



Annual Administration Report 2020-21

KERALA STATE ELECTRICITY BOARD LIMITED

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2. Preface

It is my immense pleasure to present the *Eighth Annual Administration Report* of Kerala State Electricity Board Ltd, after reconstituting it as a company, and the 64th 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 (131.43 lakh consumers as on 31.03.2021). It owns 38 Hydro Generating Stations, 2 thermal stations and few non-conventional stations and is having a total installed capacity of 3029.6 MW. The transmission asset of the company includes 426 vnumbers substations and 13775 circuit km lines, varying from 400 kV to 33 kV levels. The distribution network carries 2.96 Lakh km line and more than 83,000 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 during the years 2020,2021 have slowed down the pace of these projects.

A substantial reduction in T&D loss to 10.32% was achieved during 2020-21. This was achieved despite the addition of 3650 km of LT lines for maintaining Total Electrification Status. 3,72,116 new consumers were connected to the grid during 2020-21.

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.

Thiruvananthapuram
Date: 12.04.2022

(DR. B.ASHOK, IAS)
Chairman & Managing Director, KSEBL

3. 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.

3.1.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
Chairman & Managing Director	Sri.N.Sivasankara Pillai, IA & AS	29.1.2018 to 31.03.2021
Director (Finance)	Sri.N.Sivasankara Pillai, IA & AS	10.8.2015 to 31.03.2021
Director (Transmission & System Operation, Corporate Planning & Safety)	Sri. Venugopal N	1.04.2020 to 31.05.2020
	Sri. Kumaran. P	1.06.2020 to 4.06.2021
Director (Planning Safety & REES)	Smt. Mini George	4.06.2020 to 31.03.2021
Director (Distribution, IT ¹ & HRM ³)	Sri. Kumaran. P	1.04.2020 to 31.03.2021
Director(Generation Electrical & SCM ²)	Sri. Brijlal. V	1.09.2019 to 31.05.2020
	Sri. Suku R	4.06.2020 to 31.03.2021
Director (Transmission & System Operation)	Sri. Venugopal .N	1.04.2020 to 31.05.2020
	Dr. Rajan.P	5.06.2020 to 31.03.2021
Director (Generation –Civil)	Sri. Bibin Joseph	2.09.2019 to 31.01.2021
	Sri. Kumaran. P	1.02.2021 to 31.03.2021
Director (Ex Officio)	Dr. B. Ashok, IAS, Secretary to Government, Power Dept	1.04.2020 to 28.05.2020
	Dr. Dinesh Arora, IAS, Secretary to Government, Power Dept	28.05.2020 to 6.01.2021
	Dr. Saurabh Jain, IAS, Secretary to Government, Power Dept	6.01.2021 to 31.03.2021
	Sri. Rajesh Kumar Singh, IAS Additional Chief Secretary to Government, Finance Dept	1.04.2020 to 31.03.2021
Independent Director	Dr. V. Sivadasan	02.7.2016 to 31.03.2021



3.2.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.

3.2.1. Generation SBU

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

Director (Generation-Electrical & SCM)	Chief Engineer (Generation & PED)
	Chief Engineer (SCM)
Director (Planning, Safety & REES)	Chief Safety Commissioner
	Chief Engineer (Renewable Energy & Energy Savings)
	Deputy Chief Engineer (Commercial & Planning)with full power of Chief Engineer
Director (Generation - Civil & HRM)	Chief Engineer (Civil Construction - North)
	Chief Engineer (Civil Construction - South)
	Chief Engineer (Civil - Investigation & Construction Central)
	Chief Engineer (Civil - Dam Safety & DRIP)
	Deputy Chief Engineer (Pallivasal Extension Scheme) with full power of Chief Engineer

The Generation SBU operates and maintains 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).



3.2.2. 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.

3.2.3. 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 effecting service connection to all categories of consumers, 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 (131.43 lakh consumers as on March 2021). Implementation of Central sector 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.

3.3.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.

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

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

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

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

SOURA headed by the Deputy Chief Engineer (State Nodal Officer) is entrusted with the implementation of Roof Top solar plants

The Dyuthi works are monitored by the Dyuthi Project Monitoring Division (DPMD) with headquarters at Ernakulam.

3.4.Organisation chart

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

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4. 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 Covid 19 pandemic.

4.1. 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 10.32 % by the end of FY 2020-21. The Losses are the lowest among the utilities in the country. The reduction in losses has resulted in substantial financial savings as given in Table below.

Financial Impact of T&D Loss reduction							
Year	Energy sold ¹	Energy Input ¹	T&D loss (%)	Yearly Reduction (%)	Cumulative Reduction (%)	Energy Saved (MU)	Cost Savings ² (Rs Cr)
2016-17	20038.25	23763.58	13.93	0.44	6r.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	23058.91	26226.08	12.08	0.039	7.94	2182.09	929.20
2020-21	22540.32	25132.93	10.32	1.76	9.7	2566.38	1132.37

¹ including open access energy, ² 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 ₹ 1132.37 Cr for FY 2020-21 as shown above.

4.2. 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							System as on 31.3.21
Generation (MW)								
Hydro Capacity	15.50	22.0	3.6	6	3	0	0	2058.76
Solar KSEBL		1.156	7.6732	6.0208	2.0	1.095	0.371	17.47
Solar capacity other than KSEBL (grid connected)		13.70	59.08	24.7	19.79	51.032	104.33	282.85
Transmission Substation (Nos)	3	14	10	16	9	19	17	426
400KV	0	0	0	0	0	1	0	5*+1
220KV	1	0	0	2	0	1	4	27
110KV	1	8	3	5	3	9	10	173
66KV	0	3	0	3	1	2	1	60
33KV	1	3	7	6	5	6	2	160
Lines (circuit km)	117.60	140.14	147.43	175.38	224.6	580.43	696.10	13614.64
400KV						92	85.03	177.03+1152.56 *
220KV	36.2	0.68	0	54.1	0	73.18	238	3141.40
110KV	38.4	66.67	67.66	79.76	134.2	235.24	324.50	5030.86
66KV	0	6	0	0.44	29.5		8.4	2004.79
33KV	43	66.79	75.77	41.08	60.9	100.06	39.2	2108.00
Distribution lines (ckm)								
LT	4636	4826	5357	3130	3401	3689	3650	295921
HT	1807	2022	1844	1744	1773	1939	2195	64540
Dist Transformers	3554	2389	2270	2353	2410	2023	2372	83465
No. of consumers	42223 8	38124 7	46213 7	35364 2	36867 3	380584	372116	13142910

(* owned by PGCIL)

4.3. Financial performance

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



4.3.1. Restricted borrowings

The company executed capital projects for ₹ 3069.54 Cr during the year. However, the net additional borrowing (Long term and Short term) has been ₹ 1299.48 Cr only. This was achieved by utilising internal accruals, capital grants and consumer contribution. Details of outstanding loans for FY 2020-21 are given below.

Outstanding Loan Liabilities (₹ Cr)						
Year	Loan Opening Balance	Loan received	Repaid	Loan Closing balance	Increase over previous year	Interest due for payment
2020-21	7376.29	2825.16	1525.68	8675.77	1299.48	NIL

4.3.2. Reduction in interest payment

The Company has incurred ₹ 730.69 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 7.9 %.

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.

4.3.3. Revenue Gap

KSERC had tried up the audited accounts of the company till 2017-18 (except for FY 2014-15 for which orders are reserved) allowing 14% rate of return on equity.

The approved revenue gap till FY 2017-18 amounted to ₹ 6864.13 Cr as given below

No	Item	Revenue Gap
1	Till 31-3-2011	424.11
2	FY 2011-12 (and Review petition)	1391.93
3	FY 2012-13	3132.97
4	FY 2009-10 and 2010-11 (Remand Order)	312.60
5	FY 2013-14	195.50
6	FY 2014-15	NA
7	FY 2015-16	202.97
8	FY 2016-17 (and Review petition)	1119.92
9	FY 2017-18	84.13
	Total	6864.13



The average cost of supply per unit for the year 2020-21 was ₹ 6.97 and the gap per unit (₹ 0.81) is given in Table below.

N o	Particulars	FY16	FY17	FY18	FY19	FY20
1	Average cost of supply	5.98	6.55	6.45	6.63	6.97
2	Average revenue realized	5.82	5.80	6.07	6.50	6.16
3	Gap (=1-2)	0.16	0.75	0.38	0.13	0.81

4.4. Comparison of expenses and Revenue

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

4.5. Major initiatives

4.5.1. 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 2020-21 is listed below:

4.5.1.1. Soura

Out of the total target of 1000 MW under Soura, KSEBL could install 2.269 MW during the year from Roof Top of domestic, public and private buildings including educational institutions, hospitals and commercial establishments. Demand aggregation for first phase of Roof Top Solar (RTS) has been completed. For the first phase tender was floated and the work has been awarded to three developers. Upon detailed survey and capacity confirmation by developers, EPC orders for 2253 nos sites aggregating to 18.347 MkW capacity has been issued. As on 31.3.2021, 2.269 MW capacity has been completed and it is scheduled to complete 30 MW Phase I project by March 2022.

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 upto 3 KW and above 3KW @ 20%. State DISCOMS are authorised as the implementing agency and KSEBL was allocated 50 MW capacity for the year 2019-20. Empanelled list of developers for 2019-20 was published during November 2020 and EPC orders are being placed with developers. It is scheduled to complete the project for 2019-20 by November 2021. Further MNRE allocated 200 MW capacity to KSEBL in the subsidy programme for 2020-21 and tenders floated during February 2021 for empanelling developers in the scheme for 2020-21. The project completion for 2020-21 is targeted by June 2022.



4.5.1.2. Filament free Kerala

The project envisages replacing the entire Filament lamps in the State by energy efficient and long-lasting LED lamps and safe disposal of ICL/CFL collected with reduction in peak demand, global warming and Mercury pollution. 14 lakh domestic consumers registered for 118 lakh LED bulbs as on 31.03.2021. One Crore LED bulbs were purchased and 84.18 lakh LED bulbs were distributed to the registered consumers.

4.5.1.3. 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 ₹ 4036.30 crores for Replacement of faulty meters, Continued Electrification, Special Projects like SCADA in addition to the normal development works.

In spite of the devastating floods during 2018 & 2019 which affected the progress of Dyuthi works, financial progress of ₹ 1457.32 cr (44.3%) could be achieved. More details on Dyuthi works are included under the head Distribution SBU.

4.5.1.4. TransGrid 2.0 – 2nd 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 1st phase of the project is planned for execution during 2017-2022 and 2nd phase for 2019-2024. The works included in the 1st phase of the project are grouped into 13 packages and comprises construction of 12 substations and 2084 Circuit kilometre of EHT lines. Out of these 12 substations, 4 are Air Insulated Substations (AIS) and the remaining are Gas Insulated substations (GIS). 12 substations (AIS - 3 Nos. & GIS - 9 Nos.) are included in Phase II of the project which is grouped into 12 packages. Total cost for the two phases of the project is estimated at ₹ 10000 crores. It is proposed to arrange the finance mainly from KIIFB, PSDF under CEA, MOP and GEC, Green Energy Corridor under MNRE.

Implementation of the projects in Phase I are underway and are progressing as scheduled. 12 packages out of 13 in the 1st Phase have been awarded and tender is under process for the remaining package. Out of the 12 substations targeted in the 1st phase, 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.

4.5.1.5. ESafe

The eSafe project jointly mooted by Electrical Inspectorate and KSEB aims at zero electrical accidents in the State. KSEB has included improving safety of the distribution network as one of the primary goals under Dyuthi 2021 project. Works amounting to ₹ 2159.09 Cr were identified in the four-year project intended for improved safety. Out of this 26145 works



amounting to ₹ 775 Cr are completed as on 31.03.2021.

17390 safety inspections were conducted by Safety Officers observing COVID protocols.

4.5.2. Other Solar Projects

Ground Mounted Solar Projects: works under 3MW Ground Mounted Solar Projects at Kanjikode under KSEB Ltd funding, 1 MW plant each at Ettumanoor (expected completion November 2021) and Agali, 4 MW plant at Brahmapuram and 1.5 MW plant at Nenmara are in progress.

Solar Parks: A 50 MW Solar plant at Ambalathara in Kasaragod was developed by Indian Renewable Energy Development Agency (IREDA) and the project was commissioned in 2017; additional 5 MW capacity is proposed in the 27 acres of balance land at Nellithadam in Ambalathara village. Another 50 MW solar plant was developed by THDC India Ltd at Paivalike, Kasaragod in 250 acres of land and the same was commissioned on 31.12.2020.

It is proposed to set up 100 MW Solar Park at Cheemeni under UMREPP scheme. The District Collector, Kasaragod, allotted 575 acres of land at Cheemeni, Kasaragod (under the possession of Plantation Corporation of Kerala - PCKL) for setting up of 100 MW Solar Park and Substation, out of which 475 acres of land was handed over to RPCKL in July 2020. However, these orders for transferring the land has been kept on hold by the Government of Kerala due to objection from PCKL, Agriculture dept. etc. The matter has been taken up with the Minister for Electricity and Power Secretary and meetings have also been convened in this regard. The proposal for 100 MW can be taken up only after land is made available by Government of Kerala.

