

ANNUAL ADMINISTRATION REPORT

2018-19



KERALA STATE ELECTRICITY BOARD LIMITED

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PREFACE

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

2018-19 had been yet a year in which the organisation proved its ability in delivering outstanding performance on war footing, defying the odds. During the 2nd week of August, 2018, when Kerala faced unprecedented and continuous downpour across the State, KSEBL was one of the most affected utilities. In the calamity, 19 generating station, 50 Transmission Substations, 10 transmission corridors suffered major damages. Distribution network was shattered and more than 25 Lakh consumers were affected. The nation then witnessed the responsive PSU, switching in to a mission mode and the rest is history. Through this operation, better known as *Mission ReConnect*, KSEB could restore the service to all consumers within few hours of receding of flood water. This was appreciated even by the international media.

Kerala being the first totally electrified State in the country, KSEBL, the power utility has been targeting consumer aspirations by providing quality supply at affordable price and at the same time supporting the global commitment against global warming. During the year Government of Kerala has launched 'Oorjja Kerala Mission', aimed at the integrated development of electricity sector in the state. KSEB is the kingpin in the design and implementation of the various projects included therein.

The focus in the power generation was on green energy. During this year, KSEB had launched a demand aggregation for identifying roof-top sites, for which 2.78 Lakh consumers registered. This is part of the Oorjja Kerala Mission project 'Soura', with an ambitious target of 1000 MW Solar power by 2022. The field survey has already been completed and 41,000 rooftops capable of producing 315 MW from solar power are identified. From this 200 MW will be selected and implemented in the first phase, which is expected to be completed in the next FY. 55.19 MW of renewable energy was added to the grid in the year.

Availability of land is the major bottleneck in undertaking generation projects in the State. Transmission projects are no different. Construction of Multi Circuit Multi Voltage line, line construction using Mono Poles etc. became the Hobson's choice for minimising the land requirement and optimum usage of existing right of way. Even in the face of adversities, 9 substations and 224.6 ckm (33 KV and above) lines were constructed in the transmission sector during this year. Drone based condition monitoring of transmission lines was introduced for the first time in India.

Dyuthi 2021, the medium term plan for distribution network strengthening and eMobility were kick-started during 2018-19. A substantial reduction in T&D loss from 13.07% to below 12.48% was achieved during the reporting year. This was achieved despite the addition of 3401 km of LT lines and 2410 Distribution Transformers for maintaining Total Electrification Status. 3,68,673 new consumers were connected to the grid during this year.

I wish to express my gratitude to Government of Kerala, Kerala State Electricity Regulatory Commission, State Planning Board and Directors of the Board of KSEBL 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: 17.09.2020

(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, re-vested 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 the 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	Sri.N.Sivasankara Pillai, IA & AS	29.1.2018 till date
Director (Finance)	Sri.N.Sivasankara Pillai, IA & AS	10.8.2015 till date
Director(Distribution & IT¹)	Sri. Kumaran .P	28.6.2017 till date
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 & HRM³)	Sri.Rajeev S	21.6.2016 to 31.7.2018
	Sri. Venugopal.N	1.8.2018 to 30.11.2018
	Sri. Moni P.K	1.12.2018 to 31.3.2018
Director (Ex Officio)	Sri.Biswanath Sinha,IAS	27.2.2018 to 20.8.2018
	Sri.Sanjay M Kaul, IAS	20.8.2018 to 16.2.2019
	Smt. Usha Titus, IAS	16.2.2019 to 21.3.2019
	Dr. B Ashok	21.3.2019 till date
Director (Ex Officio)	Sri Manoj Joshi,IAS Principal Secretary(Finance),GoK	28.9.2017 till date
Independent Director	Dr. V. Sivadasan	02.7.2016 till date

¹ Information Technology, ²Supply Chain Management, ³Human 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)
	Deputy Chief Engineer(Pallivasal Extension Scheme) with full power of Chief Engineer

The Generation SBU operates and maintains 34 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 Chief Engineer (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 and one Deputy Chief Engineer (with full power of Chief Engineer) in his functions.

1.2.2 TRANSMISSION SBU

Director (Transmission & System Operation) heads the Transmission SBU. There are four Chief Engineers reporting to the Director, as given below:

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

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 Transmission 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 in Thiruvananthapuram, Kalamaserry and Kannur, 6 Divisions, 37 Subdivisions and 17 Sections.

Transgrid 2.0, one of the five projects in Urjja Kerala mission announced by the Government of Kerala, was specifically aimed at enhancing the transmission capacity for meeting future demand, improving reliability and quality of power transmitted and to reduce losses. For implementation of Transgrid 2.0, long term transmission plan, two deputy Chief Engineers with full powers of Chief Engineer were deployed in South and North region with head quarters at Kalamassery and Shoranur. Separate ARU for accounting the expenditure in respect of Transgrid .2.0 was formulated and started functioning in North region, attached to the North region office. As per Board order dated 10.08.2018, the post of Chief Engineer, PED was deployed to Shoranur and renamed as Chief Engineer-Transgrid with headquarters at Shoranur and the administrative control of two deputy Chief Engineers were brought under the Chief Engineer.

The DPR preparation, tendering, awarding of works, supervision of works etc. are done through the two offices.

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 at Angamaly comes under the jurisdiction of Distribution (Central). 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 the Northern 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.

1.3.5. New project office, SOURA was constituted vide B.O (CMD) No.384/2019 dated 27.02.2019 for implementing of 500 MW roof top solar plants

1.3.6. Central Project Monitoring Cell (**CPMC**) headed by Deputy Chief Engineer who reports to Director (Distribution & IT) was formed at Corporate Office vide B.O (FTD) No.1728/2018 dated 13/08/2018 for monitoring the day-to-day activities in connection with the distribution works during the four years starting from 2018-19 being undertaken in Dyuthi 2021.

1.4 Organisation chart

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

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2. Performance of the Company

The focus had been on quality, reliability and uninterrupted supply to consumers and the primary goal is 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. KSEBL has succeeded in its mission of providing electricity connections to all the households, despite the flood which hit the state, during August 2018. KSEB Ltd launched 'Mission ReConnect' – an operation on war footing basis for rebuilding the power infrastructure of the state which was shattered by the flood that worstly hit the State.

KSEB provided free mobile charging facility to public in Section offices & Substations and also in public places by additionally wired plug points, wherever required. KSEB restored the power supply to all the occupied consumer premises, without realising any amount from the consumer. In many consumer premises, which could not be normalized as such, KSEB team provided essential supply of one light point and power socket, by installing pre-wired kits. KSEB had also decided to bear the cost for replacing streetlights, wherever material supply was ensured by LSGD.

KSEB was able to restore supply to 99.9% of the consumer premises (25.57 lakhs out of 25.60 lakhs) by putting back all the Sub Stations and most of the Distribution transformers in the flood affected area in to service by 01.09.2018 itself through this mission.

2.1 Flood 2018

KSEB Ltd is one of the worst hit utilities in the State during the flood that hit the entire State of Kerala during August 2018. It sustained losses in all fronts viz. Generation, Transmission, Distribution and also by way of loss of revenue due to loss of load. District wise abstract of cost for restoration in three sectors viz. Generation, Transmission & Distribution of KSEB Ltd is given hereunder –

District	Cost for restoration (Rs in Lakh)			
	Generation	Transmission	Distribution	Total
Thiruvananthapuram	2.00	68.00	259.94	329.94
Kollam		53.00	212.66	265.66
Pathanamthitta	300.00	149.00	985.00	1434
Kottayam		17.00	178.00	195
Alappuzha		256.00	172.92	428.92
Ernakulam	1.00	328.00	5017.64	5346.64
Idukki	5295.00	272.43	275.96	5843.39
Thrissur	1000.00	1091.65	1401.56	3493.21
Palakkad		396.00	368.98	764.98
Malappuram	1350.00	86.05	337.40	1773.45
Kozhikode	137.00	132.00	369.06	638.06
Wayanad		128.00	79.38	207.38
Kannur			317.06	317.06
Kasargod			280.22	280.22
Providing supply to de-electrified houses			15000.00	15000.00
Total	8085.00	2977.13	25255.78	36317.91

Five major hydro generating stations and fourteen small hydel stations of KSEB Ltd. were affected due to the flood and subsequent landslide. 10 Power Transformers were submerged, operation of 50 Substations were affected. Many transmission towers were toppled; 10 major transmission corridors

became dysfunctional due to the flooding. Power Distribution in 300 odd Electrical Sections in seven Districts was severely affected. 1735 Distribution Transformers were either submerged or damaged. More than 10,000 Distribution Substations were switched off to avoid casualty. Feeding from 16,158 Nos. Distribution Transformers were affected. Service to 25.60 Lakh consumers were disrupted in the calamity. Reconstruction of 5275.80 km Distribution lines, replacement of more than three lakh Single Phase energy meters, about fifty thousand Three Phase energy meters and three Lakh ELCBs which were damaged due to submergence were required for resuming normalcy.

In addition to the above, there was continued injury resulting from loss of generation to the tune of 400 MW due to the flood and associated landslide which necessitated load restriction. KSEB was forced to procure high cost power to minimise the restriction. It was estimated that KSEB has sustained huge loss by way of loss of revenue due to loss of load. It was assessed that the loss in this account is Rs 472.10 Crore (821 MU @ Rs 5.75 per kWh). The massive flood and landslide shattered the backbone of Electricity Infrastructure in the State.

While attempting post flood recovery measures, top most priority was given to ensure the safety of employees and public. Installations (generating stations, substations, distribution transformers) were switched off & isolated to ensure safety of men & materials. As many as fifty substations were shut down when the water level raised alarmingly. More than 10,000 transformers were isolated in the distribution network. These installations were energized as and when the situation improved.

Mission ReConnect

It was realised that if the normal systems & procedures are followed, the restoration to normalcy in seriously affected Districts would take months. Kerala then witnessed Mission ReConnect - an Operation on war footing for rebuilding the Power Infrastructure in the State. Priority was given to restore normalcy to the extent possible.

Task Forces were set up and Special Officers were assigned to ensure seamless coordination between various operating wings of KSEB and also external stakeholders. By and large the responsibility of the task forces included the following.

- i. Impact Assessment (identification of deeply affected Electrical Sections and demarcating areas where external help is required)
- ii. Damage Assessment.
- iii. Material Requirement Assessment.
- iv. Ensuring Co-ordination between the various teams (internal as well as external).
- v. Making recommendations for optimum deployment of manpower.
- vi. Progress monitoring, consolidation, and reporting.
- vii. Making public aware of the extent of damage, measures to restore the supply, safety precautions, etc including publicity through electronic & print media, public address systems etc.

A State Level Task Force (SLTF), Mission Reconnect, headed by a Deputy Chief Engineer and supported by two Executive Engineers (one in each shift) and six Asst Executive Engineers (two in each shift) was constituted to coordinate the activities at Corporate level. They were responsible for -

- a. Material Availability Assessment (in various Stores across the State).
- b. Gap Analysis (work force & material).
- c. Device logistics for ensuring availability of sufficient materials at the right time at the right location.

- d. Co-ordination with external agencies e.g. Government agencies like NDRF, SDMA, PGCIL etc, other DISCOMS like TANGEDCO, SPDCL (AP), TATA Power Ltd etc, companies like L&T, who are willing to extent a helping hand in the hour of need.
- e. Providing necessary clarification to field officers on queries regarding procedures and formalities to be adopted for successful culmination of the mission.

Five Chief Engineers were designated as District Level Special Officers for the severely affected areas.

Circle Level Task force were constituted in Pathanamthitta, Alappuzha, Haripad, Thodupuzha, Ernakulam, Perumbavoor, Thrissur, Irinjalakkuda & Kalpetta by the PMU team (a dedicated technical team under the direct control of the Deputy Chief Engineers responsible for planning and implementation of Dyuthi 2021) in the Electrical Circles. This team acted as interlinking point between State & Section Level Task Forces. Deputy Chief Engineer of the Electrical Circle was the Chairperson and EE, PMU the Convener. Deputy Chief Engineers of respective Transmission Circles (or Executive Engineers of Transmission Divisions, where Transmission Circles are not functioning within the jurisdictional areas), Electrical Inspector of the District, EEs of Electrical Divisions, AEEs of PMUs, representatives from association of pensioners, officers, workmen, contractors, wiremen & Kerala Electrical Traders Association etc, were included as members of the team. This task force worked in close coordination with people's representatives of the area.

Section Level Task Forces were constituted in Sections identified as severely hit during this calamity. This Task Force was headed by the Assistant Executive Engineer of the concerned Subdivision. Assistant Engineer of the concerned Electrical Section was the convener. Member of the LSGD, representatives from associations of pensioners, officers, workmen, contractors, wiremen & Kerala Electrical Traders Association, consumer groups, voluntary organizations etc were included as members of the team. An officer of the level of Senior superintendent was entrusted with the task of collecting information and for dissemination of information to the local public and local media, and passing on the updated status to the state level task force.

Ministry of Power and the Government of India has also taken keen interest in restoration of the Power infrastructure and resume normalcy in the State. A Delegation from the MoP, led by the Chief Engineer of Central Electricity Authority has conducted detailed discussion with the Members of the Board of Directors and Senior Officers of KSEB Ltd on 23.08.2018 regarding steps to be taken on various fronts to tide over the crisis consequent to the massive floods. Through consultations, immediate requirements were identified for speedy restoration.

Generation

Generation has been fully restored at all the 5 major stations and 10 SHEPs. The SHEPs which are yet to be restored are Chembukadavu - 2, Barapole and Vellathooval. Removal of mud, debris & rectification of pumps, reconstruction of road to the power houses etc are carried out in almost all the flood affected stations. Repair and renewal of equipment carried out in Panniyar HEP, Ranni - Perinadu, Mattupetty & Adyanpara SHEPs. Poringalkuthu & PLBE Power Houses were put back in service after re-assembling of equipment and repair of civil structures. Civil protection works were carried out along penstock route of Unit 5 & 6 machines of Kakkayam HEP, for the restoration of the station. Protection walls were to be constructed extensively along with the repair and renewal of Powerhouse equipment at Adyanpara SHEP.

