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# Bhutan Electricity Authority

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# ANNUAL REPORT 2021-2022

# FROM THE CEO'S DESK

It is an honor for me to present the 17th issue of the Annual Report for the fiscal year 2021-2022 of the Bhutan Electricity Authority.

During the last fiscal year, BEA reviewed the electricity tariff proposals of the Druk Green Power Corporation Limited (DGPC), Mangdechu Hydropower Project Authority (MHPA) and Bhutan Power Corporation Limited (BPC) and approved the generation and consumer tariffs and wheeling charges for the period between 1st September 2022 to 30th June 2025.

In order to enhance the electricity supply reliability, BEA also determined the System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) for Paro, Thimphu and industrial areas of Phuntsholing on special case basis. BEA will continue its efforts to enhance the power supply reliability in the entire country in the coming years.

BEA issued the Guideline for Exemption of License for Generation of Electricity from Distributed Energy Resources below 500kW with an objective to provide the interested resource developers an opportunity to install and operate renewable energy systems for self-consumption purpose. BEA also developed a 'Guidelines for Public Consultation Meeting' to provide clear procedures for processing of license and tariff petition, development of regulations and consultation proceedings to the stakeholders of BEA.

During the year, BEA updated the Tariff Determination Regulation 2016 and Guidelines for filing Tariff Application 2018 and processed few license renewals. The Technical audit of hydropower plants was also carried out to assess the operation and maintenance and safety measures in place.

All these activities were achieved with the timely guidance of his Excellency Tengye Lyonpo, the Hon'ble Chairman, other Authority Members and the stakeholders. On behalf of the Secretariat, I would like to express our sincere gratitude and look forward for the continued guidance and support in the common endeavor to enhance the power sector.

Tashi Delek.

(Samdrup K Thinley)
**Chief Executive Officer**

# CONTENTS

# BHUTAN ELECTRICITY AUTHORITY

The main goals of the Bhutan Electricity Authority (BEA), as an electricity regulatory agency, are to ensure a reliable, quality, and secure electricity supply, non-discriminatory access to the electricity system and a fair balance of the interests of the public, customers, and participants in the electricity sector with the following main functions:

1) Development of regulations, codes, principles, and procedures relating to:
   a) Performance standards, including minimum technical and safety requirements for construction, operation, and maintenance of generation, transmission, and distribution facilities;
   b) Tariff-setting for a generation not regulated by the power purchase agreement, transmission, distribution, and retail sale with terms and conditions for connection fees and investment contribution from customers, and provision of access to the transmission grid and distribution networks;
   c) Subsidies to entities carrying out non-economic viable electricity supply based on the policies executed by the Minister;
   d) Requirements for Licensees' reporting, accounting, and issuance of information to the Authority;
   e) System operation, including the dispatch of generation; and
   f) Levies, charges, or royalties to be paid by Licensees.

2) Processing of applications for issuances of licenses for generation, transmission, system operation, export, import, distribution, and sale of electricity;

3) Monitoring of the performance of Licensees and their compliance with the provision of this Act, regulations, standards, codes, licenses, and contracts approved by the Authority and concession agreements entered into between the Minister and Licensees;

4) Approval and determination of tariffs proposed by the Licensees;

5) Prescribing and collecting fees, charges, or royalties from Licensees;

6) Imposition of any fines, sanctions or penalties for any breach of provisions of this Act, regulations, standards, codes and licenses;

7) Establishment of a dispute resolution process and settle disputes between Licensees and between Licensees and customers relating to the enforcement of this Act, regulations, codes, standards, and licenses issued under this Act.

# MEMBERS OF THE AUTHORITY

**DashoYeshi Wangdi**
(Chairman)
Secretary (former)
Ministry of Economic Affairs

**Dasho Ugen T. Dorji**
(Member)
Chairman
Singye Group of Companies

**Dasho Bharat T. Yonzen**
(Member)
Royal Privy Council

**Mr. Yeshi Tenzin**
(Member)
Director
Operation and Maintenance Dept.
Druk Green Power Corporation

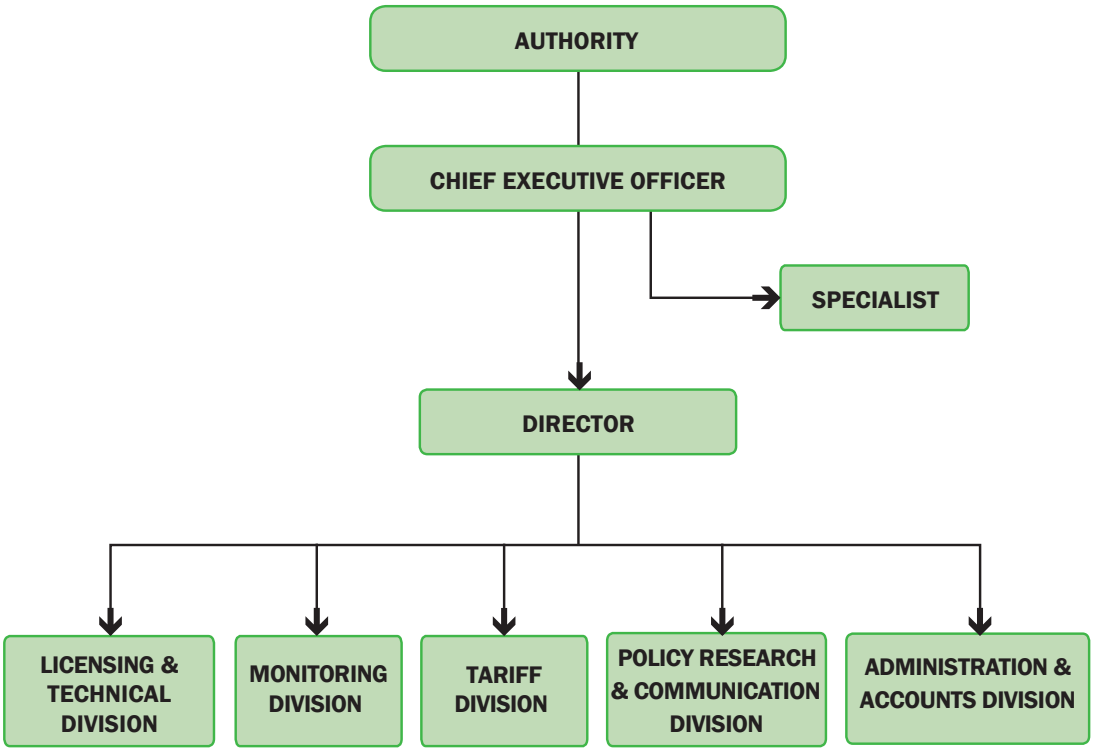
**Mr. Loknath Chapagai**
(Member)
Specialist
Department of Industry
Ministry of Economic Affairs

