BEFORE
MEGHALAYA STATE ELECTRICITY REGULATORY COMMISSION,
SHILLONG

PETITION

FOR

APPROVAL OF BUSINESS PLAN

FOR CONTROL PERIOD

FY 2021-22 TO FY 2023-24

FILED BY

Powering Meghalaya

MEGHALAYA POWER TRANSMISSION CORPORATION LIMITED

Lum JingShai, Short Round Road,
Shillong - 793001

BEFORE THE HON'BLE MEGHALAYA STATE ELECTRICITY REGULATORY COMMISSION

FILE/ PETITION NO.....

IN THE MATTER OF

APPROVAL OF BUSINESS PLAN FOR THE CONTROL PERIOD FY 2021-22-FY 2023-24OF THE MEGHALAYA POWER TRANSMISSION CORPORATION LIMITED (MePTCL) UNDER REGULATION 8 OF THE MEGHALAYA STATE ELECTRICITY REGULATORY COMMISSION (MULTI YEAR TARIFF) REGULATIONS, 2014.

AND IN THE MATTER OF

MEGHALAYA POWER TRANSMISSION CORPORATION LIMITED; LUMJINGSHAI, SHILLONG – 793001, MEGHALAYA

PETITIONER

IT IS RESPECTFULLY SUBMITTED BY THE PETITIONER THAT:

1. In exercising its powers conferred under the section 131 and 133 of the Electricity Act 2003, the State Government of Meghalaya notified "The Meghalaya Power Sector Reforms Transfer Scheme 2010" on 31st March 2010 leading to restructuring and unbundling of erstwhile Meghalaya State Electricity Board (MeSEB) into four entities namely

    (a) Meghalaya Energy Corporation Limited (MeECL), the Holding Company
    (b) Meghalaya Power Distribution Corporation Limited (MePDCL), the Distribution Utility
    (c) Meghalaya Power Generation Corporation Limited (MePGCL), the Generation Utility
    (d) Meghalaya Power Transmission Corporation Limited (MePTCL), the Transmission Utility.

2. However, the holding company - MeECL carried out the functions of distribution, generation and transmission utilities from 1st April 2010 to 31st March 2012. Therefore, through notification dated 31st March 2012, State Government notified an amendment to The Power Sector Reforms Transfer Scheme leading to effective unbundling of MeECL into MeECL (Holding Company), MePDCL (Distribution Utility), MePGCL (Generation utility) and MePTCL (Transmission Utility) from 1st April 2012 onwards.

3. On 23rd December 2013, the Government of Meghalaya notified the vesting of the Assets and Liabilities as on 1st April 2010, in the MeECL. Subsequently, the Government of Meghalaya notified the 4th Amendment to the Notified Transfer Scheme on 29th April 2015, wherein the opening balances of all the four entities namely, MePGCL, MePTCL, MePDCL and MeECL as on 1st April 2012 were indicated.

4. The unbundled utilities for generation, transmission and distribution started their independent commercial operation from FY 2013-14. MSERC has also issued the segregated tariff orders of generation, transmission and distribution separately from FY 2013-14.

5. MePTCL has begun segregated commercial operations as an independent entity from 1st April 2013 onwards.

6. Under Meghalaya State Electricity Regulatory Commission i.e. MSERC (Multi Year Tariff) Regulations, 2014, MePTCL is filing the business plan petition for the 3rd Control period.

7. The Board of Directors of MePTCL have accorded approval for filing of this petition and authorized the undersigned to file the petition accordingly. The copy of the Board's resolution is hereby enclosed as **Annexure-IV**.

8. The applicant, therefore, humbly prays to the Hon'ble Commission to pass appropriate orders on the following:

   a. Approval of Business Plan for the Control Period of FY 2021-22 to FY 2023-24

   b. To approve the principles and methodology proposed by MePTCL.

   c. To pass such orders, as Hon'ble Commission may deem fit and proper and necessary in view of the facts and circumstances of the case.

   d. To condone any inadvertent omissions, errors & shortcomings and permit the applicant to add/change/modify/alter this filing and make further submissions as required.

(P. Sun)
SE (ELECT-II)
O/O Director (Transmission)
Meghalaya Power Transmission Corporation Limited

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1 Background

1.1 Introduction

1.1.1 The Power Supply Industry in Meghalaya had been under the control of the erstwhile Meghalaya State Electricity Board (MeSEB) with effect from 21st January 1975. On 31st March 2010, the State Government issued a Notification "The Meghalaya Power Sector Reforms Transfer Scheme 2010" thereby giving effect to the transfer of assets, properties, rights, liabilities, obligations, proceedings and personnel of the erstwhile MeSEB to four successor companies. On 31st March 2012, Government of Meghalaya issued further amendment to the above-mentioned transfer scheme, to transfer Assets and Liabilities including all rights, obligations and contingencies with effect from 1st April 2012 to namely:

- Generation: Meghalaya Power Generation Corporation Ltd. (MePGCL)
- Transmission: Meghalaya Power Transmission Corporation Ltd. (MePTCL)
- Distribution: Meghalaya Power Distribution Corporation Ltd. (MePDCL)
- Meghalaya Energy Corporation Limited (MeECL), a holding company.

The Government of Meghalaya issued further notification on 23rd December 2013 thereby notifying the revised statement of Assets and Liabilities as on 1st April 2010 to be vested in Meghalaya Energy Corporation Limited.

1.1.2 The MSERC is an independent statutory body constituted under the provisions of the Electricity Regulatory Commissions (ERC) Act, 1998, which was superseded by Electricity Act (EA), 2003. The Hon'ble Commission is vested with the authority of regulating the power sector in the State inter alia including determination of tariff for electricity consumers.

1.2 Provision of Law for Business Plan

1.2.1 The Hon'ble Commission has notified the Meghalaya State Electricity Regulatory Commission (Multi Year Tariff) Regulations, 2014 on 15th September 2014. It is submitted that Meghalaya State Electricity Regulatory Commission (Multi Year Tariff) regulations, 2014 since amended via notification dated 18 June 2020, states as under:

"The applicability of these Regulations is hereby extended for a further period of 3 years with effect from 1.04.2021 to 31.03.2024 onwards".

1.2.2 As per Regulation 8 of the MYT Regulations, 2014, MePTCL has to file the Business Plan for the control period of FY 2021-22 to FY 2023-24. The relevant regulation 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 guidelines and 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.

1.3 Preamble

1.3.1 The petition for Business Plan for the Control Period (FY 2021-22 to FY 2023-24) is filed in accordance with the Meghalaya State Electricity Regulatory Commission (Multi Year Tariff) Regulations, 2014 (hereinafter referred to as "MYT Regulations, 2014") which have been notified by the Hon'ble Commission on 15th September 2014 and further amended on 28th August 2017.

1.3.2 Based on the Business Plan, Meghalaya Power Transmission Corporation Limited (MePTCL) is required to forecast the Aggregate Revenue Requirement (ARR) for three years of control period from FY 2021-22 to FY 2023-24. As per the MYT Regulations, Business Plan should comprise of estimates for demand and supply forecast, capital investment plan, power procurement plan, financing plan, physical targets etc.

1.3.3 The aforementioned 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 and the impact of Covid-19, deviations are expected and shall be brought to the notice of the Hon'ble MSERC 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. This Business Plan, as submitted under MYT Regulations 2014 will be considered as a base for determination of ARR and tariff for future period.

1.4 Business Plan

1.4.1 As per the regulations of the Hon'ble Commission, MePTCL submits Business plan for the third control period FY 2021-22 to FY 2023-24.

1.4.2 A business plan is conventionally defined as:

"*Business Plan is a formal statement of a set of business goals, the reasons why they are believed attainable, and the plan for reaching those goals. It may also contain background information about the organization or team attempting to reach those goals.*"

1.4.3 Accordingly, this business plan is developed for the Control period bearing in mind the growth plan for the control period after considering the strength and weakness of the company and evaluating its business environment. 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 approach undertaken for preparation of various plans and forecasts is explained in detail in the relevant sections of Business Plan.

1.4.4 There are a 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.

1.4.5 The primary objectives for developing the business plan are as follows:

- Providing a tool for Strategic Planning: The Business Plan is intended to chart the Company's way forward. The key objective for developing the business plan is to analyse and anticipate the major requirements of transmission infrastructure commensurate with the expected demand growth of electricity. Business Plan may prove to be a tool to strategically plan for capital investments and it's financing. Further, it may help in timely execution and monitoring of the work.
- For the regulatory compliance of submission of Business Plan as mandated by MSERC MYT Regulations, 2014.
- Aid in Decision Making and better operational efficiency: The Business Plan may aid in decision making while planning and in the execution of the project. Further, proactive actions may be taken during the execution of the project in order to achieve the company's goal of supplying quality power to all. This may help in improving the operational efficiency by running the transmission network in accordance with the set performance target.

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

2 Company Profile

2.1 Background and profile of MePTCL

2.1.1 The Company is a Transmission Licensee within the meaning of Section 2 (73) of Electricity Act 2003. Further, Section 42 and 43 of the Electricity Act 2003 prescribes the following major duties of the Transmission Licensee:

- To undertake transmission of electricity through intra- State transmission system.
- To build, maintain and operate an efficient, co-ordinated and economical intra-State transmission system.
- To comply with the directions of the Regional Load Dispatch Centre and the State Load Dispatch Centre.
- To comply with such technical standards, of operation and maintenance of transmission lines, in accordance with the Grid Standards, as may be specified by the Authority.
- To provide non-discriminatory open access to its transmission system for use by any licensee or generating company on payment of the transmission charges or any consumer as and when such open access is provided by the State Commission, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission.

2.1.2 As per Meghalaya Power Sector Transfer Scheme, MePTCL has been vested with the function of transmitting power by the State Government of Meghalaya, the Business Scope of the Company falls within the legal framework as specified in the Act and includes:

- Undertaking transmission of electricity through intra-State transmission system.
- Ensuring development of an efficient, coordinated and economical system of intra-State transmission lines for smooth flow of electricity from a generating station to the load centers.
- Discharging all functions of planning and co-ordination relating to intra-state transmission system with Central Transmission Utility, State Government, Generating Companies, Regional Power Committees, Authority and Licensees.
- To provide non-discriminatory open access to its transmission system for use by any licensee or generating company or any consumer as and when such open access is provided by the State Commission.
- Engaging in any business for optimum utilisation of assets, with prior intimation to the State Commission.

