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Bhutan Electricity Authority

Royal Government of Bhutan

Thimphu : Bhutan

ANNUAL REPORT 2018-2019

MESSAGE FROM THE CHAIRMAN

It is my humble privilege to present the 14th Annual Report of the Bhutan Electricity Authority for the fiscal year 2018-2019.

Since the establishment of BEA in the year 2006, as a growing organization, the Bhutan Electricity Authority (BEA) has been continuously enhancing in delivering its regulatory services to its stakeholders, particularly the power sector licensees and electricity customers in the country through our various annual operation plans and work targets. As such, once again, I am very pleased to report here few of the BEA's following significant activities carried out during the fiscal year 2018-2019 as a part of our continuous regulatory service delivery.

With much satisfaction and confidence, BEA is pleased to report here that the electricity tariff review for the period 2019 to 2022 has been carried out with one of the highest professionalisms, largely contributed by the growing understanding of our electricity customers and the power sector licensees on the electricity tariff determination aspects. In fact, in its own absolute terms, the electricity tariff determination has always been carried at its best by BEA within the mandates of the Electricity Act 2001 and the Tariff Policy of the Royal Government.

The year also witnessed renewal of the construction license of three hydropower projects – 1200MW Punatsangchu-I Hydropower Projects, 1020MW Punatsangchu-II Hydropower Project, and 118MW Tansibji Hydropower Project. BEA is confident to report here that the level of professional scrutiny on the reasons for delay of these projects while processing the construction license renewal has been at its highest-thanks to our many years of efforts in developing our employees in hydropower knowledge and skills. BEA will continue to contribute in acceleration of these much-delayed hydropower projects that will have larger benefit to our national economy.

As carried out in the past many years, BEA will also continue, rigorously, on electrical safety awareness programs with view to significantly reduce the electrical accidents in our power system. As part of the effort, during the fiscal year 2018-2019, BEA carried out safety awareness program to pub-

lic through TV, radios and convening meeting with the public in different dzongkhags.

As a concluding remark, I would humbly like to assure here that BEA will continuously provide appropriate regulatory response to the changing needs of the electricity business operation within the framework of the prevailing laws of our country.

Finally, I would like to provide my gratitude to Hon'ble Tengye Lyonpo for his support and guidance to BEA and my deep appreciations to the Authority Members, staff of the Secretariat, the Licensees and the stakeholders for extending their continuous support and cooperation to BEA.

Tashi Delek.

(Sonam Tenzin)
Chairman

FROM THE CEO'S DESK

It is an honor for me to present the 14th Annual Report of the Bhutan Electricity Authority (BEA) for the fiscal year 2018-2019.

Year on year, BEA has been able to enhance its regulatory capacity in facilitating the advancement of safe and efficient electricity services in the country through our annual operational targets and work plans. As such, I am pleased to report here that BEA has carried out many important activities during the fiscal year 2018 to 2019.

During the last fiscal year, BEA reviewed the electricity tariff proposals of the Druk Green Power Corporation Limited (DGPC) and the Bhutan Power Corporation Limited (BPC), scrutinizing their investments very judiciously. We are happy to report here that electricity generation tariff of DGPC has been determined at Nu.1.42 per unit compared to the Nu.1.59 per unit of the previous tariff period – thus reducing the electricity generation tariff. BEA will continue to scale up efforts for such rationalization that will be fair to all our stakeholders.

BEA also carried out electricity safety awareness program to the general public as part of its continuous effort to prevent the electrical accidents in our power system. As part of the same effort, BEA conducted electricity safety audits in various district electricity offices of BPC. As such, for breach of electrical safety provisions, BEA imposed fines to licensees during the financial year 2018-2019 with view to deter them from non-compliance.

BEA has been strategically working for the last few years in determining the correct electricity distribution reliability standard. As part of the effort, during the year 2018-2019, BEA issued several directives continuously in proper recording of power reliability. Consequently, last year witnessed best power reliability data. With a view to improve power reliability determination, BEA has planned the amendment of the Distribution Code 2008 for the upcoming

fiscal year. During the year, BEA processed several license renewals with higher professionalism with gain in experience.

All the above activities of BEA could be achieved under the timely guidance and support of His Excellency, Tengye Lyonpo and the Authority Members. We are therefore highly grateful to them. We are also thankful to our Licensees and other government agencies for their continuous co-operation.

Tashi Delek.

(Samdrup K Thinley)
Chief Executive Officer

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1. AUTHORITY

As per Section 8 of the Electricity Act of Bhutan, the Authority should consist of a Chairman, minimum of three members and a Chief Executive Officer as the member secretary. All the Authority Members are appointed by the Hon'ble Minister of Ministry of Economic Affairs in accordance with Section 8.1 of the Electricity Act of Bhutan.

The Authority members are constituted from various organizations of the Royal Government and private sector. Following are the current Members of the Bhutan Electricity Authority.

MR. SONAM TENZIN (CHAIRMAN)

Mr. Sonam Tenzin, Director, Department of Trade, Ministry of Economic Affairs was appointed as the Chairman of Bhutan Electricity Authority on 6th December 2015 for a period of four years.

DASHO UGYEN TSHECHUP DORJI (MEMBER)

Dasho Ugyen Tshechup Dorji, Vice Chairman, Singye Group of companies was appointed as the Member of Bhutan Electricity Authority on 20th May 2016 for a period of four years.

MR. MEWANG GYELTSHEN (MEMBER)

Mr. Mewang Gyeltshen, Director, Department of Renewable Energy, Ministry of Economic Affairs was appointed as the Member of Bhutan Electricity Authority on 6th December 2017 for the period of four years.

MR. TASHI GYALPO (MEMBER)

Mr. Tashi Gyalpo, Attorney-At-Law, Bhutan Legal Eagles, Thimphu, was appointed as Member of Bhutan Electricity Authority on 24th March 2017 for the period of four years. Mr. Tashi Gyalpo also served as the Member of Bhutan Electricity Authority in the past during his tenure with the Office of Attorney General.

MR. NORBU DHENDUP (MEMBER)

Mr. Norbu Dhendup, Chief, I&CG Division, Ministry of Finance, was appointed as Member of Bhutan Electricity Authority on 30th December 2015 for a period of four years.

MR. SAMDRUP K THINLEY (MEMBER SECRETARY)

Mr. Samdrup K Thinley was appointed as the Chief Executive Officer of Bhutan Electricity Authority for a period of five years with effect from 1st September 2017. The Chief Executive Officer is also the ex-officio Member Secretary of the Bhutan Electricity Authority.