Floating Solar Projects: Government has decided to set up a 50 MW floating Solar Project at the unusable wet land in West Kallada, Kollam District. The project will be executed through NHPC. A company named West Kallada Non-Conventional Energy Promoters Pvt. Ltd (WKNCEPPL) was registered on behalf of the land owners and the right to use of the land for setting up the Solar Plant has been handed over to the Company. A lease deed for utilisation of land is executed with land owners and MoU signed with NHPC. The MNRE, GoI had accorded in principle approval on 08.12.2020 for developing it as Solar Park. NTPC is setting up a 92 MW plant in the Kayamkulam Kayal in the area under their possession. 5 MW is already completed and ready for partial commissioning and another 17 MW is expected by December 2021. The project completion is expected in March 2022.

Potential of 125 MW (25 MW at Cheruthoni and 100 MW at Anchuruli) was identified in the Idukki Reservoir. However, since the reservoir area comes under reserve forest, obtaining environmental & forest clearance is doubtful. Even permission for carrying out Environmental Impact Assessment is not obtained so far.

4.5.3. 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 31.03.2021, about 1.3565 Crore LED bulbs were distributed of which 4967 LED bulbs were distributed during 2020-21.

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

4.6.COVID -19

Compared to the previous year, an increase of 4.30% was expected in the annual energy consumption in 2020-21. However, the year began under strict country wide lockdown in the wake of Covid-19 pandemic. The impact of the lockdown on monthly reduction in electricity consumption was in the range of 12-16% during the first quarter of the year. The year recorded an overall reduction of 2.17% in energy consumption. Industrial and commercial consumption with comparatively higher electricity prices had dropped, while average consumption of low income generating domestic consumers increased. Revenue loss in 2020-21 as compared to the previous year is estimated at ₹544 crore. In addition, the concessions given by the government to various sections have taken a heavy toll on financials of KSEB.

Concessions in Fixed Charge: Relief on Fixed Charge extend during the first phase of Covid during FY 2020-21 alone comes to ₹72 Crore. Industrial and commercial customers were given a 25% discount on fixed charges over a period of three-months. Although a portion of this was borne by the Central Government Institutions, the remaining amount was not fully approved by the Regulatory Commission. This resultant liability to KSEB was about ₹18 crore. Additionally, there was liability of ₹3.28 crore due concessions given to cinema theatres by way of 50% discount on fixed charges for a period of 10 months.

Concession to Domestic consumers: During the lock-down period, the consumption of domestic customers had increased. The State Government has decided to absorb the additional burden and an amount of ₹151.19 crore and corresponding interest for delayed payment up to 31.12.2020 was agreed to be given as government subsidy. The additional financial burden on account of this was ₹175 Crore which is to be released by the Government.

Other concessions: The relaxations on disconnection even on default of electricity charges and waiver of surcharge also affected the revenue. As on 31.03.2021 the arrears receivable had increased to ₹2876.03 Cr by 31.03.2021. KSEB had absorbed the bank charges (₹8.69 Crore) and application fee (for new connections) for online transactions to minimise the requirement of consumers to visit KSEB offices.

During the second wave of covid-19 pandemic also Government of Kerala has allowed reliefs to Industrial / Commercial consumers and Cinema theatres and decided to provide relief on fixed charge/demand charge to Industrial / Commercial consumers (25%) and cinema theatres (50%) for the month of May 2021. Installments were also allowed to remit the balance amount for these consumers. The financial commitment for this is estimated as ₹24.37 Cr



5. 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 SBU maintains 61 dams (List attached as Annexure -4) 38 large and small Hydro stations, two thermal generating stations and one wind farm. The present status of various projects thus undertaken by SBU-G is given below:

Hydro Electric Projects Status		
Description	Projects.	Capacity (MW)
Projects commissioned	1	6
Works in progress	10	193.5
Tenders invited	6	53
Work awarded during 2020-21	1(PES)	60
DPR and Administrative sanction accorded	4	

5.1.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 six Generation Circle Offices at Meencut, Moolamattom, Moozhiyar, Trissur, Kothamangalam and Kozhikode under the office for carrying out the above functions. Brahmapuram Diesel Power Plant (BDPP) and Kozhikode Diesel Power Plant (KDPP) are also attached to this office.

5.1.1. Generation of Electricity:



The total installed capacity of hydro stations owned by KSEBL is 2058.761 MW and the designed annual generation capacity is 7071.37 MU for hydro stations. A list of generating stations within State and its capacity is given in **Annexure-3**.

During 2020-21, a total of 7109.09 MU energy was produced from the generating stations. The summary is given in the table below.

No	Source	Energy Generated (MU)	Percentage of total generation (%)
1	Hydel Power stations	7071.37	99.47%
2	Thermal Power stations	7.85	0.11%
3	Wind generating station	1.14	0.02%
4.	Solar stations	28.73	0.40%
	Total	7109.09	100

5.1.2. Works undertaken during 2020-21:

RMU works undertaken during 2020-21 are as follows:

No	Station	Unit	Status (as on March 2021)
1	Sholayar HEP(3x18MW)		Unit#3 taken over by KSEBL on 18-09-2019. Unit#2 taken over by KSEBL on 19-01-2020. #1 synchronized on 05-09-2020. Three machines commissioned as on 05-10-2020.
2	Sholayar Penstock works		Unit #3 penstock work completed on 22.12.2018. Unit #2 penstock work completed 24.10.2019. Unit #1 Penstock work completed on 26.08.2020.
3	Sengulam SHEP (4x12.8MW) –R&M work of butterfly valve		Work awarded on 20.01.2021.
4	Renovation of Sengulam Pump House		Work in last stage.
5	Kuttiyadi HEP		Work in progress
6	Idukki stage I (3x130 MW)	U#1,U#2 & U#3	Work completed



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

No	Station	Status (as on March 2021)
1	Moozhiyar 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 Extention 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 2021)
1	Poringalkuthu HEP(1x24MW)	Work in progress. Physical Progress of E&M works : 93.3%; Civil- 89.12%.
2	Barapole SHEP(3x5 MW)	Project taken over on 17.1.20.
3	Chimony SHEP (1x2.5MW)	Performance test conducted on 29.9.19. Performance test report submitted on 05.11.2020.
4	Poovaramthodu SHEP	Combined Civil & E&M works tendered from office of the Chief Engineer (CC-North).
5	Thottiyar SHEP 1x30+1x10 MW	Work in progress.
6	Pallivasal Extension scheme (2x30MW)	Balance E&M work – Tendering in progress.
7	Perumthenaruvi SHEP (2x3MW)	Performance test conducted.
8	Chinnar (2x12 MW)	Combined Civil & E&M works tendered from office of the Chief Engineer (Civil Investigation and Construction Central).
9	Anakkayam SHEP (3x2.5 MW)	Combined Civil & E&M works tendered from office of the Chief Engineer (Civil Investigation and Construction Central).
10	Bhoothathankettu SHEP (3x8MW)	Work in progress.
11	Kakkayam SHEP (2x1.5 MW)	Commissioned on 16.7.18.
12	Upper Kallar (2x1 MW)	Work in progress.
13	Chathankottunada Stage II (3x2MW)	Project completed & synchronised
14	Chathankottunada Stage I (2x2.5MW)	DPR approved. (from progress)
15	Upper Sengulam (1x24MW)	Revised administrative sanction obtained.
16	Adyanpara SHEP (2x1.5MW+1x0.5MW)	Project commissioned on 3.9.2015. Performance test evaluated.
17	Olikkal SHEP(2x2.5MW)	Combined Civil & E&M works tendered from office of the Chief Engineer (CC-North).
18	Moorikkadavu SHEP (2x0.75 MW)	DPR approved.
19	Peruvannamoozhy (2x3MW)	Work awarded on 25.01.2020
20	Pazhassi sagar (3x2.5 MW)	Work awarded on 25.01.2020
21	Marippuzha SHEP	Combined Civil & E&M works tendered from office of the Chief Engineer (CC-North).



5.2.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 2020-21 are summarised in the tables below:

Investigation and DPR Preparation			
No	Project / Scheme	Activity	Remarks
1	Chathankottunada stage 1 (5MW)	Detailed Project Report prepared	Administrative sanction awaited
2	Pasukkadavu SHEP (4MW)	Detailed Project Report prepared	Administrative sanction awaited
3	Keerithodu	Detailed Project Report prepared	Administrative sanction awaited
4	Idukki Extension scheme	Agreement executed with M/s WAPCOS on 3.9.2020	Study in progress
5	Pallivasal Augmentation Phase I	Detailed Investigation Report prepared	
6	Moorikkadavu SHEP (1.5 MW)	DPR preparation	
7	Pambla SHEP (10MW)	DPR prepared	
8	Upper Poozhithode	Detailed Investigation Report prepared	Investigation in progress
9	Perumthenaruvi Stage II	Proposal under scrutiny	
10	Mankulam SHP(40MW)	Land acquisition nearing completion	91% land acquired
11	Anakkayam (7.5MW)	Tender invited (turnkey)	In progress
12	Lower Poozhithode	DPR preparation	

Construction Works		
No	Project / Scheme	Construction Work / Project Stage
1	Poringalkuthu SHP(24MW)	Overall physical progress – 94.87%
2	Chinnar SHP(24MW)	Overall physical progress – 66.63%
3	Marayoor Section Office	Overall physical progress – 60%
4	Mini VB at Chengannur	Work started on 5.1.21
5	Chinnar Phase II	Work tendered



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

The Safety of all the 61 dams owned by KSEBL are monitored and assured by the Dam Safety Department headed by a Chief Engineer under Generation SBU with headquarters at Pallom, Kottayam. 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, Pambla & Padinjarathara sites. Testing of materials and mix design studies for various ongoing projects are carried out in Cement Concrete Lab, Idamalayar.

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

Dam Rehabilitation and Improvement Project (DRIP) is assisted by the World Bank/IDA, co-ordinated by Central Water Commission, Ministry of Water Resources, and Government of Kerala with a funding pattern of 80% from World Bank and 20% from State/Central Government budgetary support. DRIP envisages, (1) Physical and technical dam rehabilitation and improvement, (2) Managerial upgrading of dam operation and maintenance, (3) Institutional reforms and strengthening of regulatory measures pertaining to safe and financially sustainable dam operations.

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

Phase I of DRIP was completed on 31st March 2021. An amount of ₹ 134 Cr was allocated to KSEBL under DRIP I out of which ₹ 125 Cr was utilized by KSEBL. An amount of ₹ 150 Cr was allocated to KSEBL under DRIP II & III.

5.4.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 and Pazhassi Sagar are in progress
- Maripuzha SHEP tendered
- 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

5.5.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 Circle offices. The design works of all the ongoing projects are undertaken by this wing. A summary of works activities of this office during 2020-21 is given in the table below:

No	Project	Circle	Capacity (MW)	Energy (MU)	Status
1	Thottiyar HEP	Kothamangalam	40	99	In progress 55%
2	Sengulam Augmentation	Kothamangalam		85	In progress 74.85%
3	Bhoothathankettu SHEP	Kothamangalam	24	83.5	In progress 99.5%
4	Upper Kallar SHEP	Kothamangalam	2	5.14	In progress 92%
5	Peechad SHEP	Kothamangalam	3	7.74	For tendering
6	Western Kallar SHEP	Kothamangalam	5	17.41	For tendering
7	Upper Sengulam	Kothamangalam	24	53.22	For tendering
8	Deviyar	Kothamangalam	24	25.94	For tendering
9	Marmala	Pallom	7	23.02	For tendering
10	Ladrum	Pallom	3.5	12.13	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 ten hospital projects and KSEBL received ₹ 5.75 crores as centage from KIIFB, as on 31.03.2021. The Consultancy Wing is also executing various works under other departments and obtained ₹ 1.38 crores as centage.

The Civil Division in Vydyuthi Bhavanam, Pattom carries out all maintenance and operation of activities and capital works related to the head office estate and the Inspection Bungalow at Paruthipara.

5.6.Deputy Chief Engineer (Pallivasal Extn Scheme) with full power of CE

This office carries out the construction work of Pallivasal Extension Scheme (60MW). The civil works of the project has been tendered and arranged in three segments and the work is progressing. So far 86.05% of the work has been completed.



6. 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 31.3.2021 is given below.

Transmission System as on 31.03.2021		
kV	Transmission Lines (in Ckt-km)	Substations (Nos)
400	177.03+1152.56*	5 +1 *
220	3141.40	27
110	5030.86	173
66	2004.79	60
33	2108.00	160
Total	13614.64	426
Total Transformation Capacity (in MVA)		21894.56

* 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. In addition to the above, transmission network strengthening works undertaken under Transgrid 2.0 projects are being executed by the Deputy Chief Engineers, Transgrid (North) & Transgrid (South) under the jurisdiction of Chief Engineer, Transgrid. A number of major transmission network expansion works were also completed.

A summary of new substations and Transmission lines completed during 2020-21 is shown in the Table below.

kV	Substations (Nos)				Transmission Lines (in Ckt-km)				Capacity addition / enhancement (MVA)			
	Trans North	Trans South	Trans grid	Total	Trans. North	Trans South	Transgrid	Total	Trans. North	Trans South	Transgrid	Total
400				0			86	86				
220			4	4			238	238	100		1120	1220
110	4	6		10	123.18	73.28	128	324.5	186	100		286
66	1			1	8.4			8.4	10	8		18
33	1	1		2	33.7	5.5		39.2	41	16		57



Total		17		696.1				1581
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6.1.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 Thrissur, Palakkad, Malappuram, Kozhikkode and Kannur .

