

# ANNUAL ADMINISTRATION REPORT

2019-20



**KERALA STATE ELECTRICITY BOARD LIMITED**

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## PREFACE

It is my immense pleasure to present the *Seventh Annual Administration Report* of Kerala State Electricity Board Ltd, after reconstituting it as a company, and the 63<sup>rd</sup> report as an integrated Public Sector Power Utility in the state since original constitution in 1957.

KSEB is synonymous to electricity in Kerala. It is a company incorporated under the Indian Companies Act, 1956, and is fully owned by the Government of Kerala. It is the State Transmission Utility (STU) and the Distribution Licensee in the State of Kerala which also owns Generation assets. It is directly supplying electricity to 99% of the consumers in the State (128.26 lakh consumers as on 31.03.2020). It owns 38 Hydro Generating Stations, 2 thermal stations and few non-conventional stations and is having a total installed capacity of 2238 MW. The transmission asset of the company includes 417 numbers substations and 12381 circuit km lines, varying from 400 kV to 33 kV levels. The distribution network carries 2.93 Lakh km line and more than 81,000 Distribution Transformers. Even though our internal resources are limited, capable of meeting only 30% of the energy requirement, KSEB manages to meet the power requirement of the entire state without imposing any power restrictions by procuring power from other agencies and power exchange. After enabling the State to become 100% electrified in 2017, KSEB continues to provide Power on Demand.

KSEB is the flag bearer of the prestigious Oorjja Kerala Mission launched by the State Government. The Transgrid 2.0 – aiming strengthening of the transmission infra, Dyuthi 2021 – targeting world class power distribution, Soura – mission to enhance solar capacity, Filament Free Kerala – project for eliminating filament lamps and eSafe – targeting safety in electricity network are progressing. It is true that the flood during August 2019 and pandemic of Covid 19 have slowed down the pace of these projects.

A substantial reduction in T&D loss to 12.08% was achieved during the reporting year. This was achieved despite the addition of 3689 km of LT lines for maintaining Total Electrification Status. 3,80,584 new consumers were connected to the grid during this year.

Mission ReConnect, relaunched after the flood of 2019 proved the organizational strength to tackle difficult times, once again. More than 50 lakh consumers were affected in the floods during 2019 which mostly devastated the northern part of the State. The employees stood together as a team, restoring service to all the consumers within hours of receding of flood water. During the Fani cyclone, volunteers from KSEB extended their helping hand to their peers in Odisha. The noble gesture was well appreciated by Odisha Government.

KSEB was hoping to achieve a financial turn-around, from red to green this fiscal. Outstanding debts could be reduced and there was reduction in interest and finance charges. But for the unexpected loss due to flood, the organisation would have booked a decent profit.

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.

Sd/-

Thiruvananthapuram  
Date: 04 .08.2021

**(DR. B.ASHOK, IAS)**  
**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 managed 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
<b>Chairman &amp; Managing Director</b>	Sri.N.Sivasankara Pillai, IA & AS	29.1.2018 to 31.03.2020
<b>Director (Finance)</b>	Sri.N.Sivasankara Pillai, IA & AS	10.8.2015 to 31.03.2020
<b>Director(Distribution &amp; IT<sup>1</sup>)</b>	Sri. Kumaran .P	28.6.2017 to 31.03.2020
<b>Director(Corporate Planning, Generation Electrical, SCM<sup>2</sup> &amp; Safety)</b>	Sri. Venugopal .N	20.6.2017 to 31.08.2019
<b>Director(Generation Electrical &amp; SCM )</b>	Sri. Brijlal. V	1.09.2019 to 31.03.2020
<b>Director (Transmission &amp; System Operation)</b>	Smt.P. Vijayakumari	01.6.2015 to 31.08.2019
<b>Director (Transmission, System Operation, Corporate Planning &amp; Safety)</b>	Sri. Venugopal .N	1.09.2019 to 31.03.2020
<b>Director (Generation –Civil &amp; HRM<sup>3</sup>)</b>	Sri. Venugopal.N	1.04.2019 to 1.09.2019
<b>Director (Generation –Civil )</b>	Sri. Bibin Joseph	2.09.2019 to 31.03.2020
<b>Director (Ex Officio)</b>	Dr. B Ashok, IAS Secretary, Power Dept., GoK	21.3.2019 to 31.03.2020
<b>Director (Ex Officio)</b>	Sri Manoj Joshi, IAS Principal Secretary(Finance),GoK	28.9.2017 to 31.03.2020
<b>Independent Director</b>	Dr. V. Sivadasan	02.7.2016 to 31.03.2020
<sup>1</sup> Information Technology, <sup>2</sup> Supply Chain Management, <sup>3</sup> Human Resource Management		

### 1.2 STRATEGIC BUSINESS UNITS

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

### 1.2.1 GENERATION SBU

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

<b>Director (Corporate Planning ,Generation-Electrical, SCM &amp; Safety)</b>	Chief Engineer (Generation & PED)
	Chief Engineer(Renewable Energy & Energy Savings)
<b>Director (Generation - Civil &amp; HRM)</b>	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 38 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 wing 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 at 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.

The implementation of Transgrid 2.0, long term transmission plan is entrusted with the Chief Engineer-Transgrid with headquarters at Shoranur. Under the administrative control of the Chief

Engineer, two deputy Chief Engineers in South and North region with headquarters at Kalamassery and Shoranur are executing the works under Transgrid.

Transmission SBU manages the construction, operation and maintenance of EHT substations and transmission lines including that to EHT consumers. It 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, 64 Subdivisions and 217 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, 70 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, 53 Subdivisions, 213 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, 29 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 ( 22 KV Distribution also in existence in some parts of Palakkad district). It is directly supplying electricity to more than 99% of the consumers in the state (128.26 lakh consumers as on March 2020). Implementation of Central Government Schemes such as RAPDRP (Part B), DDUGJY, IPDS, distribution projects funded externally, like MP LAD/MLA LAD/ Kerala Development Schemes, monitoring of Urjja Kerala Mission Project, Dyuthi 2021, are undertaken by Distribution SBU.

The Chief Engineer (IT, CR & CAPs) 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. SOURA headed by the Deputy Chief Engineer (Nodal Officer) is entrusted with the implementation 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 for monitoring the day-to-day activities in connection with the distribution works during the four years starting from 2018 to 2022 which is being undertaken in Dyuthi 2021. The Dyuthi Project Monitoring Division (DPMD) was formed on 21.08.2019 with headquarters at Ernakulam.

## 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 emphasis 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 constant efforts have started fetching commendable results. In its mission of providing electricity connections to all the households, the utility has succeeded, despite the flood which hit the state especially Central and Northern districts, during August 2019. Within no time, 'Mission ReConnect' – an operation on war footing basis was launched for rebuilding the power infrastructure of the state which was shattered by the flood.

### 2.1 Flood 2019

The flood during August 2019 shattered the northern part of the State of Kerala with KSEB Ltd. sustaining major losses in all fronts viz. Generation, Transmission, Distribution. Major losses due to the monsoon in 2019 were in the northern districts of Palakkad, Kannur, Kozhikode, Malappuram and Wayanad. The operation of three generators with 50 MW capacity in Kakkayam, one of KSEB's major hydroelectric power stations has been interrupted due to land slide and significant damage occurred to 7 minor hydroelectric power stations and floating solar plant on the Barapole Canal. The operation of 43 substations, including two 220 kV substations and six 110 kV substations, was disrupted. It is estimated that 50.47 Lakh consumers were affected by the flood during 2019. In addition to the above, Board sustained 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			1419.50	1419.50
Kollam			1029.60	1029.60
Pathanamthitta	5.00		653.32	658.32
Kottayam			1455.96	1455.96
Alappuzha		28.40	597.50	654.3
Ernakulam	100.00	0.30	1689.14	1789.74
Idukki	39.00		1007.61	1046.61
Thrissur	3.00	286.35	1917.45	2206.80
Palakkad		16.46	2746.52	2762.98
Malappuram	50.00	35.00	3258.12	3343.12
Kozhikode	541.00	34.66	3276.44	3852.10
Wayanad	75.00	6.00	540.68	621.68
Kannur	650	7.26	1645.56	2302.82
Kasargod		1.29	1189.36	1190.65
<b>Total</b>	<b>1463.00</b>	<b>415.72</b>	<b>22426.76</b>	<b>24305.48</b>

#### **Mission ReConnect 2019**

In light of previous experience, the Mission ReConnect has been redesigned following the Flood 2019, coordinating various teams to properly utilize the necessary equipment and manpower, and take initiatives to ensure the safety of the public. Measures to utilize the reserve material for other projects to rectify flood-related damages were put in place and ensured availability of inventory.



Power supply to Distress Relief camps and KWA's pump houses were restored on war footing, relieving the hardships of the civilian population. As part of Mission Reconnect 2019, power supply was restored at all inhabitable houses and other buildings by 20.08.2019 itself. In case of generating stations, except one generator at Kakkayam and Vellathooval SHEP, all other affected stations and generators were made operational in record time.

### Generating Stations Restored After Flood as on 31.03.2020

Sl. No.	Station	Installed Capacity (MW)	Present available Capacity (MW)	Approximate restoration expense (in Lakhs)		Expected period of restoration (days)
				Civil	Electrical	
1	Kakkayam	225	75	500		60
				200	300	
2	Chembukadavu I	2.7	1.8	5		10
				5	0	
3	Chembukadavu II	3.75	0	25		14
				15	10	
4	Adyanpara	3.5	0	50		30
				45	5	
5	Urumi I	3.75	3.75	2		-
				2	0	
6	Urumi II	2.4	1.6	2		14
				2	0	
7	Vilangad	7.5	7.5	2		-
				2	0	
8	KSHEP	3	0	-		30
9	Barapole canal Bank- Solar	1	0	300		
				100	200	
<b>Total</b>		<b>252.6</b>	<b>89.65</b>	<b>886</b>		
				<b>371</b>	<b>515</b>	

The Machines of Kakkayam Power House were (KES, KAES) affected due to land slide occurred near power house on 08.08.2019. Mud and water entered power house and Units 4, 5, & 6 stopped completely. Chembukadavu I & 2 SHEPs flooded during the rain in August 2019. The restoration works in the flood affected HEPs were completed and machine synchronized to grid on following dates :

Sl No.	Name of Project	Date of restoration
1	Kakkayam Unit #4	1.11.2019
2	Kakkayam Unit #5	22.09.2019
3	Kakkayam Unit #6	04.09.2019
4	Chembukadavu I Unit#1&2	14.08.2019
5	Chembukadavu I Unit #3	10.09.2019
6	Chembukadavu II Unit#3	08.09.2019
7	Chembukadavu II Unit#2	09.09.2019
8	Chembukadavu II	10.09.2019

Land slide along penstock route and weir side occurred at Adyanpara Power House and machine was forced shutdown on 05.08.2019. The Power House was affected severely for which restoration works were undertaken and machine was put on service on 14.06.2020.

On 09.08.2019 1 MW canal bank solar project has been washed away during the flood. About 340 Nos solar panels were damaged in both canal bank and canal top solar projects. 3 MW canal top projects and 1 MW canal bank projects were charged on 17.08.2019 and 27.08.2019 respectively.

In the restoration phase, resuming service to consumers was the priority for the distribution wing. Restoration works in the worsely hit districts of Kannur and Malappuram gained momentum on deploying about 200 Staff and contract workers from other parts of the state which led to restoration of supply in record time. Reconstruction of 17074 Kms distribution lines, 31129 poles and 445 Distribution Transformers were required for resuming normalcy. Against all odds, KSEB could restore all disrupted Distribution Networks and effect almost all service connections within a week; the remaining few, which were kept isolated on safety considerations, were also re-electrified immediately after the water receded. The cost for restoration in the distribution wing was estimated as Rs.224.26 Cr.

In the transmission sector, due to the inflow of floodwater in Substations and the damages caused in transmission lines, functioning of 43 Substations were disrupted which include 2 Nos. 220 KV Substations and 6 Nos. 110 KV substations. The working of Substations was resumed after receding of water. As a result of rise in water level in the Chaliyar river, to avoid any electrical accidents, the 220 KV line from Areacode Substation in Malappuram district feeding Kanjirode Substation was switched off resulting in power failure in the districts of Kannur, Kasaragode and partially in Kozhikode from 9.08.2019 AN to 10.08.2019. One transmission tower toppled in Kunnamkulam – Punnayoorkulam 110 KV transmission line and two towers were stumbled in the Vaikom – Thycattuserry 66 KV line. In addition to this, many number of 33 KV poles were damaged. Alternate feeding arrangements were put in place to provide supply to consumers even before restoring the waterlogged Substations.