2. FUNCTION OF THE AUTHORITY

The Section 11.1 of the Electricity Act of Bhutan mandates the BEA with the following functions:

i) To develop regulations, standards, codes, principles and procedures, which include, but are not limited to the following:

   a) Performance standards, including minimum technical and safety requirements for construction, operation and maintenance of generation, transmission and distribution facilities;
   b) Tariff-setting, including tariffs for generation not regulated by power purchase agreement, transmission, distribution and retail sale. These regulations should also comprise terms and conditions for connection fees and investment contribution from customers, and for 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 and planning executed by the Minister;
   d) Requirements for Licensees' reporting, accounting and issuance of information to the Authority;
   e) System operation, including dispatch of generation; and
   f) Levies, charges or royalties to be paid by Licensees.

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.

As per the section 11.2 of the Electricity Act, the Authority, in the performance of his functions, is required to:

a) Ensure the reliability, quality, security and efficiency of electricity supply;
b) Encourage competition in electricity generation, transmission and supply;
c) Ensure non-discriminatory access to the transmission and distribution system;
d) Ensure a fair balance of the interests of the public, customers and participants in the electricity sector;
e) Facilitate the development of generation, transmission and distribution of electricity throughout the country; and
f) Ensure the protection of the natural resources, the environment and other public interests affected by the development of electricity supply.

3. THE SECRETARIAT

The Secretariat is headed by the Chief Executive Officer (CEO) who is responsible for overall functioning of the Secretariat. BEA has been granted an autonomous status by the Royal Government of Bhutan on 30th November 2009 and accordingly the employees of the Secretariat were delinked from the Civil Service with effective 1st January 2010.

During the 77th Authority Meeting of the BEA held on 30th October 2018, the following Organogram of the Secretariat was approved which is functional today.

3.1 Manpower Strength

The staff strength of BEA prior to becoming a fully autonomy was 14 numbers. Subsequent upon grant of full autonomy the Secretariat started recruiting staff to fill the various post in accordance with the approved staff strength to be able to discharge the roles and responsibilities enshrined in the Electricity Act. The staff number of BEA staff has increased to 37 numbers as of June 2019.

Sl. No.	Division	Number
1	Office of the Chief Executive Officer	3
2	Office of the Director	1
3	Licensing &Technical Division	6
4	Monitoring Division	5
5	Tariff Division	4
6	Policy, Research & Communication Division	6
7	Administration & Accounts Division	12
	Total	**37**

3.2 Human Resource Development

To develop capacity and skills of BEA employees, the employees attended various trainings, conference and study tours. The short-term trainings were mainly focused in the field of (a) economic and finance to understand the electricity tariff determination aspects and financial evaluation of electricity infrastructures; (b) technical regulations to uplift the technical knowledge in the aspect of regulations; and (c) human resource management course.

Country	Training/Conference/Study tour	Period	No. of participants
India	ITEC program on EVH substation	27th Aug – 5th Oct 2018	1
Turkey	17th ERRA Energy Investment and Regulation Conference	8th – 11th Oct 2018	2
Poland	Seminar on Hydro-2018 Conference	15th – 17th Oct 2018	1
Turkey	17th ERRA Energy Investment and Regulation Conference and Chairman's meeting	31st Dec 2018 – 6th Jan 2019	1
Thailand	Seminar on future of work on digital Era	31st Dec 2018 – 6th Jan 2019	1

India	Conference on Hydropower in India- policy, changing role in energy mix and cross border challenges	19th – 20th Jan 2019	1
Vietnam	Study tour to Electricity Regulatory Authority of Vietnam	19th – 22nd Feb 2019	6
Thailand	Study tour to Electricity Regulatory Authority	26th – 27th Feb 19	6
Thailand	Hydrology for development of hydropower	27th Feb 19 – 3rd March 2019	4
India	SAFIR core course	5th – 8th April 2019	1
Skopje	Chairman's meeting among regulators regional association	15th – 16th April 2019	1

3.3 Revenue and Expenditure

As authorized by the Electricity Act of Bhutan, the budget for BEA activities are funded through the collection of annual license fees, tariff review applications fee and hydropower project construction license fee from the licensees.

3.3.1 Revenue

License and other fees collected during two consecutive years of 2017-2018 and 2018-2019 are as follows.

SL No.	Name of company	Particulars of receipt	Financial year (in Ngultrum)	
			2017-18	2018-19
1	Bhutan Power Corporation Limited (BPC)	Annual License fee	16,289,500	16,744,100
2	Druk Green Power Corporation Limited (DGPC)	Annual License fee	14,800,000	14,800,000
3	Dagachhu Hydro Power Corporation Limited (DHPC)	License Application fee for operation of 126 MW	1,260,000	1,260,000
4	Bhutan Power Corporation Limited (BPC)	Tariff Determination Fee	-	11,720,000
5	Druk Green Power Corporation Limited (DGPC)	Tariff Determination Fee	-	3,700,000
6	Department of Revenue & Custom (DRC)	Proceeds from sale of disposable asset	642,200	883,500
7	Financial Institution	Interest from Investments	2,280,000	1,400,000
		Total Amount	**35,271,700**	**50,507,600**

3.3.2 Expenditure

The Hon'ble Tengye Lyonpo, upon recommendation by the Authority, approves the annual budget of the BEA Secretariat in accordance to authority provided to him by the Electricity Act of Bhutan. Following are the expenditures incurred during the last two years.

SL. No.	Object Code	Particulars	Expenditure (Nu. In millions)	
			2017-18	2018-19
1	1.01	Pay & Allowance	13.033	14.000
2	11.01	Travel - In Country	1.212	1.316
3	11.02	Travel- Out Country	2.022	2.330
4	12.01	Utilities: Tel. Fax, Internet	0.400	0.600
5	12.02	Utilities: Telegram, Postage etc.	0.013	0.007
6	12.03	Utilities: Electricity, Water, Sewerage, etc	0.088	0.089
7	13.01	Rental: Building	1.176	1.142
8	14.01	Office Supplies: Stationeries, Printing & Publications	0.811	0.786
9	14.06	S&M: Uniform, extension kits, Linens etc.	0.036	0.038
10	14.08	S&M: Others (News Magazine)	0.015	0.134
11	15.01	MOP: Building	0.029	0.025
12	15.02	MOP: Vehicle	0.763	0.592
13	15.05	MOP: Equipment	0.043	0.041
14	15.07	MOP: Computers	0.026	0.034
15	17.01	Operating Exp-Advertising	0.622	0.547
16	17.02	Taxes, Duties, Royalties, Handling & Bank charges	0.061	0.007
17	17.08	Op. Exp-In - Country Meetings & Celebration	1.112	1.519
18	18.01	Hospitality & Entertainment	0.098	0.099
19	24.01	Subscription to International organization (SAFIR/ERRA)	0.588	0.628
20	24.03	Contribution – Provident Fund	0.987	1.031
21	25.01	Retirement Benefit	0.343	0.132
TOTAL CURRENT EXPENDITURE			**23.478**	**25.097**
1	45.01	Training: HR Development	1.979	1.966
2	53.01	Purchase of Vehicle	-	-
3	54.01	Furniture	0.177	0.139
4	54.02	Office Equipment	0.188	0.090
5	54.03	Computer and Peripherals	0.550	0.483
6	55.01	Professional Services	1.190	0.633
TOTAL CAPITAL EXPENDITURE			**4.084**	**3.311**
TOTAL EXPENDITURE INCURRED			**27.562**	**28.408**
TOTAL APPROVED BUDGET			**31.438**	**38.196**

4. ACHIEVEMENTS AS PER THE OPERATIONAL PLAN

4.1 Processing Hydropower Construction License

4.1.1 Renewal of Construction License of PHPA-II

The Punatsangchu-II Hydroelectric Project Authority (PHPA-II) was issued the License for construction of 1020 MW Punatsangchhu-II Hydropower Plant for the period from February 9, 2012 till February 8, 2019. As the completion of Project within the licensed period was not possible, the PHPA-II was informed in May 16, 2018 to process the renewal of their construction license. Consequently, PHPA-II applied for a construction license renewal on August 2018.