**Mr. Sonam Penjor**
(Member)
Director
National Credit Guarantee Scheme
Ministry of Finance

**Mr. Ugyen**
(Member)
Chief Engineer
Department of Hydropower and Power System
Ministry of Economic Affairs

**Mr. Samdrup K Thinley**
(Member Secretary)
Chief Executive Officer
Bhutan Electricity Authority

# ORGANIZATION STRUCTURE



# FINANCIAL STATEMENT

## 1. Revenue

BEA collected the following annual license fees for the fiscal year 2020 - 2021 and 2021 - 2022 as shown in Table 1.

**Table 1: Annual License Fees for the Fiscal Year 2020 – 2021 and 2021 – 2022**

| Agency/Licensee | Particular | 2020-2021 (Million Nu.) | 2021-2022 (Million Nu.) |
|---|---|---|---|
| Bhutan Power Corporation Limited | Annual License Fee | 20.249 | 20.891 |
| Druk Green Power Corporation | Annual License Fee | 14.800 | 14.800 |
| Dagachu Hydropower Corporation Limited | Annual License Fee | 1.260 | 1.260 |
| Mangdechu Hydroelectric Project Authority | Annual License Fee | 7.200 | 7.200 |
| Tangsibji Hydro Energy Limited | License Modification Fee | 0.100 | 0.100 |
| Financial Institution | Interest | 3.594 | 0 |
| Bhutan Power Corporation Limited | Tariff Determination Fees | 0 | 16.110 |
| Druk Green Power Corporation Limited | Tariff Determination Fees | 0 | 3.700 |
| Mangdechu Hydroelectric Project Authority | Tariff Determination Fees | 0 | 1.800 |
| Bhutan Power Corporation Limited | System Modification Fee | 0 | 0.100 |
| Kholongchu Hydro Energy Limited | License Modification Fee | 0 | 0.100 |
| PHPA II | License Modification Fee | 0 | 0.100 |
| **Total** | | **47.203** | **66.161** |

## 2. Approved Budget and the Expenditure (2021 - 2022)

**Table 2:** Approved Budget and the Expenditure for the Fiscal Year 2021 – 2022.

| Object Code | Particulars | Approved Budget (Million Nu.) | Expenses (Million Nu.) |
|---|---|---|---|
| **1.01** | Pay &Allowance | 24.550 | 22.620 |
| **11.01** | Travel - In Country | 2.050 | 1.254 |
| **11.02** | Travel- Out Country | 0.350 | 0.033 |
| **12.01** | Utilities: Tel. Fax, Internet | 1.000 | 0.582 |
| **12.02** | Utilities: Telegram, Postage etc. | 0.020 | 0.003 |
| **12.03** | Utilities: Electricity, Water, Sewerage etc | 0.130 | 0.050 |
| **13.01** | Rental: Building | 1.020 | 1.015 |
| **14.01** | Office Supplies: Stationeries, Printing & Publications | 0.750 | 0.711 |
| **14.06** | S&M: Uniform, extension kits, Linens etc. | 0.100 | 0.050 |
| **14.08** | S&M: Others (News Magazine) | 0.040 | 0.023 |
| **15.01** | MOP: Building | 0.300 | 0.240 |
| **15.02** | MOP: Vehicle | 0.800 | 0.789 |
| **15.05** | MOP: Equipment | 0.150 | 0.073 |
| **15.07** | MOP: Computers | 0.300 | 0.300 |
| **17.01** | Operating Exp-Advertising | 0.825 | 0.662 |
| **17.02** | Taxes, Duties, Royalties, Handling & Bank charges | 0.010 | 0.002 |
| **17.08** | Op. Exp-In - Country Meetings | 2.550 | 2.199 |
| **18.01** | Hospitality & Entertainment | 0.150 | 0.084 |
| **24.01** | Subscription to International Organization (SAFIR/ERRA) | 0.755 | 0.000 |
| **24.03** | Contribution – Provident Fund | 2.330 | 1.982 |
| **25.01** | Retirement Benefit | 0.450 | 0.077 |
| **TOTAL CURRENT EXPENDITURE** | | | |
| 45.01 | Training: HR Development | 1.000 | 0.110 |
| 53.01 | Purchase of Vehicle | 0.000 | 0.000 |
| 54.01 | Furniture | 0.620 | 0.612 |
| 54.02 | Office Equipment | 0.320 | 0.319 |
| 54.03 | Computer and Peripherals | 0.750 | 0.729 |
| 55.01 | Professional Services | 2.800 | 0.225 |
| **Sub-total Current** | | **38.650** | **32.745** |
| **Sub-total Capital** | | **5.49** | **1.994** |
| **Total** | | **44.140** | **34.739** |

# ACCOMPLISHMENTS

## 1. Amend Tariff Determination Regulation, 2016

During 2021-2022 fiscal year, the Tariff Determination Regulation 2016 was amended to incorporate mainly the following provisions:

(i) appropriate treatment of assets received free of cost from the Royal Government;
(ii) three options for treatment of inventories that could be based either on capital assets or on operation and maintenance cost or based on applicable benchmarks as relevant;
(iii) revision of operation and maintenance cost allowances in line with the Domestic Electricity Tariff Policy of the Royal Government; and
(iv) truing-up of cost of system operator on annual basis.

## 2. Amend Guidelines for Filing Tariff Applications 2018

The BEA amended the Guidelines for Filing Tariff Applications in accordance with the Tariff Determination Regulation 2022, incorporating provisions for submission of detail information on the asset and investment proposal and other information by licensees that would enable the detail assessment and determination of cost and tariff. The amended guidelines also require to establish tariff team within respective licensee with objective to provide efficient and accurate information on proposed cost and investment.