6.1.1. Achievement

6.1.1.1. Substation & Lines Commissioned regionwise

Region	Voltage level	Substations commissioned	Lines Commissioned		
Transmission South	110 kV	1	Muttathara	1	Veli - Muttathara UG Cable 630 Sq mm
		2	Balaramapuram Upgn	2	Neyyattinkara - Balaramapuram DC line
		3	Thiruvalla Upgn	3	Tapline to Thiruvalla-UG Cable 630sqmm
		4	Marady Upgn	4	LILO from Kothamangalam - Koothattukulam
		5	Koothattukulam	5	Koothattukulam - Kothamangalam DC line
		6	Edathala Upgn	6	LILO form Kothamangalam – Aluva
	33 kV	1	Vilakkulam	1	Kattakkada - Balaramapuram DC
Transmission North	110 kV	1	Thambalamanna Upgn	1	Varkala - Vilakulam SC line (UG / OH)
		2	Kuttikkattor Upgn	2	Agasthiamoozhy-Thambalamanna UG 630Sqmm
		3	Nenmara Upgn	3	Kunnamangalam – Kuttikkattoor
		4	Mankada Upgn	3	Kollengode - Nenmara - Vadakkenchery DC
				4	LILO line to Mankada (Malapramba - Mankada)
				5	110 kV MCMV line from Ambalathara to Kanhangad - Cheruvathoor line
	66 kV	1	Ambalavayal	6	Pinarayi - Thalassery II
	33 kV	1	Pothukallu	1	LILO to Ambalavayal from Sulthan Bathery tap
				1	Adyanpara-Pothukallu SC line
				2	Parappur – Mullassery
			3	LILO to 33 kV SS Mundur from Viyyur - Parappur	
Transgrid	400 kV			4	Solar park, Paivalike - Kubanoor 33 kV DC UG
	220 kV			1	Malapramba - Areacode 400/220 kV MCMV
		1	Aluva GIS	1	Pallikkara – Aluva DC line
		2	Kaloor GIS	2	Brahmapuram - Kaloor (UG+OH)
		3	Chalakkudy	3	Konnakkuzhy - Chalakkudy LILO line from Lower Periyar- Madakkathara
4	Kothamangalam	4	Kothamangalam-Aluva MCMV		



				5	Nallalam – Kizhissery 220/110 kV MCMV
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6.1.1.2. Substations and Lines under construction

400kV Substation: Kottayam

220 KV

Substations	Lines
1. Chithirapuram	1. LILO from Idukki- Udumal to Chithirapuram
2. Kunnamangalam	2. LILO from Kaniyambetta- Areacode to Kunnamangalam
3. Vizhinjam (Upgn.)	3. Kattakkada - Balaramapuram-Vizhinjam
4. Ettumanoor	4. Kottayam - Ettumanoor
5. Thalassery (Upgn.)	5. Mundayadu - Thalassery
6. Kunnamkulam (Upgn.)	6. LILO from HVDC – Nallalam to Kunnamkulam
	7. Pallivasal- Aluva 220/110 kV MCMV
	8. Pathanamthitta - Adoor MC(220/110)line

110 KV

Substations	Lines
1. Adoor (Upgn)	1. Pathanamthitta - Adoor MC(220/110)line
2. Alappuzha (Upgn)	2. LILO from Punnapra-Chengalom to Alappuzha
3. Edakkara (Upgn)	3. Nilambur - Edakkara
4. Karunagappally (Upgn.)	4. Sasthamcotta - Karunagappally DC line (upgn.)
5. Kuravilangad (Upgn)	5. Ettumanoor - Kuravilangad
6. Sulthan Bathery	6. Kainatty -Sulthan Bathery
7. Mannuthy	7. LILO from Madkkathatara - Ollur to Mannuthy
8. Murikkassery	8. LILO from Kuthumkal – Neriamangalam to Murikkassery
9. Palackal	9. LILO from Madakkathara – Valappad to Palackal
10.Njarackal (Upgn)	10.Chera - Njarackal
11.Vazhoor	11.LILO from Pallom – Kanjirappally to Vazhoor
12.Kuttanadu (Upgn)	12.LILO from Punnapra –Kodimatha Kuttanadu
13.Kavalam	13.LILO from Punnapra –Kodimatha to Kavalam
14.Nilambur (Upgn)	14.Manjeri - Nilambur
15.Vennakkara GIS	15.LILO from Arangottukara - Edappal
16.Pattamby	16.Ettumanoor - Pala
17.Panthalakkode	
18.Kuthumunda (Upgn)	

33 KV

Substations	Lines
1. Marayur	1. Pallivasal - Marayur
2. Kidangara	2. Edathua - Kidangara
3. Thumboor	3. LILO from Irinjalakkuda – Parappukkara



6.2. Chief Engineer (TransGrid 2.0)

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.



6.2.1. Completed works under TransGrid 2.0

- Construction of 400kV MC MV line from Malaparamba to Areakode (86 ckm), 220kV MCMV Line from Malaparamba to Kizhissery (59.82ckm), 220/110kV MCMV line from Kizhissery to Chelari (20.2ckm) and from Chelari to Nallalam (24.74 ckm) and 110kV line from Areakode to Kizhissery (14.87ckm)
- Construction of 220 KV Substation Chalakkudy and Kothamangalam
- Construction of 220kV GIS at Aluva & Kaloor.
- Construction/upgradation of 220/110kV, Brahmapuram-Thuthiyoor (7.87 km) and Kothamangalam –Aluva (68 km) lines.
- 220 kV cable laying work from Thuthiyoor to Kaloor 14 km
- 220kV Line construction Chalakkudy - Konnakuzhy portion (LILO) of North South interlinking package completed (22.3km)

6.2.2. Ongoing works under TransGrid 2.0

- Stringing work in progress for Pallivasal –Aluva
- Work in progress for 220 kV S/s Chithirapuram
- Construction of 400kV GIS at Kottayam
- Construction of 220kV GIS at Kunnamkulam, Thalassery, Ettumanoor, Kunnamangalam and Vizhinjam
- 220/110kV lines from Kottayam to Thuravur and Ettumanoor
- 220/110kV line from Kodungallur to Irinjalakkuda
- Upgrading Mundayad Mylatty 110kV line to 220/110kV MCMV line
- LILO to Kunnamkulam 220kV Substation from Wadakkanchery using MCMV line
- Upgrading Mundayad Thalassery line to 220/110kV MCMV line
- Construction of 220kV MCMV lines to Pathanamthitta and Kakkad substations
- Construction of 220kV MCMV line to proposed Vengallur substation
- LILO Line to Kunnamangalam Substation

Expenditure of Transgrid 2.0 works as on 31.03.2021		
Sl No.	Project Execution by	Cumulative expenditure till 31.03.2021 in ₹ Lakhs
1	Own fund	19420.62
2	PSDF	54290.27
3	KIIFB	80257.18



	TOTAL	153968.07
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6.3. Chief Engineer (Transmission - System Operation)

Power System Management and Grid Operation through State Load Despatch Centre at Kalamaserry 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, a function of the Distribution Business Unit, is also carried out at present through Chief Engineer (TSO). The operation of SLDC is managed by the Deputy Chief Engineer (Grid & Office) who also assists the CE (TSO) in office functions. The Deputy Chief Engineers of System Operation Circles at Kalamasserry, Kannur and Thiruvananthapuram are responsible for the protection, communication, SCADA and meter testing for energy audit.

6.3.1. System Operation for the year 2020-21

The year began under strict country wide lockdown imposed in the wake of Covid-19 pandemic. The impact of the lockdown on monthly reduction in electricity consumption was in the range of 12-16% during the first quarter of the year. With most of the restrictions withdrawn, the consumption increased during the 3rd quarter. However, the unusual rains during the winter months again led to negative growth in the months of January and February whereas March recorded the highest growth rate of around 8% during the year. The month also recorded the highest single day consumption and day demand. This is attributable partly to the assembly election activities also.

The reduction in consumption in the initial months of the year due to the extension of lockdown has resulted in reduced hydro utilisation and consequent build-up of storage in all major hydel reservoirs, especially at Idukki in the beginning of water year on 1st June. The water year began with a carryover storage of 1092MU (26.4%) against a planned level of 750MU. The monsoon was weak in the months of June and July resulting in reduced inflow of up to 1200MU from the anticipated quantum. However, the monsoon revived strongly during August and compensated the deficit in inflow in the subsequent months.

The commissioning of HVDC Pugalur-Madakkathara Pole I&II and 400kV Kozhikkode-Madakkathara double circuits was a major milestone achieved during the year. During the year 220kV sub station Chalakkudy was commissioned on 20.10.2020, the GIS at Kaloor and Chalakkudy on 05.12.2020 and Aluva GIS on 16.02.2021.



6.3.2. System management

The energy consumption during the year registered a negative growth of (-) 4.3% due to the impact of covid restrictions and unusually high winter and summer rains.

Demand	
Evening Peak	4284MW
Morning Peak	3394MW
Day Peak	3967MW
Internal generation	7637.2654MU
Total import	17507.7343MU

The year 2020-21 recorded following all-time records in the power consumption and demand scenario of the State.

	Current scenario			
Daily Consumption	88.417MU	19.03.2021	88.3386MU	23.05.2019
Day Peak	3967MW	25.03.2021	3933MW	23.05.2019

6.3.3. Hydel Scenario

The water year began with a carryover storage of 1092MU (26.4%) against planned 750MU with Idukki storage at 36.36%. Storage at all other reservoirs were at planned level. With IMD predicting normal monsoon and as only 3 units were available at Idukki, the station was operated as must run during June to bring the water level to safe level. However, the monsoon was weak in the months of June and July resulting in reduced inflow of up to 1200MU from the anticipated quantum. However, the monsoon made a strong revival in August and compensated the deficit in inflow in the subsequent months. The Anticipated vs. Actual Inflow/ Hydel generation details during the water year is summarized below:

Month	Inflow			% of Anticipated	Hydro Generation(MU)	
	Anticipated (MU)	Actual (MU)	Surplus(+) / Shortage(-)		Anticipated	Actual
June -20	843	313	-530	37.2%	608	525.3
July -20	1408	723	-685	51.3%	589	434
August- 20	1629	2156	+527	132%	583	603.26
September -20	902	1442	+540	160%	501	641.51
October -20	650	857	+207	132%	579.7	754.31
November- 20	454	426	-28	94%	540	521.84
December-20	232	266	+34	115%	548.7	488.31
January-21	106	282	+176	266%	480.5	584.32
February-21	69	115	+46	167%	516.2	623.73
March 21	90	100	+10	111%	713	671.6
April 21	107	116	+9	108%	708	644.75
May 21	136	653	+517	480%	660.3	725.7
Total						



6.3.4. Market Operations

During the year 2020-21, the System Operation wing has managed the system in the most effective and economic manner.

The details of monthly Power Purchase and Sales through power exchanges during FY 2020-21 are given below:

Month	Purchase			Sale		
	Qty in MU	Amount (Rs.Crs)	Rate	Qty in MU	Amount	Rate
			(Rs/unit)			(Rs/unit)
Apr-20	0.916665	0.309643	3.38	-0.907	-0.26812	2.96
May-20	0.14655	0.068327	4.66	-2.02546	-0.63966	3.16
Jun-20	0.01467	0.002133	1.45	-8.30028	-2.35522	2.84
Jul-20	9.32113	2.330781	2.50	-0.10627	-0.0418	3.93
Aug-20	1.81602	0.403983	2.22	-11.4855	-2.7886	2.43
Sep-20	3.48067	0.918597	2.64	-21.4863	-6.22235	2.90
Oct-20	0.370343	0.125433	3.39	-65.5569	-18.4067	2.81
Nov-20	11.45173	3.254276	2.84	-6.25444	-2.34032	3.74
Dec-20	2.421413	0.865469	3.57	-31.4756	-11.9841	3.81
Jan-21	47.62318	15.77294	3.31	-37.3674	-15.9066	4.26
Feb-21	8.30528	3.226195	3.88	-32.4448	-15.2548	4.70
Mar-21	8.844485	3.908962	4.42	-44.0207	-24.8331	5.64
TOTAL	94.7121	31.1867	3.29	-261.43	-101.04	3.86

The optimization measures of SLDC Operation initiated in the second half of the year has resulted in substantial financial gain to the Board. With the monsoon showing a strong revival trend during August and reservoirs recording healthy inflow, a new proposal for entering the market so as to flex the generation from the hydro stations and to make use of the price differential in the market during different time slots without impacting overall hydro utilization was operationalized with effect from 31.08.2020. As per the then existing procedure, sale/purchase was arranged through power exchanges through DAM and RTM as per LGB conditions and accommodating must run generation, low demand conditions in merit order with surrender/ URS as the case may be -referred to as **Normal Market Operation**. As per the new proposal, there could be sale and purchase during different time blocks on the same day. However, the market rates may be remaining low on some days or for a couple of days and hence the energy balance may not be achieved on the same day, but could be balanced in a period, the criterion being no significant impact on the overall hydro utilisation plan - referred to as **Special Market Operation**. As per this, sale bids were offered in the market when the prices were high and purchase bids were placed in the market when the prices were low, so that overall, there would be a net margin.

With the operationalization of this new strategy, a high-cost sale of around 142.41MU was carried out through the power exchange by flexing the available margin in the hydro generation during the high-rate slots of the Day Ahead and Real Time Market. Also, a strategy to export to grid when the real time frequency was less than 49.95 Hz was employed. The sale was made good through low-cost purchase and import at frequency above 50.05Hz.