2.1.3 MePTCL has inherited a very old network from MeSEB which itself had inherited the network from Assam State Electricity Board (ASEB) in 1975. However, both erstwhile MeSEB and MePTCL have added significant network assets in previous few years in order to sustain the load growth and to provide reliable power transmission corridor to the state of Meghalaya. The Key Achievements of MePTCL are highlighted below:

Table 1: Key Achievements from 2015 to 2020

Details	31.03.2015	31.03.2020
Length of 400 KV lines (Km)	4.428	4.428
No. of 400KV/ 220KV Grid Substations	1	1
Capacity of 400KV/ 220KV Grid Substations (MVA)	950	950
Length of 220 KV lines (Km)	226.84	226.84
No. of 220KV/ 132KV Grid Substations	1	1

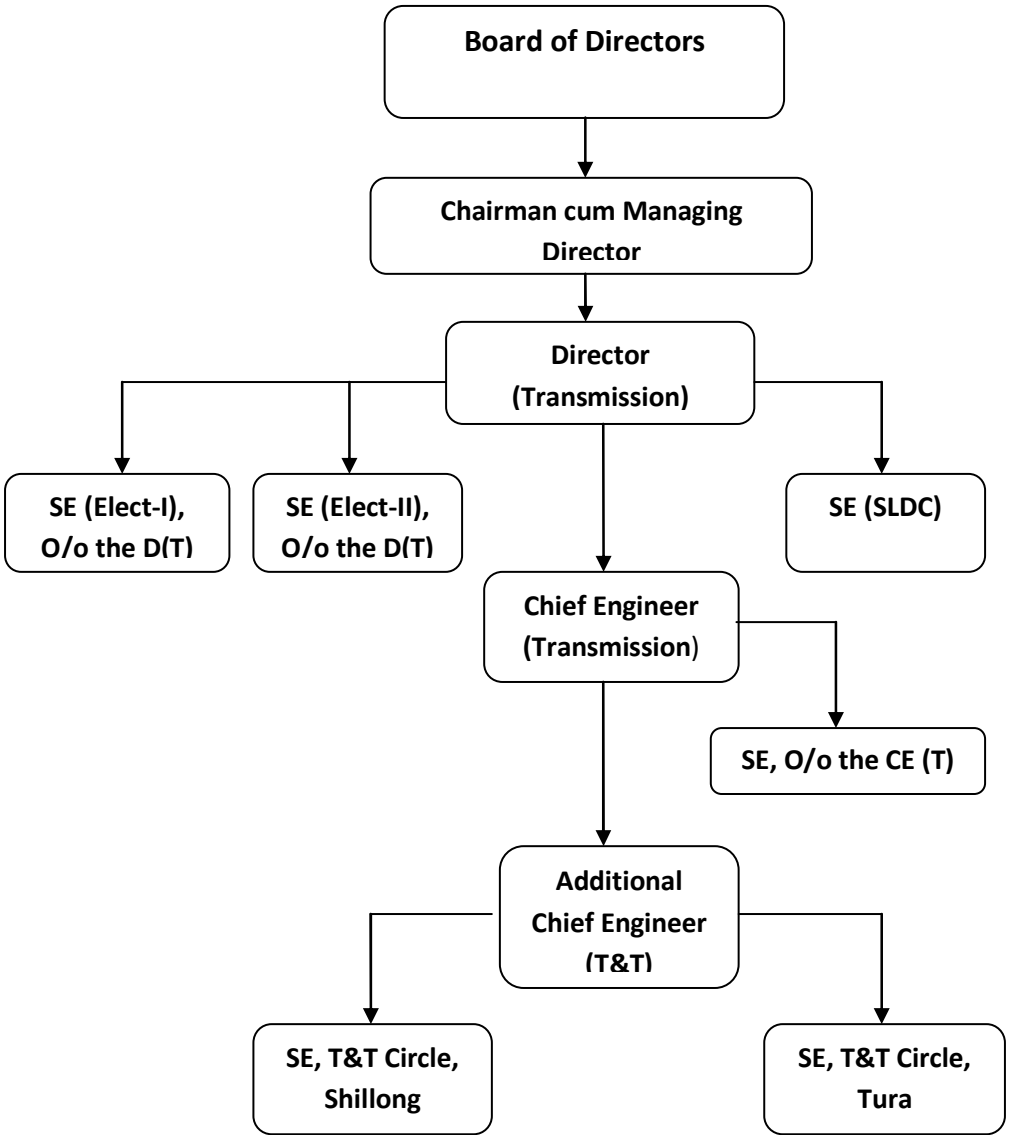
Details	31.03.2015	31.03.2020
Capacity of 220KV/ 132KV Grid Substations (MVA)	520	555
Length of 132 KV lines (Km)	990.280	1202.308
No. of 132KV Grid Substations	13	18
Capacity of 132KV Grid Substations (MVA)	460	595
Length of 132 KV M/C lines	-	21.746

2.2 Human Resource

2.2.1 Organization Structure

MePTCL has its Corporate Office at Shillong. Smt. A. Nikhla as CMD, heads the Company. The broad organization chart is shown below:

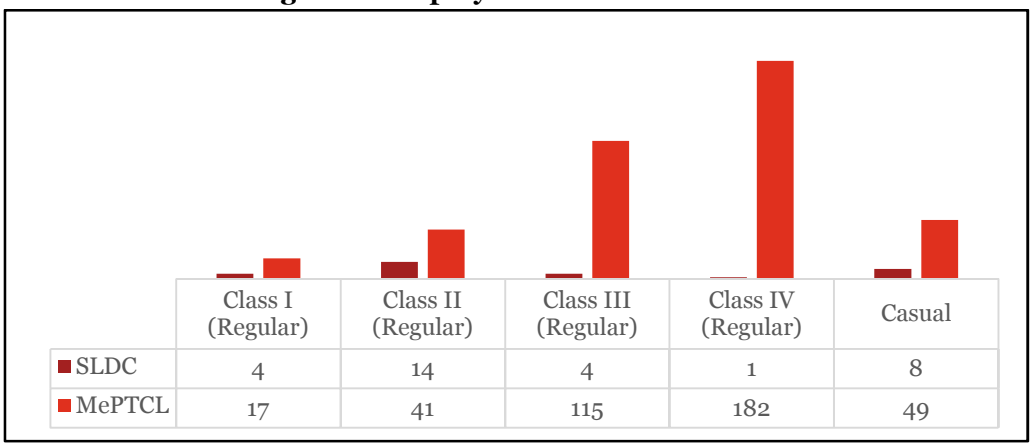
Figure 1: Organization Chart of MePTCL



2.2.2 Existing Human Resource

At present MePTCL has 355 regular employees on regular payroll and 49 casual employees as on 30.06.2020, while SLDC has 23 regular employees and 8 casual employees. The class-wise number of Regular & Casual employees of MePTCL and SLDC is highlighted in the graph below:

Figure 2: Employee Details of MePTCL



2.2.3 Manpower Requirement and Recruitment Plans of MePTCL & SLDC

With the growing demand, the transmission lines and network has increased and new sub-stations to be commissioned soon, etc. as well as increasing quantity of power to be handled by SLDC, both MePTCL and SLDC would require additional employees to carry out their operation in an efficient manner.

2.2.3.1 Manpower Requirement Plan of MePTCL

The licensee has planned to recruit new personnel which would be required when the upcoming projects would be operational such as 220/132KV sub-station at Mawphlang, New Shillong, Mawmihthied, Ichamati, and Nangalbibra, as well as 132/33KV sub-stations at Mynkre, Ampati, Phulbari, Praharinagar, Baghmara, Nongpoh and Killing. The table below represents the financial year wise employee requirement of MePTCL during the control period.

Table 2: Financial Year Wise Employee Requirement for MePTCL for the Control Period from FY 2020-21 (Second Half) to FY 2023-24

Sl. No.	Designation	Requirement			
		FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Class I					
1.	Executive Engineer (Electrical)	-	2	1	2
	Sub-total (I)	**-**	**2**	**1**	**2**
Class II					
1.	Assistant Executive Engineer (Electrical)	3	12	6	11
2.	Assistant Engineer (EI)	-	10	5	10
	Sub-total (II)	**3**	**22**	**11**	**11**
Class III					
1.	Junior Engineer (Electrical)	15	10	5	5
2.	LDA cum Typist	3	4	2	3
	Sub-total (III)	**18**	**14**	**7**	**8**

Sl. No.	Designation	Requirement			
		FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Class IV					
1.	Lineman/ Jugali	30	40	20	30
2.	Peon	3	4	2	3
3.	Sweeper cum Cleaner	3	4	2	3
4.	Security Personnels	18	24	12	18
5.	LV Drivers	3	4	2	3
Sub-total (IV)		**57**	**76**	**38**	**57**
Grand Total (I+II+III+IV)		**78**	**114**	**57**	**78**

The sub-station wise employee recruitment plan of MePTCL during the control period has been attached as **Annexure II**.

2.2.3.2 Manpower Requirement Plan of Meghalaya State Load Despatch Centre

The State Load Despatch Center has planned to recruit new personnel which would be required in the future for undertaking various activities of the SLDC.