The assessment of the application for renewal of license of PHPA-II revealed the followings as the cause of project delay.

a) The construction of dam was delayed by around 43 months, in total, on encountering adverse geological condition on left bank abutment and the shear zone on dam foundation. The stripping works of left bank dam abutment due to poor geology resulted to more excavation of the overburden and additional strengthening, delaying the dam construction by around 20 months; while the treatment of shear zone on the dam foundation involving excavation of around 54,000 cumecs of mucks from shear-zone area and concreting it back resulted to delay the dam construction works by around 23 months.

b) The construction of headrace tunnel was delayed by around 36 months due to poor geology, largely encountering rock class IV and V (worse than envisaged in detailed project studies).

c) The powerhouse complex construction has been delayed by around 55 months due to massive cavity formation at the crown of downstream

surge gallery by the fallen mass of around 46,000 cumecs in March 2016. The cavity will have to be filled up with concrete mass, while additional strengthening measures are being carried out in the power house cavern, transformer cavern and downstream surge gallery.

The construction progress of dam is reported to be around 74%; headrace tunnel around 90%; and powerhouse around 50% as of December 2018.

Therefore, within the extent of reasonability, the project delay was found acceptable and accordingly, construction license of PHPA-II has been extended till 2021 (as against September 2023 proposed by PHPA-II) in accordance to the provision of the Electricity Act and the Construction License Condition issued to PHPA-II.

4.1.2 Renewal of Construction License of PHPA-I

Punatsangchhu-I Hydroelectric Project Authority (PHPA-I) was issued the license to construct the 1200 MW Punatsangchhu-I Hydropower Plant, initially, for the period from November 11, 2008 to November 10, 2015. The construction license was renewed from November 10, 2015 till July 31, 2019 as the construction of Project has been delayed mainly due to the sliding of right bank hill at the dam site, requiring the following slope stabilization measures:

a) Consolidation Grouting at right bank with total number of 566 drill holes measuring around 36 km in total depths, resulting to usage of 530,544 cement bags;

b) Micro-piling (325mm dia RCC) with total number of 934 drill holes measuring around 73km in total depths, resulting to the usage of 324,198 cement bags;

c) 100 tones capacity Cable Anchoring with total numbers of 419 drill holes measuring 29.7 km in total depths, resulting to usage of 57,712 cement bags; and

d) Finally, RCC piling (2m diameter) with total number of 190 drill holes measuring around 9.8 km in total depths, resulting to usage of 30,000 cements bags

The application of renewal of construction license for second time from PHPA-I was received in January, 2019. The PHPA-I justified that the delay of the project has been mainly caused by the local landslide occurred in August 2016 on the downstream of dam axis at the right bank, resulting to following additional slope stabilization measures (on both upstream and downstream of dam axis) as per the information provided in December 2018:

a) Consolidation Grouting of 276 drill holes measuring around 14km in total depths, resulting to usage of around 33,000 cement bags;

b) Micro-piling (325mm dia RCC) with total number of 191 drill holes measuring around 12km in total depths, resulting to usage of around 59,000 cement bags;

c) 100 tones capacity Cable Anchoring with 154 drill holes measuring around 11km km in total depths, resulting to usage of around 16,000 cement bags; and

d) RCC piling (2m diameter) with total number of 39 drill holes measuring around 2 km total depths, resulting to usage of 8000 cements bags.

The construction progress of dam is reported to be around 70%; headrace tunnel around 100%; and powerhouse around 90% as of December 2019.

Therefore, within the extent of reasonability, the project delay was found acceptable and subsequently, construction license of PHPA-I has been extended till March 2023 in accordance to the provisions of the Electricity Act and the Construction License Condition of PHPA-I.

4.1.3 Renewal of Construction License of THyE

The Tangsibji Hydro Energy Limited (THyE) was issued license to construct 118 MW Nikachhu Hydropower Plant in Trongsa District for the period from November 19, 2014 to November 13, 2018. However, as the completion of Project within the licensed period was not possible, THyE applied for license renewal in February 28, 2018.

The verification of license application revealed the followings as the causes for the project delay:

(i) The tendering works for award of the construction works lasted for 17 months were not considered in the overall construction schedule;

(ii) Encountering of poor geology on the left bank dam abutment and in the head race tunnel resulted the construction delay for over 1 year

Therefore, BEA extended the construction license of THyE for construction of 118MW Nikachu Hydropower Project till December 2021 based on the provisions of the Electricity Act and License Condition issued to THyE.

4.2 Generation License to MHPA

Consequent upon the 99% completion of construction of 720 MW Mangdechhu Hydropower Plant, the Mangdechu Hydropower Project Authority (MHPA) applied for operation license in July 2018. The MHPA was issued construction license by BEA for the period April 24, 2012 to April 23, 2019. The MHPA completed the project in time.

Upon verification by BEA, the construction of the major components of the project such as dam, headrace tunnel, surge shaft, pressure shaft powerhouse, cavern and tailrace tunnels were completed. Various dam safety monitoring instruments were also found to be installed. Review of the quarterly report of MHPA to BEA also indicated that quality test of the concrete used for construction of civil structures were carried in accordance to the design requirement.

Considering the completion of construction of project, MHPA was issued the generation license for operation of 720MW Hydropower plant in March 2019 based on the section 22, 23, 24 and 25 of the Electricity Act.

4.3 Distribution Power Reliability Standard

Since few years back, BEA has been gathering the power outage data of the distribution system from the Bhutan Power Corporation Limited (BPC). However,

owing to severe anomalies in the recorded power outage data, BEA has not been able to determine the reliability standard of BPC's distribution system until now. Consequently, several requests and reminders were issued to BPC for upkeeping of proper data record in requirements of the BEA Distribution Code 2008. New data recording format was also issued in the year 2017 to 19 electricity distribution offices of BPC with view to improve the recording quality of power outage data.