## 3. Review Investment Plans of DGPC (Tariff Period 2022-2025)

DGPC submitted their Investment Plan proposal 2022-2025 to BEA worth Nu 5.29 billion. The proposed investment of DGPC included the rehabilitation of dam complex, powerhouse, generating units, residential buildings and upgradation of SCADA system, generator excitation and governing system of the existing four hydropower plants under DGPC and the construction of corporate building office. A detailed review of the DGPC investment plan was carried out in consultation with the power plant officials and the DGPC tariff team. BEA approved Nu 3.25 billion of the proposed DGPC Investment Plan for the period 2022-2025.

## 4. Review Investment Plans of MHPA (Tariff Period 2022-2025)

DGPC submitted their Investment Plan Proposal for Mangdechhu Hydropower Plant (MHP) worth Nu 1.47 billion for the tariff period 2022-2025 to the BEA on 3rd November 2023. Major investments include the purchase and reclamation of Pelton turbines and construction of additional residential colonies for the operation and maintenance employees. A detailed

review of the MHPA investment plan was carried out in consultation with the power plant officials and the DGPC tariff team. BEA approved Nu.1.14 billion of the proposed DGPC Investment Plan for the period 2022-2025.

## 5. Review Investment Plans of BPC (Tariff Period 2022-2025)

BPC submitted their investment plans for the tariff period 2022-2025 worth Nu 18.3 billion to the BEA on 1st October 2021. The major investment plans are for new transmission lines and substations, smart grid, distribution lines and substations, mainly owing to the infrastructure development for upcoming industries. A detailed review of the BPC investment plan was carried out in consultation with the BPC tariff team, Project officials and ESSD managers. BEA approved investment worth Nu 13.9 billion for the period 2022-2025

## 6. Determination of System Operator Charges for Tariff Period 2022-2025

BEA reviewed the application for System Operator Charges as per the approved System Operator Charges Regulation 2022. The capital expenditure of the System Operator was also reviewed from the perspectives of fulfillment of obligations as per the Act/Regulations/ Codes/License Conditions/Performance Standards issued by the Authority and from the perspective of fulfillment in catering the growing system operation requirements, and enhancement of operational efficiency. The operation and maintenance costs such as salaries, wages, and transportation expenses, insurance of assets, maintenance expenses, office materials, rentals, consumables, manpower and capacity building requirements and other non-O&M expenses were also reviewed. As part of the review, the BEA conducted stakeholder consultation with the Department of Hydropower and Power System (DHPS), Druk Green Power Corporation Limited (DGPC), Mangdechhu Hydroelectric Project Authority (MHPA), Dagachhu Hydropower Corporation Limited (DHPC) and Bhutan Power Corporation Limited (BPC). The total System Operator Cost of Nu 529.5 million was approved for the period 2022-2025 and apportioned to BPC and generation companies.

## 7. DGPC Generation cost for the Period 2022-2025

DGPC proposed revision of the generation tariff from Nu 1.42/kWh to Nu 1.54/kWh for the tariff period from 1st July 2022 to 30th June 2025. After completing the preliminary screening of the tariff revision proposal of DGPC, the tariff revision proposal was also published on the website of the BEA on 21st March, 2022. A public consultation was conducted virtually on 3rd May 2022 during which DGPC, MHPA and BPC presented the rationale for their tariff proposals while the Association of Bhutanese Industries (ABI) presented their findings on the tariff proposal submitted by DGPC, MHPA and BPC.

Based on the detailed review and consultations, BEA set the generation tariff of DGPC as Nu 1.34 per unit for the tariff period 2022-2025.

## 8. MHPA Generation cost for the Period 2022-2025

MHPA proposed revision of the generation tariff from Nu 3.77/kWh to Nu 3.85/kWh for the tariff period from 1st July 2022 to 30th June 2025. After completing the preliminary screening of the tariff revision proposal of MHPA, the tariff revision proposal was also published on the website of the BEA on 28th March, 2022. A public consultation was conducted virtually on 3rd May 2022 during which DGPC, MHPA and BPC presented the rationale for their tariff proposals while the ABI presented their findings on the tariff proposal submitted by DGPC, MHPA and BPC.

Based on the detailed review and consultations, BEA determined the generation tariff of MHPA as Nu 3.64 per unit for the tariff period 2022-2025.

## 9. BPC cost of supply for the Period 2022-2025

BPC submitted the revision of electricity tariffs petition for the tariff period 1st July 2022 to 30th June 2025 on 8th March 2022. BPC submitted the rationale for tariff revision to implement work programs for capital investments in line with BPC's Five-Year Plan and for investments for reliable and quality electricity supply. As part of the tariff review process, a public hearing was conducted on 3rd May 2022 in virtual mode. The public hearing was attended by general public including HV and MV consumers and officials from DHPS, DGPC, BPC, Tangsibji Hydro Energy Limited (THyE), DHPC, Punatsangchhu-I Hydroelectric Project Authority (PHPA-I), Punatsangchhu-II Hydroelectric Project Authority (PHPA-II), and ABI.

Based on the detailed review and consultations, BEA determined the cost of supply as Nu 2.29 per unit for High Voltage (HV) consumers, Nu 3.71 per unit for Medium Voltage (MV) consumers, Nu 4.85 per unit for Low Voltage (LV) consumers and Nu 0.23 per unit as Wheeling Charges for the tariff period 2022-2025.

## 10. Extension of Construction License of PHPA-II, THyE and KHEL

The Punatsangchu Hydroelectric Project Authority-II (PHPA-II), Tangsibji Hydro Energy Limited (THyE) and Kholongchu Hydro Energy Limited (KHEL) submitted the application requesting for the renewal of their construction license. The three Projects submitted that the delay in the construction in the Project were mainly due to geological surprises, change

in laws and force majeure conditions (due to the pandemic). As a part of the assessment, a notification for public and private objection on the renewal was notified in the national newspaper, where no objections were received. BEA also conducted site visits to all three Project sites for verification.

BEA approved the construction license of PHPA-II till 31st March 2024, THyE till 30th June 2023 and KHEL till 30th June 2022.