Surplus inflow was obtained in the subsequent months also except November. The market operation also included purchase of power whenever needed. As the power requirement is predominantly in the peak hours, the rate is also usually high. Netting off the purchase and sale for the half year ending 31st March 2021, around 153MU was sold, fetching around Rs.70.81Cr. This effectively corresponds to the sale of extra inflow received during the period after purchasing the power required for peak hours. Apart from this to accommodate the excess inflow surrender of both CGS and LTA power were done. The surrender of LTA was meticulously planned month over month to restrict the schedules of LTA power up to incentive. Thus, for the financial year 2020-21 nil incentive were payable to the LTA generators. The storage at the reservoirs as on 31st March was almost tallying with the planned figures. Hence it may be noted that the market operation could be achieved without any additional hydro generation and was made possible by virtue of the excess inflow obtained during this period as well as the reduction in consumption from the planned level.

By the above-mentioned market operations strategy, financial gain of Rs. 282.54 Cr achieved during the second half of 2020-21, which will have definite impact of reduction in power purchase cost of the Board.

The financial impact on account of the scrupulous market operation and real time scheduling undertaken by system operation wing can be summarised as follows:

Special market operation without appreciable energy exchange	Rs. 70.81 Cr
Sale of surplus hydro in merit order with the power from CGS and LTA generators	Rs. 3.55 Cr
Surrender of share from CGS & LTA by proper utilisation of excess water received	Rs. 194.46 Cr
Deviation Management	Rs. 20.82 Cr
Total	Rs. 282.54 Cr

6.3.5. System Operation Circles

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/pre-commissioning/ 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.



6.4. 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 31.03.2021						
No	Scheme	Estimate (Rs Cr)	Estimate Accepted (Rs Cr)	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. Last installment received on 17-1-2020.
2	Implementation of Automatic Demand Management Scheme	6.03	5.30 (02.01.2017)	4.77 (90%)	4.293 (90%)	Project completed and final 10% claim submitted on 24-3-2021.
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%)	Line works completed & Commissioned; Project closed.
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%)	Line works completed & charged; Project closure 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%)	Procurement completed Progress: Physical= 75%; Financial= 68 %.
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%)	First Tranche of 20% claim received. Sanction for technology change (from SDH to MPLS) awaited
Total		783.11	726.86	581.80	446.486 (76.74%)	

6.5. 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 2020-21, PSE wing had conducted 29 Load flow studies, 32 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.



7. 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 (132.03 lakh consumers as on March 2021). IT initiatives of KSEB and matters related to Customer Relations headed by Chief Engineer (IT&CR) are also undertaken by this SBU. 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. Major activities carried out in the Distribution sector are detailed as below:

7.1.Dyuthi 2021

With a grand vision to uplift the distribution system of the State to the best in the nation and also to achieve international standards in the distribution services by the year 2022, the Board had decided to implement a comprehensive network-based distribution plan ‘Dyuthi 2021’, as part of the Urja Kerala Mission. The focus of this project is to provide 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 Board had issued approval for the following 4-year plan from 2018-19 to 2021-22 as shown below.

Financial Year	Capital Investment (Rs in Crore)			
2018-19	723.64	60.00	50	50
2019-20	1221.06	54.49		
2020-21	1066.65	47.61		
2021-22	720.68	42.18		
Sub Total	3732.03	204.27	50.00	50.00
Total (2018-22)	Rs. 4036.30 Crore			

As a part of this, Project Management Teams (PMUs) were constituted, one in each Electrical Circle under the direct control of respective Deputy Chief Engineers, as an exclusive team to formulate the Distribution Plan and also for the effective implementation of the plan.

Despite the paradigm shift in approaches and results, there has been a slippage in the set schedule owing to several factors such as the obligation of completing centrally aided projects like IPDS, RAPDRP and DDUGJY, the devastating floods in 2018 and 2019 and the lockdown



and restrictions imposed by the Government to curb the spread of COVID-19 pandemic. However KSEBL has been completed works amounting to Rs. 1457.06 crore up to 31.03.2021. The year wise financial achievement is detailed below.

7.2.Service at doorsteps

Due to the restriction imposed due to Covid 19 pandemic and subsequent lockdown, the entry of Public to KSEBL Section offices were restricted creating hardship to the Public. To overcome the difficulty and to offer services to the consumers and other applicants in an effective and cordial manner, “Services at doorsteps” an online platform wherein a consumer/applicant can request service by registering online or through customer care number. On receipt of the request, the staff entrusted with, visits the consumer/applicant’s house to offer the requested service. This was introduced as a pilot project under Electrical Circle, Palakkad from 01.10.2020 onwards which was subsequently extended to 368 Sections out of 776 Electrical Sections during the FY.

The services like a new electricity connection, change of ownership, change of connected load / contract load, replacement of power line / meter etc. are now available through this procedure and the person requesting the service can register through the concerned Section office or 1912 customer care number. After receiving the request, the staff entrusted visits the person’s house and collect the documents.

The project received great response from the public due to COVID restrictions and State wide implementation of this project was decided vide the Board Order B.O (FTD) No. 81/2021 (No. CP/Plg.3/Misc- Service at door steps/2021) dated 29.01.2021. State Level inauguration with selected Electrical Section offices was conducted on 06.02.2021 by Hon’ble Chief Minister of Kerala. “Service at Doorsteps” was implemented in 368 out of 776 Electrical Sections at the time of the State level inauguration, as part of the first phase of implementation of the same. It was decided to implement the “Service at Doorsteps” Project at all Section Offices, after rectification of initial hassles and development of the mobile application.

In the backdrop of lockdown restrictions due to the COVID-19 pandemic in the State, the above scheme has gained wide popularity amongst the public.

7.3.Simplification of Service Connection Procedures

The Kerala State Electricity Board Limited, in line with Ease of Doing Business consideration, simplified the service connection procedures on production of two documents, i.e. proof of identity and proof of ownership/legal occupancy in normal cases. This facility was extended for connections under LT V-B category also, vide B.O(FTD) No.666/2020(D(D&IT)/D6-AE3/Ease of doing Business/2018-19 dtd.5.11.2020, after ensuring that the purpose for which the connection is sought is included in the list of activities under the category LT V-(B) in the prevailing tariff order, irrespective of whether the applicant has produced the requisite certificates/ approvals/ permits from the competent authority.

As part of Ease of Doing Business as per Board order BO (FTD) No. 141/2021 (No CP/Plg.III/EoDB /2021) Dated, Thiruvananthapuram, 18.02.2021 KSEBL has decided to



Dispense with the practice of affixing Special Adhesive Stamp in Application for new LT Service Connections.

A brief summary of zone wise activities and achievements of this SBU are given below:

Description	Achievement during 2020-21				
	South	Central	North	N. Malabar	Total
No. of service connections effected	83988	99887	127070	62161	372116
11 kV line constructed (km)	742	683	400	370	2195
LT line constructed (km)	798	709	1507	636	3650
No. of distribution transformers installed (Nos.)	404	783	775	410	2372
Meter replacement (Nos)	128439	125971	124075	62202	440687
HT re-conductoring (C.Km)	204	366	393	176	1138
LT re-conductoring (C.Km)	9952	12789	5479	3626	31845
1Phase to 3Phase Conversion (km)	623	471	646	390	2130

7.4. Centrally Aided 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.

7.4.1. The Integrated Power Development Scheme (IPDS)

IPDS is a 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, 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.



7.4.2. DeenDayal Upadhyaya Gram Jyothi Yojana (DDUGJY)

DDUGJY is 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 was submitted during the year 2020-21 to the MoP through REC which is pending approval.

7.4.3. Saubhagya Scheme or Pradhan Mantri Sahaj Bijli Har Ghar Yojana

This 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. 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. ₹95.75 crore (less State tax, net amount of ₹88.45 crore) was sanctioned to Kerala to reconnect 3,19,171 households de- electrified during 2018 floods. The closure report of Saubhagya has already been submitted to REC on February 27, 2020. Balance amount of ₹13.27 Cr was received during 2020-21.

7.5.Consumer Grievance Redressal Forums (CGRF)

CGRF 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 during 2020-21 are given below.

Item	South	Central	North	Total
Complaints received	125	123	185	433
Complaints settled	94	106	151	351
Complaints to be settled	31	17	34	82



7.6. Information Technology and Customer Care Department

This wing is headed by Chief Engineer (IT, CR & CAPs) 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.

7.6.1. SCADA/DMS Project

Ministry of Power, Govt. of India/PFC 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 was 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. 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.

7.6.2. Major software works undertaken during 2020-21

No	Application / Projects	Work done
1	Centralised LT Billing Application software- Orumanet	Billing software modified for introducing subsidy in connection with covid & rebate on fixed charges, Revamping of mobile application for LT consumers, Integration with NIC portal for GST invoice generation
2	HT/EHT Billing System - Energise	Door-lock billing logic, Modifications in Monthly invoice, relief/rebate introduced in billing software
3	Online Electricity bill Payment Facilities	software integration, technical monitoring, security scrutiny, reconciliation, payment towards online providers
4	'Kseb' mobile app	Easy electricity bill payment through mobile devices
5	Cyber Security Implementation	As per guidelines provided by Ministry of Power, National Critical Information Infrastructure Protection Council (NCIIPC), CERT-IN and other Government agencies
6	Research and Development Projects	Implementation of Smartgrid technologies



No	Application / Projects	Work done
		in electric distribution network of KSEBL by CDAC
7	Smart City Mission Ltd, Kochi	integration works of KSEBL with IC4 Kochi are under progress.
8	KFON (Kerala Fibre Optic Network) project	High speed, reliable and scalable fibre network across the state to provide connectivity to all Government and Educational institutions The project is progressing and First Phase launched on 15.02.2021.

7.6.3. Maintenance and Support Activities undertaken during 2020-21

No	Application / Projects	Work done
1	Online Portal For LT Consumers - 'ORUMA Web'	online payment of Electricity bills of LT consumers through centralised collection of payments from Friends and Akshaya Centres
2	Human Resource Management System - 'HRIS'	Payroll, PF, Pension and Employee/Office Information System modules. Additions/Modifications in Attendance Management System integrated with Biometric Tracking system
3	Green Channel	Processing the application for new HT/EHT service connection
4	ARU Accounting System - 'SARAS'	Integration of SARAS with the LT billing application software and SCM, Module for budget preparation & budgetary control, Integration of SARAS with RARDRP applications, Modifications for GST implementation in progress
5	Supply Chain Management System(SCM)	Integration between SCM-SARAS and OrumaNET, SCM with RAPDRP applications in progress. Steps to implement the software in the Transmission and Generation Wing initiated.
6	E-Office	Pilo Implementation of e-Office package done in 25 KSEBL offices
7	Students internship online application portal	web enabled software application developed for industrial training/ project work/organizational study / research work/ industrial visit etc
8	Social Media Help Desk	Functioning under CCC and uses WhatsApp (9496001912) , Facebook account (fb.com/ksebl), Instagram account (@ksebltd), Twitter account (@KSEBLtd) for interaction with the customers
9	Corporate Service Centre	single window payment provision for corporate consumers in Vidyuthi Bhavanam, Trivandrum. Monthly about 4900 corporate consumers remit current charges using the Cash Deposit Machine (CDM) installed at CCC on 24X7 basis. An amount of Rs 64,56,84,889/- collected in Corporate Service Centre through bulk payment, CDM and direct collection at CCC during 2020-21.



No	Application / Projects	Work done
10	Helpdesk Activities	Support and maintenance to the existing computerised Systems, viz. LT Billing, HT/EHT Billing, Human Resource Information System, KSEB's official website, e-tendering, Mail Messaging System, File and Mail Management System, Suit Management System, Attendance Management System etc.
11	Centralized Customer Care Services (CCC)	Attended to 31,65,381 calls at the Call Centre. 4,72,247 complaints registered through IVRS, 89,771 through WSS and 25,57,339 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.
12	Urja sowhrida, Billing Information system	Disseminates electricity bill information to the customers via SMS and e-mail as soon the bill is prepared. Reminder SMS sent in case of non-payment before due date and disconnection date.
13	Urjadooth, Outage Management system	An Outage Management System (OMS), implemented to send power outage information up to distribution transformer level to all the consumers through automated SMS
14	OMS- dash board	Shows real-time view of number of feeders, transformers, transformers under outage, feeders under outage, SAIFI, SAIDI and power availability of deferent level of offices.
15	SMART- Safety Application	Safety Monitoring and Reporting Software (SMART) - Accident Reporting, generation of statutory reports for Electrical Inspectorate, etc
16	Assessment of Distribution Offices based on Key Performance Indices (KPIs)	Analysis reports for all levels of office provided as line graph, bar-chart, speedometer-graph etc. Customer care centre data also integrated to the KPI system and analytical monthly-summary reports generated to view the trend in customer complaints.
17	Project Monitoring Software ProMoS	The integration of ProMos with SCM software is in progress
18	LD Permit work Management System	For managing the permit to work processes at EHT levels. Modified versions of this application to suit the revised requirements of stake holders are released for testing by end users.
19	E-Tendering	Developed and maintained by IT mission of Kerala and all KSEBL offices can upload tender in this online facility for the works with PAC above Rs.5 Lakhs.
20	Video Conferencing System	Video Conferencing System set up are functioning successfully in the following 10 locations, viz. VB, Trivandrum, Transgrid KLMY VB, Kozhikode 110 kV S/S, Kundara, 220 kV S/S, Edappon, 220kV S/S , Pallom, LD, Kalamassery, 400 kV S/S, Madakkathara, 220kV S/S Areekkode, 220kV S/S, Kanjhilode.
21	Maintenance of KSEBL website	KSEBL official website maintained by IT wing



No	Application / Projects	Work done
22	System Administration and Maintenance	Hardware related works like designing the system architecture and maintaining the Central Servers, database and the Wide Area Network, fixing of system parameters for configuration of the computer systems and peripherals, maintains Server Systems research and planning to adopt new technologies, assessing hardware requirements, furnishing technical specification, procurement assistance for Hardware items and networking equipments for KSEBL offices, implementation of software, hardware and networking related works, Bio metric Attendance management system etc., maintenance and supervision of systems in the corporate office, field offices, Data Center/ DR Center, DC/ DR Technical & Physical infrastructure, online LT bill payment support, E-payment gateway etc., maintenance monitoring of storage, routers, switches, firewall etc. and MPLS – VPN connectivity of DC, DR and Field Offices.
23	Mobile Applications	Released Android based Mobile Apps for consumers and employees
24	Asset Data Updation Software	Development of software application to collect Asset Data from all wings of KSEBL and integration of Asset Management application with Land Management, Transmission Asset Management and Distribution Asset Management Software in progress

7.6.4. Phase II IT Implementation under IPDS

DPR for Rs 22.86 Crore, covering 21 Towns was sanctioned on 20.02.2017. M/s. BCITS, Bangalore was appointed as the IT Implementation Agency. Go-Live declared in pilot town Kottarakara on 25th June 2021. Project has been rolled out in Adoor and Pandalam towns on 13th September 2021 and Chengannur town on 24th September 2021. Another 9 towns are scheduled for Go live this month. Out of the approved grant amount of Rs. 13.72 Crores, an amount of Rs. 2.43 Crore has been received so far.

