Bhutan Electricity Authority

Electricity Tariff in Bhutan

December 2017

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

BEA	Bhutan Electricity Authority
BPC	Bhutan Power Corporation Limited
CoD	Commercial operation Date
DC	Demand Charge
DETP	Domestic Electricity Tariff Policy 2016
DGPC	Druk Green Power Corporation Limited
DHPS	Department of Hydropower and Power Systems
DoE	Department of Energy
DoP	Department of Power
DRE	Department of Renewable Energy
DTRC	Domestic Tariff Review Committee
EAB	Electricity Act of Bhutan 2001
EC	Energy Charge
HV	High Voltage
kWh	Kilowatt Hour
kVA	Kilovolt Ampere
LV	Low Voltage
MoEA	Ministry of Economic Affairs
MTI	Ministry of Trade and Industry
MV	Medium Voltage
MW	Megawatt
PPA	Power Purchase Agreement
SHDP	Bhutan Sustainable Hydropower Development Policy 2008
TDR	Tariff Determination Regulation 2016

1 BACKGROUND

The Royal Government of Bhutan started to develop its hydropower sector in the early 1960s with the assistance from the Government of India. With the development of the hydropower projects, the transmission and distribution network expanded across the country under the Department of Power (DoP), Ministry of Trade and Industry (MTI) which was responsible for policy, planning, operation and maintenance of the power system. The electricity tariff was proposed by the MTI and approved by the Royal Government for the first time in 1982 and tariffs were revised by the Royal Government in 1987, 1995, 1997, 2000 and 2001.

In 2001, the National Assembly enacted the Electricity Act of Bhutan (EAB) which required the restructuring of the electricity supply industry by separating the regulatory and operational activities of the power sector. This resulted in the erstwhile DoP to be restructured into three agencies namely; Department of Energy (DoE), Bhutan Power Corporation Limited (BPC) and Bhutan Electricity Authority (BEA).

The DoE was responsible for formulation of policies, planning and coordination of activities for the energy sector. In addition, DoE was responsible for implementing the rural electrification program and development of new export-oriented hydropower projects.

BPC was established as a public utility company and made responsible for electricity transmission, distribution and supply within the country and the management of the operations of embedded generation (off-grid mini/micro/small hydro and diesel generating units).

BEA as a division under the DoE looked after the regulatory issues and development of the regulatory framework for tariff determination. While the development of the Tariff Determination Regulation (TDR) was going on, a Domestic Tariff Review Committee (DTRC) was established in 2003 to review the tariff revision proposals submitted by Bhutan Power Corporation Ltd. The recommendations of proposals were submitted to the Lhengye Zhungtshog for approval. Thus, the electricity tariffs for the year 2003 - 2006 were approved by the Royal Government based on the recommendations of the DTRC.

The year 2006 marked the establishment of Bhutan Electricity Authority consisting of members from relevant agencies. The BEA approved the TDR in 2007. Based on the approved TDR, the BEA reviewed the BPC tariff for the first time in 2007 for the period 1st July 2007 to 30th June 2010.

Meanwhile, in 2008 all the existing hydro power plants (Chukha, Kurichhu, Basochhu and Tala Hydropower Plants) were amalgamated to form the Druk Green Power Corporation Limited (DGPC). The DGPC was made responsible for operation of hydropower plants fully owned by the Royal Government and for accelerating hydropower development by developing new hydropower projects independently, through joint ventures or through any other arrangements with domestic and international partners. The generation tariff for DGPC was approved by BEA for the first time in 2010 for a period of three years.

Since then the BEA has been reviewing the Druk Green Power Corporation and Bhutan Power Corporation tariffs every three years and the last review was conducted in 2016 which resulted in the determination of the tariffs for the period 1st January 2017 to 30th June 2019.

2 INTRODUCTION TO ELECTRICITY TARIFF

Electricity tariff is the pricing structure the BPC charges a customer for energy consumption on a monthly basis. The BPC currently charges its customers based on the supply voltage level, i.e. Low Voltage (230/415 V), Medium Voltage (6.6/11/33 kV) and High Voltage (66 kV and above). The tariff structure for the period 1st July 2017 to 30th June 2018 is provided in the table below.

Table 1: Current Tariff Structure

Customer Category	Tariff
LV Consumers (230/415 V)	
Block I (Rural Domestic) -<= 100 kWh	Nu. 0.00/kWh
Block I (Others) - <= 100 kWh	Nu.1.28/kWh
Block II - >=101 kWh to <= 300 kWh	Nu.2.60/kWh
Block III - >= 301 kWh	Nu. 3.43/kWh
LV Bulk	Nu. 3.90/kWh
MV Consumers (6.6/11/33 kV)	
Demand Charge	Nu.275/kVA/month
Energy Charge	Nu. 2.07/kWh
HV Consumers (66 kV and above)	
Demand Charge	Nu.262/kVA/month
Energy Charge	Nu.1.59/kWh

The Low Voltage (LV) customers are billed only an Energy Charge (EC) and the Medium Voltage (MV) and High Voltage (HV) customers are billed both Energy and Demand Charge (DC). The EC is levied as Nu./kWh consumption basis, whereas the DC is levied according to the peak demand of the consumer in kVA.

The LV rural domestic households, rural cooperatives, rural micro trade and community lhakhangs are provided first 100 units free and charged at LV block II and LV block III tariff for consumption beyond 100 units. The LV (others) includes urban households, religious institutions which are charged a progressive tariff Block I – III. The LV customers such as commercial, industrial, institution, agriculture, street lighting, temporary connection for non-residential purpose, etc. are charged at Block III rate. The LV bulk includes customers with more than 100 kW load including government/corporate/private institutions/commercial complexes, armed forces complexes, etc. and are charged higher than the LV Block III tariff.

The MV customers are mostly small industrial units requiring power supply between three (3) MW to 15 MW which are charged both energy and demand charge. The HV customers are the large-scale industries which requires power supply more than 15 MW and charged both energy and demand charge.

This electricity tariff payable to BPC is derived as cost of supply less subsidies provided by the Royal Government as illustrated in Figure 1.

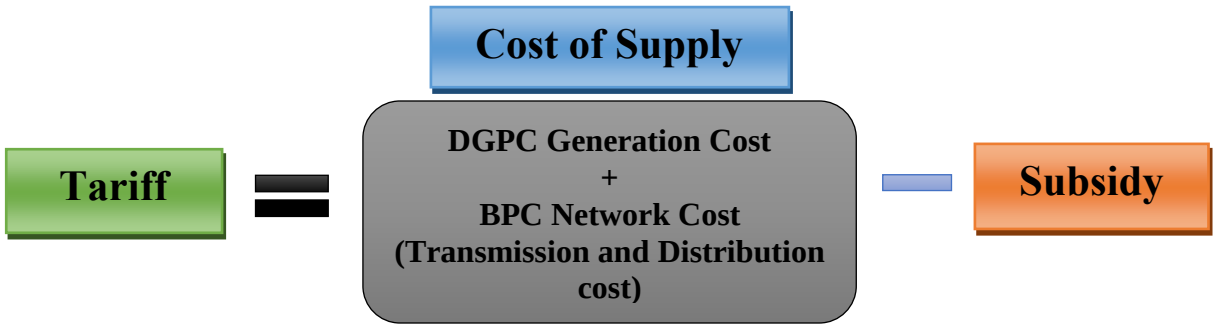

Figure 1: Electricity Tariff Components

2.1 Cost of supply

The Cost of Supply (CoS) of a customer category is computed as the sum of DGPC cost of generation and BPC network cost (transmission and distribution cost).

The DGPC cost of supply is determined as the sum of allowances for operation and maintenance costs, depreciation, return on fixed assets i.e. including an allowance for company taxation, cost of working capital and any regulatory fees, duties or levies that the Licensee is liable to pay under the Laws of Bhutan.

The BPC network cost includes the operation and maintenance costs, depreciation, return on fixed assets i.e. including an allowance for company taxation, cost of working capital and any regulatory fees, duties or levies that the Licensee is liable to pay under the Laws of Bhutan, cost of losses to transmit, distribute and supply electricity to the customers.

2.2 Subsidy

A subsidy is a financial support granted to BPC by the Royal Government to keep the Medium Voltage and Low Voltage customer tariffs lower than the Cost of Supply.

The existing LV, MV and HV tariff works out as DGPC generation cost plus BPC network cost less subsidy as provided in the Table 2.

