

Bhutan Electricity Authority



Tariff Determination Regulation 2022

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TARIFF DETERMINATION REGULATION 2022

In exercise of the power vested by Section 11.1(i) (b) of the Electricity Act of Bhutan, 2001 and in order to provide for the determination of electricity prices, the Bhutan Electricity Authority hereby adopts the Tariff Determination Regulation 2022 as follows:

PRELIMINARY

Title and Commencement

1. This Regulation shall:
 - 1) Be cited as the Tariff Determination Regulation 2022; and
 - 2) Come into force with effect from May 1, 2022.

Scope

2. This Regulation shall apply to all Licensees including:
 - 1) Generation Licensee;
 - 2) Transmission Licensee; and
 - 3) Distribution and Supply Licensee.
3. Notwithstanding Clause 2 of this Regulation, all electricity tariffs for sale of electricity shall comply with the terms of this Regulation, except for:
 - 1) Import of electricity from other countries;
 - 2) Export of electricity to other countries; and
 - 3) Sale of electricity from generators under Power Purchase Agreements.

Objective

4. The objective of this Regulation is to provide for the determination of electricity prices in accordance with the Electricity Act of Bhutan, 2001 and the Domestic Electricity Tariff Policy 2016.

Exemption

5. The Authority may, in particular cases, give dispensation from this Regulation.

Repeal

6. This Regulation repeals the Tariff Determination Regulation 2016.

Amendment

7. The Authority may amend this Regulation from time to time as it deems fit.

GENERAL CONDITIONS AND TARIFF PRINCIPLES

8. No Licensee shall levy any tariff or charges for generation, transmission, distribution and supply to any other person or entity without the approval of the Authority, with the exception of generation tariffs regulated by power purchase agreements.
9. The Licensee shall levy tariffs at specific connection points and tariffs shall be independent of distance to the customer.
10. The Authority shall determine tariffs according to the following principles, in accordance with Section 14.1 of the Electricity Act:
 - 1) Fairness to both service customers and service providers;
 - 2) No unjust discrimination against service providers or those who wish to use the services;
 - 3) Reflect the actual cost of efficient business operation;
 - 4) Conducive to efficiency improvement in business operation;
 - 5) Enhance efficient and adequate supply to satisfy the domestic demand; and
 - 6) Transparency in the determination and presentation of tariffs.
11. The Authority shall announce the tariffs publicly and disseminate in such a way that the public can examine the determination of tariffs.
12. Any deviations from the tariff principles set out in Clause 10 of this Regulation shall be in accordance with subsidy policies of Government.

TARIFF APPROVAL PROCESS

13. The Licensee shall submit their investment plans for the upcoming tariff period to the Authority, at least nine months prior to the expiry of the current tariff period.
14. The Licensee shall submit application for a revised Tariff Schedule along with complete set of documents, at least four months prior to the expiry of the current tariff period.
15. The Authority shall review the tariff in accordance with this Regulation, and shall result in the determination of Average Prices for each Customer Group.
16. The Authority shall determine efficiency and productivity targets to be used in tariff determination at each tariff review.
17. The Licensee shall provide the necessary information to conduct the tariff review.
18. The Authority may hold a public consultation in accordance with the Guideline for Public Consultation 2022.
19. The Tariff Schedule as approved by the Authority shall be consistent with the Average Prices determined in accordance with this Regulation.
20. The Authority shall set the date on which the new Tariff Schedule shall apply, and the duration of its application.

21. If the Authority fails to approve a new Tariff Schedule prior to the expiry of the prevailing Tariff Schedule, the prevailing Tariff Schedule may be adjusted by average twelve months consumer price index and continue to be in force until such time a new Tariff Schedule is approved.

Interim Tariff Applications

22. Notwithstanding Clause 20 and Clause 26 of this Regulation, a Licensee may apply to the Authority for an interim tariff adjustment prior to the expiry of the prevailing Tariff Schedules, should the business environment of the licensee be substantially and significantly different from that assumed when the preceding tariff application was made.
23. Should the Authority not concur that the business environment has changed in significant and substantial ways, then the interim tariff application shall be declined and the prevailing Tariff Schedule shall remain in force. Otherwise, the Authority shall consult with affected parties and issue a revised Tariff Schedule that shall come into force on the date determined by the Authority and shall remain in force until the end of the current Tariff Period.
24. The Authority shall provide a written response to the interim tariff application within thirty days of the application.

