



Business Plan

Approval of Business Plan for Multi-Year Control Period
from FY 2019-20 to FY 2021-22

Petition No. 265/2018

For

Electricity Department, Government of Goa (EDG)

16 November 2018

JOINT ELECTRICITY REGULATORY COMMISSION

For the State of Goa and Union Territories,

Udyog Minar, 6th & 8th Floor

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List of abbreviations

Abbreviation	Full Form
A&G	Administrative and General
ACoS	Average Cost of Supply
Act	The Electricity Act, 2003
AMR	Automatic Meter Reading
APR	Annual Performance Review
ARR	Aggregate Revenue Requirement
ATE	Appellate Tribunal of Electricity
BPL	Below Poverty Line
CAGR	Compound Annual Growth Rate
Capex	Capital Expenditure
CC	Current Consumption
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CGRF	Consumer Grievance Redressal Forum
CGS	Central Generating Stations
COD	Commercial Operation Date
Cr	Crores
DDUGJY	Deen Dayal Upadhyaya Gram Jyoti Yojana
DEEP	Discovery of Efficient Electricity Price
Discom	Distribution Company
DSM	Deviation Settlement Mechanism
ED	Electricity Department
EHT	Extra High Tension
ERP	Enterprise Resource Planning
FPPCA	Fuel and Power Purchase Cost Adjustment
FY	Financial Year
GFA	Gross Fixed Assets
HT	High Tension
HTAG	HT - Agriculture
HTD	HT - Domestic
HTI (Ferro/SM/PI/SR)	HT Industrial (Ferro Metallurgical/ Steel Melting/ Power Intensive/ Steel Rolling)
HTMES	HT - Military Engineering Services
HTTS	HT - Temporary Supply
IEX	Indian Energy Exchange Limited
IPDS	Integrated Power Development Scheme
IPP	Independent Power Producer
ISTS	Inter State Transmission System
JERC	Joint Electricity Regulatory Commission for the state of Goa and Union Territories

Abbreviation	Full Form
LT	Low Tension
MCLR	Marginal Cost of funds based Lending Rate
MU	Million Units
MYT	Multi Year Tariff
NFA	Net Fixed Assets
NTPC	NTPC Ltd.
NVVNL	NTPC Vidyut Vyapar Nigam Ltd.
O&M	Operation and Maintenance
PLF	Plant Load Factor
PLR	Prime Lending Rate
PSDF	Power System Development Fund
PPA	Power Purchase Agreement
R&M	Repair and Maintenance
R-APDRP	Restructured Accelerated Power Development and Reforms Programme
REC	Renewable Energy Certificate
RLDC	Regional Load Despatch Centre
RoE	Return on Equity
RPO	Renewable Purchase Obligation
SBI PLR	SBI Prime Lending Rate
SECI	Solar Energy Corporation of India Ltd.
SERC	State Electricity Regulatory Commission
SLDC	State Load Despatch Center
SOP	Standard of Performance
SWOT	Strengths, Weaknesses, Opportunities and Threats
T&D	Transmission & Distribution
TVS	Technical Validation Session
UI	Unscheduled Interchange
UT	Union Territory

Before the
Joint Electricity Regulatory Commission
For the State of Goa and Union Territories, Gurugram

QUORUM

Shri. M. K. Goel (Chairperson)

Smt. Neerja Mathur (Member)

Petition No. 265/2018

In the matter of

Approval of Business Plan for Multi-Year Control Period from FY 2019-20 to FY 2021-22.

And in the matter of

Electricity Department, Government of Goa..... Petitioner

ORDER

- a) This Order is passed in respect of the Petition filed by the Electricity Department, Government of Goa for approval of its Business Plan for the Multi-Year Control Period of three years commencing from 01 April 2019 to 31 March 2022.
- b) In exercise of the powers conferred on it by sub-Section (2) of Section 181 read with Section 36, Section 39, Section 40, Section 51, Section 61, Section 62, Section 63, Section 64, Section 65 and Section 86 of the Electricity Act, 2003 (36 of 2003) and all other powers enabling it in this behalf, the Joint Electricity Regulatory Commission for the State of Goa and Union Territories (except Delhi) after previous publication, issued Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Generation, Transmission and Distribution Multi Year Tariff) Regulations, 2018 on 10 August 2018.
- c) In terms of Regulation 8.1 and 16 of the aforesaid Regulations, the Petitioner has filed a Petition for approval of its Business Plan for three years Control Period i.e. from FY 2019-20 to FY 2021-22 with details for each year of the Control Period before the Commission.
- d) After receiving the Petition, the Commission scrutinized the contents of the Petition and called for further information/data, wherever required, in the form of deficiency notes so as to take a prudent view of the Petition. Comments/objections/suggestions were also invited from the stakeholders and a public hearing was conducted. All the comments/objections/suggestions made by the stakeholders in both written or verbal mode are taken into consideration.
- e) Based on the information/documents submitted by the Petitioner and keeping in view the provisions of the Electricity Act, 2003 and the relevant Regulations framed thereunder, the Commission hereby approves the Business Plan for the Control Period from FY 2019-20 to FY 2021-22 by way of this Order, which covers the capital investment plan, sales forecast, power procurement plan, performance targets, fixation of T&D loss trajectory etc.

-
- f) The Petitioner is now directed to submit the Multi Year Tariff Petition for the Control Period on or before 30 November 2018, in terms of Regulation 9 of the aforesaid Regulations.
- g) Ordered as above, read with the attached document giving detailed reasons, grounds and conditions. Copy of this Order be sent to the Petitioner, CEA and the Administration of State of Goa.

Sd/-

Neerja Mathur
(Member)

Sd/-

M.K. Goel
(Chairperson)

JOINT ELECTRICITY REGULATORY COMMISSION
(For the State of Goa and Union Territories)

Place: Gurugram

Date: 16 November 2018

1 Chapter 1: Introduction

1.1 Joint Electricity Regulatory Commission (JERC)

In exercise of powers conferred by the Electricity Act 2003, the Central Government constituted a Joint Electricity Regulatory Commission for all the Union Territories except Delhi to be known as “Joint Electricity Regulatory Commission for the Union Territories” vide notification no. 23/52/2003-R&R dated 2 May 2005. Later with the joining of the State of Goa, the Commission came to be known as “Joint Electricity Regulatory Commission for the State of Goa and Union Territories” (hereinafter referred to as “the JERC” or “the Commission”) vide notification no. 23/52/2003-R&R (Vol. II) dated 30 May 2008.

JERC is an autonomous body responsible for regulation of the Power Sector in the State of Goa and the Union Territories of Andaman & Nicobar Islands, Lakshadweep, Chandigarh, Daman & Diu, Dadra & Nagar Haveli and Puducherry, consisting of generation, transmission, distribution, trading and use of electricity. Its primary objective includes taking measures conducive to the development of the electricity industry, promoting competition therein, protecting the interest of consumers and ensuring the supply of electricity to all areas.

1.2 State of Goa

Goa, the 25th State in the Union of States of India, was liberated from Portuguese rule in 1961. It was part of Union territory of Goa, Daman & Diu till 30th May 1987 when it was carved out to form a separate State. Goa covers an area of 3702 square kilometres and comprises two Revenue districts viz. North Goa and South Goa. Boundaries of Goa State are defined in the North Terekhol River, which separates it from Maharashtra, in the East and South by Karnataka State and West by Arabian Sea. The entire State comprises of 11 talukas and for the purpose of implementation of development programmes, the State is divided into 12 community development blocks.



1.3 Electricity Department, Government of Goa (EDG)

The Electricity Department, Government of Goa (hereinafter referred to as “ED-Goa” or “EDG”) is a deemed Distribution Licensee within the meaning of Section 2 (17) of Electricity Act 2003 and pursuant to the Section 14

of the Electricity Act. Further, Section 42 and 43 of the Electricity Act 2003 prescribes the following duties of the deemed Distribution Licensee:

- To develop and maintain an efficient, coordinated and economical distribution system;
- To supply electricity on an application by any person, in accordance with the provisions specified in the Electricity Act 2003;
- To provide non-discriminatory open access to the consumers;
- To establish a forum for redressal of grievances of the consumers.

The primary objective of EDG is to undertake the transmission, distribution and retail supply of electricity in its license area and for this purpose plan, construct, and manage the power system network in all its aspects. EDG is further responsible for carrying out the business of purchasing and selling of electricity along with activities such as billing and collection in the area.

Existing Network

The network configuration of EDG (as on July 2018) is as given in the following table:

Table 1: EDG's Network Configuration (as on July 2018)

Particulars	Total
No. of 220/110/33kV Substations	5
No. of 33/11 KV Stations available	52
No. of 33 KV Feeders	219
Ckt length of 33 KV feeders (Kms)	1664
No. of 33/11KV Power Transformers	188
No. of 11 KV Feeders	299
Ckt Length of 11 KV Feeders (Kms)	3886
No. of 11 KV RMUs	1846
No. of Distribution Transformers	7106
Ckt Length of LT network (Kms)	7712
Ckt Length of LT network Service Line(Kms)	7905

1.4 Electricity Regulatory Process in Goa

The Commission has issued the Order for “Approval of Business Plan for the MYT Control Period FY 2016-17 to FY 2018-19” on 22 December 2015 in respect of EDG.

1.5 Multi Year Distribution Tariff Regulations, 2018

The Commission notified the Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Generation, Transmission and Distribution Multi Year Tariff) Regulations, 2018 on 10 August 2018. The said Regulations have been hereinafter referred to as the “JERC MYT Regulations”. As per Clause 2.1.17 of these Regulations, the “Control Period” is defined as multi-year period comprising of three financial years from FY 2019-20 to FY 2021-22.

These Regulations are applicable to all the generation companies, transmission and distribution licensees in the State of Goa and Union Territories of Andaman & Nicobar Islands, Lakshadweep, Chandigarh, Daman & Diu, Dadra & Nagar Haveli and Puducherry.

1.6 Filing and admission of Petition for Multi-Year Business Plan for FY 2019-22

As per Clause 8.1 of the JERC MYT Regulations, the Petitioner is required to file for approval of the Commission, its Business Plan for three years Control Period i.e. from FY 2019-20 to FY 2021-22 with details for each year of the Control Period.

EDG submitted the current Petition for approval of ‘Business Plan for MYT Control Period FY 2019-20 to FY 2021-22’ vide letter no. 120/03/MYT19-20 to 21-22/CEE/Tech/1242 dated 27 September 2018.

After initial scrutiny/analysis, the Petition on Business Plan for the Control Period FY 2019-20 to FY 2021-22 was admitted on 1 October 2018 and was marked as Petition no. 265/2018.

1.7 Interaction with the Petitioner

A preliminary scrutiny/analysis of the Petition was conducted and certain deficiencies were observed. Accordingly, deficiency notes were issued to the Petitioner. Further, additional information/clarifications were solicited from the Petitioner as and when required. The Petitioner submitted its response on the issues through various letters/emails. The following table provides the list of interactions with the Petitioner along with the dates:

Table 2: Interactions with the Petitioner

S. No	Subject	Date
1	Admission of the Petition by the Commission	01.10.2018
2	Deficiency Note issued by the Commission	04.10.2018
3	Replies to Deficiency Note received by the Commission	19.10.2018, 26.10.2018, 02.11.2018, 12.11.2018, 13.11.2018

The Order has referred at numerous places to various actions taken by the “Commission”. It may be mentioned for the sake of clarity that the term “Commission,” except for the Hearing and Orders, denotes the Secretariat of the Commission responsible for carrying out technical due diligence and validation of data of the Petitions filed by the utilities, obtaining and analysing information/clarifications received from the utilities, and submitting relevant issues for consideration of the Commission.

1.8 Public Hearing Process

The Commission directed the Petitioner to publish the summary of the Business Plan proposal in the abridged form to ensure public participation. The public notices were published by the Petitioner for inviting objections/suggestions from the stakeholders on the Business Plan Petition:

Table 3: Public Notices published by the Petitioner

Sl. No.	Date	Name of Newspaper	Language
1	18.10.2018	Gomantak	Marathi
2	18.10.2018	Times of India	English
3	18.10.2018	The Nav Hind Times	English

The Petitioner also uploaded the Petition on its website (<https://www.goaelectricity.gov.in/>) for inviting objections and suggestions on the Petition. Interested parties/stakeholders were requested to file their objections / suggestions on the Petition to the Commission with a copy to the Petitioner on or before 30 October 2018. The Commission has also uploaded a copy of the Petition on its website to facilitate the stakeholders.

The Commission received various objections/suggestions on the Petition. The Commission forwarded these to the Petitioner for communicating its reply to the objections. The Petitioner has sent its replies to the Commission as well as all the stakeholders who have given written comments and those who presented their comments during the Public Hearing conducted by the Commission.

The Commission also published Public Notices in the leading newspapers as tabled below, giving due intimation to the stakeholders, consumers and the public at large about the Public Hearing to be conducted by the Commission at Ravindra Bhawan, Margao, Goa on 30 October 2018 from 10:00 AM onwards.

Table 4: Public Notices published by the Commission

Sl. No.	Date	Name of Newspaper	Language
1	09.10.2018, 27.10.2018	Gomantak	Konkani
2	09.10.2018, 27.10.2018	Times of India	English
3	09.10.2018, 27.10.2018	The Nav Hind Times	Hindi

The Commission has examined the issues and concerns raised by the stakeholders in writing and / or voiced by them. The major issues raised by the Stakeholders, the responses of the Petitioner thereon and the views of the Commission, have been summarized in Chapter 2 of this Order.

1.9 Organization of the Order

This Order is organized in the following Chapters:

- **Chapter 1** of the Order provides the background and brief description of the State, Utility and Regulatory process undertaken by the Commission.
- **Chapter 2** of the Order provides the summary of various suggestions and objections raised by the stakeholders, followed by the response of the Petitioner and the views of the Commission on these issues.
- **Chapter 3** discusses the submissions of the Petitioner in its Business Plan Petition and the Commission's views thereon.

2 Chapter 2: Stakeholder Consultations

2.1 Regulatory Process

The Public Hearing was held on 30 October 2018 at Goa in respect of Business Plan Petition for Control Period from FY 2019-20 to FY 2021-22. During the Public Hearing, stakeholders presented their views in person before the Commission. All the participants from the public, who had not submitted written objections earlier, were also given an equal opportunity to present their views/suggestions in respect of the Petition.

2.2 Suggestions/ Objections of the Stakeholders, Response of the Petitioner and Commission's Views

The Commission is appreciative of the efforts of various stakeholders in providing their suggestions/ comments/ observations to make the Electricity Distribution Sector more responsive and efficient. The Commission has noted the concerns of all stakeholders and has tried to address them to the extent possible in the subsequent sections and/or through directives. The Stakeholders' comments, the response of the Petitioner and the views of the Commission are summarized below:

2.2.1 Small Control Period of three years resulting in provision of Capital Expenditure details limited to the Control Period

Stakeholder Comments

The Control Period specified in the Business Plan is for three years, which, as per them is, a short tenure considering that the power business is a long-term business. The business plan should be for a long-term period as the projects carried out by the petitioner are over a longer period, which is evident, as the total project cost is not completely budgeted in the Control Period.

Petitioner's Response

Petitioner highlighted that the Business Plan has been submitted in line with the JERC MYT Regulations, which specifies a Control Period of three years. Further, the petitioner has submitted that the estimated cost of the project is the total cost towards completion of the project, which might spill into years following the Control Period whereas the capital expenditure projected against such projects/schemes only correspond to the expenditure for the said projects/schemes in the Control Period.

Commission's View

The Commission agrees with the views of the Petitioner that the Control Period has already been specified while framing the JERC MYT Regulations which was crystallized after carrying out due proceedings including consultation of the stakeholders involved. The Commission has considered all the pros and cons of having a shorter or longer Control Period while finalizing the specified Control Period duration of three years in the JERC MYT Regulations and the duration of the Control Period is not in contention in the current Petition. As regards the project completion period, a typical project/scheme in a distribution company is collection of smaller projects that are independently capitalized on their completion. Therefore, part capitalisation of the projects/schemes to the extent that the assets in contention are put to use, is permitted by the Commission. Spilling over of the capital expenditure into the next Control Period shall have no impact on the Tariff Determination process and would therefore be inconsequential.

2.2.2 Peak Demand Forecast methodology and absence of Load Curve in the Current Petition

Stakeholder Comments

The absence of load curve in the current petition and the peak demand forecast simply on the basis of past trend indicate arbitrariness in peak demand forecasting. Various factors like downturn in industries like mining, steel smelting, MPT, etc. will affect the demand. The stakeholders further suggested that factors like construction license issued, IPB projects approved, Electrical Vehicle (EV) policy, smart city implementation, MOPA Airport under construction, growth of IT infrastructure, growth in tourism, solar policy, etc. should be considered while projecting the load. It may also be compared to 19th EPS of CEA. Stakeholders also opined that the load curve might undergo change in the light of rapid urbanisation, solar power generation, changing life style (Air conditioning etc.), growth of tourism industry, etc.

Petitioner's Response

Petitioner has submitted that it has considered last three and five year CAGR with its best judgement while projecting the load and sales in the current petition. About 8000 applications are still pending with the Petitioner. Petitioner has also considered current and expected increase in demand owing to various development projects. It is further submitted that even while projecting the category wise sales details, the petitioner has considered the respective current and expected development with respect to the category of consumers. viz. upcoming load of 30 MVA of MOPA Airport, load of 15 MVA of Electronic city (TUEM & Chimbel) and load of Konkan Railways, etc.

Commission's View

The Commission has taken note of the observations and suggestions of the stakeholders towards computation of peak demand forecast. The Commission further observes that historical Energy Sales, No. of Consumer and Contracted Load data provided by the Petitioner has been inconsistent and no clear trend can be observed from the same for several categories. This has resulted in poor forecasting of future Energy Sales, No. of Consumer and Contracted Load, which results in inaccurate revenue forecast and poor planning for future years including power procurement planning and capital expenditure planning. The Commission has addressed the issue by taking a pragmatic view while doing projections of each category, as detailed in Chapter 3. In view of the above, the Commission directs the Petitioner to improve billing process and capture the correct information of Year on Year Energy Sales, No of Consumer and Connected Load.

2.2.3 Segregation of Business Plan for Transmission and Distribution

Stakeholder Comments

The distribution licensee should have provided separate details corresponding to Transmission and Distribution utility in their actual Business Plan for the convenience of the stakeholders. Stakeholders have also proposed segregation of Transmission and Distribution employees

Petitioner's Response

Petitioner submitted that it is a bundled entity and therefore, not bound to provide segregated details regarding the distribution utility and a Transmission Utility. Though the Commission directed in the last Tariff Order regarding the unbundling of Utility, it acknowledges that no specific directive for unbundling from the state Government was issued. Therefore, the petitioner has not submitted business plan for distribution and transmission separately.

Commission's View

The Commission has taken note of the observations and suggestions of the stakeholders towards segregation of Business Plan for Distribution and Transmission Businesses separately. The Commission is of the opinion that such a separate Business Plan may not be possible unless actual unbundling of the Utility is carried out.

2.2.4 Methodology of computation of Distribution Loss

Stakeholder Comments

The methodology of computation of Distribution Losses as claimed by the petitioner, whereby, Intra-State Transmission Losses form a part of the Distribution Losses.

