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Bhutan Electricity Authority

Royal Government of Bhutan

Thimphu : Bhutan

ANNUAL REPORT 2019-2020

FROM THE CEO'S DESK

It is an honor for me to present the 15th Annual Report of the Bhutan Electricity Authority for the fiscal year 2019-2020. I am very pleased to report here that BEA has been able to carry out many of the activities despite the Covid-19 pandemic.

As per the Section 11.1(b) of Electricity Act of Bhutan 2001, the terms and conditions for investment contribution from customers for provision of access to the Transmission and Distribution networks is supposed to be regulated by the BEA. Therefore, a study on investment contribution from electricity consumers was carried out with an objective to review the current investment contribution practices in light of the challenges faced by the Licensees and concerns of the consumers and developed mechanism which is transparent and fair to both the consumers and Licensees.

BEA also approved the BPC's miscellaneous charges after carrying out extensive review that included the field visits to the Electricity Services Division offices of BPC, consumer premises and the stakeholder consultations.

During the year, BEA initiated the review of the Grid Code Regulation 2008 for first time in the last ten years with the objective to enhance the domestic power grid discipline mechanism, considering that Bhutan will be heavily integrated for cross-border trade of electricity (CBET) with the

completion of upcoming mega-hydropower projects in few years from now. The review is expected to provide clear and distinct direction for advancing of domestic power grid management and in evolution of power markets in the near future.

BEA also amended some of the provisions of the Distribution Code 2008 with view to streamline the power reliability standards. This amendment is expected to contribute in enhancement of power reliability of our distribution system over the course of the time.

The year witnessed the development and publishing of the electricity Tariff Review Reports for the tariff period 2019-2022. The Tariff Review Report contains all the details on the tariff applications submitted by the Licensees to BEA, the stakeholders' comments and feedback, and the decision of BEA with the corresponding reasons. The new electricity tariff for the Druk Green Power Corporation Limited and the Bhutan Power Corporation Limited were approved with effect from 1st October 2019 by BEA.

During the fiscal year 2018-2019, the BEA Secretariat carried out Training Need Analysis by engaging a consultant from the Royal Institute of Management. One of the findings of the report was the need to develop a job description of each position in all the divisions of the BEA Secretariat. Therefore,

job description of every level of position was developed during this fiscal year.

Since the grant of full autonomy in January 2010, BEA has been carrying out its regulatory activities such as the licensing, electricity tariff determination, and monitoring of licensees' compliances. However, with the changing times and power sector reforms and owing to the growing complexities, BEA Secretariat developed a roadmap for the next ten years (2020-2030). This document is expected to provide direction for the next one decade for BEA to implement its Annual Operational Plan by aligning its goals with prevailing national priorities.

I would like to conclude by taking this opportunity to extend my sincere gratitude to His Excellency Tengye Lyonpo and Authority Members for providing all the advice, support and guidance and would like to also express my sincere appreciation to the licensees and stakeholders for extending their untiring support and cooperation to BEA in the past one year.

TashiDelek.



(Samdrup K Thinley)
Chief Executive Officer

TABLE OF CONTENTS

1. THE AUTHORITY	1
2. ROLE of BEA	2
3. THE SECRETARIAT	3
4. REVENUE AND EXPENDITURE	4
5. HUMAN RESOURCE DEVELOPMENT	6
6. ACHIEVEMENTS OF THE YEAR	7
6.1 Ten-Year (2020-2030) Roadmap for BEA	7
6.2 Amend Guidelines for Fines 2011	7
6.3 Pilot study on machine downtime of Tala hydropower plant	8
6.4 Develop survey questionnaire to study efficacy of safety awareness program	8
6.5 Study BPC Customer Service Delivery level	9
6.6 Electrical Safety awareness program in Central Schools	9
6.7 Review Grid Code Regulation 2008	11
6.8 Amendment of Distribution Code 2008	11
6.9 Archive planned against actual construction schedule of Hydropower Projects	13
6.10 Extended Construction License of 132kv Transmission Line of THYE	14
6.11 Issued permit to survey to DGPC	14
6.12 Approved O&M of Distribution System by THyE	14
6.13 Publish DGPC, MPHA & BPC Tariff Review Report 2019-2022	14
6.14 Approval of the BPC Miscellaneous Charges for all Customer Categories	15
6.15 Review investment contribution mechanism from customers for T&D assets	16
6.16 Publish Annual Report	16
6.17 Audit books of accounts of BEA for the 2 fiscal years	16
6.18 Develop Job Description for BEA Secretariat employees	17
6.19 Develop BEA Procurement Manual	17
7. OPERATIONAL PLAN FOR THE FISCAL YEAR 2020-2021	18
7.1 Develop of BPSO Fees and Charges Regulation	18
7.2 Develop Guidelines for Determination of Regulatory Asset Base	18
7.3 Determination of the Regulatory Asset Base of Licensees	19
7.4 Review of Safety Code 2008	19
7.5 Review Compensation Rates of Distribution Code 2008	19

7.6 Develop Regulation to Integrate RE Sources to the Power System	20
7.7 Monitoring of Distribution System of BPC	20
7.8 Monitoring of Customer Service Delivery	21
7.9 Draft Tariff Determination Regulation for RE Resources	21
8. LICENSED HYDRO POWER PLANTS IN OPERATION	22
9. LICENSED HYDROPOWER PROJECTS UNDER CONSTRUCTION	23
10. SMALL AND MICRO HYDROPOWER AND WIND POWER PLANTS	24
11. SAFETY INCIDENT CASES	25
12. TARIFF FOR THE PERIOD JANUARY 2020 – JUNE 2022	26
13. GALLERY OF EVENTS	28

1. THE AUTHORITY

2.1 CURRENT MEMBERS



Dasho Yeshi Wangdi (Chairman)
Secretary (Former)
Ministry of Economic Affairs
(From December 2019)



Dasho Ugen Tshechup Dorji
(Members)
Vice Chairman,
Singye Group of Companies,
Thimphu



Mr. Ugyen (Member)
Chief Engineer
Department of Hydropower and
Power Systems
MoEA (from December 2019)



Mr. Sonam Penjor (Member)
The Chief, Fiscal Policy Division,
Department of Macroeconomic
Affairs,
MoF (from January 2020)



Mr. Tashi Gyalpo (Member)
Attorney-At-Law
Bhutan Legal Eagles, Thimphu



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

2.2 ERSTWHILE MEMBERS



Mr. Sonam Tenzin (Chairman)
Director General
Department of Trade
Ministry of Economic Affairs
(Till December 2019)



Mr. Mewang Gyeltshen (Member)
Director
Department of Renewable Energy
Ministry of Economic Affairs
(Till September 2019)



Mr. Norbu Dendup (Member)
Chief
(I&CG Division)
Ministry of Finance
(Till December 2019)