7.6.5. Real Time Data Acquisition System for Non-SCADA Towns under IPDS

DPR for Rs 5.25 Crore, covering 125 substations of 63 Towns was sanctioned on 12.12.2018. M/s. SCOPE TNM Pvt. Ltd. was appointed as the RT-DAS implementation agency. The implementation activities in the two substations under the pilot town of Nedumangad have been completed on 22nd August 2021. Implementation activities are progressing in another 6 Substations and initiated in another 51 Substations. Out of the approved grant amount of Rs. 3.15 Crores, an amount of Rs. 0.95 Crore has been received so far.



7.6.6. ERP Implementation under IPDS

DPR for Rs. 42.64 crore was approved on 7.2.2018 by PFC. On 09.05.2019 Board decided to carry out customisation/development and implementation of ERP solution with the in-house development team under IT wing as part of partial turnkey basis execution sanctioned by PFC and supply, installation and commissioning of server, storage etc. through open tender process. The procurement, installation and commissioning of hardware has been completed. As part of in-house development of ERP application, development / customisation of almost all the ERP modules have been completed. Unit testing and integration related works are progressing. Parallel run in few departments within the Head office has been completed and its evaluation is progressing. Out of the approved grant amount of Rs. 25.58 Crores, an amount of Rs. 7.74 Crore has been received so far.

IT Projects under IPDS			
Scheme	Sanction value	Grant (60%of sanction)	Fund Released by PFC
Phase II IT	22.86	13.72	2.43
ERP	42.64	25.58	7.74
RT-DAS	5.25	3.15	0.945
Total	70.75	42.45	11.12



8. Human Resources Management

The Chief Engineer (HRM) heads and manages the Human Resources activities for the company. The company has 32552 regular employees as on 31-03-2021, (Generation SBU: 1311, Transmission SBU: 2983, Distribution SBU: 26722 and Corporate Office: 1536). 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.
I	Appointment	
1	Recruitment through KPSC	403
2	Selected for Compassionate appointment	18
3	Sport Quota appointment	0
4	Paid apprentices appointed	0
5	Unpaid apprentices appointed	818
II	Promotions	
1	Promotions (up to the rank of AEE/AAO)	3156
III	Vacancies	
1	Vacancies reported to KPSC	262
IV	Training	
1	Officers deputed for foreign training	0
2	Officers deputed outside state for training	12
3	Officers deputed for training inside the State	303
4	Employees Trained in own institutes	10670

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

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

During 2020-21, as restrictions were imposed on the conduct of classroom training programmes due to Covid-19, trainings were adjourned from February 2020 to May 2020. Later online trainings were resorted to which commenced from June 2020. By the end of December 2020, classroom trainings resumed though in restricted manner. Only trainings



sponsored by RECIPMT, statutory trainings, computer based trainings etc were conducted as class room sessions.

CEA approved syllabus is now adopted for training of Supervisors and Technicians. Previously statutory training as per CEA stipulation was introduced for newly recruited graduate engineers. But now it has been extended to the graduate engineers who are already in service.

A total of 91 nos of REC sponsored trainings were conducted by 4 RPTIs during a short span of time from last week of December to end of March for C&D category employees on various variants as per the MoA between KSEBL and REC Institute of Power Management and Training (RECIPMT), Hyderabad. Rs.97,17,900/- has been claimed to RECIPMT to be reimbursed for the FY 20-21 against the expenditure incurred on the above trainings.

Many Educational Institutions and students from Professional Colleges have identified KSEBL for undergoing their Project work/Research Work/Industrial Training/Industrial Visit etc. Accordingly 195 students from various educational institutions have undergone their Project work/Research Work/Industrial Training/Industrial Visit and an amount of Rs.3,81,990 /- (Rupees Three lakh Eighty One Thousand Nine Hundred and Ninety only) had been generated from these activities during 2020-2021.

An amount of Rs. 1,26,02,660/-(Rupees One Crore Twenty Six Lakh Two Thousand Six Hundred and Sixty only) has been spent towards the training and non-training expenditure during the year 2020-2021.

The abstract of training programmes conducted during the year 2020-21 :

Name of Training Center	No. of Program	No. of Participants	No. of Training days	Man days	Expenditure (₹)	Non training Expenditure (₹)	Total Expenditure (₹)
RPTI Trivandrum	48	1887	102	192474	1000304	389139	1389443
RPTI Kottayam	51	1683	109	183447	1093852	307055	1400907
RPTI Thrissur	59	1744	131	228464	1232576	1047533	2280109
RPTI Kozhikode	85	3623	143	518089	1635187	595548	2230735
PETARC	41	1394	146	203524	1189641	3236921	4426562
HRD	12	117	49	5733	750144		750144
SRCTC	7	339	9	3051	124760		124760
Total	303	10787	689	1334782	7026464	5576196	12602660

9.



10. 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 2020-21, the Resident Engineer witnessed about 11 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.

11. Safety Wing

Chief Safety Commissioner in the rank of Chief Engineer heads Safety Department. The mission of the Wing is to maintain a persistent and systematic safety culture in the organization to reduce the accidents to zero level. The Safety wing functioning in Corporate Office have jurisdiction over all wings of KSEBL.

Safety awareness programs were conducted on 26th June 2020 observing National Electrical Safety Day and National Electrical Safety Week for one week starting from 26th June 2020. During the year 17390 safety inspections were conducted observing COVID protocol. Safety committee meetings, safety awareness meetings etc were conducted through online platform. 'Operation Shudhi' was conducted on October 15th 2020 to reduce accidents by clearing creepers and vegetation from electric lines and installation. The details of fatal and non-fatal accidents during 2020-21 is listed below:

Board's Installation (Nos.)		Consumer Premises (Nos.)	
Fatal	Non-Fatal	Fatal	Non-Fatal
147	261	120	18



12. 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 2020-21 comes to Rs.1235.37 Crore and that for transmission materials comes to Rs.159.93 Crore. 94 Nos of tenders were invited and 113Nos. of Purchase Orders were issued during 2020-21. Purchase order issued for a total amount of Rs.644.24 Crore, (Including PSC Poles – Rs.46.13 Crore, Steel – Rs.7.39 Crore). Store Verification Unit verified stocks in 10 stores only due to Covid 19. Store verification is temporarily held up due to the pandemic situation. During 2020-21, 53 Nos. of e-auction were conducted for the disposal of 422 lots of selected scrap items through the web portal of M/s.MSTC Limited, and realised Rs.63.19 Crore.

13. Renewable Energy and Energy Savings Department

Renewable energy &Energy savings is headed by Chief Engineer (Renewable Energy and Energy savings) who reports to Director (CP,GE,SCM &Safety). With the reconstitution of the Board of Directors of KSEBL on 4.06.2020, REES was bought under the Director (Planning, REES & SCM). The activities of the department include works under RE projects and Innovation. The major achievements during the year are listed below:

Sl.No.	Achievements during 2020-21
1	Under DELP Project, distributed 4967 Nos. LED Bulbs to the consumers
2	Filament Free Kerala- Procured 1 crore LED bulbs
3	Installation of Electric Vehicle Charging Stations at KSEBL premises in 6 Corporations were commissioned. Installation of EV charging stations at KSEBL/Govt. premises in 56 cities are in progress
4	Work of installation, testing & commissioning (Phase 1) of data acquisition systems for performance monitoring of Solar PV systems at Renewable Energy Data Centre in the office of Chief Engineer (REES), Vydyuthi Bhavanam, Thiruvananthapuram with Data server in Progress
5	Supply, erection, testing and commissioning of grid Tied GM solar plant owned by KSEBL with total installed capacity of 8MWp(4MWp-Brahmapuram,3MWp-Kanjikkode,1MWp-Agali) in progress at Agali and Kanjikkode. Tree cutting sanction awaited for Brahmapuram project
6	Proposed to invite tariff based bidding to implement PM KUSUM scheme under Component A and feeder level solarisation under Component C
7	For West Kallada Floating Solar Project (50 MW)by M/s NHPC, in principle approval was received from MNRE for developing as Solar Park. Land Document verification in progress.



Completed Solar Projects as on 31.03.2021			
No.	Name of the projects	Installed capacity (MW)	Date of completion
1	KUHS	0.25	26.02.2021
2	On grid consumers as on 31.3.2021	123.478	
On-going Solar Projects as on 31.03.2021			
No	Name of the project	Installed capacity (MW)	Target for completion
1	Nenmara	1.5	2021-22
2	Ettumanoor, Kottayam	1.00	2021-22
3	Agali Palakkad	1	2022
4	Brahmapuram Ernakulam	4	2022
5	Kanjikode Palakkad	3	2022
6	West Kallada Floating Solar by NHPC	50	2022
7	PM Kusum	40 in component A 11 in component C	2022
Status of ongoing Solar Projects In Government Buildings as on 31.03.2021			
Sl. No	Name of the Project	Capacity kWp	Target for completion
1	Jilla panchayath,Kozhikode(21 locations)	330	2021
2	District panchayath,TVM(6 locations),	385	2021
3	District panchayath,TVM(4 locations),	121	Completed on May2020
4	Attingal municipality,2 nd & 3 rd phase	83	2021-22
5	Jilla panchayath, Kollam, 4locations	90	2021-22
6	LSGD,District panchaytah,Kottayam	22	2021-22
7	Jilla panchayath, Malappuram,11locations	110	2021-22
8	Jilla panchayath, Kannur,2nd phase,29 locations	450	2021-22
9	Jilla panchayath, Kasaragode,5 locations,1st phase	245	2022
10	Jilla panchayath, Kasaragode,7 locations	70	2021-22
11	Calicut University	57	2020-21
12	LSGD Malabar 1	315	2020-21
13	LSGD Malabar 2	305	2020-21
14	Kerala State Library Council,TVM	15	2020-21
15	Arogya Bhavan & KSDMA	50	2021-22
16	Collectorate building	380	2020-21
17	Jilla panchayath,Palakkad Govt.goat farm,Agali	500	2021-22
	TOTAL	3528	



14. Planning

Planning Wing is headed by Deputy Chief Engineer (Commercial & Planning) who reports to Director (Corporate Planning, Generation Ele, SCM & Safety) in matters related to planning functions. The assigned responsibilities of the wing can be broadly classified as (1) preparation of plans, (2) liaising with Government on policies, and corporate matter (3) monitoring of plan progress and reporting, (4) submission of various reports to Board of Directors, Government and external agencies and (5) publication of Annual Administration Report 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. The wing is providing reports to State and Union Government, and to various agencies like CEA, PFC, REC, Planning Board etc. During the FY 2020-21, Planning wing prepared and consolidated data for Economic Review and All India Electricity Statistics. Input notes for Budget Speech, Governor's address, Governors' Conference, MPs' Conference, Collectors' Conference, Demand for Grant etc were also provided.

Extremely Severe Cyclonic Storm Tauktae hit Kerala zone in May 14, 2021 and continued intensively till May 17. There was massive disruption to electricity network of KSEB resulting in heavy monetary loss and service interruption. 39 Lakh consumers were affected; KSEB suffered loss of ₹ 46.65 Cr. The torrential rains and resultant landslides in October 2021, which affected 7.6 Lakh consumers also put heavy toll on KSEB. The estimated loss due to this calamity was about ₹25 Cr. 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.

Government of India had proposed amendment to Electricity Act, 2003 in February 2021. Planning wing compiled detailed remarks which enabled KSEB to furnish comprehensive suggestion to State Government and Ministry of Power, Gol on 20.02.2021.

The Planning wing prepared the Annual Plan of KSEBL for FY 2021-'22 with a total outlay of ₹ 4308.79 Cr and the revised outlay for FY 2020-21 for ₹ 3557.91Cr vide B.O (FTD) No.673 /2020 (CP/Plg.1/AP/20-21), dated: 06.11.2020. Planning wing liaised with NABARD, Government of Kerala and implementing field offices with respect to six RIDF projects. Reimbursement claims for Implementation of 2 MW Upper Kallar SHEP and 6 MW Peruvannamoozhi SHEP was forwarded to Government during this period. Compilation of Annual Administration Report 2019-20 was completed and that of Power System Statistics for FY 2018-19, 2019-20 and 2020-21 are in progress.

