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Ministry of Power

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1. Introduction, Vision & Mission

During 2020, under the Ministry of Power and Energy, the Ministry included 'Energy Sector' development activities as well. It included administrative and management functions of the Energy Sector Institutions such as Ceylon Petroleum Corporation, Ceylon Petroleum Storage Terminal Limited, Petroleum Resource Development Secretariat..... However, this report contains only the performance of the 'Power Sector' and the 'Power sector institutions' during the period under review.

Electricity has become an integral part of people's lives as it drives many aspects of one's daily life. Electricity also plays a vital role in the economic development of the country as one of the major contributors by way of acting as the lifeblood to carry out all economic and social activities of the country continuously, without any interruption. Electricity also enhances the quality of lives of the citizens which has ripple effect on every aspect of the country.

This Ministry was able to achieve the target of providing electricity to all by the end of 2019 by reaching 99.9% in household electrification. Due to frequent developments made to the National Electricity Grid, electrification levels in the Southern, Western, Sabaragamuwa, North Central and Eastern provinces have reached up to 100% and the electrification levels of Kandy, Nuwara Eliya, Ampara and Vavuniya Districts have also reached up to 100%.

A number of Power Generation Projects and Transmission and Distribution projects are being implemented in order to cater to electricity demand growing approximately by 5% annually.

Vision

A sustainably Developed Sri Lanka

Mission

Providing leadership in the areas of Power through electricity generation, transmission and distribution, supply, procurement of coal for power plants and electricity related project execution.

2. Subjects and Functions Assigned to the Ministry

As per the Extraordinary Gazette No. 2153/12 of 10.12.2019, following functions were assigned to the Ministry of Power & Energy

- Formulation of policies, programmes and projects, implementation, monitoring and evaluation of projects and programmes in relation to the subjects of Power and Energy and the subjects of the statutory institutions comes under the purview of the Ministry.
- Exploring, planning, monitoring and developing the activities relating to the generation of electricity and other energies by utilizing power sources such as solar, water, thermal, coal, wind and waste.
- Controlling greenhouse gas emission.
- Rural electrification.
- Managing demands and developing renewable energy in order to improve energy efficiency.
- Formulation of an appropriate energy policy for the control, regulation and utilization of power resources.
- Importing, refining, storage, distribution and coordination and implementation of marketing activities of Petroleum-based products and natural gas.
- Petroleum products and activities related to refining.
- Exploration of petroleum & natural gasses and related activities.

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- Matters relating to the production of Gas and by-products from petroleum production sources, storage, maintenance of stocks, production and distribution.
- Development of infrastructure facilities in relation to the supply and distribution of fuel.
- Supervision of the Institution under the purview of the Ministry.

According to the Extraordinary Gazette No. 2187/27 published on 09.08.2020, Ministry of Power has given following special priorities to accomplish under the relevant subjects and functions on the Ministry purview.

a. Subjects & Functions

Providing policy guidance to relevant State Ministry, and formulating policies in relation to the subject of Power, in conformity with the prescribed Laws, Acts and Ordinances, implementation of projects under the national budget, state investment and National Development Programme, and formulating, implementing, monitoring and evaluating policies, programmes and projects, related to subjects and functions under below-mentioned Departments, State Corporations and Statutory Institutions for "Assuring low-cost power generation and efficient distribution" based on the national policies implemented by the government, and in accordance with the policy statement "Vistas of Prosperity and Splendour".

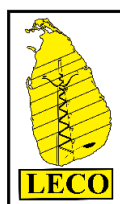
b. Special Priorities

- Developing a Smart Grid to ensure maximum efficiency and utility of the power generated.
- Expanding investments to increase the power generation capacity of the Lak Vijaya coal power plant.
- Equilibrating the mix of renewable energy power plants, thermal power plants and natural power plants, and thereby reducing the cost of power generation and eliminate uncertainties that may occur.
- Implementing the power generation plan based on long-term requirements.
- Making the power transmission and distribution processes efficient.
- Minimizing the cost of power in order to maintain the international competitiveness of the industrial production process