Petitioner's Response

The petitioner has rectified an apparent error in computation of Distribution Losses for FY 2017-18 from 14.41% to 11.42%. The petitioner has specified that owing to lack of availability of separate data for Distribution and Transmission Utility, Distribution Losses are not maintained separately. The Petitioner has reinstated that the rectified Distribution Loss values are the lowest among other states in India.

Commission's View

The Commission has noted the observations of the Stakeholder and observes that the actual unbundling of the Utility is yet to be carried out. Meanwhile, the Commission directs the Petitioner to arrange for installation of requisite infrastructure for computation of the Transmission and Distribution losses separately.

2.2.5 Gap between energy required at periphery and energy proposed to be procured

Stakeholder Comments

The gap between the energy required at the periphery and the energy proposed to be procured was enquired.

Petitioner's Response

The Petitioner submitted that the gap between energy required at periphery and energy proposed to be procured was owing to Inter-State transmission loss. Energy proposed to be procured received at the periphery after consideration of transmission loss of 3.26% and 9.87% for western region and southern region respectively.

Commission's View

The Commission has noted the submission made by the Stakeholder and the Petitioner. The Commission has analyzed the submission of the Petitioner and have approved the Power Procurement as per the energy requirement of the respective years of the Control Period.

2.2.6 Long Term Strategy towards meeting 100 MW Power Deficit

Stakeholder Comments

The Petitioner has not specified any Long Term Strategy towards meeting the 100 MW Power Deficit currently met by Bilateral Power Purchase through IEX or from other generating stations.

Petitioner's Response

The Petitioner submitted that the petitioner does not have its own generation and majority of the power requirement for the Petitioner is met through its share from Central Sector Power Stations of the National Thermal Power Corporation (NTPC) as allocated by the Central Government. The Petitioner has also proposed to purchase deficit power from Co-generation, Exchange and Traders. Further Petitioner has submitted that it is procuring thermal power from NTPC for long-term period as per PPA signed.

The Petitioner also submitted that the peak demand is not constant. It is only for certain block of time. In case power requirement arising in the peak hours, the petitioner shall be procuring through IEX at the prevailing rate. The Short-term Power Purchase rate was to the tune of Rs.11/unit a few months back. While it may not be prevalent during every peak hours, it may be observed that the Petitioner shall manage to procure power at average rate below Rs.3.50/unit.

Commission's View

The Commission has noted the submission made by the Stakeholder and the response of the Petitioner, and reiterates the Petitioner's response.

2.2.7 Actual Capital Expenditure vis-à-vis planned Capital Expenditure**Stakeholder Comments**

The actual Capital Expenditure in the previous Control Period (FY 2016-19) were at 22.6% of the approved Capital Expenditure (Rs.667 Cr against approved amount of Rs.2943 Cr). The target Capital Expenditure for FY 2019-2022 is Rs. 2,880 Cr, which is comparatively higher than the actual executed Capital Expenditure (Rs. 667 Cr).

Petitioner's Response

The Petitioner submitted that the lower capital expenditure and capitalisation during last Control Period was mainly due to delay in process of approval of schemes. Scheme wise capital expenditure along with schemes approved by the Commission in the Current Petition. The list of work to be executed under Infrastructure Development through ED fund is also provided on page 89 of their Business Plan Petition.

Commission's View

The Commission has noted the submission made by the Stakeholder and the response of the Petitioner. The issue has been dealt with in the appropriate section of this Order.

2.2.8 Reliability Indices for Distribution Utility**Stakeholder Comments**

The Petitioner to publish metrics relating to power supply interruption and power quality for the 33 kV and 11 kV feeders. In the event that a consumer experiences increased interruption beyond the benchmarked reliability level, the consumer may be provided with an appropriate compensation. The Stakeholders have requested the Commission to specify the compensation rates and the benchmark SAIFI and SAIDI compensation rates for voltage wise level of consumers.

Petitioner's Response

The Petitioner admitted that there were numerous interruptions in power supply in the preceding years owing to pre-monsoon works needing shutdowns. Further, certain cyclonic activities, tree-trimming, etc. are carried out periodically, which require shutdowns. The project for Conversion of overhead 11 KV line to aerial bunched cabling works was also in progress, thus necessitating shutdowns.

However, the Petitioner assured that concrete measures were undertaken in the recent past, which will help to get the power network on track and will help in un-interrupted power supply. The Petitioner has also submitted that Capital expenditure towards strengthening the IT infrastructure has been proposed, which would help in analysis of interruption data. Once such Infrastructure is available, reliability indices of SAIFI and SAIDI shall be recorded and maintained.

Commission's View

The Commission noted the submission made by the Stakeholders. However, the indices towards performance measurement are specified in Standards of Performance Regulations, which also covers the benchmark values and the compensation for failing to meet the benchmark values. However, infrastructure towards monitoring of various indices is necessary, and the Petitioner shall arrange to get it installed in order to facilitate monitoring of the same.

2.2.9 Proposed Inclusions in the Current Petition

Stakeholder Comments

The following details are to be provided by the Petitioner in their Current Petition in order to submit a complete Petition. Major suggestions among them are as follows:

- Realistic Taluka wise peak demand forecast
- Analysis of data regarding transformation capacities, loading and network configuration
- To provide daily and seasonal load curve
- To consider approved loss of 10.75% FY 2018-19 for the MYT period without any further increase in MYT period.
- To provide a table indicating energy required to be purchased, considering intra state losses
- To propose quantum of rooftop Solar generation within Goa under net-metering which will be allowed during MYT period.
- To spell out strategy for filling the gap between power allocation and projected peak load MW.
- To provide trajectory to improve billing and collection efficiency
- To provide list of capital works with administrative approval and otherwise separately under each scheme
- To specify the substation that are proposed to be automated and feeders that are proposed to be changed with underground/aerial bunched cable to improve reliability.
- To publish reliability indices at 33 kV level and a trajectory to improve the same
- HT Tariff to be increased 5 times while limiting the number of HT Consumers. Industries shall arrange for their own power through solar /other non- fossil fuels.

Petitioner's Response

Petitioner has not responded to these queries as the queries were directed towards the methodology of Tariff Computation, which is not in the purview of the Current Petition.

Commission's View

The Commission has noted the submission made by the Stakeholder and shall consider the parameters suggested by the stakeholder in its Tariff Determination Process. Further, the Commission has approved the T&D loss trajectory of the Petitioner without allowing any increase from the loss trajectory approved in the previous Control Period.

2.2.10 Reduction in dependence on Fossil Fuels

Stakeholder Comments

There was no attempt to consider reduction of fossil fuel based power procurement, thereby violating India's International Commitment to reduce the fossil fuel use. It is also submitted that the Commission may direct Petitioner to set up Solar projects in the state.

Petitioner's Response

The Petitioner submitted that GoI has taken concrete steps towards reducing dependence on the Fossil Fuels by setting aspirational targets for Renewable Capacity addition across India. However, the Petitioner submitted that the Renewable power generation cannot replace the conventional power completely. Petitioner has also highlighted that Solar Policy preparation is in the final stages and therefore, Petitioner may be directed towards the same

Commission's View

Noting the submission of the Stakeholders and the Petitioner, the Commission is of the opinion that the fall in dependence on Fossil Fuels has been orchestrated by the steep increase in the Renewable Power Obligation applicable for the Petitioner, thereby increasing power procurement through Renewable sources of energy while reducing the dependence on Fossil Fuels to that extent.

2.2.11 *Tariff Structure*

Stakeholder Comments

The Tariff is competitive towards the industrial and high-end commercial consumers instead of poor and domestic consumers.

Petitioner's Response

The Petitioner highlighted that the domestic consumer and agricultural consumer tariff is lower than the rate of average cost of supply (ACoS), whereas Tariff charged to commercial and industries are higher than the domestic and rate of ACoS. Subsidising consumer who are paying higher than the rate of ACoS and subsidised consumer are those consumer who are charged lower than rate of ACoS. Therefore, the Petitioner submitted that Industries are charged at higher rate contrary to what is suggested by the objector.

Commission's View

The Commission has noted the submission made by the Stakeholder and shall consider the suggestions by the stakeholder in its Tariff Determination Process.

3 Chapter 3: Approval of the various components of the Business Plan Petition for the Multi-Year Control Period FY 2019-20 to FY 2021-22

3.1 Introduction

This chapter deals with the key aspects of the Business Plan Petition submitted by the Petitioner, and is structured as below:

- Forecast of Number of Consumers, Connected Load and Sales for the Control Period
- Intra-State Transmission and Distribution (T&D) loss
- Power Procurement Plan
- Capital Investment Plan
- Manpower Plan

In the subsequent sections, the Commission has recorded Petitioner's submissions and analysed them. The Commission has subsequently recorded its reasoning while approving each of the components.

3.2 Forecast of Number of Consumers, Connected Load and Sales for the Control Period

3.2.1 Overall approach

Petitioner's submission

The Petitioner has chosen FY 2018-19 as the Base Year and has arrived at the revised sales figures based on the audited energy sales of FY 2014-15 and provisional energy sales from FY 2015-16 to FY 2017-18 as the audit figures these years are not available as of now. For projecting the No. of Consumers and the Connected Load for each of the categories for the base year FY 2018-19, the Petitioner has considered the trends for FY 2015-16 to FY 2017-18. Further, the Petitioner has also considered the connections released in the Q1 of FY 2018-19 and the pending no. of connection applications for estimating the No. of Consumers for the Control Period. The Petitioner has used the CAGR for past years' to forecast the number of consumers, connected load and sales for the upcoming Control Period. Due to abnormal trends observed in some categories, the Petitioner has resorted to using normalized CAGR rates or assuming a subjective rate for projections.

Summary of the past data and the CAGR considered by the Petitioner for each category for projecting number of consumers, connected load and sales is as given in the tables below:

Table 5: Summary of category wise Number of Consumers and growth rate considered by the Petitioner for projections

No. of Consumers Consumer Category	Actuals					CAGR			
	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year	CAGR Considered
LTD/Domestic	420855	463295	468864	463272	498741	3.14%	2.49%	4.34%	2.00%
LTIG/Low Income Group	11340	6778	2177	1125	1835	-8.19%	-35.31%	-36.58%	0.00%
LTC/Commercial	86013	95328	91923	89328	94802	1.55%	-0.18%	2.46%	1.55%
LTI/Industry	46309	11652	6050	6010	5963	-0.72%	-20.01%	-40.10%	0.00%

No. of Consumers	Actuals					CAGR			
Consumer Category	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year	CAGR Considered
LTP/Mixed (Hotel Industries)	122	75	190	109	138	-14.78%	22.54%	3.13%	3.13%
Tariff LTAG/ Agriculture (Pump sets / Irrigation)	10325	11113	10904	11118	11280	1.71%	0.50%	2.24%	2.24%
LTAG/ Agriculture (Allied Activities)	230	512	0	188	185	-	-28.77%	-5.30%	0.00%
LTPL/ Public Lighting	1457	1664	112	3042	215	38.55%	-49.45%	-38.02%	0.00%
LTH/ Hoarding and Signboards	-	36	64	62	63	-0.78%	20.51%	0.00%	0.00%
LTTS/ Temporary Supply	4557	5352	4452	4224	5181	7.88%	-1.08%	3.26%	3.26%
HTI/ Industrial	515	535	557	657	692	11.46%	8.96%	7.67%	7.67%
HTFS Industrial (Ferro Metallurgical / Steel Melting/ Power Intensive/ Steel Rolling)	24	37	37	32	29	-11.47%	-7.80%	4.84%	2.00%
HTC/ Commercial	176	186	96	191	210	47.90%	4.13%	4.51%	4.51%
HTAG/ Agriculture (Pump Sets/ irrigation)	41	42	43	39	41	-2.35%	-0.80%	0.00%	0.00%
HTAG/ Agriculture (allied activity)	33	34	0	2	3	-	-55.48%	-45.09%	0.00%
HTD/ Domestic	-	-	2	3	3	-	-	-	-
HTMES/ Defence Establishment	12	12	11	12	12	4.45%	0.00%	0.00%	0.00%
HTTS/ Temporary Supply	1	2700	-	1	1	-	-92.82%	0.00%	0.00%
Single Point Supply	-	-	-	1	1	-	-	-	-
Total	5,82,010	5,99,351	5,85,482	5,79,415	6,19,395	2.86%	1.10%	1.57%	-

Table 6: Summary of category wise Connected Load and growth rate considered by the Petitioner for projections

Connected Load (kW)	Actuals					CAGR			
Consumer Category	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year	CAGR Considered
LTD/Domestic	1127149	1634435	1642607	1152770	1382385	-8.26%	-5.43%	5.24%	5.00%
LTIG/Low Income Group	1201.0	2046.0	2046.0	106	231	-66.40%	-51.67%	-33.78%	0.00%
LTC/Commercial	335851.0	280456.0	281843.0	296465	309108	4.73%	3.30%	-2.05%	5.00%
LTI/Industry	459406.0	168091.0	168091.0	109194.9	140551	-8.56%	-5.79%	-25.63%	0.00%
LTP/Mixed (Hotel Industries)	3298.0	4569.0	4569.0	2075.2	2868	-20.77%	-14.38%	-3.43%	0.00%

Connected Load (kW)	Actuals					CAGR			
	Consumer Category	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year
LTAG/Agriculture (Pump sets / Irrigation)	63970.0	61326.0	61326.0	38938.6	44255	-15.05%	-10.30%	-8.80%	0.00%
LTAG/Agriculture (Allied Activities)	21463.0	5600.0	5600.0	4082.0	1535	-47.64%	-35.04%	-48.29%	0.00%
LTPL/ Public Lighting	9011.0	9598.0	9598.0	11840.1	1600	-59.17%	-44.96%	-35.09%	0.00%
LTH/ Hoarding and Signboards	-	523.0	523.0	599.0	619	8.79%	5.78%	0.00%	0.00%
LTTS/ Temporary Supply	16316.4	7502.0	7502.0	15327.3	20684	66.05%	40.22%	6.11%	6.11%
HTI/ Industrial	455290.5	340788.0	340788.0	460234.0	462691	16.52%	10.73%	0.40%	-
HTFS Industrial (Ferro Metallurgical/ Steel Melting/ Power Intensive/ Steel Rolling)	93316.0	111840.0	111840.0	109050.0	98700	-6.06%	-4.08%	1.41%	-
HTC/ Commercial	67716.0	74767.0	74767.0	65210.0	70965	-2.58%	-1.72%	1.18%	-
HTAG/ Agriculture (Pump Sets/ irrigation)	8211.0	8258.0	8258.0	7800.0	8240	-0.11%	-0.07%	0.09%	0.09%
HTAG/ Agriculture (allied activity)	26879.0	90796.0	30796.0	860.0	1310	-79.38%	-75.66%	-53.01%	0.00%
HTD/ Domestic	-	-	-	-	300	-	-	-	-
HTMES/ Defence Establishment	6818	7080	7080	6955	6955	-0.89%	-0.59%	0.50%	0.50%
HTTS/ Temporary Supply	0	-	-	350	350	-	-	-	0.00%
Single Point Supply	-	-	-	4035	4035	-	-	-	0.00%
Total	26,96,260	28,07,675	27,57,234	22,86,192	25,57,382	-3.69%	-3.06%	-1.31%	-

Table 7: Summary of category wise Sales and growth rate considered by the Petitioner for projections

Sales (MU)	Actuals		Actual Provisional			CAGR			
	Consumer Category	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year
LTD/Domestic	844.2	905.2	1,022.7	803.8	1,110.6	4.21%	7.05%	7.10%	5%
LTIG/Low Income Group	8.262	9.4	2.3	1.6	1.8	-12.28%	-42.77%	-32.04%	0%
LTC/Commercial	286.0	319.9	324.7	300.9	414.2	12.93%	8.99%	9.70%	5%
LTI/Industry	82.4	95.2	87.1	78.6	94.5	4.12%	-0.27%	3.47%	3.47%
LTP/Mixed (Hotel Industries)	4.7	5.5	6.7	5.1	5.3	-11.00%	-1.44%	2.91%	2.91%

Sales (MU)	Actuals		Actual Provisional			CAGR			
Consumer Category	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year	CAGR Considered
LTAG/Agriculture (Pump sets / Irrigation)	17.8	20.1	16.4	13.4	16.4	0.01%	-6.55%	-2.03%	0%
LTAG/Agriculture (Allied Activities)	2.1	5.2	-	0.6	0.9	-	45.08%	-19.80%	0%
LTPL/ Public Lighting	37.1	35.7	2.8	36.6	2.7	-1.90%	-57.94%	-48.27%	0%
LTH/ Hoarding and Signboards	-	0.1	0.2	0.2	0.2	16.22%	34.02%	-	-
LTTS/ Temporary Supply	17.9	17.0	16.2	15.5	20.5	12.52%	6.43%	3.48%	3%
HTI/ Industrial	955.1	898.4	1,079.1	1,180.7	1,358.4	12.20%	14.78%	9.21%	5%
HTFS Industrial (Ferro Metallurgical/ Steel Melting/ Power Intensive/ Steel Rolling)	517.4	803.9	500.0	454.2	442.6	-5.91%	-18.04%	-3.82%	5%
HTC/ Commercial	117.9	144.0	56.4	97.8	104.4	36.10%	-10.15%	-2.98%	5%
HTAG/ Agriculture (Pump Sets/ irrigation)	6.1	6.5	21.0	4.6	4.9	-51.95%	-9.19%	-5.53%	0%
HTAG/ Agriculture (allied activity)	138.1	138.5	-	3.4	4.5	-	68.05%	-57.47%	0%
HTD/ Domestic	-	-	0.24	0.3	0.3	10.55%			0%
HTMES/ Defence Establishment	26.65	26.423	24.67	24.90	26.9	4.40%	0.58%	0.22%	0.22%
HTTS/ Temporary Supply	0.06	0.27	-	0.13	0.3	-	-	46.08%	0%
Single Point Supply	-	-	-	5.21	5.5	-	-	-	-
Total	3070.56	3,431.2	3,160.4	3,027.5	3614.71	6.95%	1.75%	4.16%	-

The Petitioner's projections of number of consumers, connected load and sales for FY 2018-19 and the upcoming Control Period is as given in the tables below:

Table 8: Petitioner's submission on projection of Number of Consumers for upcoming Control Period

No. of Consumers	Base Year (RE)		Projections	
Consumer Category	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTD/Domestic	5,08,716	5,14,292	5,24,578	5,35,069
LTIG/Low Income Group	1,835	1,840	1,840	1,840
LTC/Commercial	96,275	97,631	99,148	1,00,689
LTI/Industry	5,963	6,001	6,001	6,001
LTP/Mixed (Hotel Industries)	142	142	147	151
Tariff LTAG/ Agriculture (Pump sets / Irrigation)	11,532	11,805	12,069	12,339
LTAG/ Agriculture (Allied Activities)	185	193	193	193
LTPL/ Public Lighting	215	237	237	237
LTH/ Hoarding and Signboards	63	63	63	63
LTTS/ Temporary Supply	5,350	6,001	6,197	6,399
HTI/ Industrial	745	782	842	907
HTFS Industrial (Ferro Metallurgical / Steel)	30	32	33	34

No. of Consumers Consumer Category	Base Year (RE)	Projections		
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Melting/ Power Intensive/ Steel Rolling)				
HTC/ Commercial	219	230	241	252
HTAG/ Agriculture (Pump Sets/ irrigation)	42	43	44	45
HTAG/ Agriculture (allied activity)	3	3	3	3
HTD/ Domestic	3	3	3	3
HTMES/ Defence Establishment	12	12	12	12
HTTS/ Temporary Supply	1	4	4	4
Single Point Supply	1	1	1	1
Total	6,31,333	6,39,316	6,51,655	6,64,242