Table 3: Financial Year Wise Breakup of Employee Requirement for SLDC for the Control Period from FY 2020-21 (Second Half) to FY 2023-24

Sl. No.	Designation	Division	Requirement			
			FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Class I						
1.	Divisional Head / Executive Engineer	Services	1	-	-	-
		Sub-total (I)	**1**	**-**	**-**	**-**
Class II						
1.	Assistant Executive Engineer – Reliability Coordinator	System Operation	1	-	-	-
2.	Assistant Executive Engineer – Grid Ancillary Services Coordinator	System Operation	-	-	1	-
3.	Assistant Executive Engineer – Logistics (IT & Communication)	System Logistics	1	-	-	-
4.	Assistant Executive Engineer – Scheduling	Market Operation	-	1	-	-
5.	Assistant Executive Engineer – Open Access	Market Operation		1	-	-
6.	Assistant Executive Engineer – Energy Metering	Market Operation	1	-	-	-
7.	Assistant Executive Engineer – Energy Accounting	Market Operation	1	-	-	-
8.	Assistant Executive Engineer – Settlement & Clearing	Market Operation	-	1	-	-
9.	Assistant Executive Engineer – User Registration, SLDC Fees & Charges, Billing & Collection	Market Operation	-	1	-	-
10.	Assistant Executive Engineer – Regulatory Affairs	Services	1	-	-	-
11.	Assistant Executive Engineer – Human Resources	Services		-	-	1
12.	Shift Engineer / Assistant Engineer – Resource Scheduling	Market Operation	-	4	-	-
13.	Shift Engineer / Assistant Engineer – Open Access	Market Operation	-	4	-	-
14.	Assistant Engineer – Grid Ancillary Services	System Operation	-	-	1	-
15.	Assistant Engineer – Analysis & Offline Simulations	System Operation	1	-	-	-
16.	Assistant Engineer – Energy Management System	System Operation	-	1	-	-
17.	Assistant Engineer –System Protection Coordination	System Operation	-	1	-	-
18.	Assistant Engineer –Planned Outage Coordination	System Operation	-	1	-	-
19.	Assistant Engineer – Dispatcher Training Simulator	System Operation	-	1	-	-
20.	Assistant Engineer –Documentation	System Operation	1	-	-	-
21.	Assistant Engineer –Coordination Committee	System Operation	-	1	-	-
22.	Assistant Engineer – SCADA Hardware	System Logistics	1	-	-	-
23.	Assistant Engineer – SCADA Software	System Logistics	1	-	-	-
24.	Assistant Engineer – Telemetry	System Logistics	1	-	-	-
25.	Assistant Engineer – Online Database Development	System Logistics	1	-	-	-
26.	Assistant Engineer – Online Database Maintenance	System Logistics	-	1	-	-
27.	Assistant Engineer – IT Software Development	System Logistics	1	-	-	-

Sl. No.	Designation	Division	Requirement			
			FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
28.	Assistant Engineer – IT Systems Maintenance	System Logistics	1	-	-	-
29.	Assistant Engineer – Applied R&D	System Logistics	-	-	1	-
30.	Assistant Engineer & Junior Engineer – Energy Metering	Market Operation	-	1	-	-
31.	Assistant Engineer & Junior Engineer – Energy Accounting	Market Operation	1	-	-	-
32.	Assistant Engineer – Settlement & Clearing	Market Operation	-	1	-	-
33.	Assistant Engineer - SLDC Fees & Charges, Billing & Collection	Market Operation	-	1	-	-
34.	Assistant Engineer – Law & Regulatory Affairs	Services	1	-	-	-
		Sub-total (II)	**15**	**21**	**3**	**1**
Class III						
1.	Junior Divisional Accountant	Services	1	1	-	-
2.	Establishment Supervisor	Services	1	-	-	-
		Sub-total (III)	**2**	**1**	**-**	**-**
Class IV						
1.	Technician	Services	1	-	-	-
2.	Gardening Assistant	Services	1	-	-	-
3.	Sanitation Attendant	Services	1	-	-	-
		Sub-total (IV)	**3**	**-**	**-**	**-**
		Grand Total (I+II+III+IV)	**21**	**22**	**3**	**1**

2.2.4 Revision of Pay for MeECL and its Subsidiaries.

Before corporatization, Meghalaya State Electricity Board (MeSEB) had a policy for considering revision of pay scale of employees every 5 years. This policy of revision of pay has continued till date even for the successor entities of MeSEB as per the decision taken by the Employees Association and the Management in the year 2010.

As per this policy, MeECL and its subsidiary companies decided on 25 October 2019 to implement a revised pay scale of employees effective from January 2020 with the following impact.

Table 4: Impact of RoP 2020 on Employee Expenses

Particulars	Amount (INR Cr)
Existing Monthly Employee Costs before ROP 2020	**23.37**
Revised Monthly Employee Costs after ROP 2020	**29.68**
Total Financial Implications due to ROP 2020	**6.31**
% Change in Employee Costs due to ROP 2020	**27%**

The Board approval for RoP 2020 along with the detailed financial implication and other supporting documents is given in **Annexure III**. For the third control period MYT, the subsidiaries of MeECL will take into account the impact of ROP 2020 in its employee expense projections.

2.2.5 Capacity Building

2.2.5.1 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 identifies 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 available manpower is the primary objectives of HRDC.

2.2.5.2 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 trainings at various levels.

2.2.5.3 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: These training institutes recognized by the CEA, 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 several short-term courses on Technology-Management interface, NPTI also conducts professional courses, integrating power-training 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.

2.2.5.4 **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 non executives and Class-IV are categorized as C&D employees).
- Franchisee Training.

2.2.5.5 **Capacity Building in Meghalaya Energy Corporation Limited (MeECL)& Its Subsidiaries – Human Resource Development**

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). Details of trainings conducted in FY 2019-20 and FY 2020-21 for the officers is given below:

Table 5:Training Details for FY 2019-20

Sl. No	Name of Institute	Field of Training (Thermal/ Hydro/ Transmission/ Distribution/ Management)	Total Training (Days/ Man)
1	Training programme on **"Technician Development Programme**", organized by Power Grid Corporation of India Ltd. (PGCIL), Lapalang, Shillong under Capacity Building & Institutional Strengthening (CBIS) of NERPSIP, with effect from 16.04.2019 to 10.05.2019 at Powergrid, Misa Substation, Nowgaon, Assam. **Total Personnel-25 (twenty-five) [Technical]. Linemen-25.**	**Transmission**	**20 x 25 = 500**
2	Workshop on **"National eVidhan Application (NeVA)**", organized by Meghalaya Legislative Assembly, held on the 24th& 25th April 2019 at the Annexe Hall, Assembly Building, Rilbong, at 10:30 A.M. **Total Personnel-2 (two) [Technical]. AEE-1, JE-1.**	**Management**	**2 x 2 = 4**
3	Training programme on **"*Finance & Accounts Practices*",** organized by Power Grid Corporation of India Limited (PGCIL) from 22nd to 24th April 2019 at 10:00 A.M in the ICSSR Hall, NEHU, Shillong. **Total Personnel-26 (twenty-six) [Technical]. CE-1, ACE-4, SE-8, EE-8, RE-5**	**Management**	**2 x 26 = 52**
4	Training Programme, organised by the Central Project Management Unit (CPMU) of Dam Rehabilitation and Improvement Project, CWC, New Delhi in association with the IIT, Roorkee and Motilal Nehru National Institute of Technology, Allahabad on **"Conventional and Advanced Hydrometric Technique for Discharge Estimation"** held on The 10th – 12th June, 2019 at Indian Institute of Technology, Roorkee, Uttarakhand. **Total Personnel-2(two) [Technical], AEE(C)-2.**	**Hydro**	**2 x 3 = 6**
5	Training Programme respectively under IPDS conducted by PFC Ltd, held on the 8th& 9th May 2019 at 10.00 A.M in the Hotel Polo Towers, Shillong. **Total Personnel-83(eighty-three) [Technical], AEE (Elect)-23, JE-24, ES-1, Linemen-II- 11, Electrician-3, C/Electrician-2, Jugali-19.**	**Distribution**	**2 x 83 = 166**
6	Training Programme, organised by the Central Project Management Unit (CPMU) of Dam Rehabilitation and Improvement Project, CWC, New Delhi in association with the IIT, Roorkee and Motilal Nehru National Institute of Technology, Allahabad on **"Hydrological and Hydraulic Methods of Flood Routing**" held on the 13th -14th June, 2019 at Indian Institute of Technology, Roorkee, Uttarakhand. **Total Personnel-2(two) [Technical], AEE(C)-2.**	**Management**	**2 x 2 = 4**
7	Programme on "**Power System Logistics Conclave**" organized by North Eastern Regional Load Dispatch Centre (NERLDC), POSOCO, Lower Nongrah, Lapalang, Shillong to be held on 6th& 7th June 2019 at NERLDC Conference Hall, Shillong. **Total Personnel-2(two) [Technical], SE(Elect)-1, EE(Elect)-1.**	**Transmission**	**2 x 2 = 4**