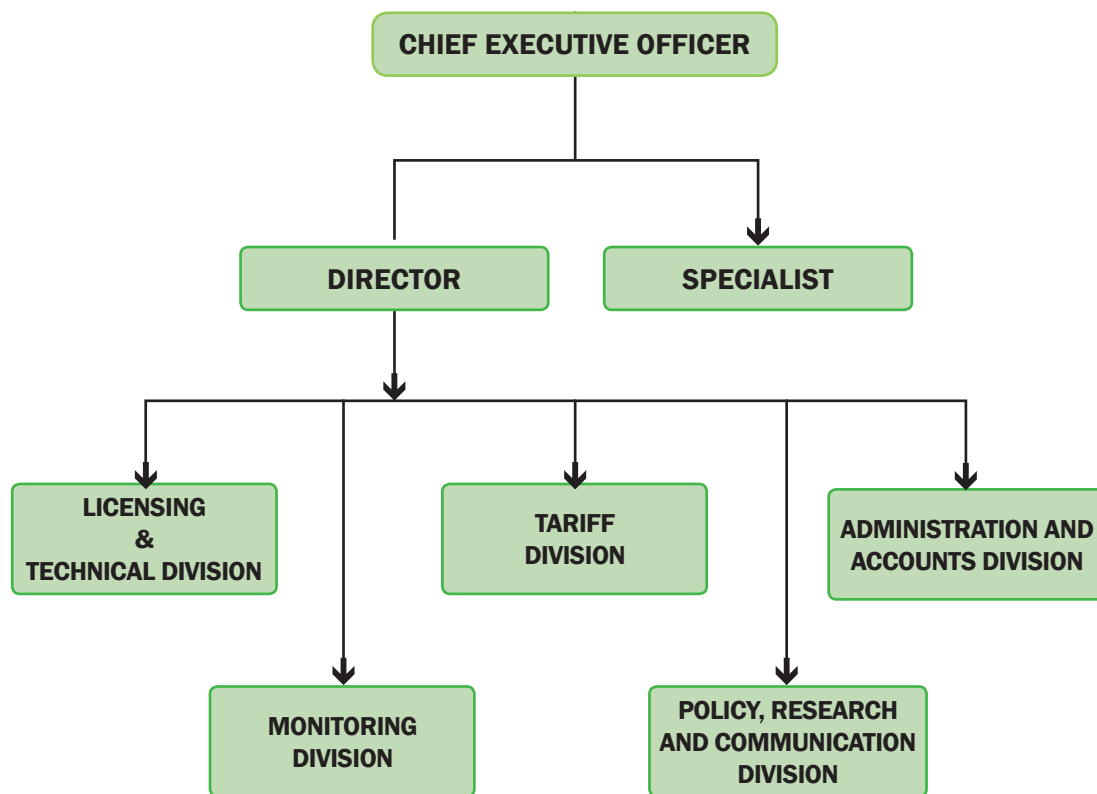
2. ROLE OF BEA

The main functions of BEA are:

- i) To develop regulations, standards, codes, principles and procedures, which include, but are not limited to the following:
- ii) To process applications and issue, modify and revoke licenses for generation, transmission, system operation, export, import, distribution and sale of electricity;
- iii) To monitor the performance of Licensees and their compliance with provision of this Act, regulations, standards, codes, licenses and contracts approved by the Authority and concession agreements entered into between the Minister and Licensees;
- iv) To determine, or approve tariffs proposed by the Licensees, and review existing tariffs;
- v) To prescribe and collect fees, charges or royalties from Licensees;
- vi) To impose any fines, sanctions or penalties for any breach of provisions of this Act, regulations, standards, codes, licenses or contracts to be approved by the Authority, and concession agreements entered into between Licensees and the Government;
- vii) To establish 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, contracts approved by the Authority and concession agreements entered into between the Minister and Licensees, or otherwise any other arrangement for settlement of disputes which are not determined by the mentioned legal instruments; and
- viii) Any other duties or responsibilities delegated by the Minister.

3. THE SECRETARIAT

The Secretariat is headed by Chief Executive Officer (CEO) who is also the Member Secretary of the Bhutan Electricity Authority. The CEO and the Director are recruited on contract basis for a period of 5 years while rest of the employees are the regular staff. There are five Divisions in the Secretariat responsible for licensing, monitoring, tariff setting, policy research and general administration.



The current staff strength of the Secretariat is thirty six (36). Following are the employee profile grouped under the field of different profession.

Category	Master	Bachelor	Up to High School
Management	3	--	--
Electrical Engineering	4	9	--
Civil Engineering	--	2	--
Law	--	1	--
General	3	6	8

4. REVENUE AND EXPENDITURE

4.1 REVENUE

Sources of Revenue	Million Ngultrum
Annual License Fees	
Druk Green Power Corporation Ltd	14.800
Bhutan Power Corporation Ltd	18.310
Dagachhu Hydro Power Corporation Ltd	1.260
Mangdechhu Hydroelectric Project Authority (MHPA)	7.200
Other Fees and charges	
MHPA Tariff Determination Fees	1.800
Interest from Investment	1.802
TOTAL	45.172

4.2 APPROVED BUDGET vs EXPENDITURE

Object Code	Particulars	Budget (Nu. Mn)	Expenses (Nu. Mn)
CAPITAL EXPENDITURE			
45.01	Training – Human Resource Development	2.100	0.902
53.01	Purchase of vehicle	5.000	4.934
54.01	Furniture	0.310	0.293
54.02	Office Equipment	0.984	0.832
54.03	Computer & Peripherals	0.630	0.464
55.01	Professional Services	2.850	0.676
TOTAL (CAPITAL)		11.874	8.101

Object Code	Particulars	Budget (Nu. Mn)	Expenses (Nu. Mn)
CURRENT EXPENDITURE			
1.01	Pay & Allowance	19.400	18.282
11.01	Travel : In-Country	2.090	1.671
11.02	Travel : Out-Country	3.300	1.559
12.01	Utilities: Telephone, Fax, E-Mail, Internet	1.100	0.689
12.02	Utilities: Transmission, Postage	0.020	0.005
12.03	Utilities: Electricity/Water/Sewerage charges	0.120	0.081
13.01	Rental Building	1.300	1.199
14.01	Office Supplies, Printing, Publications	0.890	0.884
14.06	S&M - Uniforms, linens, extension kits etc.	0.150	0.030
14.08	S&M - Others (Newspaper, Magazine)	0.080	0.021
15.01	Maintenance of Property-Building	0.300	0.021
15.02	Maintenance of Property - Vehicle	0.800	0.735
15.05	Maintenance of Property - Equipment	0.100	0.032
15.07	Maintenance of Property - Computers	0.150	0.142
17.01	Op. Exp - Advertisement	0.600	0.303
17.02	Op. Exp -Taxes, Duties, Royalties, Handling/Bank charges	0.010	0.005
17.08	Op.Exp: In - Country Meetings	3.100	1.766
18.01	Hospitality & Entertainment	0.100	0.077
24.01	Subscription to International organization (SAFIR & ERRA)	0.650	0.276
24.03	Contribution – Provident Fund	2.010	1.677
25.01	Retirement Benefits	1.000	0.788
TOTAL(CURRENT)		37.270	30.246
GRAND TOTAL		49.144	38.346