Table 9: Petitioner's submission on projection of Connected Load for upcoming Control Period

Connected Load (kW/kVA/HP) Consumer Category	Base Year (RE)	Projections		
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTD/Domestic	13,75,773	14,06,668	14,77,001	15,50,851
LTIG/Low Income Group	182	188	188	188
LTC/Commercial	3,08,370	3,15,672	3,31,456	3,48,029
LTI/Industry	1,39,208	1,40,584	1,40,584	1,40,584
LTP/Mixed (Hotel Industries)	2,845	2,845	2,845	2,845
Tariff LTAG/ Agriculture (Pump sets / Irrigation)	44,226	45,331	45,331	45,331
LTAG/ Agriculture (Allied Activities)	1,495	1,532	1,532	1,532
LTPL/ Public Lighting	1,604	1,646	1,646	1,646
LTH/ Hoarding and Signboards	582	582	582	582
LTTS/ Temporary Supply	18,799	21,545	22,622	23,753
HTI/ Industrial	4,74,980	4,96,386	5,01,386	5,11,386
HTFS Industrial (Ferro Metallurgical / Steel Melting/ Power Intensive/ Steel Rolling)	1,01,300	1,02,300	1,03,300	1,04,300
HTC/ Commercial	71,057	83,370	99,370	1,05,370
HTAG/ Agriculture (Pump Sets/ irrigation)	8,000	8,635	8,643	8,650
HTAG/ Agriculture (allied activity)	1,310	1,310	1,310	1,310
HTD/ Domestic	300	300	300	300
HTMES/ Defence Establishment	6,955	6,955	6,990	7,025
HTTS/ Temporary Supply	620	2,368	620	620
Single Point Supply	-	-	-	-
Total	25,57,606	26,38,216	27,45,705	28,54,301

Table 10: Petitioner's submission on projection of Sales for upcoming Control Period

Sales (MU) Consumer Category	Base Year (RE)	Projections		
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTD/Domestic	1,166.13	1,190.95	1,250.50	1,313.02
LTIG/Low Income Group	1.76	1.81	1.81	1.81
LTC/Commercial	434.87	444.65	466.88	490.23

Sales (MU)	Base Year (RE)	Projections		
Consumer Category	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTI/Industry	97.73	98.65	102.07	105.61
LTP/Mixed (Hotel Industries)	5.46	5.46	5.62	5.78
Tariff LTAG/ Agriculture (Pump sets / Irrigation)	16.36	16.77	16.77	16.77
LTAG/ Agriculture (Allied Activities)	0.86	0.88	0.88	0.88
LTPL/ Public Lighting	2.66	2.73	2.73	2.73
LTH/ Hoarding and Signboards	0.24	0.24	0.24	0.24
LTTS/ Temporary Supply	21.22	23.93	24.77	25.63
HTI/ Industrial	1,426.34	1,489.18	1,503.86	1,533.22
HTFS Industrial (Ferro Metallurgical / Steel Melting/ Power Intensive/ Steel Rolling)	464.78	469.26	473.74	478.23
HTC/ Commercial	109.65	127.77	151.32	160.15
HTAG/ Agriculture (Pump Sets/ irrigation)	4.85	5.23	5.23	5.23
HTAG/ Agriculture (allied activity)	4.52	4.52	4.52	4.52
HTD/ Domestic	0.29	0.29	0.29	0.29
HTMES/ Defence Establishment	26.95	26.95	27.01	27.07
HTTS/ Temporary Supply	0.30	1.77	1.77	1.77
Single Point Supply	5.46	5.46	5.46	5.46
Total	3,790.43	3,916.51	4,045.47	4,178.64

Commission's Analysis

The overall approach of the Commission for projecting the number of consumers, connected load and sales for FY 2018-19 and the upcoming Control Period is described below:

- The Base Year considered by the Petitioner is FY 2018-19 and the same is in line with the JERC MYT Regulations. The Commission has also considered FY 2018-19 as the Base Year for carrying out projections. The values for FY 2018-19 have been arrived at by considering relevant growth rates approved by the Commission for respective categories and applying the same to FY 2017-18 values.
- The Growth rates considered by the Petitioner for projecting number of consumers, load and sales are primarily based on historical CAGRs. The Commission has determined Growth rates separately for each consumer category based on past trends and other relevant parameters given below:
 - Year on year growth
 - CAGR (multiple periods)

The Commission here would like to bring to notice the fact that the Petitioner was unable to submit the data on number of consumers and connected load prior to FY 2013-14. Further, upon analysing the data on number of consumers, connected load and energy sales submitted by the Petitioner, various discrepancies were observed which were communicated to the Petitioner. The Petitioner in reply submitted that the discrepancies were on account of transition in the billing system taken place in the previous years. The Commission had discussed this issue of discrepancies in data in detail in the Tariff Order of FY 2018-19. The Petitioner, however, during this Business Plan proceeding has submitted that the transition of billing system is almost complete and assured that the quality of data will improve in the coming months.

Since the data provided by the Petitioner is found to have several discrepancies in several categories, with data for FY 2015-16 and FY 2016-17 being unreliable and data for number of consumers and connected load not provided prior to FY 2013-14, the Commission has taken suitable assumptions while projecting the number of consumers, connected load and energy sales for the Control Period for such categories.

The Commission emphasizes on the fact that it is of utmost importance for the Petitioner to provide reliable and accurate data without which the projections would not be precise. The Commission, therefore, directs the Petitioner to properly prepare and maintain the commercial data and submit the same during the Multi Year Tariff proceedings that are to take place later in this financial year.

3.2.2 Category-wise analysis

The historical Year on Year growth and CAGR for number of consumers, load and sales are given in the tables below:

Table 11: Historical Year-on-Year growth and CAGR for Number of Consumers

No. of Consumers Consumer Category	Y-o-Y Growth				CAGR		
	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	5 year	4 year	3 year
LTD/Domestic	10.08%	1.20%	(1.19%)	7.66%	4.34%	2.49%	3.14%
LT-LIG/Low Income Group	(40.23%)	(67.88%)	(48.32%)	63.11%	(36.58%)	(35.31%)	(8.19%)
LTC/Commercial	10.83%	(3.57%)	(2.82%)	6.13%	2.46%	(0.18%)	1.55%
LTI/Industrial	(74.84%)	(48.08%)	(0.66%)	(0.78%)	(40.10%)	(20.01%)	(0.72%)
LT Mixed/ LT-P Hotel Industries	(38.52%)	153.33%	(42.63%)	26.61%	3.13%	22.54%	(14.78%)
Low Tension-AG/LT-AGP (Pump Sets/Irrigation)	7.63%	(1.88%)	1.96%	1.46%	2.24%	0.50%	1.71%
Low Tension-AG/LT-AGA (Allied Activities)	122.61%	(100.00%)	-	(1.60%)	(5.30%)	(28.77%)	-
LT Temporary	17.45%	(16.82%)	(5.12%)	22.66%	3.26%	(1.08%)	7.88%
HTD Domestic	-	-	50.00%	0.00%	-	-	22.47%
HTC Commercial	5.68%	(48.39%)	98.96%	9.95%	4.51%	4.13%	47.90%
HTI Industrial	3.88%	4.11%	17.95%	5.33%	7.67%	8.96%	11.46%
High Tension-Ferro/SM/PI/SR	54.17%	0.00%	(13.51%)	(9.38%)	4.84%	(7.80%)	(11.47%)
High Tension-AG/HT-AGP (Pump Sets/Irrigation)	2.44%	2.38%	(9.30%)	5.13%	0.00%	(0.80%)	(2.35%)
High Tension-AG/HT-AG (Allied Activities)	3.03%	(100.00%)	-	50.00%	(45.09%)	(55.48%)	-
Military Engineering Services/defense Establishments	0.00%	(8.33%)	9.09%	0.00%	0.00%	0.00%	4.45%
Public Lighting	14.21%	(93.27%)	2616.07%	(92.93%)	(38.02%)	(49.45%)	38.55%
Hoardings/Signboards	-	77.78%	(3.13%)	1.61%	-	20.51%	(0.78%)
HT Temporary	269900.00%	-	-	0.00%	0.00%	(92.82%)	-
Single Point Supply	-	-	-	0.00%	-	-	-
Total	2.98%	(2.31%)	(1.04%)	6.90%	1.57%	1.10%	2.86%

Table 12: Historical Year-on-Year growth and CAGR for Connected Load

Connected Load (kW/HP/KVA) Consumer Category	Y-o-Y Growth				CAGR		
	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	5 year	4 year	3 year
LTD/Domestic	45.01%	0.50%	(29.82%)	19.92%	5.24%	(5.43%)	(8.26%)
LT-LIG/Low Income Group	70.36%	0.00%	(94.82%)	117.92%	(33.78%)	(51.67%)	(66.40%)
LTC/Commercial	(16.49%)	0.49%	5.19%	4.26%	(2.05%)	3.30%	4.73%
LTI/Industrial	(63.41%)	0.00%	(35.04%)	28.72%	(25.63%)	(5.79%)	(8.56%)

Connected Load (kW/HP/KVA)	Y-o-Y Growth				CAGR		
	Consumer Category	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	5 year	4 year
LT Mixed/ LT-P Hotel Industries	38.54%	0.00%	(54.58%)	38.20%	(3.43%)	(14.38%)	(20.77%)
Low Tension-AG/LT-AGP (Pump Sets/Irrigation)	(4.13%)	0.00%	(36.51%)	13.65%	(8.80%)	(10.30%)	(15.05%)
Low Tension-AG/LT-AGA (Allied Activities)	(73.91%)	0.00%	(27.11%)	(62.40%)	(48.29%)	(35.04%)	(47.64%)
LT Temporary	(54.02%)	0.00%	104.31%	34.95%	6.11%	40.22%	66.05%
HTD Domestic	-	-	-	-	-	-	-
HTC Commercial	10.41%	0.00%	(12.78%)	8.83%	1.18%	(1.72%)	(2.58%)
HTI Industrial	(25.15%)	0.00%	35.05%	0.53%	0.40%	10.73%	16.52%
High Tension-Ferro/SM/PI/SR	19.85%	0.00%	(2.49%)	(9.49%)	1.41%	(4.08%)	(6.06%)
High Tension-AG/HT-AGP (Pump Sets/Irrigation)	0.57%	0.00%	(5.55%)	5.64%	0.09%	(0.07%)	(0.11%)
High Tension-AG/HT-AG (Allied Activities)	237.80%	(66.08%)	(97.21%)	52.33%	(53.01%)	(75.66%)	(79.38%)
Military Engineering Services/defense Establishments	3.84%	0.00%	(1.77%)	0.00%	0.50%	(0.59%)	(0.89%)
Public Lighting	6.51%	0.00%	23.36%	(86.49%)	(35.09%)	(44.96%)	(59.17%)
Hoardings/Signboards	-	0.00%	14.53%	3.34%	-	5.78%	8.79%
HT Temporary	-	-	-	0.00%	-	-	-
Single Point Supply	-	-	-	0.00%	-	-	-
Total	4.15%	(1.80%)	(17.09%)	11.88%	(1.31%)	(3.06%)	(3.69%)

Table 13: Historical Year-on-Year growth and CAGR for Sales

Sl. No	Sales (MU)	YoY Growth					CAGR				
		FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	7 year	6 year	5 year	4 year	3 year
1	LTD/Domestic	5.88%	7.22%	12.98%	(21.40%)	38.17%	6.72%	6.85%	7.10%	7.05%	4.21%
2	LT-LIG/Low Income Group	10.46%	13.80%	(75.54%)	(30.43%)	7.13%	(22.07%)	(25.11%)	(32.04%)	(42.77%)	(12.28%)
3	LTC/Commercial	14.06%	11.86%	1.50%	(7.33%)	37.66%	8.84%	10.56%	9.70%	8.99%	12.93%
4	LTI/Industrial	0.06%	15.57%	(8.54%)	(9.76%)	20.13%	1.74%	2.78%	3.47%	(0.27%)	4.12%
5	LT Mixed/ LT-P Hotel Industries	(52.08%)	16.28%	21.82%	(23.88%)	4.03%	(8.97%)	(11.67%)	2.91%	(1.44%)	(11.00%)
6	Low Tension-AG/LT-AGP (Pump Sets/Irrigation)	37.79%	13.17%	(18.41%)	(18.29%)	21.81%	2.49%	4.89%	(2.03%)	(6.55%)	0.01%
7	Low Tension-AG/LT-AGA (Allied Activities)	-	147.62%	-	-	39.14%	-	-	(19.80%)	(45.08%)	-
8	LT Temporary	(8.97%)	(4.96%)	(4.71%)	(4.32%)	32.73%	2.27%	0.86%	3.48%	6.43%	12.52%
9	HTD Domestic	-	-	-	25.00%	9.17%	-	-	-	-	10.55%
10	HTC Commercial	2.70%	22.15%	(60.83%)	73.40%	6.77%	(3.44%)	(1.87%)	(2.98%)	(10.15%)	36.10%
11	HTI Industrial	2.83%	(5.94%)	20.11%	9.42%	15.05%	6.05%	7.90%	9.21%	14.78%	12.20%
12	High Tension-Ferro/SM/PI/SR	(17.93%)	55.37%	(37.80%)	(9.16%)	(2.54%)	(4.64%)	(6.83%)	(3.82%)	(18.04%)	(5.91%)
13	High Tension-AG/HT-AGP (Pump Sets/Irrigation)	(4.06%)	6.69%	223.08%	(78.10%)	6.09%	(6.98%)	(5.23%)	(5.53%)	(9.19%)	(51.95%)
14	High Tension-AG/HT-AG (Allied Activities)	-	0.28%	-	-	31.97%	-	-	(57.47%)	(68.05%)	-

Sl. No	Sales (MU)	YoY Growth					CAGR				
		FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	7 year	6 year	5 year	4 year	3 year
15	Military Engineering Services/defense Establishments	4.57%	(0.87%)	(6.63%)	0.93%	7.99%	1.40%	1.07%	0.22%	0.58%	4.40%
16	Public Lighting	13.10%	(4.12%)	(92.16%)	207.14%	(92.74%)	(33.42%)	(39.56%)	(48.27%)	(57.94%)	(1.90%)
17	Hoardings/Signboards	-	-	100.00%	0.00%	48.47%	-	-	-	34.02%	16.22%
18	HT Temporary	(91.23%)	315.99%	-	-	126.76%	(7.11%)	(16.77%)	46.08%	3.32%	-
19	Single Point Supply	-	-	-	-	4.87%	-	-	-	-	-
	Total	4.86%	12.07%	(7.89%)	(4.21%)	19.40%	3.91%	4.36%	4.24%	1.75%	6.95%

The historical data given above, along with other parameters, as applicable, has been used for category wise analysis as described below:

LTD - Domestic

Petitioner's submission

The Petitioner has considered a subjective growth rate of 5% for estimating the sales and connected load in this category. Although the 6-year CAGR is coming out to be greater than 5%, the Petitioner has taken a conservative estimate of the growth rate owing to limitations in the current infrastructure of handling additional load. The Petitioner, in a similar approach has assumed a conservative growth rate of 2% for projecting the number of consumers.

Commission's analysis

LT Domestic sales constitute a significant proportion of the energy sales of the Petitioner. The Commission for projecting the energy sales has considered the 3-year CAGR, as reliable data for this category was only available for the last 2-3 years. With increasing electrification levels, enhanced standard of living and rapid urbanization in the State of Goa, energy sales in Domestic category is slated to increase at a steady rate. Similarly, for projecting the number of consumers, the Commission has relied upon the 3-year CAGR. In respect of projections of connected load, the Commission expects it to be commensurate with the sales growth. Therefore, the Commission has approved a CAGR of 4.21% (similar to sales growth) for projecting connected load. The summary of growth rates approved by the Commission is given in the following table:

Table 14: Growth rates approved by the Commission for LTD-Domestic category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved
LTD Domestic	2.00%	3.14%	5.00%	4.21%	5.00%	4.21%

LTD Low Income Group

Petitioner's submission

The Petitioner has not assumed any growth in the number of consumers, connected load and sales of this category as the consumers under this category have seen a decline due to a gradual shift to the LTD - Domestic category.

Commission's analysis

The Commission, similar to the Petitioner's approach has not assumed any increase in the number of consumers, connected load and energy sales under this category. The summary of growth rates approved by the Commission is given in the following table:

Table 15: Growth rates approved by the Commission for LTD- LIG category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved
Commercial	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

LT- Commercial**Petitioner's submission**

The Petitioner submitted that the sales and number of consumers under this category have been observed to be increasing at a much higher rate as compared to other categories due to increased tourism activity. The 3/4/5/6 year CAGR have been observed to be in the range of ~9-13%. The Petitioner has however assumed a conservative growth rate of 5% for estimating the sales and connected load for the Control Period. Further, 3-year CAGR has been considered for estimating the number of consumers during the Control Period.

Commission's analysis

The Commission has considered the growth in sales on a higher side for this category owing to increasing tourist activity in the State. With the state aiming to become one of the biggest tourist destinations in the world, the increase in Commercial activity in the state is inevitable. Accordingly, the Commission has considered the 4-year CAGR for projecting connected load and energy sales and a 5-year CAGR for projecting number of consumers. The summary of growth rates approved by the Commission is given in the following table:

Table 16: Growth rates approved by the Commission for LT- Commercial category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved
LT Commercial	1.55%	2.46%	5.00%	3.30%	5.00%	8.99%

LT Industry**Petitioner's submission**

The number of consumers, connected load and sales have seen a dip in this category in FY 2015-16 and FY 2016-17 with increase in FY 2017-18. The Petitioner has assumed a 5-year CAGR of 3.47% for projection of energy sales with no growth assumed in the number of consumers and connected load.

Commission's analysis

The Commission opines that the 5-year CAGR of 3.47% is reflective of the observed historical trends in sales and hence approves the same. In respect of projections for number of consumers and connected load, the Commission has considered no increase in number of consumers and connected load, in line with the submission of the Petitioner, due to various discrepancies observed in the data. The summary of growth rates approved by the Commission is given in the following table:

Table 17: Growth rates approved by the Commission for LT industry category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved	Growth Rate submitted	Growth Rate approved
LT Industry	0.00%	0.00%	0.00%	0.00%	3.47%	3.47%

LT Mixed (Hotel Industries)**Petitioner's submission**

The Petitioner has considered the 5-year CAGR for projecting the energy sales and number of consumers for this category. No increase has been considered in the connected load from the base year as a decreasing trend has been observed during the past years.

Commission's analysis

The growth rates for this category were also found to be irregular. Further, the Commission opines that the growth rates considered by the Petitioner are reasonable and has accordingly approved the same. The summary of growth rates approved by the Commission is given in the following table:

Table 18: Growth rates approved by the Commission for LT Mixed (Hotel Industries) category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
LT Mixed (Hotel Industries)	3.13%	3.13%	0.00%	0.00%	2.91%	2.91%

LTAG/ Agriculture (Pump Sets) and LTAG/ Agriculture (Allied Activities)

Petitioner's submission

A decreasing trend in the energy sales and connected load has been observed in both of these categories. Hence, the growth rate for energy sales and connected load has been assumed to be nil for these categories. 5-year CAGR has been considered for the projecting the number of consumers in LTAG/ Agriculture (Pump Sets) category.