Sl. No	Name of Institute	Field of Training (Thermal/ Hydro/ Transmission/ Distribution/ Management)	Total Training (Days/ Man)
8	Training Programme, organised by the Central Project Management Unit (CPMU) of Dam Rehabilitation and Improvement Project, CWC, New Delhi in association with the IIT, Roorkee and Motilal Nehru National Institute of Technology, Allahabad on **"Geotechnical and Seismic consideration in Dams"** held on the 17th -18th June, 2019 at Indian Institute of Technology, Roorkee, Uttarakhand. **Total Personnel-2(two) [Technical], AEE (C)-2.**	**Management**	**2 x 2 = 4**
9	Training Programme, organised by the Central Project Management Unit (CPMU) of Dam Rehabilitation and Improvement Project, CWC, New Delhi in association with the IIT, Roorkee and Motilal Nehru National Institute of Technology, Allahabad on **"Geotechnical and Seismic consideration in Dams"** held on the 19th -21st June, 2019 at Indian Institute of Technology, Roorkee, Uttarakhand. **Total Personnel-2(two) [Technical], AEE(C)-2.**	**Management**	**2 x 3 = 6**
10	Workshop on **"Latest Trends in Inspection & Investigations of Dam"**, organised by AF Academy under the aegis of Central Water Commission and in association with Central Board of Irrigation & Power (CBIP), ICID-CIID and World Bank on 30th& 31st May 2019 at New Delhi. **Total Personnel-2(two) [Technical], CE(C)-1, SE(C)-1**	**Management**	**2 x 3 = 6**
11	Training programme on "Emerging Trends in Power Sector –NER" for senior management, organized by POWERGRID from 17th to 19th June 2019 at POWERGRID Academy of Leadership (PAL), Manesar, Gurugram, Haryana. **Total Personnel-4(four) [Technical], SE(Elect)-2, EE(Elect)-2**	**Management**	**4 x 3 = 12**
12	Training on "***Capacity Development Proramme***", organized by Asian Development Bank held on 8th - 10th July 2019 at ASCI, Hyderabad. **Total Personnel-1(one) [Technical], SE(Elect)-1.**	**Distribution**	**1 x 3 = 3**
13	Training programme on **"Project Planning Implementation, Monitoring & Evaluation"** organized by Department of Public Enterprises (DPE), Government of India held on 15th -19th July 2019 at IIT Kharagpur. **Total Personnel-1(one) [Technical], AEE(C)-1**	**Hydro**	**1 x 5 = 5**
14	Training Programme on "**Website Quality Certification**" at Electronics Test & Development Centre, STQC Directorate, Ministry of Electronics & Information Technology, Government of India, 1st& 2nd Floor, Central Block, HOUSEED Complex, Beltola-Basistha Road, Dispur, Guwahati – 781006 from 10:00 A.M to 5:00 P.M on the 15th – 16th July, 2019. **Total Personnel-1(one) [Technical], AEE (Comp. Engr)-1.**	**Management**	**1 x 2 = 2**
15	The 22nd National Conference on e-Governance (NCeG) 2019 to be held on the 8th and 9th August 2019 at State Convention Centre, Shillong. **Total Personnel-1(one) [Technical], SE(Elect)-1, EE(Elect)-1**	**Management**	**2 x 2 = 4**
16	Training programme on **"*Finance & Accounts Practices*"** (INDAS), to be organized by Power Grid Corporation of India Limited (PGCIL) under Capacity Building & Institution Strengthening (CBIS) of NERPSIP on 2nd& 3rd September 2019 from 9.30 A.M in the ICSSR Hall, NEHU, Shillong. **Total Personnel-26 (twenty-six) [Accounts], DAO/SO-26.**	**Management**	**2 x 26 = 52**
17	Training programme on **"Online Right to Information Portal"** organized by Meghalaya Administrative Training Institute", Shillong held on 4.10.2019 at IT Training Hall, IT&C Department at 11.00 A.M. **Total Personnel-6(six) [Administration], CE-4, ACE(C)-1, Under Secretary-1**	**Management**	**1 x 6 = 6**
18	Training programme on **"Project Planning Implementation, Monitoring & Evaluation"** organized by	**Hydro**	**5 x 1 = 5**

Sl. No	Name of Institute	Field of Training (Thermal/ Hydro/ Transmission/ Distribution/ Management)	Total Training (Days/ Man)
	Department of Public Enterprises (DPE), Government of India to be held on 15th -19th July 2019 at IIT Kharagpur. **Total Personnel-1(one) [Technical], AEE(C)-1.**		
19	Training programme on **"Smartgrid"** organised by Power Grid Corporation of India Limited, at Smart Grid Knowledge Centre, Manesar, Haryana with effect from 9th – 11th September 2019. **Total Personnel-1(one) [Technical], AEE (Elect)-1.**	**Distribution**	**3 x 1 = 3**
20	Training programmme on **"Urban Planning & Management"** conducted by Meghalaya Administrative Training Institute (MATI), Shillong held on 24.10.2019 from 9.30 A.M at MATI, Shillong. **Total Personnel-3(three) [Technical], AEE (Elect)-2, AEE (C)-1.**	**Management**	**1 x 3 = 3**
21	Training programmme on **"ADB Procurement, bid Evaluation (Technical & Financial etc)"** conducted by ADB on the 20th& 21st November 2019 in the Conference Hall, Lumjingshai, MeECL, Shillong from 10.00 A.M onwards. **Total Personnel-32(thirty-two) [Technical], CE(Elect)-2, Comp Secretary-1, ACE-4, SE-8, Dy. CAO-1, Sr. AO-1, EE-8, AAO-3, AEE-3, DAO-1**	**Management**	**2 x 32 = 64**
22	Workshop on **"Breakdown Analysis and Remedies of Electrical Equipment"** conducted by NTPC, Bhubaneswar to be held on26.11.2019from 10.00 A.M to 4.00 PM in the HRD Centre Hall Umiam. **Total Personnel-40(forty) [Technical], SE-2, EE(Elect)-12, EE (C)-6, AEE/RE-20**	**Distribution**	**1 x 40 = 40**
23	Workshop on **"a cloud based modular HR Management system under CBIS Programme of NERPSIP Project"** organized by the Power Grid Corporation of India Ltd., to be held on the 28th February 2020 in the Conference Hall, Lumjingshai, Shillong from 11.00 A.M onwards. **Total Personnel-21(twenty-one) [Technical], Directors-3, CEs-7, Comp. Secretary-1, CAO(I/C)-1, ACEs/ Dy. Director (HRDC)-9**	**Management**	**1 x 21 = 21**
24	Seminar on "Implementation of Smart Metering System" organized by Genus Power Infrastructures Limited, New Delhi held on 27th February 2020 in the Conference Hall, Lumjingshai, Shillong from 1:00 P.M onwards. **Total Personnel-20(twenty) [Technical], Director-1, CEs-3, ACEs-6, SE-4, EEs-6**	**Distribution**	**1 x 20 = 20**
25	Workshop todemonstrate **"a cloud based modular HR Management system under CBIS Programme of NERPSIP Project"** organized by the Power Grid Corporation of India Ltd., held on the 28th February 2020 in the Conference Hall, Lumjingshai, Shillong from 9.30 A.M onwards. **Total Personnel-28(twenty-Eight) [Technical], Directors-3, CS-1, CEs-7, CFO-1, CAO(I/C) -1, Jt. Secretary-1, Dy. Director (HRDC) 1, ACEs-11, Dy. CAO-1, EE-1**	**Management**	**1 x 28 = 28**

Table 6:Training Details for FY 2020-21 (As on August):

Sl. No.	Name of Institute	Field of Training (Thermal/ Hydro/ Transmission/ Distribution/ Management)	Total Training (Days/ Man)
1	Training on **"E-learning Course on Project management through live Webinars under CBIS Programme of NERPSIP for Executives"** organized by Power Grid held on 12th June 2020 from 3:00 P.M onwards. **Total Personnel-29 (twenty-nine) [Technical]. CE-1, ACE-1, EE-8, AEE/ RE-19.**	**Management**	**1 x 29 = 29**
2	Training on **"Webinar on Contract Management, Project Management & Risk Assessment"** organized by Power Grid Corporation of India Ltd. (PGCIL), held on 15th& 16th May 2020 from 3:00 P.M onwards. **Total Personnel-10 (ten) [Technical]. CE-1, ACE/Dy Dir-1(HRDC)-2, SE-1, EE-5, AEE-1.**	**Management**	**2 x 10 = 20**
2	E-learning course under CBIS –NERPSIP on "**PreventionofSexual Harassment for Internal Committee"** organized by the PGCIL held from 7th July 2020 to 10th July 2020 from 11.A.M to 1.P.M. **Total Personnel-4 (four) [Technical/Administration]. SE-1, Under Secy-1, AEE-1, AE-1**	**Management**	**4 x 4 = 16**
3	Training programme on the subject "**Accounting Finance (Basic)"** (Capacity Building plan 2020-22) under CBIS –NERPSIP, organized by the PGCIL through Administrative Staff College of India (ASCI) Hyderabad, held from 20th July 2020 to 24th July 2020. **Total Personnel-25 (twenty-five) [ACCOUNTS]. CFO-1, Sr. AO-1, DAO-23**	**Management**	**5 x 25 = 125**
4	Online training programme on the topic **"CEA Contractual Standards for Distribution Works"** organized and sponsored by TATA Power DDL, New Delhi through Chief Program Manager, REC Ltd, RO, Shillong held on 5th August 2020 from 11:00 A.M to 12:30 P.M. **Total Personnel-30 (thirty)[TECHNICAL].EE-13, AEE-17.**	**Distribution**	**1 x 30 = 30**

Human Resources Development Centre (HRDC), Umiam, MeECL is entrusted with the training for the officers and staffs of the three subsidiary corporations of MeECL, namely, MePGCL, MePTCL and 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 three subsidiary corporations are being sent regularly to free training programme organized 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 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.

2.2.6 Proposed Training Plans of Meghalaya State Load Dispatch Centre

In the previous control period, various staffs of SLDC, have attended several training programs at (NPTI) Power Systems Training Institute, Bangalore and NPTI, Guwahati Campus on Basic Level Power System Operator examination. In continuation to this, the state load dispatch centre has proposed training programs for its personnel as presented below:

Table 7: Training Plan for FY 2020-21, 2021-22, 2022-23 & 2023-24 & Expected Expenditure (INR lakhs)

Name of the Course	Expected Expenditure Per Head	Number of Officers Proposed (A) & Expected Expenditure (B) (INR Lakhs)							
		FY 2020-21		FY 2021-22		FY 2022-23		FY 2023-24	
		(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
Basic Level Power System Operator + Refresher** Power System Operator (every 3 years)	0.80	2	1.60	5	4.0	5	4.0	2	1.60
Specialist Level	0.80					4	3.6	2	1.60
	Total	**2**	**1.60**	**5**	**4.0**	**9**	**7.6**	**4**	**3.20**

2.2.7 Way forward

In accordance with the CEA Guidelines & Apprentices Act, 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.

2.3 Repair and Maintenance Plan of MePTCL and State Load Dispatch Center

Repair and maintenance (R&M) activities are essential to maintain high degree of system reliability, and availability. The R&M cost impacts the operational cost and is a part of the A&G cost, during tariff determination. Thus, the planned R&M (O&M) activities during the control period, will have an impact on the business of the licensee.

2.3.1 Repair and Maintenance Plan of MePTCL

The table below represents the year wise O&M cost planned for various activities such as, repair and maintenance of transmission lines, sub-stations, and power transformers, etc.