Vide BO (FTD) No. 141/2021 (No CP/Plg.III/EoDB /2021) dated 18.02.2021, it was decided to dispense with the requirement of affixing special adhesive stamp on LT service connection applications. KSEB had organized a meeting with its customer's representative on 10.03.2021, aiming to minimise regulatory compliance burden for business & citizen. Subsequently Secretary, Power Department, Government of Kerala convened discussions with different functional arms of the department to firm up the proposals.

On 26.08.2020 KSEB invited Expression of Interest from qualified bidders for shortlisting firms intending to undertake 'Power Quality Monitoring, Analysis and Benchmarking' of its



Distribution system. It is understood to be the first of its kind where a distribution utility attempted to conduct power quality study on its network. 14 bidders participated from which 7 were shortlisted and declared eligible to participate in the Request for Quote (RfQ) stage.

Market Monitoring Group prepared daily reports on Demand (MW) & Consumption (MU), Power availability from various sources vis-à-vis planned figures, 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 provided daily inputs to Director (Trans- SO).

14.1. 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. In the State Budget-2020-21, an amount of ₹ 23.20 cr was provided as State share for works under Innovation fund and ESCOT. The works included under Innovation fund in the State budget were Implementation of Enterprise resource Planning (ERP), Tidal and Wave Energy Projects, Implementation of Smart grid pilot project in Kochi City, VGF- balance amount for spill over works and Other new renewable energy projects. The works included under ESCOT were Standardisation of Distribution Transformer (DTR) stations and High Voltage Distribution System (HVDS). As per revised State Plan 2020-21, the amount has been revised to ₹ 6 Cr. Although KSEBL posed schemes amounting to ₹ 6 cr under ERP and VGF for West Kallada for obtaining AS, no sanction was obtained during the year. Even though, utilization certificate for ₹ 4.35 Cr against the amount utilized for ERP during 2020-21 based on the AS already issued during 2019-20 was forwarded to GoK, no amount was released during the year.

14.2. NILAAVU Streetlight Program

Government of Kerala, vide GO (MS) No 117/2020 /LSGD dtd 10.08.2020 launched Nilaavu Streetlight Program for replacing conventional street lights with LED Street Lights in all local bodies across Kerala. KSEB was selected as the implementing agency. The scheme was later modified vide GO (MS) No 202/2020/LSGD dtd 25.12.2020. The Detailed Project Report for the project was prepared by Planning Wing. 10.5 lakh street lights are proposed to be replaced across Kerala in two phases and the approximate cost of the project would be ₹ 290 Cr; the savings per year for LSGs across the State after completion of this project is estimated as 185 MU in electricity consumption and ₹ 80 Cr in electricity bills. The first phase is for installation of 2 lakh streetlights and period of implementation is from January to March 2021 and the second phase is for installation of 8.5 lakhs streetlights and period of implementation is from February to June 2021.

KSEBL placed purchase order with M/s EESL on 26.2.2021 for supply of 2 lakh LED street lights for the 1st phase of the first phase of the project and EESL supplied 1.55 lakh LED street lights and 1.26 lakh fixtures as on 31.3.2021.

15. 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.

15.1. Power Procurement and sale during 2020-21

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

15.1.1. Purchase of Power

15.1.1.1. Long Term Power Procurement

- i. 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.	M/s Kosamattom Financiers Ltd	30.12.2020	1	3.93	PPA executed
2.	M/s Inox Renewables Ltd	21.12.2020	16	4.09	Initialed Tripartite PPA under the consideration of KSERC
3.	Pathankayam SHEP	12.01.2021	8	3.94	PPA initialed. Approval of KSERC to be obtained

- ii. Bid for procuring 200MW Solar power from Ground Mounted Solar PV projects within India.
- iii. PPA initialed on 05.02.2021 with NTPC and The TATA Power Company Ltd for 90 MW and 110 MW respectively at ₹ 2.97 per unit after getting approval of KSERC.



15.1.1.2. Medium Term Power Procurement

NIL

15.1.1.3. Short Term Power Procurement

1. Purchase through DEEP: To meet the Summer 2021 demand KSEB Ltd had purchased RTC and peak power through DEEP portal from 01-04-2021 to 31-05-2021 as follows:

Period		Bid Qtm MW	Duration hrs	Offered Qtm MW	Price discovered Rs/kwh	Trader
From	To					
01-04-2021	15-04-2021	100	RTC	50	3.04	GMRETL
				50	3.04	AEL
01-04-2021	15-04-2021	100	14-24	50	3.40	GMRETL
				50	3.41	PTC
16-04-2021	30-04-2021	100	RTC	50	3.04	GMRETL
				50	3.04	AEL
16-04-2021	30-04-2021	100	14-24	50	3.42	GMRETL
				50	3.43	PTC
01-05-2021	15-05-2021	100	RTC	50	3.04	GMRETL
				50	3.04	AEL
01-05-2021	15-05-2021	100	14-24	50	3.47	GMRETL
				50	3.48	PTC
16-05-2021	31-05-2021	100	RTC	50	3.04	GMRETL
				50	3.04	AEL
16-05-2021	31-05-2021	100	14-24	50	3.47	GMRETL
				50	3.48	PTC

Banking of power during Summer 2021

Name of the Bidder	Supply Period	Quantum MW	Duration (Hrs)	Return %	Return period	Return duration	Trading margin (ps/kwh)
PTC- TPDDL	Mar-21	50	RTC	102%	16-06-2021 to 30-09-2021	0-5	2.48
		100	14-24				
	Apr-21	50	RTC			22-24	



16. Tariff and Regulatory Affairs Cell (TRAC)

TRAC headed by Deputy Chief Engineer (TRAC), 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 2020-21 is given below.

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

No.	Subject	Period
I	Petitions (before KSERC)	
1	Implementation of OTS- 2021	2021
2.	Single point supply tariff of various consumers	
3.	Fuel surcharge petitions	Four quarters of 2020-21
4.	Seeking approval trading margin in PSA for 200 MW wind power from SECI	
5.	For the approval for the NILAVU project and the street light tariff for the LED lights used in the project.	2020-21
6.	For the approval of various relief measures announced by the State Government in connection with the Covid-19 pandemic	2020-21
7.	For the procurement of 200 MW solar from ISTS solar projects	
8.	Seeking approval for enter into short term power procurement arranged through banking transaction with Tata Power Ltd.	
9.	Seeking final orders with respect to the drawal of power from the 350 MW power contracted under DBFOO bid-2	
10	Seeking approval for the settlement reached in case of RGCCPP	
11	Approval for detailed procedure for implementing KSERC (Renewable Energy and net metering) Regulations) 2020 for approval	
12.	Seeking approval for the modification on the terms and conditions of the agreement entered with INDSIL	
13	For granting approval for the power purchase agreement for the procurement of 200 MW solar power.	
II	Remarks/counter/suggestion (Licensees)	
14.	True up petition of KINESCO, Technopark, CSEZA, TCED	FY 2017-18
15.	True up petition of CSEZA, Thrissur Corporation, KDHPCL, CPT	2018-19
16.	Truing up petition of KINESCO	FY 2015-16 to 2016-17
17.	Capital investment plan of Technopark	2012-13 to 2016-17



No.	Subject	Period
18.	Capital investment plan of Thrissur Corporation	2020-21
19.	Relief for lockdown restriction of Thrissur Corporation	
20.	Approval of supplementary PPA for reduction of contract demand Review petition	
21	Review petition filed by Thrissur Corporation on power factor penalty Appeal Petitions	
III	Reply /clarification/counter affidavit/comments	
22	Prepared and furnished data for 9 th integrated ranking exercise of SBU-D	2020-21
23	Prepared the Technical particulars	for 2019-20
24	Filed counter affidavit before KSERC on petition filed by various consumers in the matter of Low voltage Supply Surcharge, tariff relief and billing methodology before KSERC	
25	Filed review petition against approval of GFA addition for 2016-17	
26	Filed reply to objection filed by HT &EHT association in the matter of GFA addition for the FY 2016-17.	
27	Provided report to KSERC on monthly power purchase, RPO obligations etc.	
IV	Other relevant initiatives	
28	Filed counter on the appeal filed by Indian Railways before APTEL	
29.	Prepared the rejoinder affidavit to be filed before APTEL in the matter of Truing up orders 2011-12, 2012-13 and 2013-14.	
V	Comments before CERC	
30	Filed comments of KSEBL on draft CERC(Terms & Conditions of tariff) (first amendment) Reg,2020	
31	Filed comments of KSEBL on draft CERC(Terms & Conditions for determination of tariff) (second amendment) Reg,2020	
32	Filed reply to tariff petition for 2019-24 before CERC of NLC TPS	
VI	Petition /Counter affidavit before CERC	
33	Filed petition before CERC on lignite transfer price of NLC station.	

17.



18. 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 2014-15 to 2020-21:

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Energy Sales within state (MU)	18426.27	19325.07	20038.25	20880.71	21536.77	22660.93	22151.60
Outside state (MU)	369.17	53.48	49.30	117.51	824.78	55.95	261.43
Total sales (MU)	19178.96	19378.55	20087.55	20998.22	22361.55	22716.87	22413.03
Revenue from operations (₹ Cr)	10116.26	10914.43	11218.83	12318.17	13521.22	14644.44	14420.63
Other Income (₹ Cr.)	296.61	332.71	400.78	347.27	481.74	210.16	748.76
Total (₹ Cr)	10412.87	11247.14	11619.61	12665.44	14002.94	14854.60	15169.39

The decrease in revenue from tariff during 2020-21 was due to Covid 19 Pandemic.

The statement of profit and loss (₹ Cr) for the financial year 2020-21 is shown below.

Year	Revenue Operation	Other income	Total Revenue	Total Expenditure	Prior-period credit/(Charges)	Profit/Loss (Loss)
2020-21	14420.63	748.76	15169.39	16991.74	-	-1822.35

Comparative statement of accounts is given in Annexure 5.

Salient features of Annual Statement of Accounts for 2020-21 are given below.

- Total income for the year 2020-21 is ₹ 15169.39 Cr and the expenditure is ₹ 16991.74 Cr. The profit and Loss account recorded a Loss of ₹ 1822.35 Cr for the Year.
- The company had borrowed ₹ 2825.16 Cr and repaid ₹1525.68 Cr during the year as against Rs. 3799.40 Cr and repayment of ₹ 2279 Cr during previous year. The total outstanding long term loan (provisional) was ₹ 8675.77 Cr at the year end.

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



19. 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 Headquarters 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 2020-21 are given below:

Section	Value of Bills processed / quantum	Value of objections raised	Value of Recovery/Savings
RCA	₹ 1209.92 Crore	₹ 10.05 Crore	₹ 4.79 Crore
WAD	₹14.46 Crore		
Regional Audit Offices	379 Audit Reports	₹ 34.87 Crore	₹ 19.64 Crore
Pension Audit	5195 PPO/Service Books verified	₹ 19.49 Lakh	₹ 15 Lakh
Pay Fixation	4502 Service Books verified	₹ 44.26 Lakh	₹ 71.82 Lakh
EAS	₹ 28.26 Crore	₹ 38.28 Lakh	₹ 8.84 Lakh
GPF	Closure 1498 Nos. (₹ 207.57 Cr) NRA audited - 8677 Nos (₹273.76 Cr)	NA	NA

Efforts taken by Arrear Clearance Cell resulted in the saving of ₹ 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 ₹ 12.23 crore. Internal audit conducted by Regional Audit Offices, Pay Fixation, Pension Audit and Establishment Audit Sections resulted in the realisation of ₹ 24.61 Crore, ₹ 52.05 lakh, ₹ 27.32 lakh and ₹ 3.39 lakh respectively. Pre-check carried out by the Resident Concurrent Audit Wing saved ₹ 8.62 Crore.



20. Special Officer (Revenue)

The billing and collection monitoring of 6584 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 2020-21, an arrear amount of ₹ 8.74 Cr with Principal amount of ₹ 5.86 Cr and Interest amount of ₹ 2.88 Cr had been collected through One Time Settlement Scheme 2020. Details of HT, EHT Consumers and Licensee with consumption are provided below.

Apart from Government and Public Sector undertakings, bulk consumers of private sector were also bought under Centralised Government Billing system increasing the total number to 15,474. Arrear amount of ₹ 4.733 Cr was collected from Minor Irrigation HT consumers. In 2020-21 no Vydyuthi Adalath was conducted. 7 nos. OTS were settled during 2020-21.

21. 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. CPRO is the State Public Information Officer of Chairman and Managing Director and other Directors of KSEBL.

Mass communication and Advertisement: The regular official Press Release on activities, programs, achievements and developments in KSEB for all classes of media including communication on supply interruptions to Print and FM radio are prepared by this section. This wing is responsible for uploading of videos in the internet-based video channel (www.ksebmedia.in) and the telecast of the television programme ‘Spandanam’ on 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 2020-21, exhibitions trade fairs and other Public events were cancelled due to Covid-19 pandemic. CPRO is appointed as the Nodal officer for Malayalam Official Language. The PR wing published 453 tender notices in newspapers and 9 Nos. Statutory notices in Government Gazette incurring a total expenditure of ₹ 2.33 Cr during 2020-21.



