DRUK GREEN POWER CORPORATION LIMITED

Proposal for Domestic Generation Tariff for Punatshangchhu Hydropower Project-II (PHP-II)

July 2025 - June 2028

January 2026

Contents

1. Executive Summary

This proposal for Domestic Generation Tariff of Punatsangchhu-II Hydropower Project is prepared by Druk Green Power Corporation Limited (DGPC) for the tariff period July 2025 - June 2028. The Project is built under the bilateral arrangement between RGoB and GoI and the Project has achieved full commissioning with synchronization of last unit on August 27, 2025.

During the 13th BPSCC meeting held on July 16, 2024, it was decided that DGPC need to file the domestic tariff for Punatsangchhu-II project to Electricity Regulatory Authority (ERA). Accordingly, DGPC submitted the tariff proposal to ERA on August 21, 2024, however, the review of the proposal was kept in abeyance due to revision to the Domestic Electricity Tariff Policy 2016, which were undertaken to align the policy with the Renewable Energy Roadmap 2024. Subsequently, the National Energy Policy 2025 (NEP 2025) was launched in June 2025 by the Ministry of Energy and Natural Resources. Following the issuance of the NEP 2025, ERA notified the Tariff Determination Regulation 2025 on 1 December 2025 and informed utilities to re-submit their tariff revision applications in line with the new regulatory framework.

Under the TDR 2025, and in accordance with the provisions of NEP 2025, the tariff determination methodology for generation utilities has been revised. The return allowance framework has shifted from a net asset–based approach to an equity-based return, calculated on actual equity infusion and actual debt. Accordingly, this tariff proposal has been prepared for the period from July 2025 to June 2028 in accordance with the Tariff Determination Regulation 2025 (hereinafter referred to as the *TDR 2025*) and the National Energy Policy 2025 (hereinafter referred to as the *Energy Policy*). The proposal reflects the actual cost of efficient business operations of Punatsangchhu-II Hydropower Project (PHPA-II). The generation tariff has been computed using the Electricity Regulatory Authority's (ERA) Generation Tariff Model, based on the parameters prescribed under the TDR 2025 and the Policy.

The total project cost considered for the tariff is the total generation cost to completion which is **Nu. 133,976.60 million** (inclusive of IDC of Nu. 43,500.75 million), excluding the transmission line cost. The debt equity ratio of 70:30 has been considered on the project hard cost of Nu. 90,475.85. The other cost parameters such as inventory and O&M cost has been considered as per the tariff determination regulation 2025. The project has the design annual generation of 4,575 GWh and the royalty energy of 13%. Based on the above, the proposed domestic generation tariff of **Nu. 4.28 per kWh** for the project has been arrived at by using the total project cost of Nu. 133,976.60 million.

The proposal for generation tariff is based on the recovery of the cost of generation reflecting the cost of efficient business operation. The proposed tariff has been worked out based on the provisions of the Energy Policy to enable the recovery of permissible costs as per the regulatory framework. DGPC submits to the Electricity Regulatory Authority (ERA) for consideration of the domestic generation for Punatsangchhu- II for the period July 2025 - June 2028 tariff period.

2. Introduction

This proposal for the revision of the domestic generation tariff of Punatsangchhu -II Hydropower Project has been prepared in accordance with the provisions of the Tariff Determination Regulation 2025 (TDR 2025), the Guideline for Determination of Regulatory Asset Base 2021 (RAB Guideline), and the National Energy Policy 2025. DGPC submitted a tariff proposal on August 21, 2024, however, the review of the proposal was kept in abeyance following revisions to the Domestic Electricity Tariff Policy 2016 to align it with the Renewable Energy Development Roadmap 2024. Subsequently, the National Energy Policy 2025 was launched in June 2025, and ERA issued the Tariff Determination Regulation 2025 on 1 December 2025, notified utility companies to re-submit their tariff applications in line with the new regulatory framework.