It is estimated that in the transmission sector, KSEBL had suffered a monetary loss of Rs 4.16 Cr during this year's monsoon. The damages in the transmission wing could be bought down considerably by switching off the Substations and shifting the Safety relays and associated equipment to safety well in advance in anticipation of flood.

### **Fani Cyclone**

Based on the decision of the Government of Kerala to provide experienced hands in various fields to Odisha in connection with restoration activities related to FANI cyclone, KSEBL deputed 200 skilled workers including Contract workers to Odisha for the restoration of electricity connections in the badly hit areas. They made significant contributions for restoring supply in various parts of Odisha by reconstructing 11 KV and 33KV lines and distribution transformers. This was a milestone achievement of KSEBL during 2019-20.

### **COVID-19**

With the reporting of the first Covid case in India on 30th January 2020 at Trissur, Kerala and the subsequent cases during March 2020, nationwide lockdown was imposed on 23rd March 2020 till 31st March 2020. The power sector has been declared an essential service under the lockdown. The primary impact on the power sector is due to the sharp fall in energy demand because of the lockdown. The secondary impact in the power sector due to the pandemic is the slowdown in execution of various projects in the power sector and implications thereof. All capital, and renovation modernization works were suspended due to the pandemic. Urgent works for restoring supply were only undertaken. The total sale per day has nosedived to an average of 65MU from the expected average sale of 85 MU during the peak summer.

## 2.2 Physical Performance

The rising demand of the consumers in power sector can be met with only by continuously upgrading and developing its physical assets. The Generation, Transmission and Distribution business Units of the Company had carried out various capacity expansion activities during the recent years, which are given in the Table below along with the increase in consumer strength.

Particulars	Capacity Additions							
	Year	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Generation</b>								
Hydro Capacity (MW)	0	15.50	22.0	3.6	6	3	0	2058.76
Solar KSEBL (MW)			1.156	7.6732	6.0208	2.0	1.095	17.48
Solar capacity other than KSEBL (grid connected) MW			13.70	59.08	24.7	19.79	51.032	154.603
<b>Transmission Substation (Nos)</b>								
400KV	0	0	0	0	0	0	1	1+5*
220KV	0	1	0	0	2	0	1	23
110KV	5	1	8	3	5	3	9	166
66KV	1	0	3	0	3	1	2	68
33KV	4	1	3	7	6	5	6	159
Lines (circuit km)	<b>184.03</b>	<b>117.60</b>	<b>140.14</b>	<b>147.43</b>	<b>175.38</b>	<b>224.6</b>	<b>580.43</b>	<b>12380.61</b>
400KV								571.96
220KV	0	36.2	0.68	0	54.1	0	73.18	2952.66
110KV	112.59	38.4	66.67	67.66	79.76	134.2	235.24	4797.75
66KV	0	0	6	0	0.44	29.5		2000.75
33KV	71.44	43	66.79	75.77	41.08	60.9	100.06	2057.49
<b>Distribution lines (ckm)</b>								
LT	3735	4636	4826	5357	3130	3401	3689	293280
HT	1884	1807	2022	1844	1744	1773	1939	64212
Distr Transformers	3200	3554	2389	2270	2353	2410	2023	81470
No. of consumers	415216	422238	381247	462137	353642	368673	380584	<b>12826185</b>

(\* owned by PGCIL)

## 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 12.08 % by the end of FY 2019-20. 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 <sup>1</sup>	Energy Input <sup>1</sup>	T&D loss (%)	Yearly Reduction (%)	Cumulative Reduction (%)	Energy Saved (MU)	Cost Savings <sup>3</sup> (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
2019-20	<b>23058.91</b>	<b>26226.08</b>	<b>12.08</b>	<b>0.039</b>	<b>7.94</b>	<b>2182.09</b>	<b>929.20</b>

<sup>1</sup> including open access energy, <sup>3</sup> 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.929.20 Cr for FY 2019-20 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. 2934.12 Cr during the year. However, the net additional borrowing has been Rs. 1520.37 Cr only. This was achieved by utilising internal accruals, capital grants and consumer contribution. Details of outstanding loans for FY 2019-20 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	
2019-20	5488.32	3799.40	2279.03	7008.69	1520.37	NIL

### 2.4.2 Reduction in interest payment

The Company has incurred Rs. 597.31 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 8.5 %.

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 true 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. 6778.74 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)	1118.66
	Total	6778.74

\*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) and approved Rs.39.61 Cr in 2020-21

The average cost of supply per unit for the year was Rs 6.52. The gap per unit (Rs. 0.35) came down in the year similar to the previous year as given in Table below.

No	Particulars	FY11	FY12	FY13	FY14	FY 15	FY16	FY17	FY18	FY19	FY20
1	Average cost of supply	4.38	4.65	6.66	5.87	6.34	5.98	6.55	6.45	6.63	6.68
2	Average revenue realized	3.54	3.46	4.29	5.29	5.65	5.82	5.80	6.07	6.50	6.56
3	Gap (=1-2)	0.84	1.20	2.37	0.58	0.69	0.16	0.75	0.38	0.13	0.12

## 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

The 'Oorjja Kerala Mission' launched during 2018, aimed at the integrated development of electricity sector in the state is progressing. The Status of the projects during 2019-20 is listed below:

#### Soura

Soura aims to achieve a cumulative capacity of 1000 MW of renewable content through Solar Projects by 2021, 50% (500 MW) of which is expected from Roof Top Solar Plants (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 within the country.

Demand aggregation for first phase of RTS has been 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. Accordingly tender was floated and the work has been awarded to three developers. It is scheduled to complete the 46.5 MW Phase I project by December 2020. The Government of India (MNRE) has launched the Phase II RTS programme for domestic consumers wherein subsidy upto 40 % is given to domestic consumers for installation of RTS plants. State DISCOMS are authorised as the implementing agency and KSEBL was allocated 50 MW capacity for the year 2019-20. Tenders were floated in March 2020. It is expected that the allocated capacity of 50 MW can be completed by March 2022.

#### Filament free Kerala

The project envisages replacing the entire Filament lamps in the State by energy efficient LED lamps and safe disposal of ICL/CFL collected with reduction in peak demand, global warming and Mercury pollution. 13.3 lakh domestic consumers registered for 107 lakh LED bulbs in 1<sup>st</sup> phase. Although tender was floated for procurement of one crore 9W LED bulbs on 4.12.2019 none of the bidders satisfied the pre-qualification criteria which led to retendering on 30.3.2020.

#### Dyuthi 2021

The Dyuthi project commenced during FY 2018-19 focuses on providing uninterrupted, quality power to all, with lowest technical and commercial losses, maintaining best safety standards and to develop a system capable of integrating renewable energy sources. The total plan outlay is Rs 4036.30 crores. The Board had issued approval for the 4 year plan from 2018-19 to 2021-22 as shown below:

Financial year	Capital Investment (Rs in Crore)			
	Normal development	Replacement of faulty meters	Continued Electrification	Special Projects like SCADA
2018-19	723.64	60.00	50.00	50.00
2019-20	1221.06	54.49		
2020-21	1066.65	47.61		
2021-22	720.68	42.18		
<b>Sub Total</b>	<b>3732.03</b>	<b>204.27</b>	<b>50.00</b>	<b>50.00</b>
<b>Total</b>	<b>Rs.4036.30 Crore</b>			

GIS map preparation & DPR formulation were new experience for Distribution Works. In spite of the devastating floods during 2018 & 2019 which affected the progress of Dyuthi works, the achievement made is as below:

Financial Year	Target (in Crore)	Achievement	Financial Progress
2018-19	734.30	452.15	61.5%
2019-20	1200.34	387.03	32.2%
<b>TOTAL</b>	<b>1934.64</b>	<b>839.18</b>	<b>43.3%</b>

#### TransGrid 2.0 – 2<sup>nd</sup> Generation Transmission network

Transgrid project aiming the strengthening of transmission network for meeting the future energy demand of the State is planned to be implemented in two phases. The 1<sup>st</sup> phase of the project is planned for execution during 2017-2022 and 2<sup>nd</sup> phase for 2019-2024. The works included in the 1<sup>st</sup> 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 Rs. 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 1<sup>st</sup> Phase have been awarded and tender is under process for the remaining package. Out of the 12 substations targeted in the 1<sup>st</sup> phase, one Substation has already been completed, 6 substations (3 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. 359.6 Circuit kilometre 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.

#### E Safe

The E Safe project jointly proposed by Electrical Inspectorate and KSEBL aims in achieving zero electrical accidents. Works amounting to Rs.2159.09 Cr were identified under Dyuthi pertaining to safety.

### 2.6.2 Demand Side Management

Domestic Efficient Lamp Programme (DELP) is a programme announced by GoI as part of National LED Mission of Ministry of Power. DELP intends to distribute 1.5 Crore bulbs to consumers excluding 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 31.03.2020, about 1.3560 Crore LED bulbs were distributed of which 60707 LED bulbs were distributed during 2019-20.

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	0	0
Works in progress	10	193.5
Tenders invited	1	6
Work awarded during 2019-20	0	0
DPR and Administrative sanction accorded	11	89.5

##### 3.1.1 Chief Engineer (Generation & PED), Moolamattom

The Chief Engineer (Generation & PED) has the primary responsibility of maintaining and operating 38 large and small Hydro stations, two thermal generating stations and one wind farm. Chief Engineer (Generation & PED) is 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. 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 are also carried out by this wing.

There are five Generation Circle Offices at Meencut, Moolamattom, Moozhiyar, Trissur and Kothamangalam under the 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 hydro stations owned by KSEBL is 2058.76 MW and the designed annual generation capacity is 7215 MU for hydro stations. A list of generating stations within State and its capacity is given in **Annexure-3**.

During 2019-20, a total of 5781.23 MU energy was produced from the generating stations. The summary is given in the table below.

No	Source	Energy Generated (MU)	Percentage (%)
1	Hydel Power stations	5741.83	99.32
2	Thermal Power stations	12.03	0.21
3	Wind generating station	1.42	0.02
4.	Solar stations	25.95	0.45
<b>Total</b>		<b>5781.23</b>	<b>100</b>



The carry forward storage in the reservoirs for the water year 2019-20 as on 01.06.2019 was 653.628 MU (15.79 % of the total storage capacity). The storage of Idukki Reservoir was 19.51 % and that of Sabarigiri reservoir was 13.18 %. Power generation from the generating stations such as Kakkayam, Chembukadavu I & II, Adyanpara, Barapole was affected due to land slide and flood occurred in the month of August 2019.

