ANNUAL ADMINISTRATION REPORT

2017-18

KERALA STATE ELECTRICITY BOARD LIMITED

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CONTENTS

3. *Installed Capacity Kerala*

Comparative Statement of Accounts from 2013-14 to 2017-18

Statement of Profit & Loss account for 2017-18

Balance Sheet 17-18

Departmental Publications

8. *Typical Map of Distribution Network (HT)*

PREFACE

It is my pleasure to present the *Sixth Annual Administration Report* of KSEBL, after reconstituting it as a company and 62nd report as an integrated Public Sector Power Utility in the state since original constitution in 1957.

The year 2017-18 had been remarkable period of success and achievement for KSEBL and the State of Kerala. Kerala attained the enviable position of being the first state in the country having electrified all the households by May 2017.

In order to transform the Distribution sector to achieve global standards, KSEBL initiated steps for the comprehensive revamping of the Distribution network. Capturing close to 13 lakh GPS coordinates and associated attribute data of HT distribution network by about 6000 employees of the organization using their personal smartphones within record time was a highly appreciable task. Formation of PMUs for Distribution planning and coordinating the activities lead to work identification and preparation of bankable DPR for the control period 2018-22.

A substantial reduction in T&D losses from 13.93% to 13.07 % was achieved during the reporting year. This was achieved despite the addition of 3,53,642 new consumers to the system, for which 3130 km of LT lines had to be drawn and 2353 Distribution Transformers were installed.

Certain remarkable achievement could also be made in transmission sector. The Transgrid 2.0 project gained momentum and the first Transgrid 2.0 project was successfully commissioned utilizing tubular poles for the first time in the state. The Malappuram – Manjeri 110 kV DC line, the first transmission line in the State using monopoles was commissioned during the year under the transgrid project. Further, *Sixteen* new substations could be commissioned during the year. The commissioning of long pending 220 kV Substation at Kattakkada and Ambalathara 220 KV Substation which was commissioned in record time for the power evacuation of 50 MW solar park are the remarkable achievements. In addition, 175.38 Ckms of transmission lines (33KV and above) and 809.9 MVA transformation capacity were added to the grid during the period. ‘Hybrid switchgears’ and SCADA based Substation Automation System

(SAS) were commissioned for the first time.

74 MW renewable energy was added to the grid which includes own projects, contributions by IPPs, Prosumers and 14 MW at 'Solar Park' at Kasargode. Consumers-owned-solar power plants connected to grid at HT and LT levels during this period totals to 9.261 MW.

I wish to express my gratitude to Government of Kerala, Kerala State Electricity Regulatory Commission, State Planning Board and Directors of Board for their wholehearted support and encouragement. I place on record my appreciation for the contribution made by the officers and employees at all levels, and thank them for their hard work, co-operation and support.

Thiruvananthapuram
Date: 01.10.2019

Sd/-
(N. S. Pillai IA & AS)
Chairman & Managing Director, KSEBL

1. CORPORATE MANAGEMENT

Kerala State Electricity Board Limited' (KSEBL) was incorporated under the Indian Companies Act, 1956 on 14.01.2011 and Certificate of Commencement of Business was obtained on 06.06.2013. The Government of Kerala, following the Section 131 and 133 of Electricity Act 2003, revested the assets and liabilities of former Kerala State Electricity Board (KSEB) with KSEBL which was vested with the Government by the first transfer scheme notification dated 25-09-2008, by a notification called the 'second transfer scheme' on 31.10.2013.

The Company functions as integrated electricity utility and carries out the business of generation, transmission and distribution of electricity and serves almost 99% of consumers in the state of Kerala.

1.1 The Board of Directors

The Company is directed at the corporate level by the Board of Directors of the company headed by Chairman and Managing Director. The full-time directors of the company take decisions on routine affairs related to each strategic business unit and departments. The List of directors, their portfolio and term are given in the Table below.

Board of Directors	Name	Term
Chairman & Managing Director	Dr.K.Ellangovan,IAS	24-10-2016 to 28-01-2018
	Sri.N.Sivasankara Pillai, IA & AS	29-1-2018 to till date
Director (Finance)	Sri.N.Sivasankara Pillai, IA & AS	10.8.2015to till date

Director (Distribution, Safety & Generation E)	Sri.Venugopal .N	21.6.2016 to 28.6.2017
Director(Distribution & IT[1])	Sri. Kumaran .P	28.6.2017 till date
Director(Corporate Planning & SCM[2])	Dr. O.Asokan Sri. Venugopal.N	Till 31.5.2017 1.6.2017 to 19.6.2017
Director(Corporate Planning, Generation Electrical, SCM & Safety)	Sri. Venugopal .N	20.6.2017 till date
Director (Transmission & System Operation)	Smt.P.Vijayakumari	01.6.2015 till date
Director (Generation –Civil & HRM[3])	Sri.Rajeev S	21.6.2016 till date
Director (Ex Officio)	Sri.Paul Antony,IAS Principal Secretary (Power),GoK Sri.Biswanath Sinha,IAS	2.6.2016 to 26.2.2018 27.2.2018 till date
Director (Ex Officio)	Dr.K.M.Abraham Addl.Chief Secretary (Finance),Gok. Sri Manoj Joshi,IAS Principal Secretary(Finance),GoK	1.4.2015 to 27.9.2017 28.9.2017 till date
Independent Director	Dr. V. Sivadasan	02.7.2016 till date

[1] Information Technology, [2]Supply Chain Management, [3]Human Resource Management

1.2 Strategic Business Units

The company while continuing to function as integrated electricity utility in consistence with the State Government policy is carrying out the business through three separate Strategic Business Units (SBU) for each of the functions of Generation, Transmission and Distribution, headed by Full Time Directors.

1.2.1 Generation SBU

The Director (Corporate Planning, Generation Electrical, and SCM & Safety) and the Director (Generation Civil & HRM) manages the Generation SBU. The Directors are supported in management by the Chief Engineers given in the table below.

Director (Corporate Planning ,Generation-Electrical, SCM & Safety)	Chief Engineer (Generation & PED) Chief Engineer (Renewable Energy &Energy Savings)
Director (Generation - Civil & HRM)	Chief Engineer (Civil Construction - North) Chief Engineer (Civil Construction - South) Chief Engineer (Civil - Investigation & Construction Central) Chief Engineer (Civil - Dam Safety & DRIP)

The Generation SBU operates and maintains 35 hydroelectric

generating stations, 2 thermal power plants, and the wind farm at Kanjikode. Renovation, Modernization and Up-rating of the old hydroelectric projects which have surpassed their useful life are also being carried out by this Department. The Director (Generation-Electrical) supported by the CE (Gen & PED) manage these functions of Generation SBU.

Investigation, planning and design of all hydroelectric projects, land acquisition matters connected with various hydel projects, works connected with the environmental and forest clearance aspects of generation schemes, safety and maintenance of dams and connected structures, construction works of all hydroelectric projects are carried out by the Civil Department of Generation SBU. The related activities such as construction and maintenance of various office buildings, fabrication of line materials for distribution, yard structures for substations and accessories for hydraulic structures etc are also carried out by the Civil Department. The Director (Generation Civil & HRM) is assisted by the four Civil Chief Engineers in his functions.

1.2.2 TRANSMISSION SBU

Director (Transmission & System Operation) heads the Transmission SBU. There are three Chief Engineers and two Deputy Chief Engineers (with full powers of Chief Engineers) having head quarters at Kalamassery and Shornur report to the Director, as given below:

- Chief Engineer (Transmission – North)
- Chief Engineer (Transmission – South)
- Chief Engineer (Transmission – System Operation)
- Deputy Chief Engineer(Electrical) – Transgrid (South)
- Deputy Chief Engineer(Electrical) – Transgrid (North)

The Northern Transmission Zone is headed by Chief Engineer (Transmission – North) with headquarter in Kozhikode. This Zone is administered through 5 Transmission Circles, 15 Divisions, 59 subdivisions. The Southern zone has headquarters in Thiruvananthapuram and has 6 Transmission Circles, one Division Pathanamthitta with ARU, 14 Divisions, 81 Subdivisions. It is headed by Chief Engineer (Transmission – South). The System Operation is a separate function of State Transmssion Utility and carried out by the Transmission SBU. It is headed by Chief Engineer (Transmission – System Operation) with headquarters at Kalamassery and has 3 System Operation Circles, 6 Divisions, 37 Subdivisions and 17 Sections.

The Board of Directors decided (16.03.2016) to implement the ambitious **Transgrid 2.0** project specifically aimed for strengthening the transmission network within the state to meet the increasing power demand, ensure supply reliability as per standards and to have evacuation system to increase the import capability. It was decided vide a Board Order dated 29.7.2016 to reconstitute the Southern Region Transmission Development Team as Transgrid (South) headed by a Deputy Chief Engineer(Electrical) with Full Powers of Chief Engineer reporting to the

Director (Transmission & System Operation) with headquarters at Kalamassery for developing transmission system in Southern Kerala. Similarly Transgrid (North) was formed which is headed by a Deputy Chief Engineer with Full Powers of Chief Engineer having its head quarters at Shornur and reporting to Director(Transmission & System Operation).

Transmission SBU manages the construction, operation and maintenance of EHT substations and transmission lines including that to EHT consumers. Transmission SBU is responsible for the implementation of transmission loss reduction programs and coordinating the activities for system development. Transmission SBU exercise control over all load dispatch activities, with full responsibility for real time management and matters pertaining to protection system and communication system. Scheduling of generation, scheduling of annual maintenance, import of power from independent power producers and central generating stations and export of power are managed by this SBU. Other important activities include monitoring of daily system statistics, implementing policy matters related to merit-order dispatching, communication planning, networking of computers and co-ordination of activities under the system operation circles.

1.2.3. Distribution SBU

Director (Distribution & IT) heads the Distribution SBU. The Distribution License areas of KSEB are through four regional offices headed by four Chief Engineers namely,

- Chief Engineers, Distribution (South)
- Chief Engineer, Distribution (Central)
- Chief Engineer, Distribution (North)
- Chief Engineer, Distribution (North Malabar)

The South Region with headquarters at Thiruvananthapuram has 7 Electrical Circles, 22 Divisions, 63 Subdivisions and 216 Electrical Sections. Transformer Meter Repair (TMR) Divisions at Thirumala & Pallom are also attached to southern region. The Central Region with its headquarters at Ernakulam has 7 Electrical Circles, 25 Divisions, 69 Subdivisions and 235 Electrical Sections. TMR Division coming under Central region is the TMR Division at Angamaly. The North Region with its headquarters at Kozhikode has 7 Electrical Circles, 20 Divisions, 52 Subdivisions, 212 Electrical Sections. TMR Division at Shoranur comes under North region. The North Malabar Region is headed by the Chief Engineer who is having headquarters at Kannur. This region has 4 Electrical Circles, 9 Divisions, 27 Electrical Sub divisions, 108 Electrical Sections. TMR Division, Kannur is attached to North Malabar region.

The Distribution SBU distributes and supply electricity in the entire State, except few small areas of other Licensees. The activities of the SBU include construction, operation and maintenance of distribution network upto a voltage level of 11 KV. Implementation of Central Government Schemes such as RAPDRP (Part B), DDUGJY, IPDS, state sector projects funded externally, like MP LAD/MLA LAD/ Kerala Development Schemes are undertaken by Distribution SBU.

Chief Engineer (IT, CR & CAPs) also assist the Director (Distribution & IT) in activities related with IT based projects, customer relations and centrally aided projects.

1.3. The Corporate Office

The Corporate office carries out the corporate and common functions of the company such as corporate planning, financial matters and Audit, Legal affairs, Human resources management, Commercial matters, Tariff & Regulatory affairs etc.

1.3.1. The following Heads of Departments in corporate office report to the Chairman and Managing Director directly:

- Legal Adviser & Disciplinary Enquiry Officer
- Chief Vigilance Officer
- Secretary (Administration)
- Chief Public relations officer
- Chief Personnel Officer

1.3.2. Director (Finance) handles matters related to financial management, internal audit, tariff, Power Purchase and related commercial aspects. The offices with the following Heads of Departments function under the Director (Finance):

- Deputy Chief Engineer (Commercial and Planning) with full powers of Chief Engineer
- Financial Advisor
- Chief Internal Auditor
- Special Officer (Revenue)
- Company Secretary

1.3.3. The corporate supportive functions such as corporate planning, supply chain management, safety management are carried out by separate departments under the Director (Corporate Planning, Generation Electrical, SCM & Safety) supported by the following department heads:

- Chief Engineer (SCM)
- Deputy Chief Engineer (Commercial and Planning)with full powers of Chief Engineer
- Chief Engineer (Renewable Energy &Energy Savings)
- Chief Safety Commissioner

1.3.4. Secretary (Administration) carries out general administration matters of the company and is authorised representative of KSEBL in the matters of general administration and legal affairs. The Resident Engineer, New Delhi reports to the Secretary.

1.4 Organisation chart

The Organisation chart of Kerala State Electricity Board Ltd is given in Annexure- I.

**2. Performance of the Company

KSEBL has succeeded in its mission, despite several difficulties, during the financial year 2017-18, of providing electricity connections to all the households and Anganwadis occupied or ready for occupation as on March 31, 2017. Only a few cases were pending where statutory approvals were pending from Government departments and agencies. The State of Kerala became the first one in the country to achieve Total Electrification of Households even while the country is striving hard to attain Total Village electrification. The ambitious project was declared as successfully completed on May 29, 2017, that is, at the same time Government of India launched the scheme for 24x7 Power for all. The focus, after attaining this project, had been on quality, reliable and uninterrupted supply to consumers and the primary goal will be to improve efficiency and quality of power sector services. KSEBL had taken several initiatives to improve the physical and financial performance during the past several years. The consistent efforts have started bringing commendable results.

2.1 Physical Performance

A Power Utility has to constantly upgrade and expand its physical assets for serving the growing demand of customers. The Generation, Transmission and Distribution business Units of the Company had carried out various capacity expansion activities during the recent years, which are given in the Table below along with the increase in consumer strength.

Particulars	Capacity Additions						
Year	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	System as on 31.3.18
Generation							
Hydro Capacity (MW)	1.25	0	15.50	22.0	3.6	6	2055.76
Solar Capacity (MW)				1.156	6.71	7.5	14.71
Transmission							
Substation 220KV (Nos)	0	0	1	0	0	2	22
Substation 110KV (Nos)	1	5	1	8	3	6	154
Substation 66KV (Nos)	1	1	0	3	0	3	74
Substation 33KV (Nos	8	4	1	3	7	5	149
Lines (circuit km)	123.92	184.03	117.60	140.14	147.43	175.38	
220KV (circuit km)	26.87	0	36.2	0.68	0	54.1	2856.88
110KV (circuit	27.55	112.5	38.4	66.67	67.66	79.76	4521.5

km)		9					
66KV (circuit km)	4.60	0	0	6	0	0.44	2151.12
33KV(circuit km)	64.90	71.44	43	66.79	75.77	41.08	1943.51
Distribution							
LT lines (circuit km)	3066	3735	4636	4826	5357	3130	286784
HT lines circuit km	1579	1884	1807	2022	1844	1744	60892
Distr Transformers	2643	3200	3554	2389	2270	2353	77724
No. of consumers	403421	415216	422238	381247	462137	353642	**12276321**

2.2 Loss Reduction

The company has been taking earnest effort to reduce both Technical and commercial losses in the system and was able to achieve substantial loss reduction in the past several years. The reduction in losses was achieved by improving the network, strengthening of network, coordinated theft control activities, energy audit, replacing of faulty and electromechanical meters etc. The T & D loss in the financial year 2008-09 was 18.83% which has been reduced to 13.07% by the end of FY 2017-18. The Losses are the lowest among the utilities in the country. The reduction in losses has resulted in substantial financial savings as given in Table below.