Commission's analysis

Due to irregular trends observed in this category and unavailability of requisite data, the Commission has assumed a nominal rate for estimating the no. of consumers, connected load and energy sales for this category. The same shall be considered as per actuals during the time of true up of respective years. The summary of growth rates approved by the Commission is given in the following table:

Table 19: Growth rates approved by the Commission for LTAG category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
LTAG/ Agriculture (Pump Sets)	2.24%	2.00%	0.00%	2.00%	0.00%	2.00%
LTAG/ Agriculture (Allied Activities)	0.00%	2.00%	0.00%	2.00%	0.00%	2.00%

LT Temporary Supply

Petitioner's submission

The Petitioner has considered the 5-year CAGR for projecting the number of consumers, connected load and energy sales for this category. The Petitioner further submitted that although temporary connections do not follow any particular pattern, it has projected the number of consumers, sales and connected load for this category.

Commission's analysis

The Commission has not considered any growth in this category as no particular pattern can be derived from historical figures. The summary of growth rates approved by the Commission is given in the following table:

Table 20: Growth rates approved by the Commission for LT Temporary Supply category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
LT Temporary supply	3.30%	0.00%	6.11%	0.00%	3.48%	0.00%

HTI Industrial

Petitioner's submission

The Petitioner has submitted that two electronic cities namely Chimbhel electronic city and TUEM electronic city are expected to come in the area with a load of 63 MVA and 40 MVA respectively. However, only a part of this load will come in this Control Period, accordingly, the Petitioner has envisaged 5 MVA connected load in FY 2020-21 and 10 MVA load in FY 2021-22. Accordingly, a proportionate increase has been assumed while estimating the number of consumers, connected load and energy sales.

Commission's analysis

The Commission notes that energy sales under this category constitute a significant proportion of energy sales of the Petitioner. In respect of projections of number of consumers, the Commission opines that the growth rate considered by the Petitioner is reasonable and is reflective of the historical trends. Therefore, the Commission approves the 5-year CAGR of 7.67% for projecting number of consumers. In respect of sales projections, the Commission opines that the 7-year CAGR is more representative of the historical trends observed and hence approves the same. Further, the Commission expects the load growth to be commensurate with the growth in sales and hence approves the CAGR of 6.05% (similar to sales) for projecting sales. The summary of growth rates approved by the Commission is given in the following table:

Table 21: Growth rates approved by the Commission for HTI Industrial category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
HTI Industrial	7.70%	7.67%	0.00%	6.05%	5.00%	6.05%

HT Industrial (Ferro Metallurgical/ Steel Melting/ Power Intensive/ Steel Rolling)

Petitioner's submission

The Petitioner has considered the growth in this category on subjective basis, based on the inputs provided by the field divisions. The growth rate considered for estimating the number of consumers, connected load and energy sales has been shown in *Table 22*.

Commission's analysis

The Commission observes that the YoY growth has been negative for number of consumers, sales and connected load in the last two years. Therefore, the Commission opines that a subjective growth rate of 0% is appropriate for projecting number of consumers, connected load and sales.

Table 22: Growth rates approved by the Commission for HTI (Ferro/SM/PI/SR)

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
HTI (Ferro/SM/PI/SR)	2.00%	0.00%	0.00%	0.00%	5.00%	0.00%

HT Commercial

Petitioner's submission

The Petitioner submitted that an International Airport (MOPA) is expected to come up within its serving area. However, only a part of this load is expected to be functional during the Control Period. Hence, it has assumed a connected load of 10 MVA expected to commission on this account during the Control Period. Further, two new substations serving the Indian Railways are expected to commission during the Control Period. Accordingly, 6 MVA load has been assumed on account of this load. Thus, based on the various new developments happening in the served area and the inputs provided by the field divisions, the growth rate for projecting the number of consumers, connected load and energy sales has been assumed as shown in *Table 23*.

Commission's analysis

The Commission on analysis of the data provided by the Petitioner found abrupt trends during the last five years. Due to distortion of data provided, no proper trend could be observed. Therefore, the Commission owing to increased commercial activity in the State, upcoming airport in Petitioner served area and comparatively reliable data for last two years has considered the YoY growth rate in FY 2017-18 over FY 2016-17 for the purpose of estimating the energy sales in the upcoming period. Further, 5-year CAGR has been assumed for projecting the number of consumers and connected load in the category. The summary of growth rates approved by the Commission is given in the following table:

Table 23: Growth rates approved by the Commission for HT Commercial

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
HT Commercial	4.51%	4.51%	0.00%	1.18%	5.00%	6.77%

HTAG/Agriculture (Pump sets and irrigation), HTAG/Agriculture (allied activity), HTD/Domestic, HTMES/Defense Establishment, Single Point Supply and HTTS/Temporary

Petitioner's submission

The Petitioner has considered a subjective growth rate for HTAG, HTD, HTTS and Single Point Supply categories for projecting the number of consumers, connected load and energy sales due to absence of any particular pattern observed during the last five years. The Petitioner has considered 5-year CAGR for HTMES category for projecting the energy sales and connected load. However, no increase has been assumed in projecting the number of consumers.

Commission's analysis

With regards to the HTAG, HTD, HTTS and Single Point Supply no particular trends were observed. The CAGR and YoY growth rates for most of these categories were coming out to be negative. The Commission therefore has not considered any growth in these categories in line with the approach followed by the Petitioner. For HTMES category, the Commission has considered the similar growth rates as assumed by the Petitioner. The summary of growth rates approved by the Commission is given in the following table:

Table 24: Growth rates approved by the Commission for HTAG/HTD/HTMES/HTTS/ Single Point Supply categories

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
HTAG/Agriculture (Pump sets and irrigation)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HTAG/Agriculture (allied activity)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HTD/Domestic	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HTMES/ Defense Establishment	0.00%	0.00%	0.50%	0.50%	0.22%	0.22%
Single Point Supply	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HTTS/Temporary	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

LT- Public Lighting & LH/ Hoardings and Signboards

Petitioner's submission

Similar to the LTAG category above, a decrease in number of consumers, connected load and energy sales has been observed in the previous years. Accordingly, no increase has been assumed and the number of consumers, connected load and energy sales have been considered at the same level as the base year during the complete Control Period.

Commission's analysis

No increase is considered in consumers, load and sales for the Public Lighting and Hoarding and Signboard category due to unavailability of requisite data. The same shall be considered as per actuals during the time of true up of respective years. The summary of growth rates approved by the Commission is given in the following table:

Table 25: Growth rates approved by the Commission for LTPL and LH category

Consumer Category	Growth in no. of consumers		Load growth		Sales growth	
	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved	CAGR submitted	CAGR approved
LTPL	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LH/ Hoardings and Signboards	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

3.2.3 Consumer growth projections approved by the Commission

The summary of the projections for number of consumer growth for the Base Year and the upcoming Control Period based on CAGRs approved by the Commission is given below:

Table 26: Consumer growth projections approved by the Commission for the upcoming Control Period

Consumer Category	Growth Rate Approved	Consumer growth projections			
		Base Year (Estimated)		Control Period (Approved)	
		FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTD/Domestic	3.14%	514,401	530,554	547,213	564,396
LT-LIG/Low Income Group	0.00%	1,835	1,835	1,835	1,835
LTC/Commercial	2.46%	97,134	99,524	101,972	104,480
LTI/Industrial	0.00%	5,963	5,963	5,963	5,963
LT Mixed/ LT-P Hotel Industries	3.13%	142	147	151	156
Low Tension-AG/LT-AGP (Pump Sets/Irrigation)	2.00%	11,506	11,736	11,970	12,210
Low Tension-AG/LT-AGA (Allied Activities)	2.00%	189	192	196	200
LT Temporary	0.00%	5,181	5,181	5,181	5,181
HTD Domestic	0.00%	3	3	3	3
HTC Commercial	4.51%	219	229	240	251
HTI Industrial	7.67%	745	802	864	930
High Tension-Ferro/SM/PI/SR	0.00%	29	29	29	29
High Tension-AG/HT-AGP (Pump Sets/Irrigation)	0.00%	41	41	41	41
High Tension-AG/HT-AG (Allied Activities)	0.00%	3	3	3	3
Military Engineering Services/defense Establishments	0.00%	12	12	12	12
Public Lighting	0.00%	215	215	215	215
Hoardings/Signboards	0.00%	63	63	63	63
HT Temporary	0.00%	1	1	1	1
Single Point Supply	0.00%	1	1	1	1
Total		637,684	656,531	675,954	695,970

3.2.4 Load growth projections approved by the Commission

The summary of the projections for load growth for the Base Year and the upcoming Control Period based on CAGRs approved by the Commission is given below:

Table 27: Load growth projections approved by the Commission for the upcoming Control Period

Consumer Category	Growth Rate Approved	Load growth projections (kW)			
		Base Year (Estimated)	Control Period (Approved)		
		FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTD/Domestic	4.21%	1,440,583	1,501,232	1,564,434	1,630,297
LT-LIG/Low Income Group	0.00%	231	231	231	231
LTC/Commercial	3.30%	319,309	329,846	340,731	351,975
LTI/Industrial	0.00%	140,551	140,551	140,551	140,551
LT Mixed/ LT-P Hotel Industries	0.00%	2,868	2,868	2,868	2,868
Low Tension-AG/LT-AGP (Pump Sets/Irrigation)	2.00%	45,140	46,043	46,964	47,903
Low Tension-AG/LT-AGA (Allied Activities)	2.00%	1,566	1,597	1,629	1,662
LT Temporary	0.00%	20,684	20,684	20,684	20,684
HTD Domestic	0.00%	300	300	300	300
HTC Commercial	1.18%	71,802	72,650	73,507	74,374
HTI Industrial	6.05%	490,684	520,370	551,853	585,240
High Tension-Ferro/SM/PI/SR	0.00%	98,700	98,700	98,700	98,700
High Tension-AG/HT-AGP (Pump Sets/Irrigation)	0.00%	8,240	8,240	8,240	8,240
High Tension-AG/HT-AG (Allied Activities)	0.00%	1,310	1,310	1,310	1,310
Military Engineering Services/defense Establishments	0.50%	6,990	7,025	7,060	7,095
Public Lighting	0.00%	1,600	1,600	1,600	1,600
Hoardings/Signboards	0.00%	619	619	619	619
HT Temporary	0.00%	350	350	350	350
Single Point Supply	0.00%	4,035	4,035	4,035	4,035
Total		2,655,562	2,758,250	2,865,665	2,978,033

3.2.5 Sales growth projections approved by the Commission

The summary of the projections for sales growth for the Base Year and the upcoming Control Period based on CAGRs approved by the Commission is given below:

Table 28: Sales growth projections approved by the Commission for the upcoming Control Period

Consumer Category	CAGR Approved	Energy Sales growth projections (MU)			
		Base Year (Estimated)	Control Period (Approved)		
		FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTD/Domestic	4.21%	1,157.35	1,206.08	1,256.86	1,309.77
LT-LIG/Low Income Group	0.00%	1.76	1.76	1.76	1.76
LTC/Commercial	8.99%	451.39	491.97	536.20	584.40

Consumer Category	CAGR Approved	Energy Sales growth projections (MU)			
		Base Year (Estimated)	Control Period (Approved)		
		FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
LTI/Industrial	3.47%	97.73	101.12	104.63	108.26
LT Mixed/ LT-P Hotel Industries	2.91%	5.46	5.62	5.78	5.95
Low Tension-AG/LT-AGP (Pump Sets/Irrigation)	2.00%	16.69	17.03	17.37	17.71
Low Tension-AG/LT-AGA (Allied Activities)	2.00%	0.88	0.89	0.91	0.93
LT Temporary	0.00%	20.51	20.51	20.51	20.51
HTD Domestic	0.00%	0.29	0.29	0.29	0.29
HTC Commercial	6.77%	111.50	119.05	127.11	135.72
HTI Industrial	6.05%	1,440.60	1,527.76	1,620.19	1,718.21
High Tension-Ferro/SM/PI/SR	0.00%	442.64	442.64	442.64	442.64
High Tension-AG/HT-AGP (Pump Sets/Irrigation)	0.00%	4.85	4.85	4.85	4.85
High Tension-AG/HT-AG (Allied Activities)	0.00%	4.52	4.52	4.52	4.52
Military Engineering Services/defense Establishments	0.22%	26.95	27.01	27.07	27.13
Public Lighting	0.00%	2.66	2.66	2.66	2.66
Hoardings/Signboards	0.00%	0.24	0.24	0.24	0.24
HT Temporary	0.00%	0.30	0.30	0.30	0.30
Single Point Supply	0.00%	5.46	5.46	5.46	5.46
Total		3,791.79	3,979.76	4,179.35	4,391.31

3.3 Intra-state T&D losses

Petitioner's submission

The Petitioner has submitted that the T&D losses as approved in the previous Business Plan Control Period could not be achieved due to several billing issues, transition of the billing and collection agencies and less infusion of funds to strengthen and improve the distribution network. Since, now most of the issues have been resolved and billing is being done through SAP, it is important to revise the loss trajectory based on accurate and most recent data. The Petitioner also submitted that it is difficult to reduce the transmission and distribution loss further due to technical constraints, however increased efforts are being taken to reduce these losses with implementation of SAP, R-APDRP Part A schemes etc. The results of all these efforts shall be expected in the upcoming Control Period. The T&D loss trajectory as submitted by the Petitioner for the Control Period has been provided in the table below:

Table 29: T&D loss (%) trajectory proposed by the Petitioner for the upcoming Control Period

Base Year	Projections		
FY 2018-19 (RE)	FY 2019-20	FY 2020-21	FY 2021-22
11.25%	11.00%	10.75%	10.50%

Commission's analysis

The T&D losses approved by the Commission in the current Control Period vis-à-vis T&D losses achieved by the Petitioner during the same period is given in the following table:

Table 30: T&D losses approved by the Commission in the current Control Period vis-à-vis T&D losses achieved by the Petitioner

	T&D loss (%)	
	Approved ¹	Actual (A)/ Estimate (E)
FY 2016-17	11.25%	-
FY 2017-18	11.00%	11.42% (A)
FY 2018-19	10.75%	11.25% (E)

The Commission would like to point out that approx. 54% of the total sales is towards HT industries, where losses are very low. In view of the capital expenditure proposed by the Petitioner and nature of schemes planned to be carried out, the Commission opines that the Petitioner should be in a position to further reduce losses in the upcoming Control Period. The Commission observes that the Petitioner did not meet the T&D loss targets in the existing Control Period and will be penalized for failing to do so during true-up for respective financial years. Further, Clause 6.1 of the JERC MYT Regulations states the following:

“Provided further that the Commission may change the values for Base Year and consequently the trajectory of parameters for Control Period, considering the actual figures from audited accounts.”

Accordingly, the Commission has set the T&D loss trajectory for the upcoming Control Period based on the actual T&D losses in FY 2016-17 and FY 2017-18 and the estimate provided by the Petitioner for FY 2018-19. The Commission further observes that the Petitioner has proposed to achieve T&D loss of 10.75% in FY 2020-21. However, the Petitioner was directed to achieve that target by the end of the current Control Period. In view of the above, the Commission opines that the Petitioner should be in a position to achieve T&D loss of 10.75% at least by FY 2019-20 and has accordingly set the trajectory with a reduction of 25 basis points for each subsequent year. The T&D loss trajectory approved by the Commission is given in the following table:

Table 31: T&D loss trajectory approved by the Commission

	FY 2019-20		FY 2020-21		FY 2021-22	
	Petitioner's submission	Approved by Commission	Petitioner's submission	Approved by Commission	Petitioner's submission	Approved by Commission
T&D loss trajectory (%)	11.00%	10.75%	10.75%	10.50%	10.50%	10.25%

3.4 Power Procurement Plan

3.4.1 Energy Requirement

Petitioner's submission

The Petitioner has submitted the projection of energy requirement at periphery by grossing up the sales projections with distribution loss trajectory as proposed. The summary of the energy requirement as estimated by the Petitioner is provided in the following below:

Table 32: Energy requirement proposed by the Petitioner

Particulars	Projections			
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
ENERGY REQUIREMENT (MU)				
Energy sales within the State/UT	3,790.43	3,916.51	4,045.47	4,178.64
Distribution losses				
%	11.25%	11.00%	10.75%	10.50%
MU	480.48	484.06	487.27	490.23
Energy required at State Periphery	4,270.90	4,400.57	4,532.74	4,668.87

¹ Business Plan Order dated 22 December 2015

Commission's analysis

Based on the sales projections and T&D losses approved by the Commission above, the energy requirement at State periphery and the total energy input estimated by the Commission for the upcoming Control Period is provided in the following table:

Table 33: Energy requirement at UT periphery and total energy input approved by the Commission

Particulars	Revised Estimate	Approved Projections		
	FY 2018-19 ²	FY 2019-20	FY 2020-21	FY 2021-22
Energy Required				
Energy sales within the State (A)	3,791.79	3,979.76	4,179.35	4,391.31
T&D Loss (%) (B)	10.75%	10.75%	10.50%	10.25%
Energy required at State Periphery (C = A/(1-B))	4,248.51	4,459.12	4,669.66	4,892.83
Within State Generation (Co-Gen) (D)	168.19	168.19	168.19	168.19
Net energy required at State Periphery (E = C – D)	4,080.32	4,290.93	4,501.47	4,724.64

3.4.2 Power Purchase Quantum

Petitioner's submission

The Petitioner has made the following assumptions for projecting the quantum of power purchase for the upcoming Control Period:

- **Allocation to the Petitioner:** The firm allocation and allocation from the unallocated quota from the various generating stations has been considered based on the revised allocation issued by the Western Region Power Committee (WRPC) vide No. WRPC/Comml-I/6/Alloc/2018/8673 dated 21.09.2018. The Petitioner also submitted that it has received additional allocation of 3 MW during peak hours from September 22, 2018 onwards.
- **Power purchase from new stations:** The Petitioner has envisaged purchase of power from four new generating stations for FY 2018-19 and the upcoming Control Period:
 - 7.31 MW allocation from Lara Super Thermal Power Station from second half of FY 2019-20
 - 14.55 MW allocation from Khargone Thermal Power Station from second half of FY 2019-20
 - 11.75 MW allocation from Gadarwara Super Thermal Power Station from second half of FY 2019-20
 - 2.00 MW allocation from Kameng Hydro Electric Power Plant from second half of FY 2019-20
- **Plant Load Factor (PLF):** The Petitioner has considered the average plant load factor of FY 2017-18 with the rational that the energy requirement in the previous years has been volatile therefore average PLF of last years would not present a clear picture of the parameter.
- **Auxiliary consumption:** The Petitioner has considered the auxiliary consumption parameters as prescribed by the CERC Tariff Regulations 2014-19.
- **Inter-state transmission losses:** The Petitioner has considered inter-state transmission losses of 3.26% for western region and 9.87% for southern region

Apart from the above conventional sources, EDG has made tie-ups with Renewable energy generators for the Control Period to meet its RPO obligations. For Solar Power, EDG is in advance stage of finalization of 125 MW solar with NTPC Solar and envisages the supply to start from second half of FY 2020-21. Further, the petitioner has also tied up with SECI for 2x50 MW Wind power. The expected COD of first unit of 50 MW is May 2019 and that of second unit of 50 MW is November 2019. In addition to above, to meet any shortfall and to fulfill the Solar and Non Solar RPO obligation, the Petitioner has proposed to purchase power through short term market via traders.