3. Institutions under the purview of the Ministry



CEB: Established by Act No.17 of 1969. It is empowered to generate electrical energy, transmit it and distribute same to all categories of consumers and to collect revenue as per the tariff approved by the Public Utilities Commission of Sri Lanka (PUCSL)



Lanka Electricity Company (Private) Limited (LECO): A subsidiary of CEB with shareholding of 54.84%, and with minority shareholding of the Treasury 43.56%, Urban Development Authority 0.79% and Local Authority 0.81%

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LTL: A subsidiary of CEB with shareholding of 63%, with minority shareholding of its employees (37%)



Lanka Coal Company (Pvt). Ltd. : A subsidiary of CEB with shareholding of 60%, with minority shareholding by the Treasury (20%), Sri Lanka Shipping Corporation (10%) and Sri Lanka Ports Authority (10%)



Sri Lanka Energies (Pvt) Ltd: A subsidiary of CEB with 100% shareholding.

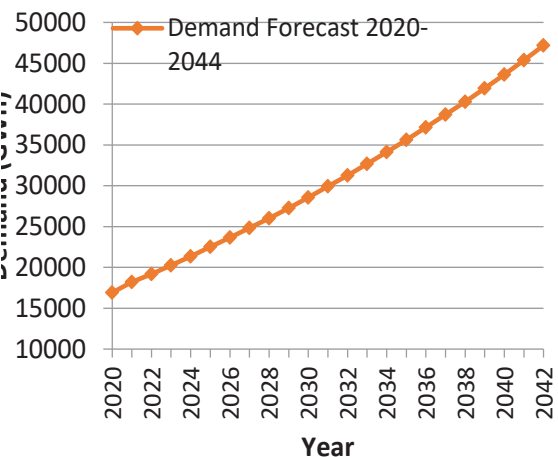
4. Power Sector Status and Performance during 2020

4.1 Electricity Demand, Forecast for 2020 and Electricity Consumer Growth

The country has already been reached 100% access to electricity. Sri Lanka is known as the only country in South Asia that has 100% electricity accessibility with supply of uninterrupted power over 24 hours.

Demand for electricity is growing at a rate of about 5% per year. In 2019, Average daily demand for energy was 45.89 GWh. However, reported average daily demand during this year is around 40 GWh, due to the prevailing COVID 19 pandemic situations.

As per the updated Long-Term Generation Expansion Plan of CEB for the period 2020-2039, the forecasted electricity demand is as follows.

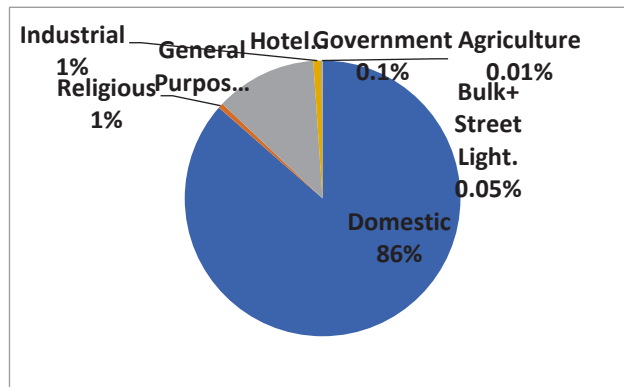


Year	Demand (GWh)	Net Generation (GWh)	Peak Demand (MW)
2020	16,914	18,542	3050
2021	18,194	19,910	3254
2022	19,187	20,959	3403
2023	20,233	22,065	3561
2024	21,337	23,230	3728
2025	22,501	24,458	3903

Total number of electricity consumers in the country as at early September 2020 is 7,159,728. This was 7,022,103 at the end of 2019. Accordingly, 137,625 numbers of new connections were provided during 2020. The numbers of consumers coming under different categories are given below,

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Electricity Consumer Base (Up to Sep. 2020)	
Domestic	6,188,169
Religious	43,878
General Purpose	850,094
Industrial	68,254
Government	4,626
Hotel	555
Agriculture	577
Bulk+ Street Light.	3,575
Total	7,159,728



4.2 National Energy Policy and Strategies of Sri Lanka

'National Energy Policy and Strategies of Sri Lanka' was first published in 2008 in Extra Ordinary Gazette No. 1553/10 of 10.06.2008. The Country was able to achieve several goals set in this policy document (2008) such as complete electrification and renewable energy development. This policy has to be reviewed and updated after three years. Accordingly, the National Energy Policy and Strategies were updated. This was a long outstanding task after public scrutiny and review by sector experts. New National Energy Policy and Strategies of Sri Lanka was then published in the Government Extra Ordinary Gazette No. 2135/61 on 09 August 2019 and was tabled in the parliament on 22 October 2019.