Financial Impact of T&D Loss reduction

Year	Energy sold[1]	Energy Input[1]	T&D loss (%)	Yearly Redcution (%)	Cumulative Reduction (%)	Energy Saved (MU)	Cost Savings[3] (Rs Cr)
2008-09	12414.32	15293.53	18.83	-	-	-	-
2009-10	13971.09	16978.04	17.71	1.12	2.31	234.09	91.30
2010-11	14547.90	17337.78	16.09	1.62	3.93	584.98	228.14
2011-12	15980.53	18946.29	15.65	0.44	4.37	741.44	289.16
2012-13	16838.24	19879.70	15.30	0.35	4.72	864.71	337.24
2013-14	17454.04	20525.25	14.96	0.34	5.06	977.82	381.35
2014-15	18426.27	21572.90	14.57	0.39	5.45	1131.99	441.47
2015-16	19325.07	22727.31	14.37	0.20	5.65	1240.036	483.61
2016-17	20038.25	23763.58	13.93	0.44	6.09	1405.43	548.12
2017-18	20880.70	24340.79	13.07	0.86	6.95	1704.92	664.92

[1] including open access energy, [3] in power purchase over FY2008-09 ,

The savings in energy due to loss reduction was used to meet the increase in yearly demand from consumers partially and consequently savings in additional power purchase cost. The cumulative savings owing to reduction in losses over the years in power purchase cost is to the tune of Rs. 664.92 Cr for FY 2017-18 as shown above.

2.3 Financial performance

The company has been adopting prudent financial management practices to improve its financial position. These include availing loans at the barest minimum after fully utilizing internal accruals and obtaining funds from least cost sources. These are described below.

2.3.1 Restricted borrowings

The company had executed capital projects for Rs. 2056 Cr during the year. However, the net additional borrowing has been Rs. 54.92 Cr only. This was achieved by utilising internal accruals, capital grants and consumer contribution. Details of outstanding loans for FY 2017-18 are given below.

It may be seen from the table, by restricting the fresh borrowings and repaying the debts promptly, the Board has substantially reduced the outstanding debts over the period.

Outstanding Loan Liabilities (Rs Cr)

Year	Loan Opening Balance	Loan received	Repaid	Loan Closing balance	Increase over previous year	Interest due for payment
2017-18	6424.42	5650.13	5595.21	6479.34	54.92	610.98

2.3.2 Reduction in interest payment

The Company has incurred Rs. 610.58 Cr towards interest on loans. Interest could be restricted substantially because of lower level of borrowing as reasoned above and the competitive interest rate at which the loan was availed. The interest as a percentage of average loan works out to be 9.47 %.

The Board has substantially reduced the interest burden by taking fresh borrowing from least cost sources and reduction of cost of raising finance by way of dispensing with Government guarantee ,upfront payments ,commitment charges etc.

2.3.3 Revenue Gap

KSERC had trued up the audited accounts of the company till 2016-17 (except for FY 2014-15 for which orders are reserved) allowing 14% rate of return on equity.

The approved Revenue Gap till FY 2016-17 amounted to Rs. 6686.18 Cr as given below

No	Item	Revenue Gap
1	Till 31-3-2011	424.11
2	FY 2011-12	1386.97
3	FY 2012-13	3132.92
4	FY 2009-10 and 2010-11 (Remand Order)	312.60
5	FY 2013-14	195.60
6	FY 2014-15	NA
7	FY 2015-16	202.97
8	FY 2016-17	1031.06
	Total	6686.18

The average cost of supply per unit (Rs 6.35) as well as the gap per unit (Rs. 0.61) came down in the year in comparison to previous year as given in Table below. This was primarily due to the tariff revision ordered on 17-04-2017 and the reduction in power purchase cost achieved during the year.

No	Particulars	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18
1	Average cost of supply	4.38	4.65	6.66	5.87	6.22	5.86	6.48	6.35
2	Average revenue realized	3.54	3.46	4.29	5.29	5.26	5.41	5.49	5.74
3	Gap (=1-2)	0.84	1.20	2.37	0.58	0.97	0.45	0.99	0.61

2.4 Comparison of expenses and Revenue

Comparison of various components of expenditure over the last five years is given in **Annexure 4**.

2.5 Major achievements and initiatives

2.5.1 Demand Side Management

Domestic Efficient Lamp Programme (DELP) announced by GoI as part of National LED Mission of Ministry of Power. EESL, the supply agency for the entire country supplied 1.5 Crore bulbs by 17.01.2018 to Kerala as per MoU with KSEBL. DELP intends to distribute 1.5 Crore bulbs (2 each) to 75 Lakhs domestic consumers, later it was decided to distribute among all the category of consumers except Government and public

institutions. LED Bulbs were distributed free of cost to Non-Paying Group (NPG) & BPL consumers with connected load up to 1000 watts and monthly consumption up to 40 units. As on 31.03.2018, about 1.264 Crore LED bulbs were distributed.

2.5.2 Total Household Elecrification

The Government of Kerala announced, in June 2016, its mission to electrify all households in the State by March 2017. Aim of the project was to provide access to electricity to all households by ensuring last mile connectivity. The distribution network was to be extended wherever possible and where extension was not feasible as in the case of remote colonies or habitats, Decentralised & Distributed Generation (DDG) and Micro-Grids were proposed.

Identifying the beneficiaries was the first important step since accurate data pertaining to unelectrified households were not available. The beneficiaries were identified by opening multiple channels for registration. The beneficiary could register directly at the local Electrical Section offices or with elected representatives. A central registration facility was also opened. The beneficiary could send a *missed call* from mobile and the operator at the Customer Care Centre at the Head office, Thiruvananthapuram would contact back the beneficiary and assist in registering the application. There was a web portal *"Power For All"* indigenously developed for applicant registration and for providing various reports / statistics to Government and departments. More than 1.52 lakh applicants registered in the project. Around 1.24 lakh applicants belonged to BPL category and SC and ST applicants were 32,000 and 17,500 respectively. Thus the objective of providing electricity to the underprivileged in the society was clearly achieved.

The requirement of various documents for obtaining electricity connection was causing delay in releasing connections and hardship to the beneficiaries, KSERC approved the simplified application procedures and forms suggested by KSEB Ltd as per GoK directive. This ensured that electricity connections could be released based on maximum 2 documents – proof of identity and proof of ownership. The rules were further liberalized when KSEBL as per GoK directive issued an order to release electricity connections to residential structures of plinth area not more than $100m^2$ without insisting proof of ownership. Also, Local self government helped the cause by modifying rules to release electricity connections to households of plinth area not more than 1500 sq. ft on the basis of temporary residential certificate. Further, online facility for filing LT service connection applications has also been introduced which enables applicants to fulfill their need without visiting section offices.

2.5.3 Dyuthi-2021, Medium term distribution plan 2018-2021

After achieving the total electrification status of all of its households in May 2017, aspiration of the society has shifted from the requirement of having an electric connection to the necessity of getting quality, reliable power. Five specific goals were identified for achieving this overall objective – (i) enhancing reliability and quality of the power supplied, (ii)

improving energy efficiency and reducing system losses, (iii) ensuring safe installations, (iv) ensuring that the State remains totally electrified & (v) ensuring hassle free integration of renewable sources. This demanded a relook into the distribution system management.

The usual practice of short term planning, i.e. preparation of Annual Plans covering one Financial Year, was not appropriate to address the new requirements. Considering all these aspects, the Board vide BO (FTD) No 3029/2017 (D(D&IT) / Plan Process/2017-18) dated 04.12.2017 has adopted detailed guidelines for evolving the distribution plan up to the horizon year 2021 – 2022. The horizon year was identified in consideration of Multi Year Tariff control period (2018-2022) envisaged by the state regulatory commission also.

After detailed considerations, it was decided to go for a network based approach, with comprehensive remodeling of functions to achieve the goals. Having considered the pros and cons of earlier planning approaches viz. conventional (top-down) approach and decentralised planning process (bottom-up), KSEB has given in-principle approval to introduce novel concept of participative planning.

A spatial geo-referenced or Geographical Information System (GIS) layout of the high tension network was the most essential tool for the network based plan process. M/s ICFOSS selected and customized an open source, android based smartphone compatible application which facilitates capturing of geo coordinates using GPS technology along with other attributes. The concept was tested in two pilot studies before state wide roll out. KSEB then ventured into the work of mapping its high tension network spanning more than 60,000 kilometers along the length and breadth of the State and close to 15 lakh network features. The application was given the state wide roll out after pilot studies on 04.12.2017. Major portion of the work, which is actually the entire work with certain first level miss outs, was completed by 31.12.2018, the targeted date itself. More than 6000 employees of the organization used their personal smartphones to capture close to 13 lakh coordinates and associated attribute data. Approximately 75 officers then traced the mapped points in a geo-referenced map, capturing attributes like feeder names, Substations etc. The completed high tension grid map was made available to all through internet platform from 15.03.2018. In spite of heavy odds, the project turned out to be an unqualified success.

A typical map of the distribution network is attached as Annexure-8:

2.5.4 TransGrid 2.0 – **Second Generation Transmission network**

Ministry of Power, GoI has sanctioned a 2000 MW HVDC corridor from Pugalur in Tamil Nadu to Madakkathara, Thrissur. It is an extension of 6000 MW HVDC corridor from Raigarh, Chhattisgarh to Pugalur. Kerala's existing transmission network is insufficient to meet the growing demand within the state reliably and efficiently transmit the power contracted from interstate generating stations and that received via this HVDC corridor along with the upcoming corridors in the state. Keeping this in mind, KSEBL has planned a long term transmission plan TransGrid 2.0 which includes construction/up gradation of existing substation as well as construction/ up gradation of existing lines using the existing RoW in most of the areas. For construction of new line, it is proposed to use tubular/monopole towers in most of the areas in order to minimize the RoW issues. TransGrid 2.0 aims at the long term stability of Kerala Grid so as to ensure quality and reliable power transmission in the state.

Administrative sanction was issued (B.O (DB) No.868 /2016dated 16.03.2016) for TransGrid 2.0 for an amount of Rs 10000 Cr. GoK has accorded administrative sanction for the TransGrid 2.0 project at an estimated cost of Rs.6375 Cr over a period of five years vide G.O (Rt) No.195/2016/PD dated, Thiruvananthapuram 06/10/2016.

Taking into account the above facts along with the importance of the transmission planning, a long term transmission plan, **TransGrid 2.0**, up to 2023 horizon year was prepared to streamline the investment and activities of KSE Board and the same was approved by the Board.

The projects are planned for execution under two phases. The elements which are critical to the system for relieving congestion and constraint free power evacuation from the HVDC and other ISTS/Generation nodes are listed as TransGrid 2.0-Phase-1 works and needs to be expedited to ensure their availability by 2019-20 time frame. The works pertaining to evacuation of power from Renewable resources are proposed to be carried out under the Green Corridor project funding and are also shown as a separate group. This has been taken up with CEA and MNRE for including in the Green corridor project funding mechanism. The works under this scheme is also planned to be executed so as to be available by 2019-20 time frame. Phase-2 works are to be taken up in coordination with the completion of Phase-1 works so that a seamless integration of the planned elements is achieved for strengthening the network. The balance work planned in TransGrid 2.0 is proposed to be taken up in the field by the concerned transmission circles in accordance with their expected availability period mentioned in the plan report. Special Teams has been created within KSEB itself for the implementation of the project.

The following chapters provide activities and achievements of the three ***Strategic Business Units*** (SBU) of the company, viz, Generation,

Transmission and Distribution.

3.0. ACTIVITIES & ACHIEVEMENTS

3.1. GENERATION SBU

The Hydro Electric potential is the only conventional energy resource of the state, since there is no known fossil fuel reserve in Kerala. Though Kerala is bestowed with 44 rivers, most of the hydro potential locations are deep in reserve forests and cannot be tapped economically because of legal and environmental concerns. Therefore the focus has shifted to developing Small and Medium Hydro Power Stations to meet at least a part of the state energy requirement. Development of Hydro Electric stations, right from initial investigation till commissioning is under taken by the Generation SBU of KSEBL in addition to operation and maintenance of old and new stations. The present status of various projects thus undertaken by SBU-G is given below:

Hydro Electric Projects Status

Description	Projects.	Capacity (MW)
Projects commissioned	1	6
Works in progress	9	166.5
Tenders invited	4	43.5
Works awarded	3	37.5
DPR and Administrative Sanction accorded	NIL	

3.1.1 Chief Engineer (Generation), Moolamattom

The Chief Engineer (Generation) has the primary responsibility of maintaining and operating 35 large and small Hydro stations and two thermal generating stations. Office of CE (Gen) also carries out the Renovation, Modernisation and Up-gradation (RMU) work of generating stations. He is also a member of the committee for the approval of Detailed Project Reports of new hydel projects.

The primary responsibility of the office is to ensure maximum availability of all hydro and thermal generating stations and to generate power as required by the State Load Despatch Centre. The routine and break-down repairs and recommended maintenance has to be carried out in time to make the machines available. The Renovation, modernisation and Upgradation works on hydro stations are also carried out under the direction of this office.

There are five generation circle offices at Meencut, Moolamattom, Moozhiyar, Trissur and Kothamangalam under this office for carrying out the above functions. Brahmapuram Diesel Power Plant (BDPP) and Kozhikkode Diesel Power Plant (KDPP) are also attached to this office.

Generation of Electricity: The total installed capacity of stations owned by KSEBL is 2232.45 MW and the designed annual generation capacity is 7184.84 MU for hydro

stations, but contributes less than 30% of the total energy requirement of the state. A list of generating stations within State and its capacity is given in **Annexure-3.**

During 2017-18, a total of 5497 MU of energy was produced from the generating stations. The summary is given in the table below.

No	Source	Energy Generated (kWh)	Percentage (%)
1	Hydel Power stations	5488890390	99.7
2	Thermal Power stations	1865185	0.03
3	Wind generating station	1478144	0.03
4.	Solar stations	13403763	0.24
	Total	5504637482	100

The carry forward storage in the reservoirs for the water year 2017-18 as on 01.06.2017 was 501.403 MU (12.11% of the total storage capacity) as against the normally planned figure of 550MU. The storage of Idukki Reservoir was 11.06% and that of Sabarigiri reservoir was 12.40%. Though 2017 monsoon started normally, the precipitation was much less than the normal. The inflow received during the month of June 2017 was 70.41% of the 10-year moving average (560.08MU). The deficiency in monsoon was identified as a potential threat for the water year 2017-18 in consideration of the various weather reports. As the water levels were also very low, power purchase from the exchange was increased during the period other than evening peak hours also for meeting the real-time demand and to conserve water in the storage type reservoirs. The deficit of monsoon continued in July 2017 and the situation became worse.

The power contracted through long term contracts was fully operationalised (except 100MW) from October 2017 onwards and this resulted in maximum availability of power from October onwards. This helped in overcoming the shortages due to low monsoon. One unit each of Idukki and Sholayar was under shutdown for Renovation & Modernisation. Generation from Thermal stations were restricted because of high Unit cost for generation on liquid fuel.

Renovation & Modernisation works: As already mentioned, RMU works of old machines and equipment in several generating stations are now carried out. A summary of the RMU works and status is given below:

No	Station	Unit	Status
1	Poringalkuthu	U#1	Almost completed (99.8%)
	-do-	U#2	Nearing Completion (91%)
	-do-	U#3	Commissioned (28-10.2017)
2	Idukki (Moolamattom)	U#3	Valve Casting Completed; Power house wiring in progress; EOT crane work awarded; Transformer Fire protection 95% completed; 4 Feeder Panels replaced
3	Kuttiyadi		RLA study of penstock completed; Draft DPR submitted
4	Sholayar	U#3	MIV erection Completed; Drainage system completed; 11kV Control Room Completed; Unit Control Equipments and Generator control panels erected. Old Penstock dismantled; Fabrication of new one in progress Overall progress (26%)

5	Moozhiyar	SCADA	Replacement of PLC and peripheral cards in progress.

Effluent Monitoring: During the year, the Online Continuous Emission Monitoring System for three stacks at BDPP and Online Effluent Quality Monitoring System with real line data transfer facility to Central Pollution Control Board and Kerala State Pollution Control Board was commissioned.

Safety Award: Kozhikode Diesel Power Plant (KDPP) has bagged the safety award from Factories & Boilers and became the runner-up for outstanding safety performance in National Safety Award. The statutory requirement of installation of online Pollution Monitoring system (OPMS) has been implemented.