## 11. Develop Guidelines for License Exemption

BEA developed and approved the Guideline for Exemption of License for Generation of Electricity from Distributed Energy Resources below 500kW with an objective to provide the interested resource developers an opportunity to install and operate renewable energy systems for self-consumption purpose. As per the guideline, the resource developers intending to install and operate the renewable energy system with capacity of 10kW or less are directly exempted from applying for license exemption, while the systems with installed capacity above 10kW and up to 500kW require license exemption certificate from BEA.

## 12. Determine Reliability Indices for Thimphu, Paro and Phuntshogling

BEA determined the System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) for Paro, Thimphu and industrial areas at Pasakha and Kabreytar in Phuntsholing based on the power outage data provided by BPC. The average SAIFI and SAIDI for 2019 and 2020 are as follows.

i) **Paro**: SAIDI is 4.10 hr/customer/year and SAIFI of 7 times/customer/year.
ii) **Thimphu**: SAIDI is 3.55 hr/customer/year and SAIFI of 3 times/customer/year.
iii) **Pasakha, Phuntsholing**: SAIDI is 6.16 hr/customer/year and SAIFI of 4 times/customer/year.
iv) **Kabreytar**, **Phuntsholing**: SAIDI is 27.12 hr/customer/year and SAIFI of 30 times/customer/year.

## 13. Review of Regulatory Fees Regulations 2006

In accordance to Section 13.1 (i) of the Electricity Act of Bhutan 2001, BEA adopted Regulatory Fees Regulation 2006 to collect Annual License Fees to fund the annual activities of BEA and Application Fees to cover the administrative service costs relating to determination of tariff and processing of license applications.

Based on the forecasted annual license fees collection at the existing licensee fee rate and

forecasted expenditure, the study indicated that BEA will have a budget deficit of Nu 11.00 million and Nu 16.00 million during the first two years i.e. in the FY 2022/23 and 2023/24. However, after 2023/24 fiscal year, the forecasted revenue collected at the existing annual license fee rate will be sufficient to meet the forecasted budget requirement. As such, BEA decided that the budget deficit during the year 2022-2023 and 2023-2024 could be met from savings. Thus, the existing Regulatory Fees Regulation 2006 was retained as it is, since the existing annual license fees will able to meet the projected budgetary requirement of BEA after the fiscal year 2024-2025.

## 14. Amend Public Hearing Procedure

To uphold the performance of BEA in a manner that is transparent, fair, reasonable and efficient as mandated by Section 12 of the Electricity Act of Bhutan 2001, BEA developed a Public Hearing Procedure for providing clear procedures in conducting the public hearing to hear all views and opinions of stakeholders for consideration while providing fair decision.

## 15. Technical Audit of Hydropower Plants

The Electricity Act of Bhutan 2001, Section 11.1 (iii) mandates BEA to monitor the performance of Licensees and their compliance with provision of this Act, regulations, standards, codes and licences. Accordingly, during the fiscal year 2021-2022, BEA conducted the technical auditing of 60MW Kurichhu Hydropower Plant (KHP) from 18th to 22nd April 2022 and 336MW Chukha Hydropower Plant (CHP) from 26th to 30th April 2022 of the DGPC mainly in the areas of operation and maintenance and safety aspects based on the provisions of the Grid Code 2008, Safety Regulation 2008, Safety Code 2008, Licence Conditions and other guidelines on power generation plant. The audit also examined the safety procedures followed during operating and maintenance of power plant and submitted the findings to the Authority.

## 16. Customer Awareness on Guaranteed Service Levels and Compensation

In the past years, BEA carried out a study on customer service delivery of BPC which resulted in the need for creation of awareness to the customers on guaranteed service levels. Increasing number of consumers are expecting higher customer service and are more aware of the services provided by the distribution utility. Such initiatives will further drive the distribution utility to improve their service quality. Based on such objective, during this fiscal year, BEA produced an animated video on the guaranteed service levels of BPC specified in the Distribution Code Regulation 2022 and the compensations to be paid to consumers for not meeting the prescribed service levels. The animated video was then aired on national television, Bhutan Broadcasting Service (BBS TV) from 27th December 2021 till 10th January 2022.

## 17. Implementation of Internal House wiring Regulations 2016

In exercise of the power vested by Section 87 of the Electricity Act of Bhutan 2001, BEA developed and issued the Internal House Wiring Regulations 2016 (IHWR 2016) for safe electrical internal house wiring system installation. The section 87 of the Electricity Act states, "*the Authority shall, within twelve months after the commencement of this Act, by statutory instrument, make regulations relating to the generation, transmission, distributions, retail, internal house wiring and utilization of the electricity system.*"

To further enhance the electrical safety of the homes of our people and other inhabiting building structures, BEA carried out study on the relevant rules, regulations, standards and practices of other agencies pertaining to the internal house wiring system. The study identified that a number of stake-holding agencies such as Thromde Offices, Department of Engineering Services (DES) and the Department of Human Settlement (DHS) of the Ministry of Works and Human Settlement (MOWHS), Bhutan Standards Bureau and the Ministry of Labour and Human Resources are involved directly or indirectly in the internal house wiring installation.

The study strongly indicated that strengthening the coordination among these stake-holding agencies is expected to significantly enhance the safety of Internal House Wiring installation to reduce the electrical hazards to our lives and homes.

## 18. Permit to Survey

BEA also issued Permit to Survey to DGPC to carry out Feasibility Study of Phase II Small Hydropower Projects of 85MW Jomori Hydropower Project in Samdrup Jongkhar and renewed the Permit to Survey for carrying out detailed project report of Punatsangchhu-I Hydroelectric Project Barrage/Weir Option.

# ELECTRICITY TARIFF 2022-2025

As per the Section 11 of the Electricity Act of Bhutan, one of the key functions of the BEA is to develop tariff-setting regulation and determine or approve tariffs of the Licensees. Since the prevailing tariffs of DGPC, MHPA, BPC approved in 2019 will be expiring on 30th June 2022, BEA received the generation and end-user tariff revision proposal from these licensees for the tariff period 2022/2023 to 2024/2025 as shown in Table 3.