5. HUMAN RESOURCE DEVELOPMENT

Considering the utmost importance for enhancing the HR capacity of the BEA officials, the officials in the year 2019-2020 attended the following programs to learn and exchange and share experiences for efficient and effective management of the regulatory activities.

a) Ex-country

Country	Training/Study tour	Period	Participants
Thailand	Legal Framework Training	14 - 26 Oct 2019	1
Thailand	Environmental Monitoring and Risk Assessment in Renewable Energy Project	27 Feb - 6 Mar 2020	1
Thailand	Finance and Non-Finance Statement	8 -14 Oct 2019	1
Thailand	Negotiation Skills and Leadership	18 - 24 Oct 2019	2
India	SAFIR (18 th Core Course)	20 - 23 Jan 2020	1
Bhutan	Electricity Tariff Setting: A Practical Guide (Online program)	22 Jun -17 Jul 2020	9

b) In-Country

The Five-days training on Human Values was conducted in Phuntsholing by engaging the resource person from Gyalpozhing College of Information Technology (GCIT). The training was aimed to develop and instill holistic approach towards individual's life and professional growth through correct understanding of human reality and existence. Although the core aspiration of all human beings is to be happy, most of us somehow stumble over inapt approaches, drifting from our desired goals. Thus, recognizing a correct path is of utmost importance, which begins with understanding the true self. The training was highly appreciated for its simplicity in contents and practicability in your daily lives.

c) Staff recruitment

During the year the Secretariat recruited one Human Resource Officer, Tariff Officer and a Messenger on account of the vacant post created due to resignation from BEA

6. ACHIEVEMENTS OF THE YEAR

6.1 TEN-YEAR (2020-2030) ROADMAP FOR BEA

The Bhutan Electricity Authority was granted full autonomy from 1st January 2010 and since then, all the Divisions carried out respective operational plans every fiscal year in line with the provisions of the Electricity Act, 2001 for last ten years. Main areas of activities include issuance of license, determination of electricity tariffs and monitoring on electrical safety. While operational plans based on the provisions of the Electricity Act were carried out diligently and professionally, it was felt the importance to take the stock of all past activities and identify further regulatory needs in the future to fulfill mandates of the Electricity Act of Bhutan 2001 and relevant policies of the government. Taking considerations of the evolving national plans and policies, priorities of electricity sector development and need of sound regulatory reforms, the BEA developed the Roadmap for BEA (2020-2030). The Road map is developed to serve as a guide during journey of BEA to achieve targeted milestones in order to enhance the regulatory services through developing in house capacity, sound organization set up and active stakeholder engagements.

6.2 AMEND GUIDELINES FOR FINES 2011

One of the functions of the BEA is to impose fines, sanctions or penalties for any breach of provisions of the Act, regulations, standards, codes, licensees or contracts to be approved by the BEA and concession agreements entered into between Licensees and the Government as per the Section 11.1 vi), Part 2, of the Electricity Act of Bhutan, 2001.

Therefore, the BEA developed the Guidelines for Fines in 2013 to assist in handling cases related to imposition of sanctions - both punitive as well as correctional - for any non-compliance by the Licensees and also assist to assess the extent and degree of seriousness of the violation. The BEA felt the need to review the criteria of the aggravating factors of the guidelines to minimize subjectivity and scope since it is applicable only for electrical safety violations. The following are the amendments made in the Guidelines of Fines:

1) Document renamed as Rules for Fines and Penalty 2020; 2) The scope includes general public; 3) The term seriousness of violation changed to number of violations; 4) The negligent factor removed; 5) Inserted the additional factor 'failure to cooperate and; 6) Under financial capacity, separate fine amount for licensees and general public.

6.3 PILOT STUDY ON MACHINE DOWNTIME OF TALA HYDROPOWER PLANT

The study on Machine Downtime of Tala Hydropower Plant (THP) was conducted to identify and analyze various electromechanical reasons for power plant outages. The exercise was intended to make BEA understand the issues which will facilitate in making appropriate considerations during the investment review for tariff determination.

The BEA collected the data of the recent three (3) years (2016-2018) from the Head Office of Druk Green Power Corporation (DGPC) and during the site visit to THP. The study focused on the forced outages of repetitive nature which have impact to the generation and possibilities of reappearing in future.

The THP experienced a total generation loss of 66.48MU in the past three (3) years (2016-2018) due to the aforementioned outages, translating to revenue loss of Nu. 105.70 Million (66.48MU @ Nu.1.59) at the domestic tariff. It was observed that issue such as the problem with nozzle assembly existed since the commissioning of the power plant. The nozzle problem contributed to 94% of the total energy loss in three (3) years. The DGPC has submitted the investment for purchasing new design nozzle injector assembly including governing system for all units for THP in the current tariff period. The BEA anticipates that such investment will enhance the energy generation of THP.

6.4 DEVELOP SURVEY QUESTIONNAIRE TO STUDY EFFICACY OF SAFETY AWARENESS PROGRAM

The public electrical safety awareness campaigns have been conducted in accordance to the provisions of the Safety Regulation, 2008 of the BEA for past couple of years. The objective was to educate the public on hazards associated with the use of electricity and precautions to be taken to minimize the risks. The public safety awareness programs were carried out mainly through the following medium: i) Presentations in the public gathering; ii) BBS TV; iii) BBS radio in three dialects; iv) Local TV using the local cable operator's services and; v) Circulation of electrical safety brochures/pamphlets.

With a view to assess the effectiveness of such safety awareness program carried out through different medium of communication, it was envisaged to conduct a survey. However, to carry out proper survey it was felt necessary to conduct pilot survey before implementing a full blown survey. Accordingly, in the fiscal year 2019-20, it was proposed to design questionnaires and accordingly carry out pilot testing in one dzongkhag. The full-fledged survey is expected to be carried in the following fiscal years after the successful piloting of the questionnaires.

The questionnaire was designed and tested in Tsirang dzongkhag through random sample selection of sixty five (65) respondents. The data collected was analyzed using the Statistical Package for Social Science (SPSS) software. Subsequently, the questionnaire was revised based on the test and changes incorporated in order enhance clarity of the questions to the public while conducting the full blown survey.

6.5 STUDY BPC CUSTOMER SERVICE DELIVERY LEVEL

The BEA has issued the Distribution Code 2008 that consists of the distribution operating code and guaranteed service level standards. Accordingly, BPC as a Distribution Licensee in the country is mandated to attain the service levels outlined in clause 7 of the Distribution Code 2008 to ensure good customer service delivery. The BEA reviewed the national legal frameworks existing in the country that support the consumers for good quality services. The Secretariat also conducted research on few countries of their practices on the customer service delivery with a view to emulate the best practices.

Taking into consideration the variety of services provided by the BPC, the BEA collected service level data from three Electricity Services Division (ESD) Offices of Haa, Phuentsholing, and Thimphu. The analysis results present a simple overview of the current situation concerning the quality of electricity service standards.

The analysis of the three ESD offices focused on the commercial quality aspect relating to nature and quality of customer services provided to the electricity consumers, such as provisions of a new connection, meter reading, billing, handling of customers' requests and complaints.