Quality Management Certification: The ISO : 9001 -2015 Quality Management Certification was conferred for the Poringalkuthu Power House on 26-12-2017.

3.1.2. Chief Engineer (Projects - Electrical Design)

The electrical design, tendering and monitoring of Hydro-Electric Projects are carried out by the PED office lead by a Chief Engineer. The main responsibilities of PED office include:

- Design and finalization of technical specifications, tendering, execution and monitoring activities of electro mechanical & hydro mechanical works of new hydroelectric power generation Projects.
- Residual Life Assessment (RLA) Study, Scope finalization of Renovation, Design and finalization of technical specifications, tendering execution and monitoring activities of electro mechanical & hydro mechanical works of RMU of existing hydro power projects.

The following table indicates the project works undertaken by PED during FY 2017-18 and its status:

No	Project	District	Capacity	Status
1	Perumthenaruvi SHP	Pathanamthitta	2 x 3 MW	Commissioned on 23.10.2017
2	Porigalkuthu RMU	Thrissur	4 x 9 MW	Unit #1,3,4 Completed. Unit #2 work in progress. Penstock renovation extended to 30.6.2018
3	Kakkayam SHP	Kozhikode	2 x 1.5 MW	Proposed to be completed by 28.03.2018
4	Porigalkuthu SHP	Thrissur	1 x 24 MW	Proposed to be complted by 31.12.2018
5	Bhoothathanketu SHP	Eranakulam	3 x 8 MW	Civil works in progress. E & M works expected by 31.12.2018
6	Upper Kallar	Idukki	2 x 1 MW	The civil work is in progress. E&M Agreement on 16.07.2016. Drawing scrutiny is in progress.
7	Sholayar R & M	Thrissur	3 x 18 MW	E&M Agreement on 06.07.2015. Unit #3 renovation in final stages. All E&M works to be completed by

				09.12.2018. All Penstock works to be completed by 29.04.2019.
8	Sengulam Pumphouse renovation	Idukki	--	Civil and E&M drawings under processed. Excavation for pump house building completed.
9	Idukki RMU	Idukki	--	Work Agreement executed on 24.09.2016 .All R&M work to be completed by March 2020.
10	Pallivasal Extension	Idukki	2 x 30 MW	Taken up with the OEM, M/s DEC, China & M/s ESSAR for the supervision and commissioning of the balance E&M works. Reply received including financial terms.
11	Kuttiyadi RMU	Kozhikode	3 x 25 MW	E&M works at Tendering Stage
12	Chathankottunada II	Kozhikode		E&M works at Tendering Stage
13	Thottiyar HEP	Idukki	1 x30 MW 1x 10 MW	Existing contract foreclosed. Supplier is approached for willingness to complete project
14	Peruvannamoozhi	Kozhikode	2 x 3 MW	E&M Work retendered
15	Pazhassi Sagar	Kannur	3 x 2.5MW	Civil and E&M works at Tendering Stage

3.1.3. Chief Engineer (Civil Investigation and Construction Central)

The primary responsibility of this office is identification, preparation of various reports such as pre-feasibility report, feasibility report and detailed project reports and construction of civil works related to new Hydro-Electric Projects within the state. In addition, this office carries out consultancy services to Government departments and entities. The major activities carried out during 2017-18 is summarised in the tables below:

Investigation and DPR Preparation			
No	**Project / Scheme**	**Activity**	**Remarks**
1	Pambla SHEP	Investigation	In progress
2	Mankulam Stage-II	Investigation	In progress
3	Meloram SHEP	Investigation	In progress
4	Perumthenaruvi Stage-II	Investigation	In progress
5	Chathankottunada SHEP Stage-I	Investigation Report	Prepared
6	Neyyar Dam-Toe SHEP,	Investigation Report	Prepared
7	Moorikadavu SHEP	Investigation Report	Prepared
8	Lower Poozhithodu SHEP,	Feasibility report	Prepared
9	Pallivasal Pumped Storage Scheme	Feasibility report	Prepared
10	ChathankottunadaStage-I,	Detailed Project Report	In Progress
11	Pasukkadavu	Detailed Project Report	In Progress
12	Moorikadavu	Detailed Project Report	In Progress
13	Pambla	Detailed Project	In Progress

				Report	
14	Pallivasal Scheme	Pumped	Storage	Expression of Interest	Invited

Construction Works			
No	**Project / Scheme**	**Construction Work / Project Stage**	**Status**
1	Poringalkuthu SHP	Intake gate Erection	Completed
		Intake pool	In progress
		trash rack structure	In progress
		water conductor system	In progress
		power house	In progress
		switch yard	In progress
		tail race	In progress
		erection of machines	In progress
2	Chinnar SHP	Land acquisition	In progress
		Civil Work Order	Issued on 08.03.2018
3	Mankulam SHP	Land Acquisition (Private Land)	In Progress
4	Anakkayam SHP	Forest Clearence	Awaited
5	Athirappally HEP	Preliminary Activities	Initiated

3.1.4. Chief Engineer (Civil-Dam Safety & DRIP)

The Safety of all the 58 dams owned by KSEBL are monitored and assured by the Dam Safety Department headed by a Chief Engineer under Generation SBU. The major functions of the office include (a) Monitoring of dams, related water works, instrumentation and preparation of reports etc, (b) Maintenance of dams and connected structures, (c) Operation of intake, spillway gates and disperser valves as and when required, (d) attend issues regarding land encroachment in Idukki, Ayyappancovil, Lower Periyar, Anayirankal, Kakkad and demarcation of land and land issues at Thariode and (e) Execution of Dam Rehabilitation and Improvement Project (DRIP) approved by CWC aided by World Bank. In addition, this office carries out the maintenance of colonies and inspection bungalows in Vazhathope, Kakkad, Kochupamba, Pambla & Padinjarathara sites. Testing of materials and mix design studies for various ongoing projects are carried out in Cement Concrete Lab, Idamalayar.

The Dam safety activity include Periodical (Pre-monsoon as well as post monsoon) inspections as per guide lines of CWC, KDSA of dams, instrument monitoring, seismic activity monitoring, operation and maintenance of dams, hydraulic structures and flood control activity during monsoon. A network of 6 seismological observatories in Idukki, Kulamavu, Aladi, Meencut, Chottupara and Vallakadavu are maintained by KSEBL and the seismic activity studies are routinely done to assess possible threats and impacts.

Dam Rehabilitation and Improvement Project (DRIP) is assisted by the World Bank/IDA, co-ordinated by Central Water Commission, Ministry of Water Resources, and Government of Kerala with a funding pattern of 80% from World Bank and 20% from State/Central Government budgetary support. DRIP envisages, (1) Physical and technical dam rehabilitation and improvement, (2) Managerial upgrading of dam operation and

maintenance, (3) Institutional reforms and strengthening of regulatory measures pertaining to safe and financially sustainable dam operations.

DRIP involves 37 dams from the 12 Hydro Electric Projects- Sabarigiri HE Project, Sholayar HE Project, Poringalkuthu HE Project, Sengulam HE Project, Idukki HE Project, Idamalayar HE Project, Pallivasal HE Project, Neriamangalam HE Project, Kuttiyadi HE Project, Lower Periyar HE Project, Kakkad HE Project, Panniar HE Project.

In this project, works amounting to Rs. 121 Cr approximately (works/goods/consultancy) has been tendered in 84 packages and are under various stages of implementation/processing. Work Orders amounting to Rs. 83 Cr has been awarded and is at various stages of progress. Works of Fifty (50) Packages are now completed. Out of a total expenditure of Rs. 69.44 Cr incurred up to 2017-18, an amount of Rs. 49.20 Cr has been reimbursed by the Government. The Construction of an office building for the headquarters of Dam Safety Organisation has been taken up under DRIP and is in progress. It is expected to be completed in next year.

KSEBL provide consultancy services to Government departments and organizations. Government of Kerala has declared [GO (P) No 95/2017/Fin dated 25.07.2017] KSEBL as an Accredited Agency, authorized to execute public works, as Project Management Consultant (PMC) to take up general nature works of value up to Rs.565 Cr in a financial year, by charging centage. A separate Department named **SPIN** (Sports, Pre-engineered Infrastructure and New construction technology Unit) has been executing such activities since 12.10.2015. KSEBL had built all the infrastructure activities for the 35th National Games in Kerala. A list of Projects / works / Studies carried out by the Department is given below:

No	Project / Work	Remarks	Cost (Rs Cr)
1	Shornur Vydyuthi Bhavanam	Steel structure prefab	4.32
2	Harippad Office Complex	Glass Fibre Reinforced Gypsum prefab	1.88
3	Manimala 33kV SS Control room	Glass Fibre Reinforced Gypsum prefab	0.99
4	Kumbanad, Vizhinjam, Ottapalam, and Koothattukulam, Section Offices	Dismantled Prefab structure used for National Games	0. 77
5	Noorani Artificial-turf Football stadium		2.04
6	Panampilly Nagar Sports Complex		2.96
7	Natural grass turf football pitch (FIFA Standard) Panampally Nagar		1.31
8	Electrification, Air conditioning, Mast Lighting, Water supply, sanitation etc at Panampally Nagar Sports Complex		4.09
9	Housing Units for Schedule Tribe colony in Pookode, Adimaly, Nilambur & Attappadi	Prefab Technology	0.40
10	Vamanapuram & Karamana River Basin study		0.46

The Civil Division in Vydyuthi Bhavanam, Pattom carries out all maintenance and operation of activities and capital works related to the head office estate. The work related to construction of new auditorium in Vydyuthi Bhavanam has been done by this division. An amount of Rs 40.13 Lakhs has been incurred for providing Aluminium Composite Panel cladding; Thermal Insulation and heavy duty exhaust fans inside the Auditorium.

3.1.5. Chief Engineer (Civil-Construction-North)

The office of Chief Engineer (Civil-Construction North) (CCN) carries out the structural design and construction major hydro-electric projects and office buildings and design of structures solar projects, transmission tower foundations for projects in Northern Region. The acquisitions of land for hydro-electric projects are also done by this office. The Mechanical Fabrication Facility in Kozhikode is managed by Chief Engineer (CCN). Fabrication and galvanizing of transmission and distribution line materials and poles are carried out in this unit.

The following major activities were carried out by this office during the year:

- Structural Design of narrow based multi-circuit 220 kV transmission towers for various soil types and its foundation for the Transgrid 2.0 Project.
- Structural design of control room buildings Manjeri and Mankavu Electrical sections cum sub division Pinarayi, Electrical Section Bheemanadi and office building at Venniyoor.
- Tendering and execution of civil works of Peruvannamuzhi SHEP, Pazhassi Sagar SHEP and balance civil works of Chathankottunada SHEP.
- Tendering and execution of office building in Pinarayi.
- Fabrication and supply of line materials and poles amounting to Rs 11.67 Cr.

3.1.6. Chief Engineer (Civil-Construction-South)

This office carries out design and construction of hydro-electric projects and buildings in southern region, including Thrissur District. The construction works are carried out by three Civil Circles offices. A summary of works activities of this office is given in the table below:

No	Project	Circle	Capacity	Energy	Status
1	Perunthenaruvi SHEP	Pallom	2 x 3 MW	25.77 MU	Completed
2	Ranni-Perunad SHEP	Pallom	2 x 2 MW	16.73 MU	Completed
3	Vellathooval SHEP	Kothamangalam	3.6 MW	12.17 MU	Completed
4	Neriamangalam Extension	Kothamangalam	1 x 25 MW		Completed
5	Peechi SHEP	Thrissur	1 x 1.25 MW	3.21 MU	Completed
6	Chimmony SHEP	Thrissur	1x2.5 MW	6.7 MU	Completed
7	Thottiyar HEP	Kothamangalam	40 MW	99MU	In progress
8	Sengulam Augmentation	Kothamangalam		85 MU	In progress
9	Bhoothathankettu SHEP	Kothamangalam	24 MW	83.5MU	In progress
10	Upper Kallar SHEP	Kothamangalam	2 MW	5.14 MU	In progress

11	Vadakkepuzha Extension	PM, Moolamattom*		0.70 MU	Tendered
12	Peechad SHEP	Kothamangalam	3 MW	7.74 MU	For tendering
13	Western Kallar SHEP	Kothamangalam	5 MW	17.41	For tendering
14	Upper Sengulam	Kothamangalam	24 MW	53.22 MU	For tendering
15	Deviyar	Kothamangalam	24 MW	25.94 MU	For tendering
16	Marmala	Pallom	7 MW	23.02 MU	For tendering
17	Ladrum	Pallom	3.5 MW	12.13 MU	For tendering
18	Poringalkuthu Micro HEP	Thrissur	2x 11 KW		For tendering

** Project Manager, Idukki Augmentation Scheme, Moolamattom.*

The following design works were also carried out during the year: Pallivasal Extension Scheme, Chinnar SHEP, Poringalkuthu SHEP, Mankulam HEP, Mankulam Shopping Complex, Anakkayam SHEP, Sengulam Pump House, Kaloor Substation, Angamaly Sub Station, Palarivattom Office, Vazhathope Office & IB, Kattakkada Building, Kothamangalam Building and Sholayar Renovation Works. The Parmabilkulam –Aliyar Project Agreement monitoring is also done from this office. Purchase of machineries, Mobile Crane and EOT crane for Mechanical fabrication unit under Civil Circle, Pallom are also attended by this office. Various works related to Account Closing of commissioned projects are also attended in the construction wing of this office.

3.2. TRANSMISSION SBU

Transmission Strategic Business Unit of KSEBL carries out the construction, maintenance and operation of the intra-state transmission system in Kerala. The administrative control of the State Load Dispatch Centre (SLDC) currently vested with Chief Engineer (Transmission System Operation) is under Transmission SBU. The activities related to grid protection and related communication facilities, testing of meters and power equipments are carried out by three System Operation Circles in Thiruvanathapuram, Kalamassery and Kannur.

Transmission SBU is also responsible for the implementation of transmission loss reduction programs and coordinating the activities for system development.

The Voltage wise capacity of the Transmission Network within the State as on 31-3-2018 is given below.

Transmission System as on 31.03.2018			
No	Item	Unit	Quantity / Capacity
1	400KV Transmission Lines	Ckt-km	855.96*
2	220KV Transmission Lines	Ckt-km	2856.875
3	110KV Transmission Lines	Ckt-km	4521.5
4	66KV Transmission Lines	Ckt-km	2151.12
5	33KV Transmission Lines	Ckt-km	1943.51
	Total		**12328.97**
7	400KV Substations	Nos	4*+1
8	220KV Substations	Nos	22
9	110KV Substations	Nos	154
10	66KV Substations	Nos	74
11	33KV Substations	Nos	149
	Total		404
12	Total Transmission Capacity	MVA	19994.70
** PGCIL Owned*			

The construction, Maintenance and operation of the transmission system is carried out by eleven (11) Circle offices and one Division with ARU across the state under two Chief Engineers for North and South regions.

KSEBL had taken up the ambitious ***TransGrid 2.0*** project enhancing the transmission capacity for meeting future demand, improving reliability and quality of power transmitted and reduce losses. The first project work under Transgrid 2.0 was successfully commissioned utilizing tubular poles for the first time in the state during the year. A number of major transmission network expansion works were also completed. A summary of new substations and Transmission lines completed is shown in the Table below.

No	**Particulars**	**220 kV**	**110 kV**	**66 kV**	**33 kV**	**Total**
1	Substations commissioned (No)	**2**	**6**	**3**	**5**	**16**
	Transmission North	1	3	1	0	**5**
	Transmission South	1	3	2	5	**11**

2	Lines commissioned (Ckt. Km)	**54.1**	**79.76**	**0.44**	**41.08**	**175.38**
	Transmission North	0.1	48.456	0.44	0	48.996
	Transmission South	54	31.3	0	41.08	126.38
3	Capacity addition/enhancement (MVA)	**400**	**285.5**	**47.4**	**77**	**809.9**
	Transmission North	200	172	17.4	32	**421.4**
	Transmission South	200	113.5	30	45	**388.5**

The 220 kV Substation for evacuating power from the solar park, Ambalathara was commissioned in record time in unison with the commissioning of the 50 MW Solar parks. This has resulted in considerable improvement in the quality, reliability of power. Many new and innovative equipments and devices, such as Hybrid switchgears, SCADA based Substation Automation System (SAS) were introduced. Monopole transmission towers were used in the construction of Malappuram – Manjeri 110 kV DC line for the time. Surveillance Drones were introduced for inspection of transmission lines.