3. Parameters Used for Tariff Determination

The Generation Tariff Model provided by ERA is used to calculate the average cost of supply. The average cost of supply is determined based on the cost of supply methodology and using the principles to reflect the actual cost of efficient business operation. The various inputs used in the generation tariff model are in keeping with the TDR 2025, RAB 2021 and the Tariff Policy 2025 and are presented below.

3.1 Tariff Period

The total cost and the total energy are discounted over the tariff period using the Weighted Average Cost of Capital (WACC). The tariff period is proposed as 3 (three) years as per the provisions of the Energy Policy. The total generation cost to completion have been used to calculate the tariff and the total generation cost to completion is provided as ***Annexure I.***

3.2 Cost Parameters

As per the TDR 2025 under Chapter 5 - Cost of Supply Methodology clause 45, the scope of costs includes the following:

1) Operation and Maintenance Cost;
2) Depreciation;
3) Cost of Equity and a return on fixed assets, including an allowance for company taxation;
4) Cost of Debt;
5) Power purchases and fuel costs for electricity generation, should either of these be applicable;
6) The cost of losses and non-payment of electricity bills;
7) The cost of working capital;
8) System Operator Charges; and
9) Any regulatory fees, that the Licensee is liable to pay under the Laws of Bhutan.

The cost parameters used as input in the tariff model are as below.

3.3 Cost of Equity

In accordance with Clause 14.2 of the National Energy Policy 2025, the determination of the cost of equity for renewable energy projects shall be guided by the following principles:

1) The value of equity at the time of commissioning of the renewable energy project shall be maintained throughout the project concession period for determination of Return on Equity.
2) The allowance for RoE should be comparable to that of regional power market and industrial benchmark to attract and sustain investments.

Further, the TDR 2025, under Clauses 76 to 79, provides detailed guidance on the treatment of capital structure and cost of equity for tariff determination. The key provisions are summarized below:

1) To ensure competitive and efficient pricing through an optimal capital structure, the Gearing Ratio shall be higher than the actual Gearing Ratio and up to a maximum of 70:30.
2) If the actual equity deployed is less than 30% of the Capital Cost, the actual equity shall be used for the purpose of tariff determination. Conversely, if the actual equity deployed exceeds 30% of the capital cost, the excess amount shall be considered as debt, and the maximum gearing ratio shall be maintained at 70:30.
3) The value of equity at the time of commissioning of a Renewable Energy Project shall be maintained throughout the project concession period for determination of cost of equity.
4) The cost of equity shall be as provided as 13% to 15% for Hydropower Generation Licensee and Transmission.

Based on the above policy and regulatory provisions, the debt-to-equity ratio at the time of commissioning of Punatsangchhu-II Hydropower Project have been considered for the determination of the cost of equity under this tariff proposal. Accordingly, for tariff determination, the return on equity has been computed on the 30% of the equity component. The cost of equity is proposed keeping with the provision from the TDR 2025, which states that the allowance for RoE should be comparable to that of regional power market and industrial benchmark to attract and sustain investments. The regional market specifically India, the post-tax return on equity under CERC regulation for hydropower project is 16.5%.

3.4 Cost of Debt

Based on the provisions of the Tariff Policy, the actual cost of debt for the tariff period should be considered. As per the bilateral agreement for the Punatsangchhu-II, the interest rate for loan is 10%. The bilateral agreement is enclosed as Annexure-II. As per the past precedence of bilateral projects between GoI and RGoB, the Interest accrued During Construction (IDC) is repaid in equal installments during the operational years with no additional interest applied. Based on this assumption, the cost of debt is proposed as 10% as below:

Table 1: Debt details (in MNu.)

Loan particulars	Principle Amount (MNu.)	Interest rate	Repayment period	Loan balance 31.12.2024 (MNu.)	Loan balance 31.12.2025 (MNu.)	Loan balance 31.12.2026 (MNu.)
GOI Loan	63,333.10	10%	17	63,333.10	59,607.62	55,882.15
Cost of Debt		**10%**				

3.5 Gearing Ratio

As per the TDR, to ensure competitive and efficient pricing through an optimal capital structure, the Gearing Ratio shall be higher than the actual Gearing Ratio and up to a maximum of 70:30. Therefore, the proposed gearing ratio of 70:30.