As a result of rigorous efforts, the power outage data of the year 2018 was witnessed to be recorded at its best so far with the SAIDI calculated to be as 8.09 hours/customer/year and SAIFI as 11.03 times/customer/year. To establish the confidence on the power outage data of the distribution system and on the derived reliability indices hereon, BEA will continue to gather power outage data for a year or two. In addition, while determining the indices, it has been observed that most of the outages reported by BPC are either related to schedule maintenance or weather-related interruptions that are actually excluded from the calculation of reliability indices as per the prevailing provisions of Distribution Code. In order to correct these deficiencies, guaranteed service levels provisions in Distribution Code 2008 will be amended during the following years to include those outages for reliability calculation.

4.4 Environmental Impact Management of Hydropower Projects

To study the effectiveness of the management of social and environmental impacts of hydropower project construction, BEA selected two hydropower plants of Punatsanchu- 1200MW Punatsangchu-I Hydropower Project (PHPA-I) and 1020MW Punatsangchu-II Hydropower Project (PHPA-II).

The study observed that in overall, management of dumping yards, air and water quality, and wastes are found to be carried out as per the prevailing laws and rules. However, proper management of dumping yard and quarry sites needs to be enhanced.

The PHPA-I affected around 441 acres of forest, while PHPA-II affected around 741 acres forest. As a compensatory measure, afforestation activity of 1005

acres by PHPA-I and 1500 acres by PHPA-II is being carried out. However, proper monitoring of the growth of trees and plants in afforested areas will have to be carried out by the respective project authorities.

4.5 Monitoring of Hydropower Plants of Druk Green Power Corporation

Consequent upon the series of accidents occurred within a year in one of the DGPC hydropower plants, the BEA initiated electrical safety auditing in all the DGPC-owned hydropower plants during the fiscal year. DGPC is ISO (International Standard Organization) certified organization, compliant to international standard ISO 45001:2018 (e) – Occupational Health and Safety Management System (OHSMS). As ISO compliant company, DGPC is required to comply to national laws including the regulatory requirements such as Safety Code 2008, Safety Regulation 2008, and other applicable regulations of BEA.

Considering that DGPC is ISO compliant organization, the safety audit conducted noted that in general, safety management aspects are carried out appropriately in line with safety regulations and codes of BEA in all four power plants of DGPC. However, four plants in DGPC have been notified to provide adequate and effective safety equipment and tools including the portable earthing sets. They have also been advised to appropriately deploy competent people for carrying specific jobs to avoid electrical hazards.

4.6 Compliance Auditing on the Electricity Service Division Offices of BPC

The electrical safety audits in the ten (10) Electricity Service Divisions of BPC were carried out in last fiscal year in line with the Safety Regulations and Safety Code 2008 of BEA. During this fiscal year, it has been planned to conduct electrical safety audits in the remaining nine (9) Electricity Service Division offices. Safety audit are regularly carried out to educate the safety aspects to the field staff and electricians of BPC and instill sense of importance on safety provided by the regulator and society.

Accordingly, safety audit in remaining nine (9) Electricity Supply Divisions of Haa, Samtse, Trashiyangtse, Mongar, Lhuentse, Tsirang, Gelephu, Trongsa and Zhemgang were carried out. The safety audit exercise carried out in the total of 19 ESD offices of BPC resulted to development and usage of uniform work permit system to carry out maintenance of electrical distribution system and development of standardized portable earthing system that is expected to avoid the safety incident in BPC.

4.7 Conduct Public Safety Awareness

So far BEA has carried out public awareness on electrical safety in 7 Dzongkhags. As continuation, it has been planned during this fiscal year to carry out similar program in Pemagatshel Dzongkhag, Trashigang Dzongkhag and Tsirang Dzongkhag. The past electrical accidents revealed that our public lack the awareness on the danger of electricity and exist severe negligence.

As such, the electrical safety awareness program in Tsirang was held in November 2018 attended by more than 400 people. The electrical safety awareness program held on 15th March 2019 in Pemagatshel Dzongkhag was attended by around 200 people.

In addition, during the fiscal year, BEA continued with following mode of electrical safety awareness program to educate our citizen in every corners of our country:

i) Electrical safety video clip (45 seconds) in Dzongkha language broadcasted in BBS TV for 106 slots from August till December 2018;

ii) Electrical safety video clip (45 seconds) in Dzongkha language broadcasted in local cable TV operator channel in all the 19 Dzongkhags for one month in January 2019;

iii) Safety messages broadcasted via BBS radio in 3 languages- Dzongkha, Sharchop and Lhotsham for 30 slots from January till March 2019; and

iv) Electrical safety brochures distributed to all the central schools of the

Fig. 1. Public participants for the electrical safety awareness

Fig. 2. BEA officials distributing one day subsistence allowance to the participants

Fig. 3. Chief, Monitoring Division addressing the staff and students of Yurung Central School on electrical safety

Fig.4. Public participants for the electrical safety awareness at Yurung Central School

Fig.5. Public participants for the electrical safety awareness at Sakteng, Trashigang

country, some of the ESD Offices of BPC,and public of four dzongkhags (Trashigang, Gasa, Tsirang and Pemagatshel) through gewog offices.

BEA will continue to educate our people on the electrical safety wherever necessary and we believe that electrical incident will considerably reduce in few years from now.

4.8 Review of Guidelines for Fines

BEA reviewed the criteria of the aggravating factors in the existing Guidelines for Fines (Punitive and Correctional) from variable percentage into a fixed percentage to bring clarity.

With the revised Guidelines for Fines, approved fixed percentage was subsequently applied while determining fines in following cases.

a) Fatal incident at Kabreytar, Phuentsholing that occurred on 21st September 2018. The penalty was waived in the 82nd Commission meeting held on 25th May 2019.
b) Fatal incident at Dorokha, Samtse that occurred on 28th February 2019.
c) Non-fatal incident at Tala Hydropower Plant, DGPC that occurred on 14th January 2019.

4.9 Update Guideline for Filing Tariff Application

The BEA developed Guidelines for Filing Tariff Application in the year 2012 in line with Tariff Determination Regulation (TDR), 2007 to be used by the Licensees for filing tariff applications to BEA. With the issuance of the Domestic Electricity Tariff Policy in the year 2016 by the Royal Government of Bhutan, the amended Tariff Determination Regulation 2016 was issued by BEA, therefore, requiring the updating of the Guidelines. The updated Guidelines mainly consist of new provision on the detail submission of the Investment Plan Proposal nine (9) months prior to the expiry of the prevailing tariff period for judicious scrutiny of the investments and not as four (4) months prior in the earlier case. In the cost-plus model tariff determination methodology currently being applied by

BEA, investment adds on to the existing assets that result to higher tariff. The provisions of the Guidelines were applied while determining the electricity tariff for the period 2019 to 2022.