² The values for FY 2018-19 shown here are revised estimates made by the Commission, used only for the purpose of projections for the Control Period

Based on the above inputs and assumptions, the Petitioner has projected the availability of power from tie-up sources as given in the following table:

Table 34: Power purchase plan proposed by the Petitioner for the upcoming MYT Control Period

Sr. No.	Source	Capacity (MW)	Firm allocation to Licensee		Net Power Purchase (MUs)			
			%	MW	Base Year	Projections		
					2018-19	2019-20	2020-21	2021-22
I	NTPC	24,034		574.31	3,655.75	3,784.86	3,878.18	3,874.16
	KSTPS	2,100	10.29%	216.00	1,587.61	1,587.61	1,587.6	1,587.6
	VSTPS - I	1,260	3.21%	40.47	290.06	290.06	290.06	290.06
	VSTPS - II	1,000	1.61%	16.12	119.69	119.69	119.69	119.69
	VSTPS -III	1,000	1.41%	14.12	104.84	104.84	104.84	104.84
	VSTPS-IV	1,000	1.70%	17.04	126.53	126.53	126.53	126.53
	VSTPS-V	500	1.62%	8.11	59.55	59.55	59.55	59.55
	KGPP	656	1.89%	12.41	44.36	44.36	44.36	44.36
	GGPP	657	1.93%	12.67	58.49	58.49	58.49	58.49
	SIPAT- I	1,980	1.60%	31.74	232.22	232.22	232.22	232.22
	Solapur	660	1.73%	11.41	37.33	37.33	37.33	37.33
	KSTPS-III	500	1.49%	7.43	55.13	55.13	55.13	55.13
	RSTPS	2,100	4.76%	100.00	683.95	683.95	683.95	683.95
	SIPAT- II	1,000	1.39%	13.91	101.24	101.24	101.24	101.24
	Mouda I	1,000	1.70%	17.04	62.34	62.34	37.82	33.71
	Mouda II	660	3.37%	22.22	81.25	81.25	81.25	81.25
	New Station-LARA 1&II	4,000	0.18%	7.31				
	New Station-Gadarwara	2,640	0.55%	14.55		25.65	51.30	51.30
	New Station-Khargone	1,320	0.89%	11.75		51.05	102.11	102.11
	Additional Allocation			3.00		41.23	82.46	82.46
					11.17	22.34	22.24	22.34
II	New Hydro Station			2.00		11.03	11.03	11.03
	Kameng HEP			2.00		11.03	11.03	11.03
III	NPCIL	1,520		28.13	90.37	90.37	90.37	90.37
	KAPS	440	3.53%	15.52	-	-	-	-
	TAPS	1,080	1.17%	12.60	90.37	90.37	90.37	90.37
					-	-	-	-
IV	Traders				199.30	80.57	-	-
	IEX Purchase and Sales				-	-	-	-
	Traders				199.30	80.57	-	-
					-	-	-	-
V	Within State Generations-Co-Gen	26.0			168.19	168.19	168.19	168.19
	Vedanta Plant-1	14.0			92.90	92.90	92.90	92.90
	Vedanta Plant - 2	10.0			69.89	69.89	69.89	69.89
	Goa Sponge and private limited	2.0			5.40	5.40	5.40	5.40
VI	RPO Obligation	225.0		-	341.14	450.40	570.41	710.37
	Solar				136.46	184.08	246.77	334.29
	NVVNL Solar				11.60	11.60	-	-
	Short Term Tender DEEP portal				73.76	121.38	58.80	9.45
	SECI Solar				51.10	51.10	51.10	51.10
	NTPC Solar	125.0			-	-	136.88	273.75

Sr. No.	Source	Capacity (MW)	Firm allocation to Licensee		Net Power Purchase (MUs)			
			%	MW	Base Year	Projections		
					2018-19	2019-20	2020-21	2021-22
	Non-Solar				204.68	266.32	323.64	376.08
	Short Term Tender DEEP portal (Non Solar)				202.68	111.02	15.04	67.48
	SECI WIND (Non Solar)	100.0			-	153.30	306.60	306.60
	Hindustan waste treatment plant Goa				2.00	2.00	2.00	2.00
					-	-	-	-
	Total	25,905		602.43	4,454.75	4,585.42	4,718.18	4,854.12

Commission's Analysis

The Commission has employed the following approach and assumptions to forecast the power purchase from tied-up sources for the upcoming Control Period:

- **Allocation from CGS:** The Commission has considered firm allocation and allocation from the unallocated quota from the central generating stations based on the allocation obtained from Regional Energy Account of western region prepared by WRPC vide letter number WRPC/Comml.-I/ABTREA/2018/10.0 dated 05 November 2018. Further, for Ramagundam Super Thermal Power Station (RSTPS), the Commission has considered the Regional Energy Account of southern region prepared by SRPC vide letter number SRPC/SE-1/4(REA)/2018/ dated 02 November 2018. The same share of allocation has been assumed for all the years of the upcoming Control Period.
- **Power purchase from new stations:** The Commission has used the following assumptions used by the Petitioner as follows:
 - 7.31 MW allocation from Lara Super Thermal Power Station from second half of FY 2019-20
 - 14.55 MW allocation from Khargone Thermal Power Station from second half of FY 2019-20
 - 11.75 MW allocation from Gadarwara Super Thermal Power Station from second half of FY 2019-20

However, for Kameng Hydro Electric Power Plant, the Commission has considered the COD as January 2018 as per the information available on the Company website. Therefore, the generation from this source is considered for complete FY 2018-19 and for each year of the MYT Control Period.

- **Plant Load Factor (PLF):** The Commission has made the following assumptions with respect to PLF:
 - **NTPC:** The energy availability from all the NTPC and NPCIL stations has been projected based on the average Plant Load Factor (PLF) of the respective stations in the last 4-5 years depending on the status of operation of the plant during the year.
 - No power has been projected from Kakrapara Atomic Power Plant (KAPS) as the plant is shutdown since FY 2016-17
 - **New Power Plants:** However, for new power plants the Commission has considered a normative PLF of 85% for thermal plants and 65% for Hydro Power plants
- **Co- Generation plants and Renewable Energy:** The energy availability from all the Co- Generation plants namely Vedanta Plant-1, Vedanta Plant-2 and Goa Sponge Pvt. Ltd, and renewable energy sources other than purchase through traders (DEEP Portal) has been considered the same as submitted by the Petitioner post verification of PPA's and the requisite documents.
- **Auxiliary consumption:** The Commission has considered the Auxiliary consumption based on normative auxiliary consumption allowed in Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 for thermal power plants. Accordingly, auxiliary consumption of 7.75% and 2.50% is considered for coal and gas based plants³. However, for nuclear generation power plants, the auxiliary consumption has been assumed as 10%.

- **Inter-state transmission losses:** The Commission has considered the inter-state transmission losses of 3.26% for western region and 9.87% for southern region after verification of loss calculation provided by the Petitioner.

The quantum of power procurement projected by the Commission for the upcoming Control Period is given in the following table:

Table 35: Power purchase plan approved by the Commission for the upcoming MYT Control Period

Details of the stations	Capacity (MW)	Average allocation to Licensee		Avg. PLF (in %)	Gross Generation (MU)	Aux consumption (%)	Net Generation (MU)	Power Purchase @ Gen Periphery (MU)				ISTS Losses	Power Purchase @ State Periphery (MU)			
		%	MW					Base Year	Projections				Base Year	Projections		
									2018-19 ³	2019-20	2020-21			2021-22	2018-19 ³	2019-20
NTPC																
KSTPS	2100	10.29%	216.09	89.44%	1693.13	7.75%	1561.91	1561.91	1561.91	1561.91	1561.91	3.26%	1510.99	1510.99	1510.99	1510.99
VSTPS - I	1260	3.09%	38.93	82.29%	280.66	7.75%	258.91	258.91	258.91	258.91	258.91	3.26%	250.47	250.47	250.47	250.47
VSTPS - II	1000	1.61%	16.10	82.29%	116.06	7.75%	107.06	107.06	107.06	107.06	107.06	3.26%	103.57	103.57	103.57	103.57
VSTPS -III	1000	1.41%	14.10	82.29%	101.64	7.75%	93.76	93.76	93.76	93.76	93.76	3.26%	90.71	90.71	90.71	90.71
VSTPS-IV	1000	1.70%	17.00	82.29%	122.55	7.75%	113.05	113.05	113.05	113.05	113.05	3.26%	109.36	109.36	109.36	109.36
VSTPS-V	500	1.62%	8.10	82.29%	58.39	7.75%	53.86	53.86	53.86	53.86	53.86	3.26%	52.11	52.11	52.11	52.11
KGPP	656.2	1.73%	11.35	41.85%	41.62	2.50%	40.58	40.58	40.58	40.58	40.58	3.26%	39.25	39.25	39.25	39.25
GGPP	657.39	1.64%	10.78	54.04%	51.04	2.50%	49.76	49.76	49.76	49.76	49.76	3.26%	48.14	48.14	48.14	48.14
SIPAT- I	1980	1.59%	31.48	84.55%	233.18	7.75%	215.11	215.11	215.11	215.11	215.11	3.26%	208.10	208.10	208.10	208.10
KSTPS-III	500	1.48%	7.40	89.44%	57.98	7.75%	53.49	53.49	53.49	53.49	53.49	3.26%	51.74	51.74	51.74	51.74
RSTPS	2100	4.76%	100.00	87.33%	765.04	7.75%	705.75	705.75	705.75	705.75	705.75	9.87%	636.09	636.09	636.09	636.09
SIPAT- II	1000	1.39%	13.90	84.55%	102.95	7.75%	94.97	94.97	94.97	94.97	94.97	3.26%	91.88	91.88	91.88	91.88
Mouda II	660	1.56%	10.30	43.22%	38.98	7.75%	35.96	35.96	35.96	35.96	35.96	3.26%	34.78	34.78	34.78	34.78
Mouda	1000	1.53%	15.30	43.22%	57.92	7.75%	53.43	53.43	53.43	53.43	53.43	3.26%	51.69	51.69	51.69	51.69
Solapur	660	1.82%	12.01	39.62%	41.69	7.75%	38.46	38.46	38.46	38.46	38.46	3.26%	37.21	37.21	37.21	37.21
Subtotal - NTPC (A)	16073.6		522.85		3762.82		3476.07	3476.07	3476.07	3476.07	3476.07		3316.10	3316.10	3316.10	3316.10
NPCIL																
KAPS	440	3.53%	15.52		0.00	10.00%	0.00	0.00	0.00	0.00	0.00	3.26%	0.00	0.00	0.00	0.00
TAPS	1080	1.17%	12.60	83.5%	92.17	10.00%	82.95	82.95	82.95	82.95	82.95	3.26%	80.25	80.25	80.25	80.25
Sub Total NPCIL (B)	1520		28.13		92.17		82.95	82.95	82.95	82.95	82.95		80.25	80.25	80.25	80.25
Within State Generations																
Vedanta Plant-1- Co-Gen	14.00	100.0%	14.00					92.90	92.90	92.90	92.90		92.90	92.90	92.90	92.90

³ The values for FY 2018-19 shown here are revised estimates made by the Commission, used only for the purpose of projections for the Control Period

Approval of the various components of the Business Plan Petition

Details of the stations	Capacity (MW)	Average allocation to Licensee		Avg. PLF (in %)	Gross Generation (MU)	Aux consumption (%)	Net Generation (MU)	Power Purchase @ Gen Periphery (MU)				ISTS Losses	Power Purchase @ State Periphery (MU)			
		%	MW					Base Year	Projections				Base Year	Projections		
									2018-19 ³	2019-20	2020-21			2021-22	2018-19 ³	2019-20
Vedanta Plant -2- Co-Gen	10.00	100.0%	10.00					69.89	69.89	69.89	69.89		69.89	69.89	69.89	69.89
Goa Sponge and private limited	2.00	100.0%	2.00					5.40	5.40	5.40	5.40		5.40	5.40	5.40	5.40
Sub Total - Within State Generation (C)	26.00		26.00	0.00	0.00			168.19	168.19	168.19	168.19		168.19	168.19	168.19	168.19
Renewable Sources																
NVVNL Solar								11.60	11.60	0.00	0.00	3.26%	11.22	11.22	0.00	0.00
SECI Solar								51.10	51.10	51.10	51.10	3.26%	49.43	49.43	49.43	49.43
NTPC Solar								0.00	0.00	136.88	273.75	3.26%	0.00	0.00	132.42	264.83
SECI Wind (Non Solar)								0.00	153.30	306.60	306.60	3.26%	0.00	148.30	296.60	296.60
Hindustan waste treatment plant Goa								2.00	2.00	2.00	2.00		2.00	2.00	2.00	2.00
Sub Total - Renewable Sources (D)								64.7	218	496.58	633.45		62.66	210.96	480.46	612.86
New Stations⁴																
Kameng HEP	600	0.33%	2.00	65.0%	11.39	1.20%	11.25	11.25	11.25	11.25	11.25	3.26%	10.88	10.88	10.88	10.88
Lara STPP – I & II	1600	0.46%	7.31	85.0%	54.43	5.25%		0.00	25.79	51.57	51.57	3.26%	0.00	24.95	49.89	49.89
Khargone STPP	1320	0.89%	11.75	85.0%	87.49	5.25%		0.00	41.45	82.90	82.90	3.26%	0.00	40.10	80.19	80.19
Gadarwara STPP	1600	0.91%	14.55	85.0%	108.34	5.25%		0.00	51.33	102.65	102.65	3.26%	0.00	49.65	99.31	99.31

⁴ For New Stations, capacity allocation and auxiliary consumption for the Control Period have been considered based on the Petitioner's submission

Approval of the various components of the Business Plan Petition

Details of the stations	Capacity (MW)	Average allocation to Licensee		Avg. PLF (in %)	Gross Generation (MU)	Aux consumption (%)	Net Generation (MU)	Power Purchase @ Gen Periphery (MU)				ISTS Losses	Power Purchase @ State Periphery (MU)			
		%	MW					Base Year	Projections				Base Year	Projections		
									2018-19 ³	2019-20	2020-21			2021-22	2018-19 ³	2019-20
Sub Total - New Stations (E)	5120		35.61		261.65		11.25	11.25	129.81	248.37	248.37		10.88	125.58	240.28	240.28
Total (A + B + C + D + E)	22739.6		612.58		4116.64		3570.27	3803.16	4075.02	4472.16	4609.03		3638.08	3901.08	4285.27	4417.68
Total Energy available from Central Generating Stations (CGS) (F = A + B + E)													3407.23	3521.93	3636.62	3636.62
Total Energy available from Renewable sources (D)													62.66	210.96	480.46	612.86
Total Energy available at State Periphery (F + D)													3469.89	3732.89	4117.08	4249.49

3.4.3 Energy Balance

Petitioner's submission

The energy balance proposed for FY 2018-19 and the upcoming Control Period as estimated by the Petitioner is as given below:

Table 36: Energy Balance proposed by the Petitioner (MU)

Particulars	Energy Balance			
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Energy sales within the State/UT	3,790.43	3,916.51	4,045.47	4,178.64
Distribution losses				
%	11.25%	11.00%	10.75%	10.50%
MU	480.48	484.06	487.27	490.23
Energy required at State Periphery	4,270.90	4,400.57	4,532.74	4,668.87
Energy Available at State periphery				
Central Generating Stations (CGS) (at Generator Periphery)	3,746.12	3,886.26	3,979.58	3,975.56
Traders/ Open Market	199.30	80.57	0.00	0.00
Renewable Power (at Generator Periphery)	341.14	450.40	570.41	710.37
Within State Generation (Co-Gen)	168.19	168.19	168.19	168.19
Less: PGCIL Losses (MU)	183.85	184.85	185.44	185.25
Total Energy available at State Periphery	4,270.90	4,400.57	4,532.74	4,668.87

Commission's Analysis

The Energy Balance projected by the Commission based on its analysis is given in the following table:

Table 37: Energy Balance approved by the Commission

Particulars	Revised Estimate	Approved Projections		
	FY 2018-19 ⁵	FY 2019-20	FY 2020-21	FY 2021-22
Energy Required				
Energy sales within the State (A)	3,791.79	3,979.76	4,179.35	4,391.31
T&D Loss (%) (B)	10.75%	10.75%	10.50%	10.25%
Energy required at State Periphery (C = A/(1-B))	4,248.51	4,459.12	4,669.66	4,892.83
Within State Generation (Co-Gen) (D)	168.19	168.19	168.19	168.19
Net energy required at State Periphery (E = C - D)	4,080.32	4,290.93	4,501.47	4,724.64
Energy Available				
Central Generating Stations (F)	3407.23	3521.93	3636.62	3636.62
Renewable Power (G)	62.66	210.96	480.46	612.86
Energy available at State Periphery (H = F + G)	3469.89	3732.89	4117.08	4249.49
(Deficit)/ Surplus (I = H - E)	(610.43)	(558.04)	(384.39)	(475.15)

The Commission observes that Petitioner has an energy deficit ranging from ~8.5% to ~15% in the state for the Control Period, subjecting the consumers to risk of power price fluctuations at the energy exchange. In view of the above, the Commission directs the Petitioner to take measures expeditiously to ensure that a medium term or long-term arrangement is put in place to meet the deficit in power requirements.

⁵ The values for FY 2018-19 shown here are revised estimates made by the Commission, used only for the purpose of projections for the Control Period

3.4.4 Renewable Purchase Obligation

Petitioner's submission

The Petitioner has considered the RPO targets for each year of the Control Period as per the Joint Electricity Regulatory Commission for State of Goa & Union Territories (Procurement of Renewable Energy), Third Amendment Regulations, 2016 notified on 22.08.2018. The Petitioner plans to procure renewable power (Solar and Non- solar) from various sources viz. NNVNL Solar, SECI Solar, NTPC Solar, SECI Wind and Hindustan waste treatment plant, Goa. The Petitioner has entered into PPA's with all these generators. Further, the Petitioner proposes to fulfill any shortfall in the RPO by way of open market purchase via traders. The Petitioner does not plan to buy the Renewable Energy Certificates (REC's) for fulfilling the RPO in the upcoming MYT Control Period.

The plan for meeting RPO submitted by the Petitioner is as given below:

Table 38: RPO plan proposed by the Petitioner for the upcoming MYT Control Period

S.No	Description	Unit	Revised Projections	Projections		
			FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
1	Sales Within State	MUs	3790.43	3916.51	4045.47	4178.64
2	RPO Obligation	%	9.00%	11.50%	14.10%	17.00%
	- Solar	%	3.60%	4.70%	6.10%	8.00%
	- Non Solar	%	5.40%	6.80%	8.00%	9.00%
3	RPO Obligation	MUs	341.14	450.40	570.41	710.37
	- Solar	MUs	136.46	184.08	246.77	334.29
	- Non Solar	MUs	204.68	266.32	323.64	376.08
4	Power Purchase	MUs	341.14	450.40	570.41	710.37
	- Solar	MUs	136.46	184.08	246.77	334.29
	- Non Solar	MUs	204.68	266.32	323.64	376.08

Commission's analysis

The Petitioner is procuring physical power from solar and hydro plants. However, the physical power is not enough to fulfill the standalone RPO targets for FY 2018-19 and the upcoming Control Period. The Commission, in this Order, has not considered the renewable power proposed to be procured through traders due to the inherent uncertainty surrounding this mechanism. The Commission for now has considered the balance RPO to be fulfilled by purchase of REC's. The same shall be considered as per actuals in case the Petitioner succeeds to fructify the plan. The Commission, however, directs the Petitioner to opt for long term PPAs for procuring renewable power rather than buying through traders as purchase via traders has an inherent financial risk owing to the volatility in prices in the open market. The current tie-ups with renewable energy generators are not enough to fulfill the standalone RPO for each year and the Petitioner would be obligated to procure renewable power from other sources.