Generation Stations Restored After Flood as on 31-03-2019

Sl. No	Name of Station	Installed Capacity of the plant		Generation Restored in (MW)	Unit #	Date of restoration	Generation to be restored (MW)
		No. of Generators. X Capacity in (MW)	Plant Capacity in (MW)				
HEPs							
1	Idamalayar	2 x 37.5	75	75		19.08.2018	
2	Pallivasal	3 x 5+ 3x7.5	37.5	37.5		22.08.2018	
3	Lower Periyar	3 x 60	180	180		23.09.2018	
4	Poringalkuthu	4x9	36	36		26.12.2018	
5	Panniar	2 x 16.2	32.4	32.4	I	14.01.2019	
					II	23.11.2018	
Small HEPs							
6	PLBE	1x16	16	16		27.08.2018	
7	Malampuzha	1x2.5	2.5	2.5		17.08.2018	
8	Urumi -2	3x0.8	2.4	2.4		06.09.2018	
9	Poozhithode	3 x 1.6	4.8	4.8		01.09.2018	
10	Peechi	1x1.25	1.25	1.25		18.08.2018	
11	Vilangad	3x2.5	7.5	7.5		25.08.2018	
12	Chimmony	1x2.5	2.5	2.5		24.08.2018	
13	Adyanpara	2x1.5+0.5	3.5	3.5	I	10.01.2019	
					II	17.01.2019	
					III	19.12.2018	
14	Madupatty	1x2	2	2		22.02.2019	
15	Chembukadavu - 2	3x1.25	3.75				3.75
16	Ranni-Perinadu	2x2	4	4	I	23.01.2019	
					II	29.03.2019	
17	Barapole	3x5	15				15
18	Vellathooval	2x1.8	3.6				3.6
19	Perunthenaruvi	2x3	6	6	I	13.01.2019	
					II	27.01.2019	
			435.7	413.35			22.35

Transmission

In the transmission sector, all the ten EHT Transmission corridors and the 50 Substations which were affected by flood were restored on a war footing. Details of substations affected and restoration details are as under:

DETAILS OF SUBSTATIONS AFFECTED DUE TO FLOOD

Sl. No.	Name of Station	Voltage level	Date of Switch off	Time	Date of Switch on	Time	Name of Circle
Thiruvananthapuram District							
1	Veli	110	15.08.2018	12.31PM	15.08.2018	01.17PM	Thiruvananthapuram
2	Terls	110	15.08.2018	12.31PM	15.08.2018	01.17PM	
3	Kadakkavoor	33	15.08.2018	12.34PM	17.08.2018	05.47PM	
4	Aryanad	33	14.08.2018	02.08PM	15.08.2018	03.58PM	
5	Chullimanoor	33	17.08.2018	06.55AM	17.08.2018	11.30AM	

Pathanamthitta District							Pathanamthitta
6	Kadappra	33	16.08.2018	09.35PM	22.08.2018	06.30PM	
7	Ranni-Perinad	33	16.08.2018	09.00AM	19.08.2018	05.30PM	
Alappuzha District							Alappuzha
8	Thakazhi	33	18.08.2018	03.31PM	19.08.2018	04.14PM	
9	Kuttanadu	66	17.08.2018	10.30AM	23.08.2018	06.50PM	
10	Edathua	110	16.08.2018	21.35PM	22.08.2018	05.30PM	
Kottayam District							Poovanthuruth
11	Manimala	33	15.08.2018	11.09PM	19.08.2018	04.28PM	
Idukki District							Thodupuzha
12	Adimali	110	15.08.2018	08.24PM	16.08.2018	06.44PM	
13	Kuthunkal	110	15.08.2018	03.08PM	02.09.2018	09.30AM	
14	Senapathi	33	15.08.2018	03.08PM	02.09.2018	10.10AM	
15	Upputhara	33	16.08.2018	04.55PM	17.08.2018	12.28PM	
16	Rayonpuram	110	16.08.2018	10.57AM	18.08.2018	03.45PM	
17	Koovappady	33	15.08.2018	08.15AM	22.08.2018	04.54PM	
18	Muttom	110	16.08.2018	04.28AM	17.08.2018	03.45PM	
Ernakulam District							Kalamassery
19	Kurumassery	110	15.08.2018	04.28 PM	22.08.2018	08.25 PM	
20	Kurumassery	33	15.08.2018	04.28 PM	22.08.2018	08.25 PM	
21	Puthenvelikkara	33	15.08.2018	05.30PM	30.08.2018	07.01PM	
22	Alangad	33	16.08.2018	07.00AM	22.08.2018	08.00 PM	
23	Vadakkekkara	33	16.08.2018	06.50AM	23.08.2018	05.25 PM	
Kozhikode District							Kozhikode
24	Kalpetta	33	08.08.2018	04.55PM	15.08.2018	12.20PM	
25	Vellannur	33	15.08.2018	05.00AM	15.08.2018	04.00PM	
Malappuram District							Malappuram
26	Kooriyad	33	16.08.2018	05.45PM	21.08.2018	06.00PM	
27	Pulamanhole	33	16.08.2018	12.14AM	20.08.2018	01.58PM	
28	Parappanangadi	110	18.08.2018	04.25AM	20.08.2018	04.39PM	
29	Thavanur	33	15.08.2018	02.56PM	19.08.2018	10.15AM	
30	Othukkungal	33	16.08.2018	06.00PM	19.08.2018	11.10AM	
Palakkad District							Palakkad
31	Nellyampathy	33	16.08.2018	11.35AM	18.08.2018	08.00PM	
32	Alathur	33	17.08.2018	12.05PM	19.08.2018	13:57PM	
33	Chittadi	33	16.08.2018	07.02AM	21.08.2018	10.33AM	
34	Kongad	33	09.08.2018	04.30AM	21.08.2018	02.30PM	
35	Thrithala	33	16.08.2018	10.29PM	21.08.2018	06.35PM	
36	Agali	33	16.08.2018	04.55AM	17.08.2018	07.50PM	
Thrissur District							Thrissur
37	Kandassankadavu	110	18.08.2018	07.00PM	19.08.2018	09.45AM	
38	Ayyampuzha	110	16.08.2018	08.44PM	17.08.2018	12.54PM	
39	Malayattoor	110	16.08.2018	08.39AM	18.08.2018	04.04PM	
40	Annamanada	33	15.08.2018	04.08PM	25.08.2018	03.00PM	
41	Kalady	33	15.08.2018	8.43PM	19.08.2018	12.02PM	
42	Kallettumkara	33	16.08.2018	01.20PM	17.08.2018	03.27PM	
43	Puthur	33	16.08.2018	04.06AM	16.08.2018	11.24AM	
44	Pariyaram	33	15.08.2018	11.02AM	24.08.2018	07.08PM	

45	Chirakkal	33	15.08.2018	07.06AM	22.08.2018	12.50PM
46	Traction S/s Chalakkudy	110	16.08.2018	11.10AM	16.08.2018	11.55AM
			16.08.2018	03.07PM	21.08.2018	11.24AM
47	Pattikkad	33	16.08.2018	04.58AM	27.08.2018	06.45 PM
48	Vatanappally	33	17.08.2018	06:32 PM	21.08.2018	01.25 PM
49	Koratty	33	17.08.2018	06.23AM	19.08.2018	12.36PM
50	Vellikulangara	33	15.08.2018	12.01PM	20.08.2018	05.29PM

Details of Transmission Corridors affected

SI No	Name of Line/Corridor	Date & time of Switch off	Date & time of energization	Name of Circle
1	110 kV Punnapra- Pallom	17.08.2018 07.06PM	27.08.2018 02.05PM	Poovanthuruth
2	110kV Kuthungal – Neriamangalam	15.08.2018 03.08PM	01.09.2018 06.43PM	Thodupuzha
3	110kV Pallivasal Aluva	15.08.2018 04.39PM	21.08.2018 12.36PM	Thodupuzha
4	110 kVChalakkudy - Poringal	15.08.2018 10.19PM	22.08.2018 02.41PM	Thrissur
5	110kV Viyyur – Pullazhy	18.08.2018 12.35PM	18.08.2018 02.50PM	Thrissur
6	110kV Madakkathara- Kunnamkulam	21.08.2018 12.31PM	21.08.2018 02.22PM	Thrissur
7	110kV Edamalaray- Ayyampuzha	14.08.2018 07.03PM	21.08.2018 05.03PM	Thrissur
8	110kV Edamalaray- Malayattoor	15.08.2018 11.00AM	19.08.2018 11.02PM	Thrissur
9	110kV Aluva- Chalakkudy	17.08.2018 06.34AM	21.08.2018 12.04PM	Thrissur
10	110kV Chalakkudy - Traction Chalakkudy	16.08.2018 03.07PM	21.08.2018 11.24AM	Thrissur

Distribution

In the restoration phase, resuming service to consumers was the priority for the distribution wing. The Board Management also took the following decisions to ensure faster restoration of normalcy

1. Permitted the Deputy Chief Engineers of the Electrical Circles of the flood affected areas to divert the materials already available for the Centrally Assisted Projects (viz IPDS, DDUGJY) scheme works and planned works, towards emergency restoration works.
2. Allowed Deputy Chief Engineers of the flood affected areas and the Chief Engineers (Distribution) to purchase Weather proof wire which is normally procured centrally.
3. Temporarily enhanced the limit of purchase through short tender quotations for WP wire, as well as for materials coming under decentralized purchase, for both Deputy Chief Engineers of the flood affected areas and the Chief Engineers (Distribution), without insisting on e tendering for such purchase.
4. To utilize the services of the PET teams of the Transmission wing for carrying out testing works to be done before putting the submerged transformers and equipment back in service and to make available the insulation testers and other testing equipment from the Substations and PET.
5. To utilize the vehicles of other wings for carrying out restoration activities. Also permitted the Deputy Chief Engineers of flood affected Electrical Circles to hire additional vehicles if required.

6. Authorized the Deputy Chief Engineers of flood affected Electrical Circles to make 25% advance payment while engaging contractors outside the area in restoration activities if required, and to waive the security deposit in such cases, in situations demanding it.

As a welfare measure, KSEB provided free mobile charging facility to public in Section offices & Substations and also in public places by additionally wired plug points, wherever required. Temporary supply were provided in houses where normal supply restoration is not immediately possible due to damaged and drenched circuits, with minimum facilities (one light point and one plug point with ELCB – prewired with the help of the wiremen’s associations and students of various technical institutions – Government College of Engineering, Thiruvananthapuram, TKM College of Engineering, Kollam, Mar Baselios College of Engineering And Technology, Thiruvananthapuram, Carmel College of Engineering & Technology, Punnapra, Colleges under CUSAT and CAPE, technical cell of NSS under various colleges, Kerala Chapter of IEEE to name a few) free of cost.

KSEB has also decided to bear the cost for replacing streetlights, wherever material supply is ensured by LSGD. While planning restoration, KSEB had decided to give priorities to public places like relief camps, hospitals, drinking water pumping stations etc. This has been strictly adhered to. All Relief Camps, hospitals (both government and private) and pumping stations were given connections as soon as water receded. In many of these consumer premises, Engineering Team from KSEB went an extra mile even to the extent of making the consumer premises ready for energization, rectifying internal damage.

KSEB had internally set a goal to restore all disrupted Distribution Networks and affected Service Connections by 31.08.2018. In general, this target was achieved. However, restoration was delayed in areas where water does not recede.

To meet exigencies, KSEB Ltd had placed additional orders for PSC poles and ACSR conductor. Officers, Staff & Contractors from other areas were deployed extensively.

Restoration Status

In its hour of need, KSEB Ltd received helping hand offered by many. Apart from the serving employees of the affected area, the work force included staff & petty contractors from the sections not affected by the flood, licensed wiremen, retired KSEB personnel, volunteers from the institutes such as ITIs, Polytechnics, Engineering Colleges etc. and skilled manpower of 120 personnel provided by Andhra Pradesh Southern Power Distribution Company Limited (APSPDCL). The diversion of materials to the offices in flood affected area from offices which were not affected by flood, was arranged through the Corporate Control Room. Also, the materials received from neighbouring licensees were allocated to the flood affected area from the Control Room. The progress of works on daily basis in flood affected area was consolidated by the Control Room and reported the same to the Board for issuing appropriate directions for the speedy restoration works at the field level.

KSEB was able to restore supply to 99.9% of the consumer premises (25.57 lakhs out of 25.60 lakhs) by putting back all the Sub Stations and most of the Distribution transformers in the flood affected area in to service by 01.09.2018 itself through this mission. KSEB had received vital support from the neighbouring licensees in the form of supply of materials and skilled manpower. In this regard, M/s. TSSPDCL (Telangana State Southern Power Distribution Company Ltd.) donated 100Nos of 100kVA transformers & 20,000 single phase energy meters, M/s HESCOM (Hubli Electricity Supply Company) donated 50 Nos. of 100kVA transformers, M/s GESCOM(Gulbarga Electricity Supply Company) donated 48 Nos. of 100kVA transformers, M/s TATA POWER donated 14 Nos. of RMUs (Ring Main Units) & 473 km of WP(weather Proof) wire, M/s. APSPDCL (Andhra Pradesh Southern Power Distribution Company Limited) provided skilled manpower of 120 Nos., M/s. TANGEDCO (Tamilnadu

Generation and Distribution Company Limited) transferred 250 Nos. of 100kVA transformers & 40,000 single phase energy meters and M/s. PGCIL (Power Grid Corporation Of India Limited) rendered assistance in Distribution Transformer restoration works and supplied 30 kilo litres of transformer oil.

KSEB restored the power supply to all the occupied consumer premises, without realising any amount from the consumer. In many consumer premises, which could not be normalized as such, KSEB team provided essential supply of one light point and power socket, by installing pre-wired kits. Moreover, it was ordered to exempt the areas of Electrical Sections identified as flood affected during the calamity from generation of bills from the next billing cycle and to extend the due date and disconnection date of bills already issued and generated for monthly/bi-monthly consumers in flood affected areas up to 31.01.2019 in deserving cases. Further to the above, it was ordered to waive the Reconnection Fee (RF) and surcharge for deserving consumers in flood affected areas wherever necessary and authorised the Assistant Engineers of flood affected sections and the Special Officer Revenue to give suitable instalments for remittance of bills of LT consumers and bills of HT/EHT consumers respectively of flood affected areas in deserving cases.

Reconstruction of 5275.80 km distribution lines, more than one lakh poles, 1735 Distribution Transformers, replacement and revival of more than 3 lakh de-electrified houses, replacement of about 3.5 lakh faulty meter etc were required for resuming normalcy. Against all odds, KSEB could restore all disrupted Distribution Networks and effect almost all Service Connections by 31.08.2018; the remaining few, which were kept isolated on safety considerations, were also re-electrified immediately after the water receded.

Gaja Cyclone

Principal Secretary, Chairman & Managing Director, TANGEDCO, appealed for help in restoration of supply in the 'Gaja cyclone' hit areas of Tamil Nadu, during November 2018. TANGEDCO being one of the first discoms to come to the aid of KSEBL in coping with the devastation caused by the floods in Kerala in Aug 2018, KSEBL quickly responded to the request and as per the directions of the CMD, KSEBL, several teams from KSEBL has set forth to assist in the restoration mission. The CMD, TANGEDCO has assured logistic support in terms of accommodation and food, besides cash compensation of Rs. 1000 per day per head as well as transportation expenses. A total of 412 staff from Electrical circles of Kattakkada, Kollam, Kottarakkara, Thrissur, Irinjalakkuda, Haripad, Manjeri, Shornur, Palakkad, Tirur, Nilambur, Kalpetta and Kannur, comprising officers and staff both permanent and contract, had participated in the mission of supply restoration works at Pudukottai and Nagapattanam Districts of Tamil Nadu, which was another milestone to KSEBL during 2018-19.