4.10 DGPC Investment Plan (Tariff Period 2019-2022)

As per the provisions of the Tariff Determination Regulation 2016, the Druk Green Power Corporation Limited (DGPC) is required to submit their investment proposal for the upcoming tariff period to BEA (by October 2018 for tariff period 2019 to 2022, which is 9 (nine) months prior to the expiry of the prevailing tariffs). The investment plan proposal generally includes the proposed investments for their Corporate Office, 336 MW Chukha Hydropower Plant, 60 MW Kurichhu Hydropower Plant, 64 MW Basochhu Hydropower Plant and 1020 MW Tala Hydropower Plant for the said tariff period.

During the fiscal year, the DGPC submitted their investment plans that were largely driven by installation and upgradation of power house facilities and equipment including the replacements of parts of generators such as stator windings. Therefore, during the fiscal year, BEA reviewed their investment proposal, conducted stakeholder consultations of DGPC, visited the sites for verification and finally approved less than half their investment proposal for the tariff period 2019-2022 that were essential for generation of energy.

4.11 BPC Investment Plan (Tariff Period 2019-2022)

As per the provisions of Tariff Determination Regulation 2016, the Bhutan Power Corporation submitted their Investment Plan Proposal for the period 2019-2022 to the BEA in October 2018 that is nine (9) months prior to the expiry of the prevailing tariffs. The Investment Plan proposal includes the proposed investments for their Corporate Office, Distribution System, Transmission System, System Operation and Embedded Generation. BPC justified that these capital investments are aimed in strengthening the power transmission and distribution network to improve the reliability through network expansion, improvement and up-gradation of existing transmission and distribution system to cater and replacement of old and obsolete assets.

As a part of the review, BEA officials visited some of the Electricity Services Divisions (ESD) offices, substation maintenance offices and transmission maintenance offices of BPC in January 2019 to ascertain the need on the proposed investments. BEA also conducted a consultation meeting in March 2019 with:

(i) The Department of Hydropower and Power Systems (DHPS), Ministry of Economic Affairs in presence of the Licensees (BPC and DGPC) to seek the views of the DHPS on the proposed investment plan submitted by BPC;

(ii) The Department of Industry, Ministry of Economic Affairs in presence of BPC on the proposed construction of transmission line and related infrastructures for the four Special Economic Zones (Jigmeling, Motonga, Dhamdum and Bongdeyma) to ascertain the realistic implementation schedule of these investments.

Based on the preliminary review, clarification made by BPC, sites visit and consultation meeting, BEA examined the investment plan, projects wise considering the capitalization schedule, current status of the projects as of 2018, projects' priority, the expected risk level for delay of the projects and BPC's investment performance in the past and accordingly approved the investment plan for the tariff period 2019-2022.

4.12 DGPC Generation Cost (Tariff Period 2019–2022)

The existing generation tariff of DGPC power plants expires on 30th June 2019 and as such DGPC has submitted their tariff revision proposal to the BEA in March 2019 in accordance to the BEA Tariff Determination Regulation 2016. In their tariff revision proposal, the DGPC has proposed increase of generation cost from Nu.1.59/unit of electricity to Nu.1.7/unit. Upon receipt of the application, BEA reviewed their proposal, and conducted public hearing/stake holder consultation on April 30, 2019. After that three (3) weeks were provided to the general public and all the stakeholders to submit their comments.

BEA determined the generation cost of DGPC after detailed review, considering all the comments of public and other stakeholders as Nu 1.42 per unit for the tariff period 2019-2022.

4.13 BPC Cost of Supply (Tariff Period 2019-2022)

The existing electricity tariff of BPC for the consumers of High Voltage (HV), Medium Voltage (MV) and Low Voltage (LV) and the export wheeling tariff is actually valid till 30th June 2019. As such, BPC has submitted their tariff revision proposals to BEA on March 2019 in line with the Tariff Determination Regulation 2016 for the upcoming tariff period. As per BPC, the tariff application is being prepared in line with Tariff Determination Regulation (TDR), 2016 and submitted to implement the work programs for capital investments that are in line with the BPC's Five Year Plans (FYP) and that of major power projects are in line with the plan of the Royal Government of Bhutan.

A public hearing was conducted in April 2019 as part of the tariff review process and the general public and other stakeholders were provided three (3) weeks after the public hearing to submit their written comments to BEA. During the public hearing, the Licensees presented their tariff proposals and the Association of Bhutan Industries (ABI) also presented their views and comments on the electricity tariff revision proposal of BPC and DGPC on behalf of the consumers. The BEA also noted several issues and comments raised by the general public.

Upon detailed review after considering the comments received from the general public and Licensees, the BEA approved the Cost of Supply as Nu. 0.27/kWh for export wheeling, Nu. 2.26/kWh for High Voltage consumers, Nu. 5.15/kWh for Medium Voltage consumers and Nu. 5.06/kWh for Low Voltage consumers in 30th June 2019 for the tariff period 2019-2022.

4.14 Determine MHPA Generation Cost

The 720-Megawatt Hydroelectric Project of the Mangdechu Hydroelectric Project Authority (MHPA) was scheduled to be commissioned in March 2019. As per the Electricity Act and Tariff Determination Regulation 2016 of BEA, Licensee is not authorized to levy any tariff or charges for sale of electricity generation to any other person or entity without the approval of BEA. The MHPA proposed generation tariff of Nu.3.91/kWh for sale of power in the domestic

market. The MHPA power will be largely consumed in the country during the winter season when the electricity demand supplied by the power plants of DGPC is not adequate to match the domestic load of the country.

The BEA reviewed the tariff application and approved the MHPA generation cost in June 2019.

4.15 Annual Report

In accordance to section 75 of the Electricity Act of Bhutan, BEA has to submit to 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 report in the form of annual report is submitted to Hon'ble Tengye Lyonpo and copies distributed to relevant agencies, besides the licensees.

The Annual Report consisting of various activities of the BEA was published as Annual Report and was submitted to Hon'ble Tengye Lyonpo on 29th October 2018. The report was distributed to other stake holders and relevant agencies.

4.16 Resolve Audit Memos upon auditing books of accounts for the fiscal year 2017-2018

The books of account of BEA for the fiscal year 2015-2016 were audited by the Royal Audit Authority (RAA). The BEA took appropriate actions and resolved all memos.

Recently, RAA has changed their auditing plans from Annual Cycle to Bi-Annual Cycle for BEA (that is, auditing of the books of account of BEA once in every two years). The RAA made such strategies since BEA being regulatory organization does not execute development activities requiring huge expenditure for frequent auditing.

4.17 Conduct Training Need Analysis (TNA) for BEA Secretariat employees

During the fiscal year 2017-18, the BEA Secretariat carried out an Organizational Development (OD) exercise by engaging a consultant from the Royal Institute of Management. One of the findings from the OD exercise was the need to develop skill and capacity of the BEA Secretariat. Accordingly, it was planned to conduct training need analysis for the BEA Secretariat during this fiscal year to fulfill its mandate as enshrined in the Electricity Act of Bhutan.

