# MEGHALAYA STATE ELECTRICITY REGULATORY COMMISSION

1<sup>st</sup> Floor (Front Block Left Wing), New Administrative Building, Lower Lachumiere, Shillong – 793 001 East Khasi Hills District, Meghalaya

#### CASE NO. 04

#### In the matter of:

Approval of Business Plan for the MYT Control Period from FY 2018-19 to FY 2020-21.

And

Meghalaya Power Transmission Corporation Limited...... Petitioner

Coram WMS Pariat, IAS (Retd.) Chairman ORDER

### Date: 31.10.2017

- The Meghalaya Power Transmission Corporation Limited (herein after referred to as MePTCL) is a deemed licensee in terms of section 14 of the Electricity Act, 2003 (herein after referred to as Act), engaged in the business of transmission of electricity in the State of Meghalaya.
- 2. In exercise of powers conferred by clause (Zc), (Zd) and (Ze) of sub-section 2 of section 18, read with sections 61, 62, 64, 65 and 86 of the Act and all other powers enabling on that behalf and after previous publication, the Meghalaya State Electricity Regulatory Commission (herein after referred to as MSERC or Commission) issued MSERC (Multi-Year Tariff) Regulations, 2014 (herein after referred to as MYT Regulations, 2014).
- The Commission has amended and substituted the sub-Regulation 1.4 of MYT Regulations, 2014 as reproduced below:

"1.4. These Regulations shall be applicable for the determination of Tariff in all cases covered under these Regulations effective from 1<sup>st</sup> April, 2015 onwards to 31<sup>st</sup> March, 2018 and also for the next MYT Control Period beginning from 1<sup>st</sup> April, 2018 to 31<sup>st</sup> March, 2021".

- 4. As per provisions of sub-Regulations 1.4 (amended) and Regulations 8 and 66 of MYT Regulations, 2014, MePTCL has filed the Petition for approval of its Business Plan for three years Control Period of FY 2018-19 to FY 2020-21 with details for each year of the Control Period.
- 5. As per provisions of sub-Regulations 8.1, 8.2 and 8.3, the Business Plan shall comprise of but not limited to detail...... capital investment plan, financing plan and physical targets.
- The Commission, in exercise of powers vested in Clause 8.4 under Regulation 8 of MYT Regulations, 2014, passed this order approving the Business Plan (attached herewith) for three years control period of FY 2018-19 to FY 2020-21.
- MePTCL shall submit the petition for determination of ARR and transmission charges for MYT Control Period from FY 2018-19 to FY 2020-21 on or before 30<sup>th</sup> November, 2017 in accordance with Regulation 18 of MYT Regulations, 2014.
- This Order shall be placed on the website of the Commission and a copy shall be sent to MePTCL and MeECL.

WMS Pariat Chairman

# 1 Introduction

The Meghalaya Power Transmission Corporation Limited (MePTCL) shall file its Business Plan for the control period of FY 2018-19 to FY 2020-21 in accordance with Regulation 8 of the MSERC (Multi Year Tariff) Regulations 2014. The relevant excepts of the regulations is reproduced below:

# "8 Business Plan

8.1 The Generating Company, Transmission licensee, and Distribution Licensee for Distribution Business, shall file a Business Plan for the Control Period of three (3) financial years from 1st April 2015 to 31st March 2018, which shall comprise but not be limited to detailed category-wise sales and demand projections, power procurement plan, capital investment plan, financing plan and physical targets, in accordance with guidelinesand formats, as may be prescribed by the Commission from time to time:

Provided that a mid-term review of the Business Plan/Petition may be sought by the Generating Company, Transmission Licensee and Distribution Licensee through an application filed three (3) months prior to the specified date of filing of Petition for truing up for the second year of the Control Period and tariff determination for the third year of the Control Period.

8.2 The capital investment plan shall show separately, on-going projects that will spill over into the Control Period, and new projects (along with justification) that will commence in the Control Period but may be completed within or beyond the Control Period. The Commission shall consider and approve the capital investment plan for which the Generating Company, Transmission Licensee, and Distribution Licensee for the Distribution Business, may be required to provide relevant technical and commercial details.

8.3 ....

- 8.4 The Generating Company, Transmission Licensee, and Distribution Licensee for the Distribution Business, shall get the Business Plan approved by the Commission.
- 1.2 The Commission in tariff order for FY 2017-18, dated 31.03.2017had directed the MePTCL,vide directive 7.1.1, to file the business plan by 30<sup>th</sup> August, 2017. The relevant directive is reproduced below:

"7.1 Directives

 As discussed in this Order, MePTCL shall submit its investment plan proposed to be implemented in the control period to the Commission for its approval well in time and along with the audited accounts with statutory auditor reports for FY 2017-18. Regulation 8 of MYT requires the licensee to file the business plan latest by 3 months prior to date of filing of the petition for truing up. Accordingly the Commission directs the licensee to file the business plan by 30th August, 2017".

### 1.3 Preamble

The Business Plan for the Control Period (FY 2018-19 to FY 2020-21) was filed in accordance with the Meghalaya State Electricity Regulatory Commission (Multi Year Tariff) Regulations, 2014 (hereinafter referred to as "MYT Regulations, 2014") read with amendment extending the regulations for the MYT control period of FY 2018-19 to FY 2020-21.

Meghalaya Power Transmission Corporation Limited (MePTCL) is required to forecast the Aggregate Revenue Requirement (ARR),based on the Business Plan, for the second Control Period (FY 2018-19 to FY 2020-21). As per the MYT Regulations, Business Plan should comprise of demand and supply forecast, capital investment plan, financing plan, physical targets etc.

The MePTCL had submitted that the components of Business Plan depends upon various factors such as historical data, current and future financial estimates, growth estimates, economic, financial and business related assumptions, current operational requirements, other foreseeable changes/ requirements in future etc. MePTCL has taken a rational and scientific approach while forecasting various components of Business Plan in order to arrive at realistic forecast with minimal expected deviations. However, due to a number of uncontrollable externalities, deviations are expected and shall be brought to the notice of the Commission in accordance with the provisions of MYT Regulations. The approach undertaken for preparation of various plans and forecasts is explained in detail in the relevant sections of Business Plan and the same will be considered as base for determination of ARR and tariff for MYT control period.