FORM OF ECONOMIC REGULATION

25. The Authority shall approve a Tariff Schedule for each Licensee that sets the maximum tariffs that shall be charged.
26. The Tariff Schedule so established shall apply for the duration of the Tariff Period, with appropriate indexing or other adjustments over the course of the Tariff Period.
27. Where the cost of supply for a Customer Group not eligible for subsidy are determined by the Authority to be significantly different from prevailing tariffs, the Authority may make suitable transition arrangements in order to ensure tariff stability.
28. Where the cost of supply for a Customer Group eligible for subsidy are determined by the Authority to be significantly different from prevailing tariffs, the Authority shall recommend a subsidy schedule to Government to ensure tariff stability.
29. There shall be no reconciliation of revenues accrued against costs incurred in the preceding Tariff Period in the determination of tariffs for the subsequent Tariff Period except for the System Operator charges in accordance with System Operator Charges Regulation 2021.
30. The cost of supply shall provide for an allowance for operating and maintenance costs as per the industries best practices for the recently commissioned projects and as per the actual operating and maintenance costs for generators/transmissions/distribution that have been in operation for the more than five years.
31. For generation Licensees, the determination of tariffs shall provide for an allowance for auxiliary consumption and transformation losses at the power stations as well as the

target for water utilization factor and power plant availability.

32. For transmission, distribution and supply Licensees, the costs of supply shall provide for an allowance for technical losses, commercial losses and non-payment.

COST OF SUPPLY METHODOLOGY

33. The Authority shall determine the costs of supply for the forthcoming Tariff Period for the Licensee.
34. The scope of costs shall include:
 - 1) Operation and maintenance costs;
 - 2) Depreciation;
 - 3) A return on fixed assets, including an allowance for company taxation;
 - 4) Power purchases and fuel costs for electricity generation, should either of these be applicable;
 - 5) The cost of losses and non-payment of electricity bills;
 - 6) The cost of working capital;
 - 7) System Operator Charges; and
 - 8) Any regulatory fees, duties or levies that the Licensee is liable to pay under the Laws of Bhutan.

Determination of Operation and Maintenance Costs

35. The operation and maintenance allowance shall incorporate expenses including but not limited to salaries and wages, transportation expenses, insurance of assets, maintenance expenses, office materials, rentals, consumables and all such expenses that are treated as recurrent costs under standard accounting practices.
36. The operation and maintenance allowance shall not include Corporate Social Responsibility expenses.
37. The incomes from rent and hires stemming from activities financed through costs that are included in the historical costs and asset schedule shall be deducted from the allowance.
38. The determination of the operation and maintenance allowance shall take into consideration the historical costs for the old power plants that are older than five years, as adjusted for inflation, while for the recently commissioned projects, it shall be determined based on the industry best practices, as set out in Schedule A of this Regulation; opportunities for efficiency improvements; and may include comparison with benchmarks from comparable utilities in the region.
39. The determination of the operation and maintenance allowance shall take into consideration additional costs associated with new assets and growth in the customer base, using appropriate industry benchmarks applicable to the Licensee, as set out in Schedule A of this Regulation.
40. The operation and maintenance benchmarks for new assets shall be maintained lower

than that of older assets as per the industry's benchmarks or best practices.

41. The Authority may include in the operation and maintenance allowance provision for asset write-offs not covered by insurance, and may spread such write-offs over two tariff periods should the extent of the write-off significantly influence the objective of tariff stability.

Determination of Asset Values

42. Asset values used to determine depreciation charges and the return on net fixed assets shall be based on historical asset values.
43. Assets owned by the Licensees but not in use shall not be considered for tariff determination. The Licensee shall maintain a register for the assets which fall under the above category and furnish justifications at the time of tariff review.
44. The determination of asset additions shall take into consideration the investment plans of the Licensee. These investment plans shall be submitted to the Authority for scrutiny during the tariff review.
45. The cost of investments made as per national plans but not utilized on account of the reasons beyond the control of the Licensees shall be spread out across all customer groups as per Schedule F of this Regulation. The Licensee shall maintain a register for the assets which fall under the above category and furnish justifications at the time of tariff review.
46. The asset additions with regard to hydropower and associated transmission systems including expansion and up-gradation thereof which are not approved by the Department of Hydropower and Power Systems or the concerned Agency/Shareholder(s)/Board and the asset additions with regard to rural electrification, small/mini/micro hydro 25 MW and below, non-conventional renewable energy resources including expansion and up-gradation thereof not approved by Department of Renewable Energy or the concerned Agency/Shareholder(s)/Board shall not be considered for tariff determination.
47. In the determination of depreciation and the return on net fixed assets, the Authority shall make allowance for asset additions and asset disposals and other asset value adjustments over the course of the Tariff Period.
48. In the determination of asset values, the Authority shall allow interest accrued during construction and associated labour costs to be capitalized, in accordance with standard accounting practices.
49. Where a Licensee replaces components of a capital nature, these components shall be treated as asset additions and not maintenance expenses.
50. Any asset received free of cost by the Licensee from a Government or Government-owned agency shall be treated as an equity injection of the Government.