With regards to the actual compliance in respect of the pending RPO obligations, the Commission would review the same at the time of true up / regular reviews. In view of the sales projections approved by the Commission in section 3.2, approved plan for compliance with the RPO targets is provided in the following below:

Table 39: RPO plan approved by the Commission

Description	FY 2018-19 ⁶	FY 2019-20	FY 2020-21	FY 2021-22
Sales within State (MU) (A)	3791.79	3979.76	4179.35	4391.31
Hydro Power available at State Periphery (MU) (B)	10.88	10.88	10.88	10.88
T&D Loss (%) (C)	10.75%	10.75%	10.50%	10.25%
T&D Loss (MU) (D = B * C)	1.17	1.17	1.14	1.12
Hydro Power Consumed (E = B - D)	9.71	9.71	9.74	9.77

⁶ The values for FY 2018-19 shown here are revised estimates made by the Commission, used only for the purpose of projections for the Control Period

Description	FY 2018-19 ⁶	FY 2019-20	FY 2020-21	FY 2021-22
Conventional Power Consumed (F = A - E)	3782.08	3970.05	4169.60	4381.55
RPO obligation (%)	9.00%	11.50%	14.10%	17.00%
Solar (G)	3.60%	4.70%	6.10%	8.00%
Non-Solar (H)	5.40%	6.80%	8.00%	9.00%
RPO obligation for the year (MU)	340.39	434.94	533.27	642.95
Solar (F * G)	136.15	177.76	230.71	302.57
Non-Solar (F * H)	204.23	257.18	302.57	340.39
RPO Compliance (Physical Power) (MU)	62.66	210.96	480.46	612.86
Solar	60.66	60.66	181.85	314.26
Non-Solar	2.00	150.30	298.60	298.60
RPO Compliance (REC certificate purchase) (MU)	277.73	223.98	52.82	41.78
Solar	75.50	117.10	48.85	0.00
Non-Solar	202.23	106.88	3.96	41.78

3.5 Capital Investment Plan

3.5.1 Details of capital expenditure and capitalisation

Summary of scheme wise capital expenditure and capitalisation

Petitioner's submission

The Petitioner has proposed various ongoing and new schemes for the upcoming Control Period. The summary of capital expenditure proposed by the Petitioner for the upcoming Control Period is as given in the following table:

Table 40: Capital expenditure plan proposed by the Petitioner for the upcoming Control Period

Project Details			Capital Expenditure (INR Cr)			
Sl. No.	Name of scheme	Estimated Cost (INR Cr)	Projections			Total
			FY 2019-20	FY 2020-21	FY 2021-22	
Existing Schemes						
A1	Scheduled Tribe Development Scheme (P)	379.08	35.00	35.00	35.00	105.00
A2	Infrastructure development through Electricity Duty (Plan)	1,913.77	470.00	360.00	200.00	1030.00
A3	Erection and Augmentation of 33/11 KV S/S line (Plan)	59.00	10.00	10.00	10.00	30.00
A4	Normal Development Schemes (Plan)	145.32	15.00	15.00	15.00	45.00
A5	System Improvement Schemes (Plan)	58.11	15.00	12.00	12.00	39.00
A6	Construction of staff quarters and office buildings (Plan)	19.79	2.00	2.00	5.00	9.00
A7	Strengthening of 220 KV Transmission Network	20.65	6.00	1.00	1.00	8.00
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	343.00	100.00	130.00	-	230.00
A9	R-APDRP Part A	163.13	8.00	8.00	8.00	24.00
A10	Underground Cabling	391.86	50.00	50.00	100.00	200.00
A11	R-APDRP Part B / IPDS	563.57	115.00	150.00	200.00	465.00
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	827.50	-	-	25.00	25.00
New Schemes						
B1	Smart grid Development of existing network	252.00	30.00	40.00	50.00	120.00
B2	Sub-transmission and distribution improvement scheme	1,155.00	100.00	150.00	300.00	550.00
Total			956.00	963.00	961.00	2880.00

The capitalisation schedule proposed by the Petitioner for the upcoming Control Period is as given in the following table:

Table 41: Capitalisation schedule proposed by the Petitioner for the upcoming Control Period

Project Details		Capitalisation (INR Cr)			
Sl. No.	Name of scheme	Projections			Total
		FY 2019-20	FY 2020-21	FY 2021-22	
Existing Schemes					
A1	Scheduled Tribe Development Scheme (P)	55.00	25.00	40.00	120.00
A2	Infrastructure development through Electricity Duty (Plan)	250.00	394.00	400.00	1044.00
A3	Erection and Augmentation of 33/11 KV S/S line (Plan)	-	20.00	10.00	30.00
A4	Normal Development Schemes (Plan)	15.00	15.00	15.00	45.00
A5	System Improvement Schemes (Plan)	13.00	10.00	15.00	38.00
A6	Construction of staff quarters and office buildings (Plan)	1.50	1.50	4.00	7.00
A7	Strengthening of 220 KV Transmission Network	6.00	1.00	1.00	8.00
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	-	235.00	-	235.00
A9	R-APDRP Part A	8.00	8.00	8.00	24.00
A10	Underground Cabling	50.00	50.00	100.00	200.00
A11	R-APDRP Part B / IPDS	115.00	150.00	200.00	465.00
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	-	-	25.00	25.00
New Schemes					
B1	Smart grid Development of existing network	30.00	40.00	50.00	120.00
B2	Sub-transmission and distribution improvement scheme	100.00	150.00	300.00	550.00
Total		643.50	1099.50	1168.00	2911.00

Commission's analysis

The Commission has analysed actual achievement of capital expenditure and capitalisation of the Petitioner vis-à-vis the same approved in the last two years is as given below:

Table 42: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for the last 2 years

Particulars	FY 2016-17		FY 2017-18		Total	
	Approved	Actual	Approved	Actual	Approved	Actual
Capital Expenditure (INR Cr)	576.55	163.32	1208.54	103.36	1785.09	266.68

Table 43: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for the last 2 years

Particulars	FY 2016-17		FY 2017-18		Total	
	Approved	Actual	Approved	Actual	Approved	Actual
Capitalisation (INR Cr)	182.55	174.67	579.54	100.89	762.09	275.56

The Commission observes that the Petitioner has achieved only 14.9% of approved capital expenditure for FY 2016-17 and FY 2017-18 and 36.2% of approved capitalisation for FY 2016-17 and FY 2017-18. Further, the Commission observes that the Petitioner has not informed the Commission regarding the execution and completion of the schemes undertaken by it in the existing Control Period on a quarterly basis. The Commission opines that Petitioner should do all efforts to ensure that it informs the Commission about the status of each scheme on a quarterly basis as per Clause 8.5 (f) of the JERC MYT Regulations:

“The Licensee shall submit a report for every quarter detailing the progress of the capital expenditure and capitalisation undertaken against that proposed in the Capital Investment Plan, on or before the last Day of the month succeeding the respective quarter for review by the Commission.”

If the Petitioner consistently fails to meet the approved capital expenditure and capitalisation during each quarter or if the Petitioner fails to provide the above reports on time, the Commission would be constrained to reduce the approved capital expenditure and capitalisation.

Overall approach of the Commission

In respect of existing schemes, the Commission has compared the capital expenditure and capitalisation submitted by the Petitioner with that approved by the Commission in its Business Plan Order dated 22 December 2015. Any discrepancies in the scheme wise estimated capital expenditure and capitalisation vis-à-vis that approved for FY 2016-17 to FY 2018-19 have been factored in while determining the capital expenditure for the Control Period.

In respect of the proposed new schemes and schemes under ‘Infrastructure development through Electricity Duty’, the Commission has compared capital expenditure and capitalisation proposed by the Petitioner with DPRs submitted by the Petitioner along with the Business Plan petition and replies to Deficiency Notes. If the Petitioner has failed to submit the DPRs / Technical Clearance letters from CEA for any of the proposed scheme for the upcoming Control Period or the submitted proofs/details are missing the required information, the Commission has not approved any of the capital expenditure and capitalisation proposed for the said schemes. However, the Commission may make some exceptions, subject to Petitioner furnishing documents within 30 days of this Order. Based on the Petitioner’s submissions and the overall approach discussed herein, the scheme wise analysis of proposed capital expenditure plan by the Commission is as given in subsequent sections.

A1. Scheduled Tribe Development Scheme

Petitioner’s submission

This scheme is being implemented for the benefit of the Scheduled Tribe population. Some of the planned works for the upcoming Control Period include conversion of O/H HT network to underground cabling, conversion of the HT network of Netravali 11 KV feeder which is traversing through the forest areas, new distribution transformer centers in the tribal dominated areas etc.

The benefits envisaged by the Petitioner from the scheme are as below:

- This scheme is mainly to facilitate the better power services for those areas where the tribal population accounts for 40% and above of the total population of that area. The Government has also classified different areas under Category A, Category B, and Category C, depending upon the tribal population of the area.
- This will facilitate the development of the area, which in turn will ensure the reliability of power supply to consumers of that area. The scheme is also mandatory in accordance with Govt. of India directives as per the constitutional mandate.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 44: Capital expenditure proposed by the Petitioner for Scheduled Tribe Development Scheme

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A1	Scheduled Tribe Development Scheme	35.00	35.00	35.00	105.00

Table 45: Capitalisation schedule proposed by the Petitioner for Scheduled Tribe Development Scheme

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A1	Scheduled Tribe Development Scheme	55.00	25.00	40.00	120.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order⁷ vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 46: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for Scheduled Tribe Development Scheme

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A1	Scheduled Tribe Development Scheme	-	45.00	45.00	23.51	9.99	35.00

Table 47: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for Scheduled Tribe Development Scheme

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A1	Scheduled Tribe Development Scheme	10.00	30.00	30.00	23.51	9.99	15.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order, and has only approved the balance capital expenditure and capitalisation for the upcoming Control Period.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 48: Capital expenditure approved by the Commission for Scheduled Tribe Development Scheme

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A1	Scheduled Tribe Development Scheme	21.50	0.00	0.00	21.50

Table 49: Capitalisation schedule approved by the Commission for Scheduled Tribe Development Scheme

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A1	Scheduled Tribe Development Scheme	21.50	0.00	0.00	21.50

⁷ Business Plan Order dated 22 December 2015

A2. Infrastructure development through Electricity Duty**Petitioner's submission**

The scheme wise break-up of capital expenditure and capitalisation submitted by the Petitioner for the upcoming Control Period is as given in the following tables:

Table 50: Scheme wise break-up of capital expenditure submitted by the Petitioner for Infrastructure development through Electricity Duty

Sl. No.	Name of the Scheme	Scheme Cost (INR Cr)	Proposed Capital expenditure (INR Cr)			
			FY 2019-20	FY 2020-21	FY 2021-22	Total
1	Conversion of overhead 11 KV HT network to Aerial Bunched Cabling in North and South Goa	145.51	50.00	-	-	50.00
2	Work of New 50 MVA, 220/33 KV transformer & associated works at 220KV receiving station at Ponda and erection of 220/33/11KV GIS Substation at Tuem & 220KV double circuit transmission line from PGCIL Colvale to Tuem Goa	180.00	90.00	40.00	-	130.00
3	Work of 2x10 MVA, 33/11KV (indoor type) sub-station at Badem & Mandrem	65.66	20.00	15.00	-	35.00
4	Design, Supply, installation, Testing and Commissioning of 33/11KV Gas insulated Substation 2x16/20MVA along with associated equipment at Patto Plaza Panaji	25.33	10.00	-	-	10.00
5	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment at Karaswado Mapusa.	9.77	5.00	-	-	5.00
6	Work of laying of underground 33KV double circuit 3Cx400 sq mm cable from Porvorim Substation to Saligao Substation.	7.43	3.00	-	-	3.00
7	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment's at Sal in the jurisdiction of V.P Sal in Bicholim	15.30	8.50	-	-	8.50
8	Work of conversion of existing O/H 11KV & LT line to U/G cabling system at Cacora Curchorem Municipal area in Curchorem constituency.	29.47	7.00	-	-	7.00
9	Work for conversion of 11KV and LT overhead lines to underground network in the left out parts of Margao Municipal areas in Margao & Fatorda	28.17	5.00	-	-	5.00
10	Work of erection of 33KV O/H line tapping from Mapusa II Circuit at Verla Canca to Nagoa Substation.	1.76	1.00	-	-	1.00
11	Work of S.E.T & C for replacement of 5 Nos of 110 KV SF6 Circuit breakers (MOCB) on the existing foundations with new gang operated spring.	1.40	0.20	-	-	0.20
12	Work of Development of V.P Ibrambur as Model Village under Sansad Adarsh Gram Yojana (SAGY)	1.00	0.10	-	-	0.10
13	Work of laying of 11 KV XLPE underground cable from Candolim church to Saipem village	1.61	-	-	-	0.00
14	Work of conversion of existing overhead 11KV line to underground system of feeders namely 11KV Torda, 11KV Housing Board, 11KV Pundalik Nagar feeder and associated LT network on transformer of said feeders and bifurcation of 11KV Torda feeder and Chogum road feeder emanating from 33/11KV Porvorim Sub-Station covering major portion	45.72	13.00	-	-	13.00

Sl. No.	Name of the Scheme	Scheme Cost (INR Cr)	Proposed Capital expenditure (INR Cr)			
			FY 2019-20	FY 2020-21	FY 2021-22	Total
	of Porvorim Plateau area in Porvorim constituency.					
15	Work of laying of 33KV S/C 3 core 400 Sq mm. XLPE underground cable from Naveli Amona 220/33KV Sub-substation to Marcel for a distance of 8.4kms	3.45	1.22	-	-	1.22
16	Work of linking of 33KV Velim, Canacona & MES DC feeder to 220/33KV Cuncolim Sub-Station.	3.02	2.00	-	-	2.00
17	Work of conversion of HT/LT overhead network to underground HT & LT network in Cuncolim Industrial Estate	10.80	3.00	-	-	3.00
18	Work of survey, design, supply, erection and commissioning of 3x63 MVA, 220/33 KV GIS Sub-Station at Saligao along with associated interconnecting 220 KV D/C line from 400/220 KV PGCIL Colvale Sub-Station to Saligao Sub-Station.	181.00	80.00	75.00	-	155.00
19	Work of conversion of existing overhead 11 KV feeders to underground system, erection of new DTCs, augmentation of DTC, erection of additional feeders, conversion single phase to three phase, replacement of conductor, providing guarding, DP renovation etc. under Section Office Saligao and Britona.	12.57	8.57	-	-	8.57
20	Work of providing 33 KV underground feeder from 110/33 KV Sub-Station to 33/11 KV Sub-Station at Nachinola.	12.42	8.42	-	-	8.42
21	Change of conductor of 110 KV Ponda -Verna and Ponda -Xeldem with higher current capacity HTLS conductor.	55.50	40.00	15.00	-	55.00
22	Change of conductor of 33 KV Verna Sancoale line with higher current carrying capacity HTLS conductor.	14.15	13.50	-	-	13.50
23	Work of conversion of overhead network to Underground cabling in the balance areas of Porvorim constituency (Phase II)	93.00	50.00	43.00	-	93.00
24	conversion of the overhead HT/LT network to underground cabling in the important town of Vasco, Navelim etc.	200.00	25.00	50.00	100.00	175.00
25	Erection of 33/11 Kv Sub-Stations at Navelim, Calangute, Colva.	100.00	25.00	60.00	15.00	100.00
26	Conversion of overhead HT network to Aerial Bunched Cabling (Phase II)	150.00	-	62.00	88.00	150.00
	TOTAL	1394.04	469.51	360.00	203.00	1032.51

Table 51: Scheme wise break-up of capitalisation submitted by the Petitioner for Infrastructure development through Electricity Duty

Sl. No.	Name of the Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
1	Conversion of overhead 11 KV HT network to Aerial Bunched Cabling in North and South Goa	45.00	-	-	45.00
2	Work of New 50 MVA, 220/33 KV transformer & associated works at 220KV receiving station at Ponda and erection of 220/33/11KV GIS Substation at Tuem & 220KV double circuit transmission line from PGCIL Colvale to Tuem Goa	-	150.00	-	150.00
3	Work of 2x10 MVA, 33/11KV (indoor type) sub-station at Badem & Mandrem	-	50.00	-	50.00

Sl. No.	Name of the Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
4	Design, Supply, installation, Testing and Commissioning of 33/11KV Gas insulated Substation 2x16/20MVA along with associated equipment at Patto Plaza Panaji	15.00	-	-	15.00
5	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment at Karaswado Mapusa.	10.00	-	-	10.00
6	Work of laying of underground 33KV double circuit 3Cx400 sq mm cable from Porvorim Substation to Saligao Substation.	8.00	-	-	8.00
7	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment's at Sal in the jurisdiction of V.P Sal in Bicholim	15.00	-	-	15.00
8	Work of conversion of existing O/H 11KV & LT line to U/G cabling system at Cacora Curchorem Municipal area in Curchorem constituency.	12.00	-	-	12.00
9	Work for conversion of 11KV and LT overhead lines to underground network in the left out parts of Margao Municipal areas in Margao & Fatorda	10.00	-	-	10.00
10	Work of erection of 33KV O/H line tapping from Mapusa II Circuit at Verla Canca to Nagoa Substation.	1.00	-	-	1.00
11	Work of S.E.T & C for replacement of 5 Nos of 110 KV SF6 Circuit breakers (MOCB) on the existing foundations with new gang operated spring.	-	-	-	0.00
12	Work of Development of V.P Ibrambur as Model Village under Sansad Adarsh Gram Yojana (SAGY)	-	-	-	0.00
13	Work of laying of 11 KV XLPE underground cable from Candolim church to Saipem village	-	-	-	0.00
14	Work of conversion of existing overhead 11KV line to underground system of feeders namely 11KV Torda, 11KV Housing Board, 11KV Pundalik Nagar feeder and associated LT network on transformer of said feeders and bifurcation of 11KV Torda feeder and Chogum road feeder emanating from 33/11KV Porvorim Sub-Station covering major portion of Porvorim Plateau area in Porvorim constituency.	18.00	-	-	18.00
15	Work of laying of 33KV S/C 3 core 400 sq mm. XLPE underground cable from Naveli Amona 220/33KV Sub-substation to Marcel for a distance of 8.4kms	3.00	-	-	3.00
16	Work of linking of 33KV Velim, Canacona & MES DC feeder to 220/33KV Cuncolim Sub-Station.	2.00	-	-	2.00
17	Work of conversion of HT/LT overhead network to underground HT & LT network in Cuncolim Industrial Estate	5.00	-	-	5.00
18	Work of survey, design, supply, erection and commissioning of 3x63 MVA, 220/33 KV GIS Sub-Station at Saligao along with associated interconnecting 220 KV D/C line from 400/220 KV PGCIL Colvale Sub-Station to Saligao Sub-Station.	-	-	120.00	120.00
19	Work of conversion of existing overhead 11 KV feeders to underground system, erection of new DTCs, augmentation of DTC, erection of additional feeders, conversion single phase to three phase, replacement of conductor, providing guarding, DP renovation etc. under Section Office Saligao and Britona.	11.00	-	-	11.00
20	Work of providing 33 KV underground feeder from 110/33 KV Sub-Station to 33/11 KV Sub-Station at Nachinola.	12.00	-	-	12.00

Sl. No.	Name of the Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
21	Change of conductor of 110 KV Ponda -Verna and Ponda -Xeldem with higher current capacity HTLS conductor.	35.00	15.00		50.00
22	Change of conductor of 33 KV Verna Sancoale line with higher current carrying capacity HTLS conductor.	8.00	-	-	8.00
23	Work of conversion of overhead network to Underground cabling in the balance areas of Porvorim constituency (Phase II)	20.00	29.00	30.00	79.00
24	conversion of the overhead HT/LT network to underground cabling in the important town of Vasco, Navelim etc.	20.00	50.00	100.00	170.00
25	Erection of 33/11 Kv Sub-Stations at Navelim, Calangute, Colva.	-	50.00	50.00	100.00
26	Conversion of overhead HT network to Aerial Bunched Cabling (Phase II)	-	50.00	100.00	150.00
	TOTAL	250.00	394.00	400.00	1044.00

The benefits envisaged by the Petitioner from the above schemes are as follows:

- The setting up of the 33 KV Sub-Stations at the load centers will enable the Petitioner to bifurcate the feeders, provide new feeders and thus be able to provide reliable and quality power supply.
- It will enable the Petitioner to release additional new loads, provide increase of loads of existing consumers.
- Underground cabling works will ensure reliability of the networks in the area chosen and also provide ring main system.
- The setting up of EHV Gas Insulated Sub-Stations at the load centers will enable the Petitioner to provide direct 33 KV link to the 33/11 KV Sub-stations in the vicinity which will drastically reduce the losses, enable to release additional loads from the 33 KV Sub-Stations, and also to avoid load shedding during peak hours. The Sub-Station will provide for industrial development in the region and generate employment opportunities in the region. The Sub-stations at Tuem and Saligao will also result in reduction of loading at Tivim Sub-Station, which will in turn be able to take care of the loads of the other areas.
- The change of conductor with higher capacity conductor will enable higher transfer of power from these lines thus aiding additional loads to be released and also ensuring reliability of power supply.