The main objective of National Energy Policy and Strategies is to ensure convenient and affordable energy services available for the equitable development of Sri Lanka using clean, safe, sustainable, reliable and economically feasible energy supply.

A National Steering Committee was appointed to monitor the implementation of this policy and to evaluate its impact. A Technical Working Group was appointed to assist the above committee in convening meetings and collation on Action Plans, Progress information and other correspondence with relevant agencies.

5 Progress in Power Sector during 2020

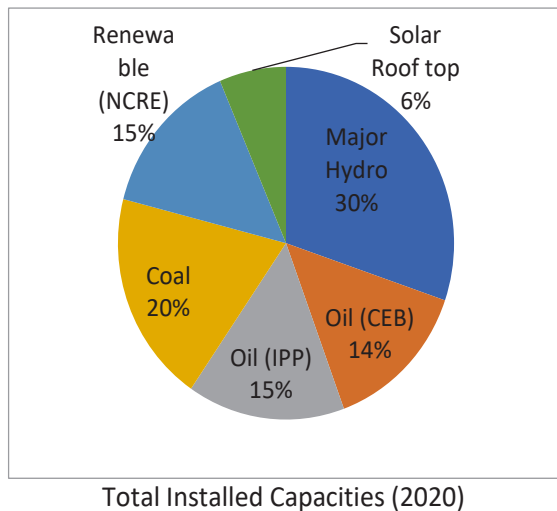
5.1 Electricity Generation, Access to Electricity and Reliability Improvement

The total Installed capacity of National Grid in 2020 is 4,623 MW, which is a 3.4% increase from last year due to renewable energy integration including solar rooftop electricity generation. 156 MW was additionally added to the system in 2020 when compared to the 2019.

Sri Lanka is a country blessed with an ample renewable energy resources, hydro being the main source. Other renewable sources such as wind, solar, dendro and biomass which is considered as Non-Conventional Renewable Energy (NCRE) sources are also used in power generation. Thermal Energy sources such as coal and thermal oil (Diesel and Furnace oil) are also used for power generation in power plants that are owned by the CEB and Independent Power Producers (IPP).

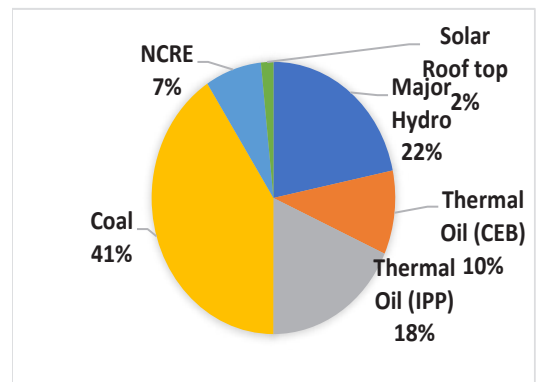
As at September 2020, a total of 297MW capacity of solar energy generated by rooftop solar systems have been added to the National grid through 27,261 systems and 62 MW of Solar Energy was generated during 2020 up to September.

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Source	Capacity (MW)	No. of Power Plants
Major Hydro	1,399	17
Thermal		
Oil (CEB)	654	9
Oil (IPP)	701	6
Coal	900	1
Renewable (NCRE)		
Mini Hydro	422.97	211
Wind	148.45	17
Solar (Ground Mounted)	63.36	20
Dendro & Biomass	38.11	12
Solar Roof top	297	
Total	4,623	293

10,725 GWh of electricity has been generated from January to early September 2020. As per the draft Long-Term Generation Expansion Plan of CEB for the period 2020-2039, the electricity generation for 2020 is forecasted as 18,542 GWh which will be reduced due to Covid-19 outbreak. By end of December 2019, 15,922 GWh of electricity has been generated. Out of the total energy generation this year, 41% has come from coal, 22% has come from hydro sources (Without Mini hydro) and 28% has come from thermal oil. The share of NCRE is 9%.