Month	Inflow
June	168MU
July	688 MU
August	2127 MU
September	1237 MU

### Works undertaken during 2019-20:

RMU works undertaken during 2019-20 are as follows:

No	Station	Unit	Status (as on March 2020)
1	Sholayar HEP(3x18MW)	U#1	Handed over to Contractor for the R&M works on 4.1.2020
		U#2,3	#2 taken over by KSEBL on 19.01.2020 & #3 on 18.9.20
2	Sholayar Penstock works	U#1 U#2	Work started on 6.01.2020 Works completed on 24.10.2019
3	Sengulam SHEP (4x12.8MW) –R&M work of butterfly valve		Tendering in progress
4	Renovation of Sengulam Pump House		In progress
5	Kuttiyadi HEP		Agreement executed with M/s BHEL on 13.12.2019 and work start
6	Idukki stage I (3x130 MW)	U#1,3 U#2	Work in progress Work completed

Operation and Maintenance work undertaken by the Generation wing are as follows:

No	Station	Status (as on March 2020)
1	Moozhayar power House	SCADA work 98% completed
2	Peppara power House	New gear box commissioned
3	Kakkad	Excitation transformer and panel commissioned
4	Kallada SHEP	Realignment work completed
5	Lower Periyar	Auto excitation works done
6	Idamalayar	LT panel replaced, Whole alignment of U#1 completed
7	Poringalkuthu	Concrete protection wall work in progress
8	Kakkayam	Restoration work after landslide during Aug 2019
9	Chempukadavu	Restoration work after landslide during Aug 2019
10	KAES	Procurement of Spare stator bars, replaced battery
11	KTR	VRLA battery replaced
12	Poozhithode	Battery replaced
13	Kuttiady Power House , kakkayam	Rectification of closing problem of spherical valve
14	Panniar	Work of automation system in progress, replaced bus isolator, CT
15	Neriyamangalam Ext Scheme	SCADA system commissioned
16	Pallivasal Power House	Updation of SCADA system, replaced 11 KV panel set
17	Madupetty SHEP	Submersible pump installed
18	Sengulam Power House	CB replaced
19	Neriyamangalam Power House	Replaced faulty tfr, RLA study completed

Status of hydroelectric projects being implemented are listed below:

No	Station	Status (as on March 2020)
1	Poringalkuthu HEP(1x24MW)	Erection of E&M equipment in progress
2	Barapole SHEP(3x5 MW)	Unit 1 & 3 runner replaced. Project taken over on 17.1.20
3	Chimony SHEP (1x2.5MW)	Performance test conducted on 29.9.19
4	Poovaramthodu SHEP	Tender process initiated for E&M works
5	Thottiyar SHEP 1x30+1x10 MW	E&M works tendering in progress

6	Pallivasal Extension scheme (2x30MW)	Balance work tendering in progress
7	Perumthenaruvi SHEP (2x3MW)	Performance test conducted
8	Chinnar (2x12 MW)	Tender documents being prepared
9	Anakkayam SHEP (3x2.5 MW)	Tender documents being prepared
10	Bhoothathankettu SHEP (3x8MW)	Work in progress
11	Kakkayam SHEP (2x1.5 MW)	Commissioned on 16.7.18. Pending E&M works
12	Upper Kallar (2x1 MW)	In progress
13	Chathankottunada Stage II (3x2MW)	Work awarded and agreement executed on 30.3.2019
14	Chathankottunada Stage I (2x2.5MW)	E&M estimate under preparation
15	Upper Senkulam (1x24MW)	E&M estimate under preparation
16	Adyanpara SHEP(2x1.5MW+1x0.5MW)	Project commissioned on 3.9.2015. Performance test evaluated
17	Olikkal SHEP(2x2.5MW)	E&M estimate under preparation
18	Moorikkadavu SHEP(2x0.75 MW)	E&M estimate under preparation
19	Peruvannamoozhy (2x3MW)	Preparation of tender documents in progress
20	Pazhassi sagar (3x2.5 MW)	Preparation of tender documents in progress
21	Poringalkuthu RMU (4x8 to 4x9 MW)	Penstock strengthening works in progress

**Conferring of ISO:** Poringal Left Bank and Poringal Left Bank Extension Power House, Sabarigiri HEP and Kakkad HEP were conferred with ISO 9001:2015.

### 3.1.3. Chief Engineer (Civil Investigation and Construction Central)

The duties entrusted with this office are 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. Consultancy services to Government departments are also undertaken by this Office. The major activities carried out during 2019-20 are summarised in the tables below:

Investigation and DPR Preparation			
No	Project / Scheme	Activity	Remarks
1	Chathankottunada stage 1 (5MW)	Detailed Project Report	Administrative sanction awaited
2	Pasukkadavu SHEP (4MW)	Detailed Project Report	Administrative sanction awaited
3	Keerithodu	Detailed Project Report	Administrative sanction awaited
4	Idukki Extension scheme	Consultancy tender invited	Evaluation
5	Pallivasal Augmentation Phase I	Preliminary survey	Field survey completed. Photogrammetric survey with drone under consideration
6	Moorikkadavu SHEP (1.5 MW)	Draft DPR	Revision
7	Pambla SHEP (10MW)	Draft DPR	Submitted before DPR Approval Committee
8	Upper Poozhithode	Preliminary survey	In progress
9	Perumthenaruvi Stage II	Preliminary survey	In progress
10	Mankulam SHP(40MW)	Land acquisition nearing completion	
11	Anakkayam (7.5MW)	Preliminary survey	

Construction Works		
No	Project / Scheme	Construction Work / Project Stage
1	Poringalkuthu SHP(24MW)	Overall physical progress – 90.36%
2	Chinnar SHP(24MW)	overall physical progress – 41.32%

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

The Safety of all the 59 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 (e) Execution of Dam Rehabilitation and Improvement Project (DRIP) approved by CWC aided by World Bank and maintenance of colonies and inspection bungalows in Vazhathope, Kakkad, Kochupamba, Pambala & 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. 122 Cr approximately (works/goods/consultancy) has been tendered in 104 packages and are under various stages of implementation/processing. Work Orders amounting to Rs. 115 Cr has been awarded and is at various stages of implementation/processing. Works of 88 Packages are now completed. Out of a total expenditure of Rs. 98.955 Cr incurred up to 2019-20 under DRIP, an amount of Rs. 62.799 Cr has been reimbursed by the Government.

The HQ of the Chief Engineer (Civil-DS & DRIP) is at 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 and 2019. Important works such as upstream treatment of Anathode dam, CCTV surveillance of 16 dams were awarded during the period. Instrumentation of Idukki dam is a major ongoing activity.

### **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, land acquisitions for hydro-electric projects, design of civil structures of solar projects, transmission tower foundations for projects in Northern Region. The Mechanical Fabrication Facility in Kolathara, Kozhikode is managed by Chief Engineer (CCN). Fabrication and galvanizing of transmission and distribution line materials and A 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
- Maripuzha SHEP tendered
- Work awarded for constructing Vidyuthi Bhavanam Kasaragod, TMR Building at Mangattuparamba Kannur and Electrical section Office at Kathirur.
- Structural Design of narrow based multi-circuit 220 kV transmission towers for various soil types and its foundation for the Transgrid 2.0 Project.
- Fabrication and supply of line materials and A poles amounting to Rs 23.30 Cr issued under Distribution plan.

### 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. The design works of all the ongoing projects are undertaken by this wing. A summary of works activities of this office during 2019-20 is given in the table below:

No	Project	Circle	Capacity	Energy	Status
1	Thottiyar HEP	Kothamangalam	40 MW	99MU	In progress 49%
2	Sengulam Augmentation	Kothamangalam		85 MU	In progress 70%
3	Bhoothathankettu SHEP	Kothamangalam	24 MW	83.5MU	In progress 91%
4	Upper Kallar SHEP	Kothamangalam	2 MW	5.14 MU	In progress 74%
5	Peechad SHEP	Kothamangalam	3 MW	7.74 MU	For tendering
6	Western Kallar SHEP	Kothamangalam	5 MW	17.41	For tendering
7	Upper Sengulam	Kothamangalam	24 MW	53.22 MU	For tendering
8	Deviyar	Kothamangalam	24 MW	25.94 MU	For tendering
9	Marmala	Pallom	7 MW	23.02 MU	For tendering
10	Ladrum	Pallom	3.5 MW	12.13 MU	For tendering

The Government of Kerala declared KSEBL as SPV for implementing infrastructure projects of Health and Family welfare Department with KIIFB funding. The Consultancy wing of KSEBL is engaged with nine hospital projects and KSEBL received Rs.4.31 crores as centage from KIIFB, as on 31.03.2020. The Consultancy Wing is also executing various works under other departments to the tune of Rs.35.43 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.

## 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 programmes and coordinating the activities for system development.

The Voltage wise capacity of the Transmission Network within the State as on 31.3.2020 is given below.

Transmission System as on 31.03.2020			
No	Item	Unit	Quantity / Capacity
1	400KV Transmission Lines	Ckt-km	571.96*
2	220KV Transmission Lines	Ckt-km	2952.66
3	110KV Transmission Lines	Ckt-km	4797.75
4	66KV Transmission Lines	Ckt-km	2000.75
5	33KV Transmission Lines	Ckt-km	2057.49
<b>Total</b>			<b>12380.61</b>
7	400KV Substations	Nos	5*+1
8	220KV Substations	Nos	23
9	110KV Substations	Nos	166
10	66KV Substations	Nos	68
11	33KV Substations	Nos	159
<b>Total</b>			<b>422</b>
12	Total Transformation Capacity	MVA	19551.4

\* 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 2019-20 is shown in the Table below.

No	Particulars	400 KV	220 kV	110 kV	66 kV	33 kV	Total
1	Substations commissioned (No)	-	1	9	2	6	18
	Transmission North	-	1	5	-	3	9
	Transmission South	-	-	4	2	3	9
2	Lines commissioned (Ckt. Km)	92	55	165.17	18.7	53.05	383.92
	Transmission North	92	46	98.67	-	23.55	260.22
	Transmission South	-	9	66.5	18.7	29.5	123.70
3	Capacity addition/enhancement (MVA)	-	100	143	40	79	362
	Transmission North	-	100	51	-	35	186
	Transmission South	-	-	92	40	44	176

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 projects were completed during 2019-20.

- Upgradation of 220kV SC line to 400/220kV MC MV line from Madakkathara to Malaparamba(92 ckm)
- 110 kV Kakkayam-Nallalam portion under NRHTLS package commissioned.
- Construction of 220 KV Substation Manjeri (Elamkur)

#### 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 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 31.03.2020		
Sl No.	Project Execution by	Cumulative expenditure till 31.03.2020 in Rs. Lakhs
1	Own fund	9648.76
2	PSDF	38559.96
3	KIIFB	30452.25
<b>TOTAL</b>		<b>78660.98</b>

### 3.2.1 Chief Engineer (Transmission - System Operation)

Power System Management and Grid Operation through State Load Despatch Centre at Kalamassery including all allied functions are carried out by the Chief Engineer (Transmission System Operation). 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 Kalamassery, Kannur and Thiruvananthapuram are responsible for the protection, communication, SCADA and meter testing for energy audit.

**System Operation:** The water year 2019-20 began with carryover storage of 653 MU as against the planned quantum of 650 MU. Though the Southwest monsoon hit the State on 8<sup>th</sup> June, the depression and consequent cyclone formation could last only for a few days and the monsoon became weak for the rest of June. The inflow received during June 2019 was one of the lowest ever recorded in the last 20 years. With record low levels inflow to the reservoirs and storage positions during June and July, the monsoon made a spectacular revival from August and almost made up the shortfall in inflow during the first two months. The South west monsoon went into an active phase during August resulting in improvement in overall storage position. Due to heavy rain and increased inflow, the group II and group III Stations were operated as must run stations as the reservoirs connected with these stations were spilling. Due to flood related damages, Kuttiady Unit #4, 5 & 6 were under FSD from 9<sup>th</sup> August 2019 onwards.

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)		Purchase(MU)
	Anticipated (MU)	Actual (MU)	Surplus(+) / Shortage(-)		Anticipated	Actual	
June	859	168	-691	19.6%	480	378	191
July	1523	688	-835	45.2%	372	323	298
August	1513	2127	614	141%	310	450	216
<b>Total</b>	<b>3895</b>	<b>2983</b>	<b>-913</b>	<b>76.6%</b>	<b>1162</b>	<b>1151</b>	<b>705</b>
September	898	1237	339	138%	510	561	12
October	666	726	60	109%	527	561	9.2
November	474	444	-30	94%	480	483	0.14
<b>Total</b>	<b>2038</b>	<b>2407</b>	<b>369</b>	<b>118%</b>	<b>1517</b>	<b>1605</b>	<b>21.34</b>
December	235	205	-30	87.3%	14	12.7	75
January	108	101	-7	93.1%	14	14.2	34.3
February	72	52	-20	72.2%	17	14	11.07
<b>Total</b>	<b>415</b>	<b>358</b>	<b>-57</b>	<b>86.3%</b>			<b>120.4</b>

The total internal generation of Kerala system during the year was 5781.23 MU and consumption was 23058.91 MU. The highest consumption of 88.3386 MU was recorded on 23.05.2019. The Maximum Demand recorded during this year was 4316 MW on 13.04.2019, between 22.00 to 22.30 hrs.