6.6 ELECTRICAL SAFETY AWARENESS PROGRAM IN CENTRAL SCHOOLS

The electrical safety awareness program was conducted every year as per the provisions of the Safety Regulation 2008 of BEA with an aim to ensure electrical safety by the Licensees to the customers and public. Upon review of the past electrical accidents that were reported by the Licensee (BPC) to BEA, the numbers of public affected by the electrical incidents were largely due to unawareness of the hazards of electricity.

This fiscal year, it was proposed to conduct a safety awareness campaign targeting the students of four Central Schools. The students have the potential to act as emissaries on electrical safety to their parents and siblings at home and to their communities. Further, in the past there had been several incidences where students were electrocuted due to negligence and carelessness. Therefore, it was deemed necessary to educate the students in Central schools on the hazards associated with daily use of electricity. The Secretariat conducted the awareness programme on the following dates:

Sl. No	Central Schools	Dzongkhag	Program date
1	Bjishong Central School	Gasa	2 September 2019
2	Drukjegang Central School	Dagana	4 September 2019
3	Tshangkha Central School	Trongsa	26 September 2019
4	Buli Central School	Zhemgang	28 September 2019

The programme was attended by students and their teachers. The electrical safety presentation contents included the following types of safety messages:

a) Indoor safety

The participants were presented with important indoor safety messages like not to wrap the damaged plug or cables with plastics, instead repair or replace immediately; not to connect electrical appliances to socket outlet without plug top; not to overload power socket outlet; never to use home-made water heaters instead use proper water heater; never to let the child play with electric cord; not safe to touch the electrical appliances and switches with wet hands; never to insert any conducting materials into power socket; never bypass the MCB; never hang stones to retain the MCB to ON position if MCB is not working; use proper fuse wire while using cutout fuses; fire caused due to short circuit should be extinguished by using fire extinguisher or sand, not with water; the internal house wiring should be done by qualified or trained person and inspected by competent person.

b) Outdoor safety

The outdoor safety included safety from hazards of overhead line, electrical poles, fallen power lines, power house and switchyard. The participants were conveyed with safety messages like to watch out for overhead lines or any electrical infrastructures while carrying or using ladders, playing kites, cutting trees, climbing trees, planting trees, and parking vehicles; never to construct any structure below or too close to the power lines; and to inform Bhutan Power Corporation Limited immediately if any fallen power line is seen.

c) Safety from lightning

Safety from lightning included messages like not to stay in water, under tall objects such as trees, power lines, telephone lines during lightning and not to use radio, television, and so on for lightning can destroy them.

While the Secretariat expects the reported number of incidences from the schools/villages to be decreasing after the awareness programme, the Secretariat still needs to reach out to those vulnerable people using electricity in far flung areas. This programme, in addition, creates awareness of the existence of BEA Secretariat to the public and the important role the public can play on the feedbacks of the services provided by the electricity supplier. The Secretariat will explore avenues to have such similar programmes for the public and employee of BPC in the future.

6.7 REVIEW GRID CODE REGULATION 2008

The review of Grid Code Regulation 2008 was conducted for necessary amendments to address the challenges for implementation of cross-border trade of electricity (CBET) and subjection of upcoming hydropower plants to India's deviation settlement mechanism. Review study was also conducted by keeping in mind the advanced level of grid operation and management achieved by India through adoption of power trading market and deviation settlement mechanism (DSM).

During the review it was noted that grid code has few provisions, which could facilitate CBET such as BEA's role in licensing the utilities, transmission and distribution licensee's obligation in providing non-discriminatory access to power system users through payment of fees and charges, metering and protection requirement, user's adherence to instruction of system operator and transmission licensee, and scheduling the dispatch and drawl of electricity. However, for efficient operation and management of electricity trade numerous regulations such as sharing of transmission charges and losses, open access transmission connectivity, deviation settlement mechanism, power exchange, congestion management, system operation fees and charges, reserve ancillary services etc. have to be included. Also, the review study indicated that a proper mechanism of disciplining our electricity grid to achieve accurate scheduling for exporting surplus electricity to India is important.

6.8 AMENDMENT OF DISTRIBUTION CODE 2008

The BEA Secretariat undertook activity on amendment of Distribution Code 2008 mainly to streamline the reliability indices calculation process and outage reporting procedures. The amendment of the Distribution Code also incorporated few provisions proposed for amendment by Bhutan Power Corporation Limited couple of years ago. As part of amendment, the BEA Secretariat streamlined the criteria and procedures for determination of reliability indices by the BPC, and substantially reduced the time period for providing electricity to the new customers. Also, momentary average interruption frequency index (MAIFI) is introduced as a new power reliability index in the amended Distribution Code. The following are the amendments made in the Distribution Code 2008:

- a. Exclude the power interruption due to non-compliance of Distribution Code, health, safety and emergency condition, customer request, illegal supply and non-payment of bills from the calculation of reliability indices in addition to other existing exclusion provisions;

- b. Include the definition of Schedule or Planned Outages and Unplanned Interruption in the Distribution Code under Interpretation and Definitions;
- c. Section 7.10.1 to be modified as *“These Guaranteed Service Levels shall not apply where, in the opinion of the Authority, the Distribution Licensee is prevented from meeting his obligations under these Regulations such as cyclone, earthquake, floods, storms, war, riot, strike, landslides, snow, fire, or any other occurrences which are beyond the control of Distribution Licensee. The Distribution Licensee shall notify the Authority in writing for such occurrences to be relaxed as per section 7.10.2 and should report as per section 9.3.1. This relaxation shall not be excused from failure to maintain the standards of performance under these Regulations where such failure can be attributed to negligence or deficiency or lack of preventive maintenance of the distribution system or failure to take reasonable precaution on the part of the Distribution Licensee.”*;
- d. Include provision on providing annual outage plans and actual outage plans by the Distribution Licensee to the BEA in order to monitor and scrutinize scheduled outages;
- e. Include provision on maintaining all power interruption data for every electricity Distribution Zone;
- f. Include provision for calculation reliability indices under different scenarios such as a) including all types of outages b) excluding the outages permitted by the Distribution Code and c) for only planned/scheduled outages;
- g. Include provision on Distribution Licensee’s responsibility of uploading the outage information on reliability indices on their website and submission of such information to the Authority; and

Distribution Licensee to calculate MAIFI in addition to other existing reliability indices such as SAIDI, SAIFI and CAIDI.

6.9 ARCHIVE PLANNED AGAINST ACTUAL CONSTRUCTION SCHEDULE OF HYDROPOWER PROJECTS

As per the Electricity Act of Bhutan (EAB) 2001, one of the important mandates of BEA is to process issuance of license for activities related to construction, generation, operation and maintenance of electricity infrastructures in Bhutan. Since 2008, BEA had issued numbers of license for construction of hydropower plants and its associated power transmission infrastructures for Punatsangchhu-I, Punatsangchhu-II, Dagachhu, Nikachhu, Mangdechhu, etc. Further, BEA had also extended construction license period for almost all of the Projects due to poor geological conditions and administrative reasons as stated by the Project developers.