Energy Mix (up to September 2020)

5.1.1 Electricity Generation Expansions

The following electricity generation projects have been in different stages of implementation implemented during 2020.

• Renewable Energy Development

1. Major Hydro Power Plants

Moragolla Hydro Power Project (31 MW)

Moragolla power project is located in Ulapane area in Kandy District and constructed on the Mahaweli River Basin. It is expected to generate 100 GWh of energy annually. The project is funded by the Asian Development Bank (ADB). The ADB has provided a loan of \$ 113.86 million for the project under the “Green Power Development and Energy Improvement Investment Programme” in 2017. Preliminary work of the project was commenced in 2018. The current physical progress of the project is 26%. Construction progress is slowed down due to COVID 19 pandemic situation in the country. It is expected to complete the project and commissioned by November 2023.

Broadlands Hydro Power Project (35 MW)

The Broadlands Hydropower Project is a run-of-river type of project, planned to build in the Kelani river. The key objective of the project is to harness the hydro potential of the downstream of the existing Polpitiya Power Station. The project will have an installed capacity of 35 MW and expected to generate 126 GWh of electricity annually. The main sites of the

project are located near Kithulgala. The main components included in the projects are the main dam, diversion dam, main tunnel, diversion tunnel, power station with two 17.5MW Turbine Generator units, Switchyard and Transmission Line.

It was decided to maintain a firm water release to safeguard White Water Rafting sport in Kithulgala area and as a result, there will be a reduction in the annual energy generation. The water release is done through a Mini Hydropower Plant to minimize the loss of generation. The total original estimated cost of the Project is 82 USD Million. 85% of the cost is covered with a loan from Industrial and Commercial Bank of China (ICBC). Other 15% will be met by a loan from Hatton National Bank of Sri Lanka. However, the ICBC loan validity was expired in 16.12.2019 and now CEB is negotiating with Peoples' Bank to meet the balance funds required to complete the remaining work. 74% of the project has been completed and expected to be commissioned by early 2021.

Uma Oya Hydro Power Project (120 MW)

Uma Oya Multipurpose Development Project is being implemented by the Ministry of Irrigation and Water Management. The Project is located in the Welimada area in Badulla District.

The Project includes the components of construction of two dams across Uma Oya and a tributary at Welimada, trans-basin diversion tunnel, underground hydropower plant, diversion of 145MCM of water to irrigate approximately 5000 hectares of land in Hambantota and Monaragala Districts and other downstream requirements. The expected annual energy production is 290 GWh. The Total estimated cost of the project 514 USD Million. 94% of the construction is completed and expected to complete the project and connect to the National Grid by early 2021.

Seethawaka Ganga Hydro Power Project

The location of the project is Seethawaka Ganga tributary of the Kelani River in Seethawaka area in Kegalle District. Originally it was expected to implement 20 MW Hydro Power Plant. Feasibility of the project was completed and identified that the cost of the project will be 80 USD Million. CEB is of the view that the project is not economically viable with high cost. Hence, CEB is considering exploring the possibilities of implementing this project as a mini-hydropower Plant.

2. Wind Power

Mannar Wind Power Park (300 MW)

Sri Lanka's first large scale Wind Farm is Mannar Wind Farm which is located in the southern coast of the Mannar Island. As the first step, 100MW of wind power will be developed. The Project comprises 30 numbers of state-of-the-art wind turbines, each rated to 3.45 MW and the total installed capacity of this wind farm is 103.5 MW. This project is built to exploit the major monsoonal wind systems in Sri Lanka. It is expected to generate 400 GWh of electricity annually.