The details of monthly Power Purchase and Sales through power exchanges during FY 2019-20 are given below:

Power Purchase and Sales in Exchanges						
Month	MU	Purchase		Sale		
		Amount (Rs.Crs)	Rate (Rs/unit)	MU	Amount (Rs. Crs)	Rate in Rs/unit
Apr-19	122.1305	47.5809689	3.9	-0.0634	-0.038487	6.07
May-19	138.9531	52.58485255	3.78	0	0	
Jun-19	185.545	61.43362055	3.31	-0.07457	-0.04930388	6.61
Jul-19	300.7051	99.68964633	3.32	-8.56571	-3.44687247	4.02
Aug-19	89.71528	31.0031128	3.46	-47.2304	-13.9129006	2.95
Sep-19	11.72735	4.2221035	3.6	0	0	
Oct-19	8.96369	2.875164	3.21	-0.01266	-0.0036109	2.85
Nov-19	4.73013	1.4910237	3.15	0	0	
Dec-19	74.42427	24.28420274	3.26	0	0	
Jan-20	38.2815	10.0125496	2.62	0	0	
Feb-20	10.82629	3.176704745	2.93	0	0	
Mar-20	4.243548	1.329649798	3.13	0	0	
<b>Total</b>	990.2458	339.6835992	3.43	-55.9467	-17.4511748	3.12

**PSDF Projects:** Six projects were undertaken during the period under the Power System Development Fund Scheme (PSDF). The status of the projects is given in the table below:

Status of PSDF Schemes as on 31.03.2020							
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%)	82.13 (100%)	Project closed
2	Implementation of Automatic Demand Management Scheme	6.03	5.30	02.01.2017	4.77 (90%)	4.293 (90%)	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.
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%)	47.521 (71%)	Work in progress
5	Renovation of Switchyard Equipments, AGC in Gen stations, AMR and associated works	33.68	22.42	15.11.2017	20.18 (90%)	4.636 (23%)	Work in progress
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%)	7.376 (10%)	Work in progress
<b>Total</b>		<b>783.11</b>	<b>726.86</b>		<b>581.80</b>	<b>446.486 (76.74%)</b>	

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

Purchase Order and work order were issued for an amount of Rs.1272.48 Lakhs for following projects viz. Procurement of Circuit breaker timing kit for PET Subdivisions, Digital SLM with Oscillator, Fire Extinguishers, Line Impedance Measurement Unit, Single Phase relay test kit for Relay Subdivisions, 110 KV Distance and 110 KV Differential Relays, LMU-LMDU sets, Twin Channel PLCC 4 sets.

**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 routine/precommissioning/ commissioning/testing and trouble shooting of all type of relays and panels of Substations and Generating 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 six 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	220 kV		Karukadom - Kothamangalam
	110 kV	Eramallur	LILO to Eramallur from SL puram - Chellanam line
		Cherai	LILO to Cherai from North Paravur - Edayar line
		Anchal	Edamon - Anchal
		Ayur	Edamon - Ayoor
			Anchal - Ayoor
			Karukadom - Kothamangalam
	66 kV	Enathu	Adoor-Enathu SC line
		Kattanam	LILO to Kattanam from Mavelikkara - Karunagappally line
	33 kV	Vydyuthi Bhavan, TVM	Medical College-Vydyuthi Bhavanam UG cable
		Vandanmedu	Nedumkandom - Vandanmedu SC
		Kalarcode	Punnapra - Kalarcode
Transmission North	400 kV		Madakkathara - Malapramba
	220 kV	Manjeri	Elamkur- Manjeri
			Madakkathara - Malapramba
	110 kV	Sreekantapuram	LILO from Kanhirode-Mattannur line (DC)
		Kodungallur	Chalakkudy - Kodungalloor
		Mala	Chalakkudy - Mala & Kodungallur - Mala
		Chemberi	Sreekandapuram - Chemberi
		Mankavu	LILO to Mankavu from Nallalam - Chevayoor line
			Kaniyambetta - Kuthumunda
	66 kV		Palakkad – INOX Air (Depposit Work – UG Cable)
	33 kV	Olavakkode	Vydhuthi Bhavanam - Olavakkode ABC Line
		Kelakom	Nedumpoil - Kelakom (UG)
Veliyambra		Tap from Mattannur-Kuyiloor line	
		Santhinagar - Pookkottumpadam	



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

220 KV		110KV	33KV
1	Kothamanagalam	Adoor (Upgn)	Marayur
2	Chalakkudy (Upgn.)	Alappuzha (Upgn)	
3	Chithirapuram	Edakkara	
4	Aluva	Koothattukulam	
5	Kaloor	Karunagappally (Upgn.)	
6	Kunnamangalam	Kuravilangad	
7	Vizhinjam (Upgn.)	Kuthumunda (Upgn)	
8	Ettumanoor	Mankada	
9	Thalassery (Upgn.)	Mannuthy	
10	Kunnamkulam (Upgn.)	Murikkassery	
11		Nenmara ( Upgn	
12		Nilambur	
13		Vennakkara GIS	
14		Edathala (Upgn.)	
15		Pattambi	
16		Thiruvalla (Upgn)	
17		Marady	
18		Kuttikattoor	
220 KV		110KV	33KV
1	Pathanamthitta - Adoor MC(220/110)line	Pathanamthitta - Adoor MC(220/110)line	Pallivasal - Marayur
2	LILO from Idukki- Udumal	LILO from Punnapra-Chengalom	
3	LILO from Kaniyambetta-Areacode	Thycattussery - Cherthala DC	
4	Kattakkada - Balaramapuram-Vizhinjam	Nilambur - Edakkara	
5	Konnakkuzhy - Chalakkudy	Ettumanoor - Pala	
6	Karukadom - Kothamanagalam	Vennakkara - Kannampully - Nenmara DC	
7	Pallivasal- Aluva 220/110 kV MCMV	Sasthamcotta-Karunagappally DC line (upgn.)	
8		Ettumanoor - Kuravilangad	
9		Kaniyambetta - Kuthumunda 110 kV DC	
10		Valambur - Mankada	
11		LILO from Madkkathatara - Ollur	
12		LILO from Kuthumkal - Neriamangalam	
13		Manjeri - Nilambur	
14		Tap to Thiruvalla from Chengannur - Believers Church	
15		Sholayar - Chalakkudy, Idamalayar-Kalamassery 110 kV Doubling	
16		Malampuzha - Kanjikode	
17		Kollengode - Nenmara - Vadakkanchery	
18		Kunnamangalam - Kuttikkattor (Upgn)	

### 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 2019-20, PSE wing had conducted 84 Load flow studies, 24 earth mat design works for Substations/generating stations, System Fault study in addition to the reactive power study and Loss studies at various voltage levels.

### 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 (128 lakh consumers as on March 2020). 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	95201	99897	125303	60183	380584
No. of street lights connections					
11 kV line constructed (km)	760	558	409	204	1931
LT line constructed (km)	1064	1096	924	605	3689
No. of distribution transformers installed(Nos.)	393	634	671	325	2023
Meter replacement (Nos)	316034	385706	351050	144393	1197183
HT re-conductoring (C.Km)	180	178	240	189	787
LT re-conductoring (C.Km)	7216	5153	4346	3427	20142
1Phase to 3Phase Conversion (km)	697	492	653	402	2244

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 Part B, IPDS, DDUGJY (except the IT part) and any other such projects announced by the Ministry of Power, Govt. of India, are coordinated, monitored 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 fund releasing requirements, and all coordinating efforts till the closure of scheme are being carried out from the Centrally Aided Projects ( CAPs) Department.

All the works under the RAPDRP Part B Scheme for an amount of Rs. 1033.174 Cr were completed by the end of March 2018 and the closure reports were submitted during 2018-19.

**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. 595.03 Cr (including PMA charge of 2.96 Cr) have been sanctioned by the MoP for IPDS in Kerala on 15.6.2016, for 63 towns under 25 Electrical Circles. The works under the scheme was completed in all the Circles by the end of December 2019 and closure report is being prepared. The grant amount received from Ministry of Power as on 31.3.2020 is Rs. 121.58 Cr. The details of progress as on 31.03.2020 are as given below:

No	Major item of work	Unit	Sanction	Achievement
1	New Substation	Nos	3	3
2	33/11KV Additional transformer	Nos.	1	1
3	Capacity enhancement	Nos.	11	11
4	R&M of 33/11KV S/S	Nos.	168	168
5	33KV New feeders	Km	52	52
6	33KV feeder re conductoring	Km	28	28
7	33 KV line Bay Extn	No	6	6
8	11KV New feeders	Km	392	392
9	11 KV line re-conductorng	Km	166	166
10	HT/LT ABC	Km	1188	1188
11	Distribution Transformer	Nos.	882	882
12	Capacity enhancement of LT S/s	Nos	412	412
13	LT line (New)	Km	199	199
14	LT line augmentation	Km	2724	2724
15	UG Cable	Km	206	206
16	HVDS	Nos	107	107
18	Metering	Nos.	650865	650865
19	Solar Panel	KWp	4810	4810

**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, Ministry of Power, Govt. of India sanctioned a total amount of Rs. 485.37 Cr (including PMA charge of Rs. 2.41 Cr) for implementing DDUGJY scheme works in 14 districts of Kerala on 05.01.2016. The scope of work includes construction of 33kV Substations, 33kV line, 11kV line, Distribution Transformers, HT & LT lines, replacement of energy meters, BPL service connections etc. Total grant of Rs. 238.62 Cr was received from MoP as on 31.03.2020.

The works under DDUGJY were executed departmentally as per the guidelines issued by Rural Electrification Corporation /MoP. All the works under the scheme were completed and closure report is being prepared. The status of the project as on 31.03.2020 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.	6	6
3	Distribution Transformers (DTRs)	Nos.	581	598
4	LT Line	Ckm	3368.11	2696.70
5	11 KV Line	Ckm	1281.94	1235.12
6	33 & 66 KV Line	Ckm	17	31.64
7	Energy Meter -Consumer	Nos.	1778944	2063687
8	Energy Meter - DTR	Nos.	23655	23436
9	Energy Meter - 11 KV Feeder	Nos.	103	97

10	Intensive Electrification of Villages	Nos.	1315	1315
11	SAGY Villages	Nos.	28	28
12	Connection to BPL	Nos.	98527	127196

**Saubhagya Scheme** or Pradhan Mantri Sahaj Bijli Har Ghar Yojana is a Government of India project launched in October 2017 to provide free electricity connections to all un-electrified households in rural areas and poor un-electrified households in urban area. As Kerala State achieved the Total Electrification of all households in May 2017, Kerala was not considered for the Saubhagya Scheme at the time of launching the scheme. The funding pattern for this project is, Sixty Percent (60%) of the project cost as Grant from Govt. of India, ten percent (10%) of the project cost as utility contribution, balance thirty percent (30%) as loan. M/s.REC is the Nodal Agency for this scheme.

As instructed by the Central team, which visited the flood affected areas in Kerala in August 2018 for assessing the damages caused to KSEBL installations as well as the damages occurred to consumer premises, KSEBL requested for financial assistance to reconnect 3 lakh rural households de-electrified in 12 districts of Kerala (12 out of 14 districts badly affected by flood) under "Mission Reconnect" to the Ministry of Power through Govt. of Kerala. Accordingly, an amount of Rs.90 Cr. was sanctioned to KSEBL in February 2019 for booking the expenditure incurred for re-effecting service connections to 3 lakh rural households in Kerala state affected in flood under Saubhagya Scheme as a special case without insisting for DPR. The closure reports for effecting re-connection to 3,19,171 numbers of de-electrified rural households for an amount of Rs 95.7513 Cr was submitted to M/s.REC through Govt. of Kerala in February 2020. The grant amount received from Ministry of Power as on 31.3.2020 is Rs. 41.32 Cr.

**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	156	123	192	471
Complaints settled	140	123	175	438
Complaints to be settled	16	0	17	33

**Information Technology and Customer Care Department** headed by Chief Engineer 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 IT support services. Customer care Centre is also managed by this wing.

**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:** Ministry of Power, Govt. of India/PFC has launched the Restructured Accelerated Power Development Reforms Programme (R-APDRP) in the XI Five year plan. The Distribution Automation system under the project- SCADA/DMS has been implemented under part- A of RAPDRP projects. In KSEBL, the SCADA/DMS project for automation of distribution systems are implemented in Thiruvananthapuram, Ernakulam and Kozhikode towns. Distribution Management

System (DMS) is a collection of applications designed to monitor & control the 11kV distribution network efficiently. Improving the reliability and quality of service in terms of reducing outages, minimizing outage time, maintaining acceptable frequency and voltage levels are the key deliverables of a DMS. It is envisaged to have centralised monitoring and control of the Distribution networks in these three towns. The Data Recovery (DR) centre of the three SCADA/DMS project area is located at Cherthala. The centralised control centres in these towns are functional.