3.2.1 Chief Engineer (Transmission - System Operation)

The operations of the State Load Despatch Centre, as mentioned above and its related works are carried out by the Chief Engineer (T.SO). The Load despatch activities include generation scheduling, maintenance scheduling, scheduling of power from Independent Power Producers (IPP) and Central Generating Stations (CGS) on long term as well as on daily basis, economic load dispatching, merit order dispatching, unit commitment policy, real time load restrictions as and when necessary, fixing up of merit order for under frequency tripping and remote switching operation from SLDC. The market operation, though it is related to the Distribution Business Unit, is also carried out at present through Chief Engineer (TSO). The operation of SLDC is managed by the Deputy Chief Engineer (Grid) who also assists the CE (TSO) in office functions. The Deputy Chief Engineers of System Operation Circles are responsible for the protection, communication, SCADA and meter testing for energy audit.

System Operation: The inflow received during the south-west monsoon period was very less than expected. In July, the inflow received was only 37.7% of the expected 10-year moving average. Power was purchased from exchanges in Day-Ahead-Market (DAM) during normal day time and off-peak hours to conserve water. The market rates were relatively low and there were only few instances of transmission corridor curtailment.

However, by the end of July, the problems were compounded by the low availability of DBFOO contracted power. There was unprecedented strong monsoon in eastern and western parts of the country that resulted in poor coal availability and wet coal issues. In September, the power from Central Generating stations also became considerably lower. The availability of power in the market reduced. The aggressive purchase by Telangana, West Bengal and Bihar caused power rates during evening peak raised substantially. Power from DAM had to be purchased at Rs.7.91 per unit to

meet the increasing peak demand in Kerala.

The Monsoon rainfall and inflow improved by the end of August, The power from run-of-river reservoirs available for the whole day in September and consequently the power purchase and availing URS power for conserving water was dropped to bring down the average purchase cost. The monsoon deficit in June and July has been partially compensated by rain fall in the latter half of August and September. The BKPL liquid thermal station was allowed to inject power to the grid to exhaust remaining fuel stock as directed by the Hon High Court. The Rajiv Gandhi Combined Power Plant (RGCCPP) in Kayamkulam was operated for two days in August because of acute power shortage caused by reduction in CGS power availability and ER-SR corridor constrains.

There were, however, surplus energy available during the rest of the year on account of excess rainfall received from August end, low demand during night off peak hours and holidays, availability power consequent to the opertionalisation of LT A(DBFOO) in October 2017 (427.5MW) and availability of full power from Koodamkulam Atomic Power plant. Full availability of power from Koodamkulam was offered for sale in DAM. There was power swap arrangement with Haryana to give back the power received during day time of summer period of 2018 during the monsoon period of 2018 Occasional showers received during summer had caused a lower manageable summer demand.

The total internal generation of Kerala system during the year was 5963.89 MU and consumption was 24388.72MU.The highest consumption of 79.2574.4401MU was recorded on 28.03.18. The Maximum Demand recorded during this year was 3884MW on 27.03.2018, between 21:30 to 22:00 hrs. The total energy consumption for the FY17-18 was 24388.72 MU, 2.4% higher than previous year.

Thus careful system operation during the year had resulted in bringing the overall power purchase cost. The details of monthly Power Purchase and Sales through power exchanges during FY 2017-18 are given below:

Power Purchase and Sales in Exchanges						
	Purchase			Sale		
Month	MU	Amount (Rs)	Rate (Rs/unit)	MU	Amount (Rs)	Rate in Rs/unit
Apr-17	118.67	396314562	3.34	0.00	0	
May-17	127.88	419666625	3.28	0.00	0	
Jun-17	38.66	116298119	3.01	-0.37	-938251	2.57
Jul-17	96.41	298238353	3.09	-0.20	-475951	2.38
Aug-17	192.28	727634476	3.78	0.00	0	
Sep-17	51.60	284042368	5.50	-0.06	-224679	3.83

Oct-17	13.92	76070732	5.46	-19.63	-79289177	4.04
Nov-17	1.04	4023520	3.87	-0.96	-3656809	3.82
Dec-17	1.65	6650545	4.02	-8.30	-32223124	3.88
Jan-18	0.00	0		-36.58	-161530280	4.42
Feb-18	0.23	1000027	4.28	-32.58	-150597690	4.62
Mar-18	13.87	73401739	5.29	-16.83	-75834251	4.50
Total	**656.23**	**2403341067**	**3.66**	**-115.51**	**-504770213**	**4.37**

PSDF Projects: Six projects undertaken during the period under the Power System Development Fund Scheme (PSDF) (1) Renovation and Upgradation of protection system of substations, (2) implementation of Automatic Demand Management Scheme (ADMS), (3) construction of 400/220 KV Multicircuit/Multi voltage transmission line from Madakkathara to Areacode, (4) Uprating Kakkaram-Nallalam 110KV line (45Km) and Upgradation of Nallalam-Chevayur-westhill-Koyilandi 110KV single circuit line to Double circuit line (32Km) (5) Renovation and upgradation of switchyard equipments, AGC systems for major Generating stations, AMR and associated works of KSEBL and (6) Reliable Communication and data acquisition system upto 110KV substations in Kerala. The first work, 'Upgradation_and renovation of 400kV and 220kV sub stations in Kerala is now nearing completion of accounts. Ninety Percent (90%) of the project cost (Rs. 91.46 Cr) amounting to Rs 82.31 Cr is provided as grant for the schemes, out of which Rs. 44.95 Cr (54.61%) has been received till the year end. The status of the projects is given in the table below:

Status of PSDF Schemes as on 31.03.2018

No	Scheme	Estimate (Rs Cr)	Estimate Accepted (Rs Cr)	MPO Sanction	Grant Approved (Rs Cr)	Grant Released (Rs Cr)	Progress
1	Renovation of Protection system of 220 kV substations	97.90	91.46	31.12.2014.	82.31 (90%)	44.951 (56.41%)	Nearing completion.
2	Implementation of Automatic Demand Management Scheme	6.03	5.30	02.01.2017	4.77 (90%)	0.477 (10%)	Issued LOA
3	400/220 KV Multicircuit/ Multivoltage Transmission line form madakkathara to Areekode. (Transgrid North-I)	371.03	371.03	16.05.2017.	333.93 (90%)	100.18 (30%)	Work awarded
4	Up-rating Kakkayam-Nallalam 110 KV line (45 km) & Upgrading Nallalam-Koyilandy 110 KV Single Circuit to Double Circuit (32Km) (Transgrid North-II)	89.13	89.13	16.05.2017	66.85 (75%)	16.670 (30%)	Work awarded
5	Renovation of Switchyard Equipments, AGC in Gen stations, AMR and associated works	33.68	22.42	15.11.2017	20.18 (90%)		Tendering Stage
6	Reliable Communication and data acquisition system up to 110 KV Sub stations in Kerala (OPGW)	185.34	147.52	15.11.2017	73.76 (50%)		Tendering Stage

Total	783.11	726.86	581.80	162.278

The status of other works which are tendered are given below:

No	Work	Estimate (Rs)	Remarks
1	Installation of RTU at Ambalathara 220 kV Substation	36,64,600	E-tendered
2	Circuit Breaker Timing Kit (PET Sub-Dvn TVM)	9,86,000	-do -
3	PDH Equipment	2,31,00,000	-do -
4	RTU for Small Hydro Stations (7 Sets)	68,20,000	-do -
5	ADMS for 322 substations	5,14,45,000	-do -
6	Digital Protection Coupler and PLCC for Kayamkulam transmission scheme and Kanhirode, Ambalathara and Mylatty 220kV substations.	1,03,40,000	-do -

System Operation Circles are responsible for the field activities in the protection, communication, SCADA and meter testing for energy audit. The relay subdivisions under the Circles carry out Various Testing and trouble shooting of transformers, lines and Panels in Sub Stations while the PET subdivisions carry out testing of all the power equipment in Sub Stations for condition monitoring and life assessment. The Meter testing sub divisions carry out the testing of meters in Sub-Stations and Generating Stations and the communication wing maintain the communication network of KSEBL.

3.2.2 Chief Engineers (Transmission)

Transmission Circles are responsible for the construction of substations, transmission lines, transmission capacity addition and the maintenance of existing transmission lines & substations. The jurisdiction of Chief Engineers Transmission South include seven transmission Circles Thiruvananthapuram, Kottarakkara ,Alappuzha, Poovanthuruthu, Thodupuzha, Kalamassery and one Division Pathanamthitta (with ARU) & the jurisdiction of Transmission North include five transmission Circles Trissur ,Palakkad ,Malappuram ,Kozhikkode and Kannur .

Achievement

	Voltage level	Substations commissioned	Lines commissioned
Transmission south	220KV	Kattakkada	Pothencode - Kattakkada DC
	110KV	Erumeli ,Muttam, Veli	TERLS –Veli
			Kanjirappally - Erumeli SC line
	66KV	Maradi, Odakkali	
	33KV	Manimala, Pattor, Attingal Kacheri, Thammanam ,Aryanadu	Nedumangad - Aryanadu (OH +UG),
			Kaloor Thammanam UG cable
			Attingal - Kacheri UG Cable
			Medical College, TVM - Pattoor 33 kV SC UG
			Ranni -Manimala 33 kV SC line
Transmission North	220KV	Solar park Ambalathara	LILO of Kanhirode - Mylatty
	110KV	Kinaloor, Manjeri,	Meppayur – Koyilandy
			LILO of Kakkayam-Chevayur line to

		Valiyavelicham	Kinaloor
			Malappuram- Manjeri
			Kubanur - Traction Uppala SC UG 3x300 Sq mm
			Kuthuparamba - Nedumpoil
	66KV	Cyberpark	LILO Nallalam - Kuttikkattoor to Cyber Park

The substations and Lines under construction are given in the Table below

Substations			
	110KV	**66KV**	**33KV**
1	Sreekantapuram Upgn.	Enathu	Rajapuram
2	Kodungallur Upg.	Kattanam Upgn.	Veliyambra
3	Nedumpoil Upg.	Tripunithura	Kelakam
4	Veli Upgn.		Olavakode
5	Muttathara		Blangad
6	Vizhinjam Upgn.		Pothukallu
7	Neyyattinkara Upgn.		Vilakulam
8	Balaramapuram Upgn.		Vydyuthi Bhavanam,TVM
9	Karunagappally upgradation		Pandalam
10	Mundakkayam		Perumthenaruvi
11	Koothattukulam		Kalarcode
12	Eramallur		Kumili
13	Mala Upgn.		Vandanmedu
14	Cherai		Marayoor
15	Manjeri Upgn.		Thammanam
16	Valiavelicham		Pattoor
			Katchery

Lines				
	220 KV	**110KV**	**66KV**	**33KV**
1	LILO from Madakkathara - Areacode line	Malappuram-Tirur 2nd ckt	Nilambur-Edakkara 2nd ckt	Belur-Rajapuram SC line
2	220/110 KV Kattakada-Balaramapuram-Vizhinjam MC+DC line	110KV Ramapuram-Melattur 2nd ckt		Medicall College-Vydyuthi Bhavanam UG cable
3		Malaparamba-Ramapuram MC(4) line		Varkala -Vilakulam SC line
4		Vidyanagar-Seethagoli-Kubanoor doubling		Edappon-Pandalam SC line
5		Mundayad- Chovva 2nd Ckt		Punnapra-Kalarcode SC
6		Paruthippara-Veli and PPRA-TERLS-Veli lines (Upgn)		Vennakkara-Olavakkode SC line
7		Balaramapuram-Vizhinjam		Adyanpara-Pothukallu SC line
8		Neyattinkara-Thirumala DC line (upgn.)		Nedumpoil-Kelakom SC line
9		Kanjirappally-Mundakkayam DC line (upgn.)		Perunthenaruvi-Ranni Perunad UG cable and Mukkom-Ranni OH line
10		Manjeri-Nilambur DC line (upgn.)		
11		Kuthuparamba-Nedumpoil DC line		

		(upgn.)		
12		Malaparamba-Ramapuram MC (4) line		
13		Ramapuram-Melattur 2nd ckt.		
14		Malappuram-Tirur 2nd ckt.		
15		110kV MC (4) LILO from 220kV S/s, Ambalathara to Kanhangad-Cheruvathur line		
16		Mannom-cherai line (LILO of Edayar- North Parur		

3.2.3 Power System Engineering

This Wing is primarily entrusted with conduct Load flow, short Circuit Studies for assessing feasibility and fault level of Substations and Lines for new Projects and enhancement of existing projects. The preparation and publishing of Single Line Diagram and Geo-referenced Grid Map and collection and analysis of Monthly Operating Review (MOR) of Substations and Generating Stations for monitoring Transformer loading, Health of equipment and take follow up action. This wing also develop and maintain Web based business modules such as Transmission Asset Management System (TrAMS), SoS (offline as well as online), Asset Commissioning and Maintenance System (A-CAMS), Monitoring of LFS and Ground Grid Design Proposals, Project Monitoring, Interruption reporting and analysis, Equipment failure reporting and analysis, Protective Device Management system etc. Matters relate to CEA, SRPC, TCC, CERC and other Central and Southern Regional Forums are also handled by PSE wing.

During FY 2017-18, PSE wing had conducted 53 Load flow studies, 30 earth mat design works, System Fault study in addition to the reactive power study and Loss studies at various voltage levels. This wing has invited tenders for drone based line monitoring and maintenance and corporate support function for the TransGrid 2.0 Project.

3.3. DISTRIBUTION SBU

The Distribution Strategic Business Unit is headed by the Director (Distribution & IT). The Licensed Distribution area of the Company are organised in to four regions and these regions are lead by Chief Engineer-Distribution (South), Chief Engineer-Distribution (Central), Chief Engineer Distribution (North), Chief Engineer Distribution (North Malabar). The Distribution SBU manages distribution of electricity business in the State other than in other Licensees' areas. The activities of the SBU include construction, operation and maintenance of distribution network upto a voltage level of 11 kV (22 kV Distribution also is in existence in some part of Palakkad District). It is directly supplying electricity to 99% of the consumers in the State (123 lakh consumers as on March 2018). IT initiatives of KSEB and matters related to Customer Relations headed by Chief Engineer (IT&CR) are also undertaken by this SBU. A brief summary of

activities and achievements of this SBU are given below:

Description	Achievement			
	South	Central	North	North Malabar Total
No. of service connections effected	80,028	96,127	1,13,007	64,480 353642
No. of street lights installed	1754	2017	811	368 4950
11 kV line constructed (km)	518	513	474	239 1744
LT line constructed (km)	923	765	777	665 3130
No. of distribution transformers installed(Nos.)	493	645	868	347 2353
Meter replacement (Nos)	2,92,552	3,96,775	3,70,311	1,77,472 1237110
HT re-conductoring (C.Km)	358	188	251	153 950
LT re-conductoring (C.Km)	4,038	2610	2249	983 9880
1Phase to 3Phase Conversion (km)	**387**	**308**	**537**	**250 1478**

The State achieved total electrification of all households in the year at an estimated cost of Rs.174 Cr which were shared by KSEB and various state Government department and agencies.

Major hurdles in achieving the target were obtaining forest clearance for construction of electric lines through forest to provide electricity to inhabitants residing inside forests and clearing objections from property owners in case of stringing lines through their properties. There were a large number of unwired households and house wiring was not in the scope of the project. However, it was later decided to wire BPL or ST households anticipating CSR funds from central and state PSUs. Also, various associations of officers and trade unions in KSEB as well as employees of various offices have taken efforts to complete the internal wiring for a considerable number of houses.