**Table 3: Proposed DGPC, MHPA and BPC cost of generation and supply**

| Licensees | Proposed Cost of Supply (Nu/kWh) |
|---|---|
| **Druk Green Power Corporation** | |
| i) Generation Cost | 1.54 |
| **Mangdechhu Hydroelectric Project Authority** | |
| i) Generation Cost | 3.85 |
| **Bhutan Power Corporation** | |
| i) High Voltage (HV) | 2.62 |
| ii) Medium Voltage (MV) | 5.48 |
| iii) Low Voltage (LV) | 4.98 |
| iv) Export Wheeling | 0.25 |

The BEA based on the comprehensive review of the tariff revision proposal and taking into consideration the comments received from the electricity customers and licensees during the public hearing held on **3rd May 2022** and through written comments received thereafter, determined the DGPC tariff of Nu. 1.34 per kWh and MHPA tariff of Nu.3.64 per kWh and HV, MV, LV and Wheeling cost of supply as shown in Table 4 below:

**Table 4: Approved average generation cost and BPC's cost of supply**

| Customer group | Average Generation Cost (Nu/kWh) | BPC Cost (Nu/kWh) | Total Cost of Supply (Nu/kWh) |
|---|---|---|---|
| High Voltage (HV) | 1.60 | 0.69 | 2.29 |
| Medium Voltage (MV) | 1.60 | 2.11 | 3.71 |
| Low Voltage (LV) | 1.60 | 3.25 | 4.85 |
| Export Wheeling | - | 0.23 | 0.23 |

Subsequently, with the approval of the subsidy allocation and directives for application

of uniform tariff of Nu. 2.66/kWh from the Royal Government on 22nd August 2022, BEA approved the electricity tariff for the period 1st September 2022 to 30th June 2025 as shown in Table 5 below.

**Table 5: Approved BPC Tariff Schedule**

| Tariff structure | Unit | 1st September 2022 to 30th June 2023 | 1st July 2023 to 30th June 2024 | 1st July 2024 to 30th June 2025 |
|---|---|---|---|---|
| ***Low Voltage (LV)*** | | | | |
| **LV Block I(Rural) 0-100 kWh** | Nu./kWh | 0 | 0 | 0 |
| **LV Block I (High landers) 0-200 kWh** | Nu./kWh | 0 | 0 | 0 |
| **LV Block I(Others) 0-100 kWh** | Nu./kWh | 1.28 | 1.28 | 1.28 |
| **LV Block II(All) >100 kWh** | Nu./kWh | 2.66 | 2.66 | 2.66 |
| ***Medium Voltage (MV)*** | | | | |
| **Energy Charge** | Nu./kWh | 1.60 | 1.60 | 1.60 |
| **Demand Charge** | Nu./kVA/ Month | 170 | 170 | 170 |
| ***High Voltage (HV)*** | | | | |
| **Energy Charge** | Nu./kWh | 1.60 | 1.60 | 1.60 |
| **Demand Charge** | Nu./kVA/ Month | 496 | 496 | 496 |
| **Wheeling** | Nu/kWh | 0.23 | 0.23 | 0.23 |

Based on the subsidy approved by the RGOB, the per unit subsidy to LV customers is as shown in Table 6 below.

**Table 6 : Per unit Subsidy to LV customers**

| Customer Category | RGoB subsidy per unit (Nu.) | | |
|---|---|---|---|
| | 1st September 2022 to 30th June 2023 | 1st July 2023 to 30th June 2024 | 1st July 2024 to 30th June 2025 |
| Low Voltage | | | |
| LV Block I (Rural) | | | |
| 0-100 kWh | 2.66 | 2.66 | 2.66 |
| LV Block I (High landers) 0-200 kWh | 2.66 | 2.66 | 2.66 |
| LV Block I (Others) | | | |
| 0-100 kWh | 1.38 | 1.38 | 1.38 |

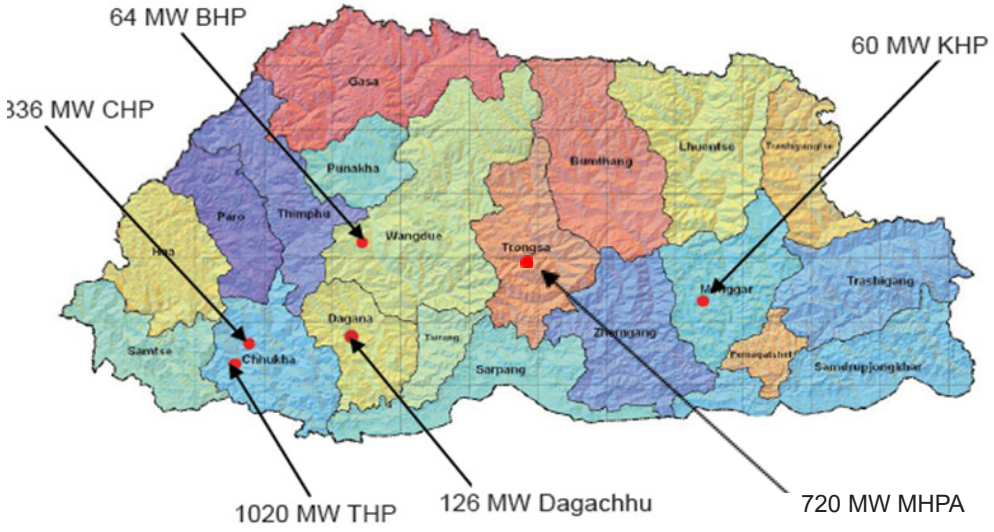
# LICENSED HYDROPOWER PLANTS IN OPERATION

The following hydropower plants are licensed by BEA to generate, supply, import, and export electrical energy:

**Table 7: Existing Hydropower Plants**

| SL. | Name of Plant | Year of Operation | Date of License | Validity of License |
|---|---|---|---|---|
| 1 | Chukha Hydropower Plant (CHP) | 1998 | Jan 1, 2009 | March 27, 2037 |
| 2 | Kurichu Hydropower Plant (KHP) | 2002 | Jan 1, 2009 | March 27, 2037 |
| 3 | Basochu Hydropower Plant (BHP) | 2005 | Jan 1, 2009 | March 27, 2037 |
| 4 | Tala Hydropower Plant (THP) | 2007 | April 1, 2009 | March 31, 2039 |
| 5 | Dagachhu Hydropower Plant | 2015 | Feb 20, 2015 | Feb 19, 2045 |
| 6 | Mangdechu Hydropower Plant | 2019 | Mar 8, 2019 | Mar 7, 2049 |