During the preparation, the Consultant held a consultation meeting with all the staffs of BEA on 19 and 20 March 2019 respectively. The TNA report was finalized on 10th June 2019.

5. OPERATIONAL PLAN FOR THE FISCAL YEAR 2019-2020

Apart from routine activities, the BEA shall undertake the following major activities.

5.1 Prepare Ten Years (2020-2030) Roadmap for BEA

BEA was granted full autonomy from 1st January 2010 and since then, all the divisions of BEA carried out respective operational plans every fiscal year in line with the provisions of the Electricity Act, 2001 for the last ten years. Main areas of activities include processing and 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, the effectivity of the regulatory activities carried out through various operational plans have not been assessed until now. During the fiscal year 2019-2020, BEA will take stock of all the past activities and study the results accomplished so far and then formulate a roadmap for the next ten years called 'The BEA Roadmap to 2030' taking into consideration the evolving national plans and priorities of the electricity sector development. This document is expected to provide direction of BEA for the next one decade.

5.2 Amend Guidelines for Fines 2011

The BEA determines the fines and penalties to be imposed to licensees as per the Guidelines for Fines 2011 for breach of the provisions of the rules and regulations issued under the Electricity Act. BEA noted that the current document is applicable only for electrical safety violations and therefore felt the need to re-examine all the provisions of the guidelines and expand the scope of the guidelines.

5.3 Pilot Study on Machine Down Time of Tala Hydropower Plant

The ideal situation for any hydropower plant would be all generating units are operated continuously throughout the year to provide reliable power supply. Nevertheless, machine breakdown occurs either through lack of proper preventive maintenance or through inappropriate human operation. The objective of this study is to identify the reasons for machine downtime with the scope limiting to electromechanical issues, and then carry out the analysis of downtime and restoration challenges. Three (3) years trend of the machine downtime caused by electromechanical parts such as turbine runner, main inlet valve, nozzle and deflector will be analyzed. The outcome of the study will be useful information while reviewing and approving the investments proposal of the hydropower plant for the purpose of electricity tariff determination. With a view to conduct comprehensive analysis, therefore the study is limited to only Tala hydropower plant. Since this kind of study is being carried out for the first time, the outcome of the study will indicate whether such machines restorations are professionally and diligently carried out or not.

5.4 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 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) BS 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 until now, it is envisaged to conduct a survey. However, to carry out proper survey it is felt necessary to conduct initially a pilot survey before implementing a full-fledged one. Accordingly, in the fiscal year 2019-2020 it is proposed to design questionnaire

and carry out pilot testing of the questionnaire in one dzongkhag. The full-fledged survey is expected to be carried in the following fiscal years after the successful piloting of the works.

5.5 Customer Service Delivery level

One of the main functions of the Distribution Licensee (BPC) is to distribute the electricity to its customers and provide them reliable electricity supply, including the connection services of a customer's electrical installation to the distribution system. In this respect, BEA has issued Distribution Code 2008 that consists of the distribution operation code and customer service level standards. Therefore, since BPC is the only electricity distribution and supply company in the country, the need to attain the service levels outlined in clause 7 of the Distribution Code 2008 is very essential for good customer service delivery. Accordingly, a study will be carried and verify their achievement of customer service levels as per the Distribution Code 2008 in three ESD Offices of BPC.

5.6 Electrical Safety Awareness Program

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. Therefore, electrical safety awareness program is being conducted every year as per the provisions of the Safety Regulation 2008 of BEA with an aim to ensure electrical safety to the employees of licensees (BPC), customers and the public.

As a part of this continuous program, during this fiscal year, it is proposed to conduct safety awareness campaign targeting the students of four Central Schools. Besides, educating themselves on electrical safety, the students have the potential to act as emissaries on electrical safety to their parents and sibling at home and to their communities.

5.7 Review Grid Code Regulation 2008

The Grid Code Regulation 2008 was developed in 2005 by the Indian Consultant (Power Grid) through the funding of Asian Development Bank. Considering the changing technology and expansion of power system network in the country, it is proposed to review the provisions of the Grid Code. Since the Indian Grid, which Bhutan is heavily connected in term of power grid, has attained almost the advanced level of grid management through implementation of "deviation settlement mechanism (DSM)", the review of the Grid Code will largely cover pertaining to deviation settlement mechanism, cross-border electricity trade and other related matters.

5.8 Amendment of Distribution Code 2008

The Distribution Code 2008 contains the operational and management aspects of electricity distribution system, terms and conditions of supply of electrical energy to the customers, and standards for supplying and maintaining electricity supply. In line with section 7.9 of Distribution Code, the BEA has been calculating the reliability indices: SAIDI and SAIFI. In the process, it was noted that most of the outages reported by BPC were largely related to schedule maintenance or weather-related outages that have to be excluded from calculation of reliability indices as per provisions of Distribution Code, therefore, resulting to very good reliability indices. However, in other countries, schedule maintenance interruptions and weather-related outages are included while calculating SAIFI and SADI. Therefore, in order to scrutinize and control the schedule maintenance outages and weather-related outages reported by BPC, it is proposed during this fiscal year to revise the guaranteed service levels provisions of the Distribution code 2008 by reviewing the best practice of regional countries.

5.9 Archive planned against actual construction schedule of Hydropower Projects

BEA renewed the construction license period of Punatsangchhu-I Hydroelectric Project Authority (PHPA-I) from November 2008 to July 2019, PHPA-II from

February 2012 to December 2021, and Tangsibji Hydro Energy Limited (THyE) from November 2014 to December 2021. Until now, BEA was relying on the information provided by the Project Authorities for extending their construction license period at the time of the renewal of construction license. And, by the time they apply for extension, the causes of project delay and its rectification works occurred in the past few years were not available completely owing to misplacing of documents or missing the information. Therefore, in order to retrieve all important information when required by BEA for extension of construction license or issuance of operation license, verifying and archiving construction work progress annually of PHPA-I, PHPA-II and THyE have become an important aspect. Therefore, beginning from the next fiscal year 2019-2020, the BEA will carry out these verification and archiving activity of these hydropower projects constructions.

5.10 Publish DGPC Tariff Review Report 2019-2022

After completion of review of the tariff revision proposals for tariff period 2019-2022 submitted by DGPC, BEA need to document all the proposals submitted and additional information and clarifications provided by DGPC. Further, the details of the public hearing including the list of attendees, presentations made by DGPC and private sector, written comments from the public and Licensees, all other internal decision reports of BEA need to be documented for future reference.

This type of report compilation will establish the basis for the decisions that were considered by BEA during each tariff review and helpful during the subsequent tariff review too. As such, BEA will compile the tariff review report during the fiscal year 2019 to 2020.