To achieve the goal Total Electrification, KSEB constructed 65 km 11kV Overhead line, 40 km 11kV Underground cable, 3040 km LT line, 39 km LT Underground cable and installed 21 Transformers. The efforts included electrification of remote colonies such as Idamalakudy, Aryanad, Ponginchuvadu, Rosemala, Arekkapu, etc as well where it was virtually impossible to transport men and materials due to non-existence of access roads and adverse geographical terrain. Around 1,600 households were electrified through DDG projects jointly by KSEB Ltd, ANERT and EMC as extending distribution mains was not feasible in those areas. A total of 1,50,384 connections have been effected as part of the Total Electrification Project. Thus, through the collective effort of all officials of KSEBL the Total Electrification project was completed as targeted and the state was declared fully electrified on 29.05.2017.

A number of distribution works were carried out in the state during the year using funds released by Members of Parliament, MLA Local Development Fund and the Kerala Development Scheme fund of Local bodies.

CENTRALLY AIDED PROJECTS such as RAPDRP, IPDS, DDUGJY (except the IT part) and any other such projects announced by the Ministry of Power, Govt. of India, are coordinated and carried out by a separate office, lead by a Deputy Chief Engineer. Corporate project management activities such as Obtaining sanction for DPR, following up through the implementation stages, monitoring progress, co-ordination with the nodal agencies appointed by GoI, facilitating for the timely funding requirement, and all coordinating efforts till the closure of scheme are being carried out from the Centrally Aided Projects (CAP) Department.

The Restructured Accelerated Power Development and Reforms Programme (R-APDRP) – Part B is one such Centrally Aided Project aims to achieve sustained distribution loss reduction. For Kerala, 43 schemes were sanctioned under this scheme at a cost of Rs. 1078.3 Cr. The 25% of the sanctioned amount is given by MoP as loan, balance 75% has to be raised by the utility as loan or own fund. Upto 50% of the scheme cost will be converted to grant on successful completion of the scheme by reducing the AT&C loss to 15% or below and sustained it for a period of 5 years. KSEB has availed the 75 % counterpart loan from M/s REC Ltd.

The Scope of Work include drawing 11 KV OH lines, laying 11 KV UG Cable, Reconductoring of 11 KV lines, installation of new and capacity enhancement of distribution transformers, drawing LT lines, Reconductoring, conversion of LT lines, Installing Streetlight meters with controllers, Replacing faulty and mechanical meters with electrostatic meters, Drawing LT and HT Arial Bunched Cables, Installing Ring Main Units.

The Works in the 40 towns with a total outlay of Rs.530.7 Cr are being done departmentally by KSEBL. For the three city schemes viz. Thiruvananthapuram, Kozhikode & Kochi, with a total outlay of Rs.547.5 Cr, work is being done on turnkey basis through contractors. The details are given below.

No	City	Project Cost (Rs. Cr)	Contractor	Amount (Rs. Cr)
	Thiruvananthapuram	178.77	M/s Leena Powertech, Mumbai	201.09 (20.81% above PAC)
2	Kochi	207.96	M/s NCC, Hyderabad	243.97 (15.13% above PAC)
3	Kozhikode	160.78	M/s L&T Ltd, Chennai	198.54 (15.06% above PAC)

Thirty eight (38) Schemes have been closed and the closure proposal has been submitted to PFC. The closure of balance 5 schemes are being carried out. This is shown in the table below.

No	Name of Project	Sanctioned Cost (Rs Cr)	Cost at closure (Rs Cr)	PFC Loan received (15%) (Rs Cr)	Balance Loan from PFC (10%) (Rs Cr)	Total Amount from PFC (25%) (Rs Cr)	Loan received from REC (Rs Cr)
1	35 Town Schemes	373.38	400.3794	56.0055	36.3915	92.397	231.2533
2	3 City schemes	547.51	599.388	82.1265	54.751	136.8775	341.4242
	Total	920.89	999.7674	138.132	91.1425	229.274	572.6775
3	Remaining 5 schemes	157.415	103.4	23.6081	2.2419	25.85	70.28709
4	**Grant Total**	**1078.305**	**1103.167**	**161.740**	**93.3844**	**255.124**	**642.9645**

The Integrated Power Development Scheme (*IPDS)* is another scheme launched by *Ministry* of Power (MoP) in September 2015 providing financial assistance for improving the sub-transmission and distribution networks in urban and semi-urban area. The scheme envisages installation of net-metered solar panels and smart meters. The Power Finance Corporation (PFC) is the Nodal Agency for this scheme. Sixty Percent (60%) of the project cost is provided as Grant, 10% shall be the utility own fund, balance 30% can be either loan or own fund of the utility. The earlier RAPDRP scheme has been subsumed in the new scheme.

An amount of Rs. 592.07 Cr have been sanctioned by the MoP for IPDS Kerala on 15.6.2016, for 63 towns under 25 Circles. DPR for the works have been sanctioned. The Solar turnkey projects have already been started. The project had to be completed by December 2018. About Rs 107.41 Cr has been received from MoP as on 31.3.2018. The details of progress are given in the table below.

No	Major item of work	Unit	Sanction	Achievement**
1	New Substation	Nos	3	0
2	33/11KV Additional transformer	Nos.	2	0
3	Capacity enhancement	Nos.	13	2
4	R&M of 33/11KV S/S	Nos.	53	2
5	33KV New feeders	Km	8	0
6	11KV New feeders	Km	327	52
7	HT/LT ABC	Km	1134	0
8	Distribution Transformer*	Nos.	1211	22
9	LT line	Km	215	18
10	UG Cable	Km	192	11
10	Consumer metering	Nos.	522587	287468
12	Feeder/DT meter	Nos.	2919	19
13	Solar Panel	KWp	5475	3870

**** Installation and Capacity Enhancement***
***** as on 31.3.18***

DeenDayal Upadhyaya Gram Jyothi Yojana (DDUGJY), launched by Govt. of India exclusively for rural area for Providing electricity to all rural households, 24X7 power, AT&C loss reduction, executing works in the Villages selected by MPs under Sansad Adarsh Gram Yojana (SAGY). The project period is 30 months. Government of India provides 60% of the Fund as Grant. For the balance, 30 % is Loan and 10% Utility Contribution.

The Monitoring Committee, MoP, GoI sanctioned a total amount of Rs. 485.37 Cr for implementing DDUGJY in Kerala on 05.01.2016. The Work include 33kv Substations, 33kV line, 11kV line, Distribution transformers, HT & LT lines, replacement of energy meters, BPL service connections etc. GoI has also permitted to re-allocate Rs. 100 Cr from metering component of the project to the Rural Electrification component. So far, a grant of Rs 173.85 Cr has been received from government grant. Utility contribution is Rs. 48.296 Cr, Loan amount is Rs. 19.764 Cr. The total amount spent is Rs. 163.12 Cr. The Works under DDUGJY are being executed departmentally as per the guidelines issued by REC/MoP. The status of the project as on 31-03-2018 is given below:

DDUGJY: Componentwise sanction and progress

No	Component	Project scope	Amount sanctioned (Rs.Cr)	Progress (Rs.Cr)	%Progress
1	Sansad Adarsh Gram Yojana (SAGY)	Developmental works in the 27 Panchayaths selected by MPs	59.14	23.17	39.18
2	Metering	Replacing 1778944 faulty/electro mechanical meters, transformer/11 KV feeder metering etc.	159.16	69.13	43.43%
3	Connecting unconnected Rural house holds	98527 BPL connection along with infrastructure works	181.6	118.02	64.99%

CONSUMER GRIEVANCE REDRESSAL FORUMS has been constituted by KSEBL as per regulation of the State Electricity Regulatory Commission. The forum has independent powers to issue orders in respect of grievances presented before the forum by consumers. The details of complaints received, settled and pending for disposal in three CGRFs are given below.

Item	South	Central	North	Total
Complaints received	286	172	282	740
Complaints settled	247	99	224	570
Complaints to be settled	39	73	58	170

Information Technology and Customer Care Department is lead by Chief Engineer and is mainly engaged in the automation of the core functional areas of KSEBL, viz. Billing, HR Management System, Accounting, Supply Chain Management etc. The department develops and implements Application software, and provides support services. Mobile application for electricity bill payment, Web application for friends and Akshaya Centres, has been developed in addition to maintenance and integration of accounting software SARAS with HRIS, SCM software.

The RAPDRP Part A-IT Implementation is carried out by the IT&CR department funded by GoI. A Wide Area Network connecting all Electrical Sections, Circles and Divisions were connected to the Data Centre through MPLS

VPN network. A Web Self Services portal provides facilities like e-Payment, bill view, consumption pattern, meter reading history etc. All Electrical Sections are attached to the above website for providing consumer services. Third Party Independent Evaluation Agency (TPIEA) verification was completed and reports are submitted to M/s PFC.

SCADA/DMS Project: Automation of distribution systems is being implemented in Thiruvananthapuram, Ernakulam and Kozhikode Cities. This Project include establishment of Control Centres in these cities for the real time monitoring and control of 11 kV distribution network, Remote terminal units (RTU) in 50 substations, Local Data Monitoring system (LDMS) at substations, Feeder Remote Terminal Units (FRTU) in 2865 Remote Terminal Units (RMU) locations on 11kV feeders and integration with SLDC, ITDC, CCC and DR.

The Centralised Customer Care Services (CCC) is managed by IT Department and had attended 6,27,925 calls at the Call Centre. 2,42,839 complaints were registered through IVRS, 26,588 through WSS and 20,81,148 through CCC-ET. A Total number of 36,268 complaints were registered through the Whats App no 9496001912. A total amount of Rs 66,90,53,446/- was collected in Customer Care Centre through bulk payment, Cash Deposit Machine (CDM) and direct collection at CCC during 2017-18.

Applications for Geographical Information System, Network Analysis, Meter Data Acquisition System, and Energy Audit have been rolled out in all 228 RAPDRP Electrical sections. The distribution networks of all RAPDRP towns are available on GIS. Incremental update of assets is being done. Remote meter readings are received in the server systems in Data Center from all RAPDRP towns. Energy audit reports of these towns are also generated. In addition, various other IT projects are given below:

No	Application / Projects	Status
1	Mobile applications for employees and consumers	Deployed
2	KPI Monitoring	Deployed
3	Management Information System	Deployed
4	Management Information System	Final Testing
5	PDA Implementation	Deployed
6	Facility Management Services(FMS)-	Deployed
7	Urja sowhrida, Billing Information system	Deployed
8	Urjadooth, Outage Management sytem	Deployed
9	Rural Feeder Monitoring	In Progress
10	SMART, Safety Application	deployed
11	Project Monitoring Software (Promos)	Deployed
12	Permit to Work management System	Beta Testing
13	IPDS Incremental IT (21 Towns)	Tendering stage
14	ERP Implementation	Tendering stage
15	Smart Meter for above 500 Unit consumers	Work Awarded
16	Smart Meter for above 200 Unit consumers (Uday)	Retendered
17	E-Payment facility	Deployed
18	E-tendering done	for Rs 2597 Cr
19	Smart City/Smart Grid project:	DPR submitted
20	Asset Data Software development	In progress

Achievements: KSEB received 'Smart Infrastructure Innovation Award' from Indian Express Group in November 2017 for Open Source platform based

applications and a special honour from REC for 'Urja Mitra' the Outage Management System.

3.4. HUMAN RESOURCES MANAGEMENT

The Chief Engineer (HRM) heads and manages the Human Resources activities for the company. The company has 33808 regular employees as on 31-03-2018, (Generation SBU: 1796, Transmission SBU: 3335, Distribution SBU: 27510 and Corporate Office: 1167). The department carries out HR functions such as (1) appointment of employees and apprentices (2) training, posting and transfer and promotion of employees (3) disbursement of salary, allowances and benefits and (4) disbursement of Terminal benefits and pension.

Activities during the year are summarized and given as below:

No	Activity	Quantum
1	Recruitment through KPSC	431
2	Selected for Compassionate appointment	57
3	Sport Quota appointment	20
4	Appointed by Court Order	8
5	Paid apprentices appointed	756
6	Unpaid apprentices appointed	1206
7	Promotions(up to the rank of AEE/AAO)	2325
8	Vacancies reported to KPSC	822
9	New Pension Claims	540
10	Disbursement of Pensions	2764
11	PRAN card processed	1404
12	NPS contribution paid (Rs Cr)	25.69
13	Officers deputed for foreign training	14
14	Officers deputed outside state	171
15	Employees Trained in own institutes	19578
16	National Training Programmmes (with REC)	110
17	Employees Trained in National Programme	2554
18	National Training Programme conducted	16
19	Employees Trained (PFC National Programme)	429

HRD Cell co-ordinate training activities of Power Engineers Training and Research Centre (PETARC) at Moolamattom, four Regional Power Training Institutes and Southern Region Computer Training Center at Thiruvananthapuram. PETARC is a CEA recognised Category -1 training centre. A training policy has been formulated and implemented from April 2017 for the proper functioning of the training programmes.

The Board had constituted a committee for formulating a training policy as

per the National Training Policy 2012 issued by Department of Personnel & Training (Training Division), Ministry of Personnel, Government of India and National Training Policy for the power sector issued by the Ministry of Power for the proper functioning of the training programmes.

National Training programme to the C&D employees (Sub Engineer, Senior Assistant, Cashier, Overseer, Lineman, Meter Reader, Electricity Worker etc.) with the financial assistance of Ministry of Power, Government of India **–** aims to improve the overall performance of the employees who have more interfaces with the customers. KSEBL has executed MoU with REC-CIRE, the nodal agency for implementing the programme. Accordingly 542 linemen were trained by conducting 23 programmes, 163 Senior Assistants were trained by conducting 8 programmes. 140 Sub Engineers were trained by conducting 6 programmes, 43 Meter Readers were trained by conducting 2 programmes 56 Overseers were trained by 3 programmes and 1610 Electricity Workers were trained by conducting 68 programmes etc.

Ministry of Power, Govt. of India has launched Integrated Power Development Scheme (IPDS) as its priority program for the urban power distribution sector. KSEBL has executed MoU with Power Finance Corporation Limited (PFC), the Nodal Agency for implementation of this scheme. Accordingly 290 Sub Engineers were trained by conducting 11 programmes and 139 Overseers were trained by 5 conducting 5 programmes generating income of 31.66 lakhs.

SMART 'e- Initiatives'– conducted Training of Trainers. A module for promoting on line applications popular among KSEBL customers and imparted to **104** Trainers.

R-APDRP Project modules – Training is given to the end users on various project modules such as MDAS, GIS, EA & NA. In co- ordination with Bureau of Energy Efficiency capacity Development programmes in DSM and Energy Efficiency were conducted for 160 middle level field officers in Distribution Department.

A completely funded training programme by ANERT on Solar Roof Top Power Plant were conducted for Engineers/ Technicians/ Supervisors (field level functionaries) of KSEBL at four Regional Power Training Institutes. Around 1960 employees participated in that training programme. This has brought a revenue of Rs.17,00,000/-(Rupees Seventeen Lakhs Only) from 17 programmes conducted at 4 RPTIs, to KSEBL during 2017-18. Also KSEBL had acted as a facilitator to three other institutions of the state in conducting 21 programmes on the above topic. This also brought a revenue of Rs.2,10,000/- (Rupees Two Lakhs Ten Thousand Only) from 21 programmes @ Rs.10,000/- per programme to KSEBL during 2017-18.

Training were arranged in co ordination with the Commissionerate of Taxes to create awareness in GST among technical and Non Technical officers/ Employees in KSEBL.

Several training sessions were conducted in "Common Emergencies with

First Aid" in view of work situations prevailing in KSEBL and also in the view of helping Public in the case of emergencies.

Many Educational Institutions and students from Professional Colleges have identified KSEBL for undergoing their Project work/Research Work/Industrial Training/Industrial Visit etc. Accordingly 96 students from various educational institutions have undergone their project work and 4883 students have undergone their industrial training in various Power Houses, Substations and Field Offices of KSEBL. An amount of Rs.47,30,500/-(Rupees Forty Seven Lakh Thirty Thousand Five Hundred Only) had been generated from these activities during 2017-18. In addition to the above, SRCTC gives opportunity to external trainees (Government Employees) for attending various training programmes on common subjects as part of business development plan of HRD.