While extending the existing construction license period, BEA assess their license application as per Part 3 of the EAB 2001. As part of the assessment process, BEA visited the project sites and gathered as many information as possible from the Project. In the past, the decision for granting or rejecting the extension of license period was completely based on reasons provided by the Project developers. Our experiences indicated that the assessment of applications based on the documents provided by Project developers at that particular instance poses challenges to BEA in understanding and verifying the site situations which resulted in the delay of Project activities. This is because it is only after few months or years from the date of actual remedial measures put in place (pertaining to poor geological conditions, natural calamity or administrative issues) that

the BEA receives the application from Project seeking for extension of the construction period. Also, it is a major hurdle for the BEA in having all the required information related to particular geological (or natural calamity) conditions and its remedial actions in much detail during the license application assessment period. In order to avoid these challenges and to provide fair and justifiable decision for extension, BEA proposed to archive all information related to the ongoing major activities of the Project based on their updated construction schedule provided to BEA from this fiscal year onwards.

Therefore, in the year 2019 to 2020 fiscal year, BEA carried out the archiving of all information on dam construction of PHPA-I, construction progress related to activities of the powerhouse of PHPA-II, and all major activities such as dam, head race tunnel and powerhouse of THyE according to their schedule submitted during the license application for extension of construction period.

6.10 EXTENDED CONSTRUCTION LICENSE OF 132KV TRANSMISSION LINE OF THYE

The THyE, which is a 100% subsidiary company of DGPC, was issued construction license by BEA for four consecutive years in 2014. However, the construction license was extended till December 2021 in 2018. In 2016, BEA issued license to THyE to construct 18.6KM 132kV double circuit (D/C) transmission line from pothead yard of Nikachhu Project to pothead yard of Mangdechhu Hydropower plant till April 15, 2020. However, on April 11, 2020, the BEA received an application from THyE seeking extension of license till December 2020. Upon review of the application by BEA Secretariat, the main reason for the delay in construction of transmission line was due to increase in scope of work owing to requirement of 11 numbers of 220kV towers in place of 132kV towers. The requirements of 220kV towers in place of 132kV towers at 11 different locations were mainly to address technical and site challenges such as long valley crossing and to obtain sufficient ground clearances. The erection of single 220kV type tower at long valley crossings would minimize having to erect multiple 132kV towers otherwise required, which would reduce huge quantities of earth cutting requirements and minimize environmental damages. However, increase in the scope of work for replacing 132kV towers by 220kV towers also resulted in increase of estimated cost from Nu. 234 million (2014 price level) to Nu. 358 million (2019 price level) which is similar to what the BEA has initially estimated in 2016 during license application assessment (i.e. Nu. 356 million at 2018 price level). The increase in the cost is mainly due to cost associated with additional civil works such as excavation, benching, concreting and reinforcement activities. Based on the reasons proposed by THyE, the construction license for construction of 132kV D/C power transmission line was extended till December 2020.

6.11 ISSUED PERMIT TO SURVEY TO DGPC

The BEA Secretariat issued Permit to Survey to Druk Green Power Corporation Limited for conducting detail survey for development of barrage/weir option of the ongoing Punatsangchhu-I hydropower project till May 2021.

6.12 APPROVED O&M OF DISTRIBUTION SYSTEM BY THYE

The BEA Secretariat approved the operation and maintenance of the 33kV electricity distribution system at the ongoing Tangsibji hydropower project construction sites by Tangsibji Hydro Energy Limited.

6.13 PUBLISH DGPC, MPHA & BPC TARIFF REVIEW REPORT 2019-2022

After the approval of the Bhutan Power Corporation Ltd, Druk Green Power Corporation Ltd and Mangdechhu Hydro Power Authority tariffs for tariff period 2019-2022, the BEA published the BPC, DGPC, MPHA tariff review reports 2019-2022 on the BEA website on 18th December 2019. The review reports include details of DGPC, MPHA and BPC proposals, BEA Secretariat review findings, comments received from the stakeholders and rationale behind the final decisions taken by BEA.

6.14 APPROVAL OF THE BPC MISCELLANEOUS CHARGES FOR ALL CUSTOMER CATEGORIES

Bhutan Power Corporation had proposed the revision of the following Miscellaneous Charges to ensure recovery of the cost of services provided by BPC and clarity in the implementation of the charges within all Electricity Services Divisions. The BPC proposed the revision of the following deposits, charges and penalties:

1) Meter Security Deposit; 2) Energy Security Deposit; 3) Meter Testing Charge; 4) Meter Chifting Charge; 5) Meter Replacement charge; 6) Service Cable Charge; 7) Testing of Service Cable not supplied by BPC; 8) Installation and Connection of Meter; 9) Testing of Earthing; 10) Testing of Internal Wiring; 11) Service Cable Connection Charge; 12) Disconnection of Supply due to Default in Payment; 13) Reconnection of Supply that was Disconnected due to Default in Payment; 14) Disconnection of Supply Requested by the Customer other than Emergency; 16) Re-Connection of Supply which was disconnected on Customer's Request other than Emergency; 17) Technical Estimation and Costing charge; 18) Extension of Power Lines including associated works; 19) Electricity Installation Shifting; 20) Capacity Reserve Charge; 21) Default Payment Penalty; 22) Penalty for Theft of Electricity; 23) Penalty for Drawing Power more than the Contracted Demand; 24) Penalty for Dishonored Cheque; 25) Penalty for Illegal Re-connection of Supply Disconnected by BPC; and 26) Penalty for illegally charging of exposed metal parts such as temporary GI fencing and exposing general public, animals and environment to risk of accident and fire by direct tapping of supply or through the meter.

During the fiscal year, the Tariff Division carried out detailed review of the proposed BPC miscellaneous charges, visited the Electricity Services Division offices and consumer premises and carried out stakeholder consultation for the finalization of the review report. The detailed review report was presented in the 90th Commission meeting and the revision of the BPC Misc. Charges was approved by the BEA Commission on 29th May 2020.

6.15 REVIEW INVESTMENT CONTRIBUTION MECHANISM FROM CUSTOMERS FOR T&D ASSETS

As per the Section 11.1(b) of Electricity Act of Bhutan 2001 terms and conditions for investment contribution from customers for provision of access to the Transmission and Distribution networks is supposed to be regulated by the BEA. Therefore, a study on investment contribution from electricity consumers was carried by the Tariff Division as part of the Bhutan Electricity Authority (BEA) Operational Plan 2019-2020. The main objective of the study was to review the current investment contribution practices in light of the challenges faced by the Licensees and concerns of the consumers and recommend an investment contribution mechanism which is transparent and fair to both consumers and Licensees.

As part of the study, BEAS reviewed the Electricity Act of Bhutan (EAB), 2001, Tariff Determination Regulation (TDR) 2016, BPC License Condition 2007, referred to practices in India, Sri Lanka, Norway and Australia and consulted with the relevant stakeholders. The findings of the study were presented to the BEA Commission during the 90th Commission Meeting held on 29th May 2020.