22. 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 12.78 % employees belong to SC community and 2.47 % belong to ST community among regular employees of the company.
- Revision of Pay & Allowances of Workmen and Officers of KSEB Ltd 2021 and allied works.
- All District Level Internal Complaints Committee (ICC's) of KSEBL were reconstituted with effect from 24.01.2021, for a period of 3 years.
- The following accident compensation claims were settled during the year

No.	Description	Amount (₹)
1	Fatal and non fatal accidents to petty contractors & workmen	93,21,975
2	Fatal and non fatal accidents to employees	1,06,12,755
3	Medical claims reimbursement to the accident victims	75,27,476
4	Claims to electrical accidents to Public	2,17,42,000
5	Claims to electrocution to cattle	6,80,000

- Details of Employees Welfare Fund disbursed are shown below.

No.	Description	Employee s	Amount (₹)
1	Retirement benefit	1476	6,81,87,134
2	Legal heirs of deceased employees	61	8,38,62,367
3	Voluntary retirement benefit	11	4,87,549
4	Resignation benefit	7	47,850
5	Educational awards to students (Class X)	444	15,54,444
6	Educational awards to students (Class XII)	286	14,40,236



23. 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 files, important legal issues taken up by field officers 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 LA&DEO attend the pre-qualification committee meetings. LA&DEO also conducts enquiries into the allegations against Board's officials, referred by the Chairman and Managing Director.

The Legal Liaison Office at Ernakulam and Resident Engineer at New Delhi monitors and conducts cases before Hon'ble High Court and Hon'ble Supreme Court & other quasi-judicial Appellate Fora at New Delhi respectively. Major Activities during the year include:

- Lok Adalaths (10 Nos.) were conducted in various districts in which 94 cases were settled for an amount of ₹ 1.20 Cr.
- Out of the 10717 cases present in various courts (8756 from the previous periods), 953 cases were disposed during the year 2020-21.

24. 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. Major achievements in FY 2020-21 include:

1. Document executed for an extent of 5.77 acres of land at Kazhakkuttam 110 KV Substation in favour of KSEBL
2. An Extent of 0.083 Hectares of land at Kottarakkara Section office got mutated in favour of KSE Board Ltd.
3. An extent of 9.4616 Hectares of land got mutated in favour of KSEBL



25. Vigilance 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 the Chairman & Managing Director. The department has two wings, viz. Vigilance and Anti-power-theft Squad.

25.1. Vigilance wing

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 during 2020-21 is given below:

No	Item	Quantum
1	Petitions received	499
2	Enquiry ordered	499
3	Completed Enquiry	355
4	References handled	3413
5	Complaints received over phone	116
6	Complaints rectified	116
7	Details furnished on Pending cases /Disciplinary proceedings	1734

25.2. Anti Power Theft Squad (APTS)

APTS team consists of two Executive Engineers under the Deputy Chief Engineer, APTS, Thiruvananthapuram, co-ordinates the activities in Southern Region and Northern Region. The Head Quarters of these 2 regional units are located at Thiruvananthapuram 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.

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.



A summary of activities of APTS team is given below:

No	Item	Quantum
1	Total numbers of inspections	23155
2	Irregularities detected	1991
3	Theft cases	379
4	Short Assessment cases	235
5	Malpractice cases	1024
6	Inspection on HT premises	164
7	Irregularities detected	29
8	Total assessed amount	₹ 14.85 Cr
9	Amount Realised	₹ 13.45 Cr



26.

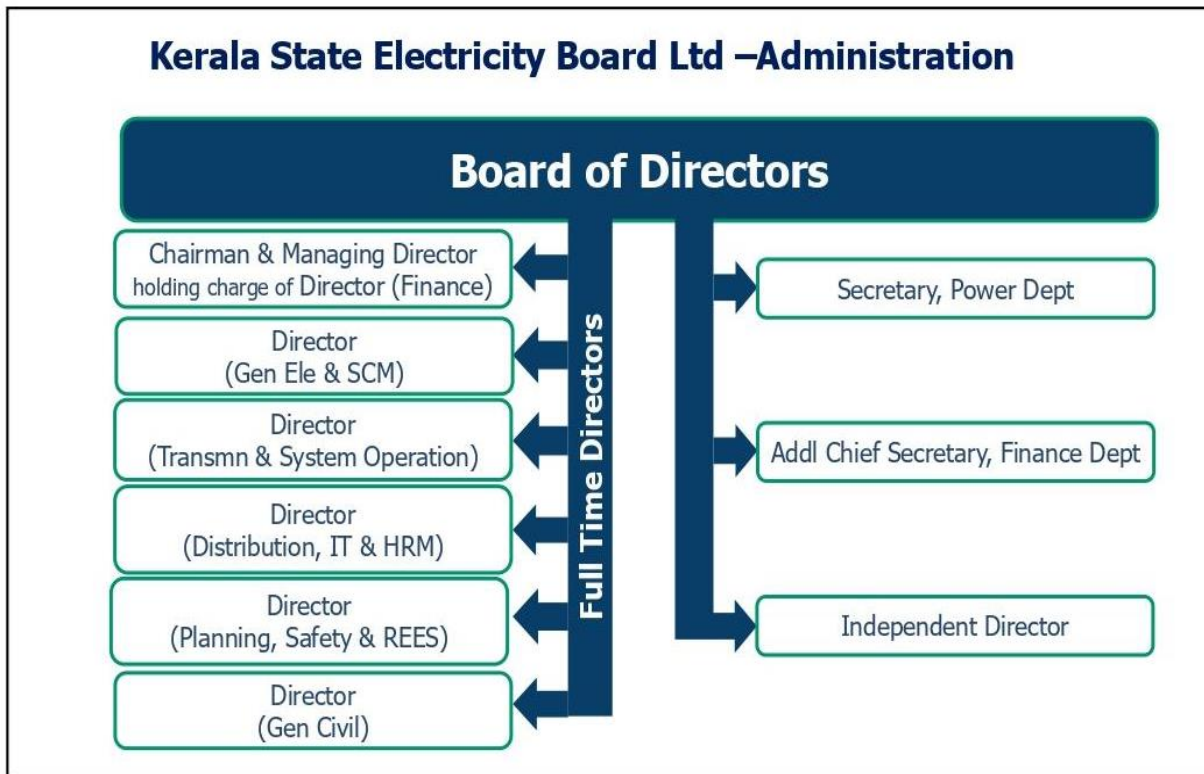
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28. Annexures

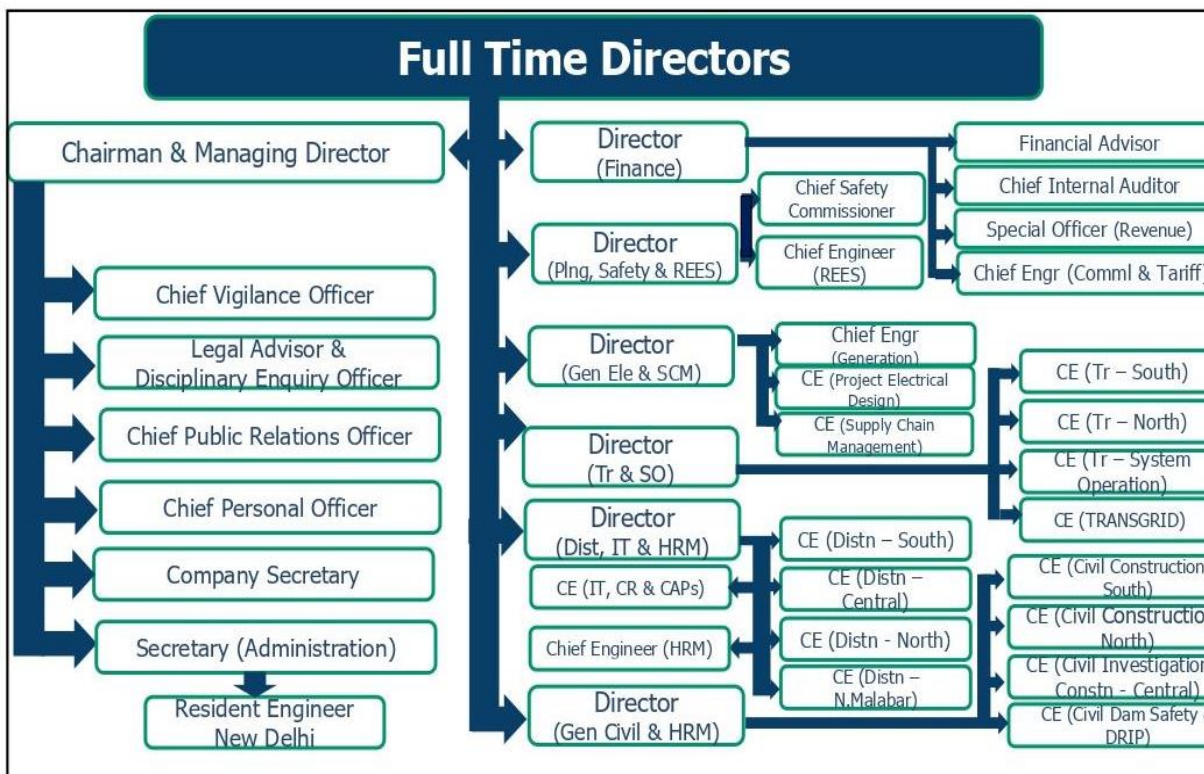




28.1. ANNEXURE 1: Organisation Chart



28.2.



28.3. ANNEXURE 2: Highlights of Kerala Power system

Total Installed capacity	3029.61 MW
Storage as on 01.04.2020	2067.435 MU
Inflow during 2020-21	6729.99 MU
Storage as on 31.03.2021	2093.94 MU
Total generation	7109.09 MU
Auxiliary consumption	32.16 MU(Generation) 19.03 MU (Substations)
Purchase from IPPs inside the State	388.71 MU
Power injection by Captive Plants / Prosumers	78.29 MU
Purchase through Generators through long term contracts	8104.65 MU at Kerala Periphery
Purchase through short term contracts	167.02 MU at Kerala Periphery
Purchase through Power exchange	94.71 MU at Kerala Periphery
Power availed through Swap	122.28 MU at Kerala Periphery
Swap Return	334.82 MU at Kerala Periphery
Sale through Power exchange (at SR)	261.43 MU at Kerala Periphery
CGS share	9167.26 MU at Kerala Periphery
Power availed through DSM(Net)	139.43 MU
Total Power purchase	18262.34 MU at Kerala Periphery
Total Generation and power purchase	25320.24 MU
External PGCIL loss	649.89 MU
Energy sale inside the state by KSEB	22151.60 MU
Energy consumption within state	22540.32 MU (including open access)
Open access purchase at Kerala periphery	407.41 MU (388.72 MU at consumer end)
Energy injection at generator end for sale outside	38.66 MU(37.14 MU at KSEB Periphery)
T & D loss in KSEBL system	2592.61 MU; 10.32(%) (including open access)
Maximum Demand recorded	4316 MW (on 13.04.2020)
Maximum Demand recorded during 2020-21	4284 MW (on 31.03.2021)
Unrestricted peak demand	4284 MW
Maximum daily consumption recorded	88.417 MU (on 19.03.2021) (All time high)
Length of EHT lines(As on 31.3.2021)	11507 Ckm
Length of HT lines(11/22/33KV)(As on 31.3.21)	64540 Ckm
Length of LT lines(As on 31.3.2021)	295921 Ckm
No. of EHT substations(As on 31.3.2021)	266 Nos.
No. of Distribution transformers(As on 31.3.21)	83465 Nos.
Total consumers	131.43 Lakhs



28.4. ANNEXURE 3: Installed capacity of Kerala as on 31.3.2021

No	Name of Station	Installed Capacity (MW)	Annual Generation capacity (MU)
KSEBL Hydel Stations			
1	Idukki	780	2398
2	Sabarigiri	340	1338
3	Idamalayar	75	380
4	Sholayar	54	233
5	Pallivasal	37.5	284
6	Kuttiyadi	75	268
7	Kuttiyadi Extension	50	75
8	Kuttiyadi Additional Extension Scheme	100	223
9	Neriamangalam	52.65	237
10	Lower Periyar	180	493
11	Poringalkuthu	36	191
12	Sengulam	51.2	182
13	Kakkad	50	262
14	Panniar	32.4	158
15	Neriamangalam Extension Scheme	25	58.27
	Subtotal (Large Hydel Stations)	1938.75	6780.27
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
	Subtotal (Small Hydro Stations)	120.011	435.017
	Subtotal Hydro Stations	2058.761	7215.172
KSEBL Thermal Stations			



No	Name of Station	Installed Capacity (MW)	Annual Generation capacity (MU)
1	Brahmapuram Diesel Power Plant (KSEB)	63.96	363.60
2	Kozhikode Diesel Power Plant (KSEB)	96	672
	Subtotal (Thermal Stations)	159.96	1035.6
KSEBL Wind Stations			
1	Kanjikode (9x0.225 MW) (KSEB)	2.025	4
	Subtotal KSEBL Wind Stations	2.025	4
KSEBL Solar Plants			
1	Kanjikode Solar Project(Ground mount)	1	1.58
2	Banasurasagar reservoir (floating Solar)	0.01	0.02
3	Solar- Chaliyoor colony	0.096	0.15
4	Solar-Poringalkuthu	0.05	0.08
5	Buildings under Generation Department (Roof Top)	0.7	1.1
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	
	Subtotal (KSEBL Solar Stations)	17.479372	25.83