The abstract of training programmes conducted during the year is furnished below.
An amount of Rs. 3,05,97,976/- has been spent towards the training and non-training expenditure during the year 2017-2018.

1	RPTI Trivandrum	115	2819	227	5552	1820378	194491	2014869
2	RPTI Kottayam	178	4621	372	10135	2828053	1264403	4092456
3	RPTI Thrissur	152	5049	357	11477	3051826	882348	3934174
4	RPTI Kozhikode	160	4386	359	9744	2719105	261528	2980633
5	PETARC	55	1933	285	16009	4494442	9932860	14427302
6	HRD External (Outside State)	46	129	201	676	2397314	9090	2406404
7	HRD Internal (Inside State)	19	171	32	205	406460	0	406460
8	SRCTC	23	756	37	2264	335678	0	335678
	Total	**748**	**19864**	**1869**	**56062**	**18053256**	**12544720**	**30597976**

3.5. BOARD SECRETARIAT

The Secretary (Administration) is the authorized representative of the Board for the general administration and legal matters and is delegated with powers to issue orders and sign Vakalaths on behalf of the Board of Directors. The Secretary is assisted by Deputy Secretary (Administration). Resident Engineer (New Delhi) & Assistant Engineer (Vehicle Monitoring cell) report to Secretary Administration. The main functions and responsibilities of this office is summarized below:

The Establishment Office (1) deals with personnel matters such as appointments, posting, transfers leave sanction , disciplinary action, pension matters of senior officers (2) correspond with Public Service Commission and Government relating appointments and recruitments (3) Clearing of audit paras regarding Board Orders, (4) Submission of answers to Legislative Assembly, Rajya

Sabha, Lok Sabha, Questions and Compilations of reports to various selected Subject Committees and (5) Account rendering of Corporate offices.

The Resident Engineer, New Delhi is responsible for liaison with Central Government ministries and Agencies, coordination and conducting cases before Hon Supreme Court and other legal fora, such as APTEL, CERC etc and act as a protocol officer and inspection officer for testing of materials. During the year Resident Engineer witnessed about 35Nos of material inspections at various locations apart from the regular liaisoning works and Protocol works.

The Vehicle Monitoring Cell is responsible for purchase of new vehicles, custody, maintenance, operation of company vehicles and management of contract vehicles.

3.6. SAFETY DEPARTMENT

Chief Safety Commissioner in the rank of Chief Engineer is the head of Safety Department. The mission of the Safety Department is to maintain a persistent and systematic safety culture in the organization to reduce the accidents to zero level. The main functions of safety department include preparation and implementation of a safety policy, safe work procedures, standardization of safety equipments and purchase, imparting safety training, conducting periodical inspections and audit, conducting safety committee meetings, inspection, analysis and reporting of accidents, liaison with electrical inspectorate, Fire and safety Department etc.

To minimize the accidents from Board's installations, the year 2018 declared as "ZERO ACCIDENT YEAR". It was decided to do way with chain earthing and implement equipotential bonding for safety at work place by using earth discharge rods / earth discharge rods with shorting clamps. The Permit To Work (PTW) was modified by developing a system of issuing work authorization and permit to work in an electronic platform; preferably, smart phone compatible, to ensure more safety in distribution works. The department developed prototypes of two innovative safety equipments such as Non-Contact Hazardous voltage detector, ACSR Detector on experimental basis by using innovative effort of board staff.

3.7. SUPPLY CHAIN MANAGEMENT DEPARTMENT

The Supply Chain Management Department is headed by Chief Engineer (SCM) and reports to Director (Corporate Planning, Gen-Ele, SCM & Safety). The department is responsible for preparation of yearly Purchase Plan, procurement of Centralized distribution and transmission materials and raw materials required for the fabrication of line materials, allocation and monitoring and review of flow of materials.

During the year, 82 Tenders were invited and 259 purchase orders worth Rs. 695.53 Cr were issued. Materials worth Rs 898.62 Cr and Rs 102.84 Cr were required for completion of targeted works. Request for Vendor Registration was invited for 24

distribution materials and 20 transmission materials on 16.02.2017 and a total of 74 firms were registered as Vendors for 79 items. Store Verification Unit verified stocks in 25 Sub Regional Stores, 3 Manufacturing facilities, 5 TMR Stores, one Transmission Division Store and 4 Generation Circle Stores. An amount of Rs.27.51 Cr was realized through sale of Scrap Materials. A Procurement manual was released for regulating procurement process.

3.8 RENEWABLE ENERGY AND ENERGY SAVINGS DEPARTMENT

Renewable energy &Energy savings is headed by Chief Engineer (Renewable Energy and Energy savings) reports to Director (CP,GE,SCM&Safety). The activities of the department are carried out by Projects wing, ESCOT (Energy Service Co-ordination Team), Innovation wing and include

- Installation of Roof top and ground mounted solar projects in KSEBL, Government Land and buildings, Local Self Government Departments and collectorates right from surveying to the execution.
- Project Management Consultancy (PMC) and Engineering Procurement and Construction (EPC) contracts for execution of Energy Saving Projects for clients.
- Energy Auditing Service and Advice on Energy Savings
- Implementation of Energy efficient pumps for agricultural irrigation and dewatering.
- Funding and implementation of innovative power projects devised by young innovators.
- Processing of connectivity and purchase agreement request from private wind and small hydro developers.

The following major projects were undertaken during the year:

1	Implementation of energy loss reduction in Jaladhara/Jalanidhi, drinking water pumping system at Erattupettah municipality with the financial support by EMC
2	Completed the Energy Audit of Govt. Medical college, Thiruvananthapuram
3	Energy Audit of Kerala Science and Technology Planetarium and Museum, Thiruvananthapuram
4	Energy Audit at Kariyavattom University buildings, Thiruvananthapuram is in progress
5	Standardization of Distribution Transformer (DTR) stations- in ES-Adimaly, Rajakkad & Rajakumary by using Government fund
6	(High Voltage Distribution System) HVDS implemented at Konni Electrical Section under ED, Pathanamthitta by using Govt fund
7	Implementation of Energy Audit recommendations of 220 KV Substation Edappon (Replacement of AC, yard lights, fans etc) by using Govt. fund
8	DELP Project cost- distributed 4521241 LED Bulbs during this year to the consumers
9	Vallachira LED Street Light project – completed cost- Rs. 49.36 Lakh
10	Street light project at Alappuzha Municipality
11	e-mobility project-6Nos Mahindra e20 plus electric cars were purchased
12	India’s first 500 KW floating solar PV power project in Banasura Sagar reservoir
13	Capacity addition of wind projects-1 MW(4*250 KW) wind project

	developed by Kosamattom Finance Ltd as IPP added to KSEBL grid.
14	Capacity addition of Small Hydro Electric projects- 8 MW Pathamkayam SHEP developed by M/s MINAR Renewable Energy Projects Pvt Ltd as IPP to KSEBL grid.
15	Energy efficient local water pumping system installed at Erattupettah; 12.5 Hp motor installation (sanctioned Amount- Rs.82,975/-. Work completed.

Completed Solar Projects

No.	Name of the projects	Installed capacity (MW)	Date of completion
1	Thalakkulathoor, Kozhikode	0.65	22.04.2017
2	Roof top of buildings- SBU Transmission (27)	0.910	02/2018
3	Roof top of buildings- SBU Distribution (12)	0.46	21.12.2017
4	Roof top of Vythuthi Bhavanam , Trivandrum	0.03	17.05.2017
5	Manjeshwaram ,Kasargod	0.50	30.05.2017
6	Kuttippuram	0.50	28.11.2017
7	Banasurasagar Reservoir Floating solar	0.50	04.12.2017
8	Pezhayikkapalli-Moovattupuzha	1.25	15.01.2018
9	Pothencode substation	2.00	02.02.2018
10	On grid consumers as on 31.03.2018	15.453	

On-going Solar Projects

No	Name of the project	Installed capacity (MW)	Target for completion
1	Peerumedu , Idukki	0.50	2018-19
2	Ponnani, Malappuram	0.50	2018-19
3	Kottiyam, kollam	0.60	2018-19
4	Ettumanoor, Kottayam	1.00	2018-19
5	Mylatti, Kasargode	1.00	2018-19
6	IPDS- RT KSEBL Bldg(South& Central)	0.445	2018-19
7	IPDS- RT KSEBL Bldg(North)	0.675	LOA cancelled
8.	Medical College, TVPM	1.1	Tendering Stage

Status of ongoing Solar projects (Government buildings) as on 31-03-2018

No.	Name of Work	Target	Capacity (kWp)& locations	Status as on 31-03-2018
1	Kozhikode Dist. Panchayath	18.10.2018	480; 44	Work order issued
2	Kannur Dist. Panchayath	19.10.2018	670; 29	Work order issued
3	Kannur District Panchayath (Ph 2)	31.03.2019	450; 30	DPR Submitted
4	Ernakulam Dist. Panchayath	31.03.2018	130; 13	DPR Submitted
5	Government Institutions	26.08.2018	57.5; 04	Work order

	South*			issued
6	Kinfra Park Thalassery	31.03.2019	130; 02	DPR submitted
7	St.John's HSS, Oliyapuram	31-03-2019	100; 01	DPR submitted
8	Pathanamthitta District Panchayath	31.06.2018	200; 08	DPR Submitted
9	District Collectorate Kozhikode	31-03-2019	100; 01	DPR submitted
10	Puthuppally Grama Panchayath	31-03-2018		Not feasible
11	Kottayam District Panchayath (Ph 2)	31-03-2019	70; 04	Survey completed.
12	Puthuppally Grama Panchayath	31-03-2018		Not feasible.
13	Pangodu Grama Panchayath	31-03-2018		Not feasible.
Total			**2387.5 kWp; 136**	

** NCESS, Attingal Municipality, Kuriyottumala Buffalo Breeding Farm*

3.9. CORPORATE PLANNING DEPARTMENT

The main functions include (1) preparation of Annual Plan, Five Year Plan, Perspective Plan, (2) Liaising with Government on policies, and Corporate matter (3) handling matters related to Central Generating station power allocations, coal block allocation, (4) putting up of new thermal and renewable plants (5) Monitoring of plan progress and reporting, (6) submission of various reports to Board of Directors, Government and external agencies and (7) publication of Annual Reports and Power system Statistics.

During the year, a major initiative to prepare a four year (for FY 2018-22) detailed distribution expansion plan and circle wise detailed project reports was started by constituting dedicated Project Management Units in all the Circle offices. Other activities of this office in the reporting period include, Preparation of Capital investment plan for FY 2018-19 and revised capital investment plan for FY 2017 -18 and submission of project proposals for Rural Infrastructure Development Funding (RIDF) to GoK along with a number of other reports to Government agencies. Delegation of Powers of Executive officers and Full Time Directors revised.

3.10 COMMERCIAL & TARIFF DEPARTMENT

Commercial and Tariff departments are headed by the Dy. Chief Engineer (Commercial & Planning), with full powers of Chief Engineer. Commercial Department is primarily responsible for purchase and sale of excess power. Major functions of Commercial departments are given below:

- Purchase of conventional and renewable power Long, through long, short and medium term competitive Bidding. Sale of surplus power, banking and swapping of power for optimal utilisation of resources. Verification and payment of Power purchase bills.
- Execution of Transmission Service Agreements, Monitoring of transmission corridors, open access power and transactions. Payment of Transmission and other Charges. Collection of energy charges, open access charges, transmission, wheeling charges etc for sale of power to other utilities, traders.

- Settlement of accounts related to energy charges, open access charges, transmission, wheeling charges, trading margins etc related to banking arrangements.
- Providing Technical and Commercial support to legal cell in matters relating to legal disputes.
- Commercial matters related to SRPC/TCC meetings, Standing Committee meetings, LTOA connectivity meetings.

Power Procurement and sale during 2017-18: The following Long and Short Term Power Procurement and Banking and swapping arrangement were made during the year:

No	Supplier	Quantum	From date	Rate	Period	Remarks
1	Jindal Power	150 MW RTC	01-10-2017	Rs 4.29 / kWh	Long Term	By bidding
2	Jhabua Power	100 MW RTC	01-10-2017	Rs. 4.29 / kWh	Long Term	By bidding
3	BALCO	100 MW RTC	01-10-2017	Rs. 4.29 / kWh	Long Term	By Bidding
4	Jinadal India	150 MW RTC	01-10-2017	Rs. 4.29 / kWh	Long Term	By Bidding
5	Ahalya Energy	8.4 MW Wind	22-02-2016	Rs. 5.23 / kwh	Long Term	Wind Power PPA 6.02.2018
6	IREDA	50 MW Solar	15-12-2016	Rs. 3.90 / kWh	Long Term	Interim tariff 50MW wef 09/2018
7	MINAR	8 MW SHP	14-08-2017	Rs. 3.49 / kWh	Long Term	Small Hydro
8	JIndal Power	200 MW RTC	01-03-2017	Rs. 3.08 / kWh	Short Term	Till 30-6-2017
9	Jindal India	100 MW RTC	01-03-2017	Rs. 3.25 / kWh	Short Term	Till 31-05-2017
10	Jindal India	100 MW Peak	01-03-2017	Rs. 3.65 / kWh	Short Term	Till 31-05-2017
11	GMR Energy	100 MW Day	01-11-2017	Power Swapping	Short Term	Till 31-03-2018

The Company started participating in tenders for purchase of power through DEEP portal invited by various Utilities/Discoms in India for the sale of surplus available and has received Letter of Award against two tenders, from Bihar State Power Holding Co. Ltd (BSPHCL) for the supply of power from KSEB Ltd during the months of June, August, September and October 2018 as follows:

No	Buyer	Quantum	From date	To Date	Time	Rate	Remarks
1	BSPHCL	50 MW	01-06-2018	30-06-2018	19:00 -24:00	Rs. 5.95 / kWh	Tender (05-02-18)
2	BSPHCL	100 MW	01-08-2018	31-08-2018	19:00 -24:00	Rs. 6.00 / kWh	Tender (05-02-18)
3	BSPHCL	100 MW	01-09-2018	30-09-2018	19:00 -24:00	Rs. 6.00 / kWh	Tender (05-02-18)
4	BSPHCL	100 MW	01-10-2018	31-10-2018	18:00 -24:00	Rs. 6.50 / kWh	Tender (05-02-18)
5	BSPHCL	100 MW	01-08-2018	31-08-2018	00:00 -06:00	Rs. 4.23 / kWh	Tender (28-03-18)

East Coast Energy Pvt Ltd (ECEPL) with whom KSEB Ltd had executed long term PSA on 02-02-2015 for the supply of 100MW RTC power from 01-10-2017 onwards, failed to achieve their project completion mile stone by 01-10-2017 and to renew their Bank Guarantee for Rs. 40 Cr provided in favour of KSEB Ltd. Hence the BG of Rs. 40 Cr was encashed on 31-01-2018 based on the terms and conditions of the executed PPA.

Tariff and Regulatory Affairs Cell (TRAC), headed by Deputy Chief Engineer, is responsible for preparing and submitting petitions for approval of income and expenses - called Annual Revenue Requirement (ARR), Expected Revenue from Charges (ERC) - and Tariff for various SBUs of the company before the State Regulator. The cell is also responsible for submitting Capital Expenditure Plan, Quarterly Fuel Surcharge Petitions, performance and compliance reports to the Commission. Petitions before various other authorities such as Central Regulatory Commission, Appellate Tribunal, High Court and Supreme Court related to power purchase and tariff are dealt by TRAC. This cell also deals with amendments of the Electricity Act, Rules, Regulations and policies of the Central and state Government and power supply agreements related to licensees within the state. A brief summary of activities carried out by TRAC during FY 2017-18 is given below.

KSERC had notified a new Multi-Year Tariff Regulation for the control period (FY 2013-2017), on 14-11-2014, repealing prevailing regulations. The norms for approval of operation and maintenance expenses were extremely inadequate and would have substantially impaired the financial position of the company. Hence the regulation was challenged before Hon High Court of Kerala (WPC 465/2015). KSEBL, therefore, could not file the ARR, ERC and Tariff petition for the control period as per the challenged regulation. KSERC, however, initiated suo-moto determination of Tariff (22-06-2016). KSEBL had submitted substantial details, the Commission had only considered partially for the tariff order issued on 17-04-2017. Since the case was pending before the Hon'ble High Court, no ARR, ERC and Tariff petition could be filed during 2017-18.