2.2 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							System as on 31.3.19
	Year	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
Generation								
Hydro Capacity (MW)	1.25	0	15.50	22.0	3.6	6	3	2058.76
Solar Capacity (MW)				1.156	6.71	7.5	1.053	16.419
Transmission								
Substation 220KV (Nos)	0	0	1	0	0	2	0	22
Substation 110KV (Nos)	1	5	1	8	3	6	3	157
Substation 66KV (Nos)	1	1	0	3	0	3	1	72
Substation 33KV (Nos)	8	4	1	3	7	5	5	154
Lines (circuit km)	123.92	184.03	117.60	140.14	147.43	175.38	224.6	11800.18
220KV (circuit km)	26.87	0	36.2	0.68	0	54.1	0	2952.34
110KV (circuit km)	27.55	112.59	38.4	66.67	67.66	79.76	134.2	4745.08
66KV (circuit km)	4.60	0	0	6	0	0.44	29.5	2145.33
33KV(circuit km)	64.90	71.44	43	66.79	75.77	41.08	60.9	1957.43
Distribution								
LT lines (circuit km)	3066	3735	4636	4826	5357	3130	3401	289804
HT lines circuit km	1579	1884	1807	2022	1844	1744	1773	62450
Distr Transformers	2643	3200	3554	2389	2270	2353	2410	79876
No. of consumers	403421	415216	422238	381247	462137	353642	368673	12552206

2.3 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 12.47% by the end of FY 2018-19. 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 Reduction (%)	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
2018-19	21750.25	24849.15	12.47	0.60	7.55	1927.90	838.64

¹ including open access energy, ³ in power purchase over FY 2008-09,

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.1927.90 Cr for FY 2018-19 as shown above.

2.4 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.

2.4.1 Restricted borrowings

The company had executed capital projects for Rs. 2215.25 Cr during the year. However, the net additional borrowing has been Rs. 384.48 Cr only. This was achieved by utilising internal accruals, capital grants and consumer contribution. Details of outstanding loans for FY 2018-19 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.

Year	Outstanding Loan Liabilities (Rs Cr)					Interest due for payment
	Loan Opening Balance	Loan received	Repaid	Loan Closing balance	Increase over previous year	
2018-19	6479.34	3078.49	2177.73	5578.58	-900.76	0

2.4.2 Reduction in interest payment

The Company has incurred Rs. 570.12 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 10.38 %.

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.

2.4.3 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. 6739.13 Cr as given below

No	Item	Revenue Gap
1	Till 31-3-2011	424.11
2	FY 2011-12 (and Review petition)	1391.93
3	FY 2012-13	3132.97
4	FY 2009-10 and 2010-11 (Remand Order)	312.60
5	FY 2013-14	195.50
6	FY 2014-15	NA
7	FY 2015-16	202.97
8	FY 2016-17 (and Review petition)	1079.05
9	FY 2017-18	
10	FY 2018-19	
	Total	6739.13

*True up sought for Fy 2017-18 (Rs. 1331.81 Cr) and 2018-19 (Rs.759.88).

Additional true up sought for FY 2016-17 (Rs.63.76 Cr)

The average cost of supply per unit (Rs 6.19) as well as the gap per unit (Rs. 0.35) came down in the year in comparison to previous year as given in Table below.

No	Particulars	FY11	FY12	FY13	FY14	FY 15	FY16	FY17	FY18	FY19
1	Average cost of supply	4.38	4.65	6.66	5.87	6.22	5.86	6.48	6.35	6.19
2	Average revenue realized	3.54	3.46	4.29	5.29	5.26	5.41	5.49	5.74	5.84
3	Gap (=1-2)	0.84	1.20	2.37	0.58	0.97	0.45	0.99	0.61	0.35

2.5 Comparison of expenses and Revenue

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

2.6 Major achievements and initiatives

2.6.1 Oorjja Kerala Mission

Government of Kerala has launched 'Oorjja Kerala Mission' on 14-6-2018, aimed at the integrated development of electricity sector in the state. It targets at implementing five important projects detailed below in the next 3 years.

Soura

KSEB intends to achieve a cumulative capacity of 1000 MW to its renewable content through Solar Projects by 2021, 50% of which is expected from Roof Tops (RTS). Another 150 MW each is expected from solar parks and floating solar projects. Remaining 200 MW is planned to be procured through reverse e-bidding, from solar projects commissioned in the country. Demand aggregation for first phase of RTS is already completed. For the first phase of 200 MW, 42,500 premises were selected from 2.78 Lakh consumers who expressed interest in associating with the project. The tendering process is going on and the first phase is expected to be completed by March 2020.

Filament free Kerala

Through this project all the existing CFL and filament bulbs in domestic and street lighting sector in the State will be replaced with energy efficient and long lasting LED lamps targeting reduction in peak demand, global warming and Hg pollution. More than 13 Lakh consumers have already registered for LED lamps in the 1st phase in which domestic sector was targeted. Tender process has already been initiated for procurement of one crore, 9watt LED lamps and the project is progressing smoothly.

Dyuthi 2021

This projects included in Oorjja Kerala mission, has commenced during FY 2018-19 with a mission to up lift the distribution grid of KSEB Ltd to international level. The total plan outlay is Rs 4036.30 crores. GIS map preparation & DPR formulation were new experience for Distribution Works. Delay in Project Finalization and DPR preparation has resulted in the slow start of the project. More attention paid for timely completion of the Centrally Aided Projects like DDUGJY and IPDS has also delayed the project. Devastating floods during 2018 & 2019 has also affected the progress. This necessitated some rework from the original plan of Dyuthi 2021.

TransGrid 2.0 – 2nd Generation Transmission network

This project aims strengthening of transmission network to meet the future energy requirement of the State and is scheduled to be implemented in two phases. The 1st phase of the project is scheduled for execution during 2017-2022 and 2nd phase for 2019-2024. The works included in the 1st phase of the project are grouped into 13 packages and comprises construction of 12 substations and 2084 Circuit kilometre of EHT lines. Out of these 12 substations, 4 are Air Insulated Substations (AIS) and the remaining 8 are Gas Insulated substations (GIS). 12 substations (AIS - 3 Nos. & GIS - 9 Nos.) are included in Phase II of the project which is grouped into 12 packages. Total cost for the two phases of the project is estimated at 10000 crores. It is proposed to arrange the finance mainly from KIIFB, PSDF under CEA, MOP and GEC, Green Energy Corridor under MNRE.

Implementation of the projects in Phase I are underway and are progressing as scheduled. 12 packages out of 13 in the 1st Phase have been awarded and tender is under process for the remaining package. Out of the 12 substations targeted in the 1st phase, 7 substations (4 Nos. AIS and 3 Nos. GIS), including associated EHT lines, will be completed by July 2020. Remaining 5 substations and associated EHT lines are scheduled for commissioning by March 2021. Remaining 257.4 Ckt-Km of EHT lines have already been completed under the project. Preliminary works for the projects included in Phase -II have started. Two out of 12 packages have been tendered and DPRs for the remaining packages are under preparation.

ESafe

The eSafe project jointly mooted by Electrical Inspectorate and KSEB is aiming zero electrical accidents .A massive publicity campaign will be the highlight of this project to sensitise the users of electricity on its safety aspects .The project aims at step wise modernization of transmission and distribution sector .Bare conductor will be replaced by covered conductor and underground cables .Auto reclosures and circuit breakers will be inducted to distribution network. Procedures will be issued for each work. Work authorization and permit to work will be issued online. Electric safety training will be given to people supervising and engaged in electrical works. In Jagratha scheme, ELCB will be installed in all household belonging to BPL consumers and rewiring, wherever necessary. Awareness Champaign on safety will be done through Asha workers, Kudumba shree, and Ayalkuttam and Resident associations. Conduction of awareness classes by KSEBL safety wing are progressing.

2.6.2 Demand Side Management

Domestic Efficient Lamp Programme (DELP) announced by Gol 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 31.03.2019, about 1.349 Crore LED bulbs were distributed of which 8.355 Lakh LED bulbs were distributed during 2018-19.

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	3
Works in progress	10	193.5
Tenders invited	1	
Works awarded	3	30
DPR and Administrative Sanction accorded	11	114

3.1.1 Chief Engineer (Generation), Moolamattom

The Chief Engineer (Generation) has the primary responsibility of maintaining and operating 34 large and small Hydro stations and two thermal generating stations. Office of Chief Engineer (Generation) also carries out the Renovation, Modernisation and Up-gradation (RMU) work of generating stations. Chief Engineer (Generation) 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.

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 2058.761 MW and the designed annual generation capacity is 7194.29 MU for hydro stations, but contributes less than 80% of the total energy requirement of the state. A list of generating stations within State and its capacity is given in **Annexure-3**.

During 2018-19, a total of 7988.72MU 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	7974551015	99.82
2	Thermal Power stations	5161090	0.065
3	Wind generating station	1416704	0.02
4.	Solar stations	7591457	0.095
Total		7988720266	100

The carry forward storage in the reservoirs for the water year 2018-19 as on 01.06.2018 was 968.734 MU (23.40 % of the total storage capacity) as against the normally planned figure of 4140.252 MU. The storage of Idukki Reservoir was 24.98 % and that of Sabarigiri reservoir was 25.04 %.

Even though monsoon started normally on June 2018, due to massive flood occurred in August 2018 power generation from the generating stations such as Panniar, Vellathooval, Adyanpara, Poringalkuthu & PLBE, Ranni Perinad was drastically affected. The inflow received during the months of 2018 is as follows

Month	Inflow
June	1504.65 MU
July	2959.37 MU
August	4284.23 MU
September	596.8 MU

Madupetty power station flooded and the station was under shutdown from August 2018- Feb 2019. Panniar station flooded during August 18. Unit #2 was made available on Nov 2018 and Unit # 1 was made available on mid Jan 2019. Poringalkuthu & PLB power houses were badly affected by the flood during 2018. Even though machines were put back into service by Nov 2018, due to vibration problem Unit 3 put under FSD from Dec 2018. Ranni Perinad Power house flooded during Aug 2018. Unit#1 came into service during Jan 2019 last. Unit #2 came into service during March 2019. Adyanpara power house has gone into force shutdown due to land slide on June 2018 and flood water entered the machine floor. After rehabilitation, Unit III of Adyanpara power house was put back into service on Dec 2018 and Unit I and II during January 2019.

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 (as on march 2019)
1	Poringalkuthu	U#1	Total 100% of penstock works completed
	-do-	U#2	
	-do-	U#3	
2	Idukki (Moolamattom)	U#3	Unit # 3 machine put back to service on March 2019.
		U#1	MIV Dispatch clearance given to M/s HSHC China for one no. of MIV.
3	Kuttiyadi		DPR Approved vide B.O. (DB) No. 1519 /2077 (DGE)/G2/RMU-KTDY/2017-18) Thiruvananthapuram. Dtd 14- 06- 2017. Technical specification for E&M works finalised, work tendered.
4	Sholayar	U#3	The penstock works of Unit# 3 was completed on 21.12.2018. Unit # 3 put back to service on 16.03.2019.
5	Moozhiyar	SCADA	Replacement of PLC and peripheral cards in progress.

Safety Award: KDPP has bagged the safety award from factories & Boilers and is 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.

Conferring of ISO : Poringal Left Bank and Poringal Left Bank Extension Power Houses were conferred with ISO 9001:2015.

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 2018-19 and its status:

No	Project	District	Capacity	Status
1	Perumthenaruvi SHP	Pathanamthita	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	Commissioned on 16.07.2018
4	Porigalkuthu SHP	Thrissur	1 x 24 MW	Proposed to be completed by 31.10.2019
5	Bhoothathanketu SHP	Ernakulam	3 x 8 MW	Civil works in progress. E & M works expected to be completed by 31.3.2020. Vetting and design approval of E&M works in progress
6	Upper Kallar	Idukki	2 x 1 MW	The civil work is in progress. E&M Agreement on 16.07.2016 E & M works expected date of completion 31.03.2020.Vetting & design approval is in progress.
7	Sholayar R & M	Thrissur	3 x 18 MW	E&M Agreement on 06.07.2015. Unit #3 renovation completed All E&M works to be completed by 30.04.2020. All Penstock works to be completed by 15.04.2020.
8	Sengulam Pumphouse renovation	Idukki	--	Civil and E&M drawings under process. Excavation for pump house building completed.
9	Idukki RMU	Idukki	--	Work Agreement executed on 24.09.2016 U#3put into commercial operation on 16.03.2019.Renovation of No.2 machine started. 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 Tendered
12	Chathankottunada II	Kozhikode	3 x 2 MW	E&M works awarded & agreement executed on 30.03.2019
13	Thottiyar HEP	Idukki	1 x30 MW 1x 10 MW	Existing contract foreclosed. Tender documents were prepared to invite separate tender for balance E&M work& tendered.
14	Peruvannamoozhi	Kozhikode	2 x 3 MW	E&M Work retendered due to the absence of competitive& responsive bidders
15	Pazhassi Sagar	Kannur	3 x 2.5MW	Civil and E&M works at Tendering Stage. E&M Work retendered due to the absence of competitive& responsive bidders

The following table indicates the project under DPR stage during FY 2018-19 undertaken by PED.

No	Project	Capacity	Energy	Status
1	Chinnar	24 MW	76.45 Mu	Tender documents under preparation
2	Anakkayam	7.5 MW	22.83 Mu	E&M estimate prepared
3	Chathankottunada SHEP Stage I	2x2.5 MW	12.06+2.4 Mu	E&M estimate prepared
4	Poovaramthode	3 MW	5.88 Mu	Revised estimate given to Chief Engineer(Civil Construction) North for obtaining revised Administrative Sanction
5	Olikkal SHEP	5MW	10.26 Mu	Revised estimate given to Chief Engineer (Civil Construction) North for obtaining revised Administrative Sanction
6	Moorikadavu SHEP	2x0.75 MW		E&M estimate prepared
7	Pambla SHEP	2x5MW		E&M estimate prepared
8	Neyyar SHEP	2x1100 KW		E&M estimate prepared
9	Passukadavu SHEP	2x2 MW	10.34 Mu	E&M estimate prepared
10	Upper shengulam I	1x24 MW	53.22 Mu	E&M estimate prepared

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 2018-19 is summarised in the tables below:

Investigation and DPR Preparation			
No	Project / Scheme	Activity	Remarks
1	Chathankottunada stage 1	Detailed Project Report	In principle sanction received
2	Pasukkadavu	Detailed Project Report	In principle sanction received
3	Keerithodu	Detailed Project Report	In principle sanction received
4	Idukki Extension scheme	Feasibility study	In progress
5	Pallivasal Augmentation	Preliminary survey	In progress
6	Kannankuzhy SHE Scheme	Feasibility study	Revised report submitted

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Construction Works		
No	Project / Scheme	Construction Work / Project Stage
1	Poringalkuthu SHP(24MW)	Overall physical progress – 80.52%
2	Chinnar SHP(24MW)	overall physical progress - 10%
3	Mankulam SHP(40MW)	69.69% of private land required for the project acquired

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, instrumentation and preparation of reports etc, (b) Maintenance and upkeep 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. 120 Cr approximately (works/goods/consultancy) has been tendered in 100 packages and are under various stages of implementation/processing. Work Orders amounting to Rs. 93 Cr has been awarded and is at various stages of implementation/processing. Works of 69 Packages are now completed. Out of a total expenditure of Rs. 86.84 Cr incurred up to 2018-19 under DRIP, 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 was completed during the year. The HQ of the Chief Engineer (Civil-DS & DRIP) was shifted to Pallom . The spillway gates and other H-M work of various dams were rehabilitated through various packages under DRIP which facilitated in a great way for the operational safety of the dams during the flood 2018.

