. In order to meet the future electricity load requirements, the following schemes are approved in Business Plan are as follows:

Table-8: Breakup of Major Projects envisaged in Himachal Pradesh

Name of proposed scheme	Project Cost (Rs. Crore)
132/220 kV Sub -Station at Charor	63.71
132/220 kV Sub Station at Sunda	68.32
66 kV Urni-Wangtoo TL	21.72
220kV Sunda Hatkoti TL	85.78
132/33kV Barsaini SS	50.32
220kV Hatkoti Switching Substation	46.13
220/132kV Majra Substation	65.66

66/22kV Nirmand Sub Station	38.16
220/66kV Gumma Ext. Substation	43.79
220/132kV Kangoo Sub Station	54.22
400kV Lahal-Rajera TL	117.76
132kV Barsaini Charor TL	56.49
66kV Nirmand Kotla TL	30.78
220kV LILO Panchkula Kunihar at Baddi TL	4.67
LILO of 132 kV D/C Kurthala - Bathari at Mazra	11.88
Joint Control Center, Kunihar (Solan)	19.06
Auxiliary Buildings (Chambi, Charor & Wangtoo)	12.96
220/66kV Addl. Sunda SS (Shimla)	37.74
220/132 kV Dehan Sub Station) and	70.84
220kV Dehan Hamirpur TL	120.68
220/66kV Heiling Sub Station	88.29
220/33kV Addl. Charor SS	35.96
33kV Switching station Palchan (land development)	3.74
33kV Switching station Palchan (Substation Part)	13.78
132kV Tangnu-Sunda TL	13.24
33kV Palchan-Prini TL	8.1
220/132kV Kalaamb Sub Station Andheri	71.15
220/132kV Dharmpur (Sub Station part)	3.36
220/132kV Dharmpur Substation (Site Development)	29.72
220/33kV Prini Sub Station (Kullu)	6.54
220 kV M/C line from PGCIL	14.35
220 kV M/C line from 220/132 kV Kala Amb to T-19 of Jamta Kala Amb line.	39.19

Source- As per data submitted by HPPTCL

The average and maximum project cost as per asset capitalization plan is 42.12 Crore and 120.68 Crore.

g) **Determination of Threshold Limit**

The development of Intra State Transmission system in Himachal pradesh involves development of GIS stations,

Automation in Sub-stations, laying of overhead lines. It is proposed that bulk ordering and bunching of Projects similar in nature should be exercised to encourage participation from maximum bidders and achieve benefits of economies of scale.

The Guideline 5.3 of Tariff Policy, 2016 empowers the State Commission to determine the threshold limit for Intra-State projects to be implemented under TBCB route. It is also pertinent to mention that Project costing below a certain threshold may not encourage participation from maximum participants and may not yield benefits of cost saving through TBCB route.

5. BEST PRACTICES FOLLOWED IN OTHER STATES

States such as Assam, Haryana, Punjab, Rajasthan and Uttar Pradesh have introduced TBCB mechanism for their Intra State Transmission System.

Table-9: TBCB mechanism adopted by Other States

State Commission	Date of Order/ Notification	Threshold limit	Remarks
Assam Electricity Regulatory Commission (AERC)	Notification dated 14/01/2019	225 Cr. and above for transmission line and 160 Cr. for Sub-stations	Notified implementation of TBCB for Intra STS for projects costing 225 Cr. And above for transmission line and 160 Cr. for Sub-stations vide Notification dated 14/01/2019
Haryana Electricity Regulatory Commission (HERC)	Order dated 26/04/2021	100 Cr. and above	Issued TBCB Order dated 26/04/2021 for Intra STS for projects costing above 100 Cr. and above
Punjab State Electricity Regulatory Commission (PSERC)	Notification dated 05/11/2018	50 Cr. and above	Notified implementation of TBCB for Intra STS for projects costing 50 Cr. and above vide Notification dated 05/11/2018
Rajasthan Electricity Regulatory Commission (RERC)	Notification dated 28/08/2018	100 Cr. and above	TBCB for Intra STS projects costing 100 Cr. and above vide Notification dated 28/08/2018
Uttar Pradesh Electricity Regulatory Commission (UPERC)	Order dated 18/01/2021	-	Adoption of Transmission Charges for Transmission System being implemented by Rampur Sambhal Transco Ltd. vide Order dated 18/01/2021

Further, Maharashtra Electricity Regulatory Commission (MERC) implemented TBCB for single Intra State Transmission project located at Vikroli vide its Order dated 21/03/2021.

6. CONCLUSION

In the recent times, it has been observed that various projects are being delayed by HPPTCL which include certain critical projects. Various State Electricity Regulatory Commissions have implemented Tariff Based Competitive Bidding for their Intra-State Transmission System in line with the Tariff Policy 2016 and Guidelines issued by Ministry of Power, Government of India.

Based on the actual investment data towards cost of projects, and in order to increase private sector participation in infrastructure projects, it is proposed that the Threshold Limit be kept as Rs 45 Crore for new transmission projects (i.e. complete package for line and sub-station) to be developed through TBCB process.

The transmission project(s) of strategic and State/National importance, on an application filed by Licensee, may be allowed under Regulated Tariff Mechanism by the Commission, in case the cost of such transmission project(s) is equal or above the threshold limit.

Comments and suggestions are invited from the Stakeholders for the introduction of TBCB in Intra State Transmission System of Himachal Pradesh.