# 1.4 Business Plan

MePTCL had submitted the Business plan for the second control period FY 2018-19 to FY 2020-21 considering the strengths and weaknesses of the company and business growth plan. MePTCL has taken a rational and scientific approach while forecasting various components of Business Plan in order to arrive at realistic forecast with minimal expected deviations. The business environment has evolved

considerably in a number of ways that affects MePTCL's strategic planning. The Business Plan is intended to give a comprehensive and up-to-date representation of the company, its market, the impact of new regulations, and the strategies that has been developed by MePTCL to achieve the objectives of the company. However, there are number of internal and external factors which affect the planning of the company and thus it makes this document a very dynamic document and which calls for regular reviews of the plan with a view to introduce any mid-term corrections.

Due to changing business environment and uncertainty over the regulations governing the Transmission business, it is submitted that the Commission should take cognizance of the fact that the business plan is a dynamic document which may need to be updated at various intervals to align with the growth path of the company with the external business environment and internal factors affecting the business/operations of the company.

24 x 7 Power for all for Meghalaya is a joint initiative of Government of India and the Government of Meghalaya with the objective to provide 24 x 7 power available for all in the State of Meghalaya. The main objectives are as illustrated below:

- Providing 24x7 reliable power supply to domestic, industrial and commercial consumers within a period of five years, i.e., by 2018-19.
- Power supply for irrigation pump sets to be provided for 8 to 10 hours a day, depending on the agro-climatic factors in different states.
- All un-electrified households to be provided access to electricity in a time bound manner in the next five years.

In order to achieve the above objectives, the MePTCL has formulated the strategy for achieving the above objectives as given below:

- Ensuring adequate capacity additions and power procurement from conventional and renewable sources to meet the projected demand for power
- Optimizing energy mix to reduce power procurement costs and improving operational efficiency of state generation plant(s)
- Strengthening the Transmission and Distribution (T&D) network to cater to the expected growth in demand
- Substantial reduction of AT&C losses as per a specified loss reduction trajectory
- Introducing energy conservation and energy efficiency measures to reduce specific end-use energy consumption
- Assisting distribution utilities to become efficient service providers and improve their financial viability.

# **1.5** Transmission system availability and transmission loss: Petitioner's submission:

Meghalaya's transmission network is highly interconnected with the neighboring Assam network, it is connected at 400 kV (Killing – Bongaigaon, Killing - Silchar), at 220 kV (Killing – Misa), and at 132 kV (Khliehriat(PG) – Badarpur (PG), Khliehriat (Meghalaya) –Panchgram (Assam), Mendipathar Substation to Agia (Assam) at 132 kVKhliehriat (Powergrid) –Khandong D/c (NEEPCO) and Umtru HEP - Kahelipara).

The existing transformation capacity available at 400 kV and 220 kV for import from the north-eastern grid is 1150 MVA. This transformation capacity serves both Assam and Meghalaya.

**Transmission System Availability:**MePTCL is making all out efforts to supply the power required by the State through its transmission system comprising 34 sub-stations and more than 1,226.83ckt.km (as on March 2017) of transmission lines of different voltage classes spread across Meghalaya. Below Table presents the Transmission System Availability figures of MePTCL from FY 14 onwards.

Table 1. Transmission System Availability from FT 2013-14 to FT 2017-16												
Transmission System	2013-14	2014-15	2015-16	2016-17	FY 2017-18							
Availability	(Actuals)	(Actuals)	(Actuals)	(Actuals)	(as on June							
					2017)							
Intra-State Availability	99.351	96.621	99.381	95.255	05.40							
Inter-State Availability	99.593	98.149	93.161	90.826	95.40							
Overall Availability	99.501	98.661	95.372	93.793	95.40							

Table 1: Transmission System Availability from FY 2013-14 to FY 2017-18

Transmission System	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21
Availability	(Projection)	(Projection)	(Projection)	(Projection)
Overall Availability	98%	98%	98%	98%

**Transmission Loss:** MePTCL has been able to reduce the transmission system losses in the last few years and achieved 4.67% in 2017-18 (Present). For reducing the losses, MePTCL has taken various measures like addition of capacitor bank, load bifurcation, modification in system configuration, procurement of more efficient equipment, conductor augmentation and replacement etc.

Particulars	FY 2013-14 (Actuals)	FY 2014-15 (Actuals)	FY 2015-16 (Actuals)	FY 2016-17 (Actuals)	FY 2017-18 (as on June 2017)							
System Loss	5.6	5.51	5.39	5.18	4.67							

Table 3: Transmission Loss from FY 2013-14 to FY 2017-18

Particulars	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21
	(Projection)	(Projection)	(Projection)	(Projection)
Transmission loss (%)	4%	4%	4%	4%

Table 4: Projected Transmission loss from FY 2017-18 to FY 2020-21

**Capacity addition (Physical targets)**: The rollout plan prepared as per the roadmap document of the 24x7 Power for All for Meghalaya is as follows:

Plan	Existing Capacity	2017-18	18 2018-19 2019-20 2020			Total	Total expected Capacity FY 22						
Transmission (Inter-State)													
New Line (Ckt Km)	198.63	0	0	0	8	8	206.63						
Transformation Capacity (MVA)	1150.00	0	0	0	0	0	1150.00						
		Trans	mission (In	tra-State)									
New Line (Ckt Km)	1028.20	41*	143.91*	478	251	913.91	1942.11						
Transformation Capacity (MVA)	500.00	110	25	1070	40	1245	1745.00						

Table 5: Physical capacity addition from FY 2017-18 to FY 2020-21

\*The values were wrongly projected by the petitioner. Values are corrected based on average cost per Ckt km and investment proposed during the year.

An additional transmission line totaling 637.90 Ckt-km of 132 kV at an estimated cost of Rs.555.65Crores and 244 Ckt-km of 220 kV at an estimated cost of Rs.116 Crores have been planned by MePTCL to enhance the transmission capacity. The target date of commissioning of these transmission lines is spread between FY 2017-18 and FY 2020-21. Additional transmission capacity so created will be adequate to meet the increased demand on the inter-state transmission lines till the year FY 2021.