No	Name of Station	Installed Capacity (MW)	Annual Generation capacity (MU)
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
10	Deviyar	0.05	0.02
	Sub- Total (IPP/CPP Hydro Stations)	70.71	240.87
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
	Sub-total (CPP / IPP Thermal Stations)	369.58	3394.75
CPP/ IPP Wind Stations			
1	Wind-Agali	18.6	37.47
2	Wind-Ramakkalmedu	14.25	32.46
3	Wind- Ahalya, Kanjikode	8.4	16.19
4	Wind-INOX, Kanjikode	16	30.84
5	Wind Kosamattom	1	1.93
6	Wind-Malayala Manorama (CPP)	10	
	Sub-total (CPP / IPP Wind Stations)	68.25	118.89
CPP / IPP / Prosumer Solar Stations			
1	Hindalco Industries Ltd.(Solar)	3	4.73
2	CIAL(Solar)	38.44	45.77
3	ANERT	2	3.15
4	Solar Park (Ambalathara & Paivalika)	100	78.84
5	KMRL	5.39	
6	Grid connected consumers	134.01	55.57
	SubTotal (Private Solar Stations)	282.84	184.91
	Total KSEBL Stations	2238.225	7917.002
	Total Private Stations	791.38	3939.4
	Total- Hydel -KERALA	2129.421	7456.022
	Thermal-KERALA	529.54	4066.75
	Wind Total -KERALA	70.275	122.89
	Solar total-KERALA	300.319	210.74
	Total Installed capacity	3029.61	12232



28.5. ANNEXURE 4: Details of Dams of KSEBL

Sl.No	Name of the Dam	Name of reservoir/PONDAGE	District in which dam is situated	Full reservoir level (m)	Whether gated dam or nor (Yes/No)	
1	Pamba	Pamba	Pathanamthitta	986.33	Yes	
2	Anathode	Kakki		981.46	Yes	
3	Kakki			981.46	No	
4	Upper Moozhiyar	Upper Moozhiyar		983	No	
5	Kullar	Kullar		1136.9	No	
6	Meenar I	Meenar I		1075.94	No	
7	Meenar II	Meenar II		1041.5	No	
8	Gavi	Gavi		1136.9	No	
9	Kochupamba	Kochupamba		935.73	No	
10	Ranni Perunad	Ranni Perunad		18.10	No	
11	Perunthenaruvi	Perumthenaruvi		51.00	No	
12	Moozhiyar	Moozhiyar		192.63	Yes	
13	Veluthode	Velithode		192.00	no	
14	Lower Meenmutty	Lower Meenmutty	Thiruvananthapuram	62.75	No	
15	Idukki	IDUKKI	Idukki	732.62	No	
16	Cheruthoni			732.62	Yes	
17	Kulamavu			732.62	No	
18	Kulamavu saddle (Near Junction)			732.62	No	
19	Kulamavu saddle(right bank)			732.62	No	
20	Erattayar			Erattayar	754.38	Yes
21	Kallar			Kallar	824.48	Yes
22	Narakakkanam			Narakakkanam	768.00	No
23	Azhutha			Azhutha	956.00	No
24	Vadakepuzha			Vadakepuzha	723.25	No
25	Kuttiyar	Kuttiyar	795.50	No		
26	Vazhikkadavu	Vazhikkadavu	936.70	No		
27	Kundala	Kundala	1758.69	Yes		
28	Mattupetty	Mattupetty	1599.59	Yes		
29	RA Head works	RA Head works	1450.92	yes		
30	Sengulam	Sengulam	847.65	No		
31	Ponmudi	Ponmudi	707.75	Yes		
32	Anayirankal	Anayirankal	1207.02	No		
33	Parakkadavu	Parakkadavu	722.30	No		
34	Mullakkanam	Mullakkanam	717.5	No		
35	Kallarkutty	Kallarkutty	456.59	Yes		
36	Viripara weir	Viripara weir	1141.59	No		
37	Lowerperiyar (Pambla dam)	Lowerperiyar (Pambla dam)		253	Yes	



Sl.No	Name of the Dam	Name of reservoir/PONDAGE	District in which dam is situated	Full reservoir level (m)	Whether gated dam or not (Yes/No)
38	Vellathooval	Vellathooval		472	no
39	Banasurasagar	Banasurasagar	Wayanad	775.6	No
40	Kuttiyadi spillway			775.6	Yes
41	Kuttiyadi saddle			775.6	No
42	Kozani saddle			775.6	No
43	Nayamoola saddle			775.6	No
44	Manjoora saddle			775.6	No
45	Kottagiri saddle			775.6	No
46	Near kottagiri saddle			775.6	No
47	Kuttiyadi (Kakkayam)			Kuttiyadi (Kakkayam)	Kozhikode
48	Urumi I	Urumi I		No	
49	Urumi II	Urumi II	107.1	No	
50	Chembukkadav	Chembukkadav	302.9	No	
51	Poozhithode	Poozhithode	271.35	No	
52	Panoth	Panoth	185.05	No	
53	Valook	Valook	183.9	No	
54	Adyanpara	Adyanpara	Malappuram	201.11	
55	Idamalayar	Idamalayar	Ernakulam	169	Yes
56	Poringalkuthu	Poringalkuthu	Thrissur	423.98	Yes
57	Sholayar main	SHOLAYAR		811.69	No
58	Sholayar flanking			811.69	Yes
59	Sholayar saddle			811.69	No
60	Karingadu	Chathankottunada - II	Kozhikode		No
61	Koothampara				No



28.6. ANNEXURE 5: Statement of accounts 2014-15 to 2020-21 (₹ in Cr)

No	Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
	Revenue Income							
1	Non-Tariff Income	533.52	759.44	550.09	608.19	481.74	210.16	748.76
2	Revenue from tariff	9879.35	10487.71	11036.78	12057.26	13521.2	14644.44	14420.63
	Total A(1+2)	10412.87	11247.15	11586.87	12665.45	14002.94	14854.6	15169.39
	Revenue Expenses							
1	Power Generation	209.91	104.26	23.45	2.08	3.29	5.71	4.8
2	Power Purchase	6782.76	6336.82	7664.4	7526.03	7869.32	8680	8057.93
3	Interest Charges	906.9	909.14	922.93	1881.08	1859.76	1899.03	1889.22
4	Depreciation	459.7	491.22	520.66	803.7	805.02	901.92	1011.98
5	Employee Cost	2893.71	3292.82	3373.76	3038.4	3354.62	3508.42	5639.86
6	Repairs & Maintenance	244.44	259.76	266.9	277.35	303.75	281.8	260.58
7	Admn. & Gen Expenses	287.05	344.09	378.72	530.39	598.56	564.64	593.86
8	Other Expenses	138.9	84.58	88.5	-142.76	222.48	50.57	183.06
9	Return/ Surplus	0	0	0	0	0	0	0
	Total (1 to 9)	11923.37	11822.69	13239.32	13916.27	15016.87	15892.09	17642.23
1	Less: Expenses Capitalised	184.14	204.5		400.34	463.02	460.94	486.69
2	Less: Interest Capitalised	53.44	57.73		66.39	260.86	307	162.86
	Total(1+2)	237.58	262.23	0	466.73	723.88	767.94	649.55
	TOTAL B	11685.79	11560.46	13239.32	13449.54	14292.99	15124.15	16991.74
	SURPLUS / (DEFICIT) (A-B)	-1272.9	-313.29	-1652.45	-784.09	-290	-269.55	-1822.35



28.7. ANNEXURE 6: Profit and Loss Statement 2017-18 to 2020-21 (₹ in Lakh)

2.

No	Particulars	on 31.3.2021	on 31.3.2020	on 31.3.2019	on 31.3.2018
I	REVENUE				
	Revenue From Operations	1442063	1464444	1352120.6	1231817.31
	Other Income	74876	21016	48174.14	34727.52
	Total Income (I+II)	1516939	1485460	1400294.74	1266544.83
II	EXPENSES				
	Purchase of Power	805793	868000	786932.13	752602.69
	Generation of Power	480	571	329.2	207.84
	Repairs & Maintenance	26058	28180	30375.11	27734.87
	Employee benefits expense	515317	304748	289201.39	263806.15
	Finance costs	172636	159203	159889.8	181469.02
	Depreciation and amortization expense	101198	90192	80502.76	80370.49
	Other Expenses				
	Administrative Expenses	59386	56464	59816.29	3038.86
	Others	16445	2197	20260.94	-1416.98
	ADD Changes in Fair Valuation and other adjustments			393.63	-12858.65
	Total expenses (IV)	1697313	1509555	1427701.25	1344954.29
III	Profit/(loss) before exceptional items and tax (III- IV)	-180373	-24095	-27406.51	-78409.46
	Exceptional Items	1861	2860	1594.34	0
	Profit/(loss) before tax (V-VI)	-182234	-26955	-29000.85	-78409.46
IV	Tax expense:				
	(1) Current tax				0
	(2) Deferred tax				0
V	Profit (Loss) for the period from continuing operations	-182234	-26955	-29000.85	-78409.46
VI	Profit/(loss) from discontinued operations			-	0
VII	Tax expense of discontinued operations			-	0
VIII	Profit/(loss) after tax from Discontinued operations			-	0
IX	Profit/(loss) for the period (IX+XII)	-182234	-26955	-29000.85	78409.46
XIV	Other Comprehensive Income				
	A (i) Items that will not be reclassified to profit or loss	-66180	-59635	-109678.6	-107632.86
	(ii) Income tax relating to items that will not be reclassified to profit or loss				0
	B (I) Items that will be reclassified to profit or loss				0
	(ii) Income tax relating to items that will be reclassified to profit or loss				0
XV	Total Comprehensive Income for the period (XIII+XIV) (Comprising Profit (Loss) and Other Comprehensive Income for the period)	-248415	-86590	-138679.45	-186042.32



XVI	Earnings per equity share (for continuing operation):				
	(1) Basic (Rs)	-5.21	-0.77	-3.96	-5.32
	(2) Diluted (Rs)	-5.21	-0.77	-3.96	-5.32
XVII	Earnings per equity share (for discontinued operation):				
	(1) Basic				
	(2) Diluted				

28.9.



28.10. Annexure 7: Balance Sheet for FY 2017-18 to FY 2020-21 (₹ in Lakh)

Particulars	on 31.03.2021	on 31.03.2020	on 31.3.2019	on 31.03.2018
ASSETS				
Non current assets				
Property, Plant and Equipment	2409083	2249182	21,24,607.56	20,48,792.59
Capital work-in-progress	413167	375003	2,99,134.38	2,49,277.74
Intangible asset	6343	2572		
Financial Assets				
Investments	2049	2049	2,049.01	2,000.01
Trade receivables	40777	74544		
Loans	7623	2178	8,342.65	8,295.03
Others	213911	294527	7773.16	6,331.70
Deferred Tax Assets (Net)				
Other non-current assets	34885	31040	5,27,469.70	4,31,532.62
Current assets				
Inventories	68496	80886	69,805.76	48,590.36
Trade receivables	202815	182204	128801.29	2,29,501.13
Cash and cash equivalents	25039	18374	27542.1	27,545.63
Bank balances Other than Cash Equivalents	18098	10930	7839.91	7,007.15
Other Financial assets	7821	11372		
Current tax Assets (Net)	628	185		
Other current assets	117055	100465	14531.57	12,676.53
Total Assets	3567790	3435511	3218594.14	30,71,550.48
Equities and Liabilities				
Equity				
Equity Share capital	349905	349905	349905	3,49,905.00
Other Equity	-1458857	-1210443	-1116306.1	-9,62,254.68
Liabilities				
Non-current liabilities				
Borrowings	1495880	1513413	1452515.45	15,93,454.49
Other Financial Liabilities	443319	393754	335984.7	3,17,044.52
Provisions	1229498	1028592	1122416.88	9,76,539.38
Other non-current liabilities	357713	304823	264514.6	1,93,405.24
Current liabilities				
Financial Liabilities				
Borrowings	311498	233023	382902.31	2,73,758.98
Trade payables	210208	199168	121457.58	95,731.97
Other financial liabilities	346171	435595	303397.72	2,33,065.58
Provisions	282455	187681	1806	900
Total Equity and Liabilities	3567790	3435511	3218594.14	30,71,550.48



28.11.

28.12. Annexure 8: HT/EHT/Licensee Consumption as on 31.03.2021

EHT (GENERAL) (A)	2	28085002
EHT (GENERAL) (B)	3	105302164
EHT I (66KV) INDUSTRIAL	13	731028652
EHT II (110 kV) INDUSTRIAL	20	1487112781
EHT II (110 KV) RT	13	410691693
EHT III (220 KV) INDUSTRIAL	1	1064318600
EHT TOTAL	52	3826538892
HT I (A) INDUSTRIAL	2500	5354319741
HT I (B) INDUSTRIAL	24	18679255
HT II (A) GENERAL	416	405251799
HT II (B) GENERAL	1084	1559345066
HT III (A) AGRICULTURE	52	12078318
HT III (B) AGRICULTURE	9	5104005
HT IV (A) COMMERCIAL	1140	571840916
HT IV(B) COMMERCIAL	1128	4546107763
HT V (DOMESTIC)	123	41239297
HT VII TEMPORARY	1	11069
HT Total	6477	12513977229
Licensee: CPT	2	78130840
Licensee: CSEZ	1	105929274
Licensee: KDHPCL	1	114559600
Licensee: KPUPL	4	146457392
Licensee: Karnataka Electricity dept	2	2031009
Licensee: MES	33	145380030
Licensee: RPL	1	66436054
Licensee: Technopark	3	107389370
Licensee: Thrissur Corporation	2	307106065
Licensee: Infopark, Cherthala	2	26209473
Licensee: SMART CITY	1	9623951
Licensee Total	52	1109253058
KMRL (Kochi Metro Rail Ltd)	2	68461674
KMRL (Kochi Metro Rail Ltd)-HT	1	146260
Grand Total	6584	17518377113



28.13. ANNEXURE 9: Departmental Publications

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