6.16 PUBLISH ANNUAL REPORT

In accordance with section 75 of the Bhutan Electricity Act of Bhutan 2001, BEA has to submit the minister a statement of the activities undertaken in the preceding financial year, within four months after the end of each financial year. Accordingly, the copies distributed to relevant agencies, besides the licensees. Annual Report consisting of various activities of the BEA was published as Annual Report and was submitted to Hon'ble Tengay Lyonpo on 31 October 2019. The Report was distributed to other stakeholders and relevant agencies.

6.17 AUDIT BOOKS OF ACCOUNTS OF BEA FOR THE 2 FISCAL YEARS

The auditing of books of accounts was scheduled from 1st to 19th June 2020, as per the Annual Audit plan of Royal Audit Authority (RAA). However, due to the COVID-19 pandemic situation the entire auditing schedules were suspended starting from March 2020. Nevertheless, based on the verbal request by the audit team leader BEA submitted- through email - the financial statement of 2017-18 on 29th April and the financial statements of 2018-19 on 11th May 2020. On 22nd June 2020 upon normalizing the rule regarding the COVID-19, the accounts division verbally enquired with the RAA team leader regarding the auditing schedule. It was informed that auditing of books of accounts have been rescheduled to next year. It is possible the RAA may audit the books of accounts for the past three years. The revised auditing schedule is yet to be uploaded in RAA's website.

6.18 DEVELOP JOB DESCRIPTION FOR BEA SECRETARIAT EMPLOYEES

During the fiscal year 2018-2019, the BEA Secretariat carried out Training Need Analysis by engaging a consultant from the Royal Institute of Management. One of the findings during the development of TNA was the need to develop a job description of each position in all the divisions of the BEA Secretariat. Therefore, job description of every level of position was developed and submitted to the Commission on May 29, 2020.

6.19 DEVELOP BEA PROCUREMENT MANUAL

The BEA Secretariat has been following the RGOB service rules and procurement manual since BEA became fully autonomous in 2010. In 2014 BEA Secretariat came up with its own BEA Service Rules and Regulation although much of the provisions were borrowed from the BCSR manual. Given the ten (10) years of experience, it is felt necessary to come up with the procurement manual that would be tailored to the growing needs of BEA. Therefore, draft procurement manual for the BEA was developed and submitted to the Commission in December 2019.

7. OPERATIONAL PLAN FOR THE FISCAL YEAR 2020-2021

7.1 DEVELOP OF BPSO FEES AND CHARGES REGULATION

In accordance to Section 39 of the Electricity Act of Bhutan 2001, the Bhutan Electricity Authority (BEA) granted the license to the Bhutan Power Corporation Limited (BPC) to operate as the Power System Operator (SO) of the country effective from 1st July 2014. Accordingly, the Bhutan Power System Operator (BPSO) was established within BPC, entrusting to coordinate and regulate power system operation and outages and manage/monitor export and import of power in an optimal manner for overall reliability and security of the national power system in accordance to the license condition issued by BEA. The license condition issued to BPC for power system operation requires BPC to maintain accounts of the activities of power system operation separately and report to BEA as separate activities. However, during the tariff review 2016 and 2019, BPSO's investments, assets and operation and maintenance expenses were considered within BPC as whole since BPSO is one of the BPC's licensed activities in addition to transmission, distribution, generation and supply activities.

Considering the need to establish an independent system operator in the near future to regulate the power system operation in a fair and transparent manner, the Royal Government is in the process of de-linking the BPSO from the BPC and setting it up as a separate entity to discharge its functions as per the Electricity Act of Bhutan 2001. Therefore, to enable BPSO to function effectively, the BEA will have to develop the regulatory framework to enable BPSO to collect fees and charges from the generation, transmission and distribution licensees and other users of the BPSO services for the purpose of its annual operating expenditure.

Therefore, during the fiscal year BEA will be develop the BPSO Fees and Charges Regulation.

7.2 DEVELOP GUIDELINES FOR DETERMINATION OF REGULATORY ASSET BASE

The current methodology used to determine the electricity tariff is the conventional Rate of Return Regulation (RORR) or cost-plus regulation where overall price levels are adjusted according to the licensee's cost of capital. In order to fairly regulate the addition of the assets to the total cost of capital of the licensees for electricity tariff determination, a guideline is required to determine the Regulatory Asset Base (RAB) of licensees. Otherwise, the electricity tariff might be unfairly revised. Since the RAB of the licensees has a major impact on the tariff, there is a need to establish clear guidelines on the determination of the RAB and scrutinize the Licensees' assets using the guideline thoroughly so that the true and efficient cost of the utility is established while determining the tariff.

7.3 DETERMINATION OF THE REGULATORY ASSET BASE OF LICENSEES

The current generation and end-user tariffs will expire on 30th June 2022 and the Licensees will be submitting their tariff revision proposals to BEA by March 2022 in line with the TDR. BEA will be engaged in the review of (i) the Investment Plan of the BPC, DGPC, MHPA, BPSO from

October 2021; and (ii) the tariff applications and annual revenue requirement of the Licensees from March 2022 onwards.

The review of the Licensees' asset is critical for the determination of the efficient cost of the Licensees. Considering the development of the Guideline for the RAB and the intense schedule in the subsequent years, this fiscal year is most appropriate to determine the RAB of BPC, BPSO, DGPC Plants and MHPA. BEA will conduct desk assessment of assets from Book of account of Licensees and make necessary site visit to verify the assets in line with approved RAB Guidelines.

In the past tariff reviews, substantial amount of time was taken to review and scrutinize the assets of the Licensees. Therefore, this exercise of determining the RAB prior to the actual tariff review will be highly beneficial to expedite the review of the tariffs in 2022.

7.4 REVIEW OF SAFETY CODE 2008

In January 2020, the BPC has requested BEA to advise them on overhead electrical conductor clearance for 400kV transmission line as the existing Safety Code 2008 of BEA has information on conductor clearances only up to 220kV. Therefore, during the fiscal year 2020-2021, BEA will review clause 8.4 of the Safety Regulation 2008 and other overhead electrical conductor clearances aspects and propose for amendment of the Safety Code 2008.

7.5 REVIEW COMPENSATION RATES OF DISTRIBUTION CODE 2008

The Distribution Code 2008 was issued by BEA in the year 2008. As per the Code, BPC is required to render minimum performance standards in relation to the services for new electricity connection, disconnection, reconnection, restoration of electricity supply, and power quality, which, otherwise obligates BPC to pay monetary compensation to the affected customers. However, the current compensation rates developed in 2008 have never been reviewed from the practical aspect of implementation, particularly in terms of the fairness of compensation rates. Therefore, in this fiscal year, BEA will review the compensation rates in the Distribution Code and propose for amendment, if found necessary.

7.6 DEVELOP REGULATION TO INTEGRATE RE SOURCES TO THE POWER SYSTEM

BEA received letter from the Hon'ble Tengye Lyonpo on July 6, 2020 directing BEA to develop regulations related to connectivity and generation dispatch of renewable energy resources to the power system. In this regard, the BEA would like to initiate the development of regulations for integrating and dispatching of the renewable energy sources.