KSEBL provide consultancy services to Government departments and organizations. The Government of Kerala has also declared KSEBL as SPV for implementing infrastructure projects of Health and Family welfare Department with KIIFB funding. The Board as per B.O(DB)No.1578/2018(DGC/AEE IV/GNL/2014) dated 26.06.2018 has accorded in-principle approval for the proposal for setting up an exclusive Special Purpose Vehicle(SPV) as a subsidiary company- proposed KEBCIL, for scaling up the consultancy works.

The Consultancy wing of KSEBL is mainly engaged with nine hospital projects funded by KIIFB & other PMC works to Govt. Departments and organizations to the tune of Rs 800 crore, to be completed within specific timeframes. The wing has been successful in the obtainment of Rs.3.20 crores to KSEBL as centage from KIIFB projects alone, as on 31.03.2019. The Consultancy Wing is also executing various works under other departments to the tune of Rs.32 crores and prefab construction of office buildings for KSEBL with a total project cost of Rs.1.45 Crores.

The Civil Division in Vidyuthi 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 Vidyuthi 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 of various components of Hydro Electric Projects and major buildings, including design of civil parts of RMU works. In addition to this, land acquisitions for hydro-electric projects, design of civil structures of solar projects, transmission tower foundations for projects in Northern Region are also undertaken by this office. The Mechanical Fabrication Facility in Kolathara, 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:

- Civil works of Peruvannamuzhi SHEP, Chathankottunada SHEP and Pazhassi Sagar are in progress
- Land acquisition for Olikkal SHEP & Poovaranthodu SHEP 78% completed
- 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 Mankavu, 220 KV substation at Manjeri, 110 KV GIS at Vennakara, Workshop cum Division Office for TMR Kannur, Electrical section Nenmara, 66 KV Substation Nilambur, 220 KV Substation Chalakudy and Kothamangalam, Section Office at Kathirur, Mankavu and Pinarayi completed.
- Fabrication and supply of line materials and poles amounting to Rs 17.87 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 during 2018-19 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	Peechad SHEP	Kothamangalam	3 MW	7.74 MU	For tendering
12	Western Kallar SHEP	Kothamangalam	5 MW	17.41	For tendering
13	Upper Sengulam	Kothamangalam	24 MW	53.22 MU	For tendering
14	Deviyar	Kothamangalam	24 MW	25.94 MU	For tendering
15	Marmala	Pallom	7 MW	23.02 MU	For tendering
16	Ladrum	Pallom	3.5 MW	12.13 MU	For tendering

The following design works were also carried out during the year: Structural drawings of Energy management Cell building pertaining to SPIN, Structural details of office complex at Palarivattom, Kattakada, Subdivision Office at Pathirapally, Section Office at Changanassery, Pothanikkad, Mancombu, Kayamkulam, Staff quarters at Kakkad, Division Office at Angamaly, Vazhathope, Attingal Town Hall building, IB Annexe at Vazhathope.

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 Thiruvananthapuram, 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 31.3.2019 is given below.

Transmission System as on 31.03.2019			
No	Item	Unit	Quantity / Capacity
1	400KV Transmission Lines	Ckt-km	947.96*
2	220KV Transmission Lines	Ckt-km	2952.34
3	110KV Transmission Lines	Ckt-km	4745.08
4	66KV Transmission Lines	Ckt-km	2145.33
5	33KV Transmission Lines	Ckt-km	1957.43
Total			12748.14
7	400KV Substations	Nos	5*+1
8	220KV Substations	Nos	22
9	110KV Substations	Nos	157
10	66KV Substations	Nos	72
11	33KV Substations	Nos	154
Total			411
12	Total Transmission Capacity	MVA	20711.40

* 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.

A number of major transmission network expansion works were also completed. A summary of new substations and Transmission lines completed during 2018-19 is shown in the Table below.

No	Particulars	400 KV	220 kV	110 kV	66 kV	33 kV	Total
1	Substations commissioned (No)		0	3	1	5	9
	Transmission North		0	1	0	2	3
	Transmission South		0	2	1	3	6
2	Lines commissioned (Ckt. Km)		0	119.15	43.00	60.90	223.05
	Transmission North		0	81.90	13.50	35.90	131.30
	Transmission South		0	37.25	29.50	25.00	91.75
3	Capacity addition/enhancement (MVA)	200	300	147	37.70	32	716.70
	Transmission North	200	200	82	3.70	11	396.70
	Transmission South		100	65	34	21	320.00

KSEBL had taken up the ambitious **TransGrid 2.0** project for enhancing the transmission capacity for meeting future demand, improving reliability and quality of power transmitted and to reduce losses. As part of TransGrid 2.0, the following line works were completed during 2018-19.

- Upgradation of 220kV SC line to 400/220kV MC MV line from Madakkathara to Malaparamba(97.38 ckm)
- Upgradation of existing 110kV DC line to 220/110kV MC MV line from Kizhissery to Chelari tap(20.20 ckm)
- Upgradation of line to 220/110 kV MCMV from Karukadom to Kothamanagalam
- 110 kV Kakkayam-Nallalam portion under NRHTLS package commissioned.

Ongoing works under TransGrid 2.0

- Stringing work in progress for Aluva-Pallikara, Brahmapuram-Thuthiyoor and Kothamangalam –Aluva.
- 220 kV cable laying work in progress from Thuthiyoor to Kaloor
- For the upgradation of Manjeri, Chalakudy and Kothamangalam to 220 kV- Control room building construction and Yard equipment erection in progress.
- Site levelling work nearing completion for 220 kV S/s Chithirapuram
- GIS building construction in progress at 220 kV S/s Kunnamangalam, Aluva & Kaloor.

Expenditure of Transgrid 2.0 works as on 31.03.2019		
SI No.	Project Execution by	Cumulative expenditure till 31.03.2019 in Rs. Lakhs
1	Own fund	4000.37
2	PSDF	16321.73
3	KIIFB	4106.87
	TOTAL	24428.97

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 & Office) who also assists the CE (TSO) in office functions. The Deputy Chief Engineers of System Operation Circles at Kalamasserry, Kannur and Thiruvananthapuram are responsible for the protection, communication, SCADA and meter testing for energy audit.

System Operation: Kerala experienced an abnormally high rainfall from 1 June 2018 to 19 August 2018. This resulted in severe flooding in most part of the State. As per IMD data, Kerala received 2346.6 mm of rainfall from 1 June 2018 to 19 August 2018 in contrast to an expected 1649.5 mm of rainfall. This rainfall was about 42% above the normal. Further, the rainfall over Kerala during June, July and 1st to 19th of August was 15%, 18% and 164% respectively, above normal.

Due to heavy rainfall, Kuttiady, Poringalkuth, Sholayar, Ponmudi, Lower Periyar and Neriamangalam dams were spilling by the end of July. A severe spell of rainfall was experienced at several places on the 8th and 9th of August 2018. Consequent to this, spill was commenced from major dams such as Idamalayar, Idukki, Pampa and Kakki on the 9th of August. From 14th to 19th August, the State witnessed an unprecedented rainfall following sustained heavy depression and cloud bursting and the same has resulted in disastrous flooding throughout the State.

The water year began with carryover storage of 982MU, 332MU more than planned quantum resulted from the excess inflow and lower consumption during the months from March to May, 2018. The south west monsoon hit Kerala on 29th May,2018, three days ahead of scheduled arrival. The beginning was spectacular and the inflow was above the normal 10 year average quantum in almost all the reservoirs during June. Smaller reservoir stations such as Poringalkuthu, Neriamangalam, Lower Periyar and Kuttiady which spills for normal rainfall, started spilling from the middle of June and hence were operated as must run stations.

By middle of July, the pattern of inflow to all major reservoirs with above normal figures was put to analysis. The possibilities of reservoir getting full and spilling were observed by end of July and hence necessary administrative preparations were made for same. From the last week of July, all hydro stations were operated under must run status and generation was maximised to utilize the available water.

Due to heavy rainfall, Kuttiady, Poringalkuth, Sholayar, Ponmudi, Lower Periyar and Neriamangalam dams were spilling by the end of July. A severe spell of rainfall was experienced at several places on the 8th and 9th of August 2018. Consequent to this, spill was commenced from major dams such as Idamalayar, Idukki, Pampa and Kakki on the 9th of August. From 14th to 19th August, the State witnessed an unprecedented rainfall following sustained heavy depression and cloud bursting and the same has resulted in disastrous flooding throughout the State.

The Anticipated vs. Actual Inflow/ Hydel generation/Spill details during the three quarters of the water year is summarized below:

Month	Inflow			% of Anticipated	Hydro Generation(MU)		Spill (MU)
	Anticipated (MU)	Actual (MU)	Surplus(+) / Shortage(-)		Anticipated	Actual	
June	760	1505	745	198%	428	579	109
July	1372	2959	1587	216%	542	847	690
August	1230	4284	3054	348%	503	1047	4249
Total	3362	8748	5386	260%	1473	2473	5048
September	945.1	596.81	-348.29	63%	643.2	800.14	213
October	686.8	859.7	173	125%	655.96	857.26	308
November	485.7	405.49	-80.21	83%	562.6	421.35	81
Total	2118	1862	-256	88%	1861	2079	602
December	237.1	159.09	-78.01	67%	512.12	360	
January	112.7	80.51	-32.19	72%	539.71	357.01	
February	77.6	58.49	-19.11	75.40%	535.92	431.3	
Total	427	298	129	70%	1588	1148	

From the table above showing the first quarter, it can be seen that against an anticipated inflow of 3362MU the actual obtained was 8748MU (260% of anticipated). Out of this, 5048MU were released as spill to downstream rivers during above period and 2473MU were generated and fed to the grid which is 1000MU more than the planned generation figure of 1473MU. With this increase in

generation and storage in major reservoirs to the extent possible, the impact of the flood could be controlled to certain extent.

This was then followed by a lull in rainfall across the State. The month of September saw deficit in rainfall. However, due to the effect of cyclone "Titli" that hit the eastern coast of the country, the rainfall and inflow was above normal during October. The inflow, spill and generation details for the period September to November is also tabulated above.

From the table it is evident that the inflow obtained during North East Monsoon period is less than the normal anticipated quantum. However, considering the storage position, Cyclone alert etc., the generation was maintained more than the planned figure by 358MU during September to October. The spill release was also required during the above period considering the then prevailed weather conditions and as a precautionary measure taken by the State. With the position as above we can see that the NE spell has received only 88% of the normal average inflow and this may be due to the unusual flood that had happened in the first spell of SW monsoon. Normally, the NE monsoon spell will deliver on an average 30% inflow of what is received during SW monsoon period. Such a pattern was also not observed this year and the inflow was less even if the 4 days intense inflow during 14th to 18th August was excluded. This shows that subsequent to August, the monsoon had receded and even the anticipated inflow was not received and the impact of NE monsoon was weak.

Thus the inflow received from the rainfall experienced could not be held in reservoirs but had to be released as spill and a portion of 1358MU could be utilised as additional generation along with the build up of storage in respective dams

Considering the poor inflow during the north east monsoon a System Operation plan with hydro generation details were prepared for the remaining period of the water year on 25th of October. However, market conditions were very favourable for sales and accordingly some aggressive strategies were devised for utilising the hydro for a better price with an intention to swap back when prices are lower.

The total internal generation of Kerala system during the year was 7626.37 MU and consumption was 21750.25 MU. The highest consumption of 86.4039 MU was recorded on 28.03.2019. The Maximum Demand recorded during this year was 4242 MW on 27.03.2019, between 22.00 to 22.30 hrs. The total energy consumption for the FY18-19 was 21750.25 MU, 2.79 % higher than previous year.

The details of monthly Power Purchase and Sales through power exchanges during FY 2018-19 are given below:

Power Purchase and Sales in Exchanges						
Month	Purchase			Sale		
	MU	Amount (Rs.Crs)	Rate (Rs/unit)	MU	Amount (Rs. Crs)	Rate in Rs/unit
Apr-18	1.265767	0.581271141	4.59	6.5162605	3.156782348	4.84
May-18	4.54073	2.121874115	4.67	32.226871	18.77697734	5.83
Jun-18	0	0		116.376978	45.74633177	3.93
Jul-18	0	0		191.933276	56.15035843	2.93
Aug-18	0.809263	0.382737561	4.73	195.703473	56.63174761	2.89
Sep-18	12.141698	6.633667714	5.46	23.90855	10.72507082	4.49
Oct-18	3.86697	2.140780966	5.54	100.52838	64.23691924	6.39
Nov-18	84.90344	31.15341694	3.67	0.95822	0.432629521	4.51
Dec-18	168.14088	58.54839816	3.48	0.1271	0.074147689	5.83
Jan-19	65.22255	21.55433057	3.30	11.20235	5.538342337	4.94
Feb-19	107.60355	35.3035826	3.28	0.768003	0.390876511	5.09
Mar-19	28.49573	10.2345208	3.59	0.37772	0.226516778	6.00
Total	476.990578	168.6545806	3.54	680.6271815	262.0867004	3.85

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) Up-rating Kakkayam-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. 72.152 Cr (87.66 %) has been received till the year end. For the implementation of ADMS, 90% of the project cost amounting to Rs.4.77 Cr is approved as grant out of which Rs. 1.431 Cr was released during the year, whereas for construction of 400/220 KV Multicircuit/Multi voltage transmission line from Madakkathara to Areacode, 90% of the approved grant amount of Rs.333.93 Cr amounting to Rs.300.53 Cr was released. For the work of uprating Kakkayam-Nallalam 110KV line, Rs.16.67 Cr was released as grant and for renovation and upgradation of switchyard equipments, Rs. 2.67 Cr was released as grant. Thus out of a total amount of Rs.581.80 Cr approved as grant, Rs.393.453 Cr (67.63%) was released as grant. The status of the projects is given in the table below:

Status of PSDF Schemes as on 31.03.2019							
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%)	72.152 (87.66%)	Work completed
2	Implementation of Automatic Demand Management Scheme	6.03	5.30	02.01.2017	4.77 (90%)	1.431 (30%)	Work awarded
3	400/220 KV Multicircuit/ Multivoltage Transmission line from Madakkathara to Areekode. (Transgrid North-I)	371.03	371.03	16.05.2017.	333.93 (90%)	300.53 (90%)	Work in progress. (49%)
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 (24.94%)	Work in progress (45%)
5	Renovation of Switchyard Equipments, AGC in Gen stations, AMR and associated works	33.68	22.42	15.11.2017	20.18 (90%)	2.67 (13.23%)	Work in progress (15%)
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%)	0.00 (0%)	Agreement executed
Total		783.11	726.86		581.80	393.453 (67.63%)	

The status of other major purchase/ work orders are given below:

Purchase Order and work order were issued for an amount of Rs.8,50,50,097 for following projects

1. Implementation of ADMS Projects for 322 SS of KSEBL
2. Supply, installation, testing and commissioning of PDH equipments
3. Supply of PLCC Equipments, Digital protection coupler, 3 Phase Relay test kit & power quality analyser etc.