3.6 Fixed Assets

The total generation cost and asset schedule that has been used in the tariff model is as given in Table below. The Generation cost is as per the approved 2nd RCE/Completion cost of PHPA-II. The asset schedule derived as per the depreciation rates given in Schedule 4 of the TDR used for the tariff calculation is given below.

Table 2. Asset Schedule (MNu.)

Asset Head	Gross Value	Acc. Depreciation	Net Value	Depreciation
Land	58.99	-	58.99	-
Buildings	4,126.09	-	4,126.09	137.40
Civil structures	1,934.62	-	1,934.62	64.49
Dam complex	47,510.62	-	47,510.62	1,583.69
Water conductor	10,519.99	-	10,519.99	350.67
Power house	69,826.29	-	69,826.29	2,327.54
Transmission equipment	-	-	-	-
Equipment	-	-	-	-
Office equipment	-	-	-	-
Total	**133,976.60**	**-**	**133,976.60**	**4,463.78**

The project cost to completion of Nu. 133,976.60 million has been capitalized as gross asset value for generation for Punatsangchhu-II excluding the transmission line cost of Nu. 3,244.70 million. The annual depreciation is of Nu. 4,463.78 million.

3.7 Investments

There is no new investment proposed for this tariff period.

3.8 O&M Allowance

The O&M cost comprises of operations and maintenance costs, employee costs, and other expenses. The wheeling charges and power import costs are not included. The proposed O&M cost is based on the provision of TDR 2025. O&M efficiency gains of 1% is proposed as new power plant experiences teething problem at the start of operation.

3.9 Inflation

The average annual inflation rate of 3.46% based on the average inflation rate for the past three years is proposed. The inflation rate derived based on the historical average inflation rates published by the National Statistics Bureau (NSB). The historical inflation figures are based from the Consumer Price Index bulletin of the NSB for non-food items and calculated as the arithmetic average of the year-on-year inflation rates. The average inflation rate is used to escalate the historical O&M cost to 2024 price levels. The O&M allowance over the tariff period is escalated as per the TDR 2025. The average annual inflation rate of 3.46% for the past three years as given below in table below is used for the tariff period.

Table 3. Year on Year historical inflation on Non-food Item

Year	2022	2023	2024	Average
Inflation figures	7.01%	3.96%	-0.6%	**3.46%**

Source: Customer Price Index Bulletin, National Accounts and Price Division, NSB

3.10 Cost of Working Capital

The calculation of the cost of working capital uses the annual inventories and arrears.

3.11 Inventories

The inventory value for Punatsangchhu-II have been considered at MHP inventory levels at 25.57 of MHP inventory which amounts to Nu. 36.22 million (in the ratio of MW = 1020/720 * 25.57 = 36.22) and, an arrear of 30 days has been proposed.

3.12 Regulatory Fees

The regulatory fees to the ERA of Nu. 10.2 million (Nu. 10,000 per MW) has been added separately in the tariff model as the annual regulatory fee for Punatsangchhu-II. As per the System Operator Charges Regulation 2022, the System Operator charges from the Generation, Transmission, Distribution Licenses and any other users is applicable. As per clause 37 of the regulation, the total cost of System Operator shall be recovered from Generation, Distribution, and any other users as System Operator charges for the service rendered by System Operator and accordingly shall be allocated as follows:

1) Generation = Half (1/2) of total cost of System Operator
2) Transmission and Distribution = Half (1/2) of total cost of System Operator

The system operator cost allocated to generation shall be further allocated to individual Generation Licensee based on the installed capacity (MW). Based on the above provisions from the regulation, the system operator charge for PHPA-II is calculated as following and considered in the tariff model.