7.7 MONITORING OF DISTRIBUTION SYSTEM OF BPC

Transformers are one of the most critical assets in the power distribution system. Transformer failures can occur due to various causes such as lightning, poor earthing, overloading, oil leakage, deterioration of insulation, inadequate maintenance, winding distortion, and due to failure of accessories such as bushings and so on. This would eventually cause power outages, personal hazards, environmental hazards and also affect power quality.

In the past years, BEA investigated few incidences of distribution transformers breakdown in the ESD offices of BPC as part of safety incident cases. The main cause of the frequent breakdown of transformer were observed to be due to overloading, aging and poor maintenance. The inadequacy in maintenance of distribution transformer and distribution lines as well as overloading and aging of distribution transformer seems to be some of the main reasons of power outages in the distribution system. However, in the past, BEA did not dwell into various aspects of transformer failures and distribution lines outages, while carrying out investigation on electrical safety incidences. Therefore, during the fiscal year 2020-2021, BEA will carry out monitoring of distribution transformers and distribution lines, mainly from the power reliability aspect. This monitoring activity in long run will not only provide reduction in unnecessary power outages but is also expected to reduce the power distribution cost through timely maintenance as well as the number of electrical accidents. However, during the fiscal year, considering the limited number of monitoring engineers, BEA will carry out monitoring of distribution system (transformers and lines) of only two ESD offices of BPC.

7.8 MONITORING OF CUSTOMER SERVICE DELIVERY

BEA has carried out monitoring of compliance on the customer service delivery of BPC during the 2019-2020 fiscal year in the three ESD offices of Thimphu, Phuntsholing and Haa in accordance to clause 7 of the Distribution Code 2008 of BEA and were observed that the records of service delivery were not adequately maintained. While the services provided by the above three ESD offices are largely located in urban areas, in order to understand and verify the services provided in the rural areas, during the current fiscal year, BEA will carry out monitoring of compliance of guaranteed service level of Distribution Code in four ESD offices of Dagana, Pemagatshel, Trashigang, and Samdrupjonkhar. The findings from these four ESD offices of BPC should reveal larger sampling of BPC's extent of compliance to the guaranteed service level of Distribution Code and accordingly recommend required regulatory response. At the same time, BEA will also create awareness in these four ESD offices on the provisions of the Distribution Code 2008, particularly on the guaranteed service level.

7.9 DRAFT TARIFF DETERMINATION REGULATION FOR RENEWAL ENEGRY (RE) RESOURCES

BEA received a letter from Hon'ble Tengye Lyonpo requesting BEA to initiate the development of regulation for determination of domestic tariff for electricity generated from Alternative Renewable Energy (RE) resources in the country vide letter no. MoEA/BEA/2020/284 dated July 6, 2020. The Department of Renewable Energy (DRE), MoEA is likely to develop over the time around four RE projects, namely 30.73 MW Solar Park at Singkhar, 17.38 MW Solar Park at Sephu (Yongtru), 23 MW Wind Farm at Gaselo and 5.25 MW Wind Farm at Rubesa as presented to the Cabinet and the Gross National Happiness (GNH). In this regard, the BEA shall initiate the drafting tariff determination of regulations for renewable energy sources.

8. LICENSED HYDRO POWER PLANTS IN OPERATION

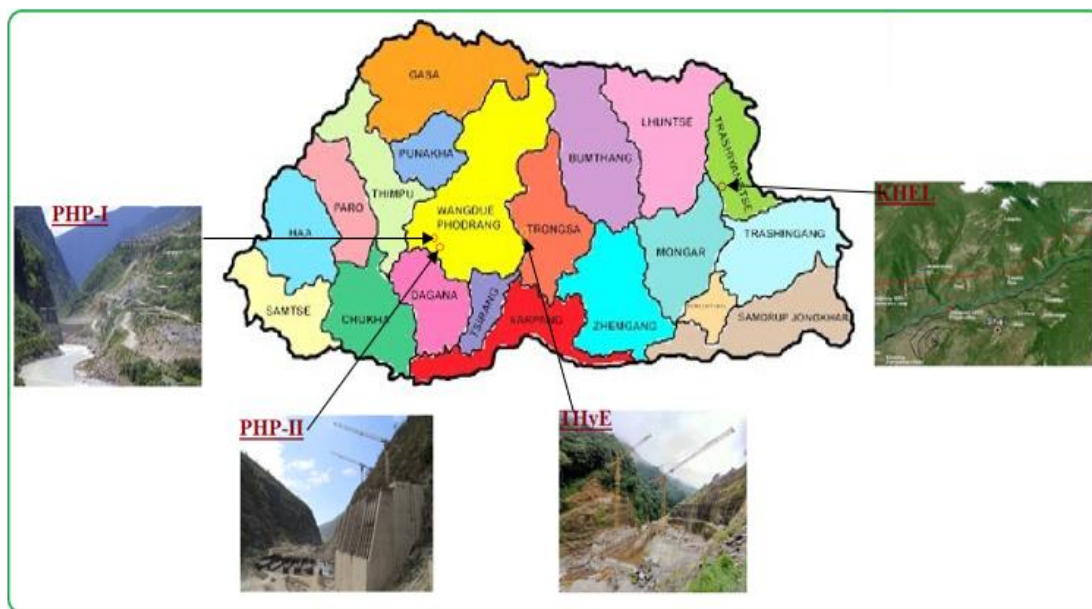
The following hydropower plants are licensed to generate, supply, import and export of electrical energy for thirty (30) years from the date of issues of license.

SL.	Name of Plant	Year of Operation	Date of License	Validity of License
1	Chukha Hydropower Plant (336MW)	1998	1 Jan 2009	Chukha Dzongkhag
2	Kurichu Hydropower Plant (60MW)	2002	1 Jan 2009	Mongar Dzongkhag
3	Basochu Hydropower Plant (64MW)	2005	1 Jan 2009	Wangduephodrang Dzongkhag
4	Tala Hydropower Plant (1020MW)	2007	1 April 2009	Chukha Dzongkhag
5	Dagachhu Hydropower Plant (126MW)	2015	20 Feb 2015	Dagana Dzongkhag
6	Mangdechhu Hydropower Plant (720MW)	2019	8 March 2019	Trongsa Dzongkhag