Determination of Depreciation

51. The allowance for depreciation shall be based on the economic life of the assets, in accordance with Schedule B of this Regulation.
52. The allowance for depreciation shall take into consideration asset additions and retirements over the Tariff Period.
53. Where a Licensee purchases replacement components of a capital nature, including replacement of turbine or generator at hydropower generating stations, these components shall be depreciated over the expected economic life of the asset under the specific circumstances of the Licensee.
54. Under circumstances when the Licensees are in difficulty in meeting the debt service obligation, accelerated depreciation may be allowed during the initial debt servicing period. This allowance will only be made where it is necessary to ensure the financial viability of the Licensee.

Determination of Return on Assets

55. The return on assets shall be determined as the product of the Weighted Average Cost of Capital and the net asset values at the start of any year.

Determination of the Cost of Working Capital

56. The amount of working capital shall include a reasonable allowance for inventories and arrears and shall be allocated across Customer Groups.
57. The allowance for inventories shall be as a percentage of operation and maintenance expenses or capital costs based on best industry practice or applicable benchmarks.
58. The allowance for arrears shall be based on the efficient duration of average energy consumption, bill preparation, delivery and payment.
59. The Authority shall determine the interest on working capital based on the prevailing lowest short-term lending rate of financial institutions in Bhutan at the time of the tariff review.
60. The cost of working capital shall be determined as the product of the interest on working capital and the amount of working capital.

Determination of the Cost of Losses

61. The Authority shall determine the losses by taking into consideration both technical and commercial losses, in accordance with Schedule E of this Regulation, and it shall be expressed as a Loss Factor being the combination of technical and commercial losses.
62. Technical losses and commercial losses shall be differentiated for each Customer Group as a function of the voltage level of supply.

63. The cost of losses shall be determined as the product of the Loss Factor, differentiated for each Customer Group, and the marginal cost of power purchases.
64. The Average Price determined for each Customer Group shall take account of a Collection Rate, common for all Customer Groups, which shall reflect the targeted rate of collections set by the Authority over the Tariff Period.

Determination of Allocation Factors

65. The Authority shall determine the allocation factors for the assets and associated costs like operation and maintenance costs, inventories, fees and levies and system operation shall be allocated to the Customer Group based on the following guidelines:
 - 1) Where assets and associated costs are exclusively used by a particular Customer Group, the same shall be allocated fully to this Customer Group;
 - 2) Where assets and associated costs are for export purposes, the entire cost shall be allocated to that Customer Group;
 - 3) Where generation, transmission and distribution assets and their associated costs are meant for joint usage by different Customer Groups, the allocation factor shall be based on capacity demand; and
 - 4) From the above Clauses 65(1), 65(2) and 65(3) of this Regulation, weighted average allocation factors for all the Customer Groups shall be determined for allocating assets and associated costs that do not fall under the above three items including fees and levies of the Authority.

APPLICATION OF SUBSIDY

66. Upon determination of the Average Price for each Customer Group, where the costs of supply for Customer Group eligible for subsidy are determined by the Authority to be significantly different from prevailing tariffs, the Authority shall recommend a subsidy schedule to the Ministry.
67. In recommending the subsidy schedule to the Ministry, the Authority shall be guided by the subsidy allocation principles of the Government.
68. The Authority shall implement subsidies as approved by the Government.

DETERMINATION OF GENERATION PRICES

Determination of the Average Cost of Supply

69. The Weighted Average Cost of Capital for the generation Licensee shall be calculated as follows:

$$WACC_g = \frac{CoE_g(1 - Gearing_g)}{1 - Tax} + (CoD_g \times Gearing_g)$$

Where,

- 1) $WACC_g$ is the weighted average cost of capital for the Generation Licensee “g”, as a percentage;
- 2) CoE_g is the cost of equity, as set out in Schedule C of this Regulation, as a percentage for the Generation Licensee “g”;
- 3) $Gearing_g$ is the ratio of debt to total net fixed assets, as set out in Schedule C of this Regulation for the Generation Licensee “g”;
- 4) CoD_g is the actual cost of debt for the tariff period for the Generation Licensee “g”, as a percentage, being the weighted average interest rate of the Licensee’s loans with suitable allowance made for currency risk of any loans not made in local currency, provided that the cost of debt should not exceed reasonable benchmarks; and
- 5) Tax is the prevailing rate of company taxation, as a percentage.