**Licensed Hydro-Power projects in Operation**

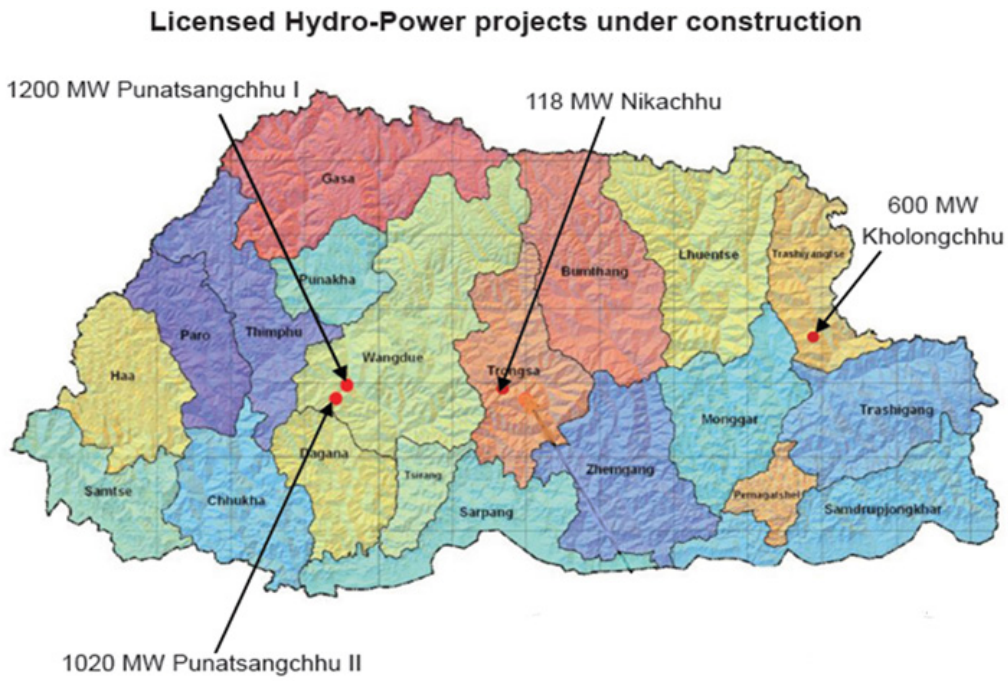


# LICENSED HYDROPOWER PROJECTS UNDER CONSTRUCTION

The BEA issued a construction license to the following hydropower plants in accordance with the provision of the Electricity Act of Bhutan 2001.

**Table 8 : Hydropower Projects under construction**

| SL. No | Name of Plant | Date of License | Validity of License |
|---|---|---|---|
| 1 | Punatsangchhu-I Hydropower Project | Nov 11, 2008 | Mar 31, 2023 |
| 2 | Punatsangchhu-II Hydropower Project | Feb 9, 2012 | Mar 31, 2024 |
| 3 | Nikachhu Hyropower Project | Nov 19, 2014 | June 30, 2023 |
| 4 | Kholongchhu Hydropower Project | July 14, 2015 | June 30, 2022 |

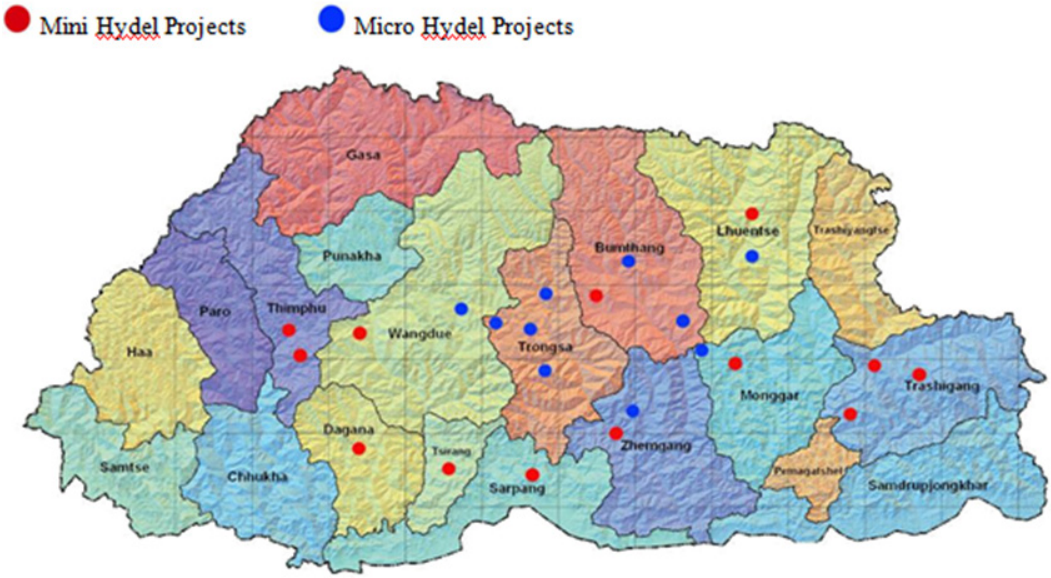


# LICENSED EMBEDDED GENERATION

BPC handed over 17 mini/micro hydropower plants, 180 kW solar power plant and 600 kW wind power plant to DGPC in June 2022. Subsequently BEA issued license on July 1, 2022 to DGPC for the operation of the following embedded generation plants.