E Tender was floated for Rs 10,78,1590/- for the following projects.

Supply, installation, testing and commissioning of 13 passenger(884kg) capacity new passenger lift, Supply of Power Quality Analyser, Supply of 3 Phase Relay Test Kit ,Supply of Digital Signal Level Meter with Oscillator and for the preparation of DPR of SAMAST.

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	Nil	
	110KV	Mundakkayam Neyyatinkara	LILO from SL puram - Chellanam Parassala- Neyyatinkara
	66KV	Thrippunithura	LILO from Vytilla-Puthencruz No.1 to Thrippunithura UG 400m Kothamangalam- Bhoothathankettu 66 KV DC
	33KV	Perumthenaruvi, Pandalam	Kumily, Vandiperiyar-Kumily Kanjirapally- Mundakkayam Edappon-Pandalam
	220KV	Nil	
Transmission North	110KV	Nedumpoil	Malaparamba- Ramapuram Malappuram-Tirur 2 nd circuit Kuthuparamba-Nedumpoil DC Gandhi road-Chevayur 110 KV SC
	66KV	Nil	Nilambur-Edakkara 2 nd circuit
	33 KV	Rajapuram, Blangad	Chavakkad(Punna)-Blangad Azhikode to Coast Guard DC Belur Rajapuram SC

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

Substations				
	220 KV	110KV	66KV	33KV
1	Manjeri	Sreekantapuram Upgn.	Enathu	Vydyuthi Bhavanam,TVM
2		Kodungallur Upg.	Kattanam Upgn.	Veliyambra
3		Muttathara		Kelakam
4		Balaramapuram Upgn.		Olavakode
5		Karunagappally upgn		Vilakulam
6		Mundakkayam Upgn		Pothukallu
7		Koothattukulam		Kalarcode
8		Eramallur		Vandanmedu
9		Mankavu Upgn		
10		Kuttikattoor Upgn		
11		Thambalamanna		
12		Ettumanoor Upgn		
13		Chemberi		
14		Kuthumunda Upgn		
Lines				
	220 KV	110KV	66KV	33KV
1	LILO from Madakkathara - Areacode line	SC UG cable from Veli	Adoor _Enathu DC line	Medical College-Vydyuthi Bhavanam UG cable
2		Neyattinkara-Thirumala DC line (upgn.)	Tap line from MVKP feeder	Varkala -Vilakulam SC line
3		Sasthamkotta – Karunagapally Dc Line (upgn)		Punnapra-Kalarcode SC
4		LILO from Aroor - Thycattussery		Nedumpoil-Kelakom SC line
5		Kothamangalam – Koothattukulam DC line upgn		Tap from Mattannur –Kuyiloor line
6		Chalakudy Kodungallur DC line (upgn)		Nedumkandom – Vandanmedu SC line
7		LILO from Nallalam – Chevayoor line		Vennakkara-Olavakkode SC line
8		LILO from Kanhirode – Mattannur line		Adyanpara – Pothukallu SC line
9		Kunnamangalam – Kuttikattoor (upgn)		
10		Agasthyamoozhy - Thambalamanna		
11		Ettumanoor - Pala		
12		LILO from Mattannur – Sreekandapuram line		
13		Kaniyampetta – Koothumunda DC		

3.2.3 Power System Engineering

This Wing is primarily entrusted with conducting Load flow studies, Short Circuit Studies for assessing feasibility and fault level of Substations and Lines for new Projects and capacity enhancement of existing substations/lines. 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 taking follow up action are other major functions. 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 related to CEA, SRPC, TCC, CERC and other Central and Southern Regional Forums are also handled by PSE wing.

During FY 2018-19, PSE wing had conducted 53 Load flow studies, 28 earth mat design works, System Fault study in addition to the reactive power study and Loss studies at various voltage levels. This wing has coordinated with Transmission Circle, Kalamaserry for carrying out User Acceptance Test of “the Drone based line monitoring system” by the Contractor

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 led 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 (126 lakh consumers as on March 2019). 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	84043	96616	126741	61273	368673
No. of street lights connections	2,041	1239	902	943	5125
11 kV line constructed (km)	544	408	557	264	1773
LT line constructed (km)	945.6	965.41	798.8	690.96	3401
No. of distribution transformers installed(Nos.)	504	729	757	420	2410
Meter replacement (Nos)	205526	290563	231663	110106	837858
HT re-conductoring (C.Km)	228.85	223.94	195.85	191.3	840
LT re-conductoring (C.Km)	2149.49	2096.54	2656.5	1452.51	8355
1Phase to 3Phase Conversion (km)	298.77	238.4	509.03	245.88	1292

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, led 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 (CAPS) Department.

The Restructured Accelerated Power Development and Reforms Programme (R-APDRP) – Part B is one such Centrally Aided Project which 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 Ministry of Power 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.

City	Project Cost (Rs. Cr)	Contractor	Amount (Rs. Cr)
Thiruvananthapuram	178.77	M/s Leena Powertech, Mumbai	201.09 (20.81% above PAC)
Kochi	207.96	M/s NCC, Hyderabad	243.97 (15.13% above PAC)
Kozhikode	160.78	M/s L&T Ltd, Chennai	198.54 (15.06% above PAC)

All the 43 Schemes have been closed and the closure proposal has been approved by PFC. PFC has released balance fund.

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	530.795	517.1933	79.6136	41.8024	121.416	301.542
2	3 City schemes	547.510	597.989	82.1265	54.751	136.8775	341.424
3	Grand Total	1078.305	1115.1823	161.740	96.5534	258.2935	642.966

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 is to be completed by September 2019. About Rs 107.41 Cr has been received from MoP as on 31.3.2019. Total expenditure as on 31.03.2019 is Rs. 229.12 crore. The details of progress as on 31.03.2019 is as given below:

No	Major item of work	Unit	Sanction	Achievement as on 31.03.2019
1	New Substation	Nos	3	2
2	33/11KV Additional transformer	Nos.	1	75%
3	Capacity enhancement	Nos.	14	8
4	R&M of 33/11KV S/S	Nos.	95	86
5	33KV New feeders	Km	26.87	7.78
6	66KV feeder re conducting	Km	27.70	26.56
7	33 KV line Bay Extn	No	6	3
8	11KV New feeders	Km	326.69	256.707
9	11 KV line re-conductoring	Km	184.97	101.34
10	HT/LT ABC	Km	1152.393	343.574
11	Distribution Transformer	Nos.	829	745
12	Capacity enhancement of LT S/s	Nos	384	363
13	LT line (New)	Km	218.015	128.061
14	LT line augmentation	Km	2416.49	1790.94
15	UG Cable	Km	192.19	50.407
16	HVDS	Nos	107	8
18	Consumer metering	Nos.	632194	457641
19	Boundary/Feeder/DTR meter	Nos.	3199	1071
20	Solar Panel	KWp	5465	4245

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, Gol 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. Gol has also permitted to re-allocate Rs. 100 Cr from metering component of the project to the Rural Electrification component. Financial details as on 31.03.2019 is as given below:

Sanctioned Project cost including PMA charge	Grant received from Govt. Of India (60%)	Loan Amount (30%) (From Board's fund)	Utility share (10%)	Financial progress as on 31.03.2019
Rs. 485.37 crore	Rs. 230.99 crore	Rs. 88.40 crore	Rs. 48.296 crore	Rs. 367.686 crore

DDUGJY: Component wise financial progress based on physical progress achieved as on 31.03.2019					
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	53.94	91.21%
2	Metering	Replacing 1778944 faulty/electro mechanical meters, transformer/11 KV feeder metering etc.	159.16	151.27	95%
3	Connecting unconnected Rural house holds	98527 BPL connection along with infrastructure works	181.6	171.15	94.25%
4	System Strengthening	Construction of 2 Nos substations, Augmentation of 7 Nos existing substations	83.07	87.60	105.45%

The Works under DDUGJY are being executed departmentally as per the guidelines issued by REC/MoP. The status of the project as on 31.03.2019 is given below:

Sl. No	Milestone Name	Unit	Sanction	Achievement
1	33/11 KV New Substations	Nos.	2	2
2	Augmentation of 33/11 KV Substations	Nos.	7	7
3	Distribution Transformers (DTRs)	Nos.	581	579
4	LT Line	Ckm	3368.11	2761.54
5	11 KV Line	Ckm	1281.94	1208.12
6	33 & 66 KV Line	Ckm	17	17
7	Energy Meter -Consumer	Nos.	1778944	1729839
8	Energy Meter - DTR	Nos.	23655	17911
9	Energy Meter - 11 KV Feeder	Nos.	103	79
10	Intensive Electrification of Villages	Nos.	1315	1315
11	SAGY Villages	Nos.	27	24
12	Connection to BPL	Nos.	98527	111041

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 led 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, Divisions and Circles 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 6,46,209 calls at the Call Centre. 4,77,721 complaints were registered through IVRS, 23,559 through WSS and 28,30,712 through CCC-ET. Complaints received from official Face book page of KSEBL, Whatsapp no 9496001912, e-mail etc are also registered and followed-up done in CCC. KSEBL has launched its Social Media initiatives from 27/02/2019 onwards. The Social Media Help Desk is functioning under Centralized Call Centre of KSEBL and currently uses Whatsapp (9496001912), Facebook account @ksebl, Twitter account KSEBLtd as its social media platform for interaction with the customers for solving their complaints and issues. A total amount of Rs 83,72,23,822/- was collected in Corporate Service Centre through bulk payment, CDM and direct collection at CCC during 2018-19.

Applications have been rolled out in all 228 RAPDRP Electrical sections. The distribution networks of all RAPDRP towns are available on GIS. Delta update of assets is being done. Remote meter readings are received in the server systems in Data Center from all RAPDRP towns. Energy audit report of these towns are also generated.

In addition, various other IT projects are given below:

No	Application / Projects	Status
1	Management Information System	Deployed
2	Asset Management,	Final Testing
3	Maintenance Management	Final Testing
4	PDA Implementation	Deployed
5	Urja sowhrida, Billing Information system	Deployed
6	Urjadoooh, Outage Management system	Deployed
7	Rural Feeder Monitoring	In Progress
8	SMART, Safety Application	deployed
9	IPDS Incremental IT (21 Towns)	Tendering stage
10	ERP Implementation	Tendering stage
11	Smart Meter for above 500 Unit consumers	Implementation started
12	Smart Meter for above 200 Unit consumers (Uday)	Revised DPR is being prepared
13	KPI Monitoring	Deployed
14	Project Monitoring Software (Promos)	Deployed
15	Permit to Work management System	Beta Testing
16	E-Payment facility	Deployed
17	E-tendering done	For tenders with PAC above Rs.5 Lakhs
18	Mobile applications for employees and consumers	Released
19	Asset Data Software development	In progress

20	Smart City/Smart Grid project:	Board sanction obtained to coordinate the implementation/installation activities
21	Facility Management Services(FMS)-	Deployed

3.4. HUMAN RESOURCES MANAGEMENT

The Chief Engineer (HRM) heads and manages the Human Resources activities for the company. The company has 33149 regular employees as on 31-03-2019, (Generation SBU: 1428, Transmission SBU: 3126, Distribution SBU: 27116 and Corporate Office: 1479). 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 in Nos.
1	Recruitment through KPSC	259
2	Selected for Compassionate appointment	72
3	Sport Quota appointment	11
4	Paid apprentices appointed	413
5	Unpaid apprentices appointed	1399
6	Promotions(up to the rank of AEE/AAO)	1006
7	Vacancies reported to KPSC	128
8	New Pension Claims	1327
9	Disbursement of Pensions	1022
10	PRAN card processed	759
11	NPS contribution paid (Rs Cr)	35.75
12	Service Charge remitted to NSDL (Rs.Lakhs)	8.13
13	Officers deputed for foreign training	5
14	Officers deputed outside state	95
15	Employees Trained in own institutes	19564
16	National Training Programmes (with REC)	2
17	Employees Trained in National Programme	7
18	Employees Trained at NPTI	7
19	Employees Trained at ESCI	18

HRD Cell co-ordinate training activities of Power Engineers Training and Research Centre (PETARC) at Moolamattom, Regional Power Training Institutes at Thiruvananthapuram, Kottayam, Thrissur and Kozhikode and Southern Regional Computer Training Center at Vydyuthi Bhavanam Thiruvananthapuram.

PETARC is a full fledged training centre of KSE Board imparting technical as well as management training to the Officers of KSEB and has been recognized as Category -1 training centre by Central Electricity Authority. The Regional Power Training Institutes are working under the control of the Deputy Chief Engineer, PETARC. All the training centres are provided with adequate training facilities

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-IPMT, the nodal agency for implementing the programme. Accordingly 150 linemen were trained by conducting 6 programmes, 74 Senior Assistants were trained by conducting 3 programmes. 75 Sub Engineers were trained by conducting 3 programmes, 74 Overseers were trained by 3 programmes and 615 Electricity Workers were trained by conducting 25 programmes etc.

SOURA– Scheme conducted Training of Trainers. A module for promoting on line applications popular among KSEBL customers and imparted to **150** Trainers.

R-APDRP Project modules – Training is given to the end users on various project modules such as MDAS, GIS, EA & NA.

Customer Care Centre – The training is given to the employees for providing a professional approach while having direct interface with the consumers.

Professional effectiveness and customer interaction skills, this training has been imparted to the field staff and officers of the Distribution wing. As part of improving the customer interaction skills, this training has been imparted to the field staff and officers of the Distribution wing.

In coordination with the Indian Institute of Technology, Roorkee capacity development programmes in Design of Small Hydro Projects were conducted for 29 middle level officers in Distribution wing.

A capacity building programme was arranged with M/s SIEMENS and M/s Mi Power in Power System Studies Software applications for 30 Electrical Engineers.

Several training sessions were conducted in “First Aid Smart Training”(FAST) in view of work situations prevailing in KSEBL and to help 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 98 students from various educational institutions have undergone their project work and 4442 students have undergone their industrial training in various Power Houses, Substations and Field Offices of KSEBL. An amount of Rs.45,07,305/-(Rupees Forty Five Lakh Seven Three Hundred and Five Only) had been generated from these activities during 2018-19. 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. 2,59,96,913/- has been spent towards the training and non-training expenditure during the year 2018-2019.