Table 2: Computation of end user tariffs

Customer group	DGPC Generation Cost (Nu/kWh)	BPC network Cost (Nu/kWh)	Total Cost of Supply (Nu/kWh)	Subsidy (Nu/kWh)	Tariff
	A	B	C = A+B	D	E = C-D
LV Consumers (230/415 V)					
Block I (Rural Domestic) -<= 100	1.59	4.22	5.81	5.81	Nu. 0.00/kWh
Block I (Others) - <= 100 kWh				4.53	Nu.1.28/kWh
Block II - >=101 kWh to <= 300				3.21	Nu.2.60/kWh
Block III - >= 301 kWh				2.38	Nu. 3.43/kWh
LV Bulk				1.91	Nu. 3.90/kWh
MV Consumers (6.6/11/33 kV)					
Demand charge	1.59	3.79	5.38	1.53	Nu.275/kVA/month
Energy charge					Nu. 2.07/kWh
HV Consumers (66 kV and above)					
Demand charge	1.59	0.64	2.23	0	Nu.262/kVA/month
Energy charge				0	Nu.1.59/kWh

3 INSTITUTIONAL SET UP

The Ministry of Economic Affairs (MoEA) is the nodal ministry of the electricity sector and the Minister is empowered to provide policy guidelines associated with the electricity sector as per EAB, 2001. In addition, as per Section 17 of the EAB, 2001 the Minister, MoEA is empowered to set general policies, targets and strategies for the electricity industry operation and general policies on tariff determination. The roles of the various agencies in the implementation of tariffs are as follows:

i. Department of Hydropower and Power Systems (DHPS) is responsible for granting approval to the utility companies for development of hydropower, up-gradation and expansion of transmission systems. It is also responsible for examining the BEA's proposal for subsidies requirement and allocation of customers to be submitted to the Minister for approval.

ii. Department of Renewable Energy (DRE) is responsible for development of rural electrification, small/mini/micro hydro (below 25 MW), expansion and up-gradation of non-conventional renewal energy. DRE is also responsible for development of policy and feed-in tariff framework of renewable energy.

iii. Bhutan Electricity Authority (BEA) is responsible for development of the tariff determination regulations for setting domestic tariff. The BEA is also responsible for submitting the subsidy allocation proposal to the Royal Government for consideration.

iv. Druk Green Power Corporation Limited (DGPC) is responsible for ensuring domestic electricity supply security and provision of the royalty energy obligations and

implementing the approved tariff set by BEA. Besides, DGPC operates and manages the hydropower plants fully owned by the Royal Government and responsible for development of new hydropower projects independently, through joint ventures and through any other arrangements with domestic and international partners on behalf of the Royal Government as may be directed.

v. Bhutan Power Corporation Limited (BPC) is responsible for electricity transmission, distribution and supply functions including management and operations of embedded generation units consisting of micro/mini/small hydro and diesel generating units. Further, it's responsible for implementation of the national plans and programs as directed/approved by MoEA.

The figure below shows an over view of the electricity sector in Bhutan.

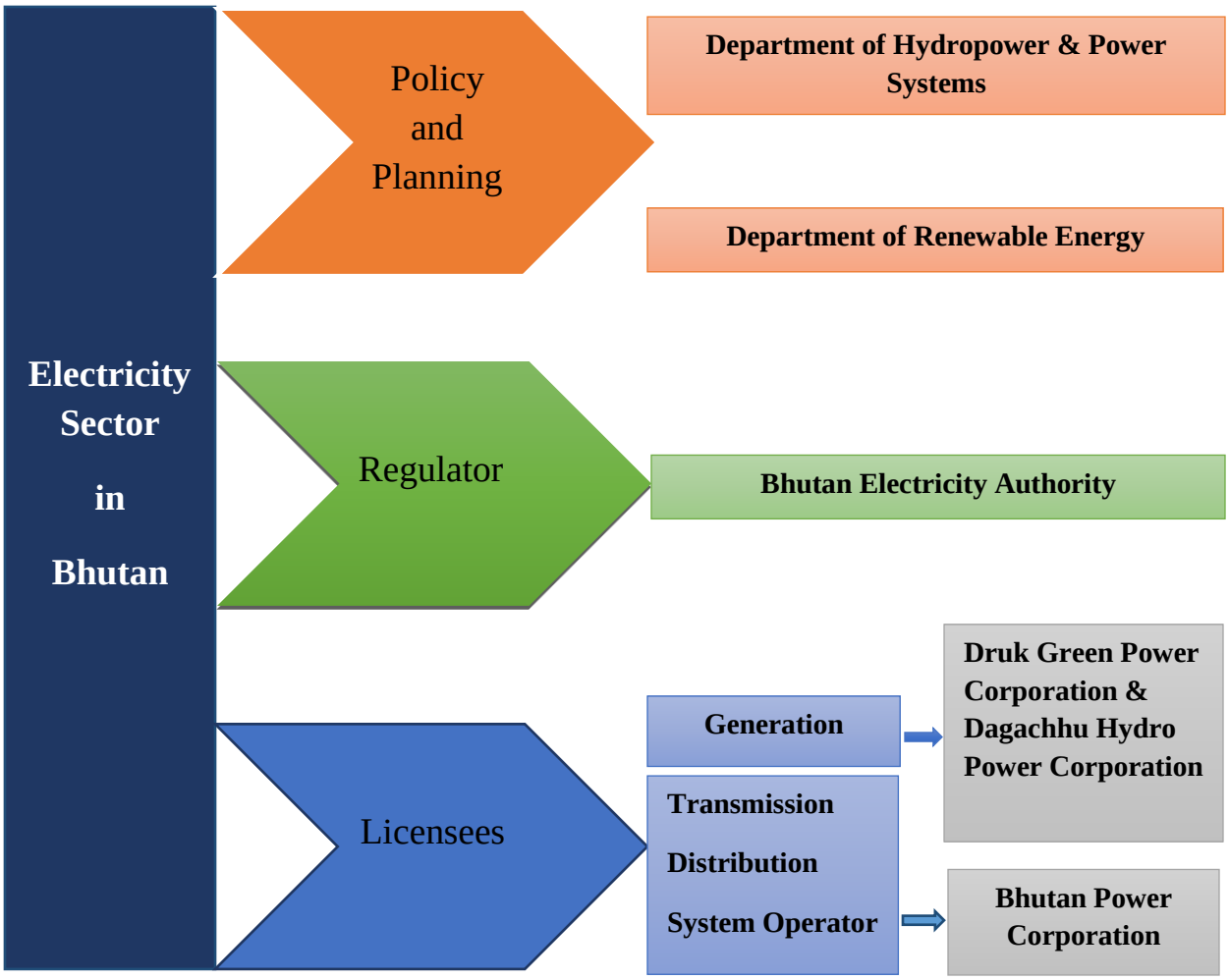

Figure 2: Electricity Sector in Bhutan

4 REGULATORY FRAMEWORK

The Section 7 of EAB, 2001 mandated the establishment of BEA to regulate the electricity generation, transmission and supply industry in Bhutan. One of the main functions of the BEA is to develop regulations for the electricity tariffs for generations not regulated by power purchase agreements (PPA), transmission and retail sale which is fair to both customers and service providers through a price system that reflects the actual cost of efficient business operation. The BEA determines tariff according to the principles set out in Section 14.1 of EAB, 2001. The Section 17 of the EAB, 2001 empowers the Minister to determine general policies, targets and strategies of the electricity industry operation and general policies on tariff determination and service provision of Licensee as well. The Minister is also empowered to approve power system expansion plan, provide policy on customer service standards and Licensee standards and provide electricity services for the underprivileged, etc as per the Section 17 of the EAB, 2001.

The MoEA issued the Domestic Electricity Tariff Policy (DETP), 2016 to provide guidelines for domestic tariff determination. This guideline through its rationalized and subsidy mechanism was issued to facilitate the Royal Government to provide affordable electricity through subsidized tariff and improve the quality of life of the people.

The Tariff Determination Regulation (TDR), 2007 was developed to provide for determination of electricity prices in accordance with the EAB, 2001. The schedules in TDR were reviewed and updated at each tariff review. Upon issuance of the DETP in 2016, the BEA issued TDR, 2016 incorporating the policy provisions.

The TDR, 2016 outlines the objectives, general conditions, tariff principles, tariff approval process, form of economic regulation, cost of supply methodology, application of subsidy, determination of generation prices and determination of end-user prices. The TDR also contains Schedules from A to F (A – Benchmarks for O&M costs, B – Depreciation rates, C – Return Allowances, D – Allowances for Auxiliary Consumption, E – Loss Allowances and F – Allocation Factors) and public hearing procedure.

The Licensee files tariff applications as per the Guidelines for Filing Tariff Application to BEA for the determination of electricity prices in accordance with TDR. The Guideline for filing tariff application outlines the procedure and format for the tariff applications to be used by the Licensees. The objective of the Guideline for filing tariff application is that the Licensees are guided appropriately to submit Tariff Application along with necessary information for the proper conduct of the tariff review.

5 TARIFF DETERMINATION PROCESS

As per the Tariff Determination Regulation, the Licensees are required to submit their investment plan for the upcoming tariff period at least nine months prior to expiry of the prevailing tariffs.

The licensees submit tariff applications for the revision of tariff schedule along with complete set of documents as per the Guidelines for Filing Tariff Application to BEA at least four months prior to the expiry of the prevailing tariffs.

Upon receipt of the tariff applications, the BEA conducts preliminary review to identify the additional information requirements. After completion of the preliminary review and receipt of all necessary documents, the tariff proposal is considered complete and published on the BEA website for public comments.

The BEA holds a public hearing where the Licensees present its tariff application to the consumers and other stakeholders. A period of three (3) weeks is allowed for submission of written comments to BEA after the public hearing. All comments received during public hearing and responses to the comments of consumers by Licensees are reviewed and taken into consideration for tariff review where relevant.

The BEA approves DGPC generation tariff and BPC cost of supply for all customer categories. After approval of DGPC and BPC cost of supply, BEA submits the tariff proposal including subsidy allocations to the Minister, MoEA through DHPS. The DHPS examines the proposals for subsidy requirement and allocation for customers and then presents it to Lhengye Zhungtshog for approval.