**Table 8 : Embedded generation projects**

| Sl. No. | Dzongkhag | Plant Name | Installed Capacity(kW) | Year |
|---|---|---|---|---|
| 1 | Thimphu | Thimphu Mini Hydropower Plant | 360 | 1967 |
| 2 | Wangdue Phodrang | Hesothangkha Mini Hydropower Plant | 300 | 1972 |
| 3 | Trashigang | Chenary Mini Hydropower Plant | 750 | 1972 |
| 4 | Thimphu | Gidakom Mini Hydropower Plant | 1250 | 1973 |
| 5 | Mongar | Khalanzi Mini Hydropower Plant | 390 | 1976 |
| 6 | Bumthang | Chumey Mini Hydropower Plant | 1500 | 1988 |
| 7 | Trashigang | Rangjung Mini Hydropower Plant | 2200 | 1996 |
| 8 | Wangdue Phodrang | Rukubji Micro Hydropower Plant | 40 | 1986-1987 |
| 9 | Bumthang | Ura Micro Hydropower Plant | 50 | 1986-1987 |
| 10 | Trongsa | Tangsibji Micro Hydropower Plant | 30 | 1986-1987 |
| 11 | Sarpang | Surrey Micro Hydropower Plant | 70 | 1986-1987 |
| 12 | Bumthang | Tamzhing Micro Hydropower Plant | 30 | 1986-1987 |
| 13 | Zhemgang | Kekhar Micro Hydropower Plant | 20 | 1986-1987 |
| 14 | Trongsa | Sherubling Micro Hydropower Plant | 50 | 1986-1987 |
| 15 | Thimphu | Thinleygang Micro Hydropower Plant | 30 | 1987 |
| 16 | Thimphu | Bubja Micro Hydropower Plant | 30 | 1987 |
| 17 | Thimphu | CMTD Begana Micro Hydropower Plant | | 1987 |
| 18 | Tsirang | Chanchey Mini Hydropower Plant | 200 | 1991 |
| 19 | Dagana | Darachhu Mini Hydropower Plant | 200 | 1992 |
| 20 | Zhemgang | Tingtibi Mini Hydropower Plant | 200 | 1992 |
| 21 | Lhuntse | Gangzur Mini Hydropower Plant | 120 | 2000 |
| 22 | Lhuntse | Rongchu Mini Hydropower Plant | 200 | 2001 |
| 23 | Trongsa | Chendebji Micro Hydropower Plant | 70 | 2005 |
| 24 | Wangdue Phodrang | Rubesa Wind Power Plant | 600 | 2014 |
| 25 | Wangdue Phodrang | Rubesa Solar Power Plant | 180 | 2021 |




# LICENSED TRANSMISSION AND DISTRIBUTION NETWORK

The transmission capacity of the Transmission substation and total transmission line length (66kV and above) from 2018 till 2021 are shown in table below.

**Table 8: Transmission line**

| Transmission System | | | | | |
|---|---|---|---|---|---|
| | **Units** | **2018** | **2019** | **2020** | **2021** |
| Transformation Capacity | MVA | 1563.5 | 1675.5 | 1675.5 | 1900 |
| Total Line Length (400kV) | km | 74.14 | 500.85 | 500.85 | 500.85 |
| Total Line Length (220kV) | | 325.04 | 325.54 | 325.54 | 325.54 |
| Total Line Length (132kV) | | 366.44 | 471.97 | 473.86 | 473.86 |
| Total Line Length (66kV) | | 353.99 | 408.17 | 408.17 | 408.17 |

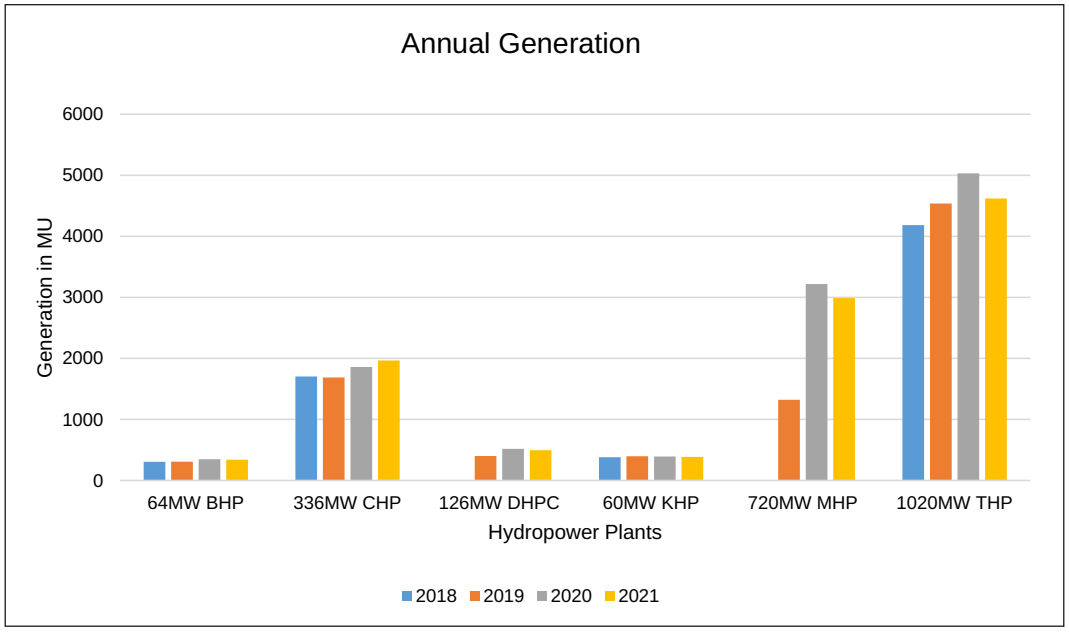
The distribution capacity of the distribution substation and total distribution line length of medium voltage (33kV), total line length of low voltage (11kV) from 2018 till 2021 are shown in table below.