Sl. No	Name of Training Center	No. of Programmes	No. of Participants	No. of Training days	Man days	Expenditure	Non training Expenditure	Total Expenditure (Rs)
1	RPTI Trivandrum	99	2273	247	6565	2014653	436877	2451530
2	RPTI Kottayam	1155	4034	379	10101.5	3232053	250044	3482097
3	RPTI Thrissur	137	4080	304	7875	2580902	1227933	3808835
4	RPTI Kozhikode	137	4521	309	9594	2782668	431360	3214028
5	PETARC	52	1448	255	956	5870540	3385090	9255630
6	HRD External (Outside State)	35	95	134	280	1186079	0	1186079
7	HRD Internal (Inside State)	16	208	34	474	1924886	0	1924886
8	SRCTC	42	1114	91.5	1759	673828	0	673828
	Total	673	17783	1753.5	29749.5	20265609	5731304	25996913

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), Chief Personal Officer, Public Relation Officer, Resident Engineer (New Delhi) & Assistant Engineer (Vehicle Monitoring cell). 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 48Nos of material inspections at various locations.

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.

The total estimated amount for distribution materials for 2018-19 came to Rs.883 Crore. The total estimated amount for transmission materials for 2018-19 was Rs.161 Crore. 94 Nos of tenders were invited and 207 Nos. of Purchase Orders were issued during 2018-19. Purchase order issued for a total amount of Rs.804.81 Crore, (Including DDUGJY – Rs.29.7 Crore, IPDS – Rs.145.7 Crore, PSC Poles – Rs.104.96 Crore, Fabrication Materials, MS Rod & GI Pipe – Rs.72.21 Crore). Store Verification Unit verified stocks in Sub Regional Stores (25 Nos.), Manufacturing facilities (3 Nos.), TMR Division Stores (5 Nos.), Transmission Division Store (1 No.), Generation Circle Stores (4 Nos.). An amount of Rs.57.82 Crore was realised through Scrap Disposal, out of which an amount of Rs.42.58 Crore was realized through e-auction. During 2018-19, 65 Nos. of e-auction was conducted for the disposal of 359 lots of selected scrap items through the web portal of M/s.MSTC Limited, Bangalore.

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 PV 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	Addition of wind power into grid 10MW by M/s Malayala Manorama in Captive Power Producer at Chittoor, Palakkad
2	Tender documents under preparation for installing Electric vehicle Charging station at KSEB premises in 6 cities
3	Floating solar PV plant at Padinjarethara (0.5MW) energized on 4.12.2018 and generation commenced on 21.01.2019
4	DELP Project cost- distributed 8.355 Lakh LED Bulbs during this year to the consumers

Completed Solar Projects as on 31.03.2019

No.	Name of the projects	Installed capacity (MW)	Date of completion
1	Peerumedu Idukki	0.5	23.04.2018
2	Ponnani Malappuram	0.5	16.01.2019
3	IPDS-RT KSEBL Bidgs (South & Central)	0.655	2018-19
4	On grid consumers as on 31.03.2019		

On-going Solar Projects as on 31.03.2019

No	Name of the project	Installed capacity (MW)	Target for completion
1	Mylatti, Kasargode	1.00	2021
2	Ettumanoor, Kottayam	1.00	2021
3	Agali Palakkad		
4	Brahmapuram Ernakulam	8	2021
5	Kanjikode Palakkad		
6	West Kallada Floating Solar by NHPC	10	2021
7	Kottiyam, Kollam	0.60	2020
8	Medical College Tvpm	1.1	2021
	Total	20	

Status of ongoing Solar Projects (Government Buildings) as on 31.03.2019

Sl. No	Name of the Project	Capacity kWp	Target
1	District Panchayath, Thiruvananthapuram -6 Locations	385	2021
2	District Panchayath, Thiruvananthapuram -4 Locations	121	2021
3	Attingal Municipality 2nd phase-2 Locations	27	2021
4	Attingal Municipality 3rd phase	56	2021
5	Jilla Panchayath Kollam-4 Locations	90	2021
6	LSGD Disrict Panchayath Kottayam.	22	2021
7	Jilla Panchayath, Palakkad	250	2021
8	Jilla Panchayath Malappuram-11 Locations	110	2021
9	Jilla Panchayath, Kannur (29 Locations) 2nd Phase	450	2021
10	Jilla Panchayath, Kasaragod (3 Locations) 1st phase	195	2021
11	Jilla Panchayath, Kasargod 3rd phase (7 Locations)	70	2021
12	Jilla Panchayath, Kasargod 4th phase (20 Locations)	200	2021
13	KUHS Kerala University of Health Sciences	250	2021
14	Calicut University	57	2021
15	Chengalai Grama Panchayath	10	2021
16	Perambra Block Panchayath	50	2021
	Total	2343 kWp	

3.9 SOURA

KSEBL along with ANERT is implementing 500 MWp Roof Top Solar Power Plants by utilizing Roof Top of domestic, public and private buildings including educational institutions, hospitals and commercial establishments and vacant lands in consonance with the Policy of the Government of Kerala under Urja Kerala Mission, a vision to develop the energy sector in the State to truly global standards. New project office for implementing of 500 MW roof top solar plants was constituted vide B.O (CMD) No.384/2019 dated 27.02.2019 with a Management Committee consisting of five members viz. Director (CP, GE,SCM, Safety), Chief Engineer (REES), Deputy Chief Engineer (Commercial & Planning) with full powers of Chief Engineer, State Nodal Officer (Soura) and an Executive Engineer in the Office of CE(REES). The major activities carried out during 2018-19 include training of 800 Nos. Solar Co-ordinators for carrying out field survey. An Assistant Executive Engineer, Assistant Engineer and a Divisional Accounts Officer were posted for the functioning of the Office.

3.10 CENTRAL PROJECT MONITORING CELL

CPMC act as a single point contact between the PMUs and corporate office and co-ordinate with various offices of SCM, FA, Regional CE's etc to ensure timely flow of materials and funds. The office was entrusted with the Standardisation of materials and work for Distribution wing. This office consolidates progress and performance report on Dyuthi 2021. This office coordinated the corporate level activities related with the manufacture and installation of Communicable Fault Passage Indicator (CFPD) for 11 kV Distribution network developed under Innovation Fund and ESCOT for the year 2018-19.

3.11 CORPORATE PLANNING

The assigned functions for the Corporate Planning wing can be broadly classified as (1) preparation of plans, (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. However, as a matter of convention, functions which are not specifically assigned to any one of the three Strategic Business Units (viz. Generation, Transmission or Distribution) are also referred to this wing. Preparing input notes for Budget Speech, Governor's address, Governors' Conference, MPs' Conference, Collectors' Conference, Demand for Grant etc and its subsequent actions are coordinated by this wing. The wing is providing reports to State and Central Government, and to various agencies like CEA, PFC etc. During the FY 2018-'19, Planning wing prepared detailed notes for two Power Minister's Conference, one in July 2018 at Shimla, HP and another in Feb 2019 at Gurugram, Haryana and also for Southern Zone council held during September 2018 at Bangalore, Karnataka.

KSEB had prepared its first Medium Term Capital Investment Plan (CIP) during 2018-19. A detailed Distribution Network strengthening plan covering four year (for FY 2018-22) viz. Dyuthi 2021 was part of the overall CIP of KSEBL. Circle wise Detailed Project Reports covering all distribution projects to be undertaken in next 4 years was attempted, presumably for the first time in the country. Revised CIP for FY 2017 -18 was also prepared.

In August 2018, Kerala witnessed an unprecedented torrential downpour and resultant landslides and flood. A detailed report on the same is included elsewhere in this report. The planning wing was instrumental in coordinating the Mission ReConnect activities which ensured that electricity service was restored to all within the shortest possible time. This wing also coordinated the 'On the Spot' visit by the Central Delegation and preparation of Calamity Reports. This helped KSEB in recovering a portion of the loss by way of Financial Assistance from the Government.

Matters related to Policy formulation and its amendments are also handled in Planning Wing. After the enactment of Electricity Act 2003, it has undergone certain amendments over the years. Though a major Electricity Amendment Bill, 2014 was introduced in the Lok Sabha in 2014, it was subsequently referred to the standing committee on energy for examination and report. Based on the observations and recommendations of the standing committee & further discussions at different level, some more amendments have been proposed during September 2018, inviting comments. KSEB, under the auspices of the Planning Wing had organised a one day Workshop to facilitate in depth deliberations by distinguished experts & policy makers and other stakeholders in October 2018 at Thiruvananthapuram. Based on the considerations in the said workshop and departmental deliberations, KSEB had submitted its comments on the then proposed Amendments in Electricity Act 2003 to the State Government and MoP, Government of India in October 2018.

eMobility initiatives in KSEB was kick-started during 2018-19. Initially, there was a broader understanding that KSEB Ltd shall establish a Bulk charging Station (BCS) at Kochi. Even though RfP for establishing a pilot charging station was prepared for the same, the State Level Task Force had advised KSEB to hold the project for the time being. Meanwhile, KSEB had ensured its readiness to meet probable challenges in adoption of eMobility in the State. After considering various aspects, Government of Kerala, in its Electric Vehicle Policy, had appointed KSEB as the State Nodal Agency for establishing the charging infrastructure in the State. In March 2018, KSEB Ltd organised a one day workshop to discuss the charging infrastructure requirements. Leading manufacturers of eVehicles & Battery Charging Stations, Central & State Government companies, experts in transportation planning & power and more than 100 delegates attended this workshop which was coordinated by Planning Wing.

During this year, KSEB has decided to set up a joint research lab along with M/s ICFOSS (International Centre for Free and Open Source Software). ICFOSS is a society under the Government of Kerala formed with a mission to promote the use of open source software. Deputy Chief Engineer, Technical Assistant to Director (Distribution & IT) is the ex-officio Chairman of the Committee and Deputy Chief Engineer, ITCU is a member. The Deputy Chief Engineer (Commercial & Planning) with full powers of Chief Engineer was entrusted to coordinate the activities and to evolve a system for assessing the efficacy of the mechanism.

During the review period, the Planning wing coordinated with NABARD, Government of Kerala and implementing field offices with respect to six RIDF projects viz. (1) Implementation of 2 MW Upper Kallar SHEP, (2) Design & Installation of 500 kWp Floating Solar Photovoltaic Project at Banasura Sagar Reservoir in Wayanad, (3) Setting up of 2 MW Grid Connected Solar Photovoltaic Power Plant at Pothencode in Thiruvananthapuram, (4) Setting up of 1.25 MW Grid Connected Solar Photovoltaic Power Plant at Pezhakkappaaly Moovattupuzha, (5) Setting up of 0.65 MW Grid connected Solar Photovoltaic Power Plant at Thalakkalathur in Kozhikode, (6) Implementation of 6 MW Peruvannamoozhi SHEP.

The State of Kerala launched Oorjja Kerala mission in June, 2018 aiming the integrated development of electricity sector in the state in three years with five flagship projects viz. Dyuthi, Transgrid, Filament Free Kerala, Soura and Esafe and also published the Draft Electricity Policy during 2018-19 in which KSEB had played a key role. Compilation of Power System Statistics for FY 2017-18 was completed. The objective of project Soura was to establish 1000MW Solar Power Capacity in the State by 2021 which includes 500 MW Roof Top Solar (RTS) projects, 200 MW land based projects by reverse e-bidding, 150 MW solar parks and 150 MW floating solar projects.

The planning wing of KSEBL took the initiative to constitute a Special Purpose Vehicle (SPV) as a Joint Venture (JV) with KSEBL and ANERT as partners for implementing the proposed Solar Projects. A six members committee was formed and the committee was entrusted to prepare a detailed study report on formation of the SPV as a JV and also to prepare a draft JV agreement. The committee has submitted its report recommending forming the new Business Entity as a Private Limited Company registered under the Companies Act, 2013 and also submitted the draft JV agreement. The representative body for the JV was a Management Committee comprising 7 members nominated by the parties. The nominations from ANERT to the Management Committee of SPV were delayed and a Management Committee for SPV was constituted by nominating five members from KSEB Limited. Also four officers from KSEB Limited were deputed to the SPV to start its functioning.

In the meantime Asian Development Bank (ADB) along with Punjab National Bank (PNB) was tasked by MNRE to support KSEB Limited in creating an enabling and responsive environment for uptake of rooftop solar installations. The planning wing initiated to conduct the Technical Assistance (TA) programme provided by the MNRE-ADB-PNB team. The TA programme provided support to KSEB Limited on various aspects including initial tendering processes, policy and regulatory matters, capacity building, demand aggregation, development of single window online portal for RTS etc. for achieving the capacity target of the RTS project. The TA programme and tendering works of first phase of RTS project were further carried out by the SPV on constitution of its Management Committee and deputation of its staff from KSEB Limited.

3.12 COMMERCIAL & TARIFF

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

- Inviting tenders related to purchase of long, short and medium term power including renewable power, Sale, banking of power, evaluation of bids, obtaining approval of Board, issuing Lol execution of agreement and participating in power procurement tenders.
- Monitoring of transmission corridors and matters related to open access
- Execution of Transmission Service Agreements
- 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 Techno - Commercial support to legal cell.
- Commercial matters related to SRPC/TCC meetings, Standing Committee meetings, LTOA connectivity meetings.

Power Procurement and sale during 2018-19 The following Long Term Power Procurement and Banking and swapping arrangement were made during the year:

I. Purchase of Power

i.

No	Supplier	Quantum	From date	Rate	Period	Remarks
1	M/s Kosamattom Finance Ltd	1 MW Wind	22.12.2018	Rs 3.07 / kWh	Long Term	By bidding

- ii. For procurement of power from the following IPPs, KSEB will execute PPA after obtaining approval from KSERC. The tariff of the same is to be determined by KSERC.

Sl No	Name of Station	Type	Date of Initialling	Capacity MW	Remarks
1	Arippara (CIAL)	SHEP	09.11.2018	4.5	KSEBL initialled PPA
2	THDCIL, Paivalike	Solar	16.01.2019	50	Ceiling rate Rs. 3.10 per kWh

- iii. KSEBL invited bids for Procurement of 200MW Solar power from Ground Mounted Solar PV projects within Kerala on long term basis for 25 years at a ceiling price of Rs.3.50/unit to be discovered through e-reverse auction. Tender was floated on March 2019, but was cancelled as it was single tender.