Table 8: Year Wise R&M Plan of MePTCL for the control period FY 2021-21 to FY 2023-24 (INR Cr)

Sl. No.	Name of Work	FY 2021-22		FY 2022-23		FY 2023-24	
		Material Cost	Erection Charge	Material Cost	Erection Charge	Material Cost	Erection Charge
1	Operation & Maintenance of 132 kV and above Transmission lines	1.9	2.8	1.8	2.41	1.0	2.0
2	Repairing & Maintenance of Power Transformers	4.0	1.6	4.0	1.6	2.0	0.8
3	Maintenance of Substations equipment's	1.0	0.5	1.0	0.5	1.0	0.5
Total		**6.9**	**4.9**	**6.8**	**4.51**	**3.0**	**3.3**

2.3.2 Repair and Maintenance Plan of SLDC

The table below presents the Repair and Maintenance Plan of SLDC for the third control period.

Table 9: R&M Plan of SLDC for the control period FY 2020-21 to FY 2023-24 (INR Lakhs)

Sl. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
1	Plants & Machinery	100.00	105	115	120
2	Buildings	1.50	2.00	2.50	3.00
3	Civil works	1.00	1.50	2.00	2.50
4	Lines & Cables	1.50	1.50	2.00	2.00
5	Vehicles	6.90	7.00	7.20	7.40
6	Furnitures & Fixtures	1.50	1.70	1.90	2.10
7	Office Equipment	1.00	2.60	2.70	2.80
8	Others	0.00	0.00	0.00	0.00
	Total	**113.40**	**121.30**	**133.30**	**139.80**

3 Key Performance Parameters (Actual and Projected)

3.1 Introduction

3.1.1 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 Kv Khliehriat (Powergrid) – Khandong D/c (NEEPCO) and Umtru HEP - Kahelipara). The existing transformation capacity available at 400 and 220 Kv for import from the North-Eastern Grid is 1150 MVA. This transformation capacity serves both Assam and Meghalaya.

3.1.2 For a transmission utility, it is most important to deliver un-interrupted power supply to its consumers. Also, transmission loss and Network Construction are two additional parameters which have greater impact on the transmission business. Day by day transmission system is

getting more and more complex with network addition. Further, with the implementation of the schemes proposed in this Business Plan and IPP evacuation plan, MePTCL will operate a larger transmission system by the end of the Business Plan. With the growth in transmission network, it will be more challenging to improve the system availability and to reduce the transmission losses over the period.

3.2 Present Performance Parameters for MePTCL

3.2.1 **Transmission System Availability (TSAF):** TSAF is an indicator of safe, secure and efficient operation of the transmission system. It indicates system reliability and stability, which are necessary to ensure continuous and uninterrupted supply to end consumers of the distribution company as well as providing continuous transmission access to the State generating stations, Central generating stations and Open Access customers. MePTCL is making all out efforts to supply the power required by the State through its transmission system comprising 20 sub-stations and more than 1,433.576 ckt.km (as on March 2020) of transmission lines of different voltage classes spread across Meghalaya. MePTCL has been undertaking repair and maintenance work for optimizing system performance. As an outcome of this, the licensee has been able to maintain close to 98% TSAF. The table below represents TSAF of MePTCL from FY 2016-17 to FY 2020-21 (till present date).

Table 10: Transmission System Availability from FY 2016-17 to FY 2019-20

	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20
Intra State	97.93	98.83	99.71	99.6
Inter State	93.30	94.88	95.69	95.68
Overall	**95.62**	**96.85**	**97.7**	**97.64**

3.2.2 **Transmission Loss:** MePTCL is undertaking continuous efforts to reduce transmission losses by replacing meters, and metering system at interface/ boundary with the Generators and Distributors. It has also established a Central Data Centre at NEHU sub-station, at a cost of INR 366.67 Lakhs which was completed in June 2016.

As an outcome of these initiatives, the licensee has been able to reduce the transmission losses continuously from 5.18% in FY 2016-17 to 4.0% in FY 2020-21, which comes well within the target set by the Hon'ble Commission. The table below presents year-on-year reduction in transmission loss of the licensee.

Table 11: Transmission Loss from FY 2016-17 to FY 2020-21

Particular	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21 (Up to Present)
Transmission Loss (%)	5.18	5.13	4.08	3.78	4.0

For further reduction of transmission losses, MePTCL has initiated the following steps:

a. **<u>Metering upgradation</u>**: For replacing the existing meters & the metering system at interface boundary with the GENCO & the DISCOM by ABT compliant meters of accuracy class 0.2S as per the latest CEA meter regulation, a detailed project report has been prepared at an estimated cost of INR 22.24 crores, for which funding is yet to be finalized. Furthermore, for more accuracy and as per the latest CEA regulations, MePTCL has taken up the work for replacing current transformers, potential transformers (of 132kV and above) etc of accuracy class 0.5S with accuracy class of 0.2S under the project, 'Renovation and Upgradation of Protection & Control System of MePTCL', funded under

the Power System Development Fund (PSDF) at an estimated cost of INR 69.19 crores. The work is completed in December 2019.

b. <u>Transmission line up-gradation</u>: Some of the transmission lines are very old and as such line loading capacity of these lines have reduced and thereby technical losses have increased due to ageing of conductors. Re-conductoring of these lines are required to enable to increase the line loading capacity as well as to reduce the line losses. In this regard, MePTCL has taken up the Re-engineering work of the 132Kv line from Mawlai sub-station to Nangalbibra sub-station by way of replacing of conductor, insulators etc at an estimated cost of INR19.23 crores funded under the Special Plan Assistance (SPA) and the works are completed in September, 2018. Furthermore, another two DPR for Re-conductoring of the 132 Kv single circuit line from Khliehriat to Ratacherra with High Temperature and Low Sag (HTLS) conductor (Meghalaya portion) and Re-engineering and strengthening by HTLS for 132 kV double circuit transmission line from Stage-I – Stage – III Power Station have been prepared for funding under PSDF. DPR has been prepared for funding under ADB and other Central sponsored schemes for 400kV LILO of 400kV Silchar-Killing at Mynkre, LILO of 400kV Silchar-Killing at Saisiej (new Shillong), 400kV Mynkre-Ichamati and 400kV Nangal-Nongstoin-Mawkyrwat-Cherra-Ichamati(to be initially charged at 220kV) for Indo-Bangla cross border trade,

3.3 Performance Parameters of MePTCL

3.3.1 **Projected Transmission System Availability:** The overall transmission system availability on 2019-20 is close to 97.6%. Details of the system availability has been shown in table 10 (Section 3.2). Based on the actual performance and the projected system improvement works, MePTCL has considered 98% as system availability for the period FY 2020-21 to FY 2023-24.

Table12: System Availability Projection for FY 2020-21 to FY 2023-24

System Availability	FY 2020-21 (Full Year)	FY 2021-22	FY 2022-23	FY 2023-24
Intra State (%)	99.8	99.8	99.8	99.8
Inter State (%)	95.8	96.0	96.1	96.2
Overall (%)	97.8	97.9	97.95	98.0

3.3.2 **Future Trend of Transmission Loss:** Based on the projected capacity addition and overall aim to deliver reliable and quality power supply to the consumers, MePTCL has proposed the following loss trajectory.

Table13: System Loss Projection for FY 2020-21 to FY 2023-24

Parameters	FY 2020-21 (Full Year)	FY 2021-22	FY 2022-23	FY 2023-24
System Loss (%)	3.8	3.8	3.8	3.7

3.3.3 **Roll Out Plans:** Based on the ongoing and upcoming works in the remaining control period, the rollout plan prepared as per the Business plan for MePTCL is given below:

Table 14: Rollout Plan for FY 2020-21 to FY 2023-24

Plan	Existing Capacity (31.03.2020)	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	Total expected Capacity as on 31.03.2024
Transmission (Inter-State)						
New Line (Ckt Km)	411.885					411.885
Transformation Capacity (MVA)	200					200
Transmission (Intra-State)						
New Line (Ckt Km)	1202.308	675	85	806	120	2888.308
Transformation Capacity (MVA)	1505	720	455	752	560	3992

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 1202.308 Ckt. Km at 132 kV, 226.84 Ckt. Km at 220 kV and 4.428Ckt. 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 595 MVA. The above capacity is generally adequate to meet the present peak requirements of the state.

4 Capital Investment Plan (CIP)

4.1 Details of Capital Expenditure

4.1.1 Purpose of Capital Investment Plan (CIP):

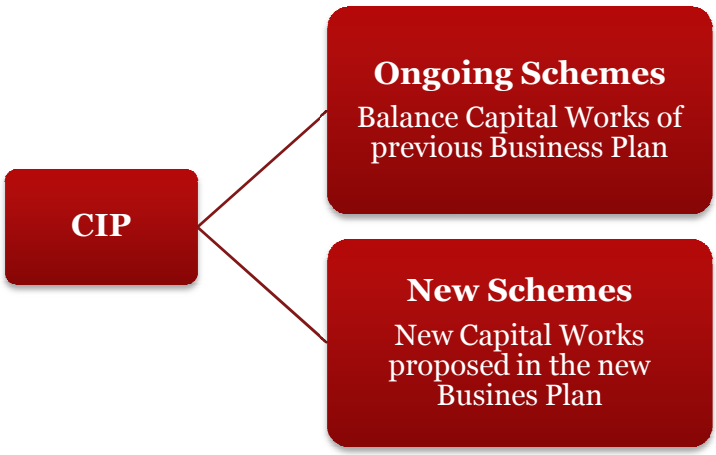
The purpose of the Capital Investment Plan (CIP) is to provide MePTCL with a roadmap for planning and implementation of proposed projects & schemes for the control period. The CIP has been prepared keeping in view various long-term needs and areas for capital expenditure as highlighted below:

- 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

4.1.2 Capital Investment Plan (CIP)

CIP includes schemes envisaged to be implemented in future. The key factors that are considered while formulating a capital investment plan includes:

a) Anticipated growth in load requirement during the control period
b) Need for system augmentation to reduce/ remove overloading in transmission lines and substations.
c) Scope for improvement in reliability of the equipment and thereby the overall transmission system so as to provide high TSAF consistently