After the approval of subsidies by Lhengye Zhungtshog, the BEA approves new tariffs for DGPC and BPC. The BEA notifies the revised tariff schedule and issues tariff orders to BPC and DGPC.

The Figure 3 illustrates the current tariff approval process of BEA.

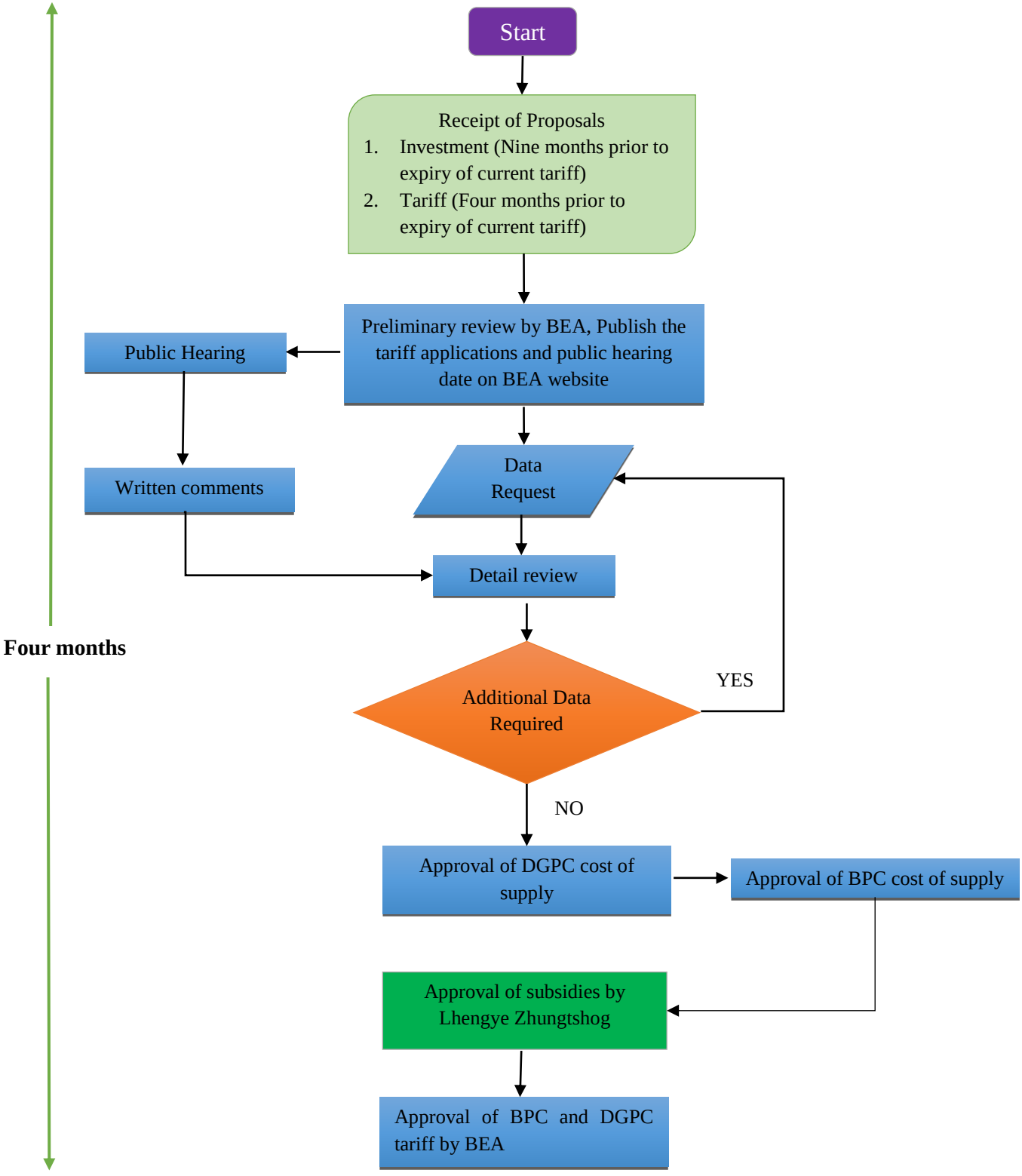

Figure 3 : Tariff Approval Process

DEVELOPMENT OF ELECTRICITY TARIFF

The electricity demand in the country increased from three (3) MW in 1979 to 336 MW in 2016 due to increase in electricity connectivity to the household carried out through rural electrification programs and development of industrial sector. The Figure 4 reflects the rise of electricity demand growth since 1979 – 2016.

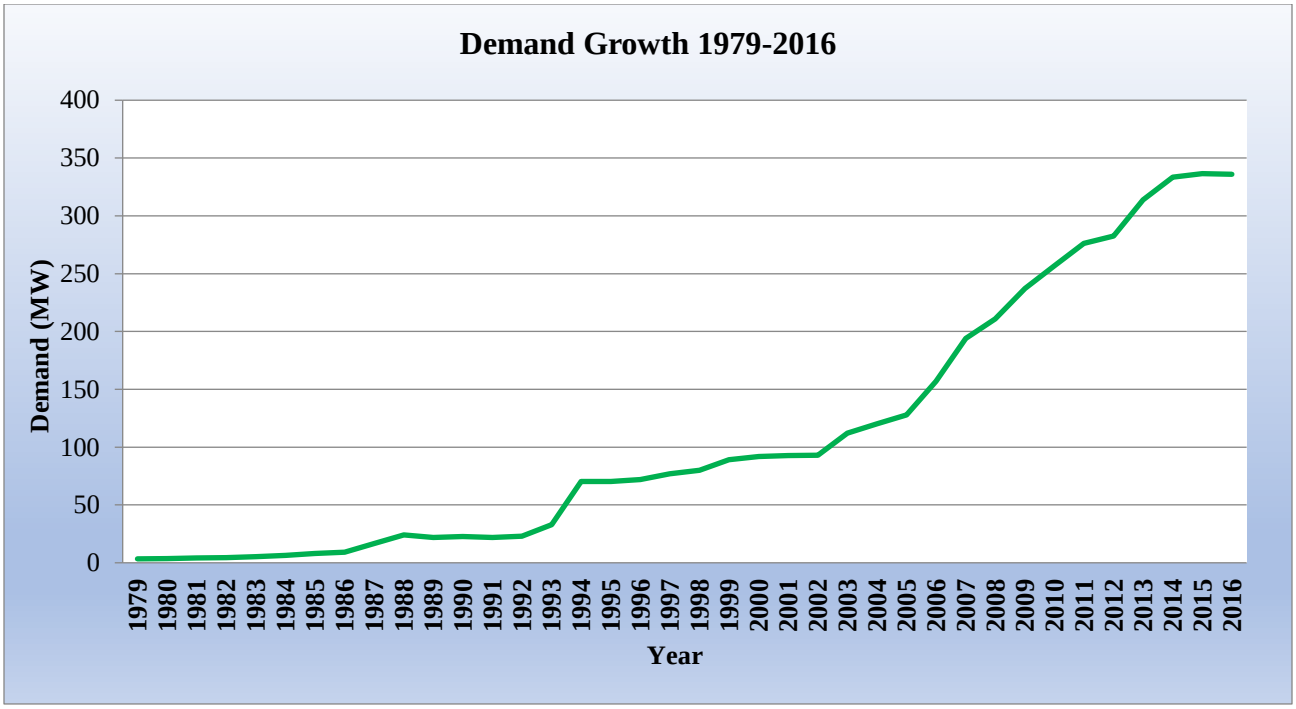

Figure 4 : Electricity Demand growth

In order to meet the demand growth, the erstwhile DoP invested in transmission and distribution lines and substations all over the country to transmit the power from the hydropower projects to the load centres. Following which, in the year 2002 BPC undertook the responsibility under the guidance of DoE to continue expansion of the grid (Distribution and transmission lines). Thus, from the network from 282 km of 11 kV distribution lines in early 1980s increased to network of transmission and distribution lines across the country in 2016 as provided in table below:

Table 3: Transmission and Distribution Lines

Sl. No	Particulars	Length (Km)
1.	400 kV transmission line	74
2.	220 kV transmission line (single circuit)	182
3.	220 kV transmission line (double circuit)	143
4.	132 kV transmission line (single circuit)	345

5.	66 kV transmission line (single circuit)	301
6.	66 kV transmission line (double circuit)	48
7.	33 kV Overhead distribution line	3,824
8.	11 kV Overhead distribution line	2591

With the increase in investments in the transmission and distribution network to increase the connectivity and to provide reliable supply of electricity, the cost of supply to the LV, MV and HV customers has increased. This increase is reflected with the gradual increase of tariff. Despite these increase in investment, the Royal Government of Bhutan has been able to provide electricity to its customer at affordable and stable rates, through its subsidy mechanism. The Figure 5 displays the growth of the LV residential tariff over the period 1982 – 2016.