70. The total cost of supply for a Generation Licensee in any year shall be determined as:

$$TC_g = OM_g + DEP_g + RoA_g + CoWC_g + SO_g + Fees_g - NTR_g$$

Where,

- 1) TC_g is the total cost of supply of the Generation Licensee “g”, in million Ngultrum;
- 2) OM_g is the allowance for operating and maintenance costs of the Generation Licensee “g”, in million Ngultrum;
- 3) DEP_g is the allowance for depreciation of assets for the Generation Licensee “g”, in million Ngultrum;
- 4) RoA_g is the return on fixed assets of the Generation Licensee “g”, in million Ngultrum, determined as:

$$RoA_g = WACC_g \times NA_g$$

Where,

- a) $WACC_g$ is the weighted average cost of capital for the Generation Licensee “g”, as determined in accordance with Clause 69 of this Regulation; and
 - b) NA_g is the net value of all fixed assets at the start of the year for the Generation Licensee “g”, in million Ngultrum.
- 5) $CoWC_g$ is the Cost of Working Capital for the Generation Licensee “g”, in million Ngultrum. The cost of working capital shall cover the allowance for arrears and inventories, and shall be calculated as follows:

$$CoWC_g = I \times [REV_g \times \frac{ARREARS_g}{365} + INVENTORIES_g]$$

Where,

- a) I is the interest rate for working capital as determined in Clause 59 of this Regulation;
- b) $REV_g = OM_g + DEP_g + RoA_g$
- c) $ARREARS_g$ is the allowed days' receivables for the Generation Licensee “g”, in

- days; and
- d) $INVENTORIES_g$ is the allowance for inventories for the Generation Licensee “g”, in million Ngultrum.
- 6) SO_g is the System Operator charges payable by the Generation Licensee “g”, in million Ngultrum.
- 7) $FEES_g$ is the allowance for regulatory fees and levies of the Generation Licensee “g”, in million Ngultrum.
- 8) NTR is the estimated Non-Tariff Revenue of the Generation Licensee “g”, in million Ngultrum
71. The annual energy volumes shall be determined as the mean annual energy generation of the past three years based on a 98% water utilization factor to the extent of generation capacity less royalty energy adjusted for auxiliary consumption, determined as follows:

$$ENERGY = \sum_i ENERGY_i \times (1 - AUX_i) \times (1 - ROYALTY_i)$$

Where,

- 1) $ENERGY$ is the annual energy volume in any year, in GWh;
 - 2) $ENERGY_i$ is the average historical mean annual energy generation of the past three years for the plant “i”, in GWh;
 - 3) AUX_i is the allowance for auxiliary consumption at the plant “i”, as set out in Schedule D of this Regulation, as a percentage; and
 - 4) $ROYALTY_i$ is the free energy that is made available to RGoB by plant “i”, as a percentage.
72. The average cost of supply shall be taken as the ratio of the discounted annual costs of supply to the discounted energy volumes, with discounting applied over the Tariff Period using the $WACC_g$, as follows:

$$AC_g = \frac{\sum_{n=1}^{TP} TC_{g,n} / (1 + WACC_g)^n}{\sum_{n=1}^{TP} ENERGY_n / (1 + WACC_g)^n}$$

Where,

- 1) AC_g is the average cost of supply for the Generation Licensee “g”, in Ngultrum per kWh;
- 2) TP is the number of years in the Tariff Period;
- 3) $TC_{g,n}$ is the total cost of supply of generation Licensee “g” in the year “n” in million Ngultrum, as determined under Clause 70 of this Regulation;
- 4) $ENERGY_n$ is the energy volume in year “n” in GWh, as determined under Clause 71 of this Regulation; and
- 5) $WACC_g$ is the weighted average cost of capital for the Generation Licensee “g”, as determined in Clause 69 of this Regulation.