Commission's analysis

The Commission, based on its overall approach, has compared capital expenditure and capitalisation proposed by the Petitioner with DPRs submitted by the Petitioner along with the Business Plan petition and replies to Deficiency Notes. If the Petitioner has failed to submit the DPRs / Technical Clearance letters from CEA for any of the proposed scheme for the upcoming Control Period or the submitted proofs/details are missing the required information, the Commission has not approved any of the capital expenditure and capitalisation proposed for the said scheme.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 52: Capital expenditure approved by the Commission for Infrastructure development through Electricity Duty

Sl. No.	Name of the Scheme	DPR Submitted (Y / N)	Scheme Cost in DPR (INR Cr)	Approved Capital expenditure (INR Cr)			
				FY 2019-20	FY 2020-21	FY 2021-22	Total
1	Conversion of overhead 11 KV HT network to Aerial Bunched Cabling in North and South Goa	N	N/A	-	-	-	0.00
2	Work of New 50 MVA, 220/33 KV transformer & associated works at 220KV receiving station at Ponda and erection of 220/33/11KV GIS Substation at Tuem & 220KV double circuit transmission line from PGCIL Colvale to Tuem Goa	Y	122.27	90.00	32.27	-	122.27
3	Work of 2x10 MVA, 33/11KV (indoor type) sub-station at Badem & Mandrem	N	N/A	-	-	-	0.00
4	Design, Supply, installation, Testing and Commissioning of 33/11KV Gas insulated Substation 2x16/20MVA along with associated equipment at Patto Plaza Panaji	Y	25.33	10.00	-	-	10.00
5	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment at Karaswado Mapusa.	Y	9.77	5.00	-	-	5.00
6	Work of laying of underground 33KV double circuit 3Cx400 sq mm cable from Porvorim Substation to Saligao Substation.	Y	8.97	3.00	-	-	3.00
7	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment's at Sal in the jurisdiction of V.P Sal in Bicholim	Y	15.75	8.50	-	-	8.50
8	Work of conversion of existing O/H 11KV & LT line to U/G cabling system at Cacora Curchorem Municipal area in Curchorem constituency.	Y	29.47	7.00	-	-	7.00
9	Work for conversion of 11KV and LT overhead lines to underground network in the left out parts of Margao Municipal areas in Margao & Fatorda	N	N/A	-	-	-	0.00
10	Work of erection of 33KV O/H line tapping from Mapusa II Circuit at Verla Canca to Nagoa Substation.	Y	1.37	1.00	-	-	1.00
11	Work of S.E.T & C for replacement of 5 Nos of 110 KV SF6 Circuit breakers (MOCB) on the existing foundations with new gang operated spring.	Y	1.46	0.20	-	-	0.20
12	Work of Development of V.P Ibrambur as Model Village under Sansad Adarsh Gram Yojana (SAGY)	N	N/A	-	-	-	0.00
13	Work of laying of 11 KV XLPE underground cable from Candolim church to Saipem village	Y	1.98	-	-	-	0.00
14	Work of conversion of existing overhead 11KV line to underground system of feeders namely 11KV Torda, 11KV Housing Board, 11KV Pundalik Nagar feeder and associated LT network on transformer of said feeders and	Y	45.72	13.00	-	-	13.00

Sl. No.	Name of the Scheme	DPR Submitted (Y / N)	Scheme Cost in DPR (INR Cr)	Approved Capital expenditure (INR Cr)			
				FY 2019-20	FY 2020-21	FY 2021-22	Total
	bifurcation of 11KV Torda feeder and Chogum road feeder emanating from 33/11KV Porvorim Sub-Station covering major portion of Porvorim Plateau area in Porvorim constituency.						
15	Work of laying of 33KV S/C 3 core 400 Sq mm. XLPE underground cable from Naveli Amona 220/33KV Sub-station to Marcel for a distance of 8.4kms	Y	4.78	1.22	-	-	1.22
16	Work of linking of 33KV Velim, Canacona & MES DC feeder to 220/33KV Cuncolim Sub-Station.	Y	3.08	2.00	-	-	2.00
17	Work of conversion of HT/LT overhead network to underground HT & LT network in Cuncolim Industrial Estate	Y	12.73	3.00	-	-	3.00
18	Work of survey, design, supply, erection and commissioning of 3x63 MVA, 220/33 KV GIS Sub-Station at Saligao along with associated interconnecting 220 KV D/C line from 400/220 KV PGCIL Colvale Sub-Station to Saligao Sub-Station.	Y	181.29	80.00	75.00		155.00
19	Work of conversion of existing overhead 11 KV feeders to underground system, erection of new DTCs, augmentation of DTC, erection of additional feeders, conversion single phase to three phase, replacement of conductor, providing guarding, DP renovation etc. under Section Office Saligao and Britona.	Y	13.44	8.57	-	-	8.57
20	Work of providing 33 KV underground feeder from 110/33 KV Sub-Station to 33/11 KV Sub-Station at Nachinola.	Y	12.43	8.42	-	-	8.42
21	Change of conductor of 110 KV Ponda -Verna and Ponda -Xeldem with higher current capacity HTLS conductor.	Y	Not specified	40.00	15.00		55.00
22	Change of conductor of 33 KV Verna Sancoale line with higher current carrying capacity HTLS conductor.	Y	165.96 (Breakup not provided)	13.50	-	-	13.50
23	Work of conversion of overhead network to Underground cabling in the balance areas of Porvorim constituency (Phase II)	N	N/A	-	-	-	0.00
24	Conversion of the overhead HT/LT network to underground cabling in the important town of Vasco, Navelim etc.	N	N/A	-	-	-	0.00
25	Erection of 33/11 Kv Sub-Stations at Navelim, Calangute, Colva.	N	N/A	-	-	-	0.00
26	Conversion of overhead HT network to Aerial Bunched Cabling (Phase II)	N	N/A	-	-	-	0.00
	TOTAL			294.41	122.27	0.00	416.68

Table 53: Capitalisation approved by the Commission for Infrastructure development through Electricity Duty

Sl. No.	Name of the Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
1	Conversion of overhead 11 KV HT network to Aerial Bunched Cabling in North and South Goa	-	-	-	0.00
2	Work of New 50 MVA, 220/33 KV transformer & associated works at 220KV receiving station at Ponda and erection of 220/33/11KV GIS Substation at Tuem & 220KV double circuit transmission line from PGCIL Colvale to Tuem Goa	-	122.27	-	122.27
3	Work of 2x10 MVA, 33/11KV (indoor type) sub-station at Badem & Mandrem	-	-	-	0.00
4	Design, Supply, installation, Testing and Commissioning of 33/11KV Gas insulated Substation 2x16/20MVA along with associated equipment at Patto Plaza Panaji	15.00	-	-	15.00
5	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment at Karaswado Mapusa.	9.77	-	-	9.77
6	Work of laying of underground 33KV double circuit 3Cx400 sq mm cable from Porvorim Substation to Saligao Substation.	7.43	-	-	7.43
7	Work of 2x10MVA, 33/11KV Indoor type substation along with associated equipment's at Sal in the jurisdiction of V.P Sal in Bicholim	15.00	-	-	15.00
8	Work of conversion of existing O/H 11KV & LT line to U/G cabling system at Cacora Curchorem Municipal area in Curchorem constituency.	12.00	-	-	12.00
9	Work for conversion of 11KV and LT overhead lines to underground network in the left out parts of Margao Municipal areas in Margao & Fatorda	-	-	-	0.00
10	Work of erection of 33KV O/H line tapping from Mapusa II Circuit at Verla Canca to Nagoa Substation.	1.00	-	-	1.00
11	Work of S.E.T & C for replacement of 5 Nos of 110 KV SF6 Circuit breakers (MOCB) on the existing foundations with new gang operated spring.	0.00	-	-	0.00
12	Work of Development of V.P Ibrambur as Model Village under Sansad Adarsh Gram Yojana (SAGY)	-	-	-	0.00
13	Work of laying of 11 KV XLPE underground cable from Candolim church to Saipem village	-	-	-	0.00
14	Work of conversion of existing overhead 11KV line to underground system of feeders namely 11KV Torda, 11KV Housing Board, 11KV Pundalik Nagar feeder and associated LT network on transformer of said feeders and bifurcation of 11KV Torda feeder and Chogum road feeder emanating from 33/11KV Porvorim Sub-Station covering major portion of Porvorim Plateau area in Porvorim constituency.	18.00	-	-	18.00
15	Work of laying of 33KV S/C 3 core 400 Sq mm. XLPE underground cable from Naveli Amona 220/33KV Sub-substation to Marcel for a distance of 8.4kms	3.00	-	-	3.00
16	Work of linking of 33KV Velim, Canacona & MES DC feeder to 220/33KV Cuncolim Sub-Station.	2.00	-	-	2.00

Sl. No.	Name of the Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
17	Work of conversion of HT/LT overhead network to underground HT < network in Cuncolim Industrial Estate	5.00	-	-	5.00
18	Work of survey, design, supply, erection and commissioning of 3x63 MVA, 220/33 KV GIS Sub-Station at Saligao along with associated interconnecting 220 KV D/C line from 400/220 KV PGCIL Colvale Sub-Station to Saligao Sub-Station.	-	-	120.00	120.00
19	Work of conversion of existing overhead 11 KV feeders to underground system, erection of new DTCs, augmentation of DTC, erection of additional feeders, conversion single phase to three phase, replacement of conductor, providing guarding, DP renovation etc. under Section Office Saligao and Britona.	11.00	-	-	11.00
20	Work of providing 33 KV underground feeder from 110/33 KV Sub-Station to 33/11 KV Sub-Station at Nachinola.	12.00	-	-	12.00
21	Change of conductor of 110 KV Ponda -Verna and Ponda -Xeldem with higher current capacity HTLS conductor.	35.00	15.00	-	50.00
22	Change of conductor of 33 KV Verna Sancoale line with higher current carrying capacity HTLS conductor.	8.00	-	-	8.00
23	Work of conversion of overhead network to Underground cabling in the balance areas of Porvorim constituency (Phase II)	-	-	-	0.00
24	Conversion of the overhead HT/LT network to underground cabling in the important town of Vasco, Navelim etc.	-	-	-	0.00
25	Erection of 33/11 Kv Sub-Stations at Navelim, Calangute, Colva.	-	-	-	0.00
26	Conversion of overhead HT network to Aerial Bunched Cabling (Phase II)	-	-	-	0.00
	TOTAL	154.20	137.27	120.00	411.47

A3. Erection and Augmentation of 33/11 KV S/S line

Petitioner's submission

As part of this scheme, erection of new Substations at Balli and Dhabal, along with the erection of the 33 KV lines is planned to be undertaken.

The benefits envisaged by the Petitioner from the scheme are as below:

- Initially, the power supply to the consumers in above areas was fed power from other sub-stations & lines which were far away. The length of the feeders was too long resulting in increase in losses and frequent interruptions. These schemes are mainly meant for reliability of power supply, bifurcation of feeder length, thereby resulting in reduction in interruptions, improvement in reliability, better voltage profile and loss reduction.
- Such schemes will also ensure that ED – Goa complies with Standard of Performance as laid down by the Hon'ble Commission and compliance to the provisions of Electricity Act 2003.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 54: Capital expenditure proposed by the Petitioner for Erection and Augmentation of 33/11 KV S/S line

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A3	Erection and Augmentation of 33/11 KV S/S line	10.00	10.00	10.00	30.00

Table 55: Capitalisation schedule proposed by the Petitioner for Erection and Augmentation of 33/11 KV S/S line

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A3	Erection and Augmentation of 33/11 KV S/S line	-	20.00	10.00	30.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 56: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for Erection and Augmentation of 33/11 KV S/S line

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A3	Erection and Augmentation of 33/11 KV S/S line	1.00	1.00	1.00	0.62	0.01	1.00

Table 57: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for Erection and Augmentation of 33/11 KV S/S line

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A3	Erection and Augmentation of 33/11 KV S/S line	2.50	1.00	1.00	-	0.01	1.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order, and has only approved the balance capital expenditure and capitalisation for the upcoming Control Period.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 58: Capital expenditure approved by the Commission for Erection and Augmentation of 33/11 KV S/S line

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A3	Erection and Augmentation of 33/11 KV S/S line	1.37	-	-	1.37

Table 59: Capitalisation schedule approved by the Commission for Erection and Augmentation of 33/11 KV S/S line

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A3	Erection and Augmentation of 33/11 KV S/S line	3.49	-	-	3.49

A4. Normal Development Schemes**Petitioner's submission**

The summary of works being implemented as part of this scheme are as follows:

1. Extension of 33 KV, 11 KV and LT lines for arranging power supply to individual and group of consumers
2. Erection of Transformer centres, metering structure, equipment for releasing of power supply to the intending consumers
3. Releasing of power supply and providing of metering to the intending consumers at different voltage levels.

The benefits envisaged by the Petitioner from the scheme are as follows:

- Normal Development Schemes are generally undertaken for new consumers; releasing supply connections to them, and thereby increasing the sales and in turn revenue generation.
- In order to ensure timely connection release to the new intending consumers, ED – Goa undertakes such schemes so that power supply can be commenced without any delay and ensuring customer satisfaction. Such schemes will also ensure that ED – Goa complies with Standard of Performance as laid down by the Hon'ble Commission and compliance to the provisions of Electricity Act 2003.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 60: Capital expenditure proposed by the Petitioner for Normal Development Schemes

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A4	Normal Development Schemes	15.00	15.00	15.00	45.00

Table 61: Capitalisation schedule proposed by the Petitioner for Normal Development Schemes

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A4	Normal Development Schemes	15.00	15.00	15.00	45.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 62: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for Normal Development Schemes

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A4	Normal Development Schemes	18.00	20.00	20.00	8.78	5.60	14.00

Table 63: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for Normal Development Schemes

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A4	Normal Development Schemes	18.00	20.00	20.00	8.78	5.60	14.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order, and has only approved the balance capital expenditure and capitalisation for the upcoming Control Period.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 64: Capital expenditure approved by the Commission for Normal Development Schemes

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A4	Normal Development Schemes	15.00	14.62	-	29.62

Table 65: Capitalisation schedule approved by the Commission for Normal Development Schemes

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A4	Normal Development Schemes	15.00	14.62	-	29.62

A5. System Improvement Schemes

Petitioner's submission

This improvement / renovation scheme is being implemented for the change of conductors, cross arms, insulators, metal parts & stay sets, etc. It also includes the conversion of LT line from 1 phase to 3 phase for improving the voltage profile, thereby enhancing the capacities of the distribution transformer centres and providing new transformer centres at load centre.

The benefits envisaged by the Petitioner from the scheme are as follows:

- To improve voltage at the tail end of each distribution system.
- Better power transformation.
- Line losses reduction.
- Less electrical accidents and breakdowns.

- Avoiding overloading of transformers and lines.
- Meet the standards of Performance laid down by the Hon'ble Commission.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 66: Capital expenditure proposed by the Petitioner for System Improvement Schemes

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A5	System Improvement Schemes	15.00	12.00	12.00	39.00

Table 67: Capitalisation schedule proposed by the Petitioner for System Improvement Schemes

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A5	System Improvement Schemes	13.00	10.00	15.00	38.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 68: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for System Improvement Schemes

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A5	System Improvement Schemes	2.00	2.00	2.00	1.73	4.27	18.00

Table 69: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for System Improvement Schemes

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A5	System Improvement Schemes	1.00	2.00	1.00	1.73	4.27	15.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order. Accordingly, it has not approved any capital expenditure and capitalisation for the upcoming Control Period, as the Petitioner's achievement of the same is more than that of the approved figures.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 70: Capital expenditure approved by the Commission for System Improvement Schemes

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A5	System Improvement Schemes	0.00	0.00	0.00	0.00

Table 71: Capitalisation schedule approved by the Commission for System Improvement Schemes

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A5	System Improvement Schemes	0.00	0.00	0.00	0.00

A6. Construction of staff quarters and office buildings**Petitioner's submission**

As part of this scheme, the new office building at Bicholim will be taken up and completed, apart from carrying out major renovation works of the staff quarters.

The benefits envisaged by the Petitioner from the scheme are as follows:

- New office buildings are proposed so that the different offices of a Division are housed in a single building which otherwise would often be housed in other rented places.
- Construction/Repairs of Staff Quarters and Office Buildings is to facilitate the availability of staff within premises of the Head Quarters for immediate reporting to duty in case of emergencies. Often such offices/quarters are constructed near the Sub-stations.
- Major capital maintenance works of staff quarters improves the living conditions of the employees.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 72: Capital expenditure proposed by the Petitioner for Construction of staff quarters and office buildings

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A6	Construction of staff quarters and office buildings	2.00	2.00	5.00	9.00

Table 73: Capitalisation schedule proposed by the Petitioner for Construction of staff quarters and office buildings

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A6	Construction of staff quarters and office buildings	1.50	1.50	4.00	7.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 74: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for Construction of staff quarters and office buildings

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A6	Construction of staff quarters and office buildings	2.00	2.00	2.00	0.52	0.24	2.00

Table 75: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for Construction of staff quarters and office buildings

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A6	Construction of staff quarters and office buildings	2.00	2.50	1.00	0.52	0.24	2.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order, and has only approved the balance capital expenditure and capitalisation for the upcoming Control Period.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 76: Capital expenditure approved by the Commission for Construction of staff quarters and office buildings

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A6	Construction of staff quarters and office buildings	2.00	1.24	0.00	3.24

Table 77: Capitalisation schedule approved by the Commission for Construction of staff quarters and office buildings

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A6	Construction of staff quarters and office buildings	1.50	1.24	0.00	2.74

A7. Strengthening of 220 KV Transmission Network

Petitioner's submission

As part of this scheme, multiple works are being executed for strengthening of the transmission network and provide additional power transformation capacities at the EHV Sub-Stations, including the work of replacement of the 40 MVA power transformer with 50 MVA power transformer at Tivim 110/33 KV Sub-Station.