Main features of SCADA/DMS are Control Centers in Trivandrum, Ernakulam & Kozhikode SCADA towns for the real time monitoring and control of 11kV distribution network, Remote terminal units (RTU) in 50 substations, Local Data Monitoring system (LDMS) at substations, Feeder Remote Terminal Units (FRTU) in 2994 Ring Main Units (RMU) locations on 11kV feeders, integration with State Load Dispatch Centre (SLDC), IT Data Centre (ITDC), Customer Care centre (CCC) and Disaster Recovery (DR) centre, Advanced distribution management system (ADMS), Schematic and geographical display of 11kV network by integrating with GIS system, Fault location isolation and supply restoration (FLISR) for improved customer service, planned maintenance support, historical storage data for analysis, load flow analysis, etc.

For the implementation of SCADA/DMS project in the three towns of KSEBL as part of RAPDRP part-A,

- PFC has accorded sanction for an amount of Rs. 83.15 Cr
- The As Built DPR amount submitted to PFC for the implementation of project is Rs.54.315 Cr
- The amount received from PFC as on date is Rs.49.425 Cr
- Balance amount to be received from PFC is Rs.4.89Cr
- M/s. Kalki Communication Technologies Ltd. is the SCADA/DMS Consultant (SDC)
- M/s Schneider Electric India Pvt.Ltd.is the SCADA Implementing Agency (SIA)

The SCADA/DMS project has been successfully implemented in the three towns, viz. Thiruvananthapuram, Ernakulam and Kozhikode and has achieved all major milestones of the project,

In 2019, the three SCADA/DMS Control Centres of KSEBL has been made fully functional and the fully operational dates of Thiruvananthapuram, Ernakulam and Kozhikode SCADA Towns are 17.07.2019, 20.09.2019 and 25.08.2019 respectively. In line with that PFC (Power Finance Corporation) empanelled TPIEA (Third Party Independent Evaluation Agency) has successfully completed the audit of project implementation. Inauguration of Thiruvananthapuram SCADA/DMS Control Centre was done by the Hon. Minister of Electricity, Kerala on 13.12.2019.

During 2020, KSEBL had submitted the As Built DPR of the SCADA/DMS project which amounts to Rs. 54.31 Cr, Utilization Certificates and other closure documents to PFC as a part of project closure activities in line with PFC guidelines for facilitating the conversion of 100% PFC loan to grant.

The approval of the As Built DPR is being awaited from PFC.

**The Centralised Customer Care Services (CCC)** is managed by IT Department and had attended 6,99,655 calls at the Call Centre. 4,90,539 complaints were registered through IVRS, 55,854 through WSS and 28,43,027 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. 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 76,78,62,404/- was collected in Corporate Service Centre through bulk payment, CDM and direct collection at CCC during 2019-20.

**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	Urjadooth, 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 33578 regular employees as on 31-03-2020, (Generation SBU: 1464, Transmission SBU: 2872, Distribution SBU: 28128 and Corporate Office: 1114). 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	1623
2	Selected for Compassionate appointment	67
3	Sport Quota appointment	7
4	Paid apprentices appointed	411
5	Unpaid apprentices appointed	899
6	Promotions(up to the rank of AEE/AAO)	1168
7	Vacancies reported to KPSC	319
8	Officers deputed for foreign training	0
9	Officers deputed outside state for training	12
10	Officers deputed for training inside the State	643
11	Employees Trained in own institutes	14183

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 Vidyuthi 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

CEA approved syllabus is now adopted for training of Supervisors and Technicians. Almost 3000 employees has been trained during the financial year 2019-20.

Ministry of Power, GoI has newly introduced Implementation of Enterprise resource Planning for KSEBL under Integrated Power Development Scheme (IPDS). Several trainings were arranged in coordination with IEEE, RECIPMT, NPTI, CPRI, India Diabetic Association and Reginal Cancer Centre, Thiruvananthapuram.

Many Educational Institutions and students from Professional Colleges have identified KSEBL for undergoing their Project work/Research Work/Industrial Training/Industrial Visit etc. Accordingly 2240 students from various educational institutions have undergone their Project work/Research Work/Industrial Training/Industrial Visit and an amount of Rs.39,31,054/-(Rupees Thirty Nine Lakh Thirty One thousand Hundred and Five Only) had been generated from these activities during 2019-20.

An amount of Rs. 2,37,98,867/- has been spent towards the training and non-training expenditure during the year 2019-2020.

The abstract of training programmes conducted during the year is furnished below.

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	89	2413	269	8507	2245656	763567	<b>3009223</b>
2	RPTI Kottayam	120	2809	339	8643	2667643	363569	<b>3031212</b>
3	RPTI Thrissur	93	2780	236	6949	2042019	1137641	<b>3179660</b>
4	RPTI Kozhikode	111	3689	289	9828	2483542	327943	<b>2811485</b>
5	PETARC	65	2001	368	12513	7040262	3609756	<b>10650018</b>
6	HRD	14	655	30	445	382899		<b>382899</b>
7	SRCTC	18	461	31	775	734370		<b>734370</b>
	<b>Total</b>	<b>510</b>	<b>14808</b>	<b>1562</b>	<b>47660</b>	<b>17596391</b>	<b>6202476</b>	<b>23798867</b>

### 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 Directors Board of Ksebl. 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 (5) Account rendering of Corporate offices and (6) Benchmark grading system, Annual performance Appraisal Report (APAR) for promotion to and above AEE/AAO/AO .

**The Resident Engineer**, New Delhi is responsible for liaison with Central Government ministries and Agencies, coordination and conducting cases before Hon’ble 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 23 Nos of material inspections at various locations in North India.

**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, Safety week 2019 was observed from 1st to 7th May. The Safety policy and Safe work procedure for Distribution & Transmission wing were prepared. Approval obtained for the operating protocol of Intake gates of Dams and Valve house of all major Hydro Electric Generating Stations of KSEB Ltd. Draft Safety Procedure for Generation wing was prepared. Tool box talks at work site were introduced for ensuring safety at work sites. Mobile App (സുരക്ഷ) for Safe Work Procedure in Distribution and Transmission is being developed and would be made available to the field staff. Safety Tool Management (STM) a new feature available in SMART software to capture issue/reissue and return of safety equipments to field users. Intensive safety surprise inspection programme named “Operation Raksha” was conducted throughout the state during December 2019. PTW Mobile Application software is ready for testing. The wing conducted “Sampoorna Suraksha Varsham 2019” campaign and Safety awareness campaign for public.

The details of fatal and non-fatal accidents occurred to Board Staff/Contract Worker/Public in Board’s installations and Consumer premises during 2019-20 is listed below:

Board's Installation (Nos.)		Consumer Premises (Nos.)	
Fatal	Non Fatal	Fatal	Non Fatal
82	203	114	25

**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 2019-20 comes to Rs.1247.75 Crore. and that for transmission materials comes to Rs.167 Crore. 45 Nos of tenders were invited and 161 Nos. of Purchase Orders were issued during 2019-20. Purchase order issued for a total amount of Rs.815.25 Crore, (Including PSC Poles – Rs.77.03 Crore, Fabrication Materials, MS Rod & GI Pipe & A pole – Rs.40.03 Crore). Store Verification Unit verified stocks in Sub Regional Stores (21 Nos.),



Manufacturing facilities (3 Nos.), TMR Division Stores (4 Nos.), Transmission Division Store (1 No.), Generation Circle Stores (3 Nos.) . An amount of Rs.35.74 Crore was realised through Scrap Disposal, out of which an amount of Rs.27.09 Crore was realized through e-auction. During 2019-20, 65 Nos. of e-auction were conducted for the disposal of 293 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 major achievements during the year are listed below:

Sl.No.	Achievements during 2019-20
1	Conducted Energy audit in the Institute of Animal Health and Veterinary Biological (IAH&VB) at Palode, Trivandrum
2	Standardisation of Distribution network and transformer stations aiming at loss reductions and safety under Electrical Section, Ollur, Kannur, Tirur and Alappuzha Electrical Circles
3	Implemented HVDS in Tirur Division, Sultanpet Section and Harippad Circle
4	Awarded the Kerala State Energy Conservation Award 2019
5	Under DELP Project, distributed 60707 Nos. LED Bulbs to the consumers
6	Filament Free Kerala- Tendering for procurement of 1 crore 9W LED bulbs in progress
7	Tendering in progress for installing Electric Vehicle Charging Stations at KSEBL premises in 6 Corporations and another 56 locations.
8	Work Order issued on 25.11.2019 for Supply, erection, testing and commissioning of grid Tied GM solar plant owned by KSEBL with total installed capacity of 8MWp (4MWp-Brahmapuram, 3MWp-Kanjikode, 1MWp-Agali). Agreement executed with M/s INKEL on 20.1.2020. Target date of completion is June 2021
9	Implementation process of PM-KUSUM scheme Component A and feeder level solarisation under Component C progressing
10	For West Kallada Floating Solar Projects, M/s NHPC has sought permission to undertake 50MW floating solar project as a whole instead of 10MW in order to avail the benefits of Solar Park and B.O dtd 31.3.2020 was issued towards this

#### Completed Solar Projects as on 31.03.2020

No.	Name of the projects	Installed capacity (MW)	Date of completion
1	Kottiyam	0.6	24.1.2020
2	IPDS(South), RT, 24 locations	0.495	30.6.2019
3	On grid consumers as on 31.3.2020	72.576	

<b>On-going Solar Projects as on 31.03.2020</b>			
No	Name of the project	Installed capacity (MW)	Target for completion
1	Mylatti, Kasargode	1.00	
2	Nenmara	1.5	2021-22
3	Ettumanoor, Kottayam	1.00	2021-22
4	Agali Palakkad		
5	Brahmapuram Ernakulam	8	2021
6	Kanjikode Palakkad		
7	West Kallada Floating Solar by NHPC	50	2021-22
	<b>Total</b>	<b>61.50</b>	

<b>Status of ongoing Solar Projects (Government Buildings) as on 31.03.2020</b>			
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 Malappuram-11 Locations	110	2021
8	Jilla Panchayath, Kannur ( 29 Locations) 2nd Phase	450	2021
9	Jilla Panchayath, Kasaragod ( 3 Locations) 1st phase	195	2021
10	Jilla Panchayath, Kasargod 3rd phase ( 7 Locations)	70	2021
11	Jilla Panchayath, Kasargod 4th phase (26 Locations)	260	2021
12	Calicut University	57	2021
13	Chengalai Grama Panchayath	10	2021
14	Perambra Block Panchayath	50	2021
15	Kerala State Library Council,TVM	15	2021
16	Collectorate buildings at Kollam	40	2021
17	Collectorate buildings at Pathanamthitta	20	2021
18	Collectorate buildings at Alappuzha	30	2021
19	Collectorate building	380	2021
20	Jilla panchayath,Palakkad-Govt.Goat Farm Agali	500	2021
21	KUHS (Kerala University of Health sciences)	250	2021
	<b>TOTAL</b>	<b>3138 kWp</b>	

### 3.9 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, REC, Planning Board etc. During the FY 2019-20, Planning wing prepared detailed notes for the Power Ministers Conference held during 11<sup>th</sup> and 12<sup>th</sup> October 2019. Data for Economic review, All India Electricity Statistics, Cost of Generation and Sale of Power were provided from Planning.

In August 2019, Kerala witnessed torrential downpour and resultant landslides and flood. 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 damage assessment which helped KSEB in recovering a portion of the loss by way of Financial Assistance from the Government.

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 Thalalalathur in Kozhikode and (6) Implementation of 6 MW Peruvannamoozhi SHEP.

Compilation of Power System Statistics for FY 2017-18, Annual Administration Report 2017-18, Annual Administration Report 2018-19 were completed.