9. LICENSED HYDROPOWER PROJECTS UNDER CONSTRUCTION

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

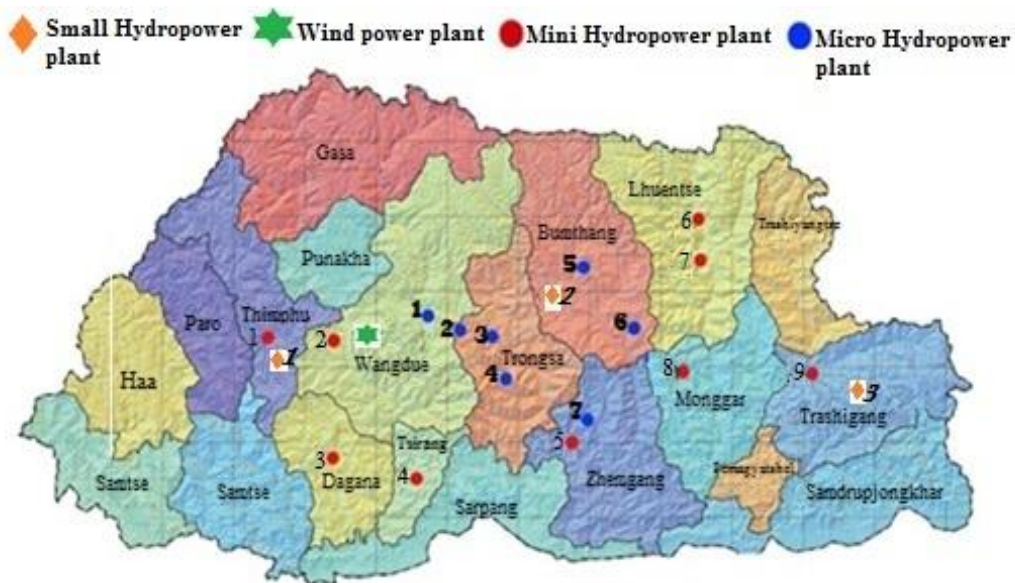
SL.	Name of Plant	Date of License	Validity of License
1	Punatsangchhu-I Hydropower Project (PHP- I) 1020 MW	11 Nov 2008	31 March 2023
2	Punatsangchhu-II Hydropower Project (PHP-II) 1200 MW	9 Feb 2012	31 Dec 2021
3	Tangsibji Hydro Energy Limited Project (THyE)118 MW	19 Nov 2014	31 Dec 2021
4	Kholongchhu Hydro Energy Limited (KHEL) 600MW	14 July 2015	1 Jan 2022



10. SMALL AND MICRO HYDROPOWER AND WIND POWER PLANTS

BPC has three (3) small hydro plant, one (1) wind power plant, nine (9) mini hydels and seven (7) micro-hydropower plants with a total generating capacity of 8.52 MW. These hydro plants are located in the following *Dzongkhags* as shown in the map below:

<p>Small Hydropower plant</p> <p>5X250 kW Gidakom mini hydel 3X500 kW Chumey mini hydel 2X1100 kW Ranjung</p>	<p>Wind power plant</p> <p>12X300 kW wind power plant</p>
<p>Mini Hydropower plant</p> <ol style="list-style-type: none"> 4X90 kW Thimphu mini hydel 3X100 kW Hesothangkha mini hydel 2X100 kW Darachu mini hydel 2X100 kW Changchey mini hydel 2X100 kW Tingtibi mini hydel 2X100 kW Rongchu mini hydel 2X60 kW Gangzur mini hydel 3X130 kW Khanlanzi mini hydel 3X250 kW Chenary mini hydel 	<p>Micro Hydropower plant</p> <ol style="list-style-type: none"> 1X40 kW Rukubji micro hydel 1X30 kW Tangsibji micro hydel 1X50 kW Sherubling micro hydel 1X30 kW Kuengarabten micro hydel 1X30 kW Tamshing micro hydel 1X50 kW Ura Micro hydel 1X20 kW Kelkhar micro hydel



11. SAFETY INCIDENT CASES

The following is the year wise safety incident cases that has occurred to the employees, public and properties.

Fiscal Year	Number of Incidents	Number of Victims				
		Employee		Public		Property
		Fatal	Non-Fatal	Fatal	Non-Fatal	
July 2011-June 2012	5	0	2	2	1	0
July 2012-June 2013	8	0	0	5	1	3
July 2013-June 2014	11	2	1	3	1	2
July 2014-June 2015	11	4	4	5	3	7
July 2015-June 2016	8	1	1	4	0	3
July 2016-June 2017	12	2	0	4	4	7
July 2017-June 2018	7	3	1	5	2	0
July 2018-June 2019	10	0	2	7	1	1
July 2019-June 2020	3	0	0	2	1	0
Total	75	12	11	37	14	23

12. TARIFF FOR THE PERIOD JANUARY 2020 – JUNE 2022

The Bhutan Electricity Authority on 30th June 2019 approved the DGPC generation cost of Nu 1.42 /kWh and MHPA generation cost of Nu 3.77 /kWh. Based on the above generation cost, the unsubsidized BPC cost of supply for the tariff period 2019-2022 are as follows.

S.N	Customer category	BPC cost of supply (Nu/KWh)
1	Low Voltage (LV)	5.06
2	Medium Voltage (MV)	5.15
3	High Voltage (HV)	2.26
4	Wheeling	0.270

The Royal Government of Bhutan has decided to utilize part of the revenue to be earned through the sale of royalty energy to subsidize the LV and MV consumers. The total subsidy allocation was about Nu. 1478.57 million per year

Accordingly, the subsidized tariff LV and MV consumers and unsubsidized HV and Wheeling tariff are as follows.

Customer Category	1/1/2020-30/6/2020	1/7/2020-30/6/2021	1/7/2021-30/6/2022	Annual Subsidy (Nu. Mill)
Low Voltage (LV) Nu/kWh				
LV Block I (Rural) 0-100	0	0	0	462.07
LV Block I (Highlanders) 0-200	0	0	0	4.51
LV Block I (Others) 0-100	1.28	1.28	1.28	229.03
LV Block II (All) 101-500	2.68	2.68	2.68	280.48
LV Block III (All) >500	3.57	3.60	3.64	336.58
LV Bulk	4.06	4.10	4.14	80.88

Customer Category	Unit	1/1/2020-30/6/2020	1/7/2020-30/6/2021	1/72021-30/6/2022	Unsubsidized Tariff (Nu./ kWh)	Avg. Annual Subsidy (Nu. Mill)
Medium Voltage (MV)						
Energy Charge	Nu./kWh	2.24	2.45	2.65	5.15	85.02
Demand Charge	Nu./kVA/month	325	325	325		

Customer Category	Unit	1/1/2020 - 30/6/2020	1/7/2020 - 30/6/2021	1/72021-30/6/2022	Unsubsidized Tariff (Nu./ kWh)
High Voltage (HV)					
Energy Charge	Nu./kWh	1.50	1.50	1.50	2.26
Demand Charge	Nu./kVA/month	292	292	292	
Wheeling Charges	Nu./kWh	0.27	0.27	0.27	0.27

13. GALLERY OF EVENTS



Signing of Compact between Chairman and CEO of Bhutan Electricity Authority





Safety Awareness Program in Drukjegang Central School, Dagana Dzongkhag

SAFETY AWARENESS PROGRAM



*Tshangkha Central School,
Trongsa Dzongkhag*



*Buli Central School,
Zhemgang Dzongkhag*



Training on Human Values conducted by Resource persons from Gyelposhing Information & Technology College (27 Jan – 1 Feb 2020)



Site visit to HV & MV consumers at Pasakha after the human values training on 31 January 2020