The benefits envisaged by the Petitioner from the scheme are as follows:

- Ensuring stable operation of the EHV Sub-Station by being self reliant in transformation capacities.
- Releasing additional loads due to the additional transformation capacity available.
- Protection audit helps the EHV Sub-Stations to operate in healthy conditions by taking corrective measures.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 78: Capital expenditure proposed by the Petitioner for Strengthening of 220 KV Transmission Network

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A7	Strengthening of 220 KV Transmission Network	6.00	1.00	1.00	8.00

Table 79: Capitalisation schedule proposed by the Petitioner for Strengthening of 220 KV Transmission Network

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A7	Strengthening of 220 KV Transmission Network	6.00	1.00	1.00	8.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 80: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for Strengthening of 220 KV Transmission Network

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A7	Strengthening of 220 KV Transmission Network	1.00	-	-	0.65	0.41	1.00

Table 81: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for Strengthening of 220 KV Transmission Network

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A7	Strengthening of 220 KV Transmission Network	1.00	-	-	0.65	0.41	1.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order. Accordingly, it has not approved any capital expenditure and capitalisation for the upcoming Control Period, as the Petitioner's achievement of the same is more than that of the approved figures.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 82: Capital expenditure approved by the Commission for Strengthening of 220 KV Transmission Network

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A7	Strengthening of 220 KV Transmission Network	0.00	0.00	0.00	0.00

Table 83: Capitalisation schedule approved by the Commission for Strengthening of 220 KV Transmission Network

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A7	Strengthening of 220 KV Transmission Network	0.00	0.00	0.00	0.00

A8. Erection of 220/110/33/11 KV Sub-Station at Verna (New)**Petitioner's submission**

The benefits envisaged by the Petitioner from the scheme are as follows:

- Quality, reliable and uninterrupted power can be fed to MPT, Dabolim Airport, Vasco, Sancoale etc.
- Laying of 33 KV dedicated feeder to the HT consumers in the vicinity of Verna Industrial Estate will also be feasible after the commissioning of this sub-station.
- Load shedding on the various consumers including industrial feeder will be eliminated thereby reducing outage time of power supply. The un-interrupted power supply to the various HT consumers will result in boosting revenue of the Department.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 84: Capital expenditure proposed by the Petitioner for Erection of 220/110/33/11 KV Sub-Station at Verna (New)

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	100.00	130.00	-	230.00

Table 85: Capitalisation schedule proposed by the Petitioner for Erection of 220/110/33/11 KV Sub-Station at Verna (New)

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	-	235.00	-	235.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 86: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for Erection of 220/110/33/11 KV Sub-Station at Verna (New)

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	40.00	30.00	11.00	-	-	5.00

Table 87: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for Erection of 220/110/33/11 KV Sub-Station at Verna (New)

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	-	79.00	11.00	-	-	-

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order, and has only approved the balance capital expenditure and capitalisation for the upcoming Control Period.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 88: Capital expenditure approved by the Commission for Erection of 220/110/33/11 KV Sub-Station at Verna (New)

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	76.00	-	-	76.00

Table 89: Capitalisation schedule approved by the Commission for Erection of 220/110/33/11 KV Sub-Station at Verna (New)

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	90.00	-	-	90.00

A9. R-APDRP Part A

Petitioner's submission

The benefits envisaged by the Petitioner from the scheme are as follows:

- Actual demonstrable performance in loss reduction
- Establishment of reliable and automated systems for sustained collection of accurate base line Data
- Adoption of information Technology in the areas of Accounting and auditing which will enable objective evaluation of the programme of utility before and after Implementation of the programme.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 90: Capital expenditure proposed by the Petitioner for R-APDRP Part A

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A9	R-APDRP Part A	8.00	8.00	8.00	24.00

Table 91: Capitalisation schedule proposed by the Petitioner for R-APDRP Part A

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A9	R-APDRP Part A	8.00	8.00	8.00	24.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 92: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for R-APDRP Part A

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A9	R-APDRP Part A	34.57	-	-	42.43	46.87	16.00

Table 93: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for R-APDRP Part A

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A9	R-APDRP Part A	34.57	-	-	42.43	46.87	16.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order. Accordingly, it has not approved any capital expenditure and capitalisation for the upcoming Control Period, as the Petitioner's achievement of the same is more than that of the approved figures.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 94: Capital expenditure approved by the Commission for R-APDRP Part A

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A9	R-APDRP Part A	0.00	0.00	0.00	0.00

Table 95: Capitalisation schedule approved by the Commission for R-APDRP Part A

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A9	R-APDRP Part A	0.00	0.00	0.00	0.00

A10. Underground Cabling**Petitioner's submission**

The benefits envisaged by the Petitioner from the scheme are as follows:

- Reduction in Interruption due to Ring Main System/UG system.
- Improvement in Revenue due to less outage time.
- Stability in power Supply and better catering of load demand.
- Improvement in voltage level/ loss reduction.
- Reduction in complaints from Consumers.
- Meeting the SOP.
- Consumer satisfaction due to improved quality of power supply.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 96: Capital expenditure proposed by the Petitioner for Underground Cabling

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A10	Underground Cabling	50.00	50.00	100.00	200.00

Table 97: Capitalisation schedule proposed by the Petitioner for Underground Cabling

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A10	Underground Cabling	50.00	50.00	100.00	200.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 98: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for Underground Cabling

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A10	Underground Cabling	4.48	9.04	100.00	0.86	0.36	20.00

Table 99: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for Underground Cabling

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A10	Underground Cabling	4.48	9.04	50.00	0.86	0.36	20.00

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business

Plan Order, and has only approved the balance capital expenditure and capitalisation for the upcoming Control Period.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 100: Capital expenditure approved by the Commission for Underground Cabling

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A10	Underground Cabling	50.00	42.30	0.00	92.30

Table 101: Capitalisation schedule approved by the Commission for Underground Cabling

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A10	Underground Cabling	42.30	0.00	0.00	42.30

A11. R-APDRP Part B / IPDS

Petitioner's submission

The benefits envisaged by the Petitioner from the scheme are as follows:

- Actual demonstrable performance in loss reduction
- Establishment of reliable and automated systems for sustained collection of accurate base line Data
- Adoption of information Technology in the areas of Accounting and auditing which will enable objective evaluation of the programme of utility before and after Implementation of the programme.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 102: Capital expenditure proposed by the Petitioner for R-APDRP Part B / IPDS

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A11	R-APDRP Part B / IPDS	115.00	150.00	200.00	465.00

Table 103: Capitalisation schedule proposed by the Petitioner for R-APDRP Part B / IPDS

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A11	R-APDRP Part B / IPDS	115.00	150.00	200.00	465.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 104: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for R-APDRP Part B / IPDS

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A11	R-APDRP Part B / IPDS	300.00	500.00	443.99	0.55	0.87	35.00

Table 105: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for R-APDRP Part B / IPDS

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A11	R-APDRP Part B / IPDS	0.00	0.00	0.00	0.00	0.00	35.00

The Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order, and has approved the Petitioner's proposed capital expenditure, as the balance capital expenditure is less than that of the proposed capital expenditure. In respect of capitalisation, the Commission notes that no capitalisation was approved from FY 2016-17 to FY 2018-19. However, in view of Commission's approval of the proposed capital expenditure, the Commission has approved the capitalisation schedule proposed by the Petitioner.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 106: Capital expenditure approved by the Commission for R-APDRP Part B / IPDS

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A11	R-APDRP Part B / IPDS	115.00	150.00	200.00	465.00

Table 107: Capitalisation schedule approved by the Commission for R-APDRP Part B / IPDS

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A11	R-APDRP Part B / IPDS	115.00	150.00	200.00	465.00

A12. EHV new Transmission / Sub-Station / Capacitor banks schemes

Petitioner's submission

The benefits envisaged by the Petitioner from the scheme are as follows:

- Increase in power transfer through change of conductors of existing EHV transmission lines
- Increase in transformation capacity at the EHV Sub-Stations thus enabling additional loads.
- Providing capacitor banks at the Sub-Stations wherever necessary, will result in better voltage profile.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 108: Capital expenditure proposed by the Petitioner for EHV new Transmission / Sub-Station / Capacitor banks schemes

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	-	-	25.00	25.00

Table 109: Capitalisation schedule proposed by the Petitioner for EHV new Transmission / Sub-Station / Capacitor banks schemes

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	-	-	25.00	25.00

Commission's analysis

The capital expenditure and capitalisation approved by the Commission for the above scheme in its previous Business Plan Order vis-à-vis the actual capital expenditure and capitalisation achieved by the Petitioner is as given in the following tables:

Table 110: Capital expenditure achieved by the Petitioner vis-à-vis approved by the Commission for EHV new Transmission / Sub-Station / Capacitor banks schemes

Sl. No.	Name of Scheme	Capital Expenditure (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	12.00	438.00	300.00	30.74	2.49	0.16

Table 111: Capitalisation achieved by the Petitioner vis-à-vis approved by the Commission for EHV new Transmission / Sub-Station / Capacitor banks schemes

Sl. No.	Name of Scheme	Capitalisation (INR Cr)					
		Approved			Achieved (Actual (A) / Revised Estimate (RE))		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17 (A)	FY 2017-18 (A)	FY 2018-19 (RE)
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	12.00	300.00	438.00	30.74	2.49	0.16

The Commission observes that the Petitioner has not provided the approval/ DPRs for the additional capital expenditure. In view of the above, the Commission, based on its overall approach, has compared the actual capital expenditure and capitalisation with the approved capital expenditure and capitalisation in its previous Business Plan Order. Accordingly, it has approved the Petitioner's proposed capital expenditure and capitalisation, as the balance capital expenditure and capitalisation is less than the proposed.

The summary of capital expenditure and capitalisation approved for the upcoming Control Period is given in the following tables:

Table 112: Capital expenditure approved by the Commission for Underground Cabling

Sl. No.	Name of Scheme	Approved Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	-	-	25.00	25.00

Table 113: Capitalisation schedule approved by the Commission for Underground Cabling

Sl. No.	Name of Scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	-	-	25.00	25.00

B1. Smart grid Development of existing network**Petitioner's submission**

The Petitioner wants to have in place a Smart grid network so as to be able to control the peak hour power situations. In line with this objective, it has proposed to take up implementation of Smart grid as a pilot project initially, and then after weighing the pros and cons, further implementation on a larger scale.

Further, Advanced Metering Infrastructure (AMI) is planned to be installed for all categories of customers to improve visualization of energy consumption and power quality management at customer level and facilitate peak load management through demand side management / demand response.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 114: Capital expenditure proposed by the Petitioner for Smart grid Development of existing network

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
B1	Smart grid Development of existing network	30.00	40.00	50.00	120.00

Table 115: Capitalisation schedule proposed by the Petitioner for Smart grid Development of existing network

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
B1	Smart grid Development of existing network	30.00	40.00	50.00	120.00

Commission's analysis

The Commission notes that the Petitioner has failed to submit the DPRs for the above schemes. Based on the Commission's overall approach, if the Petitioner has failed to submit the DPRs / Work orders for any scheme, the Commission has not approved any of the capital expenditure and capitalisation proposed for the said schemes. Therefore, the Commission cannot proceed with the approval for the said scheme without DPR/ additional details.

B2. Sub-transmission and distribution improvement scheme**Petitioner's submission**

The Petitioner wants to automate its distribution network since this is the core sector, which has a direct interface with the consumers. The entire focus shall be two-dimensional:

- Analysis based investment plan for strengthening of network, for which new sub-stations / lines / interconnectors / reconductoring, transformer augmentation / addition, revamping of Sub-Stations, High voltage distribution system, load balancing/feeder segregation, HT/LT Aerial bunched cables, capacitor banks/reactors at 11 KV and 33 KV, Laying of Under Ground cables in densely populated areas, have been planned.
- Quantum jump in reliability, for which plans are afoot to have Grid Sub-Station automation and integration with SCADA, Strategic distribution RMU, FPI and Integration with DMS, Outage

management system and integration with GIS and CRM, provisioning compatibility with SMART technologies etc.

The capital expenditure and capitalisation schedule proposed by the Petitioner for the above scheme is as given in the following tables:

Table 116: Capital expenditure proposed by the Petitioner for Sub-transmission and distribution improvement scheme

Sl. No.	Name of Scheme	Proposed Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
B2	Sub-transmission and distribution improvement scheme	100.00	150.00	300.00	550.00

Table 117: Capitalisation schedule proposed by the Petitioner for Sub-transmission and distribution improvement scheme

Sl. No.	Name of Scheme	Proposed Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
B2	Sub-transmission and distribution improvement scheme	100.00	150.00	300.00	550.00

Commission's analysis

The Commission notes that the Petitioner has failed to submit the DPRs for the above schemes. Based on the Commission's overall approach, if the Petitioner has failed to submit the DPRs / Work orders for any scheme, the Commission has not approved any of the capital expenditure and capitalisation proposed for the said schemes. Therefore, the Commission cannot proceed with the approval for the said scheme without DPR/ additional details.

Summary of capital expenditure approved by the Commission

The summary of capital expenditure approved by the Commission for the upcoming Control Period is given in the following table:

Table 118: Summary of capital expenditure approved by the Commission for the upcoming MYT Control Period

Sl. No.	Name of scheme	Approved Capital Expenditure (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
Existing Schemes					
A1	Scheduled Tribe Development Scheme (P)	21.50	0.00	0.00	21.50
A2	Infrastructure development through Electricity Duty (Plan)	294.41	122.27	0.00	416.68
A3	Erection and Augmentation of 33/11 KV S/S line (Plan)	1.37	-	-	1.37
A4	Normal Development Schemes (Plan)	15.00	14.62	-	29.62
A6	Construction of staff quarters and office buildings (Plan)	2.00	1.24	0.00	3.24
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	76.00	-	-	76.00
A10	Underground Cabling	50.00	42.30	0.00	92.30
A11	R-APDRP Part B / IPDS	115.00	150.00	200.00	465.00
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	-	-	25.00	25.00
	Total	575.28	330.43	225.00	1130.71

Therefore, the Commission approves a total capital expenditure of INR 1130.71 Cr for the upcoming Control Period.

Summary of capitalisation approved by the Commission

The summary of capitalisation approved by the Commission for the upcoming Control Period is given in the following table:

Table 119: Summary of capitalisation approved by the Commission for the upcoming Control Period

Sl. No.	Name of scheme	Approved Capitalisation (INR Cr)			
		FY 2019-20	FY 2020-21	FY 2021-22	Total
Existing Schemes					
A1	Scheduled Tribe Development Scheme (P)	21.50	0.00	0.00	21.50
A2	Infrastructure development through Electricity Duty (Plan)	154.20	137.27	120.00	411.47
A3	Erection and Augmentation of 33/11 KV S/S line (Plan)	3.49	-	-	3.49
A4	Normal Development Schemes (Plan)	15.00	14.62	-	29.62
A6	Construction of staff quarters and office buildings (Plan)	1.50	1.24	0.00	2.74
A8	Erection of 220/110/33/11 KV Sub-Station at Verna (New)	90.00	-	-	90.00
A10	Underground Cabling	42.30	0.00	0.00	42.30
A11	R-APDRP Part B / IPDS	115.00	150.00	200.00	465.00
A12	EHV new Transmission / Sub-Station / Capacitor banks schemes	-	-	25.00	25.00
	Total	442.99	303.13	345.00	1091.12

Therefore, the Commission approves a total capitalisation of INR 1091.12 Cr for the upcoming Control Period.

The Commission, in line with the overall approach, has not approved schemes for which the Petitioner did not furnish DPRs / technical sanctions. However, the Commission may make some exceptions, subject to Petitioner furnishing documents within 30 days of this Order, to enable it to pass on the impact of the same in the Multi Year Tariff Order.

3.5.2 Funding Plan

Petitioner's submission

The Petitioner has submitted that all the Capital expenditure schemes proposed for the upcoming Control Period is to be provided through ED-Goa /Govt. equity infusion, except for the following:

- **Infrastructure development through Electricity Duty (Plan):** 100% funding through Electricity Duty Fund
- **R-APDRP Part B / IPDS:** 75% funding through Grant and 25% funding through equity infusion

Commission's analysis

The Petitioner can only consider equity up to 30% of the capital cost and the balance in excess of 30% shall be treated as normative debt as per Clause 26.2 of the JERC MYT Regulations:

“Provided also that if the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as a normative loan for the Licensee for determination of tariff.”

Further, the Commission observes that the Petitioner may be availing grants, which shall be appropriately factored in as per Clause 25.4 of the JERC MYT Regulations as follows:

“the debt to equity ratio shall be considered in accordance with Regulation 26, after deducting the amount of financial support provided through consumer contribution, deposit work, capital subsidy or grant;”

Based on the analysis of proposed funding for each of the schemes, the approved funding plan is given in the following table:

Table 120: Approved funding plan for the upcoming Control Period

Sr. No.	Sources of Funds (INR Cr)	FY 2019-20	FY 2020-21	FY 2021-22	Total
A	Total Capital Expenditure	575.28	330.43	225.00	1130.71
B	Electricity Duty Fund	294.41	122.27	0.00	416.68
C	Grant	86.25	112.5	150	348.75
D	Total Capital Expenditure (excluding Electricity Duty Fund and Grant) (A-B-C)	194.62	95.66	75.00	365.28
E	Debt (%)	70%	70%	70%	70%
F	Equity (%)	30%	30%	30%	30%
G	Normative Debt (D x E)	136.23	66.96	52.50	255.69
H	Equity (INR Cr) (D x F)	58.39	28.70	22.50	109.59

3.6 Manpower Plan

Petitioner's submission

The petitioner has proposed the following manpower plan for the upcoming Control Period:

Table 121: Manpower plan submitted by the Petitioner for the upcoming Control Period

Sr. No.	Particulars	Actuals				Projections			
		FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19 (H1)	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
1	Number of employees as on 1st April	5,845	5,769	6,566	6,601	6,519	6,373	6,241	6,100
2	No. Employees on contract/deputation/ foreign service as on 1st April	716	603	594	594	594	594	594	594
3	Total number of employees (1+2)	6,561	6,372	7,160	7,195	7,113	6,967	6,835	6,694
4	Number of employees retired/ retiring during the year	171	122	128	82	146	132	141	157
5	No. Employees on contract/deputation/ foreign service retiring/removed	113	9	-	-	-	-	-	-
6	Recruitment	95	919	163	-	-	-	-	-
7	Number of employees at the end of the year (1-4+5+6)	5,769	6,566	6,601	6,519	6,373	6,241	6,100	5,943
8	No. Employees on contract/deputation/ foreign service at end of year	603	594	594	594	594	594	594	594
9	Total no. of employees at the end of the year	6,372	7,160	7,195	7,113	6,967	6,835	6,694	6,537

Commission's analysis

The Commission approves the Petitioner's additional manpower requirements. However, the Commission directs the Petitioner to furnish the Government approvals at the time of Multi-Year Tariff determination.