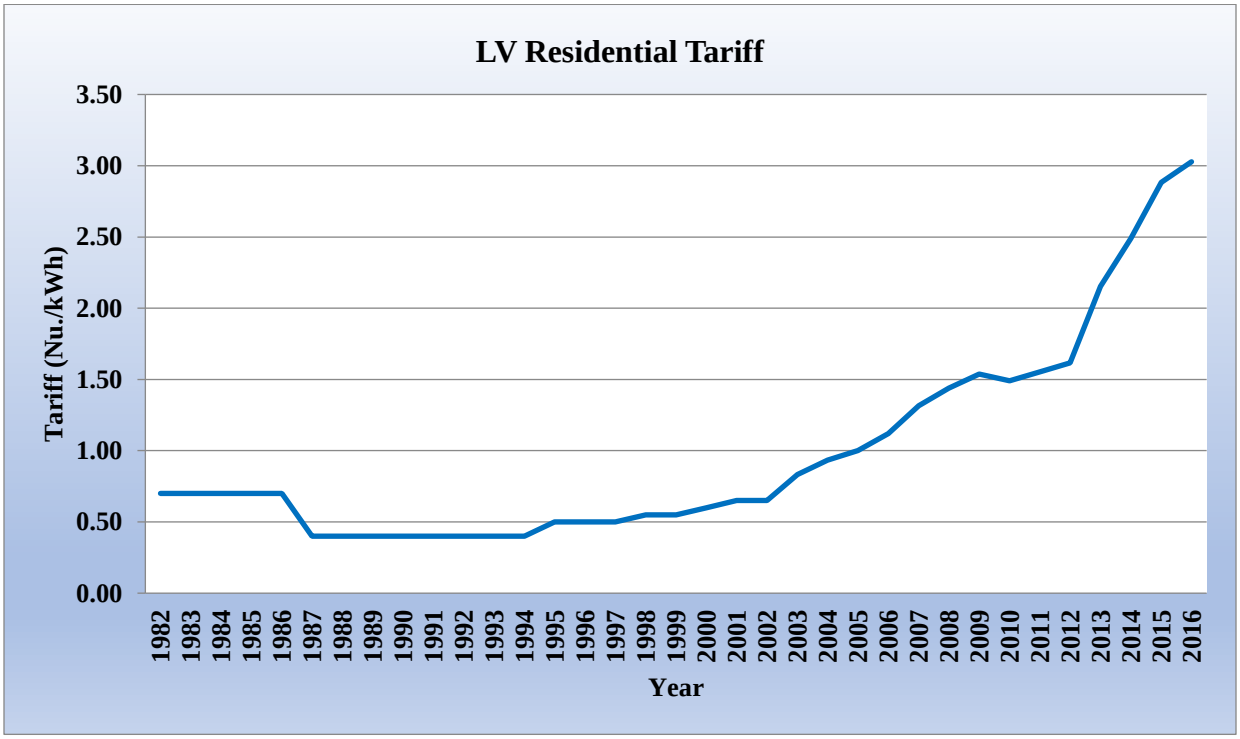

Figure 5 : LV Residential Tariff

The Figure 6 displays the growth of the HV industrial tariff over the period of 1982 – 2016. The HV industries were provided subsidy by the Royal Government till 2010 and the subsidies to HV industries were removed in 2011as per the Economic Development Policy 2010.

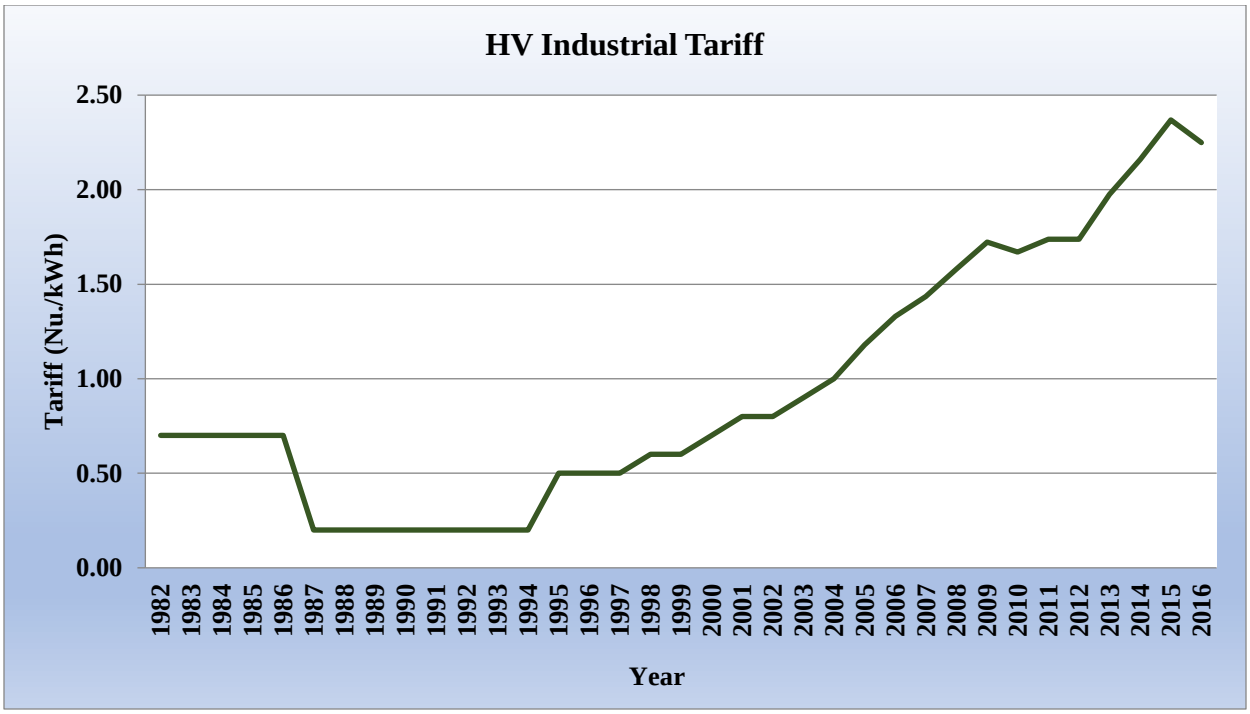

Figure 6 : HV Industrial Tariff

6 COMPARATIVE ANALYSIS

The tariff of hydropower plants and utilities in Bangladesh, India (Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Sikkim and West Bengal) and Myanmar were compared with the DGPC plant-wise generation and BPC end user tariff respectively to see how electricity tariff in Bhutan stands with respect to the neighboring countries.

6.1 Generation Tariff

The hydropower projects and their respective tariffs are dependent on their location, type of project (run of the river or reservoir), technology, year of commissioning and the tariff determination methodologies adopted in each country or state. The Table 4 provides the cost of supply of the four DGPC plants in Bhutan under the prevailing tariff determination methodology.

Table 4: DGPC plant wise tariff

Sl. No.	Name of Power Plant	Commercial Operation Date (CoD)	Installed Capacity (MW)	Tariff (Nu. /kWh)
1	Chhukha Hydropower Plant	1988	336	0.60
2	Tala Hydropower Plant	2007	1020	1.86
3	Basochhu Hydropower Plant	2005	64	2.13
4	Kurichu Hydropower Plant	2002	60	2.52
Total Installed capacity			**1480**	
Average DGPC tariff				**1.59**

While some countries provide generation tariff on plant wise basis, some determine a consolidated generation tariff for all hydropower plants under the same company. For the purpose of the analysis, the generation tariff which was available on plant wise basis has been used. The available hydropower generation tariff was ranked lowest to the highest tariff as shown in Figure 7.