Market Monitoring: Only around 30% of the demand is met from internal (hydro) sources. The State is depending on Inter-State power purchase from Central Generating Stations and Independent Power Producers to meet its power requirement. Due to seasonal as well as hourly variations in the State's Power Demand, there will be periods where KSEB Ltd is having power surplus or deficit in different seasons within same year, different months in same season, days in same month or time blocks within the same day. A portion of the energy bucket is usually filled from short term market. In order to make the net power procurement cost minimum, the strategy followed by KSEB Ltd is to procure power from power exchanges when rates are comparatively low and to sell the power through exchanges or short-term market, when surplus power is available and when the rates are attractive.

Unlike long term and medium term, the short-term strategies cannot be effectively operated based on the deliberations in the Core Committee (which meet once in a month or two) or in the monthly power position review meeting. The reason being the dynamic nature of the power market. Market Monitoring Group reports to the Board for taking timely decisions in an efficient and financially prudent manner. The group carry out daily monitoring vis-à-vis planned figures of the Demand (MW) & Consumption (MU), Power availability from various sources, Demand and Supply mismatches, Hydro storage, weather predictions, rainfall, inflow, hydro generation, Price discovered in DEEP portal for short term, power exchanges on day ahead / contingency / term ahead basis and provide daily inputs to Director (Trans- SO). Also have to provide inputs to Core Committee and monthly power position meetings.

### **3.10 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/medium term power including renewable power (Solar/wind), 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 2019-20 The following Long Term Power Procurement and Banking and swapping arrangement were made during the year:

#### Purchase of Power

##### a. Long Term Power Procurement

- KSEBL has entered into new Power Purchase Agreements/Power Sale agreements during this period for the purchase of renewable power as detailed in the table below:

Sl.No	Name of Station	Date of PPA/ Initialed PPA	Capacity MW	Tariff, Rs./kWh	Remarks
1.	Inox Renewables Ltd- Wind Power	05-04-2019	16	4.09	Tripartite PPA to be executed as directed by KSERC
2	Deviar Micro HEP	28-05-2019	0.05		PPA initialed by KSEBL and petition submitted to KSERC by developer for determination of tariff.
3	Waste to Energy power plant at Brahmapuram by M/s. G J Eco Power Private Ltd.	18-06-2019	9.76	6.17	PPA cancelled by Government
4	NTPC Floating Solar Project at Kayamkulam	28.08.2019	92	3.16	
5	Floating Solar project of NHPC at West Kallada.	31.08.2019	10	3.43	PPA initialed. NHPC has intimated that they are not proceeding with the 10MW project but proposed 50MW project at the site
6.	PSA with SECI for purchase of Wind Power	14.06.2019	200	2.83	As per order of KSERC, PSA clauses to be amended.
7.	PSA with SECI for purchase of Wind Power	06.09.2019	100	2.81	As per order of KSERC, PSA clauses to be amended.
8.	Solar project of THDCIL at Nellithadam, Kasargod	25.09.2019	5	3.10	PPA initialed. THDCIL has intimated that they are not proceeding with the project.

- Bid for procuring 200MW Solar power from Ground Mounted Solar PV projects within India.  
Petition filed by KSEBL before KSERC for approval of bid documents for procuring 200MW Solar power from Ground Mounted Solar PV projects within India.

##### b. Medium Term Power Procurement -- NIL

c. Short Term Power Procurement

1. Purchase through DEEP: To meet the Summer 2020 demand KSEB Ltd had purchased RTC and peak power through DEEP portal from 01-04-2020 to 31-05-2020 as follows:

i. Adani Enterprises Ltd from Raipur Energen Ltd, Chhattisgarh in the Western Region.

Period	Duration/Hrs	Quantum (MW) on Firm basis	Rate at Delivery Point i.e. Kerala Periphery	LOA
01.04.2020 to 30.04.2020	00:00 to 24:00	100	Rs. 3.72/ per kWh	26.12.2019 for RTC and peak power
01.05.2020 to 31.05.2020	00:00 to 24:00	150	Rs. 3.76/- per kWh	
01.05.2020 to 31.05.2020	19:00 to 23:00	50	Rs. 4.25/- per kWh	

ii. DB power from DB Power Ltd, Chhattisgarh in the Western Region.

Period	Duration/Hrs	Quantum (MW) on Firm basis	Rate at Delivery Point i.e. Kerala Periphery	LOA
01.04.2020 to 30.04.2020	19:00 to 23:00	50	Rs. 4.24/- per kWh	26.12.2019 for peak power
01.05.2020 to 31.05.2020	19:00 to 23:00	50	Rs. 4.24/-per kWh	

d. Banking of Power

i. Banking of power during Summer 2020:

KSEBL invited Expression of Interest (EoI) on 01.10.2019 for swapping power from 01.02.2020 to 30.09.2020 so as to meet the deficit during the coming summer months and return the same during next monsoon. KSERC approval has been obtained on 14/01/2020. Based on the LoAs issued to PTC and BYPL, the following banking transactions were made during the period from 01-02-2020 to 30-04-2020, with return from 16-06-2020 to 30-09-2020.

Supplier	Month	Duration/Hrs	Quantum MW)	Return Month	Return Duration (hrs)	Return Quantum (MW)
PTC TPDDL	01/02/2020 to 15/02/2020	0-6	100	16/06/2020 to 30/09/2020	00.00 -04.00 17.00 - 18.30 22.30-24. (102 % return )	250.78
		6-20	50			
		20-24	150			
	16/02/2020 to 29/02/2020	0-6	100			
		6-20	50			
		20-24	150			
	01/03/2020 to 31/03/2020	0-6	150			
		6-18	50			
		18-20	100			
		20-24	150			
	01/04/2020 to 30/04/2020	0-6	150			
		6-18	50			
		18-23	75			
		23-24	50			

BYPL	16/02/2020 to 29/02/2020	0-24	75	16/06/2020 to 30/09/2020	00.00- 03.00 13.00-17.00 22.00-24 (103 % return)	86.64
	01/03/2020 to 31/03/2020	0-24	75			

ii. Banking tender to manage power deficit during March 2020:

In order to manage the unexpected power deficit during March 2020 due to the forced outage of 2 units at Idukki hydel station, tender was invited for banking of power with KSEBL for the supply of 50MW RTC power and 100MW from 14 hrs to 24 hrs during March 2020. LoA issued as follows

Supply to KSEB Ltd from MPL-BRPL			Return from KSEB Ltd to MPL-BRPL			
Period	Duration/ (hrs)	MW	Period	Duration/ hrs	Return Percentage	Trading margin
01-03-2020 to 31-03-2020	RTC	50	01-07-2020 to 31-08-2020	04.00 to 18.00	104% (in a uniformly distributed pattern)	0.86 ps/kwh
	14.00 - 24	100				

PL-Manikaran Power Ltd; BRPL- BSES Rajadhani Power Ltd, Delhi

**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 2019-20 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 (before KSERC)	
1	Truing up of cost and Revenue	FY 2017-18
2	Mid – Term Performance Review Petition ( True up PETITION -2018-19, Revised estimate for FY 2020 and Revised Projection for FY 2021 and FY 2022)	For the control period 2018-19 to 2021-22
3	Implementation of OTS-2019	2019
4.	Single point supply tariff of various consumers	2019
5.	Fuel surcharge petitions	Four quarters of 2019-20
4	Draft power sale agreement for the floating solar project of RGCCPP, Kayamkulam	
6	Seeking approval for inviting bids implementation of 'SOURA' solar projects	
7	Seeking power sale agreement for 200 MW wind power with SECI Ltd.	
8	For granting approval of Standard Bid Documents for the	

procurement of 200 MW solar power.

9	Approval of st. Light tariff and service connection charges for the Sabarimala festival season.	
10	Seeking approval of power sale agreement for 100 MW wind power with SECI Ltd.	
11	Seeking in approval for procurement arrangement through banking transaction from 2/2020 to 09/2020	
12.	Seeking review on KSERC order on Generation Based Incentive.	
<b>Remarks/counter/suggestion (Licensees)</b>		
13	True up petition of TCED ,KDHPCL,CPT	FY 2017-18, FY 2018-19,
14	Re- Truing up petition of KINESCO	FY 2004-05 to 2014-15
15	Capital investment plan of CSEZA	2018-19
16	True up petition of Techno park	2016-17
<b>Review petition</b>		
17	Truing up of cost and revenue & addl. clarification	for 2015-16 & 2016-17
18	Truing up of cost and revenue & response to objections.	for 2016-17& 2016-17
<b>Appeal Petitions</b>		
19.	Against True up orders of KSERC, before APTEL	2015-16 &2016-17
<b>Reply /clarification/counter affidavit/comments</b>		
20	Prepared and furnished data for 8 <sup>th</sup> integrated ranking exercise of SBU-D	2019-20
21	Prepared the Technical particulars	for 2019-20
22	Additional submission on GFA addition before KSERC	for 2016-17
23	Provides clarification on tariff related matters, Regulations, Act and orders issued by various Regulatory fora	
24	Provided report to KSERC on monthly power purchase, RPO obligations etc.	
<b>Other relevant initiatives</b>		
25	Negotiation with NTPC for reduction the AFC of RGCCPP, Kayamkulam	
<b>Comments before CERC</b>		
26	draft CERC(Sharing of inter –State Transmission charges and losses) Regulations , 2019	
27	Draft lignite transfer price guidelines for the tariff period 2019-24	
28	Guidelines for tariff based competitive bidding process for procurement of power from grid connected wind solar hybrid projects.	
29	Proposed framework for RTM for electricity	
<b>Petition /Counter affidavit before CERC</b>		
30	On the claim of MPL relinquishment charges by M/s. PGCIL.	
31	Petition No. 165/MP/2019 ( regarding station heat rate for Jhabua )	
	Filed writ petition before Hon'ble High Court of Kerala pursuant to NTPC's regulation notice.	

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

### 3.11 FINANCE AND ACCOUNTS DEPARTMENT

The Finance and Accounts Department headed by the Financial Advisor & Chief Financial Officer, undertakes the company financial management, viz., long term and short term resource mobilization, working capital management, investment management, Financial planning, budgeting and budgetary control, cash flow management, corporate banking and treasury management. 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 2013-14 to 2019-20:

Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Energy Sales within state (MU)	17454.04	18426.27	19325.07	20038.25	20880.71	21536.77	22660.93
Outside state (MU)	1414.6	369.17	53.48	49.30	117.51	824.78	55.95
<b>Total sales (MU)</b>	<b>17454.04</b>	<b>19178.96</b>	<b>19378.55</b>	<b>20087.55</b>	<b>20998.22</b>	<b>22361.55</b>	<b>22716.87</b>
Revenue from operations (Rs.Cr)	9974.17	10116.26	10914.43	11218.83	12318.17	13521.22	14644.44
Other Income (Rs. Cr.)	571.30	296.61	332.71	400.78	347.27	481.74	210.16
<b>Total (Rs. Cr)</b>	<b>10545.47</b>	<b>10412.87</b>	<b>11247.14</b>	<b>11619.61</b>	<b>12665.44</b>	<b>14002.94</b>	<b>14854.60</b>

The Increase in revenue from tariff and non tariff income in 2019-20 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 2019-20 is shown below.

Year	Revenue Operation	Other income	Total Revenue	Total Expenditure	Prior-period credit/(Charges)	Profit/Loss (Loss)
<b>2019-20</b>	<b>14644.44</b>	<b>210.16</b>	<b>14854.60</b>	<b>15124.15</b>	-	<b>-269.55</b>

Comparative statement of accounts is given in Annexure 4.

Salient features of Annual Statement of Accounts for 2019-20 are given below.

- Total income for the year 2019-20 is Rs. 14854.60 Cr and the expenditure is Rs. 15124.15 Cr. The profit and Loss account recorded a Loss of Rs. 269.55 Cr for the Year.
- The company had borrowed Rs.3799.40 Cr and repaid Rs.2279.03 Cr during the year as against Rs. 2177.73 Cr and repayment of Rs. 3078.49 Cr during previous year. The total outstanding long term loan (provisional) was Rs. 7008.69 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.

### 3.12. SPECIAL OFFICER (REVENUE)

The billing and collection monitoring of 6838 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 2019-20, an arrear amount of Rs.2.41 Cr with Principal amount of Rs.1.66 Cr and Interest amount of Rs. 0.75 Cr had been collected through One Time Settlement Scheme 2019. 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 15,000. Arrear amount of Rs.3 Cr was collected various offices under Kerala Police Department and Rs.15 Cr from Minor Irrigation HT consumer. In Vidyuthi Adalath, 31 complaints were settled and Rs.1,14,28,619/- was collected during 2019-20.