DETERMINATION OF END-USER PRICES

73. The Authority, in its tariff review undertaken in accordance with Tariff Approval Process from Clause 13 to 21 of this Regulation, shall determine an Average Price for each Customer Group applicable for the Tariff Period.
74. All customers connected to a common voltage level shall comprise one Customer Group to determine Average Prices. Within each Customer Group, different tariff structures for different customer categories may be created by the Licensee to implement the subsidy policies of Government.
75. The Weighted Average Cost of Capital for each Customer Group shall be calculated as follows:

$$WACC_C = \frac{CoE(1 - Gearing_C)}{1 - Tax} + (CoD_C \times Gearing_C)$$

Where,

- 1) $WACC_C$ is the weighted average cost of capital for the Customer Group “C”, as a percentage;
- 2) CoE is the cost of equity, as set out in Schedule C of this Regulation, as a percentage for the Licensee;
- 3) $Gearing_C$ is the ratio of debt to total net fixed assets, as set out in Schedule C of this Regulation for the Customer Group “C”;
- 4) CoD_C is the actual cost of debt related to assets utilized by the Customer Group “C”, as a percentage, being the weighted average interest rate of the Licensee’s loans with suitable allowance made for currency risk of any loans not made in local currency, provided that the cost of debt should not exceed reasonable benchmarks; and
- 5) Tax is the prevailing rate of company taxation, as a percentage.

Allocation of Network Costs

76. The total annual network costs of the Licensee shall comprise the sum of the allowance for return on assets, the allowance for depreciation, the operating and maintenance allowance and any allowances for fees and levies.
77. Annual network costs allocated to each Customer Group shall comprise a share of each element of the total annual network costs, where the sum of allocations across all Customer Groups shall equal the total annual network costs referred to Clause 76 of this Regulation, in accordance with the following:

$$NETWORK_C = WACC_C \times \sum_i [ASSET_i \times AALLOC_{i,c}] + \sum_i [DEP_i \times AALLOC_{i,c}] + \sum_i [OM_i \times AALLOC_{i,c}] + FEES \times FALLOC_C$$

Where,

- 1) NETWORK_C is the network cost allocated to Customer Group “C”, in million Ngultrum;
- 2) WACC_C is the Weighted Average Cost of Capital for Customer Group “C” for the Licensee, as a percentage;
- 3) ASSET_i is the net historical value of assets in asset category “i”, in million Ngultrum;
- 4) DEP_i is the depreciation allowance for assets in asset category “i”, in million Ngultrum;
- 5) OM_i is operating and maintenance allowance for cost category “i” , in million Ngultrum;
- 6) FEES is the allowance for regulatory fees and levies, in million Ngultrum;
- 7) AALLOC_{i,C} is the allocation factor to Customer Category “C” for asset-related costs in asset category “i”, as a percentage, where $\sum_c AALLOC_{i,c}=1$;
- 8) OMALLOC_{i,C} is the allocation factor to Customer Category “C” for operating and maintenance costs in cost category “i”, as a percentage, where $\sum_c OMALLOC_{i,c}=1$; and
- 9) FALLOC_C is the allocation factor for fees, as a percentage, where $\sum_c FALLOC_{i,c}=1$

Allocation of the Cost of Working Capital

78. The allowance for the cost of working capital shall be determined as the interest on an allowance for working capital, where the allowance for working capital shall consist of an allowance for arrears and inventories.
79. The cost of working capital allocated to each Customer Group “C” shall comprise a share of the total cost of working capital, where the sum of allocations across all Customer Groups “C” shall equal the total cost of working capital referred to in Clause 78 of this Regulation, in accordance with the following:

$$CoWC_c = I \times [REV_c \times \frac{ARREARS_c}{365} + INVENTORIES_c \times IALLOC_c]$$

Where,

- 1) CoWC_C is the cost of working capital allocated to Customer Group “C” in million Ngultrum;
- 2) I is the interest rate for working capital as determined in Clause 59 of this Regulation;
- 3) REV_C = OM_C + DEP_C + RoAc

Where,

- a) OM_C is the allowance for operating and maintenance costs for the Customer Group “C”, in million Ngultrum;
- b) DEP_C is the allowance for depreciation of assets for the Customer Group “C”, in million Ngultrum; and
- c) RoAc is the return on fixed assets for the Customer Group “C”, in million

Ngultrum, determined as:

$$RoA_C = WACC_C \times NA_C$$

Where,

- i) $WACC_C$ is the weighted average cost of capital for the Customer Group “C”, as determined in accordance with Clause 75 of this Regulation, as a percentage; and
 - i) NA_C is the net value of all fixed assets at the start of the year for the Customer Group “C”, in million Ngultrum.
- 4) $ARREARS_C$ is the allowed days' receivables for the Customer Group “C”, indays;
 - 5) $INVENTORIES_C$ is the allowance for the value of inventories, in million Ngultrum; and
 - 6) $IALLOC_C$ is the allocation factor to Customer Group “C” for inventories, as a percentage, where $\sum_c IALLOC_{i,c} = 1$.