Petitions, counter affidavits, comments and reports were filed before KSERC by TRAC during the year are briefly listed below:

No	Subject	Remarks
1	Fuel Surcharge Petition	First and Second Quarter FY 2017-18
2	Capital Investment plan approval	FY 2017-18
3	Ajatha Color Lab Tariff	Compliance of HC order
4	Approval of Swapping of Power	
5	Approval of SHR for billing by Jhabua Power	
6	Approval of One-Time Settlement Scheme	
7	Approval of Cost Estimate of Distribution Works	(FY 2017-18)
8	Determination of Tariff for Sabarimala Season	(FY2017-18)

9	Disputes with Maithon Power	For Adjudication
10	Truing Up Petitions	(FY 2011-12, FY 2012-13 &FY 2013-14)
11	Draft Tariff Regulations, 2017	
12	State Advisory Committee Agenda	
13	KMRL Tariff	Petition by KMRL
14	Tariff Re-categorisation	Petition by HPLC
15	Non-Payment of Energy injected	By INDSIL
16	Hybrid Solar Inverter connectivity	By Mar
17	Enforce Purchase of Wind Power	By INOX
18	Solar Park Tariff (50 MW)	By IREDA
19	10 MW MSW at Brahmapuram	By Kochi Corporation
20	Taking over of BKPCL Plant by KSEB	By BSES Power
21	True-up Petition of 5 Dist Licensees	
22	Revised ARR&ERC of 2 Licensees	Info Park and Rubber Park
23	Capex (FY) of 2 Licensees	Info Park and Rubber Park
24	Anakampoil Power	by Anakampoil Pvt. Ltd
25	Supply Code (2014) amendment	Before Code Review Panel
26	Compliance of Directives	Tariff Order 17-04-2017
27	Quarterly Performance	All Quarters (FY 2017-18)
28	Approval of DBFOO PSAs	
29	RE Sharing with Southern states	For Agreement Approval
30	Interim Order in CIAL Case	

Seven Petitions and Counter affidavits filed before the Central Electricity Regulatory Commission (CERC). Eight Appeals were filed before Appellate Tribunal for Electricity (APTEL) during the year.

3.11 FINANCE AND ACCOUNTS DEPARTMENT

The Finance and Accounts Department headed by the Financial Advisor & Chief Financial Officer, undertakes the company financial management, viz., long term and short term resource mobilization, working capital management, investment management, Financial planning, budgeting and budgetary control, cash flow management, corporate banking and treasury management. The FA & CFO being adviser to the company also gives advice on finance and contractual matters of the company. This office prepares the accounts of the Board as a whole in addition to the Budget of the company.

The following table shows the revenue earned by the company from sale of power and other income during the period from 2012-13 to 2017-18

Particulars	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Energy Sales within state (MU)	16838.24	17454.04	18426.27	19325.07	20038.25	20880.71
Outside state (MU)	0	1414.6	369.17	53.48	49.30	117.51
Total sales (MU)	16838.24	17454.04	19178.96	19378.55	20087.55	20998.22
Income from tariff (Rs.Cr)	7223.39	9974.17	10116.26	10487.7	11036.78	12057.26
Non tariff Income (Rs. Cr.)	435.80	571.30	296.61	759.44	582.82	608.19
Total (Rs. Cr)	**7659.19**	**10545.47**	**10412.87**	**11247.14**	**11619.6**	**12665.45**

The Increase in revenue from tariff and non tariff income in 2017-18 was

caused by factors such as (1) yearly Increase in the sale of energy, (b) efficiency gain in Revenue Collection (c) Intensification of anti power theft activities (d) Reduction in commercial losses and (e) improvement in non tariff income and Tariff revision with effect from 18.04.2017.

The statement of profit and loss (Rs Cr) for the financial year 2017-18 (provisional) is shown below.

Year	Revenue Operation	Other income	Total Revenue	Total Expenditure	Prior-period credit/(Charges)	Profit/Loss (Loss)
2017-18	**12318.17**	**347.28**	**12665.45**	**13449.54**	**-**	**(784.09)**

Salient features of provisional Annual Statement of Accounts for 2017-18 are given below.

- Total income for the year 2017-18 is Rs. 12665.45 Cr and the expenditure is Rs. 13449.54 Cr. The profit and Loss account recorded a Loss of Rs. 784.09 Cr for the Year.
- The company had borrowed Rs.5650.13 Cr and repaid Rs.5595.21 Cr during the year as against Rs. 5909.19 Cr and repayment of Rs. 3238.27 Cr during previous year. The total outstanding long term loan (provisional) was Rs. 6479.34 Cr at the year end.

The profit and Loss account and Balance sheet for the year are given in Annexure-6 and Annexure - 7 respectively.

3.12. SPECIAL OFFICER (REVENUE)

The billing and collection monitoring of 5666 High tension and Extra High Tension consumers, Licensees etc and allied works are carried out by the office of Special Officer (Revenue). SOR directly reports to Director (Finance). Activities of this office are (1) Monthly revenue billing and allied works of HT/EHT consumers, licensees, captive power plants and railway traction, (2) Monthly billing of interstate wheeling charges and reactive energy charges, (3) Collection of Security deposit and additional Security deposit and its interest adjustments and accounting, (4) Issuance of disconnection/reconnection notice to defaulters and (5) follow up of revenue recovery and court cases pending before various courts/other forums.

During the financial year 2017-18, an arrear amount of Rs.30.46 Cr with Principal amount of Rs.29.90 Cr and Interest amount of Rs. 55.44 Lakhs had been collected through One Time Settlement Scheme. Details of HT, EHT Consumers and Licensee with consumption are provided below.

HT/EHT/Licensee Consumption		
Tariff Category	**Consumers ***	**Yearly Consumption (kWh)**
EHT (GENERAL)		5138858
EHT (GENERAL) (A)	2	11178250
EHT (GENERAL) (B)	3	53820281
EHT I (66KV) INDUSTRIAL	15	421652436
EHT II (110 kV) INDUSTRIAL	20	753413367
EHT II (110 KV) RT	12	265803713
EHT III (220 KV) INDUSTRIAL	1	92160668
EHT TOTAL	**53**	**1603167573**
HT I (A) INDUSTRIAL	2130	2073904679
HT I (B) INDUSTRIAL	22	12278242
HT II (A) GENERAL	303	174025197
HT II (B) GENERAL	1012	591315419
HT III (A) AGRICULTURE	50	7516889
HT III (B) AGRICULTURE	9	2094131
HT IV (COMMERCIAL)	1937	645628194
HT V (DOMESTIC)	99	14954666
HT Total	**5562**	**3521717417**
Licensee : Other State 110 KV	2	30902746
Licensee : CPT	2	34545000
Licensee : CSEZ	1	55741800
Licensee : KDHPCL	1	52401667
Licensee : KPUPL	3	82465194
Licensee : MES	32	71404820
Licensee : RPL	1	30205578
Licensee : Technopark	2	86257425
Licensee : Thrissur Corporation	2	154691112
Licensee : Infopark, Cherthala	2	7425170
Licensee : SMART CITY	1	2729043
Licensee Total	**49**	**608769555**
KMRL (Kochi Metro Rail Ltd)	**2**	**14739465**
Grand Total	**5666**	**5748394010**

(on 31-03-2018)

3.13. INTERNAL AUDIT DEPARTMENT

Internal Audit Department performs post audit, pre audit and pre-check functions through various offices in corporate office and 23 Regional Audit Offices. There are three pre check units at Kothamangalam, Kozhikode and Thrissur under RCA Office in Head quarters which is headed by an officer on deputation from the office of Accountant General. The department is headed by Chief Internal Auditor and reports to Director (Finance). The functions of various offices under internal audit department are given below:

No	Office / Section	Function
1	RCA Office	Pre-check of capital and R&M bills
2	Work Audit Section	Audit of works, purchase and miscellaneous bills
3	EAS Section	Audit of establishment bills.
4	Pay fixation section	Audit of pay and allowances
5	Pension Audit Section	Audit of Pension fixation.
6	GPF Section	Maintenance of GPF.
7	ARI Section	Interface between KSEBL and Accountant General/Govt./PUC.
8	RAO Monitoring Section	Review and follow up of audit reports of 23 Regional Audit Offices.

9	Arrear Cell	Clearance	Evaluation and consolidation of arrears of EHT/HT/LT consumers

A summary of activities of each office or section carried out during FY 2017-18 are given below:
Resident Concurrent Audit Office had carried out the following audit activities on bills in addition to Pre audit of 3242 bills amounting to Rs. 29.98 Lakhs pertaining to Corporate ARU Offices.

Bills Prechecked	Bill Value	Objected amount	Opening Objections	Amount Recovered	Amount withdrawn	Amount Overruled	Out standing Objections
1275	Rs 742.89 Cr	Rs. 5.20 Cr	Rs. 8.04 Cr	Rs. 4.24 Cr	Rs. 1.20 Cr	Rs. 1.72 Cr	Rs. 8.73 Cr

Establishment Audit Section has Pre-audited claims on 2355 bills and objections raised on claims
Rs. 4.12 Lakhs and settled all objections. The following post audits were also carried out:

Office	Bills Audited	Bill Value	Objected amount	Opening Objections	Amount Settled	Outstanding Objections
Corporate ARUs	22487	Rs 155 Cr	Rs.43,645	Rs. 51,978	Rs. 92,843	Rs. 2780
Field offices	(Discontinued since 11-07-2016)			Rs. 52.83 Lakhs	Rs. 21.10 Lakhs	Rs. 31.72 Lakhs

The following audit functions were also carried out by establishment audit office: Investigation sanctions -19; NLCs issued -1413, House Building Advance closed – 31; Conveyance advance closed - 37 and medical advance pre-audited 86. An abstract of works by Pay fixation office is shown below:

No	Particulars	Quantum
1	Field Audit conducted (Nos)	27
2	Number of Service Books audited (Nos)	11,400
3	Value of Objected cases as n 31.03.2018	Rs. 91,69,552
4	Amount of money realised	Rs. 66,72,898
5	Clarifications/Circulars/Statement of facts/RTI Information etc	69

Pension Audit Office activities include (1) field auditing of 16 ARUs where verified 8605 pension payment orders, in which objections and irregularities found amounted to Rs. 13,01,880 and the amount realised for the year 2017-18 was Rs. 20,45,420. (2) 7856 Service Book verification and added to HRIS module Service book Audited (3) Eight Pension arrear audited amount objected Rs. 6,86,115 (Post audit), Rs 1,95,440 (Pre audit) and the amount realised was Rs. 1,38,317.

. The GPF Office admitted 1188 employees, Closure of 956 GPF accounts

amounting to Rs 121.19 Cr. The Non Refundable Applications processed was 8343 for an Amount of Rs. 185.85 Cr. Temporary Advance processes 1937 applications and Credit statement issued to 32164 subscribers.

The ARI Section furnished replies to five (5) reports of PUC and 49 audit paras. Fifteen (15) Inspection reports were closed and another 438 Inspection reports were dropped. Eight (8) Audit committee meetings were held during the year and 120 Paras were proposed to be dropped.

RAO (M.Cell) received 688 Audit reports, assessed a total amount of Rs 25.68 Cr and realized an amount of Rs 19.68 Cr. Arrears Clearance Cell (Task Force) audited 27 HTB Sections for an amount Rs. 265.27 Cr.

3.14. PUBLIC RELATIONS DEPARTMENT

Public Relations Department manages corporate communication activities of KSEBL, striving to maintain healthy relationship among KSEB, Society and Media. The Department, headed by Chief Public Relations Officer, has three sections, Mass communication and Advertisement, New Media Cell, 'Front Office, Hospitality and Liaison.

Mass communication and Advertisement: The regular official Press Release on activities, programs, achievements and developments in KSEB for all classes of media including communication on supply interruptions to Print and FM radio are prepared by this section. The quarterly news letter (Spandanam) and the internal communication E-Letter for circulation through Email to all officers are prepared by PR department.

New Media Cell: The Company maintains an active presence in the new social media platforms. These platforms provide ready feedback channel from the customers and public. The contents released to the media and opinions expressed by public get shared quickly and carefully monitored by the new media cell. The Company maintains a **facebook** page (https://www.facebook.com/ksebl) and has 1.7 lakhs followers, the largest among the public sector organisations in Kerala. KSEB maintains an Internet based video channel (www.ksebmedia.in) and videos on the company activities are regularly uploaded as well as to **Youtube**. A half-an-hour television programme captioned **"Spandanam"** are released on Saturdays and Sundays in Doordarshan displaying major activities and events.

Event Management and Exhibitions: PR Department also manages conduct of Conferences, Press Meets and other events as and when necessary. Exhibitions are arranged during festivals and trade fairs to create awareness among public on usage of electricity, electrical safety, e-initiatives and showcase achievements of KSEB. CPRO is appointed as the Nodal officer for Malayalam Official Language.

3.15. PERSONNEL DEPARTMENT

The Personnel Department is responsible for carrying out functions related to personnel management functions of the company. It include Industrial

Relations and Labour Welfare activities, that is, policies and norms related to employee transfer, collective bargaining for wage and Salary package, conciliations, arbitration, adjudication, payment of Compensations, welfare activities related to Women and Physically challenged employees, petty contractors, contract workers, fixation of Dearness Allowance, implementation of biometric attendance system and management Employee Welfare Fund. The department is headed by a Personnel Officer and assisted by a Regional Personnel Officer. The functions of the department include:

The activities conducted during the year are briefly given below:

- Framed norms for general transfer of workmen and officers
  - Routine review of SC/ST representation. The last review shows that 12.78 % employees belong to SC community and 2.39 % belong to ST community among regular employees of the company.
  - Training programme was conducted for the Presiding officers and members of Complaints Committees dealing with complaints of harassment against women employees.
  - The details of assets and company policies were compiled and submitted to Administrative Reforms Commission, Government of Kerala. Monthly meetings of a committee for the purpose have been routinely done.
  - List of eligible petty contract workers compiled and submitted to Public Service Commission.
  - Order enhancing the Family Income limit for compassionate appointment released (27.11.2017).
  - Adopted Government order related to fixation of pay on promotion released (12.04.2018)
  - Order reckoning military service for fixing Time Bound Higher Grade released (07.04.2018)
- The following accident compensation claims were settled during the year

No	Description	Amount (Rs.)
1	Fatal and non-fatal accidents to petty contractors &workmen	54,17,115
2	Fatal and non-fatal accidents to employees	54,89,638
3	Medical claims reimbursement to the accident victims	90,30,370
4	Claims to electrical accidents to Public	1,04,98,000
5	Claims to electrocution to cattle	8,00000

- Details of Employees Welfare Fund disbursed are shown below.

No	Description	Employees	Amount (Rs)
1	Retirement benefit	809	2,63,88,979
2	Legal heirs of deceased employees	96	4,08,45,950
3	Retired on invalid grounds	Nil	Nil
4	Voluntary retirement benefit	8	2,77,607
5	Resignation benefit	7	43,020

6	Dismissed from service	1	5,150
7	Educational awards to students (Class X)	574	20,13,075
8	Educational awards to Students (Class XII)	223	11,15,223

3.16. LEGAL DEPARTMENT

Legal Department is headed by the Legal Advisor and Disciplinary Enquiry Officer (LA & DEO), a District Judge from the judicial Service on deputation, reports to Chairman and Managing Director.
The main function of Legal Department is to conduct cases filed by and against KSEBL before various courts including Hon'ble Supreme Court, Judicial Fora and Tribunals.

KSEBL has engaged 32 standing Counsels for conducting cases before Lower courts in the state, Three Senior Standing Counsels and five Standing Counsels for High court, and one standing counsel for Supreme Court. Nodal Officers (litigation) appointed in Electrical Circles liaison with the standing counsel and field officers to monitor the conduct of Board's cases before various legal fora.