The total estimated cost of the Project is 200 USD million is met by a loan from the Asian Development Bank (ADB). The project commenced in March 2019 and the current progress of the project is 81%. The loan savings will be utilized to establish additional 20 MW Wind Power in the same location.

As the second phase, Sri Lanka Sustainable Energy Authority (SLSEA) has commenced the surveying of identified lands in the Mannar Island to develop additional 200 MW of capacity. The necessary activities are being carried out to conduct the Feasibility Study of the project.

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Hybrid Renewable Energy Park in Pooneryne (240 MW Wind and 150 MW Solar)

Pooneryne is an area with greatest wind power potential in South Asia. It is expected to develop 240MW wind power and 15MW solar power stations in this park with private investment.

The SLSEA has identified and surveyed the land required to develop the power park. A pre-feasibility study and the bird & bat survey have been completed. International Finance Corporation is in the process of preparing the Request for Proposals documents. ADB has agreed to provide financial assistance to conduct the Environmental and Social Impact Assessment and the Geo-Technical Survey.

Chunnakum Wind Power Plant (2 X 10 MW)

Two wind power plants each 10 MW in capacity were constructed and connected to the National Grid in June 2020 and Commercial operations are carried out as Independent Power Plants (IPP).

Small Scale Wind Power Plants (60 MW)

A total capacity of 60 MW (1-10 MW wind plants) wind power plants is expected to be developed in areas such as Mannar, Bolawatta, Madampe, Kappalthurai and Trincomalee using private investments. The procurement is under way.

3. Solar Power

Soorya Bala Sangramaya - Solar Roof Top Programme

This roof top solar programme was introduced in 2016 to help different segments of the community to join renewable energy-based power generation.

In 2019, Government introduced a low-interest loan scheme with the support of USD 50 Million loan from the ADB for domestic, industrial and commercial establishments to access funds for up to 50kW solar rooftop systems. By early September 2020, a total of 297 MW capacities of solar rooftops were connected to the National Grid through 27,261 systems all over the country.

Small Scale Ground Mounted Solar Power Plants (35X1 MW and 70X 1MW)

Under these two projects, a total capacity of 105MW ground mounted solar power plants will be developed as 1MW small plants through Private Investments. 16 plants have already been completed and connected to the National Grid. 26 plants are under construction and expected to complete in December 2020. Additional 10 power plants will be connected to the grid by March 2021 and 35 plants are expected to be completed by December 2021. The rest of the planned plants are experiencing issues such as land ownership, pending approvals from various authorities, financial issues etc. where the Ministry is paying attention to resolve.

10 MW Solar Plant in Pollonnaruwa (Kaduruwela) will be implemented with Aloe vera Cultivation. The Tender was awarded in 2020 and expect to be commissioned operations by 2022.

1-10MW Solar Power Plants (total of 150 MW)

A total of 150 MW of solar power projects with 1-10MW each are expected to be develop with private investments. Currently, the procurement process is in progress.

20MW Solar Power Plants – Valachchenai (10MW) & Vavunathevu (10 MW)

2X10 MW solar power plants in Valachchenai and Vavunathevu are expected to commence the construction. Currently those are in the process of getting necessary lands.

Siyambalanduwa Solar Park (100 MW)

This will be Sri Lanka's first large scale solar Park, established in Siyambalanduwa in Monaragala District with a capacity of 100 MW. A land of 500 acres has been identified for implementing the park. Pre-Feasibility Study has been conducted and the Environmental Impact Assessment is currently ongoing. The Asian Development Bank (ADB) has provided technical assistance to analyze the

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financial and technical aspects of the project and to develop Request for Proposals (RfP). ADB has developed a business model for the project incorporating transmission facilities. It is expected to generate 148 GWh of electricity annually by the project.

Solar Power Projects under the Indian Line of Credit

The Government of India has agreed to provide a credit line of USD 100 Million by Indian Exim Bank for the solar power development project. Under this project, it is expected to implement rooftop solar on Government buildings, experiment floating solar projects and introduce solar with energy storage for low income families. The project expected to commence in early 2021.