Several assumptions have been taken 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. These attributes are expected to become clearer with preparation of Detailed Project Reports (DPR), Approval by concerned authority/ financial institution and commencement of execution. Similarly, to finance the capital expenditure, MePTCL primarily depends on 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 to MePTCL in the form of Grants & Equity. Loan component is also expected to be provided by the Government of Meghalaya. The details of schemes which are part of the present investment plan along with their funding pattern is given below

Table15: Details of Ongoing and Proposed Schemes

Sr. No.	Schemes	Project Cost (INR Cr)	Funding Pattern (INR Cr)		
			Equity	Loan	Grant
New Schemes					
1	**State Govt**				
	Construction/ Upgradation of Transmission lines	208.00	0.00	0.00	208.00
	Construction/ Upgradation of Substations	144.00	0.00	0.00	144.00
	Sub-total	**352.00**	**0.00**	**0.00**	**352.00**
2	**Center Sponsored Schemes**				
a	**SPA**				
	Construction/ Upgradation of Substations	**451.00**	**0.00**	**0.00**	**451.00**
b	**NEC/ CSS**				
	Construction/ Upgradation of Transmission lines	431.00	0.00	0.00	431.00
	Construction/ Upgradation of Substations	225.00	0.00	0.00	225.00
	Sub-total	**656.00**	**0.00**	**0.00**	**656.00**
3	**PSDF**				
	Construction/ Upgradation of Transmission lines	78.68	0.00	0.00	78.68
	Other New Works	98.46	0.00	14.50	83.96
	SLDC	8.48	0.00	0.00	8.48
	Sub-total	**185.62**	**0.00**	**14.50**	**171.12**
4	**Others**				
	Construction/ Upgradation of Transmission lines	9.60	0.00	0.00	9.60
	SLDC	10.51	0.00	10.51	-
	Sub-total	**20.11**	**0.00**	**10.51**	**9.60**
	Total	**1664.73**	**0.00**	**25.01**	**1639.72**
Ongoing/ Completed Schemes					
1	**Center Sponsored Schemes**				
a	**SPA**				
	Construction/ Upgradation of Transmission lines	35.58	0.00	0.00	35.58
	Construction/ Upgradation of Substations	18.91	0.00	0.00	18.91
	Sub-total	**54.49**	**0.00**	**0.00**	**54.49**
b	**NEC**				
	Construction/ Upgradation of Transmission lines	**9.66**	**0.00**	**0.00**	**9.66**
2	**PSDF**				
	Other on-going works	10.13	0.00	0.00	10.13
	SLDC	2.07	0.00	0.00	2.07
	Sub-total	**12.20**	**0.00**	**0.00**	**12.20**
3	**NERPSIP**				
	Construction/ Upgradation of Transmission lines	**598.73**	**0.00**	**0.00**	**598.73**
	Construction/ Upgradation of Substations				
	Sub-total				

Sr. No.	Schemes	Project Cost (INR Cr)	Funding Pattern (INR Cr)		
			Equity	Loan	Grant
5	**Others**				
	Other on-going works	**49.97**	**0.00**	**0.00**	**49.97**
	Total	**725.05**	**0.00**	**0.00**	**725.05**
	Grand total	**2389.78**	**0.00**	**25.01**	**2364.77**

4.2 Details of Fund Requirement and Capitalization

4.2.1 Fund Requirement

Within Meghalaya, the objective of the schemes is to revitalize the power sector to achieve sustainable development in the long term. The State has to implement the listed projects below on time to ensure availability of transmission system for 24x7 supply and will monitor the loading of lines and substations on periodic basis keeping in view the actual growth in loading of the load centers along with changes in consumer mix. Given below is the capital expenditure proposed for FY 2020-21 and FY 2023-24 under the various schemes mentioned above:

Table16: Capital Expenditure Plan

Sl. No.	Category	Fund Requirement (in INR Crs)				
		FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	Total
1	Transmission Lines	25.12	228.11	211.27	200.20	664.70
2	Substations	6.33	134.73	407.70	247.90	796.67
3	Other works	28.72	97.96	26.76	0.00	153.45
4	NERSIP	89.81	89.81			179.62
5	SLDC	1.70	8.95	6.88	1.50	19.03
Total Fund Requirement (in INR Crores)		**151.69**	**559.56**	**652.62**	**449.60**	**1813.47**

4.2.2 Capitalization in Third Control Period

The addition of new transmission lines, and substations is required for relieving the existing overloaded lines and substations of MePTCL. This is also necessary to meet the growing demand of the state. Given below is the capital expenditure proposed for third control period under the various schemes mentioned above:

Table17: Details of Capitalization for the year 2020-21 and 2023-24

Sl. No.	Category	Capitalization (in INRCrores)				
		FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	Total as on 31.03.2024
1	Transmission Lines	30.85	23.99	78.68	418.00	**551.52**
2	Substations		18.91	144.00	556.00	**718.91**
3	Other works	3.44	88.21	66.91		**158.56**
4	NERPSIP		598.73			**598.73**
5	SLDC	0.66	3.70	3.15	3.00	**10.51**
Total Asset Addition (in INR Crores)		**34.95**	**733.54**	**292.74**	**977.00**	**2,038.23**

4.3 Details of Schemes

The details of various schemes which are a part of the CIP are provided in the following sections.

4.3.1 North East Region Power System Improvement Project (NERPSIP)

North Eastern Region Power System Improvement Project (NERPSIP) is being implemented as a Central Sector Scheme through Power Grid Corporation of India Limited (PGCIL). The scheme is funded by the Government of India and the World Bank on 50:50 basis. The scheme comprises of development of Transmission, Sub-Transmission/ Distribution system upto 33 KV. Within Meghalaya, the objective of the scheme is to revitalize the power sector to achieve sustainable development in the long term. The addition of new substations and construction of new lines is required for relieving the existing overloaded lines and substations catering to Shillong, areas of Khasi Hills and Garo Hills districts. The added capacity is also required for catering to the growing demand throughout the state.

The total approved cost under tranche-I for Meghalaya for transmission scheme is INR 598.73 crore. The date of approval of the project is 01.12.2014. The works are in progress and is expected to be completed by Dec 2020: The works included are as follows:

- Construction of 220 kV double circuit line from Killing (Byrnihat) sub-station to Mawngap (Mawphlang) sub-station and finally up to New Shillong Township (244 circuit km) complete with up-gradation of 132/33 kV Mawngap sub-station to 2 x 160 MVA, 220/132 kV (GIS) and a new 2 x 160 MVA, 220/132 kV & 2 x 50 MVA, 132/33 kV sub-stations (GIS) at New Shillong.
- Construction of Loop In Loop Out (LILO) of both circuits of MLHEP – Khliehriat double circuit line (38 circuit km) along with a 2 x 50 MVA, 132/33 kV sub-station at Mynkre.
- Construction of 132 kV double circuit line from Ampati to Phulbari (138 circuit km) along with 2 x 50 MVA, 132/33 kV sub-station at Phulbari.

4.3.2 Power System Development Fund (PSDF)

The Government of India has approved a scheme for operationalization of Power System Development Fund (PSDF) in the 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 Dispatch 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 generator for improvement of 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.

Based on decision taken in the in NERPC forum, a third-party audit on protection was carried out in 135 sub-stations and generating stations of NER at 132KV voltage level and above. The teams comprising of members from PGCIL, NEEPCO, NHPC, NERPC and NERLDC was formed. The protection audit of the sub-stations and generating stations in NER was completed in February 2013. The findings of the audit team were discussed in the Commercial Sub-Committee and Protection Sub-Committee meetings of NERPC. Subsequently, the Ministry of Power directed for preparation of the Detail Project Report based on the

recommendations of the protection audit team for rectifying the defects. The same was sent to CEA with the request for funding through PSDF or any other sources without any financial burden to the constituents.

In order to further its objectives of having enhanced grid stability, MePTCL plans to carry out Renovation and Upgradation of Protection & Control system with funding available through PSDF. For Meghalaya, the protection audit was carried out in 1 No. 400KV and 19 Nos. 132KV substations/generating stations. 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.

Under the PSDF scheme, up to 100% funding shall be provided to various MePTCL projects such as:.

- **Renovation and upgradation of Protection & Control System of MePTCL**. This project is funded under Power System Development Fund (PSDF) at an approved cost of INR 69.19 crores and sanctioned as 100% Grant. The date of approval of the project is 04.08.2015 vide order No 10/1/2014/OM. The scheme includes replacement/installation of Circuit Breakers, Current Transformers, Potential Transformers, Capacitive Voltage Transformers, Isolators, Control & Relay Panels, Power & Control Cables, Air Conditioning System, Battery Banks, Surge Arrestors, Solar LEDs, Wave Traps, Nitrogen Injection Systems, Diesel Generator Sets, Firewalls, Numerical Relays and Diagnostic Tools in all the existing extra high tension (132 KV and above) sub-station in the state. The work was completed in December 2019.
- The '**Installation of Numerical Line Differential Relays** in 132 KV Lines' which is also Sanction of grant from PSDF by MoP vide Order No 10/01/2014-OM dated 24.05.2019 equivalent to an amount INR 3.27 Crores need to be completed within 18 months from 1st release of fund .
- *The '**Automatic Demand Management System'*** **(ADMS)** which is also Sanctioned (grant) under PSDF by MoP vide Order No 10/1/2014-OM dated 15.04.2019 equivalent to an amount INR 2.07 Crores need to be completed within 6(six) months from 1st release of fund.
- Implementation of Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST) in Electricity in the State of Meghalaya is also Sanctioned (grant) under PSDF by MoP vide Letter No. 10/1/2014-OM dated 20.03.2020 for an amount of INR 8.48 Crores and is to be completed within 12 (twelve) months from 1st release of fund.
- Replacement of the 400 KV, Bus Reactor at 400/220/132 KV Substation, Killing is also Sanctioned (grant) under PSDF by MoP vide Letter No. 10/1/2014-OM dated 20.03.2020 for an amount of INR 6.86 Crores and is to be completed within 12 (twelve) months from 1st release of fund.