5.11 Publish BPC Tariff Review Report 2019-2022

After completion of review of the tariff revision proposals for tariff period 2019-2022 submitted by BPC, BEA will have to document all the proposals submitted by BPC and additional information and clarifications provided by the BPC. Further, the details of the public hearing including the list of attendees, presentations made by BPC and private sector, comments received on the presentation from the general public, written comments from the public and Licensees, internal decisions of BEA need to be documented for future reference.

This type of report compilation will establish the basis for the decisions that were considered by BEA during each tariff review and helpful during the subsequent tariff review too. As such, BEA will compile the tariff review report during the fiscal year 2019 to 2020.

5.12 Publish Mangdechhu Hydroelectric Project Tariff Review Report 2019-2022

After completion of the review of the tariff revision proposals for tariff period 2019-2022 of 720 MW Mangdechhu Hydroelectric Project (MHP) submitted by DGPC, BEA will have to document all the proposals submitted and additional information and clarifications provided by DGPC/MHP and the internal decisions of BEA.

This type of report compilation will establish the basis for the decisions that were considered by BEA during each tariff review and helpful during the subsequent tariff review too. As such, BEA will compile the tariff review report during the fiscal year 2019 to 2020.

5.13 Approval of BPC Miscellaneous Charges for Customer

As per the provisions of Guidelines for Filing Tariff Applications 2019, BPC has submitted the proposal for revision of miscellaneous charges along with the tariff revision proposals for tariff period 2019-2022. BPC has proposed the revision of the miscellaneous charges based on following justifications.

i) Increased BPC work load due to increased rural electrification and number of customers;
ii) Introduction of 100 units free electricity;
iii) Change in electricity consumption patterns and increased customer expectation requires improvement in customer service;
iv) Increase in cost of services owing to a general inflation since 2010;
v) Bad debts resulting from inadequate charges and their application methodology; and
vi) Issues with the existing charges.

BPC mainly justified that current amount charged for services and deposits are low as compared to the cost of such services and there is a need to revise the

rates to ensure the actual cost of services are reflected and that customers are deterred from carrying out illegal activities. Further, BPC submitted that few charges are not clear and there is a need to revise the rates in a manner that will bring clarity for proper implementation.

Therefore, during the fiscal year there is a need to carry out detailed review of the proposed miscellaneous charges of BPC to assess the reasonability of the proposed charges by conducting site visits and consultation with stakeholders on the charges.

5.14 Investment Contribution Mechanism by Customers

As per the Section 11.1(b) of Electricity Act of Bhutan, BEA needs to come up with the regulation/guidelines which comprises terms and conditions for investment contribution from customers for provision of access to the Transmission and Distribution networks.

In 2015, BPC has apprised BEA on regularization of customer assets installed outside the customer premises such as the distribution lines and the distribution transformers which was financed by customers. As per BPC, these privately-owned distribution lines and transformers are not being able to be utilized by the BPC for extending the supply to other customers and therefore, BPC as a distribution licensee is interested to take over these assets for optimum utilization.

The Clause 6.4.1 of BPC License Conditions states that an intending customer applying for new service connection from the existing installation shall also have to be paid by the customers as investment contribution with the Licensees on the cost of the line extension, voltage transformation and services connection including cost of installation based on the Licensee's cost estimation. Further, as per the provisions of License Conditions, BEA shall approve the cost estimation derived by Licensee and procedures developed for cost sharing when the new customers are connected.

Therefore, during the fiscal year, BEA will carry out studies and come up with the Regulation/Guidelines incorporating aforementioned issues.

5.15 Publish Annual Report

In accordance to section 75 of the Electricity Act of Bhutan, BEA has to submit to the Minister a statement of the activities undertaken in the preceding financial year, within four months after the end of each financial year. Therefore, report in the form of annual report will be submitted to Hon'ble Tengye Lyonpo and copies distributed to all ministries and relevant agencies besides the licensees of the fiscal year 2019-2020.

5.16 Audit books of accounts of BEA for the two fiscal years

The books of account of BEA henceforth will be audited once in every two years as per the decision of the Royal Audit Authority (RAA). Therefore, as the RAA could not audit the books of accounts of BEA for the last fiscal year, the RAA will carry out the auditing for the last two years (2017-2018) and (2018- 2019) in the upcoming fiscal year.

5.17 Development of Job Description for BEA Secretariat Employees

During the fiscal year 2018-19, the BEA Secretariat carried out Training Need Analysis (TNA) by engaging a consultant from the Royal Institute of Management (RIM). One of the findings during development of TNA was the need to develop job description of each position in all the divisions of the BEA Secretariat. Accordingly, it is planned to develop the job description of every level of position in the BEA Secretariat during the upcoming fiscal year.

5.18 Develop BEA Procurement Manual

The BEA Secretariat has been following the procurement manual of Ministry of Finance, Royal Government of Bhutan since BEA became fully autonomous in 2010 until now.

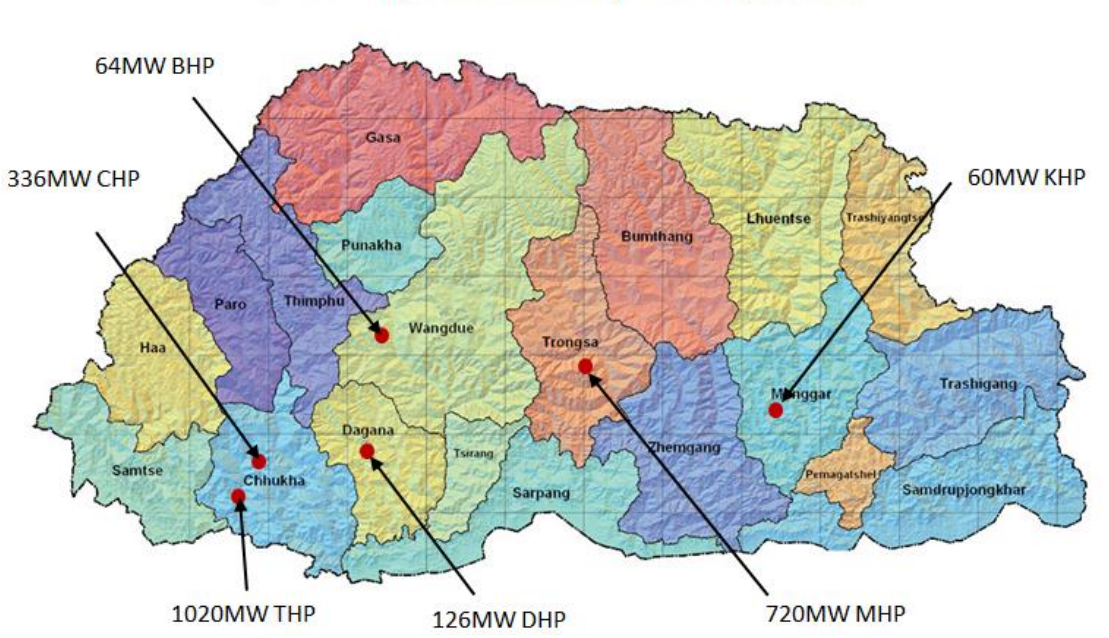
It is now felt necessary to come up with the BEA procurement manual that would be tailored to the growing needs of BEA. Accordingly, it is planned to develop separate procurement manual for BEA in this fiscal year.