4. Mini Hydro

Mini- Hydropower Plants having capacities of 11.84 MW are under construction through private investments and expected to connect to the National Grid by December 2020. A further 12.4 MW capacities of Mini-Hydropower Plants will be connected to the Grid by end of 2021.

5. Biomass

Currently, 38.11 MW has been connected to the National Grid through 12 Plants and 10 MW will be expected to connect to the system by 2021.

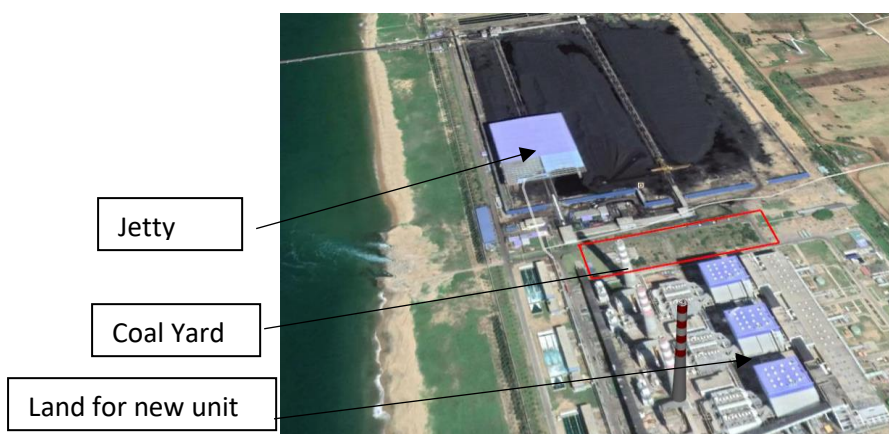
6. Waste to Energy

CEB signed Power Purchase Agreements (PPA) for the two Waste to Energy (WTE) power plants in the Country. 10 MW Muthurajawela WTE Power Plant is under construction and 90% of the construction is completed. It is expect to be commenced the commercial operations by end of 2020. 10 MW Karadiyana WTE power plant is expect to be completed in November 2021.

• Thermal Power Generation

1. Norochhole Lakwijaya Coal Power Plant – 300 MW extension

It is proposed to extend the 900MW Lakwijaya Coal Power Plant in Norochhole by adding another 300 MW unit as a joint venture between CEB and China Machinery Engineering Corporation who completed the other three coal plants in Norochhole. Environmental Impact Assessment of the Project is in progress. It is expected to x completed the project by 2023.



2. First 300 MW Liquefied Natural Gas (LNG) Power Plant - Kerawalapitiya

The first LNG fired Combined Cycle Power Plant with 300 MW capacity will be implemented in Kerawalapitiya. This plant will function as an Independent Power Producer (IPP). Procurement process has been completed. Implementation of this plant was delayed due to court cases. The contract of the construction of power plant to be awarded and expected to commence the commercial operations in 2023.

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3. Second 300 MW Liquefied Natural Gas (LNG) Power Plant in Kerawalapitiya.

This power plant is also expected to be constructed in Kerawalapitiya. The Cabinet of Ministers has given the approval to go for open competitive bidding process for the selection of a suitable contractor for construct the power plant as an IPP.



Location of First & Second LNG Power Plants

4. 130 MW Gas Turbine Power Plant in Kelanithissa.

This power plant is planned as a peaking plant and to restore electricity supply to Colombo City during emergencies. Total estimated project cost is USD 70 Million. This power plant will be commissioned in 2021 and presently CEB is seeking funds for the implementation of this project.

5. 4X24 MW Reciprocating Engine Power Plants (for Habarana, Monragala, Horana and Pallekelle Grid substations)

These plants are planned to complete the tendering process and commissioned by 2022. Currently, CEB is in the process of preparation of request for proposals (RFP).

6. 100 MW Reciprocating Engine Power Plant at Galle

The CEB has planned to implement this project in Galle. The Ministry has requested CEB that the technology and fuel option to be kept open and allow use capacity range 100-200MW. CEB is in the process of amending the bidding documents accordingly.

7. LNG Supply and Infrastructure

For the supply of LNG to the proposed power plants, the following projects have to be completed.