It is understood that Bangladesh has considerable requirement of power and for which there is inadequate internal source. The North Eastern states, including Meghalaya, have great prospect for power generation and for which there is considerable development of these sources. As the State is anticipated to have surplus power availability in the near future, it can be a hub for exporting of power to a neighbouring country like Bangladesh. The State can also provide a transmission corridor to Bangladesh evacuating future excess power available from other states like Arunachal Pradesh and even Sikkim and Bhutan. Hence in addition to addition of lines mentioned above, a 132 KV D/C line of length 40ckm from Ampati to Baksapara (1X25 MVA) along with an additional transformer bay is being added to provide power from Meghalaya to Bangladesh.

The existing intra-state transmission network for evacuation and transfer of power within the state is mainly at 132 kV level. Presently the state has 995.564 Ckt. Km at 132 kV, 226.84 Ckt. Km at 220 kV and 2.214 Ckt. Km at 400 kV of inter & intra level which are more or less adequate to meet the present peak requirements of the state. The aggregate capacity at 132/33 kV is 480 MVA. The above capacity is generally adequate to meet the present peak requirements of the state.

The Government of India (GoI) has formulated a plan for undertaking investments in Transmission & Distribution in North East Region (NER) to facilitate increased availability of power, improvement in service delivery and reduction of system losses. Presently, six NER States (Assam, Manipur, Mizoram, Meghalaya, Tripura and Nagaland) are connected to transmission network at 132 KV and below.

In order to reduce the gap between the requirement and availability of the intra-state transmission and distribution system, it was found necessary to provide 132 KV / 220KV connectivity to all these NER states for proper voltage management and loss reduction. Implementation of this project will create a reliable State power grid and improve its connectivity to the upcoming load centres, and thus extend the benefits of the MePTCL grid connected power to all the consumers. The project includes capital investments for strengthening/ augmentation of the intrastate transmission and distribution network as well as capacity building across selected six North East states of Assam, Manipur, Mizoram, Meghalaya, Tripura and Nagaland.

The North East Region Power System Improvement Project (NERPSIP) is a comprehensive scheme to be funded by World Bank and Government of India. The scheme comprises of development of Transmission, Sub-Transmission/ Distribution system up to 33 KV. Within Meghalaya, the objective of scheme is to revitalize the power sector to achieve sustainable development in long term.

### Commission's analysis:

The objective of 24 x 7 Power for All initiative is to make power available 24 x 7 to all in the State of Meghalaya. It aims at the increase in the duration of availability of power from the present level of supply both in Urban and Rural areas for all existing as well as addition of consumers in all categories of consumers in the State of Meghalaya. The 24x7 Power for all is a joint initiative of State and Central Governments and the distribution utility of the state. To achieve the objectives the transmission and distribution networks are to be strengthened and expanded to provide uninterrupted and reliable power supply. In view of the need for strengthening of transmission network to achieve the objective of 24 x 7 Power for All and also to meet the growth in demand, the Commission considers the above transmission capacity addition as proposed by the MePTCL for FY 2018-19 to FY 2020-21.

The Commission also considers the transmission system availability at about 98% and transmission loss at 4% for FY 2018-19 to FY 2020-21.

# 1.6 Capital investment plan

# Petitioner's submission:

MePTCL had submitted that the Capital Investment Plan (CIP) is to provide a roadmap for planning and implementation of proposed capital investment for the control period FY 2018-19 to FY 2020-21 and is prepared keeping in view various long term needs as highlighted below:

- Strengthening of Aging Network
- Evacuation of Power from upcoming generating stations
- Transmission Corridor development for new load centres.
- Increasing Transmission capacity for increased load
- Increased Quality and Reliability of Power Transmitted
- Appropriate Loading of Transmission Network
- Increased Control and Protection for Grid Stability
- Metering and Loss Assessment
- Loss Reduction
- Outage Reduction

MePTCL has submitted that the Capital Investment Plan (CIP) includes the projects which were under implementation or commenced/ expected to commence from FY 2009-10 to end in the period betweenFY 2017-18 &FY 2020-21. The CIP includes schemes envisaged to be implemented in future, several assumptions have been considered to project the various attributes such as scope of work, funding pattern, funding sources, project cost, commencement/ completion dates and construction period etc. The assumptions have been taken considering historical inputs and anticipated project attributes. Certain project attributes such as construction period, actual project cost, completion dates etc. for ongoing projects are also expected to change in future due to uncontrollable externalities. Therefore the project particulars are expected to change in future and shall be updated during Mid-Term Review.

MePTCL has submitted that funding of capital expenditure is through financial assistance provided by Government of Meghalaya and Government of India through various schemes as well as external aided funding by international institutions such as World Bank. Most of the funding is available/ expected to be available in the form of Grants& Equity. Loan component is also expected to be provided by Government of Meghalaya.

The details of various schemes in the CIP are provided hereunder:

# North East Region Power System Improvement Project (NERPSIP)

The Government of India (GoI) has formulated a plan for undertaking investments in Transmission & Distribution in North East Region (NER) to facilitate increased availability of power, improvement in service delivery and reduction of system losses. Presently, six NER States (Assam, Manipur, Mizoram, Meghalaya, Tripura and Nagaland) are connected to transmission network at 132 KV and below. In order to reduce the gap between the requirement and availability of the intra-state transmission and distribution system, it was found necessary to provide 132 kV/220 kV connectivity to all these NER states for proper voltage management and loss reduction.

Implementation of this project will create a reliable State power grid and improve its connectivity to the upcoming load centres to extend the benefits of the grid connected power to all the consumers. The project includes capital investment for strengthening/ augmentation of the intra-state transmission and distribution network as well as capacity building across selected six North East states of Assam, Manipur, Mizoram, Meghalaya, Tripura and Nagaland. The North East Region Power System Improvement Project (NERPSIP) is a comprehensive scheme to be funded by World Bank and Government of India. The scheme comprises of development of Transmission, Sub-Transmission/ Distribution system upto 33 kV.