LA & DEO gives legal advice and clarification on the legal matters on various files, important Legal issues taken up by various field officers of KSEBL and scrutinize reports of title deeds for the acquisition of properties. Agreements executed between KSEBL and the contractors, power purchase agreements and tender documents are vetted by LA & DEO. Nominee of Legal Adviser & Disciplinary Enquiry Officer attend the pre-qualification committee meetings. LA&DEO also conducts enquiries into the allegations against Board's officers and Workmen, referred by the Chairman and Managing Director.

The legal Department prepares statement of facts of the cases filed before various courts and fora after collecting relevant details from the field offices and does effective liaising with the Nodal officers (litigation) and the Legal Liaison Office at Ernakulam for conduct of the cases. Law department analyse the judgments of Courts, fora viz. CGRF, CDRF, Electricity Ombudsman, Electricity Appellate Authority, Human Rights Commission, Lok Aayuktha, SC/ST Commission, Child Rights Commission, Women Commission etc and tender advice to Board to take appropriate decision.

The Legal Liaison Office at Ernakulam monitors and conducts of cases before Hon'ble High Court. The Resident Engineer at New Delhi monitors the conduct of cases at Hon'ble Supreme Court and other quasi-judicial Appellate Fora at New Delhi. In matters of litigations, the above offices act according to the advice from the LA&DEO. Major Activities conducted during the year include:

- 20 Lok Adalaths at various courts. 308 cases settled in Adalaths for an amount of Rs.4.14 Cr as additional compensation for tree-cutting in connection with the line construction.

- Out of the 10130 cases present in various courts (8000 from the previous periods), 3588 cases disposed during the year.

3.17. LAND MANAGEMENT UNIT (LMU)

The Land Management Unit (LMU) was constituted on 03-03-2014 for effective inventorisation of vast areas of land in possession of the company spread over the state and to provide guidance for the effective management of land under its control. Some land is being owned by KSE Board Ltd and some taken on lease mainly from the forest department.

Steps were initiated to take stock of all the land parcels and 44 inventories systematically. The Land Management Unit prepared a detailed format to capture about 25 parameters pertaining to the land parcels and the feedback was captured in special software prepared by the IT department. During the past years, Information related to 1940 Non Forest Land parcels were compiled to a common database and made available online.

No	SBU	Land Parcels	Area (Ha)	Area (Acres)
1	Generation	1290	4544.87	11230.57
2	Transmission	496	653.19	1614.08
3	Distribution	151	46.22	114.213
4	Corporate Office	3	2.73	6.74
5	Total	1940	5247.01	12965.603

Major activities in FY 2017-18 include:

- An Extent of 22.45 Hectares (55.45 Acres) of land in prime locations were got mutated in favour of KSE Board Ltd (15.62 Hectares in 2014-15, 26.8 Hectares in 2015-16 & 19.3243 Hectares in 2016-17).
- Copies of 541 Awards relating to various landed properties of KSE Board Ltd were traced out from different sources and uploaded in the database.
- Formulated Land Management Policy for KSEB Ltd and circulated to all Officers above the rank of Executive Engineers for compliance.
- Various land related issues were settled by giving legal advice.

It has been decided (BO No. 2827 /2017/ 14-11-2017) to extend the function of the Unit at Ernakulam for the Northern Districts.

3.18. VIGILANCE AND SECURITY DEPARTMENT

Vigilance Department of KSEBL was established to investigate corruption and misconduct of employees, detection of Power theft and misuse by consumers and maintaining security of critical assets of KSEBL. The

department is headed by Inspector General of Police on deputation. Now, Superintendant of Police is acting as the Chief Vigilance officer and reports directly to Chairman & Managing Director. The department has two offices, Vigilance office and Anti-power-theft Squad office.

Vigilance office conducts enquires related to misconduct and corruption by Company employees such as Pilferage of energy, Unauthorised connections, Under Billing, Misuse, Misappropriation and theft of stores & funds and other properties etc and clearances for employee promotion pensionary benefits etc. Vigilance also process appeals preferred before Chairman & Managing Director, conducts surprise checks and conduct cases with CMD or CVO as respondent. CVO also advice on security measures of projects and other important installations.

A summary of activities of Vigilance office is given below:

No	Item	Quantum
1	Petitions received	797
2	Enquiry ordered	797
3	Completed Enquiry	533
4	References handled	5072
5	Complaints received over phone	253
6	Complaints rectified	253
7	Details furnished on Pending cases /Disciplinary proceedings	1368

Anti Power Theft Squad (APTS) team consists of three Executive Engineers under Chief Engineer, APTS, Thiruvananthapuram, co-ordinates the activities in Southern Region, Central Region and Northern Region. The Head Quarters of these 3 regional units are located at Thiruvananthapuram, Aluva and Kozhikode. There are 14 APTS units operate in various parts of State.

A summary of activities of APTS team is given below:

No	Item	Quantum
1	Total numbers of inspections	30031
2	Irregularities detected	3737
3	Theft cases	195
4	Short Assessment cases	425
5	Malpractice cases	2648
6	Inspection on HT premises	311
7	Irregularities detected	51
8	Total assessed amount	Rs 45.58 Cr
9	Amount Realised	Rs. 25.12 Cr

4.0. STATE SUPPORTED PROJECTS

Government of Kerala had been providing funds for promoting innovations related to the sector energy savings. From the year 2013-14 onwards the amount has been sanctioned under Innovation fund and ESCOT. In addition, State Budget had provided 20% of the fund for the external aided

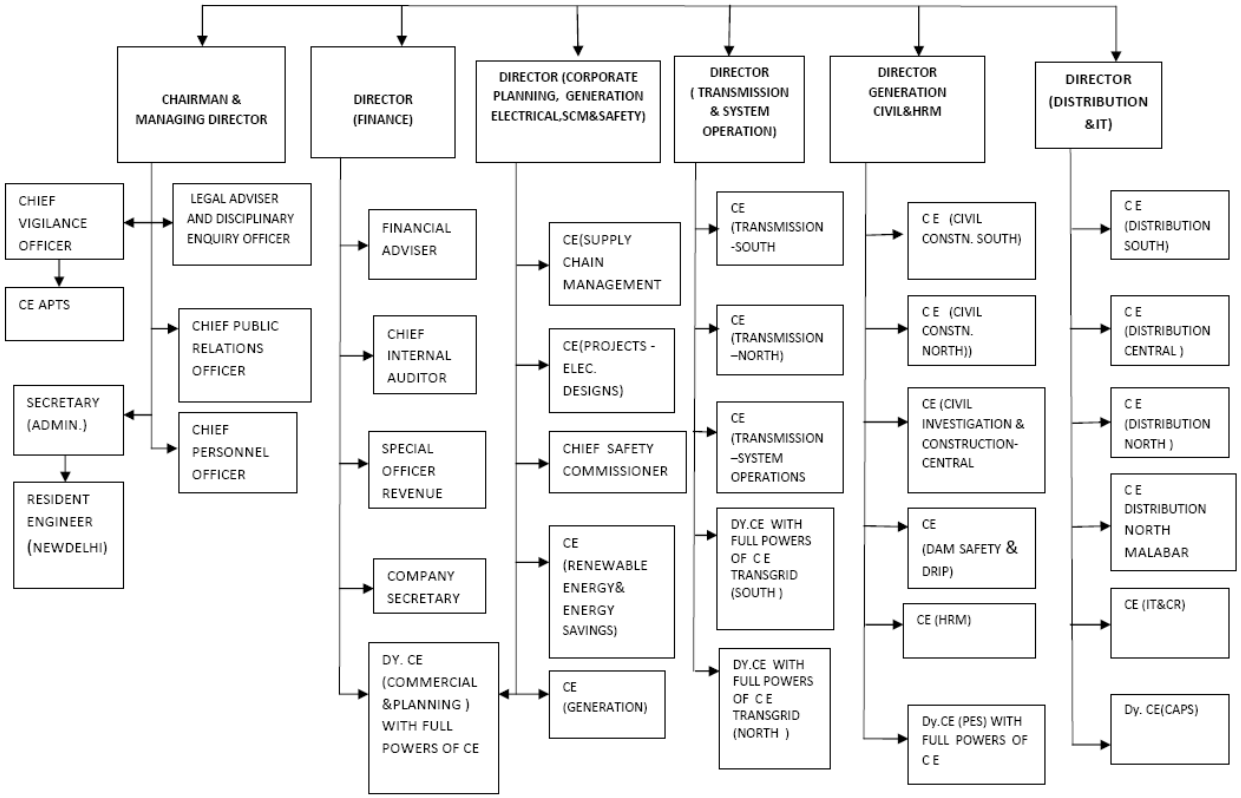
project DRIP. The details of financial support for various projects sanctioned under Innovation and ESCOT and contribution for other plan schemes for 2017-18 are furnished below.

Projects under Innovation fund and ESCOT for the year 2017-18			
No	Project	Amount (Rs Cr)	Status
1	Cloud seeding programme	9.576	Not implemented in the year owing to better monsoon
2	Pumped storage project	3	Not implemented
3	Bulk energy storage to promote Grid integration of RE power	5.974	Not implemented
4	Portable Dist. Transformers for meeting emergencies during failures	2.56	Rs. 10.84256 Lakh spent for purchasing one Transformer
5	Solar power charging station and 2 Nos e20 cars demo sharing project at Kozhikode.	0.53	Two numbers of e Cars amounting to Rs. 0.22 Cr purchased
6	Corridor mapping of power lines	2.5	included in the budget of 18-19, work completed (budget allocation is 2.75 Cr)
7	HVDS Project	0.4	Works amounting to Rs 40.21 Lakh completed.
8	Standardization of Distribution network and transformer stations	0.6	
	Total	25.14	
	Revised state budget 17-18	15.14	

57

Annexure 1

Organisation Chart of KSEB Limited as on 31.03.2018



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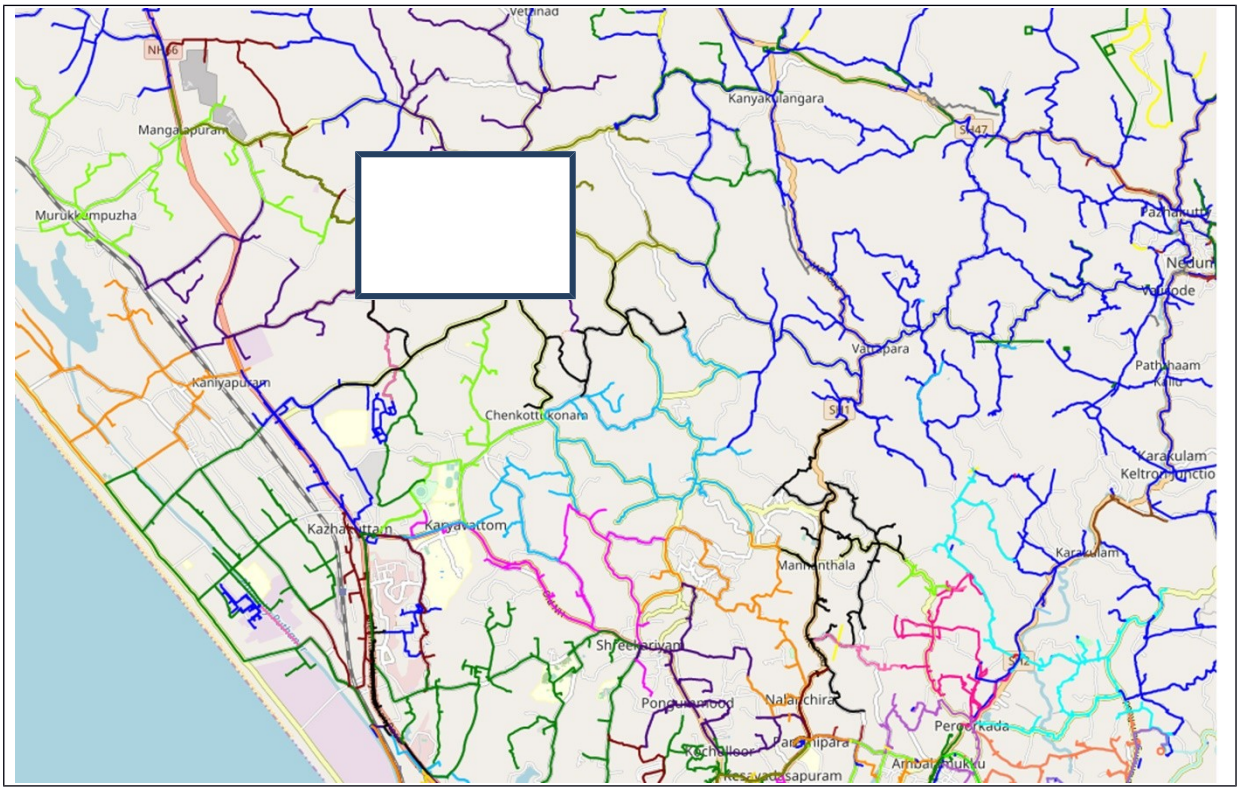
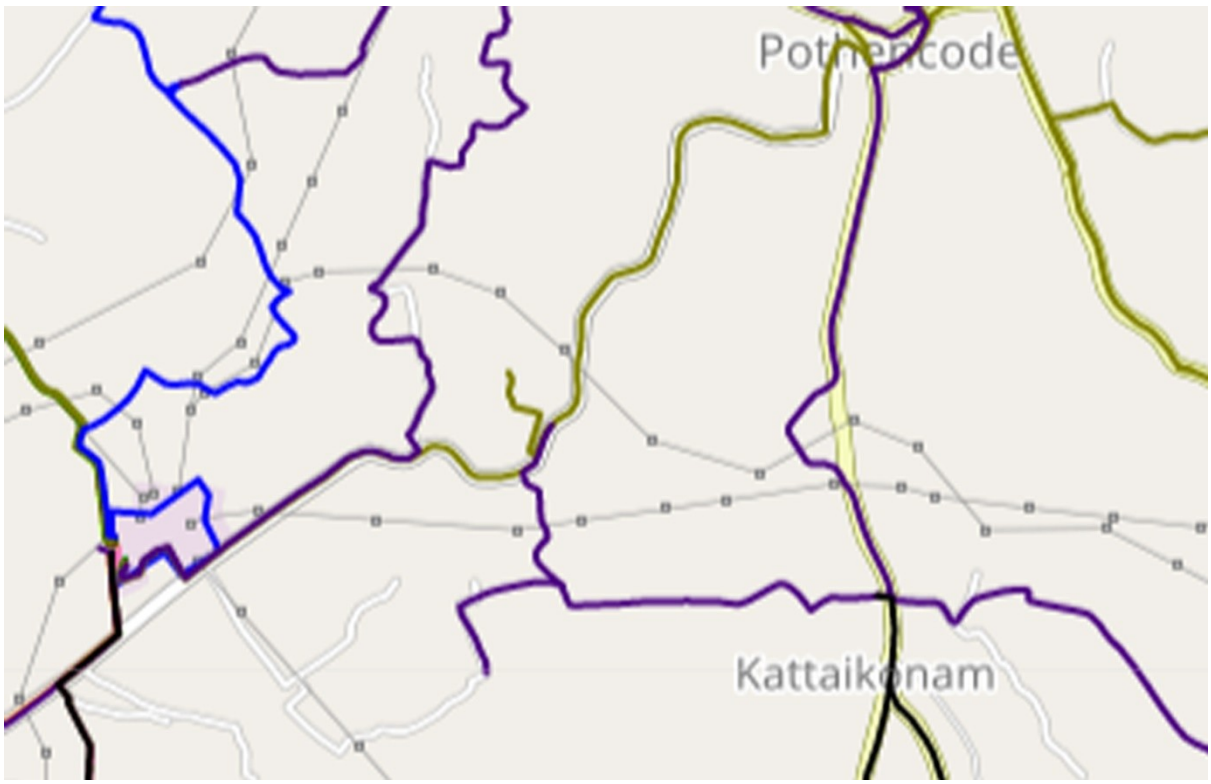
ANNEXURE 8

A portion of map under Electrical Division, Kazhakkuttam





TYPICAL MAP OF DISTRIBUTION NETWORK 1