Allocation of Cost of System Operator

80. The System Operator Cost shall be determined and allocated to the Generation and Transmission and Distribution Licensee as per System Operator Charges Regulation 2021.

Determination of domestic Power Purchase Price (PPP)

81. Upon determination of the domestic energy demand for the tariff period, the generation plants fully owned by the Government as of 2015 shall be first allocated for domestic supply.
82. For the determination of the power purchase price from the generation plants fully owned by the Government as of 2015, the weighted average generation cost shall be utilized.
83. In the event the fully owned Government plants as of 2015 are not able to meet the domestic demand, the plants with the lowest cost of generations shall be selected to supplement the energy.
84. In the event of inadequate generation from all the fully Government-owned plants to meet the domestic demand, the plants not fully owned by the Government with the lowest off-take rate shall be selected to supplement the energy.
85. The domestic Power Purchase Price, for determination of Average Costs, shall comprise the weighted average of purchases from domestic generation plants at their Average Cost, as follows:

$$PPP = \frac{AC_{e,g} \times DOMESTIC_{e,g} + \sum_i [AC_{n,g} \times DOMESTIC_{n,g}]}{DOMESTIC_{e,g} + \sum_i DOMESTIC_{n,g}}$$

Where,

- 1) PPP is the domestic Power Purchase Price in Ngultrum per kWh;
- 2) $AC_{e,g}$ is the Weighted Average Cost of generation for the existing plants “e,g” as of 2015, calculated in accordance with Clause 72 of this Regulation;
- 3) $AC_{n,g}$ is the Average Cost for each new generation plant “n,g” in Ngultrum per kWh;
- 4) $DOMESTIC_{e,g}$ is the volume of electricity supplied to the Licensee by the existing generation plants “e,g” in GWh; and
- 5) $DOMESTIC_{n,g}$ is the volume of electricity supplied to the Licensee by each new generation plant “n,g”, in GWh.

Determination of Average Costs

86. The cost of supply for a Customer Group in a particular year shall be determined as the sum of energy purchase costs, valued at the domestic Power Purchase Price determined under Clause 85 of this Regulation, import price, network costs allocated to that Customer Group, the cost of Working Capital allocated to that Customer Group, System Operator cost less any Non-Tariff Revenue from that Customer Group, as follows:

$$COST_C = (1 + LOSS_C) \times PPP \times SALES_C + IP \times IMPORT \times IMALLOC_C + NETWORK_C + COWC_C + SOC_C - NTR$$

Where,

- 1) $COST_C$ is the cost of supply for Customer Group “C”, in million Ngultrum;
 - 2) $LOSS_C$ is the sum of technical and commercial losses allocated to Customer Group “C” as set out in Schedule E of this Regulation, as a percentage;
 - 3) PPP is the domestic Power Purchase Price, determined under Clause 85 of this Regulation, in Ngultrum per kWh;
 - 4) $SALES_C$ is the sales for the year attributed to Customer Group “C”, in GWh;
 - 5) IP is the average import price in Ngultrum per KWh;
 - 6) IMPORT is the volume of electricity imported by the Transmission and Distribution Utility, in GWh;
 - 7) $IMALLOC_C$ is the allocation of import costs to Customer Groups, where $IMALLOC_C$ for the high voltage Customer Group equals one (1), and $IMALLOC_C$ for other Customer Groups equals zero;
 - 8) $NETWORK_C$ is the network costs allocated to Customer Group “C”, determined under Clause 77 of this Regulation, in million Ngultrum;
 - 9) $CoWC_C$ is the Cost of Working Capital allocated to Customer Group “C”, determined under Clause 79 of this Regulation, in million Ngultrum;
 - 10) SOC_C is the cost of System Operator allocated to Customer Group “C”, in accordance with Clause 80 of this Regulation, in million Ngultrum; and
 - 11) NTR_C is the estimated Non-Tariff Revenue for the year arising from Customer Group “C”, in million Ngultrum.
87. The Average Price for a Customer Group shall be determined as the ratio of the discounted costs of supply for that Customer Group to the discounted electricity sales to that Customer Group, where sales are adjusted for an allowed collection rate, and where discounting occurs over the Tariff Period at the WACC applicable to the Customers, as follows:

$$AP_C = \frac{\sum_{n=1}^{TP} COST_{C,n} / (1 + WACC_C)^n}{\sum_{n=1}^{TP} (SALES_{C,n} \times COLL) / (1 + WACC_C)^n}$$

Where,

- 1) AP_C is the Average Price for Customer Group “C”, in Ngultrum per kWh;
- 2) TP is the number of years in the Tariff Period;
- 3) $COST_{C,n}$ is the cost of supply allocated to Customer Group “C” in year “n”, as determined in accordance with Clause 86 of this Regulation in million Ngultrum;
- 4) $SALES_{C,n}$ is the volumes of electricity sales expected from Customer Group “C” in year “n”, in GWh;
- 5) COLL is the target collection rate set by the Authority for the Licensee, as a percentage; and
- 6) $WACC_C$ is the Weighted Average Cost of Capital for the Customer Group “C”, as determined in accordance with Clause 75 of this Regulation, as a percentage.