6. LICENSED HYDROPOWER PLANTS IN OPERATION

The following hydropower plants are under operation and are licensed by BEA. The year of commercial operation, date of license issued, validity of license, capacity and location of the plants are as shown below:

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

Licensed Hydro-Power Projects in Operation

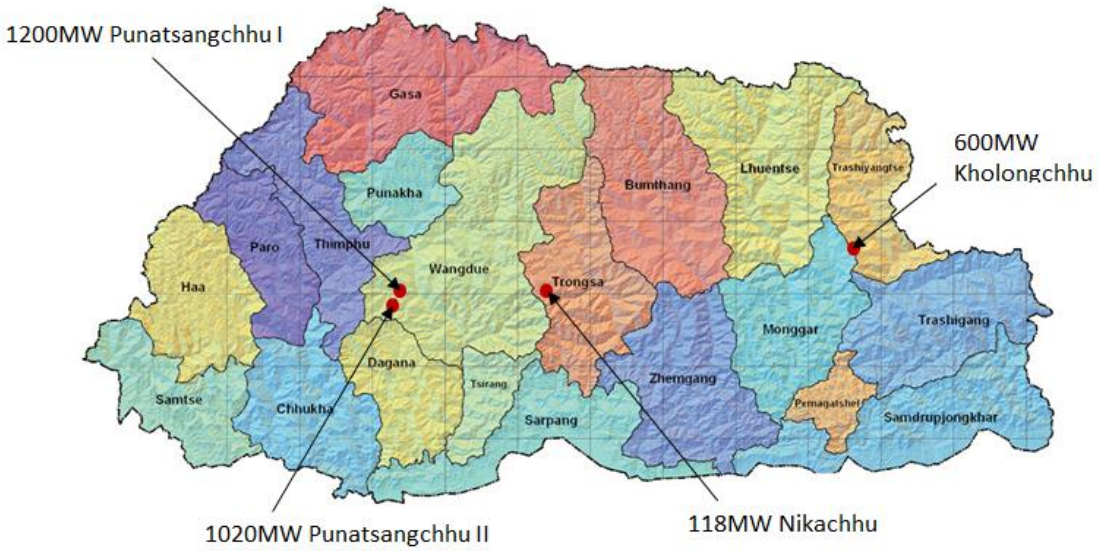


7. LICENSED HYDROPOWER PROJECTS UNDER CONSTRUCTION

The following hydropower plants are under construction and are licensed by BEA. The year of commercial operation, date of license issued, validity of license, capacity and location of the plants are as shown below:

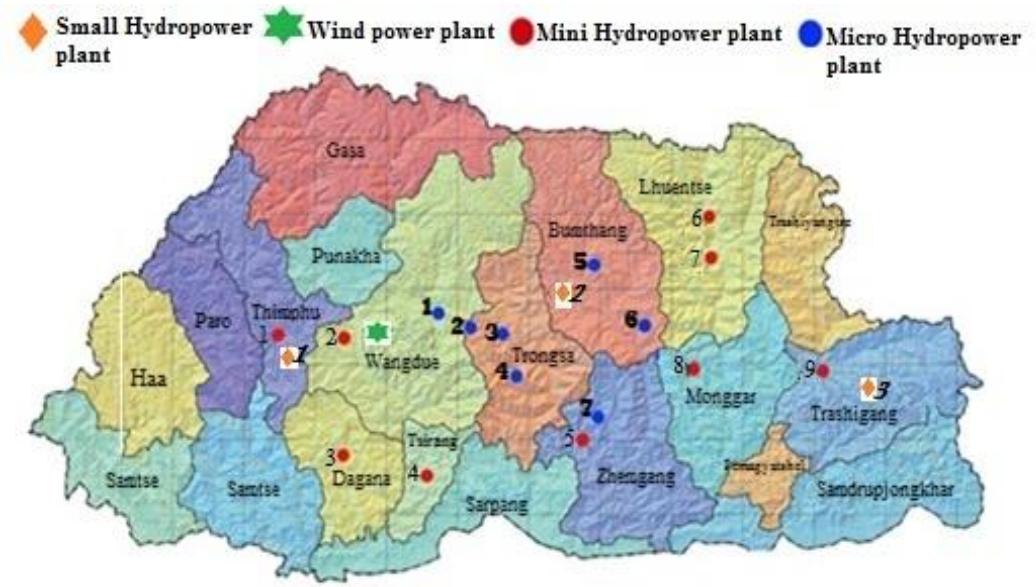
SL.	Name of Plant	Date of License	Validity of License
1	Punatsangchhu-I Hydropower Project (PHP-I)	11 Nov 2008	31 March 2023
2	Punatsangchhu-II Hydropower Project (PHP-II)	9 Feb 2012	31 Dec 2021
3	Nikachhu Hyropower Project (NHP)	19 Nov 2014	31 Dec 2021
4	Kholongchhu Hydropower Project (KHP)	14 July 2015	1 Jan 2022

Licensed Hydro-Power projects under construction



8. LICENSED SMALL, WIND MINI AND MICRO HYDROPOWER 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 *Dzongkhag*s as shown in the map below:



Small Hydropower plant	Wind power plant
1. 5X250 kW Gidakom mini hydel 2. 3X500 kW Chumey mini hydel 3. 2X1100 kW Ranjung	1. 12X300 kW wind power plant
Mini Hydropower plant	**Micro Hydropower plant**
1. 4X90 kW Thimphu mini hydel 2. 3X100 kW Hesothangkha mini hydel 3. 2X100 kW Darachu mini hydel 4. 2X100 kW Changchey mini hydel 5. 2X100 kW Tingtibi mini hydel 6. 2X100 kW Rongchu mini hydel 7. 2X60 kW Gangzur mini hydel 8. 3X130 kW Khanlanzi mini hydel 9. 3X250 kW Chenary mini hydel	1. 1X40 kW Rukubji micro hydel 2. 1X30 kW Tangsibji micro hydel 3. 1X50 kW Sherubling micro hydel 4. 1X30 kW Kuengarabten micro hydel 5. 1X30 kW Tamshing micro hydel 6. 1X50 kW Ura Micro hydel 7. 1X20 kW Kelkhar micro hydel

9. GLIMPSES OF TARIFF PUBLIC HEARING ON 30 APRIL 2019 IN THIMPHU

Public