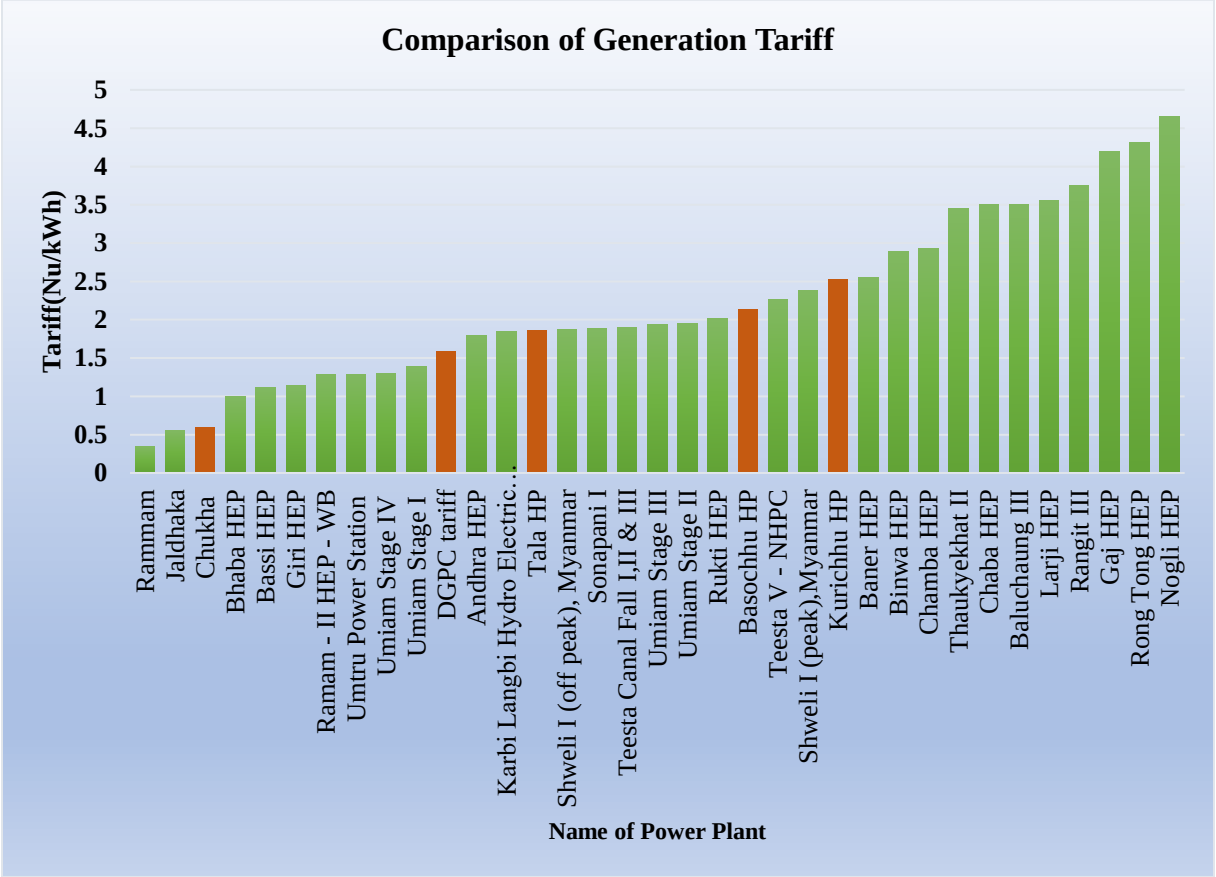

Figure 7 : Comparison of Generation Tariff

The generation tariff for Chukha Hydropower Plant is one of the lowest tariffs among researched countries. The tariff for Tala Hydro Hydropower Plant is comparable with the off-peak tariff but much lower than the peak tariff of large scale hydropower projects in Myanmar. Further, both Kurichhu Hydropower Plant and Basochhu Hydropower Plant tariff is much lower than the plants in Indian states of similar capacity and those commissioned around the same time.

6.2 End User Tariff

The prevailing end user tariff for LV, MV and HV consumers in Bhutan was compared with the electricity tariff rates of India (Arunachal Pradesh, Himachal Pradesh, Meghalaya, Sikkim and West Bengal), Bangladesh and Myanmar. In Bhutan, only Energy Charge is levied on LV consumers while Demand Charge is levied to the MV and HV consumers in addition to the Energy Charge.

The figures below display the existing energy and demand charge for the LV consumers of utilities in Bangladesh, India (Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Sikkim and West Bengal) and Myanmar including Bhutan.

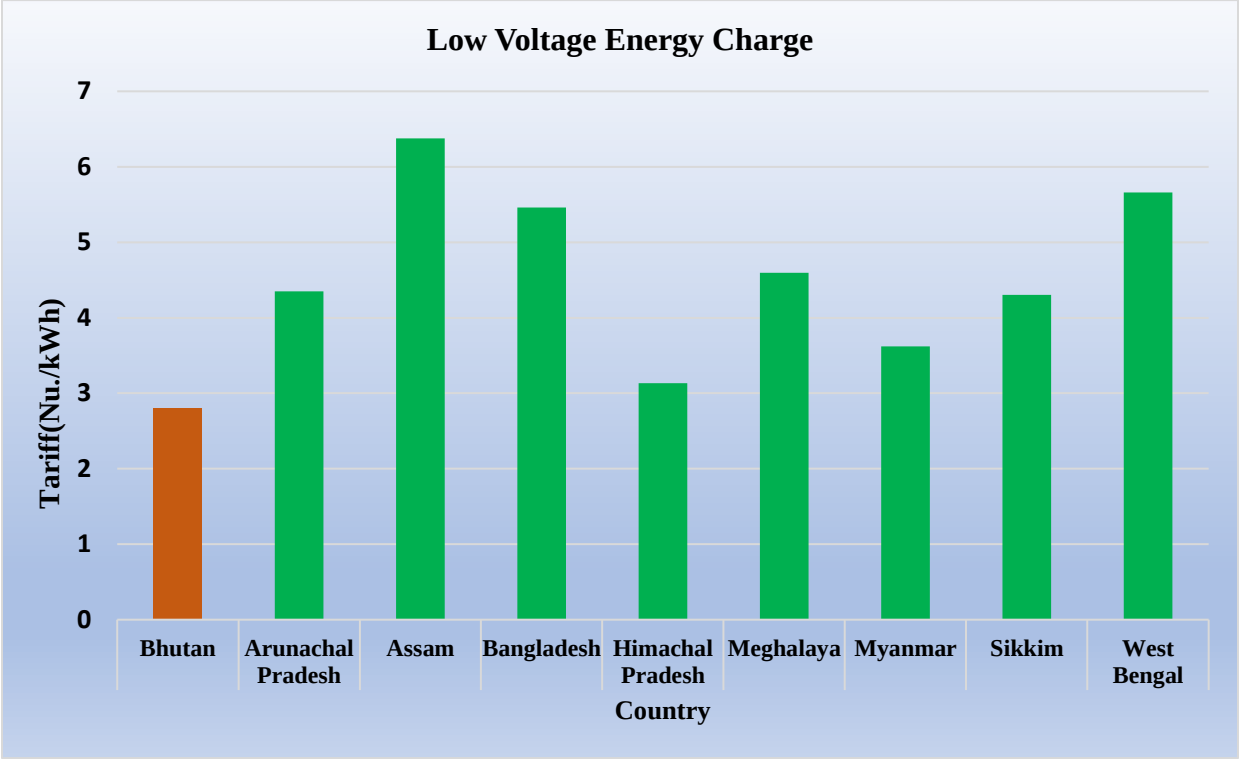

Figure 8 : Comparison of LV Energy Charge

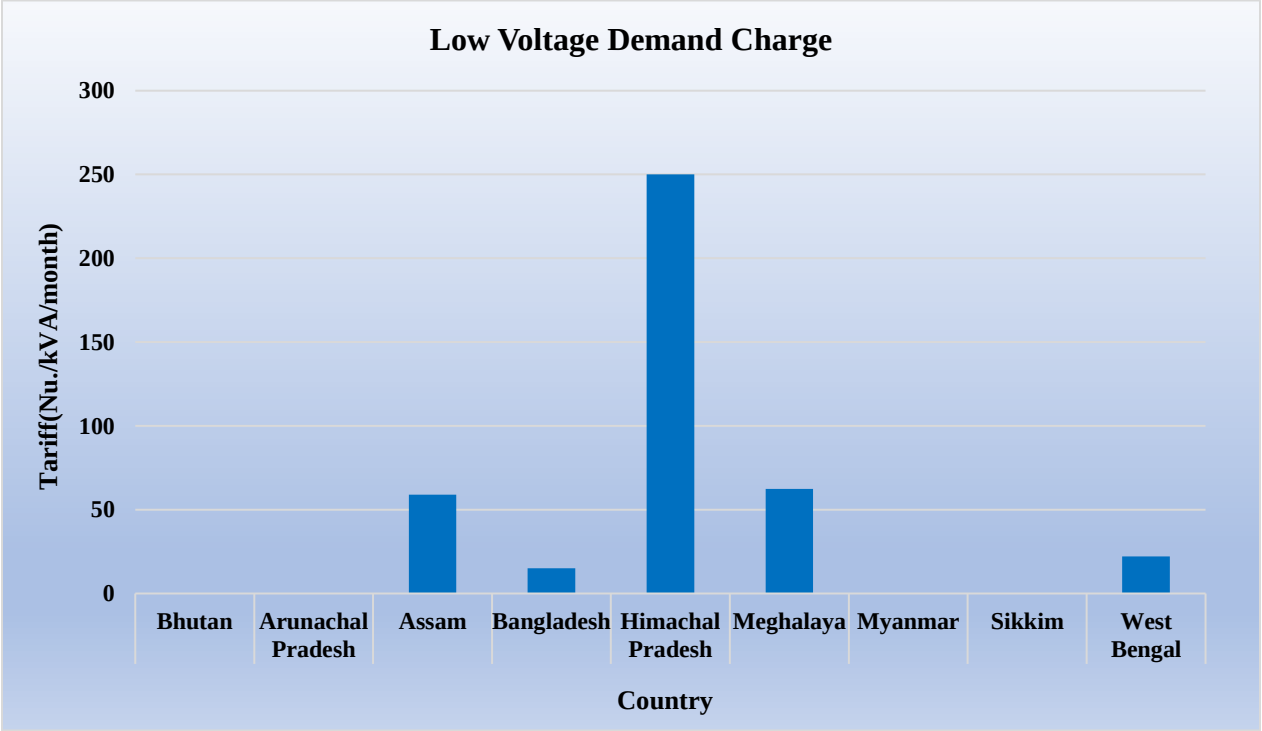

Figure 9 : Comparison of LV Demand Charge

From the Figures 8 and 9, it can be seen that the LV consumers in Bhutan enjoy much lower tariff rates than most neighboring Indian states, Bangladesh and Myanmar. Further, the LV customers are levied DC in addition to EC in Assam, Bangladesh, Himachal Pradesh, Meghalaya and West Bengal where as in Bhutan only EC is levied.

The Figures 10 and 11 below compares the existing energy and demand charge for the MV consumers of utilities in Bhutan, Bangladesh, India (Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Sikkim and West Bengal) and Myanmar.