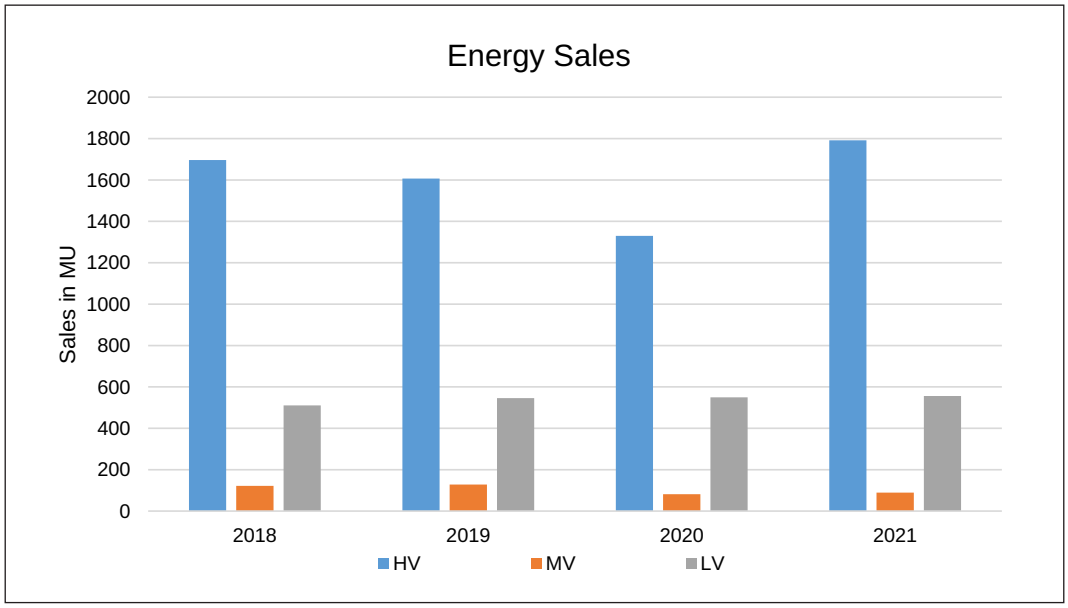
**Table 9: Distribution line**

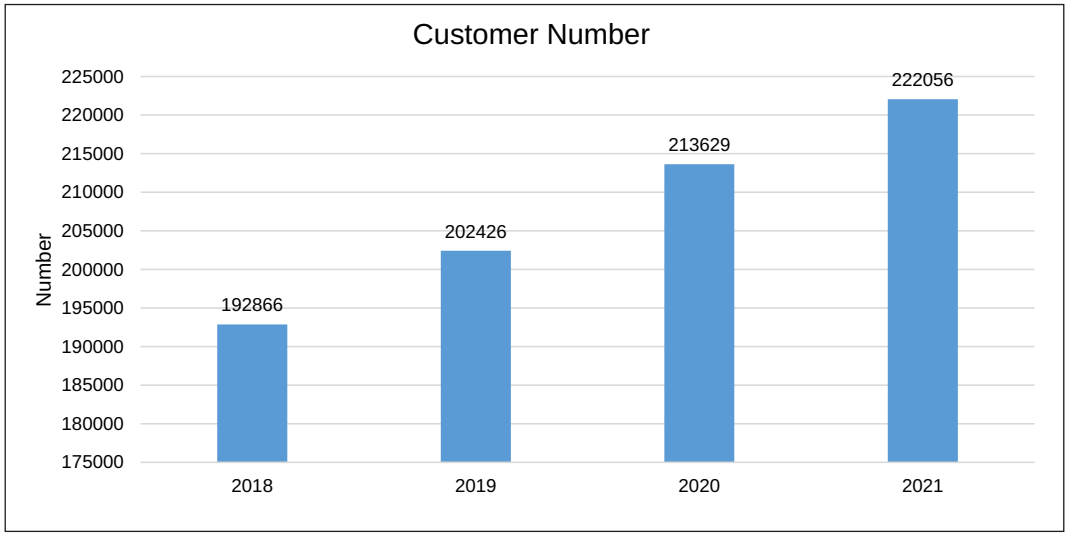
| Distribution System | | | | | |
|---|---|---|---|---|---|
| | **Units** | **2018** | **2019** | **2020** | **2021** |
| Transformation Capacity | MVA | 879.6 | 878.9 | 908 | 959.2 |
| OH Line Length (33kV) | km | 3,834.55 | 3,847.20 | 4,035.99 | 4134 |
| OH Line Length (11kV) | | 2,719.85 | 2,631.28 | 2,502.80 | 2551.3 |
| UG Line Length (33kV) | | 13.24 | 12.56 | 14.58 | 14.58 |
| UG Line Length (11kV) | | 106.16 | 114.34 | 134.02 | 135.15 |

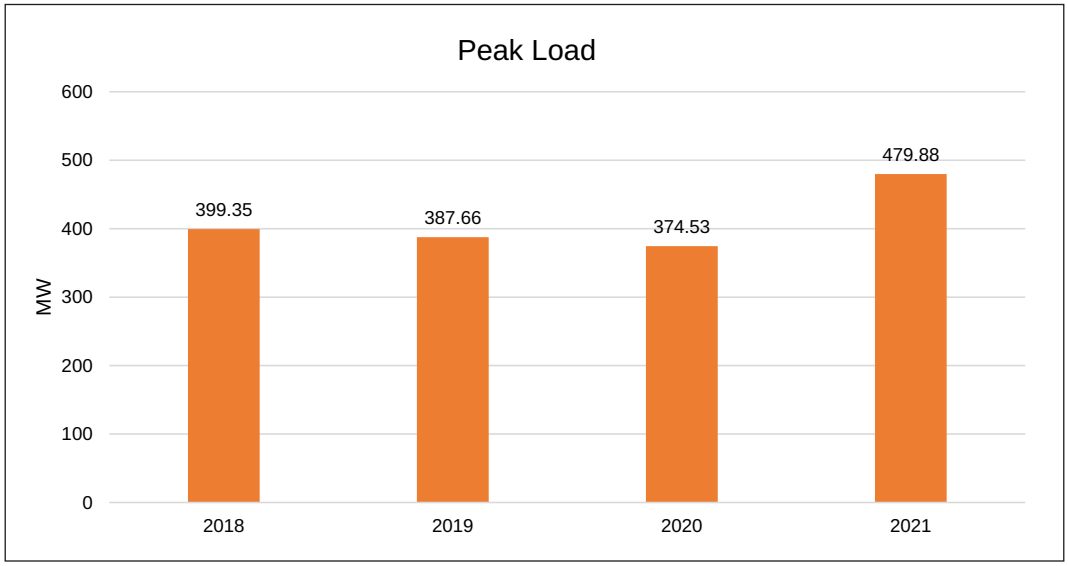
# POWER SECTOR PERFORMANCE

The following information provides performance of the power sector




Energy Sales
Sales in MU
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2018
2019
2020
2021
HV
MV
LV


Customer Number
Number
225000
220000
215000
210000
205000
200000
195000
190000
185000
180000
175000
192866
202426
213629
222056
2018
2019
2020
2021


Peak Load
600
500
400
300
200
100
0
MW
399.35
387.66
374.53
479.88
2018
2019
2020
2021