4.3.3 Other Central Sponsored Schemes

Some of the other works in the investment plan have been funded by other central sponsored schemes like NEC and NESIDS. The details are given in Annexure I (a) and I (b).

i. North Eastern Council:

Under the schemes of North Eastern Council (NEC), the funds are available in form of grants to MePTCL.

The following ongoing projects are being implemented under the NEC Scheme:

- Augmentation of 132/33 kV sub-station from 35 MVA to 50 MVA, at Rongkhon, with a total capital expenditure of INR 4.69 crores. The project is scheduled to be completed by 31.12.2020.
- Construction of 132 kV double circuit LILO on Mawlai-Cherra line at Mawngap sub-station, with a total capital expenditure of INR 4.97 crores. The project is scheduled to be completed by 31.03.2021.
- Construction of the 132 KV D/C line from Nangalbibra to Baghmara, with a total capital expenditure of INR 81.00 crores. The project is scheduled to be completed by 31.03.2025
- Construction of the 220KV D/C Nangalbibra (PG)-Mawphlang line including 220 KV LILO of Mawphlang – New Shillong line at Mawmihthied/Cherra, with a total capital expenditure of INR 230.00 crores. The project is scheduled to be completed by 31.03.2024
- Construction of the LILO of the 132 KV D/C line from Stage-III Powerhouse to Umtru Powerhouse on Multi Circuit Towers at Nongpoh, with a total capital expenditure of INR 20.00 crores. The project is scheduled to be completed by 31.03.2024
- Construction of 132 KV D/C LILO of Umtru – Kahelipara Line at Killing with HTLS, with a total capital expenditure of INR 45.00 crores. The project is scheduled to be completed by 31.03.2024
- Re-conductoring of 132 KV UPS-Sarusajai line with HTLS, with a total capital expenditure of INR 40.00 crores. The project is scheduled to be completed by 31.03.2025
- Construction of 132 KV D/C Nangalbibra – Nangal (PG) line with HTLS, with a total capital expenditure of INR 15.00 crores. The project is scheduled to be completed by 31.03.2025
- Construction 220/132 KV, 2x160 MVA Sub-station at Mawmihthied/ Cherra, with a total capital expenditure of INR 70.00 crores. The project is scheduled to be completed by 31.03.2024
- Construction of 132/33 KV, 2 x 25 MVA sub-station at Nongpoh, with a total capital expenditure of INR 45.00 crores. The project is scheduled to be completed by 31.03.2023
- Construction of the 132/33 KV, 2 x 25 MVA GIS sub-station at the 400/220/132 KV sub-station at Killing, Byrnihat, with a total capital expenditure of INR 35.00 crores. The project is scheduled to be completed by 31.03.2024
- Augmentation of the 132/33 KV NEHU sub-station from 2 x 20 MVA to 2 x 50 MVA capacity along with reengineering of Bus-bar, with a total capital expenditure of INR 20.00 crores. The project is scheduled to be completed by 31.03.2023
- Augmentation of the 132/33 KV Nangalbibra sub-station from 2 x 12.5 MVA to 2 x 50 MVA capacity along with reengineering of Bus-bar, with a total capital expenditure of INR 30.00 crores. The project is scheduled to be completed by 31.03.2023
- Augmentation of the 132/33 KV Cherra sub-station from 1 x 12.5 MVA to 2 x 25 MVA capacity, with a total capital expenditure of INR 25.00 crores. The project is scheduled to be completed by 31.03.2023

The projects under the existing Schemes of NEC will accrue socio-economic benefits to the people of North Eastern Region enhancing their capabilities and livelihood.

ii. North East Special Infrastructure Development Scheme (NESIDS):

The North East Special Infrastructure Development Scheme, or commonly known as NESIDS, was sanctioned by the Government of India to focus on projects relating to infrastructure creation concerning water supply, power and connectivity, and thereby enhancing tourism. It also focuses on the social infrastructure of the primary and secondary sectors of health and education. The scheme is to be implemented by the Ministry of Development of North Eastern Region. The projects related to the above-mentioned sectors proposed by the State Governments in North East are being considered, in consultation with the respective line Ministries.

The following projects are being carried out under NESIDS:

- Augmentation of 132/33KV, 2X20 MVA Mawlai substation to 132/33KV, 3x50 MVA substation including re-engineering of the 132 KV Busbar' with capital expenditure of INR 49.8 crores. It is scheduled to be completed by March 2020.

4.3.4 Special Plan Assistance (SPA)

A number of major infrastructures have been created in the State under this Scheme supported by the erstwhile Planning Commission, Government of India. The details of the ongoing projects and proposed projects under this scheme is presented in **Annexure I (a)** and **Annexure I (b)** respectively.

4.4 Impact of Covid-19 on Capex Works:

COVID-19 is having a massive impact on capex projects of MePTCL. The various restrictions put in place to control the effects of the virus have triggered shortages of raw material and manpower and disrupted supply chains. The construction has been halted and there has been a delay in resumption of construction works. The construction workers are staying away from work sites due to fear over corona virus infection and many of them have returned to their villages. The scenario implies that the construction work will be slow, pushing costs upward given the interest and debt servicing needed for that extra period. These disruptions can lead to possible time and cost overruns for the licensee.

4.5 Schemes under Implementation

There are several schemes which are under implementation currently and have been included in the Capital Investment Plan. The details of the ongoing schemes are attached as Annexure **I (a)**.

4.6 New Schemes: Proposed/ to be Proposed for Implementation

There are several schemes which are envisaged to be implemented in future keeping in view objectives mentioned earlier. For the purpose of CIP, the cost estimates, completion period, start date etc. have been projected based on MePTCL experience. These schemes are highlighted in **Annexure I (b).**

4.7 Funding of Capital Expenditure

MePTCL plans on funding majority of its capital expenditure through grants available under central sponsored schemes and state government funding. The funding for the works with a loan component is envisaged through Power Finance Corporation/ Rural Electrification Corporation.

4.8 Detailed Investment Plan as per MSERC Formats

The detailed Capital Expenditure plan for the remaining control period is provided as **Annexure I** as per prescribed format of MSERC vide MYT Regulations, 2014. The CIP includes the ongoing and proposed works under different schemes, total project cost, start and end date of completion of works and its funding pattern

5 Annexure I:

I (a): Investment Plan for ongoing schemes spilling into FY 2020-21 and FY 2021-22

Sl. No.	Project Details	Project Start Date(DD-MM-YY)	Project Completion date (DD-MM-YY)	Total Capital Expenditure approved by MSERC/ Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme						Equity component	Debt Component			
								Loan amount (INR Cr.)	Loan source		
A	**Transmission lines on-going works**										
1	Stringing of second circuit of the 132 kV Agia-Nangalbibra line	26.09.2012	Dec-20	21.19	19.07					21.19	SPA
2	Augmentation of 132/33 kV sub-station from 35 MVA to 50 MVA, at Rongkhon.	08.09.2010	31.12.2020	4.69	0.70					4.69	NEC
3	Construction of 132 kV double circuit LILO on Mawlai-Cherra line at Mawngap sub- station	22.03.2011	31.03.2021	4.97	1.24					4.97	NEC
4	Construction of 132 kV double circuit LILO line of 132 kV Rongkhon-Ampati line at Praharinagar	01.04.2014	30.03.2022	14.39	4.10	4.10				14.39	SPA
B	**Sub-station on-going works**										
1	132 kV sub-station at Praharinagar	01.04.2014	30.03.2022	18.91	6.33	6.33				18.91	SPA
C	**Others on-going works**										
1	Installation of Numerical Line Differential Relays in 132 KV Lines	01.06.2019	31.03.2021	3.27	1.14					3.27	PSDF
2	Replacement of the 400 KV, Bus Reactor at 400/220/132 KV Substation, Killing	31.08.2020	31.08.2021	6.86	4.00	2.86				6.86	PSDF

Sl. No.	Project Details	Project Start Date(DD-MM-YY)	Project Completion date (DD-MM-YY)	Total Capital Expenditure approved by MSERC/ Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme						Equity component	Debt Component			
								Loan amount (INR Cr.)	Loan source		
3	Augmentation of 132/33KV, 2X20 MVA Mawlai substation to 132/33KV, 3x50 MVA substation including re-engineering of the 33KV Busbar'	01.06.2019	31.03.2022	49.8	23.406	23.406				49.80	NESIDS
4	Survey work for Construction of 220KV D/C Mawphlang Ichamati Line and 220/132/33 KV Ichamati substation	26.05.2020	26.01.2021	0.17	0.17					0.17	Others
D	**North Eastern Region Power System Improvement Projects (NERPSIP): Tranche-I**										
1	220 kV double circuit Byrnihat (Killing) – Mawngap – New Shillong line	01.04.2016	31.03.2022	598.73	89.81	89.81			Govt. of Meghalaya	598.73	NERPSIP
2	LILO of both circuit of MLHEP-Khliehriat 132 kV double circuit line at Mynkre										
3	132 kV double circuit line from Phulbari to Ampati										
4	220/132 kV sub-station at New Shillong										
5	220/132 kV sub-station at Mawngap										
6	132 / 33 kV, 2 x 50 MVA sub-station at New Shillong										
7	132/ 33 kV, 2 x 50 MVA sub-station at Mynkre										
8	132/ 33 kV, 2 x 50 MVA sub-station at Phulbari										

Sl. No.	Project Details	Project Start Date(DD-MM-YY)	Project Completion date (DD-MM-YY)	Total Capital Expenditure approved by MSERC/ Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme						Equity component	Debt Component			
								Loan amount (INR Cr.)	Loan source		
E.	**SLDC**										
1	Automatic Demand Management System' (ADMS)	01.06.2019	Aug/Sept 2020	2.07	0.04					2.07	PSDF