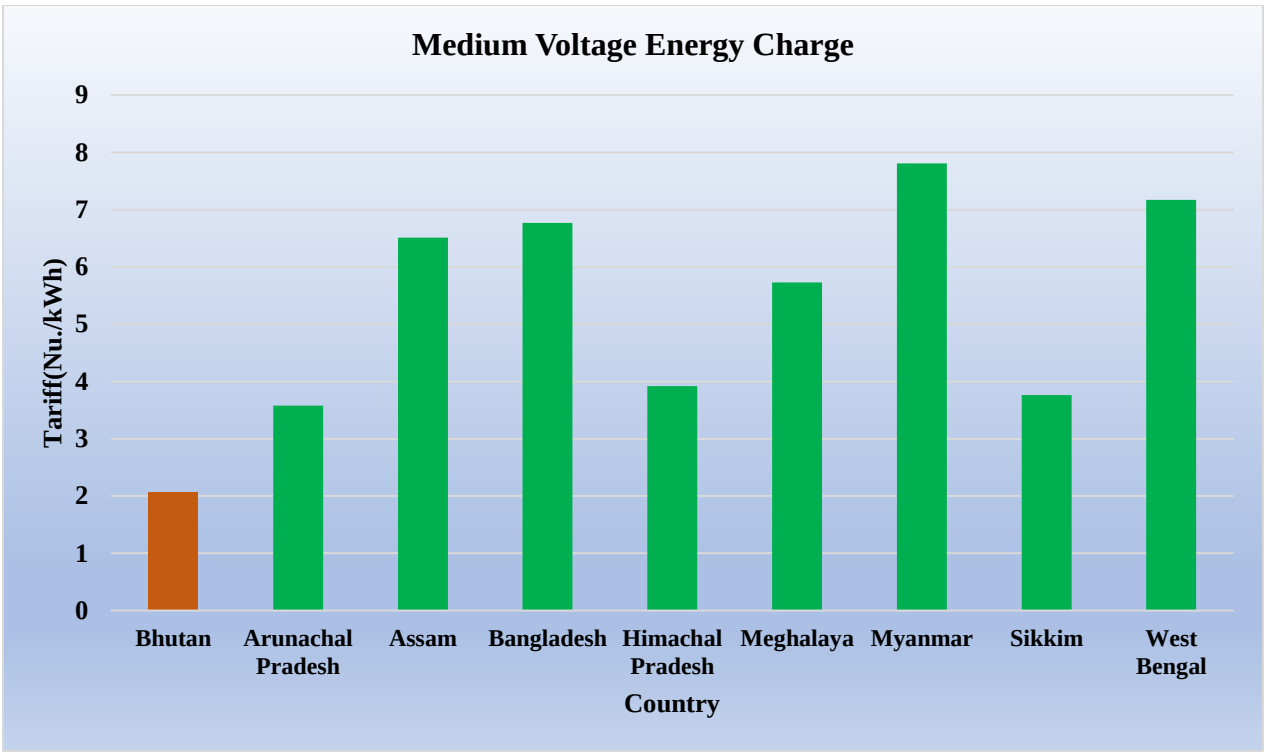

Figure 10 : Comparison of MV Energy Charge

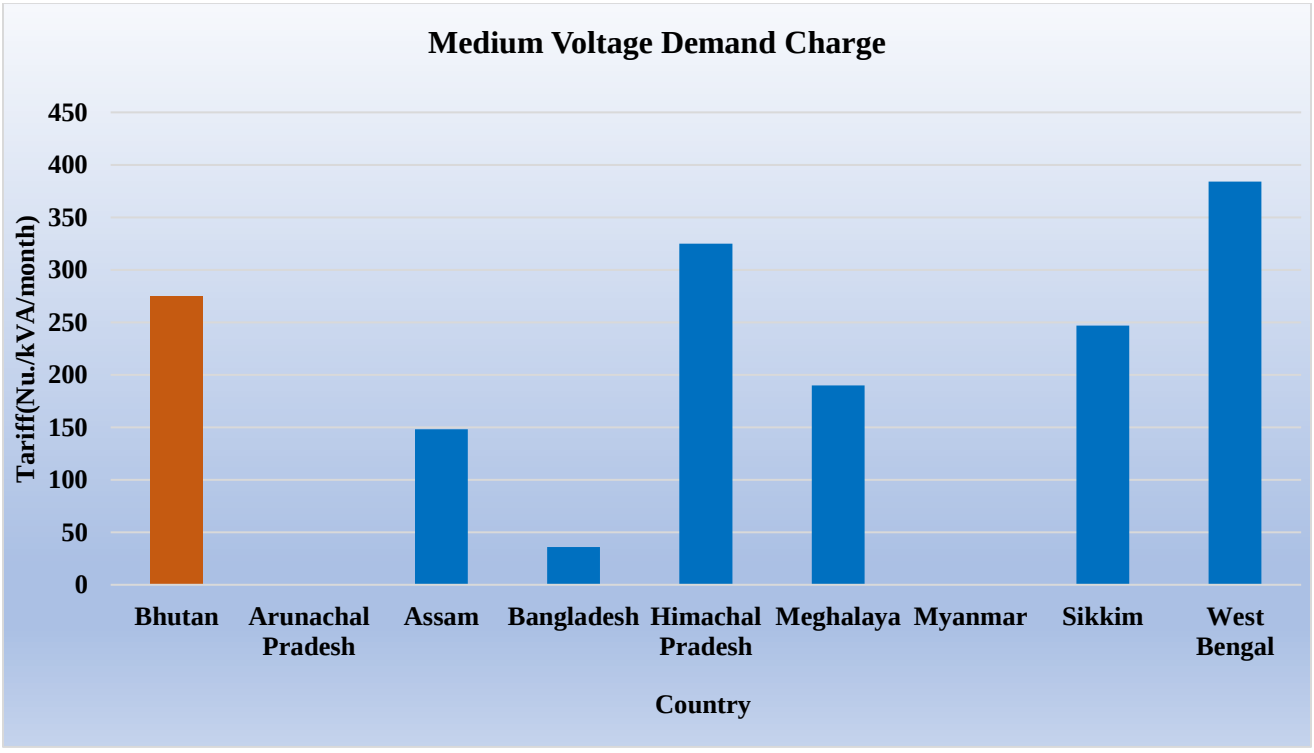

Figure 11 : Comparison of MV Demand Charge

From the Figures 10 and 11, the Energy Charge for the MV consumers in Bhutan is lowest compared to neighboring Indian states, Bangladesh and Myanmar. While it seems that the MV Demand Charge alone is higher than some of the demand charge in neighboring countries, the average tariff (Energy and Demand charge) of Nu. 3.83/kWh for MV customers in Bhutan is lower than the average tariff in the Indian states and countries in the region.

The Figures 12 and 13 below display the existing energy and demand charge for the HV consumers of utilities in Bangladesh, India (Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Sikkim and West Bengal) and Myanmar including Bhutan.