<b>HT/EHT/Licensee Consumption as on 31.03.2020</b>		
<b>Tariff Category</b>	<b>Consumers</b>	<b>Yearly Consumption (kWh)</b>
EHT (GENERAL) (A)	2	14791420
EHT (GENERAL) (B)	3	50176257
EHT I (66KV) INDUSTRIAL	14	354959880
EHT II (110 kV) INDUSTRIAL	20	705424370
EHT II (110 KV) RT	13	305205155
EHT III (220 KV) INDUSTRIAL	1	121573800
<b>EHT TOTAL</b>	<b>53</b>	<b>1552130882</b>
HT I (A) INDUSTRIAL	2388	2151669561
HT I (B) INDUSTRIAL	24	13898969
HT II (A) GENERAL	382	205708978
HT II (B) GENERAL	1068	645206323
HT III (A) AGRICULTURE	51	8025959
HT III (B) AGRICULTURE	9	2128285
HT IV (A) COMMERCIAL	1130	222325072
HT IV(B) COMMERCIAL	1071	322484589
HT IV COMMERCIAL		201962375
HT V (DOMESTIC)	117	17759960
HT VII TEMPORARY		80560
<b>HT Total</b>	<b>6240</b>	<b>3791250631</b>
Licensee : Karnataka Electricity dept	2	821766
Licensee : CPT	2	37428150
Licensee : CSEZ	1	56580050
Licensee : KDHPCL	1	59785140
Licensee : KPUPL	4	95507095
Licensee : MES	33	72267443
Licensee : RPL	1	26341820
Licensee : Technopark	3	90036025
Licensee : Thrissur Corporation	2	161828600
Licensee : Infopark, Cherthala	2	12211660
Licensee : SMART CITY	1	4644290
<b>Licensee Total</b>	<b>52</b>	<b>617452039</b>
KMRL (Kochi Metro Rail Ltd)	2	17641263
KMRL (Kochi Metro Rail Ltd)-HT	1	110080
<b>Grand Total</b>	<b>6348</b>	<b>5978584895</b>

### 3.13 INTERNAL AUDIT DEPARTMENT

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

No	Office / Section	Function
1	RCA Office	Pre-check of capital and R&M bills
2	Work Audit Section	Audit of works, purchase and miscellaneous bills
3	EAS Section	Audit of establishment bills.
4	Pay fixation section	Audit of pay and allowances
5	Pension Audit Section	Audit of Pension fixation.
6	GPF Section	Maintenance of GPF.
7	ARI Section	Interface between KSEBL and Accountant General./Govt./PUC.
8	RAO Monitoring Section	Review and follow up of audit reports of 23 Regional Audit Offices.
9	Arrear 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 2019-20 are given below:

Sl. No.	Section	Value of Bills processed / quantum	Value of objections raised	Value Recovery/Savings	of
1	RCA	Rs.1241.43 Crore	Rs.162.77 Crore	Rs.8.62 Crore	
2	WAD	Rs.16.69 Crore			
3	Regional Audit Offices	681 Audit Reports	Rs.30.54 Crore	Rs.24.61 Crore	
4	Pension Audit	6671 PPO/Service Books verified	Rs.33.02 Lakh	Rs.27.32 Lakh	
5	Pay Fixation	9410 Service Books verified	Rs.36.27 Lakh	Rs.52.05 Lakh	
6	EAS	Rs.14.05 Crore	Rs.5.62 Lakh	Rs.3.39 Lakh	
7	GPF	Closure 1264 Nos. (Rs.156.11 Crore) NRA audited - 10240 Nos (Rs.307.31 Crore).	NA	NA	
8	ACC	NA	NA	Rs.140.64 Crore	

Efforts taken by Arrear Clearance Cell resulted in the saving of Rs.1.07 crores in respect of water charge settlement of Electrical Division Nedumangad and Vidyuthi Bhavanam, Thiruvananthapuram. Remarks offered by the WAD Section on M/s.Jhabua Power on -Fuel shortage methodology resulted in a cost saving of Rs.12.23 crore. Internal audit conducted by Regional Audit Offices, Pay Fixation, Pension Audit and Establishment Audit Sections resulted in the realisation of Rs.24.61 Crore, Rs.52.05 lakh, Rs.27.32 lakh and Rs.3.39 lakh respectively. Pre-check carried out by the Resident Concurrent Audit Wing saved Rs.8.62 Crore.

### 3.14. PUBLIC RELATIONS DEPARTMENT

Public Relations Department of KSEBL manages corporate communication activities, effectively engaging conventional as well as new mass media thus upholding healthy relation with media and Society. 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](http://www.ksebmedia.in)) and the telecast of the television programme 'Spandanam' on the 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 2019-20, exhibitions were conducted in 12 venues (Rs.5,55,000/-). CPRO is appointed as the Nodal officer for Malayalam Official Language. The PR wing published 208 tender notices in newspapers (Rs.1,34,54,345/-) and 16 Nos. Statutory notices in Government Gazette (Rs.82,295/-) during the year.

### 3.15. 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 the General transfer of workmen and officers during the year
- Routine review of SC/ST representation done which illustrates 12.56 % employees belong to SC community and 1.82 % belong to ST community among regular employees of the company.
- Compliance report as directed by the Hon'ble Supreme Court of India and Hon'ble High Court of Kerala regarding petition filed by petty contract workers for absorbing them in regular service of KSEBL submitted to GoK
- Review meeting in respect of the Administrative Reforms Committee constituted in KSEBL being carried out in line with the guidelines issued by the Administrative Reforms Commission, Government of Kerala
- The following accident compensation claims were settled during the year

No	Description	Amount (Rs.)
1	Fatal and non-fatal accidents to petty contractors & workmen	78,54,718
2	Fatal and non-fatal accidents to employees	28,60,187
3	Medical claims reimbursement to the accident victims	49,09,159
4	Claims to electrical accidents to Public	1,35,95,000
5	Claims to electrocution to cattle	5,89,000

- Details of Employees Welfare Fund disbursed are shown below.

No	Description	Employees	Amount (Rs)
1	Retirement benefit	1075	4,44,14,050
2	Legal heirs of deceased employees	118	9,94,69,497
3	Voluntary retirement benefit	12	5,15,618
4	Resignation benefit	7	39,150
5	Educational awards to students (Class X)	562	19,67,562
6	Educational awards to Students (Class XII)	275	13,75,275

### 3.16. LEGAL DEPARTMENT

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

KSEBL has engaged 79 Standing Counsels for conducting cases before Lower courts within the state, Two Senior Standing Counsels and Seven Standing Counsels for conducting cases in the Hon'ble High court of Kerala, and one Standing Counsel for conducting cases in the Hon'ble Supreme Court of India. 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 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. Major Activities conducted during the year include:

- Lok Adalaths (26 Nos.) were conducted in various districts in which 698 cases were settled for an amount of Rs.26.84 Cr.
- Out of the 10636 cases present in various courts (7572 from the previous periods), 3412 cases were disposed during the year.

**3.17. LAND MANAGEMENT UNIT (LMU)**

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

Steps were initiated to take stock of all the land parcels and 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. 1983 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	1331	4557.39	11261.55
2	Transmission	497	645.76	1595.70
3	Distribution	151	43.91	108.49
4	Corporate Office	4	10.82	26.74
<b>Total</b>		<b>1983</b>	<b>5257.88</b>	<b>12992.48</b>

Major achievements in FY 2019-20 include:

1. An Extent of 102.36 Hectares (252.839 Acres) of land in prime locations got mutated in favour of KSE Board Ltd.
2. Copies of 454 Awards relating to various landed properties of KSE Board Ltd were traced out from different sources and uploaded in the database.

**3.18. VIGILANCE AND SECURITY DEPARTMENT**

Vigilance Department of KSEBL was established to investigate corruption and misconduct of employees, detection of Power theft and misuse by consumers and maintaining security of critical assets of KSEBL. The department is headed by Inspector General of Police on deputation. Now, Superintendent of Police is acting as the Chief Vigilance officer and reports directly to Chairman & Managing Director. The department has two wings, viz. Vigilance and Anti-power-theft Squad.

Vigilance wing conducts enquires related to misconduct and corruption by employees of KSEBL 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	631
2	Enquiry ordered	631
3	Completed Enquiry	565
4	References handled	3790
5	Complaints received over phone	262
6	Complaints rectified	262
7	Details furnished on Pending cases /Disciplinary proceedings	2014

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, Ernakulam and Kozhikode. 14 APTS units operate in various parts of State having Head Quarters at Thiruvananthapuram, Kollam, Thiruvalla, Alappuzha, Kottayam, Ernakulam, Vazhathope, Thrissur, Palakkad, Malappuram, Kozhikode, Kalpetta, Kannur and Kasaragod.

A summary of activities of APTS team is given below:

No	Item	Quantum
1	Total numbers of inspections	26644
2	Irregularities detected	2951
3	Theft cases	338
4	Short Assessment cases	301
5	Malpractice cases	1949
6	Inspection on HT premises	338
7	Irregularities detected	85
8	Total assessed amount	Rs 31.62 Cr
9	Amount Realised	Rs. 16.27 Cr

APTS now operate in a technically high platform with sophisticated testing equipments like electronic reference standard meters with theft analyzing capability and Meter reading instruments for downloading tamper data from memory of consumer meter. APTS Units Thiruvananthapuram, Thrissur and Palakkad are now engaged in solar testing and inspection work also.

#### 4.0. STATE SUPPORT SCHEMES

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 2019-20 are furnished below.

Projects under Innovation fund and ESCOT for the year 2019-20		
Project	Amount (Rs in Crore)	Details of AS received (Rs in Crore)
West Kallada floating solar project		
Tidal & wave Energy project		0.02
ERP	22.20	5.68
New Innovative Projects		
ESCOT –standardisation of DTR stations & HVDS	1.00	1
HVDS		
<b>Total</b>	<b>23.20</b>	<b>6.70</b>

<b>ANNEXURE 2 : HIGHLIGHTS OF KERALA POWER SYSTEM</b>	
Total Installed capacity	2238 MW
Storage as on 01.04.2019	1797.879 MU
Inflow during 2019-20	5778.26 MU
Storage as on 31.03.2020	2082.104 MU
Total generation	5781.23 MU
Auxiliary consumption	38.81 MU(Generation) 19.6 MU (Substations)
Purchase from IPPs inside the State	273.86 MU
Power injection by Captive Plants /Prosumers	34.37 MU
Purchase through Traders	8137.11 MU at Kerala Periphery
Purchase through Power exchange	990.24 MU at Kerala Periphery
Power availed through Swap	352.67 MU at Kerala Periphery
Swap Return	231.93 MU at Kerala Periphery
Sale through Power exchange (at SR )	55.95 MU at Kerala Periphery
CGS share	10082 MU at Kerala Periphery
Power availed through DSM(Net)	513.5 MU
Total Power purchase	20383.76 MU at Kerala Periphery
Total Generation and power purchase	26106.57 MU
External PGCIL loss	744.75 MU
Energy sale inside the state by KSEB	22660.93 MU
Energy consumption within state	23058.91 MU (including open access)
Open access purchase at Kerala periphery;	405.86 MU (386.52 MU at consumer end)
Energy injection at generator end for sale outside	37.5 MU( 35.96 MU at KSEB Periphery)
T & D loss in KSEBL system	3167.17 MU ; 12.08 (%) (including open access)
Maximum peak demand recorded	4316 MW (on 13.4.2020 at 21.00 to 21.30 hrs)
Unrestricted peak demand	4316 MW
Maximum daily consumption recorded	88.3386 MU (on 23.05.2019)
Length of EHT lines( As on 31.3.2020)	10323 Ckm
Length of HT lines(11/22/33KV)(As on 31.3.20)	66270 Ckm
Length of LT lines( As on 31.3.2020)	293280 Ckm
No. of EHT substations( As on 31.3.2020)	263 Nos.
No. of Distribution transformers(As on 31.3.20)	81470 Nos.
Total consumers	128.26 Lakhs Nos.