The objective of scheme is to revitalize the power sector to achieve sustainable development in long term in the State of Meghalaya. The NERPSIP is expected to be undertaken through funding in three tranches. The works covered under Tranche I are broadly highlighted in the following table:

S. No	Work	Rating	Unit	<b>Capacity Addition</b>
1	Substations	132/33 KV	MVA	300
2	Substations	220/ 132 KV	MVA	760
3	Transmission lines	220 KV	CKm	244
4	Transmission lines	132 KV	CKm	172

Table 6: NERPSIP Asset addition

The addition of new substations and construction of new lines is required for relieving the existing overloaded lines and substations and also for catering to growing demand in the state of Meghalaya.

Under the Tranche I funding, the proposed project expenditure is ~ Rs. 599 Crore, 50% of which is to be funded by Government of India in the form of Grant and 50% by Government of India from World Bank. The work is being executed by Power Grid India Limited. The Tranche I funding shall be utilized for first phase of construction expected to take 48 months to complete. Construction started from March 2017 and shall be completed by FY 2019.

# Power System Development Fund (PSDF)

The Government of India has approved a scheme for operationalisation of Power System Development Fund (PSDF) in year 2014. PSDF is a fund constituted under Central Electricity Regulatory Commission (Power System Development Fund) Regulations, 2014 to be utilized for the following purpose:

- Transmission systems of strategic importance based on operational feedback by Load Despatch Centers for relieving congestion in inter-State transmission system (ISTS) and intra-State Transmission Systems which are incidental to the ISTS.
- Installation of shunt capacitors, series compensators and other reactive energy generates for improvement voltage profile in the Grid.
- Installation of special protection schemes, pilot and demonstrative projects, standard protection schemes and for setting right the discrepancies identified in the protection schemes and for setting right the discrepancies identified in the protection audits on regional basis.
- Renovation and Modernization (R&M) of transmission and distribution system for relieving congestion
- Any other scheme/ project in furtherance of the above objectives such as technical studies and capacity building

MePTCL further to its objectives of having enhanced grid stability, plans to carry out Renovation and Upgradation of Protection & Control system with funding available through PSDF. The scope of work includes the following:

- Modification in switching scheme
- Replacement of existing EM/static relays by numerical relays / bay control and protection units and substation automation system (SAS) and providing Time Stamping of Events (TSE), Disturbance Recording (DR) & Events Logging (EL).
- Replacement of old obsolete equipments (Circuit Breakers, Surge Arresters, Isolators, Earthing switches, CTs, PTs/CVTs and materials.
- Establishment of reliable communication link and providing carrier inter-trip facility.
- Improvement in DC system and providing DG sets.

- Improving existing Earthing system.
- Providing required firefighting system.
- Providing modern diagnostic tools.
- Any other improvement required.

The 132/33KV transmission substations which are envisaged to be included for renovation and upgradation are at Mawlai, NEHU, NEIGRIHMS, Khliehriat, Lumshnong, Umiam, Cherrapunjee, Nongstoin, Mawphlang, Nangalbibra, Rongkhon, EPIP-I, EPIP-II and Killing.

The estimated cost for renovation and upgradation of these 14 substations is Rs. 69.19 Crore which is expected to be made available in form of 100% Grant from PSDF. The work is under progress.

### **Boundary Metering**

This is a consolidated scheme for replacement of meters and metering system at interface of Transmission Network with Generating stations and Distribution network along with establishment of a Central Data Centre.

Meghalaya receives power from State and Central Generating Stations, Bilateral Agreements, etc. MePTCL has an interface with various entities such as state generating stations of MePGCL, Central Transmission Utility, Open Access Users, Distribution utility MePDCL and Extra High Tension consumers connected at 132 KV. The power flowing into and outside the state is measured at various interface points by the ABT meters. The quantum of power flow inside the state through the intra state lines is recorded by energy meters installed at various grid substations, which are not ABT compliant. Therefore, there is an urgent need to install ABT compliant meters at all boundary points at the switching stations and outgoing feeders inside the state for time block measurement of power from state owned generation to the Distribution utility.

In ABT regime, the actual energy in time block frame is measured throughout the day and deviation from schedule is to be settled as per the Unscheduled Interchange (UI) rates, as notified by the Central Electricity Regulatory Commission from time to time. The financial impact of this deviation from schedule, if not accounted properly, might result in significant increase in cost or rate of input energy especially with the advent of Deviation Settlement Mechanism (DSM) under which the deviation charges are substantial.

In addition to above, determination of accurate transmission loss in the state

transmission system to take corrective steps, if necessary, to bring down the loss to the acceptable limit. The ABT grid metering system needs to be an integrated metering system, where all meters need to act in synchronism to deliver the overall intended purpose. A comprehensive ABT grid metering system (having integrated hardware and software) together with the capability of giving adequate and sufficient information for load management on a interval-wise/daily/weekly/monthly basis is needed for the on-line measurement and management of any deviations from schedule (UI management) for MeECL (holding company) as a whole. The overall scope covers establishment of a Central Data Centre (CDC) together with operations and maintenance support and generating the daily and monthly DSM accounting reports. The broad scope of work is as given below:

- Establishment of Central Data Centre
- Installation of ABT Compliant Meters
- Installation of Communication Media
- Installation of Terminal Equipments

The Boundary Metering scheme is envisaged to be covered in three phases depending on the priority of investment. The coverage under various phases is given below:

Phase	Network Covered	Estimated Cost (Rs. Cr)	Status
I	Replacing the meters & the metering system at interface boundary with the Generators & Distribution along with the establishment of a Central Data Centre (CDC) at NEHU substation	3.66	Work Completed
II	220 kV Lines: MISA – Killing line Complete Replacement of the meters & the metering system at interface boundary with the Generators & Distribution with the establishment of a Central Data Centre (CDC) at NEHU substation	22.24	DPR is ready,Financing to be taken up

**Table 7: Boundary Metering Scheme Status** 

### **Schemes under Implementation**

Thecapital investment schemes under implementation and new schemes proposed to be implemented are detailed in the table below:

-			
SI.No.	Scheme	Project Cost (Rs. Crore)	Purpose of Scheme
Transm	nission lines on-going works		
1.	Construction of 132 kV single circuit line on	16.75	System strengthening works
	double circuit towers from Rongkhon sub-		
	station to Ampati		
2.	Stringing of second circuit of the 132 kV Agia-	21.19	System strengthening works
	Nangalbibra line		
3.	LILO of 132 kV NEIGRIHMS-Khliehriat line at Lad	5.55	System strengthening works
	Nongkrem		
4.	Re-engineering and strengthening of 132 kV	19.23	System strengthening works
	Mawlai - Nongstoin - Nangalbibra single circuit		
	transmission line		
5.	Augmentation of 132/33 kV sub-station from 35	4.69	System strengthening works
	MVA to 50 MVA, at Rongkhon.		
6.	Construction of 132 kV double circuit LILO on	4.97	System strengthening works
	Mawlai-Cherra line at Mawngap sub- station		
7.	Construction of 132 kV double circuit LILO line	14.39	System strengthening works
	of 132 kV Rongkhon-Ampati line at		
	Praharinagar		
Sub-sta	ation on-going works		
8.	132 kV sub-station at Mendipathar	9.56	System strengthening works
9.	132 kV sub-station at Ampati	14.04	System strengthening works
10.	132 kV sub-station at Lad Nongkrem	24.31	System strengthening works
11.	132 kV sub-station at Praharinagar	18.91	System strengthening works
<u>Others</u>	on-going works		
12.	Renovation & Upgradation of protection and	69.19	System strengthening works
	control system		
North I	Eastern Region Power System Improvement Projec	ts (NERPSIP): Tra	anche-I
13.	220 kV double circuit Byrnihat (Killing) –		System strengthening works
	Mawngap – New Shillong line		
14.	LILO of both circuit of MLHEP-Khliehriat 132 kV		System strengthening works
	double circuit line at Mynkre		
15.	132 kV double circuit line from Phulbari to		System strengthening works
	Ampati	598 73	
16.	220/132 kV sub-station at New Shillong	000110	System strengthening works
17.	220/132 kV sub-station at Mawngap		System strengthening works
18.	132 / 33 kV, 2 x 50 MVA sub-station at New		System strengthening works
	Shillong		
19.	132/ 33 kV, 2 x 50 MVA sub-station at Mynkre		System strengthening works
20.	132/33 kV, 2 x 50 MVA sub-station at Phulbari		System strengthening works

# **Table 8: Schemes under Implementation**

SI.No.	Name of the Scheme	Project Cost (Rs. Crore)	Purpose of Scheme
Transm	ission Line New Works		1
1.	LILO of both the circuits of 132 kV Stage-III Umtru	20.60	System strengthening works
	double circuit line at Nongpoh		, , ,
2.	132 kV single circuit line from Rongkhon sub-station to	9.60	Evacuation of Ganol HEP
	Ganol HEP		
3.	Re-engineering and strengthening of 132 kV single	6.46	System strengthening works
	circuit Mawlai- Sumer line		
4.	Re-conductoring of 132 kV Lumshnong-Ratacherra line	7.00	System strengthening works
5.	Construction of 132 kV double circuit line from Myntdu	77.50	System strengthening works
	- Leshka HEP to 132 kV Mustem sub-station		and additional evacuation
			source for MLHEP
6.	Construction of 132 kV double circuit line from Stage-III	39.90	System strengthening works
	to Stage-I		
7.	Construction of 132 kV single circuit line on double	74.30	System strengthening works
	circuit towers from Mawphlang sub-station to Balat		
8.	LILO of 2nd circuit 132 kV Agia-Nangalbibra line at	9.80	System strengthening works
-	Mendipathar	7.00	
9.	Construction of LILO of 132 KV Agia-Hatsingimari	7.00	System strengthening works
10	(Assail) line at Phulbari (Meghalaya)	20.92	Suctor strongthoning works
10.	Killing sub station	29.82	System strengthening works
11	132 KV D/C line from Amnati to Baksanara (1x25	85	System strengthening works
11.	MVA) along with additional transformor hav [For	05	System strengthening works
	power supply to Bangladesh		
Sub-sta	tion New Works		
12.	132 kV sub-station at Nongpoh	38.54	System strengthening works
13.	Augmentation of 132/33 kV Mawlai sub-station from 3	50.78	System strengthening works
	x 20 MVA to 3 x 50 MVA along with re-engineering of		, , ,
	132 kV bus bar		
14.	Renovation and modernisation of 132 kV Khliehriat	15.00	Sub-station augmentation
	sub-station including upgradation to 2 x 25 MVA		works
	132/33 kV transformer		
15.	132 kV sub-station at Balat	23.20	System strengthening works
Others	New Works	ſ	
	Complete replacement of meter and metering system	22.24	For proper loss analysis
16.	between Generator and distributor in all sub-stations		
	and power stations		
17.	Installation & Commissioning of OPGW Communication	27.00	System communication
	station and nower station		upgrade
10	Installation of Numerical line differential protection	152	System communication
10.	relays	4.52	ungrade
19	Ungradation of Communication System	9.80	System communication
15.		5.00	upgrade
20.	DPR for reliable communication scheme for	19.73	System communication
_	substation at 132 KV and above voltage level		upgrade
North E	astern Region Power System Improvement Projects (NER	PSIP): Tranche-II	
21.	Construction of 132 kV D/C line from Nangalbibra to	54.01	System improvement works
	Rongkhon		
22.	Construction of 132 kV D/C Mawngap - Nongstoin -	90.94	System improvement works
	Nangalbibra line		
23.	Construction of 132 kV D/C Cherrapunjee - Ichamati	19.50	System improvement works
	line		
24.	Construction of 132 kV D/C Phulbari - Mendipathar line	88.30	System improvement works
25.	132 kV, 2 x 20 MVA sub-station at Ichamati	25.13	System improvement works

Table 9: New Schemes proposed for implementation

The Capital Expenditure from FY2009-10 to FY 2020-21 is summarized in the table below:

Schamas	Project	Fun	ding Patte	rn
Schemes	Cost	Loan	Grant	Equity
New Schemes				
Construction/ Upgradation of Transmission lines	319.53	287.58	31.95	-
Construction/ Upgradation of Substations	127.52	114.77	12.75	
System Protection, Control system, metering etc.	83.29	57.20	6.36	-
NER Power system Improvement Project	277.88	-	-	277.88
Ongoing/ Completed Schemes				
Construction/ Upgradation of Transmission lines	116.17	104.25	11.92	-
Construction/ Upgradation of Substations	66.82	60.14	6.68	
System Protection, Control system, metering etc.	69.19	62.27	6.92	-
NER Power system Improvement Project	598.73	-	-	598.73
Total	1585.48	637.68	71.19	876.61

### Table 10: Summary of Projects from FY2009-10 to FY 2020-21

(Rs. crore)

It is submitted that as per the 24x7 - Power for All for Meghalaya is a Joint Initiative of Government of India (GoI) and Meghalaya State Government with the objective to provide 24x7 power available to all households, industry, commercial businesses, public needs by FY 2019. MePTCL has requested the Commission to approve the above schemes and consider the requirement of the State to implement the initiative of the Government of India (GoI) and the Government of Meghalaya to provide 24x7 power for all.

# Commission's analysis:

The Commission has examined the capital investment/expenditure plan submitted by the MePTCL. The Commission approves the capital investment/expenditure plan keeping in view the requirement of strengthening of intra-state transmission system and distribution system requirement to meet the 24 x 7 Power to All and to meet the demand growth in the state. The year on year capex and capitalisation is depicted based on capex plan and date of completion of the schemes/works.

The Commission provisionally approves the scheme-wise capital investment plan for MYT control period of FY 2018-19 to FY 2020-21 as given in the table below:

#### Table 11: Scheme-wise/work-wise capital investment plan approved for FY 2017-18 and MYT control period from FY2018-19 to FY 2020-21

(Rs. crore)

				Source o	f funding		up to FY	2017-18	FY 20	)18-19	FY 20	)19-20	FY 20	20-21	FY 2	021-22	To	tal
SI. No.	Name of the Scheme/Project	Approved Outlay	Grant	Equity	Loan	Total	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitalis ation
1	2	3	4	5	6	7 = (4+5+6)	8	9	10	11	12	13	14	15	16	17	18= (8+10+12 +14+16)	19= (9+11+13 +15+17)
А	Ongoing works																	
1	132 kV single circuit line from New Umtru to EPIP-II and from New Umtru HEP to old Umtru HEP	7.66		6.89	0.77	7.66	7.66	7.66									7.66	7.66
2	132 kV multi circuit line from 220/132 kV killing SS to EPIP-I SS and 132 kV double circuit line from 220/132 kV Killing SS to EPIP-II SS	21.74		19.57	2.17	21.74	21.74	21.74									21.74	21.74
3	132kV single circuit line on Double circuit towers from Rongkhon SS to Ampati	16.75		15.08	1.68	16.75	16.75	16.75									16.75	16.75
4	Stringing of 2nd circuit of 132kV Agia-Nangalbibra line	21.19		19.07	2.12	21.19	21.19	21.19									21.19	21.19
5	LILO if 132kV Neigrihms- Khliehriat line at Lad Nongkrem	5.55		5.00	0.55	5.55	5.55	5.55									5.55	5.55
6	Re-engineering and strengthening of 132kV Mawlai-Nongalbibra Single circuit line	19.23		17.31	1.92	19.23	19.23	19.23									19.23	19.23
7	Augmentation of 132/33kV SS from 35 MVA to 50 MVA at Rongkhon	4.69		4.22	0.47	4.69	4.69			4.69							4.69	4.69

	Name of the Scheme/Project			Source o	f funding		up to FY 2017-18		FY 2018-19		FY 2019-20		FY 2020-21		FY 2021-22		Total	
SI. No.		Approved Outlay	Grant	Equity	Loan	Total	Сарех	Capitali sation	Capex	Capitali sation	Сарех	Capitali sation	Сарех	Capitali sation	Capex	Capitali sation	Capex	Capitalis ation
1	2	3	4	5	6	7 = (4+5+6)	8	9	10	11	12	13	14	15	16	17	18= (8+10+12 +14+16)	19= (9+11+13 +15+17)
8	Construction of 132kV double circuit LILO on Mawlai-Cherra at Mawngap SS	4.97		4.47	0.50	4.97	4.97			4.97							4.97	4.97
9	Construction of 132kV double circuit LILO of 132kV Rongkhon-Ampati line at Praharinagar	14.39		12.95	1.44	14.39	12.79		1.60	14.39							14.39	14.39
10	132kV SS at Mehdipathar	9.56		8.60	0.96	9.56	9.56	9.56									9.56	9.56
11	132kV SS at Ampati	14.04		12.64	1.40	14.04	14.04	14.04									14.04	14.04
12	132kV SS at Lad Nongkrem	24.31		21.88	2.43	24.31	24.31	24.31									24.31	24.31
13	132kV SS at Praharinagar	18.91		17.02	1.89	18.91	16.21		2.70	18.91							18.91	18.91
14	Renovation and Upgradation of protection and control system	69.19		62.27	6.92	69.19	51.89		17.30	69.19							69.19	69.19
15	NERPSIP Tranche-I works	598.73		598.73		598.73	448.73		150.00	598.73							598.73	598.73
	Sub-Total (A):	850.91	0.00	825.70	25.22	850.91	679.31	140.03	171.60	710.88	0.00	0.00	0.00	0.00	0.00	0.00	850.91	850.91
В	New Schemes/works																	
16	LILO of 132kV Stage-III Umtru double circuit line Nongpoh	20.60		18.54	2.06	20.60	5.11		8.30		7.19			20.60			20.60	20.60
17	132 kV single circuit line from Rongkhon SS to Ganol HEP	9.60		8.64	0.96	9.60	9.60			9.60							9.60	9.60
18	Re-engineering and strengthening of 132kV Single circuit line Mawlai- Sumer	6.46		5.81	0.65	6.46			6.46	6.46							6.46	6.46
19	Re-conductoring of 132kV Lumshnong-Ratacherra line by HT-LS conductor	44.55		40.10	4.45	44.55			44.55	44.55							44.55	44.55