Allocation of Net Import Cost for Import through Generation Licensee

88. Any net monthly import cost to meet the shortfall of domestic supply shall be allocated to HV customers on a monthly basis. The monthly import cost shall be determined as follows:

$$IC_{i,n} = IMPORT_n \times \frac{SALES_{i,n}}{SUMSALES_n}$$

Where,

- 1) $IC_{i,n}$ is the monthly import cost allocated to the HV Customers “i” in a month “n”, in Ngultrum;
 - 2) $IMPORT_n$ is the cost of net electricity imported by generation licensee in month “n”, in Ngultrum;
 - 3) $SALES_{i,n}$ is the volumes of electricity sales attributed to the HV customers “i” in a month “n”, in GWh; and
 - 4) $SUMSALES_n$ is the sum of electricity sales to all HV customers in a month “n”, in GWh.
89. The wheeling charges and transmission losses of the imported power from the international border delivery point till the customer end shall be directly passed on to the concerned customer for whom the power was imported from the neighboring countries.

Principles for Determining Tariff Schedules

90. In preparation for the Tariff Schedules, the Licensees shall be guided by Clause 7.14 of the Domestic Electricity Tariff Policy 2016.
91. In the tariff applications, Licensees shall submit detailed Tariff Schedules, demonstrating

that the expected revenue from electricity sales for each Customer Group is consistent with the Average Price for that Customer Group determined according to this Regulation. Any subsidies required to achieve the tariffs in the schedule shall be shown in Ngultrum per kWh per customer category.

DEFINITION

In this Regulation, unless the context otherwise provides:

- (1) “**Act**” means the Electricity Act of Bhutan, 2001;
- (2) “**Authority**” means the Bhutan Electricity Authority;
- (3) “**Average Price**” means a price in Ngultrum per kWh for each Customer Group that is determined by the Authority in its price reviews according to the provisions of this Regulation;
- (4) “**Bhutan Electricity Authority**” means the authority of that name established pursuant to Part 2 of the Act;
- (5) “**Customer Group**” means a group of customers, where each Customer Group is defined by the voltage at which supply is provided;
- (6) “**Domestic Supply**” means the generation, transmission or distribution of electricity for domestic consumption by way of the generation, transmission or distribution system respectively;
- (7) “**Gearing Ratio**” means the ratio of debt to total net fixed assets;
- (8) “**Government**” means the Royal Government of Bhutan;
- (9) “**GWh**” means one million kilowatt-hours;
- (10) “**kWh**” means kilowatt-hour, being a measure of electrical energy;
- (11) “**License**” means a license issued under the provisions of Part 3 of the Act;
- (12) “**Licensee**” means any person issued with a license pursuant to Part 3 of the Act;
- (13) “**Minister**” means the Minister who is the Head of the Ministry;
- (14) “**Ministry**” means the Ministry which is assigned responsibility for the electricity sector;
- (15) “**Ngultrum**” means the currency of the Kingdom of Bhutan;
- (16) “**Non-Tariff Revenue**” means revenue collected from Customers or Licensee that are obtained from sources other than tariff revenue;
- (17) “**Power Purchase Agreement**” means a bilateral contract dealing with the sale and purchase of power and electrical energy;
- (18) “**Royalty Energy**” means the energy to be provided by a generation Licensee to the Royal Government of Bhutan free of charges;

- (19) **“System Operator”** means the person/s designated by the Authority, whose function is defined under Section 39 of the Electricity Act of Bhutan, 2001;
- (20) **“Subsidy”** means a financial transfer from the Royal Government to consumers in order to reduce the cost or price of services;
- (21) **“Tariff Period”** means the period, in a designated number of years, for which the approved tariffs shall apply;
- (22) **“Tariff Schedule”** means the detailed set of charges to be applied by a Licensee for the provision of electricity supply services; and
- (23) **“WACC”** means the Weighted Average Cost of Capital determined in this Regulation.