<b>Annexure 3 : Installed capacity of Kerala as on 31.3.2020</b>			
<b>No</b>	<b>Name of Station</b>	<b>Installed Capacity (MW)</b>	<b>Annual Generation capacity (MU)</b>
	<b>KSEBL Hydel Stations</b>		
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
	<b>Sub total (Large Hydel Stations)</b>	<b>1938.75</b>	<b>6780.27</b>
1	Chembukadavu stage I	2.7	6.59
2	Chembukadavu stage II	3.75	9.03
3	Kallada	15	65
4	Kuttiadi tailrace	3.75	15
5	Lower meenmutty	3.5	7.63
6	Malampuzha	2.5	5.6
7	Malankara	10.5	65
8	Mattupetty	2	6.4
9	P.L.B.E	16	74
10	Peppara	3	11.5
11	Urumi stage I	3.75	9.72
12	Urumi stage II	2.4	6.28
13	Poozhithode SHP	4.8	10.97
14	Ranni Perinad SHP	4	16.73
15	Peechi SHP	1.25	3.21

16	Vilangad SHP	7.5	22.63
17	Chimmony SHP	2.5	6.7
18	Adyanpara SHP	3.5	9.01
19	Barapole SHP	15	36
20	Poringalkuthu Micro (Screw type Turbine)	0.011	0.082
21	Vellathooval SHP	3.6	8.985
22	Perunthenaruvi	6	31.61
23	Kakkayam SHEP	3	7.34
	<b>Sub Total (Small Hydro Stations)</b>	<b>120.011</b>	<b>435.017</b>
	<b>Sub Total Hydro Stations</b>	<b>2058.761</b>	<b>7215.172</b>
	<b>KSEBL Thermal Stations</b>		
1	Brahmapuram Diesel Power Plant (KSEB)	63.96	363.6
2	Kozhikode Diesel Power Plant (KSEB)	96	672
	<b>Sub total (Thermal Stations)</b>	<b>159.96</b>	<b>1035.6</b>
	<b>KSEBL Wind Stations</b>		
1	Kanjikode (9x0.225 MW) (KSEB)	2.025	4
	<b>Sub total KSEBL Wind Stations</b>	<b>2.025</b>	<b>4</b>
	<b>KSEBL Solar Plants</b>		
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	1.1
6	Palakkad Tribal Colonies (DDG)	0.065	0.1
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	0.03	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
23	Kottiyam	0.6	
24	KSEBL Rooftop IPDS south	0.495	
	<b>Sub total (KSEBL Solar Stations)</b>	<b>17.479372</b>	<b>25.83</b>
	CPPs/IPP hydro Stations		
1	Kuthungal (CPP)	21	79
2	Maniyar (CPP)	12	36
3	Ullunkal (IPP)	7	32
4	Iruttukkanam (IPP)	4.5	13
5	Pambumkayam (Mankulam) Mini HEP (IPP)	0.11	0.29
6	Karikkayam SHP (IPP)	15	46.52
7	Meenvallom SHP (IPP)	3	8.37
8	Kallar micro HEP(IPP)	0.05	0.13
9	Pathamkayam	8	25.54
	<b>Sub- Total (IPP/CPP Hydro Stations)</b>	<b>70.66</b>	<b>240.85</b>
	CPP / IPP Thermal Stations		
1	Kayamkulam (N.T.P.C) (Central sector)RGCCPP	359.58	2158
2	Co-Generation Plant PCBL (CPP)	10	70.08

	<b>Sub-total (CPP / IPP Thermal Stations)</b>	<b>369.58</b>	<b>3394.75</b>
	CPP/ IPP Wind Stations		
1	Wind-Agali	18.6	37.47
2	Wind-Ramakalmedu	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
6	Wind-Malayala Manorama (CPP)	10	
	<b>Sub-total (CPP / IPP Wind Stations)</b>	<b>68.25</b>	<b>118.89</b>
	CPP / IPP / Prosumer Solar Stations		
1	Hindalco Industries Ltd.(Solar)	1	1.58
2	CIAL(Solar)	38.4376	45.77
3	ANERT	2	3.15
4	SOLAR ENERGY CORPORATION	50	78.84
5	KMRL	5.39	
6	Grid connected consumers	72.601	55.57
	<b>SubTotal (Private Solar Stations)</b>	<b>169.4286</b>	<b>184.91</b>
	<b>Total KSEBL Stations</b>	<b>2238.225</b>	<b>8280.602</b>
	<b>Total Private Stations</b>	<b>677.9186</b>	<b>3939.4</b>
	<b>Total- Hydel -KERALA</b>	<b>2129.421</b>	<b>7456.022</b>
	<b>Thermal-KERALA</b>	<b>529.54</b>	<b>4430.35</b>
	<b>Wind Total -KERALA</b>	<b>70.275</b>	<b>122.89</b>
	<b>Solar total-KERALA</b>	<b>186.908</b>	<b>210.74</b>
	<b>Total Installed capacity</b>	<b>2916.144</b>	<b>12220.002</b>

<b>ANNEXURE 4 : Comparative statement of accounts from 2013-14 to 2019-20 (Rs Cr)</b>								
<b>No</b>	<b>Particulars</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>Revenue Income</b>							
1	Non-Tariff Income	571.97	533.52	759.44	550.09	608.19	481.74	210.16
2	Revenue from tariff	9978.88	9879.35	10487.71	11036.78	12057.26	13521.20	14644.44
	<b>Total A(1+2)</b>	<b>10550.85</b>	<b>10412.87</b>	<b>11247.15</b>	<b>11586.87</b>	<b>12665.45</b>	<b>14002.94</b>	<b>14854.60</b>
	<b>Revenue Expenses</b>							
1	Power Generation	240.45	209.91	104.26	23.45	2.08	3.29	5.71
2	Power Purchase	6902.65	6782.76	6336.82	7664.40	7526.03	7869.32	8680.00
3	Interest Charges	834.81	906.90	909.14	922.93	1881.08	1859.76	1899.03
4	Depreciation	516.28	459.70	491.22	520.66	803.70	805.02	901.92
5	Employee Cost	2579.99	2893.71	3292.82	3373.76	3038.40	3354.62	3508.42
6	Repairs & Maintenance	227.04	244.44	259.76	266.90	277.35	303.75	281.80
7	Admn. & Gen Expenses	253.50	287.05	344.09	378.72	530.39	598.56	564.64
8	Other Expenses	28.51	138.90	84.58	88.50	-142.76	222.48	50.57
9	Return/ Surplus	116.17	0.00	0.00	0.00	0.00	0.00	0
	<b>Total (1 to 9)</b>	<b>11699.40</b>	<b>11923.37</b>	<b>11822.69</b>	<b>13239.32</b>	<b>13916.27</b>	<b>15016.87</b>	<b>15892.09</b>
1	Less :Expenses Capitalised	182.95	184.14	204.50		400.34	463.02	460.94
2	Less : Interest Capitalised	117.31	53.44	57.73		66.39	260.86	307.00
	<b>Total(1+2)</b>	<b>300.26</b>	<b>237.58</b>	<b>262.23</b>	<b>0.00</b>	<b>466.73</b>	<b>723.88</b>	<b>767.94</b>
	<b>TOTAL B</b>	<b>11399.14</b>	<b>11685.79</b>	<b>11560.46</b>	<b>13239.32</b>	<b>13449.54</b>	<b>14292.99</b>	<b>15124.15</b>
	<b>SURPLUS / (DEFICIT) (A-B)</b>	<b>-848.29</b>	<b>-1272.90</b>	<b>-313.29</b>	<b>-1652.45</b>	<b>-784.09</b>	<b>-290.00</b>	<b>-269.55</b>

Annexure -5 : Statement of Profit and Loss for 2019-20 (Rs Lakhs)					
No	Particulars	on 31.3.2020	on 31.3.2019	on 31.3.2018	on 31.3.2017
I	<b>REVENUE</b>				
	Revenue From Operations	1,464,444.00	1,352,120.60	1,231,817.31	1,121,883
	Other Income	21016.00	48,174.14	34,727.52	40,078
	<b>Total Income (I+II)</b>	<b>1,485,460.00</b>	<b>1,400,294.74</b>	<b>1,266,544.83</b>	<b>1,161,960</b>
II	<b>EXPENSES</b>				
	Purchase of Power	868,000.00	786,932.13	752,602.69	739,332
	Generation of Power	571.00	329.20	207.84	2,345
	Repairs & Maintenance	28,180.00	30,375.11	27,734.87	26,513
	Employee benefits expense	304,748.00	289,201.39	2,63,806.15	336,077
	Finance costs	159,203.00	159,889.80	181,469.02	95,992
	Depreciation and amortization expense	90,192.00	80,502.76	80,370.49	71,888
	Other Expenses				
	Administrative Expenses	56,464.00	59,816.29	3,038.86	37,479
	Others	2,197.00	20,260.94	-1,416.98	8,364
	ADD Changes in Fair Valuation and other adjustments		393.63	-12,858.65	-6,566
	<b>Total expenses (IV)</b>	<b>1,509,555.00</b>	<b>1,427,701.25</b>	<b>1,344,954.29</b>	<b>1,311,423</b>
III	Profit/(loss) before exceptional items and tax (III- IV)	-24,095.00	-27,406.51	-78,409.46	-149,463
	Exceptional Items	2860.00	1,594.34	-	-
	Profit/(loss) before tax (V-VI)	-26955.00	-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	-26955.00	-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)	-26955.00	-29,000.85	78,409.46	-149,463
XIV	Other Comprehensive Income				
	A (i) Items that will not be reclassified to profit or loss	-59635.00	-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)	-86590.00	-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	0.77	0.38	2.25	-
	(2) Diluted	0.77	0.38	2.25	-

<b>Annexure- 6 : Balance Sheet at the Year end FY 2019-20(Rs Lakhs)</b>				
<b>Particulars</b>	<b>on 31.03.2020</b>	<b>on 31.3.2019</b>	<b>on 31.03.2018</b>	<b>on 31.03.2017</b>
<b>ASSETS</b>				
<b>Non current assets</b>				
Property, Plant and Equipment	2249182	2,124,607.56	2,048,792.59	2,068,736.35
Capital work-in-progress	375003	299,134.38	249,277.74	178,329.19
Intangible asset	2572			
<b>Financial Assets</b>				
Investments	2049.00	2,049.01	2,000.01	2,000.01
Trade receivables	74544.00			
Loans	2178.00	8,342.65	8,295.03	8,389.85
Others	294527.00	7773.16	6,331.70	55,070.04
<b>Deferred Tax Assets (Net)</b>				
<b>Other non-current assets</b>	31040.00	527,469.70	431,532.62	493,289.29
<b>Current assets</b>				
Inventories	80886.00	69,805.76	48,590.36	31,018.91
Trade receivables	182204.00	128801.29	229,501.13	192,339.65
Cash and cash equivalents	18374.00	27542.10	27,545.63	23,603.23
Bank balances Other than Cash Equivalents	10930.00	7839.91	7,007.15	6,827.98
Other Financial assets	11372.00			
Current tax Assets (Net)	185.00			
Other current assets	100465.00	14531.57	12,676.53	8,046.66
<b>Total Assets</b>	<b>3435511.00</b>	<b>3218594.14</b>	<b>3,071,550.48</b>	<b>3,067,651.15</b>
<b>Equities and Liabilities</b>				
<b>Equity</b>				
Equity Share capital	349905.00	349905	349,905.00	349,905.00
Other Equity	-1210443.00	-1116306.10	962,254.68	740,788.01
<b>Liabilities</b>				
<b>Non-current liabilities</b>				
Borrowings	1513413.00	1452515.45	1,593,454.49	426,656.76
Other Financial Liabilities	393754.00	335984.70	317,044.52	311,596.98
Provisions	1028592.00	1122416.88	976,539.38	2,028,767.16
Other non-current liabilities	304823.00	264514.60	193,405.24	142,922.30
<b>Current liabilities</b>				
<b>Financial Liabilities</b>				
Borrowings	233023.00	382902.31		

			273,758.98	276,746.30
Trade payables	199168.00	121457.58	95,731.97	81,846.53
Other financial liabilities	435595.00	303397.72	233,065.58	189,998.14
Provisions	187681.00	1806	900.00	-
<b>Total Equity and Liabilities</b>	<b>3435511.00</b>	<b>3218594.14</b>	<b>3,071,550.48</b>	<b>3,067,651.15</b>

## 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

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