			Source of funding				up to FY 2017-18		FY 2018-19		FY 2019-20		FY 2020-21		FY 2021-22		Total	
SI. No.	Scheme/Project	Approved Outlay	Grant	Equity	Loan	Total	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitalis ation
1	2	3	4	5	6	7 = (4+5+6)	8	9	10	11	12	13	14	15	16	17	18= (8+10+12 +14+16)	19= (9+11+13 +15+17)
20	Construction of 132 kV double circuit line from Myntdu-Leshka HEP to 132 kV Mustem SS	77.50		69.75	7.75	77.50			29.64		30.03		17.83	77.50			77.50	77.50
21	Construction of 132kV double circuit line from Stage-III to Stage-I	39.90		35.91	3.99	39.90			18.10		15.21		6.56	39.87			39.87	39.87
22	Construction of 132kV single circuit line on double circuit towers from Mawphlang SS to Balat	74.30		66.87	7.43	74.30					41.44		32.87	74.31			74.31	74.31
23	LILO of 2nd circuit 132 kV Nangalbibra line at Mendipathar	9.80		8.82	0.98	9.80					5.00		4.80	9.80			9.80	9.80
24	LILO of 2nd circuit 132 kV Agia-Hatsingimari (Assam) line at Phulbari (Meghalaya)	7.00		6 30	0.70	7.00					5.00		2 00	7.00			7.00	7.00
25	LILO of 132 kV double circuit Umtru-Kahelipara line at Killing SS	29.82		26.84	2.98	29.82					5.00		15.43	7.00	14.39	29.82	29.82	29.82
26	132 kV D/C line from Ampati to Baksapara (1x25 MVA) along with additional transformer bay (for power supply to Bappladech)	85.00		76 50	8 E O	8E 00			20.22		20.22		28.24	85.00			85.00	8E 00
20	New works - Substations	85.00		70.50	6.50	85.00			20.55		20.55		20.54	85.00			0.00	0.00
27	122 kV/SS at Nongpoh	27.84		24.06	2 79	27.84	15.00		22.84			27.84					27.84	27.94
20	132 kV/SS at Polot			20 00	2.70		13.00		10.00		10.00	57.04	2 77			72.77		22.04
29	Augmentation of 132/33kV Mawlai SS from 3 x 20 MVA to 3 x 50 MVA along with re-engineering of 132 kV bus bar	50.78		45.70	5.08	50.78	30.15		20.62		10.00	50.77	5.22			<i>LJ.LL</i>	50.77	50.77

	Name of the Scheme/Project		Source of funding				up to FY 2017-18		FY 2018-19		FY 2019-20		FY 2020-21		FY 2021-22		Total	
SI. No.		Outlay	Grant	Equity	Loan	Total	Сарех	Capitali sation	Capex	Capitali sation	Сарех	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Capex	Capitalis ation
1	2	3	4	5	6	7 = (4+5+6)	8	9	10	11	12	13	14	15	16	17	18= (8+10+12 +14+16)	19= (9+11+13 +15+17)
30	Renovation and modernisation of 132 kV Khliehriat SS including upgradation to 2 x 25 MVA 132/33 kV transformer	15.00		13.50	1.50	15.00			5.00		5.00		5.00	15.00			15.00	15.00
	Complete replacement of meter and metering system between Generator and distributor in all substations and																	
31	power stations Installation and Commissioning of OPGW communication network and RTUs at 400 kV/220 kV/132 kV substation and	22.24		20.02	2.22	22.24			22.24			22.24					22.24	22.24
32	power station	27.00		24.30	2.70	27.00							27.00	27.00			27.00	27.00
33	Installation of numerical line differential protection relays	4.52		4.07	0.45	4.52			1.51		1.51		1.50	4.52			4.52	4.52
24	Upgradation of	0.90		0 01	0.09	0.80			2 27		2 27		2.26	0.80			0.80	0.90
34	DPR for reliable communication scheme for SS at 132 kV and above voltage level	19.73		17.76	1.97	19.73			3.27		9.87		9.87	19.74			19.74	19.74
	North Eastern Region Power System Improvement Projects (NERPSIP) - Tranche-II																	
27	132 kV D/C line from	E4 01		E4 01		E4 01					20.00		20.00		14.01	E4 01	E4 01	E4 01
57	132 kV D/C Mawngap - Nongstoin - Nangalbibra	54.01		54.01		34.01		<u> </u>			20.00		20.00		14.01	54.01	54.01	34.01
38	line	90.94		90.94		90.94					40.00		40.00		10.94	90.94	90.94	90.94
39	132 kV D/C Cherrapunjee -	19.50		19.50		19.50					5.00		10.00		4.50	19.50	19.50	19.50

	Name of the Scheme/Project	Approved Outlay	Source of funding				up to FY 2017-18		FY 2018-19		FY 2019-20		FY 2020-21		FY 2021-22		Total	
SI. No.			Grant	Equity	Loan	Total	Сарех	Capitali sation	Capex	Capitali sation	Capex	Capitali sation	Сарех	Capitali sation	Сарех	Capitali sation	Capex	Capitalis ation
1	2	3	4	5	6	7 = (4+5+6)	8	9	10	11	12	13	14	15	16	17	18= (8+10+12 +14+16)	19= (9+11+13 +15+17)
	Ichamati line																	
40	132 kV D/C Phulbari - Mendipathar line	88.30		88.30		88.30					40.00		40.00		8.30	88.30	88.30	88.30
41	132 kV (2 x 20 MVA) SS at Ichamati	25.13		25.13		25.13					10.00		10.00		5.13	25.13	25.13	25.13
	Sub-Total (B)	892.54	0.00	831.09	61.45	892.54	59.86	0.00	220.86	60.61	276.85	110.85	277.68	390.14	57.27	330.92	892.52	892.52
	Total (A+B)	1743.45	0.00	1656.79	86.67	1743.45	739.17	140.03	392.46	771.49	276.85	110.85	277.68	390.14	57.27	330.92	1743.43	1743.43

### 1.7 Human Resource

### Petitioner's submission:

MePTCL has submitted that in order to meet the increasing demand for electricity, there is a requirement for addition of generating capacity, expansion of associated transmission and distribution networks and upgrading of technology. The challenge to provide power to all requires a corresponding increase, not only in the quantity, but also in the quality of human resources. Hence, the purpose of establishing the Human Resources Development Centre (HRDC) is to ensure that skilled manpower in adequate numbers is made available across various activities of MeECL. The HRDC therefore identify the skill gaps, frame occupational standards, facilitate development of practical as well as high quality training contents and ensure adequate availability of faculty for capacity building. Thus training and upgrading the skills of the manpower is the primary objectives of HRDC.