II. Sale of Power

- i. Sale of surplus power was arranged to Bihar State Power Holding Co. Ltd (BSPHCL) as shown below during June-2018, August-2018, September 2018 and October 2018 by participating in two tenders floated by BSPHCL in DEEP portal during 2017-18 as shown below:

Quantum	From date	To Date	Time	Tariff
50 MW	01-06-2018	30-06-2018	19:00 -24:00	Rs. 5.95 / kWh
100 MW	01-08-2018	31-08-2018	19:00 -24:00	Rs. 6.00 / kWh
100 MW	01-09-2018	30-09-2018	19:00 -24:00	Rs. 6.00 / kWh
100 MW	01-10-2018	31-10-2018	18:00 -24:00	Rs. 6.50 / kWh
100 MW	01-08-2018	31-08-2018	00:00 -06:00	Rs. 4.23 / kWh

- ii. Sale of surplus power was arranged to Chhattisgarh State Power distribution Co.Ltd. (CSPDCL) as shown below during the October 2018 and November 2018 as shown below:

Quantum	From date	To Date	Time	Tariff
150 MW	01-10-2018	31-10-2018	0:00 -07:00	Rs. 4.09 / kWh
200 MW	01-11-2018	30-11-2018	06:00 -10:00	Rs. 5.16 / kWh
149 MW	01-09-2018	30-09-2018	10:00 -13:00	Rs. 4.37 / kWh

III. Banking of Power:

(I) KSEB Ltd executed banking agreement with Mittal Power Processors Ltd on 24-01-2019, for arranging banking of power from Haryana Power Purchase Centre (HPPC) for the period from 16-02-2019 to 31-07-2019 as shown below:

Supply from MPPL(HPPC) to KSEB Ltd			Return to MPPL(HPPC) from KSEB Ltd		
Period	Duration	MW	Period	Duration	Return%
16-02-2019 to 15-03-2019	20-24 hrs	150	1.07.2019 to 31.07.2019	0-6 hrs	100%

Accordingly MPPL had already supplied 16.8MU during the above period which has to be returned as 16.8MU @100% during July 2019 from 0-6 hrs.

(ii) KSEB Ltd had executed agreement on 21-03-2019, with MPPL arranging banking of power from Haryana Power Purchase Centre (HPPC) for the period from 01-03-2019 to 30-09-2019 as shown below:

Supply from MPPL(HPPC) to KSEB Ltd			Return to MPPL(HPPC) from KSEB Ltd		
Period	Duration	MW	Period	Duration	Return%
01-03-2019 to 31-03-2019	0-24 hrs (RTC)	50	01-07-2019 to 30-09-2019	0-24 hrs (RTC)	105%

(iii) On 13-02-2019, KSEB Ltd had issued authorization to Arunachal Pradesh Power Corporation Pvt Ltd (APPCPL), for arranging banking of power from Haryana Power Purchase Centre (HPPC) for the period from 01-03-2019 to 31-08-2019 as shown below:

Supply from APPCPL(HPPC) to KSEBL			Return to APPCPL(HPPC) from KSEBL		
Period	MW	Duration	Period	Duration	Return%
01-03-2019 to 15-03-2019	100	0-24 hrs (RTC)	01-07-2019 to 31-08-2019	0-24 hrs (RTC)	105% on uniform basis
16-03-2019 to 31-03-2019	150				

Accordingly APPCPL had supplied 92.24392 MU during March 2019 which has to be returned to them @ 105% i.e 96.85612 MU as RTC power from July 2019 to August 2019.

(iv) On 15-02-2019, KSEB Ltd had issued authorization to GMR Energy Trading Ltd (GMRETL) above, for arranging banking of power from Punjab State Power Corporation Ltd (PSPCL) for the period from 01-04-2019 to 15-07-2019 as shown below

Supply from GMRETL(PSPCL) to KSEBL on firm basis			Return to GMRETL(PSPCL) from KSEBL on firm basis		
Period	Duration	MW	Period	Duration	Return%
01-04-2019 to 30-04-2019	0-24 hrs (RTC)	100	15-06-2019 to 15-07-2019	0-24 hrs (RTC)	105%

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 2018-19 is given below.

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

No.	Subject	REMARKS
Petitions		
1	Truing up of cost and Revenue	FY 2015-16, 2016-17
2	Multi Year Tariff Petition	For the control period 2018-19 to 2021-22
3	Approval for procurement of 200 MW solar power through competitive bidding process	
4	Quarterly Performance report	From 3 rd Quarter of 2017-18 to 2 nd quarter of 2018-19 (4 quarters)
5	For approval of sale of excess power in the short term market.	
6	Approval of sale of excess power in the short term market	
7	For adjudication of payment dispute in PPA with Maithon power Ltd.	
8	Seeking approval for Edamon –Kochi Line compensation package	
9	For approval of additional expense incurred as a result of natural calamity	
10	Seeking in principle approval for procurement of 150 MW peak power on short term basis from 10/2018 to 5/2019.	
Remarks/counter/suggestion (Licensees)		
11	True up petition of TCED ,Infopark,RPIL	FY 2016-17
12	ARR& ERC of Smart City, Infopark, TCED	FY 2018-19 to 2021-22
13	Capital investment plan of Technopark	2017-18
14	True up petition of Technopark	2015-16
Review petition		
15	Truing up of cost and revenue	for 2015-16.
16	Truing up of cost and revenue	for 2016-17
Reply /clarification/counter affidavit/comments		
17	Truing up petition filed by KSEBL	for 2015-16
18	Truing up petition filed by KSEBL	for 2016-17
19	Additional submission on Truing up of cost and revenue	for 2015-16.
20	The objections raised by HT & EHT Industrial Consumers Association against MYT petition for the control period 2018-19 to 2121-22 & Truing up petition filed by KSEBL for the year 2015-16	
21	Petition filed by M/s Ajantha Colour Lab regarding tariff of Photo studios.	
22	Petition filed by M/s KMRL before KSERC.	
23	Petition filed by BSNL on their tariff	
24	In BKPL case pursuant to Hon'ble High Court Judgment	

25	On amendment of concluded PPAs as per SAKTI policy
26	Petition filed by KREEPA before KSERC
27	Approval of AFC of RGCCPP, Kayamkulam
28	On petition for approval of PSA of 50 MW solar park of IREDA at Kasargod
29	Seeking exemption from availability –norms specified in the KSERC MYT regulations consequent to natural calamity
30	Comments on draft KSERC(Terms & Conditions for determination of tariff) Regulations , 2018
31	Petition filed by MINAR.

Also filed petitions/counter affidavits /statement of facts before Hon’ble APTEL and Hon’ble CERC in five cases each.

3.13 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. Centralised disbursements and Non operative collection bank accounts comes under the purview of this office. 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 Total sales and the revenue earned by the company from operations and other income during the period from 2012-13 to 2018-19:

Particulars	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Energy Sales within state (MU)	16838.24	17454.04	18426.27	19325.07	20038.25	20880.71	21536.77
Outside state (MU)	0	1414.6	369.17	53.48	49.30	117.51	824.78
Total sales (MU)	16838.24	17454.04	19178.96	19378.55	20087.55	20998.22	22361.55
Revenue from operations (Rs.Cr)	7223.39	9974.17	10116.26	10487.7	11036.78	12057.26	13521.22
Other Income (Rs. Cr.)	435.80	571.30	296.61	759.44	582.82	608.19	481.74
Total (Rs. Cr)	7659.19	10545.47	10412.87	11247.14	11619.6	12665.45	14002.94

The Increase in revenue from tariff and non tariff income in 2018-19 was caused by factors such as (a) 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 (f) Tariff revision with effect from 18.04.2017.

The statement of profit and loss (Rs Cr) for the financial year 2018-19 is shown below.

Year	Revenue Operation	Other income	Total Revenue	Total Expenditure	Prior-period credit/(Charges)	Profit/Loss (Loss)
2018-19	13521.12	481.74	14002.94	14292.94	-	-290.00

Comparative statement of accounts is given in Annexure 4.

Salient features of provisional Annual Statement of Accounts for 2018-19 are given below.

- Total income for the year 2018-19 is Rs. 14002.94 Cr and the expenditure is Rs. 14292.95 Cr. The profit and Loss account recorded a Loss of Rs. 290 Cr for the Year.
- The company had borrowed Rs.2177.73 Cr and repaid Rs.3078.49 Cr during the year as against Rs. 5650.13 Cr and repayment of Rs. 5595.21 Cr during previous year. The total outstanding long term loan (provisional) was Rs. 5578.58 Cr at the year end.

The profit and Loss account and Balance sheet for the year are given in Annexure-5 and Annexure - 6 respectively.

3.14. SPECIAL OFFICER (REVENUE)

The billing and collection monitoring of 5951 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 2018-19, an arrear amount of Rs.14.64 Cr with Principal amount of Rs.12.18 Cr and Interest amount of Rs. 2.46 Cr had been collected through One Time Settlement Scheme. Details of HT, EHT Consumers and Licensee with consumption are provided below.

Apart from Government and Public Sector undertakings, private sector was also bought under Centralised Government Billing system increasing the total number to 10,000.

HT/EHT/Licensee Consumption		
Tariff Category	Consumers *	Yearly Consumption (kWh)
EHT (GENERAL) (A)	2	13451152
EHT (GENERAL) (B)	3	52647950
EHT I (66KV) INDUSTRIAL	14	415746669
EHT II (110 KV) INDUSTRIAL	20	715701653
EHT II (110 KV) RT	13	303413750
EHT III (220 KV) INDUSTRIAL	1	115442001
EHT TOTAL	53	1616403175
HT I (A) INDUSTRIAL	2256	2167206289
HT I (B) INDUSTRIAL	23	12948177
HT II (A) GENERAL	359	186731136
HT II (B) GENERAL	1030	607485713
HT III (A) AGRICULTURE	53	6804999
HT III (B) AGRICULTURE	9	2208383
HT IV (COMMERCIAL)	2061	700235998
HT V (DOMESTIC)	107	16354843
HT Total	5898	3699975538
Licensee : Other State 11 KV	2	722404
Licensee : CPT	2	35429400

Licensee : CSEZ	1	56189000
Licensee : KDHPCL	1	58087402
Licensee : KPUPL	4	88132568
Licensee : MES	32	69988201
Licensee : RPL	1	31055270
Licensee : Technopark	2	87655575
Licensee : Thrissur Corporation	2	156569000
Licensee : Infopark, Cherthala	2	8474270
Licensee : SMART CITY	1	3342915
Licensee Total	50	595646005
KMRL (Kochi Metro Rail Ltd)	2	14908473
Grand Total	6003	5926933191

*(on 31-03-2019)

3.15. 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 Clearance Cell	Evaluation and consolidation of arrears of EHT/HT/LT consumers

A summary of activities of each office or section carried out during FY 2018-19 are given below:

Sl.No.	Section	Value of bills processed/quantum	Value of Objections raised	Value of recovery/savings
1	RCA	Rs.819.57 Cr	Rs.5.52 Cr	Rs.3.34 Cr
2	WAD	Rs.35.38 Cr	Rs.16.41 Cr	Rs.16.41 Cr
3	Regional Audit Offices	589 Nos. Audit reports	Rs.32.60 Cr	Rs.22.28 Cr
4	Pension audit	13041 PPO/service books verified	Rs.56.92 Lakhs	Rs.18.61 Lakhs
5	Pay fixation	10644 Service Books verified	Rs.73.74 Lakhs	Rs.60.46 Lakhs
6	EAS	Rs.130.76 Cr	Rs.12.34 Lakhs	Rs.2.44 Lakhs
7	GPF	Closure 944 Nos. NRA audited-14351 Nos.	Rs.105.07 Cr Rs.368.55 Cr	NA
8	ACC	NA	NA	Rs.136.15 Cr

Efforts taken by the Arrear Clearance Cell resulted in the realization of Rs.5.65 Cr from Health Department, and Rs.20.50 Cr under the OTS scheme, 2018. An amount of Rs.110 Cr has been credited to KSEB account against current charge arrears of KWA with effect from 10/2018. As part of settlement of KWA arrears as on 30.09.2018 Government order was issued to settle the arrear of Rs.1326.69 Cr in four instalments from 2019-20.

3.16. PUBLIC RELATIONS DEPARTMENT

Public Relations Department manages corporate communication activities of KSEBL, through effective use of conventional as well as new media. The Department, headed by Chief Public Relations Officer, has two sections, Mass communication and Advertisement, 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. This wing is responsible for uploading of videos in the internet based video channel (www.ksebmedia.in) and the telecast of the television programme ‘Spandanam’ on Doordarshan.

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. During the year 2018-19, exhibitions were conducted in 8 venues (Rs.8,35,000/-). CPRO is appointed as the Nodal officer for Malayalam Official Language. The PR wing published 675 tender notices in newspapers (Rs.1,46,29,565/-) and 4 Nos. Statutory notices in Government Gazette (Rs.21,495/-) during the year.

3.17. PERSONNEL DEPARTMENT

The Personnel Department is responsible for carrying out the 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 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 12.81 % employees belong to SC community and 2.44 % belong to ST community among regular employees of the company.
- Government order enhancing the maximum annual family income limit of deceased employees for claiming appointment under Compassionate employment scheme from Rs.6 lakhs to Rs. 8 lakhs adopted in KSEBL with effect from 22.11.2018
- List of eligible petty contract workers compiled and submitted to Public Service Commission.
- As per guidelines issued by the Administrative Reforms Commission, Government of Kerala, monthly review meetings are convened by the Administrative Reforms Committee constituted in KSEBL
- The following accident compensation claims were settled during the year

No	Description	Amount (Rs.)
1	Fatal and non-fatal accidents to petty contractors &workmen	64,73,086
2	Fatal and non-fatal accidents to employees	64,70,096
3	Medical claims reimbursement to the accident victims	68,89,946
4	Claims to electrical accidents to Public	1,04,25,000
5	Claims to electrocution to cattle	4,42,000

- Details of Employees Welfare Fund disbursed are shown below.

No	Description	Employees	Amount (Rs)
1	Retirement benefit	920	3,37,48,333
2	Legal heirs of deceased employees	97	4,05,07,919
3	Retired on invalid grounds	Nil	Nil
4	Voluntary retirement benefit	9	3,59,771
5	Resignation benefit	11	80,815
6	Dismissed from service	3	34,900
7	Educational awards to students (Class X)	453	15,85,953
8	Educational awards to Students (Class XII)	238	11,90,238

3.18. 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 liaisoning 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:

- Lok Adalaths were conducted in various districts in which 343 cases were settled for an amount of Rs.4.49 Cr.
- Out of the 14291 cases present in various courts (10130 from the previous periods), 6719 cases were disposed during the year.

3.19. 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 inventorise this in a systematic way. 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. 1982 Land parcels (Non Forest Land) were entered in the above Database and are made available online.

No	SBU	Land Parcels	Area (Ha)	Area (Acres)
1	Generation	1330	4556.50	11259.34
2	Transmission	498	647.48	1599.97
3	Distribution	151	44.46	109.87
4	Corporate Office	3	2.73	6.74
	Total	1982	5251.17	12975.92

Major achievements in FY 2018-19 include:

1. An Extent of 153.21 Hectares (378.43 Acres) of land in prime locations got mutated in favour of KSE Board Ltd.
2. Copies of 538 Awards relating to various landed properties of KSE Board Ltd were traced out from different sources and uploaded in the database.
3. Various land related issues were settled by giving legal advice.

3.20. 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, Superintendent 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	776
2	Enquiry ordered	776
3	Completed Enquiry	776
4	References handled	4959
5	Complaints received over phone	368
6	Complaints rectified	368
7	Details furnished on Pending cases /Disciplinary proceedings	1481

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. 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	26825
2	Irregularities detected	3089
3	Theft cases	237
4	Short Assessment cases	475
5	Malpractice cases	1949
6	Inspection on HT premises	212
7	Irregularities detected	16
8	Total assessed amount	Rs 32.69 Cr
9	Amount Realised	Rs. 16.87 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. The details of financial support for various projects sanctioned under Innovation and ESCOT and contribution for other plan schemes for 2018-19 are furnished below.