I (b): Investment Plan for Proposed Schemes in FY 2021-22 and FY 2023-24

Sl. No	Project Details	Project Start Date (DD-MM-YY)	Project Completion Date (DD-MM-YY)	Total Capital Expenditure Projected by Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Project outlay in FY 2022-23 (Projected) in INR Cr.	Project outlay in FY 2023-24 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme								Equity component	Debt Component			
										Loan amount (INR Cr.)	Loan source		
A.	**Transmission Line New works**												
1	Construction of the 220 KV D/C line from Mawphlang to Ichamati including LILO at Mawmihthied/Cherra	01.04.2021	31.03.2024	110.00		44.00	33.00	33.00				110.00	State Govt
2	Construction of the 132 KV D/C line from Nangalbibra to Baghmara	01.04.2022	31.03.2025	81.00			32.40	24.30				81.00	NEC
3	Construction of the 220KV D/C Nangalbibra (PG)-Mawphlang line including 220 KV LILO of Mawphlang – New Shillong line at Mawmihthied/Cherra	01.04.2021	31.03.2024	230.00		92.00	69.00	69.00				230.00	NEC
4	Construction of the LILO of the 132 KV D/C line from Stage-III Powerhouse to Umtru Powerhouse on Multi Circuit Towers at Nongpoh.	01.04.2021	31.03.2024	20.00		8.00	6.00	6.00				20.00	NEC
5	Construction of 132 KV D/C LILO of Umtru – Kahelipara Line at Killing with HTLS.	01.04.2021	31.03.2024	45.00		18.00	13.50	13.50				45.00	NEC
6	Re-conductoring of 132 KV UPS-Sarusajai line with HTLS.	01.04.2022	31.03.2025	40.00			16.00	12.00				40.00	NEC
7	Construction of 132 KV line from New Shillong – IIM	01.04.2021	31.03.2024	13.00		5.20	3.90	3.90				13.00	State Govt

Sl. No	Project Details	Project Start Date (DD-MM-YY)	Project Completion Date (DD-MM-YY)	Total Capital Expenditure Projected by Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Project outlay in FY 2022-23 (Projected) in INR Cr.	Project outlay in FY 2023-24 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme								Equity component	Debt Component			
										Loan amount (INR Cr.)	Loan source		
	Shillong												
8	Construction of 132 KV D/C Nangalbibra – Nangal (PG) line with HTLS	01.04.2022	31.03.2025	15.00			6.00	4.50				15.00	NEC
9	Construction of the 132 KV S/C line on D/C towers from Mawphlang to Balat	01.04.2023	31.03.2026	85.00				34.00				85.00	State Govt
10	132 kV single circuit line from Rongkhon sub-station to Ganol HEP	01.04.2021	31.03.2022	9.60		9.60						9.60	Project of Ganol/ Others
11	Re-conductoring and strengthening of the 132 kV S/C line from Khliehriat to Ratacherra by HTLS conductor	01.04.2021	31.03.2023	51.82		31.09	20.73					51.82	PSDF (Including Assam section)
12	for Re-conductoring and strengthening of the 132 kV D/C line from Stage-I to Stage -III Power Station by HTLS conductor	01.04.2021	31.03.2023	26.86		16.12	10.74					26.86	PSDF
B.	**Sub-Station New works**												
1	Construction of a 220/132 KV, 2X 160MVA and 132/33KV, 2 x 50 MVA Sub-stations at Ichamati	01.04.2022	31.03.2025	60.00			24.00	18.00				60.00	State Govt
2	Construction of a 132/33 KV, 2 x 25 MVA Sub-station at Baghmara	01.04.2022	31.03.2025	45.00			18.00	13.50				45.00	State Govt
3	Construction 220/132 KV, 2x160 MVA Sub-station at	01.04.2021	31.03.2024	70.00		28.00	21.00	21.00				70.00	NEC

Sl. No	Project Details	Project Start Date (DD-MM-YY)	Project Completion Date (DD-MM-YY)	Total Capital Expenditure Projected by Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Project outlay in FY 2022-23 (Projected) in INR Cr.	Project outlay in FY 2023-24 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme								Equity component	Debt Component			
										Loan amount (INR Cr.)	Loan source		
	Mawmihthied/ Cherra.												
4	Construction of 132/33 KV, 2 x 25 MVA sub-station at Nongpoh.	01.04.2021	31.03.2023	45.00		27.00	18.00				State Govt.	45.00	NEC
5	Construction of the 132/33 KV, 2 x 25 MVA GIS sub-station at the 400/220/132 KV sub-station at Killing, Byrnihat	01.04.2021	31.03.2024	35.00		14.00	10.50	10.50				35.00	NEC
6	Replacement of 5 MVA, 132/33 KV transformer with 20 MVA transformer at Rongkhon 132/33KV substation	01.04.2021	31.03.2023	5.00		3.00	2.00					5.00	State Govt
7	Construction of 25 MVA, 132/33 KV Transformer s at IIM Shillong	01.04.2021	31.03.2023	12.00		7.20	4.80					12.00	State Govt
8	Provision of additional 25 MVA, 132/33 KV transformer with terminal equipments at Ampati 132/33KV substation	01.04.2021	31.03.2023	7.00		4.20	2.80					7.00	State Govt
9	Augmentation of the 132/33 KV NEHU sub-station from 2 x 20 MVA to 2 x 50 MVA capacity along with reengineering of Bus-bar	01.04.2021	31.03.2023	20.00		12.00	8.00					20.00	NEC
10	Augmentation of the 132/33 KV Nangalbibra sub-station from 2 x 12.5 MVA to 2 x 50 MVA	01.04.2021	31.03.2023	30.00		18.00	12.00					30.00	NEC

Sl. No	Project Details	Project Start Date (DD-MM-YY)	Project Completion Date (DD-MM-YY)	Total Capital Expenditure Projected by Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Project outlay in FY 2022-23 (Projected) in INR Cr.	Project outlay in FY 2023-24 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme								Equity component	Debt Component			
										Loan amount (INR Cr.)	Loan source		
	capacity along with reengineering of Bus-bar												
11	Augmentation of the 132/33 KV Cherra sub-station from 1 x 12.5 MVA to 2 x 25 MVA capacity.	01.04.2021	31.03.2023	25.00		15.00	10.00					25.00	NEC
12	Construction of 2x25 MVA, 132/33 KV sub-station at Balat and bay extension at Mawphlang sub-station	01.04.2022	31.03.2025	15.00			6.00	4.50				15.00	State Govt
13	Construction of 132/33KV, 2*10 MVA Substation at Kharkhutta, North Garo Hills	2022-23	2023-24	90.00			54.00	36.00				90.00	SPA
14	Construction of 132/33KV, 2*10 MVA Substation at Chokpot, South Garo Hills	2022-23	2023-24	101.00			60.60	40.40				101.00	SPA
15	Construction of 132/33KV, 2*20 MVA Substation at Chokchokia, West Garo Hills	2022-23	2023-24	90.00			54.00	36.00				90.00	SPA
16	Construction of 220/132/33KV, 2*100 MVA Substation at Rongsai, West Garo Hills	2022-23	2023-24	170.00			102.00	68.00				170.00	SPA
C.	**Others New Works**												
1	Reliable Communication &Data Acquisition	01.04.2021	31.03.2022	29.00		29.00				14.50		14.50	PSDF

Sl. No	Project Details	Project Start Date (DD-MM-YY)	Project Completion Date (DD-MM-YY)	Total Capital Expenditure Projected by Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Project outlay in FY 2022-23 (Projected) in INR Cr.	Project outlay in FY 2023-24 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme								Equity component	Debt Component			
										Loan amount (INR Cr.)	Loan source		
	System Upto 132 KV												
2	Upgradation and Integration of RTU For Improvement of Real Time Telemetry Status of Sub Stations In Meghalaya	01.04.2021	31.03.2022	2.55		2.55					State Govt.	2.55	PSDF
3	Additional Detailed Project Report for Renovation and Upgradation of Protection & Control System	01.04.2021	31.03.2023	45.42		27.25	18.17					45.42	PSDF
4	Remote Monitoring & Time Synchronization of Numerical Relays	01.04.2021	31.03.2023	21.49		12.89	8.60					21.49	PSDF
D.	**SLDC**												
1	MIS automation Data Analytics & Data Science for Management Information Services	Jun 2021	Mar-22	1.00		1.00				1.00			
2	Weather Forecasting: Installation of weather stations and their telemetry to transmit real time data to SLDC	Jun 2021	March 2022	0.70		0.70				0.70			
3	Load Forecasting: Installation of Load Forecasting tool for forecasting data for operational and planning purposes utilising SCADA and weather data	Oct 2021	Dec 2022	1.00		0.30	0.70			1.00			
4	Scientific Earthing of SLDC assets:	01-Nov-20	March 2021	0.06	0.06					0.06			

Sl. No	Project Details	Project Start Date (DD-MM-YY)	Project Completion Date (DD-MM-YY)	Total Capital Expenditure Projected by Govt/ DPR/ FI (INR Cr.)	Project outlay in FY 2020-21 (Projected) in INR Cr.	Project outlay in FY 2021-22 (Projected) in INR Cr.	Project outlay in FY 2022-23 (Projected) in INR Cr.	Project outlay in FY 2023-24 (Projected) in INR Cr.	Source of Financing for Scheme			Capital Subsidies/ Grants Component (INR Cr.)	Funding Agency
	Name of scheme								Equity component	Debt Component			
										Loan amount (INR Cr.)	Loan source		
	Chemical Earthing of SLDC assets in line with IEEE-80 standards												
5	System Study of Meghalaya power system: Steady state and dynamic study of the power system using load flow study software	Jan 2021	Mar 2021	0.60	0.60					0.60			
6	Construction of SAMAST building: Housing of SAMAST infrastructure & office	01-Jan-21	Mar 2022	2.00	1.00	1.00				2.00			
7	Synchro phasor Wide Area Dynamic Measurement System: Installation of PMUs in EHV grid and power stations	Ápr 2022	Oct 2023	3.00			1.50	1.50		3.00			
8	ADMS Expansion project: Installation and integration of FRTUs at grid substations	01-Oct-21	Oct 2022	2.00		1.00	1.00			2.00			
9	SLDC SCADA System Expansion: Expansion of Video Projection System in Control Room	Jun 2022	Dec 2022	0.15			0.15			0.15			
10	Implementation of Scheduling, Accounting, Metering, and Settlement of Transaction in Electricity (SAMAST)	31.08.2021	31.08.2022	8.48		4.95	3.53					8.48	PSDF