At the national level, a statutory body, namely, the Central Electricity Authority (CEA) was constituted under the Electricity Act to promote measures for advancing the skill of persons engaged in electricity industry. CEA has already setup the standards for mandatory training required for various skill for the generation, transmission, distribution, etc. The CEA has recognized 74 (seventy four) training institutes throughout the country under the Government and Private Sector, for providing such training at various levels.

Basically three types of training infrastructures and facilities are available for personnel in the power industry:

- Training institutes recognized by CEA for imparting statutory induction training: There are 74 (seventy four) training institutes recognized by the CEA through the country. These institutes cater to the training needs of personnel working in thermal power stations, hydro generating stations, transmission utilities and distribution utilities. For example, the National Power Training Institute (NPTI) has established a Centre for Advanced Management & Power Studies (CAMPS) at its Faridabad campus. In addition to a number of short-term courses on Technology-Management interface, NPTI also conducts professional courses, integrating powertraining experience with academics, like PDC & PGDC in Power Plant Engineering and B.E./B.Tech. in Power Engineering etc. The other institution, the Central Board of Irrigation & Power (CBIP) also conducts power industry interfaced placement oriented long term training programmes in generation, transmission and distribution, besides high end short term programmes in advance technologies in all disciplines of power sector.
- Lineman Training Institutes: Most utilities are having at least one lineman-training

center. These institutes are set up by the respective organizations for imparting training to their own employees.

• Other training facility include training program with academic institutions outside power sector.

**Statutory training requirement:** The Central Electricity Authority notifies the mandatory training (measures relating to safety and electricity supply) Regulations 2010, specifically the regulations 6 & 7 of the said CEA Regulations 2010. For implementing the above regulations effectively and on rational basis, the CEA has framed guidelines and norms to prescribe the procedure to be followed by CEA/MoP for recognition and grading of the training institutes for power sector in the country. Presently, following types of training are provided to the workforce in power segment for electricity generation, transmission and distribution personnel:

- Operation & Maintenance Training to all existing employees engaged in O&M of generating projects and transmission & distribution system ranging from 4 Weeks to 30 Weeks. This includes the classroom training, Simulator training for Thermal & Hydro and On-Job training.
- Induction level training for new recruits for 1 month (Technical & Non-Technical).
- Refresher/Advanced training of 5 Days in a year to all existing personnel of varying degrees in various specializations in line with National Training Policy for Power Sector.
- Management training of 5 Days in a year to the senior Executives/Managers in India/abroad in line with National Training Policy for Power Sector.
- Distance Learning Certificate Programs on Power Distribution Management for JEs/ AEs.
- Certificate of Competency in Power Distribution (CCPD).
- Training under Distribution Reforms, Upgrades and Management (DRUM). C&D Employees Training (Non-executives in secretarial staff, accounts wing, technical staff in nonexecutives and Class-IV are categorized as C&D employees).
- Franchisee Training.

# Capacity Building in Meghalaya Energy Corporation Limited (MeECL)

Human Resources Development Centre (HRDC), Umiam, MeECL is entrusted with the training for the officers and staffs of the 3 (three) subsidiary corporations of MeECL, namely, Meghalaya Power Generation Corporation Limited (MePGCL), Meghalaya Power Transmission Corporation Limited (MePTCL) and Meghalaya Power Distribution Corporation Limited (MePDCL). Various initiatives taken for capacity building are highlighted as below:

• Capacity building under World Bank Project - The World Bank has proposed funding

for capacity building for MePTCL and MePDCL for the next three years. Proposal under this scheme is being prepared by the nodal officers of the two corporations, namely, Chief Engineer (Transmission) & Chief Engineer (Distribution).

- Capacity building in various Training Institutes Officers from the 3 (three) subsidiary corporations are being sent regularly to free training programme organised by various training institutes like National Power Training Institute (NPTI), Indian Institute of Technology (IIT), Roorkee, National Thermal Power Corporation Limited (NTPC) and many more. For such training, the respective corporations bear the expenditure of travelling and boarding only.
- Capacity building through own resources The capacity building measures mentioned above are required to be supplemented by training programmes specifically required for the 3 (three) corporations. These include training for field engineers in technical areas, management and human relationships, among others. For such training programmes, funding is being allocated in the budget of the respective corporations.
- Training program is also initiated under World Bank funded scheme on Regulatory Affairs, Operation and Maintenance of lines and Sub stations and Training is also imparted to AEEs and Res of Grid Sub Stations on Operations of Testing Equipments underPSDF.

# Way forward

In accordance with the CEA Guidelines & Apprentices Act as stated above, the HRDC, MeECL has been imparting On-the-job training, Induction training, C&D Trainings, R-APDRP Trainings, trainings on behavioral attitudes, etc as required. The HRDC is striving to develop the entire human resources of MeECL by meeting the growing and evolving demands of the technological advancement

# Commission's analysis:

The Commission concur with the utility for enhancement of skills though imparting job oriented training and other skills required to the employees to perform their duties efficiently, effectively and optimally in their day to day works. The manpower study may be conducted and based on the study the man power may be optimally utilised by placing right personnel at the right job for optimum efficiency.

The Commission, however, observes that no expenditure is projected by the utility towards training expenses for the control period.