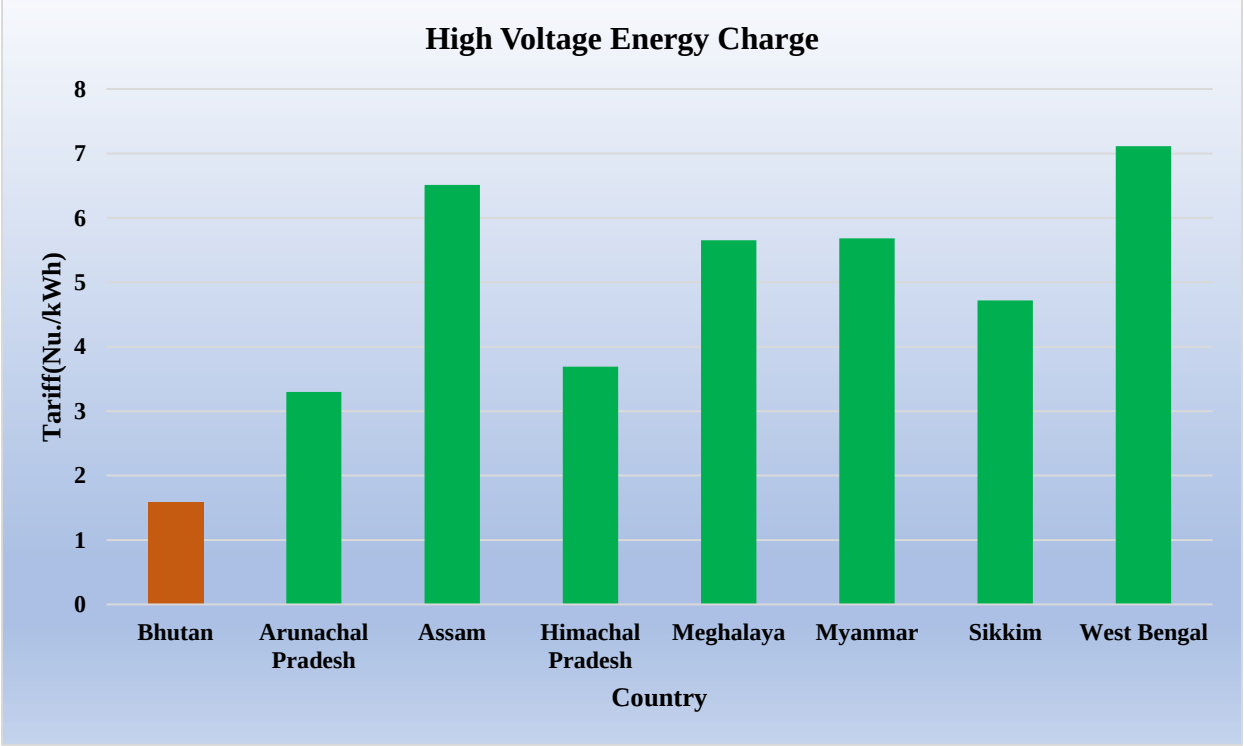

Figure 12 : Comparison of HV Energy Charge

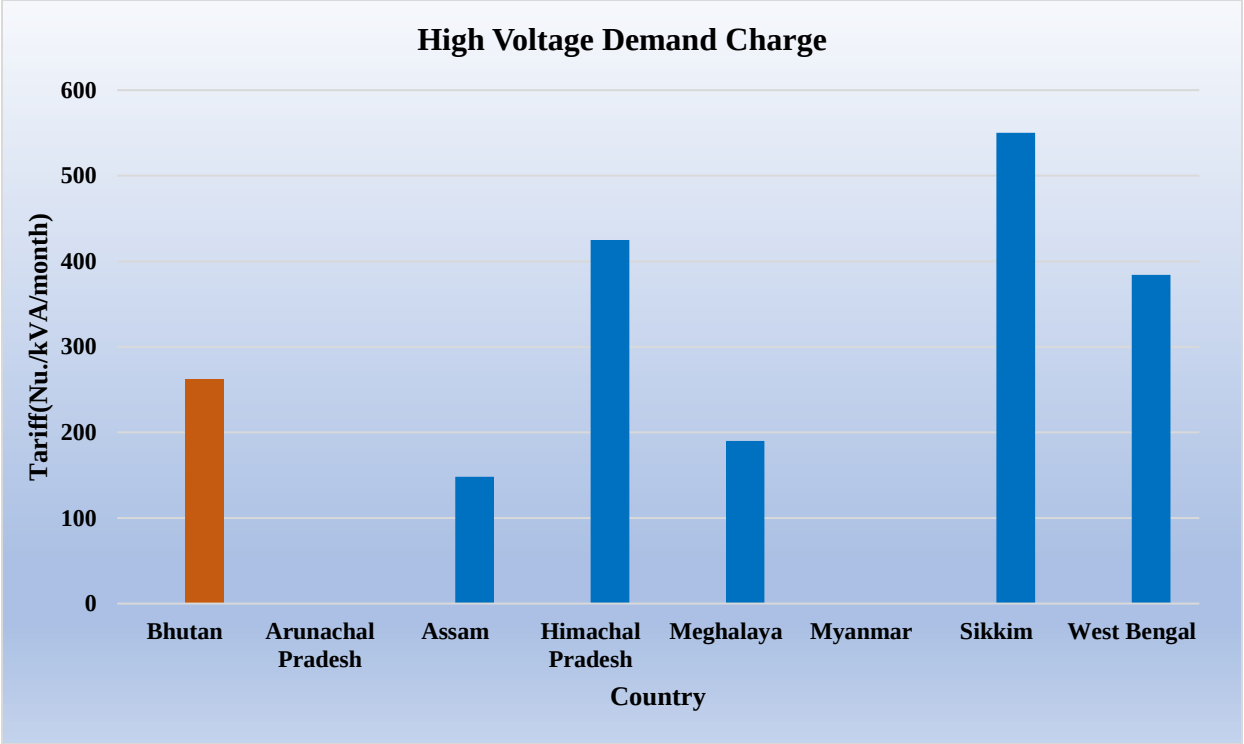

Figure 13 : Comparison of HV Demand Charge

From the Figures 12 and 13, the EC for the HV consumers in Bhutan is lowest compared to neighboring Indian states and Myanmar. While it seems that the HV Demand Charge alone is higher than some of the DC in neighboring countries, the average tariff (energy and demand charge) of Nu 2.23/kWh for HV consumers in Bhutan is lower than the average tariff in the Indian States and Myanmar.

7 ANNEXURES

7.1 Annexure: Domestic Power Tariff

Period	Customer Category	Tariff
From 1st April 1982 to 31st March 1987	• Domestic: Rural, Urban	Nu. 0.70/kWh
	• Commercial & Institutional	Nu. 0.80/kWh
	• Industrial	Nu. 0.70/kWh
	• Bulk	Nu. 0.60/kWh
	• Public lighting	Nu. 0.70/kWh
	• Unmetered rate for light point	Nu. 5.00/month
	• Unmetered rate for power point	Nu 20.00/month
From 1st April 1987 to 31st March 1995	• General Tariff (Domestic, Commercial, Institutional, Industrial, Bulk & Public Lighting)	Nu. 0.40/kWh
	• BCCI Tariff	Nu. 0.20/kWh
	• Unmetered rate for light point	Nu. 5.00/month
	• Unmetered rate for power point	Nu. 15.00/month
From 1st April 1995 to 30th June 1997	• General Tariff (Domestic, Commercial, Institutional, Industrial, Bulk & Public Lighting)	Nu. 0.50/kWh
	• Tariff for major Industry (BCCI & BFAL)	Nu. 0.50/kWh
	• Unmetered rate for light point	Nu. 5.00/month
	• Unmetered rate for power point	Nu. 25.00/month
From 1st July 1997 to 31st December 1999	• Rural Household	Nu. 0.50/kWh
	• Urban Household	Nu. 0.60/kWh
	• Bulk, Institutional, Commercial, Industrial & Public Lighting	Nu. 0.60/kWh
	• Unmetered rate for light point	Nu. 5.00/ month
	• Unmetered rate for power point	Nu. 25.00/ month
From 1st January 2000 to 30th June 2001	• Rural Household	Nu. 0.50/kWh
	• Urban Household	Nu. 0.70/kWh
	• Bulk, Institutional, Commercial, Industrial & Public Lighting	Nu. 0.70/kWh
	• Unmetered rate for light point	Nu. 5.00/ month
	• Unmetered rate for power point	Nu. 25.00/ month
From 1st July 2001 to 31st December 2002	• Rural Household	Nu. 0.50/kWh
	• Urban Household	Nu. 0.80/kWh
	• Bulk, Institutional, Commercial, Industrial & Public Lighting	Nu. 0.80/kWh
From 1st January 2003 to 30th June 2004	**LV Consumers** • Block I - <= 80 kWh • Block II - >=81 kWh to <= 200 kWh • Block III - >= 201 kWh	 Nu. 0.60/kWh Nu. 0.90/kWh Nu. 1.00/kWh
	Medium voltage (MV) Consumers (6.6/11/33 kV) • Energy Charge	 Nu. 0.95/kWh

	High voltage HV Consumers (66 kV and above) • Energy Charge	 Nu. 0.90/kWh
From 1st July 2004 to 31st July 2005	**LV Consumers** • Block I - <= 80 kWh • Block II - >=81 kWh to <= 200 kWh • Block III - >= 201 kWh	 Nu. 0.60/kWh Nu. 0.95/kWh Nu. 1.20/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 54/kW/month Nu. 0.95/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 54/kW/month Nu. 0.90/kWh
From 1st August 2005 to 30th June 2006	**LV Consumers** • Block I - <= 80 kWh • Block II - >=81 kWh to <= 200 kWh • Block III - >= 201 kWh • LV Bulk	 Nu. 0.60/kWh Nu. 1.10/kWh Nu. 1.30/kWh Nu. 1.25/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 54/kW/month Nu. 1.10/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 54/kW/month Nu. 1.05/kWh
From 1st July 2006 to 30th June 2007	**LV Consumers** • Block I - <= 80 kWh • Block II - >=81 kWh to <= 200 kWh • Block III - >= 201 kWh • LV Bulk	 Nu. 0.70/kWh Nu. 1.20/kWh Nu. 1.45/kWh Nu. 1.35/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 54/kW/month Nu. 1.25/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 54/kW/month Nu. 1.20/kWh
From 1st July 2007 to 30th June 2008	**LV Consumers** • Block I - <= 80 kWh • Block II - >=81 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.75/kWh Nu. 1.25/kWh Nu. 1.55/kWh Nu. 1.55/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 65/kW/month Nu. 1.30/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 65/kW/month Nu. 1.29/kWh
From 1st July 2008 to 30th June 2009	**LV Consumers** • Block I - <= 80 kWh • Block II - >=81 kWh to <= 300 kWh	 Nu. 0.75/kWh Nu. 1.35/kWh

	• Block III - >= 301 kWh • LV Bulk	Nu. 1.70/kWh Nu. 1.70/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 75/kW/month Nu. 1.43/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 75.kW/month Nu. 1.40/kWh
From 1st July 2009 to 31st July 2010	**LV Consumers** • Block I - <= 80 kWh • Block II - >=81 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.75/kWh Nu. 1.40/kWh Nu. 1.85/kWh Nu. 1.85/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 85/kW/month Nu. 1.55/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 85/kW/month Nu. 1.51/kWh
From 1st August 2010 to 30th June 2011	**LV Consumers** • Block I - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.85/kWh Nu. 1.47/kWh Nu. 1.94/kWh Nu. 1.94/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 95/kW/month Nu. 1.63/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 85/kW/month Nu. 1.51/kWh
From 1st July 2011 to 30th June 2012	**LV Consumers** • Block I - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.85/kWh Nu. 1.54/kWh Nu. 2.04/kWh Nu. 2.04/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 105/kW/month Nu. 1.71/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 105/kW/month Nu. 1.54/kWh
From 1st July 2012 to 30th September 2013	**LV Consumers** • Block I - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.85/kWh Nu. 1.62/kWh Nu. 2.14/kWh Nu. 2.14/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge	 Nu. 115/kW/month