Projects under Innovation fund and ESCOT for the year 2018-19		
Project	AS Amount (Rs in Crore)	STATUS
West Kallada floating solar project	13.8	Waiting for VGF
Fault pass indicators	3.095	1400 Nos developed
Bulk charging stations	1	Estimate prepared for the building
Twin micro turbine at PLBE	1.145	Dropped
Drone based corridor mapping	2.75	Purchased the Drone based system
Infrastructure for Pre assessment of solar potential	1	Equipment and software purchased
ESCOT –standardisation of DTR stations & HVDS	0.6	In progress
HVDS	0.4	Completed
Total	23.79	

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ANNEXURE 2 : HIGHLIGHTS OF KERALA POWER SYSTEM	
Total Installed capacity	2995.87 MW
Storage as on 01-04-2018	1873.289 MU
Inflow during 2018-19	6741.27
Storage as on 31-3-2019	1811.797 MU
Total generation	7626.37 MU
Auxiliary consumption	49.35 MU
Purchase through Traders	7652.05 MU at Kerala Periphery
Purchase through Power exchange	476.99 MU at Kerala Periphery
Power availed through Swap	142.77 MU at Kerala Periphery
Swap Return	168.02 MU at Kerala Periphery
Sale through Power exchange (at SR)	824.78 MU at Kerala Periphery
CGS share	9241.09MU at Kerala Periphery
Power availed through DSM(Net)	252.45 MU @ average rate of Rs.2.44/-
Total Power purchase	18046.57 MU at Kerala Periphery
Total Generation and power purchase	25623.58 MU
External PGCIL loss	714.90 MU
Energy sale inside the state by KSEB	21536.77MU
Energy consumption within state	21750.25 MU (including open access)
Open access purchase at Kerala periphery;	216.60 MU (205.44 MU at consumer end)
Energy injection at generator end for sale outside	39.17MU (37.40 MU at KSEB Periphery)
T & D loss in KSEBL system	3098.90 MU ; 12.47(%) (including open access)
Maximum peak demand recorded	4242 MW (27.3.2019,22:30-22:30 hrs)
Unrestricted peak demand	4242 MW
Maximum daily consumption recorded	86.4039 MU (28-3-2019)
Length of EHT lines(As on 31.3.2019)	9529.495 Ckm
Length of HT lines(11/22/33KV)(As on 31.3.19)	64393.5 Ckm
Length of LT lines(As on 31.3.2019)	289804 KM
No. of EHT substations(As on 31.3.2019)	257 Nos.
No. of Distribution transformers(As on 31.3.19)	79876 Nos.
Total consumers	12552206 Nos.

Annexure 3 : Installed capacity of Kerala as on 31.3.2019			
No	Name of Station	Installed Capacity (MW)	Annual Generation capacity (MU)
KSEBL Hydel Stations			
1	Idukki	780	2398
2	Sabarigiri	340	1338
3	Idamalayar	75	380
4	Sholayar	54	233
5	Pallivasal	37.5	284
6	Kuttiyadi	75	268
7	Kuttiyadi Extension	50	75
8	Kuttiyadi Additional Extension Scheme	100	223
9	Neriamangalam	52.65	237
10	Lower Periyar	180	493
11	Poringalkuthu	36	191
12	Sengulam	51.2	182
13	Kakkad	50	262
14	Panniar	32.4	158
15	Neriamangalam Extension Scheme	25	58.27
	Sub total (Large Hydel Stations)	1938.75	6780.27
1	Chembukadavu stage I	2.70	6.59
2	Chembukadavu stage II	3.75	9.03
3	Kallada	15.00	65
4	Kuttiadi tailrace	3.75	15
5	Lower meenmutty	3.50	7.63
6	Malampuzha	2.50	5.6
7	Malankara	10.50	65
8	Mattupetty	2.00	6.4
9	P.L.B.E	16.00	74
10	Peppara	3.00	11.5
11	Urumi stage I	3.75	9.72
12	Urumi stage II	2.40	6.28
13	Poozhithode SHP	4.80	10.97
14	Ranni Perinad SHP	4.00	16.73
15	Peechi SHP	1.25	3.21
16	Vilangad SHP	7.50	22.63
17	Chimmony SHP	2.50	6.7
18	Adyanpara SHP	3.50	9.01
19	Barapole SHP	15.00	36
20	Poringalkuthu Micro (Screw type Turbine)	0.011	0.082
21	Vellathoval SHP	3.60	12.70
22	Perunthenaruvi	6.00	25.77
23	Kakkayam SHEP	3.00	7.34
	Sub Total (Small Hydro Stations)	120.011	434.902
	Sub Total Hydro Stations	2058.761	7215.172
KSEBL Thermal Stations			
1	Brahmapuram Diesel Power Plant (KSEB)	63.96	363.6
2	Kozhikode Diesel Power Plant (KSEB)	96	672
	Sub total (Thermal Stations)	159.96	1035.6
KSEBL Wind Stations			
1	Kanjikode (9x0.225 MW) (KSEB)	2.025	4.00
KSEBL Solar Plants			
1	Kanjikode Solar Project(Ground mount)	1	1.58
2	Banasurasagar reservoir (floating Solar)	0.01	0.02
3	Solar- Chaliyoor colony	0.096	0.15

4	Solar-Poringalkuthu	0.05	0.08
5	Buildings under Generation Department (Roof Top)	0.7	1.10
6	Palakkad Tribal Colonies (DDG)	0.065	0.10
7	Barapole canal Grid connected	4	6.31
8	BanasurasagarSolar flower, fountain, canopy	0.003372	0.01
9	Kollangode S/s	1	1.58
10	Padinjarethara Dam top	0.4	0.63
11	Idayar S/s	1.25	1.97
12	Thalakulathoor, Kozhikode	0.65	1.02
13	Vydyuthi Bhavanam, Pattom roof top	0.065	0.05
14	Manjeswaram, ground mounted	0.5	0.79
15	Buildings under Trans.Department(Roof top)	0.91	1.43
16	Buildings under Dist. Department (Roof top)	0.46	0.73
17	Banasurasagar reservoir (floating Solar)	0.51	0.79
18	Kuttippuram	0.5	0.79
19	Pezhakkappalli	1.25	1.97
20	Pothencode	2	3.15
21	Ponnani Malappuram	0.5	0.79
22	Peerumedu	0.5	0.79
	Sub total (KSEBL Solar Stations)	16.419	25.83
	Total KSEBLstations	2235.14	8276.602
	CPPs/IPP hydro Stations		
1	Kuthungal (CPP)	21	79
2	Maniyar (CPP)	12	36
3	Ullunkal (IPP)	7	32.22
4	Iruttukkanam (IPP)	4.5	13
5	Pambumkayam (Mankulam) Mini HEP (IPP)	0.11	0.29
6	Karikkayam SHP (IPP)	15	62.42
7	Meenvallom SHP (IPP)	3	8.37
8	Kallar micro HEP(IPP)	0.05	0.13
9	Pathamkayam	8	21.024
	Sub- Total (IPP/CPP Hydro Stations)	70.66	252.454
	CPP / IPP Thermal Stations		
1	BSES Kerala Power Ltd (BKPL) (IPP)	157	1099
2	Kasargode Power Corporation (IPP)		
3	Kayamkulam (N.T.P.C) (Central sector)	359.58	2158
4	Co-Generation Plant PCBL (CPP)		70.08
	Sub-total (CPP / IPP Thermal Stations)	516.58	3327.08
	CPP/ IPP Wind Stations		
1	Wind-Agali	18.6	37.47
2	Wind-Ramakkalmedu	14.25	32.46
3	Wind- Ahalya, Kanjikode	8.4	16.19
4	Wind-INOX, Kanjikode	16	30.84
5	Wind Kosamattom	1	1.93
	Sub-total (CPP / IPP Wind Stations)	58.25	118.89
	CPP / IPP / Prosumer Solar Stations		
1	Hindalco Industries Ltd.(Solar)	1	1.58
2	CIAL(Solar)	29.027	45.77
3	ANERT	2	3.15
4	SOLAR ENERGY CORPORATION	50	78.84
5	Grid connected consumers	35.24	55.57
	SubTotal (Private Solar Stations)	117.267	184.91
	Total Private Stations	762.757	3883.334
	Total Installed capacity	2999.9222	12163.936

ANNEXURE 4 : Comparative statement of accounts from 2013-14 to 2018-19 (Rs Cr)							
No	Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
	Revenue Income						
1	Non-Tariff Income	571.97	533.52	759.44	550.09	608.19	481.74
2	Revenue from tariff	9978.88	9879.35	10487.71	11036.78	12057.26	13521.20
	Total A(1+2)	10550.85	10412.87	11247.15	11586.87	12665.45	14002.94
	Revenue Expenses						
1	Power Generation	240.45	209.91	104.26	23.45	2.08	3.29
2	Power Purchase	6902.65	6782.76	6336.82	7664.40	7526.03	7869.32
3	Interest Charges	834.81	906.90	909.14	922.93	1881.08	1859.76
4	Depreciation	516.28	459.70	491.22	520.66	803.70	805.02
5	Employee Cost	2579.99	2893.71	3292.82	3373.76	3038.40	3354.62
6	Repairs & Maintenance	227.04	244.44	259.76	266.90	277.35	303.75
7	Admn. & Gen Expenses	253.50	287.05	344.09	378.72	530.39	598.56
8	Other Expenses	28.51	138.90	84.58	88.50	-142.76	222.48
9	Return/ Surplus	116.17	0.00	0.00	0.00	0.00	0.00
	Total (1 to 9)	11699.40	11923.37	11822.69	13239.32	13916.27	15016.87
1	Less : Expenses Capitalised	182.95	184.14	204.50		400.34	463.02
2	Less : Interest Capitalised	117.31	53.44	57.73		66.39	260.86
	Total(1+2)	300.26	237.58	262.23	0.00	466.73	723.88
	TOTAL B	11399.14	11685.79	11560.46	13239.32	13449.54	14292.99
	SURPLUS / (DEFICIT) (A-B)	-848.29	-1272.90	-313.29	-1652.45	-784.09	-290.00

Annexure -5 : Statement of Profit and Loss for 2018-19 (Rs Lakhs)				
No	Particulars	on 31.3.2019	on 31.3.2018	on 31.3.2017
I	REVENUE			
	Revenue From Operations	1,352,120.60	1,231,817.31	1,121,883
	Other Income	48,174.14	34,727.52	40,078
	Total Income (I+II)	1,400,294.74	1,266,544.83	1,161,960
II	EXPENSES			
	Purchase of Power	786,932.13	752,602.69	739,332
	Generation of Power	329.20	207.84	2,345
	Repairs & Maintenance	30,375.11	27,734.87	26,513
	Employee benefits expense	289,201.39	2,63,806.15	336,077
	Finance costs	159,889.80	181,469.02	95,992
	Depreciation and amortization expense	80,502.76	80,370.49	71,888
	Other Expenses			
	Administrative Expenses	59,816.29	3,038.86	37,479
	Others	20,260.94	-1,416.98	8,364
	ADD Changes in Fair Valuation and other adjustments	393.63	-12,858.65	-6,566
	Total expenses (IV)	1,427,701.25	1,344,954.29	1,311,423
III	Profit/(loss) before exceptional items and tax (III- IV)	-27,406.51	-78,409.46	-149,463
	Exceptional Items	1,594.34	-	-
	Profit/(loss) before tax (V-VI)	-29,000.85	- 78,409.46	-149,463
IV	Tax expense:			
	(1) Current tax		-	-
	(2) Deferred tax		-	-
V	Profit (Loss) for the period from continuing operations	-29,000.85	-78,409.46	-149,463
VI	Profit/(loss) from discontinued operations	-	-	-
VII	Tax expense of discontinued operations	-	-	-
VIII	Profit/(loss) after tax from Discontinued operations	-	-	-
IX	Profit/(loss) for the period (IX+XII)	-29,000.85	78,409.46	-149,463
XIV	Other Comprehensive Income			
	A (i) Items that will not be reclassified to profit or loss	-109,678.60	-107,632.86	-
	(ii) Income tax relating to items that will not be reclassified to profit or loss		-	-
	B (i) Items that will be reclassified to profit or loss		-	-
	(ii) Income tax relating to items that will be reclassified to profit or loss		-	-
XV	Total Comprehensive Income for the period (XIII+XIV)(Comprising Profit (Loss) and Other Comprehensive Income for the period)	-138679.45	-1,86,042.32	-149,463
XVI	Earnings per equity share (for continuing operation):			
	(1) Basic (Rs)	-3.96	-5.32	-4.27
	(2) Diluted (Rs)	-3.96	-5.32	-4.27
XVII	Earnings per equity share (for discontinued operation):			
	(1) Basic		-	-
	(2) Diluted		-	-

Annexure- 6 : Balance Sheet (Provisional) at the Year end FY 2018-19(Rs Lakhs)			
Particulars	on 31.3.2019	on 31.03.2018	on 31.03.2017
ASSETS			
Non current assets			
Property, Plant and Equipment	2,124,607.56	2,048,792.59	2,068,736.35
Capital work-in-progress	299,134.38	249,277.74	178,329.19
Financial Assets			
Investments	2,049.01	2,000.01	2,000.01
Loans	8,342.65	8,295.03	8,389.85
Others	7773.16	6,331.70	55,070.04
Deferred Tax Assets (Net)			
Other non-current assets	527,469.70	431,532.62	493,289.29
Current assets			
Inventories	69,805.76	48,590.36	31,018.91
Trade receivables	128801.29	229,501.13	192,339.65
Cash and cash equivalents	27542.10	27,545.63	23,603.23
Bank balances Other than Cash Equivalents	7839.91	7,007.15	6,827.98
Other current assets	14531.57	12,676.53	8,046.66
Total Assets	3218594.14	3,071,550.48	3,067,651.15
Equities and Liabilities			
Equity			
Equity Share capital	349905	349,905.00	349,905.00
Other Equity	-1116306.10	-962,254.68	-740,788.01
Liabilities			
Non-current liabilities			
Borrowings	1452515.45	1,593,454.49	426,656.76
Other Financial Liabilities	335984.70	317,044.52	311,596.98
Provisions	1122416.88	976,539.38	2,028,767.16
Other non-current liabilities	264514.60	193,405.24	142,922.30
Current liabilities			
Financial Liabilities			
Borrowings	382902.31	273,758.98	276,746.30
Trade payables	121457.58	95,731.97	81,846.53
Other financial liabilities	303397.72	233,065.58	189,998.14
Provisions	1806	900.00	-
Total Equity and Liabilities	3218594.14	3,071,550.48	3,067,651.15

ANNEXURE 7

DEPARTMENTAL PUBLICATIONS

1. System Operation
2. Power System Statistics
3. ARR & ERC
4. Annual Accounts
5. Budget Estimate
6. Annual Administration Report
7. Directors report