Schedule A: Benchmarks for O&M costs

<i>Activity</i>	<i>Benchmark cost</i>
Large hydropower generation	1.0 to 1.5 percent of capital cost, adjusted by the change in the consumer price index since installation.
Micro and mini-hydropower generation	2.5 percent of capital cost, adjusted by the change in the consumer price index since installation.
Diesel generation	10 percent of capital cost, adjusted by the change in the consumer price index since installation.
Transmission	1.0 percent of capital cost, adjusted by the change in the consumer price index since installation.
Distribution	3.0 percent of capital cost, adjusted by the change in the consumer price index since installation.
Others	2.0 percent of capital cost, adjusted by the change in the consumer price index since installation.

Schedule B: Depreciation rates

<i>SI.</i>	<i>Type</i>	<i>Subtype</i>	<i>Rate</i>
1	Buildings & land	Buildings	3.33 %
		Civil Structures	
		Land	0.00 %
2	Generation	Civil Works	3.33 %
		Electro-mechanical*	
		Mini and Micro-Hydro Installations (<5 MW)	5.00 %
		Diesel Generating Sets	
3	Transmission	>= 220 kV Lines	3.33 %
		132 kV Lines	
		66 kV Lines	
		Transmission Substation	
		Equipment	
4	Distribution	33 kV Lines	3.33 %
		11 kV Lines	
		6.6 kV Lines	
		LV Lines	
		Distribution Substation Equipment	
5	Vehicles	Heavy Vehicles	15.00 %
		Light and Medium Vehicles	
		Earth Mover	
		Two Wheelers	
6	Office Equipment	Computers & Accessories	20.00 %
		Printer	
		Photocopier	
		Overhead Projectors	
		Telecommunication Equipment	
		Other Office Equipment	
		Software	
		Furniture	10.00 %
7	Tools	Tools & Plants	10.00 %
		Fire Fighting Equipment	
		Electrical Equipment	

Schedule C: Return Allowances

<i>Activity</i>	<i>Cost of Equity</i>	<i>Cost of Debt</i>	<i>Gearing Ratio</i>
Generation	As prescribed in the Domestic Electricity Tariff Policy 2016	The actual cost of debt	As prescribed in the Domestic Electricity Tariff Policy 2016
Wheeling Export/Import			
High Voltage			
Medium Voltage			
Light Voltage			

Schedule D: Allowance for Auxiliary Consumption

<i>Item</i>	<i>Hydropower</i>
Auxiliary consumption and transformation loss	1.20 percent

Schedule E: Loss Allowances

Maximum allowable Loss allowances for the Customer Groups for Export Wheeling, HV, MV and LV are provided below:

<i>Item</i>	<i>Wheeling (Export / Import) & HV</i>	<i>MV</i>	<i>LV</i>
Technical losses	2 percent	2.5 percent	9 percent
Commercial Losses	1.14 percent	1.14 percent	1.14 percent
Collection rate	100 percent	100 percent	100 percent

Schedule F: Allocation Factors

The allocation factors for transmission, distribution and supply Licensees are presented below.

<i>Items</i>	<i>Category</i>		<i>Export</i>	<i>HV</i>	<i>MV</i>	<i>LV</i>	
AALLOC _{i,c} Allocation of Asset related Costs	Building		20%	26%	10%	44%	
	Generation	Mini/micro hydels	0%	0%	30%	70%	
	Transmission	Civil structures		36%	46%	6%	12%
		400+kV lines		99%	1%	0%	0.0%
		220kV lines		42%	58%	0%	0%
		132kV lines		18%	63%	4%	15%
		66kV lines		0%	37%	15%	48%
		Substations		33%	51%	7%	9%
		Meters		36%	46%	6%	12%
	Distribution	Civil structures		0%	0%	14%	86%
		33kV lines		0%	0%	16%	84%
		11kV lines		0%	0%	16%	84%
		6.6kV lines		0%	0%	0%	100%
		LV lines		0%	0%	0%	100%
		Substations/ transformers		0%	0%	0%	100%
Meters		0%	0%	14%	86%		
Others		20%	26%	10%	44%		
OM AALLOC _{i,c} Allocation of O&M Costs	Generation		0%	0%	30%	70%	
	Transmission		36%	46%	6%	12%	
	Distribution		0%	0%	14%	86%	
	Others		20%	26%	10%	44%	
IAALLOC _{i,c} , Allocation of inventories			20%	26%	10%	44%	
FAALLOC _{i,c} , Allocation of Fees & Levies			20%	26%	10%	44%	