	• Energy Charge	Nu. 1.79/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 105/kW/month Nu. 1.54/kWh
From 1st October 2013 to 30th June 2014	**LV Consumers** • Block I (Rural Domestic) -<= 100 kWh • Block I (Others) - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.00/kWh Nu. 0.98/kWh Nu. 1.86/kWh Nu. 2.46/kWh Nu. 2.56/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 155/kW/month Nu. 1.98/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 130/kW/month Nu. 1.67/kWh
From 1st July 2014 to 30th June 2015	**LV Consumers** • Block I (Rural Domestic) -<= 100 kWh • Block I (Others) - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.00/kWh Nu. 1.12/kWh Nu. 2.13/kWh Nu. 2.82/kWh Nu. 3.07/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 195/kW/month Nu. 2.19/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 155/kW/month Nu. 1.81/kWh
From 1st July 2015 to 31st December 2016	**LV Consumers** • Block I (Rural Domestic) -<= 100 kWh • Block I (Others) - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.00/kWh Nu. 1.28/kWh Nu. 2.45/kWh Nu. 3.23/kWh Nu. 3.68/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 235/kW/month Nu. 2.43/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 180/kW/month Nu. 1.96/kWh
From 1st January 2017 to 30th June 2017	**LV Consumers** • Block I (Rural Domestic) -<= 100 kWh • Block I (Others) - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.00/kWh Nu. 1.28/kWh Nu. 2.52/kWh Nu. 3.33/kWh Nu. 3.79/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge	 Nu. 250/kVA/month

	• Energy Charge	Nu. 2.00/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 262/kVA/month Nu. 1.59/kWh
From 1st July 2017 to 30th June 2018	**LV Consumers** • Block I (Rural Domestic) -<= 100 kWh • Block I (Others) - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.00/kWh Nu. 1.28/kWh Nu. 2.60/kWh Nu. 3.43/kWh Nu. 3.90/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 275/kVA/month Nu. 2.07/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 262/kVA/month Nu. 1.59/kWh
From 1st July 2018 to 30th June 2019	**LV Consumers** • Block I (Rural Domestic) -<= 100 kWh • Block I (Others) - <= 100 kWh • Block II - >=101 kWh to <= 300 kWh • Block III - >= 301 kWh • LV Bulk	 Nu. 0.00/kWh Nu. 1.28/kWh Nu. 2.68/kWh Nu. 3.53/kWh Nu. 4.02/kWh
	MV Consumers (6.6/11/33 kV) • Demand Charge • Energy Charge	 Nu. 300/kVA/month Nu. 2.16/kWh
	HV Consumers (66 kV and above) • Demand Charge • Energy Charge	 Nu. 262/kVA/month Nu. 1.59/kWh

7.2 Annexure: Comparison of Generation Tariffs

Sl. No.	Name of the Power Plant	Country/State	Installed Capacity (MW)	CoD (Year)	Tariff (Nu./kWh)
1.	Rammam	West Bengal	51	1995-1996	0.35
2.	Jaldhaka	West Bengal	44	1967	0.56
3.	**Chukha**	**Bhutan**	**336**	**1986-1988**	**0.60**
4.	Bhaba HEP	Himachal Pradesh	120	1978	1.00
5.	Bassi HEP	Himachal Pradesh	60	1970	1.12
6.	Giri HEP	Himachal Pradesh	60	1978	1.14
7.	Ramam - II HEP - WB	Sikkim	50	1995	1.28
8.	Umtru Power Station	Meghalaya	11.2	1957-1968	1.29
9.	Umiam Stage IV	Meghalaya	60	1992	1.30
10.	Umiam Stage I	Meghalaya	36	1965	1.39
11.	**DGPC tariff**	**Bhutan**	**1480**		**1.59**
12.	Andhra HEP	Himachal Pradesh	16.95	1987	1.79
13.	Karbi Langbi Hydro Electric Project	Assam	100	2007	1.84
14.	**Tala HP**	**Bhutan**	**1020**	**2006-2007**	**1.86**
15.	Shweli I (off peak)	Myanmar	600	2008	1.87
16.	Sonapani I	Meghalaya	1.5	2009	1.88
17.	Teesta Canal Fall I,II & III	West Bengal	67.5	1997-1999	1.90
18.	Umiam Stage III	Meghalaya	60	1979	1.94
19.	Umiam Stage II	Meghalaya	20	1970	1.95
20.	Rukti HEP	Himachal Pradesh	1.5	1979-1980	2.01
21.	**Basochhu HP**	**Bhutan**	**64**	**2002-2005**	**2.13**
22.	Teesta V - NHPC	Sikkim	510	2008	2.26
23.	Shweli I (peak)	Myanmar	600	2008	2.38
24.	**Kurichhu HP**	**Bhutan**	**60**	**2001-2002**	**2.52**
25.	Baner HEP	Himachal Pradesh	12	1996	2.55
26.	Binwa HEP	Himachal Pradesh	6	1984	2.89
27.	Chamba HEP	Himachal Pradesh	0.45	1938	2.93
28.	Thaukyekhat II	Myanmar	120	2013	3.45
29.	Chaba HEP	Himachal Pradesh	1.75	1913-1914	3.50
30.	Baluchaung III	Myanmar	52	2013	3.51
31.	Larji HEP	Himachal Pradesh	126	2006	3.55
32.	Rangit III	Sikkim	60	2000	3.75
33.	Gaj HEP	Himachal Pradesh	10.5	1996	4.20
34.	Rong Tong HEP	Himachal Pradesh	2	1986-1987	4.31
35.	Nogli HEP	Himachal Pradesh	2.5	1963	4.65

7.3 Annexure: Comparison of end user tariffs

Customer Category	Tariff Energy Charge (EC)- Nu /kWh Demand Charge – Nu./kVA/month																	
Low Voltage	**Bhutan**		**Arunachal Pradesh**		**Assam**		**Bangladesh**		**Himachal Pradesh**		**Meghalaya**		**Myanmar**		**Sikkim**		**West Bengal**	
Block kWh/mth	**EC**	**DC**	**EC**	**DC**	**EC**	**DC**	**EC**	**DC**	**EC**	**DC**	**EC**	**DC**	**EC**	**DC**	**EC**	**DC**	**EC**	**DC**
0 – 100	1.28		4.35	-	4.71	25	3.51	12.7	1.20		3.00	50	1.99	-	1.72		3.68	3.13
101 – 300	2.60		4.35	-	7.08	30	4.42	12.7	2.73		4.38	50	2.56	-	4.11		5.24	5
Above 300	3.43		4.35	-	6.71	56	6.87	12.7	4.35		5.00	50	2.84	-	5.45		6.74	5
LV Bulk	3.90		4.35	-	7.0	125	7.04	22.3	4.25	250	6	100	7.10	-	5.94		6.98	75
Medium Voltage	2.07	275	3.58	-	6.51	148	6.77	36.1	3.92	325	5.73	190	7.81	-	3.76	247	7.17	384
High Voltage	1.59	262	3.30	-	6.51	148	-	-	3.69	425	5.65	190	5.68	-	4.72	550	7.11	384

8 REFERENCES

i. Electricity Act of Bhutan, 2001

ii. Tariff Determination Regulation, 2016

iii. Domestic Electricity Tariff Policy, 2016

iv. Power Data Book 2016, Bhutan Power Corporation Ltd

v. Power Data Book 2013, Bhutan Power Corporation Ltd

vi. Power Data Book, 2011, Department of Energy

vii. Tariff Order for FY 2015-16 For Department of Hydro Power Development Royal Government of Arunachal Pradesh.

viii. Determination of Aggregate Revenue Requirement for FY 2016-17 & Order for Retail Tariff for FY 2016-17 And True-up of ARR of FY 2013-14, Review of ARR of FY 2014-15 for Department of Power Royal Government of Arunachal Pradesh.

ix. True Up for FY 2014-15 & FY 2015-16 and ARR FOR FY 2016-17 to FY 2018-19 and TARIFF FOR FY 2017-18, Assam Power Distribution Company Limited (APDCL).

x. TRUE-UP FOR FY 2014-15 & FY 2015-16 and ARR FOR FY 2016-17 to FY 2018-19 and TARIFF FOR FY 2017-18, Assam Power Generation Corporation Limited (APGCL).

xi. Ministry of Electricity and Energy, Country Presentation of Myanmar August ,2016

xii. Tariff Order for the FY 2016-17 For Energy & Power Department, Royal Government of Sikkim April, 2016, Sikkim State Electricity Regulatory Commission Gangtok, Sikkim

xiii. Annual Report & Accounts 2015-16, West Bengal State Electricity Distribution Company Limited

xiv. Details of Various Generating Stations located in West Bengal (as on 31.3.2015)

xv. Gist of the Tariff order dated 28/10/2016 for the year 2016-17 issued by the West Bengal Electricity Regulatory ("Commission").

xvi. Multi Year Tariff Order for Himachal Pradesh State Electricity Board Limited, Generation Business for the period FY 2014-15 to FY 2018-19.

xvii. Schedule for Tariff and Schedule of General &Services Charges (Applicable w.e.f 01.04.2016), Himachal Pradesh State Electricity Board Limited.