Table 4. System Operator Approved Charges (July 2025 to June 2028)

S. N	Parameters	July 2025 – June 2028
1	O&M Cost	196.73
2	Capital Expenditure	39.86
3	Regulatory Fees (2025-2028)	0.46
4	Total Cost	237.05
5	Less fund savings from last period	(42.29)
6	Payable for Fiscal year 2024-2025	36.97
7	Total Annual Charges	231.73
8	50% allocation to Generation	115.87

Table 5. Allocation of System Operator Charge

S. N	Power plan Yearly Charges	July 2025 - June 2026	July 2026 – June 2027	July 2027 - June 2028
		41.57	37.19	37.01
1	Allocated to DGPC Generation	25.51	22.82	22.71
2	Allocated to PHPA-II	11.78	10.54	10.49
3	Allocated to Nikachhu	1.36	1.22	1.21
4	Allocated to Dagachhu	1.46	1.30	1.30
5	Allocated to Sephu	0.26	0.23	0.23
6	Allocated to Suchhu	0.21	0.19	0.19
7	Allocated to Burgangchhu	0.62	0.56	0.56
8	Allocation to Yungichhu	0.37	0.33	0.33

Based on the allocation of the charges to generation, the BPSO cost from Punatsangchhu-II is calculated as Nu. 11.78 million for July 2025 to June 2026, Nu. 10.54 for July 2026 to June 2027 and Nu. 10.49 for July 2027 to June 2028.

3.13 Energy Volumes

The energy of 3,932.49 GWh has been considered for the domestic generation tariff proposal based on the followings.

3.14 Annual Energy Volumes

The annual mean generation projected for Punatsangchhu-II is 4,575 GWh. Energy volumes net of royalty energy of 13% and adjusted for auxiliary losses (1.20%) is 3,932.49 GWh have been considered in the calculation of the tariff as shown in Table below.

Table 6. Energy Volumes

Year	Values
Annual Energy	4,575
Less: Auxiliary Losses (1.20%)	54.90
Less: Royalty (13%)	587.61
Energy net off Aux. Losses & Royalty	3,932.49

4. Generation Tariff

The domestic generation tariff for Punatsangchhu-II works out to Nu. 4.28 per kWh. The detailed outputs of the tariff model are given in ***Annexure III.*** The tariff proposal has been prepared in line with the provisions of the TDR and the Tariff Policy. The proposed tariff will enable Punatsangchhu-II to earn returns as permissible within the Tariff Policy and the regulatory framework. The tariff proposed also need to adequately service the liabilities of the projects.

5. Annexures

5.1 Annexure I: Bilateral Agreement between GOI and RGOB (attached separately)

5.2 Annexure II: Statement of 2nd RCE/Completion Cost (attached separately)

5.3 Annexure III: Project cost details (attached separately)

5.4 Annexure VI: Output of the tariff model

Total Cost of Supply (mill Nu.)					
	2025	**2026**	**2027**	**2028**	**2029**
OM	926.99	949.76	973.09	997.00	1,021.49
DEP	4,463.78	4,463.78	4,463.78	4,463.78	4,463.78
Cost of Debt	6,333.31	5,960.76	5,588.21	5,215.67	4,843.12
Cost of Equity	5,219.76	5,219.76	5,219.76	5,219.76	5,219.76
CoWC	174.85	171.43	168.02	164.62	161.23
Annual License Fees	10.20	10.20	10.20	10.20	10.20
System Operator Charges	11.78	10.54	10.49	10.49	10.49
TC	17,140.67	16,786.23	16,433.56	16,081.52	15,730.07
Energy volumes (GWh)					
	2025	2026	2027	2028	2029
$ENERGY_i$	4,520	4,520	4,520	4,520	4,520
ENERGY	3,932	3,932	3,932	3,932	3,932
ROYALTY	588	588	588	588	588
Average Cost of Supply					
Tariff period	1	2	3	4	5
Discounted TC	15,200	28,400	39,859	49,803	58,429
Discounted ENERGY	3,487	6,580	9,322	11,753	13,910
AC	**4.28**	**Nu/kWh**			