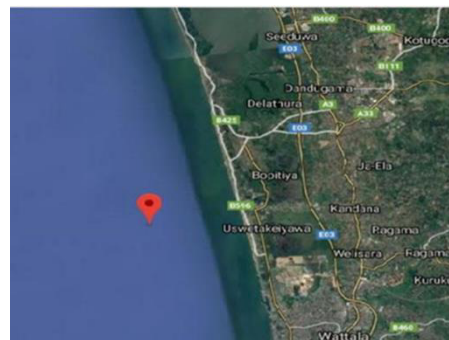
- Deployment of floating Storage Regasification (FSRU) and mooring system at kerawalapitiya. As a Built Own Operate (BOO) basis by CEB. RFP documents are prepared by CEB with the assistance of the consultants appointed by Asian Development Banks. (ADB)
- Construction of Gas Pipeline from FSRU to the power plants. Responsibility of construction of the Gas pipeline is on the Ceylon Petroleum Corporation (CPC).
- LNG supply – the CEB will be given a special licence by the Minister of Energy for 5 years for the supply of LNG for the power plants

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The commercial operations of the above project is expected to commence in 2024.



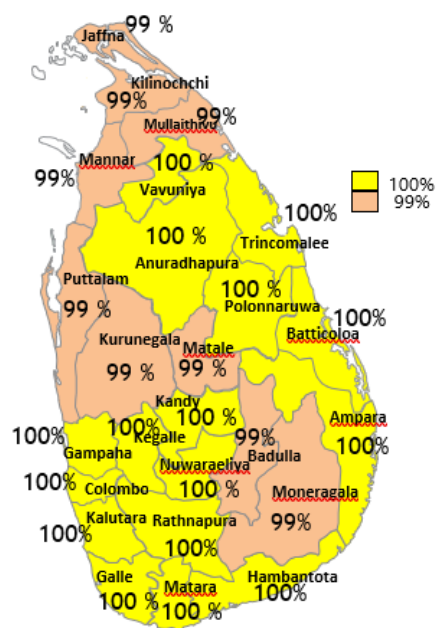
FSRU



Kerawalapitiya, Place where FSRU will locate

5.1.2. Enhance Electricity Accessibility

Present Electrification rate of the country is 99.9%. Accessibility to electricity is 100% of the country. There have been 137,625 new electricity connections given during 2020 up to the Month of September.



5.1.3. Electricity Transmission & Distribution Projects Development

Our Transmission Network is consisting 748km of 220kV transmission lines and 2,242 km of 132kV lines. There are 75 Grid substations in the network and 134 primary substations. Operations of the transmission network are carried out by CEB.

The Distribution Network consists of 32,682 km of 33kV lines, 2,312 km of 11 kV lines and 150, 169 km of low voltage lines and 33,476 Distribution Grid Substations.

To ensure reliable quality and uninterrupted power supply, as well as to absorb more renewable energy to the system, transmission network developments are carried out frequently. Most of these developments are done with the assistance of the ADB, JICA and AFD.

The following projects are being carried out in 2020. There are 20km of 400 kV transmission lines, 691km of 220 kV lines and 585km of 132 kV line will be completed by implementing the following ongoing projects.

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		Project	Total Estimated Cost (RS Mn)	Current Status	Commissioning year
		ADB Funded			
1		Clean Energy & Network Efficiency			
	1.1	Mannar Transmission Infrastructure. Lot A: Augmentation of Vavuniya 132/33kV Grid Substation & Construction of Mannar 132/33 kV grid Substation Lot B: Construction of new Anuradhapura to vavuniya 55km Transmission line & Vavuniya to Mannar 70km, 132 Transmission line.	4,149	Lot A: Substation Energized on Feb 26, 2020, and rectification of defects ongoing. Lot B: 100% Completed in 2019	Commissioned on 26.02.2020
2		Green Power Development and Energy Efficiency Improvement Investment (Tranche I)			
	2.1	Transmission Infrastructure Capacity enhancement Lot A: Construction of Kappalthurai 220/132 kV GSS and Augmentation of Kerawalapitiya, Katunayake, Trincomalee GSS Lot B1: Augmentation of New Anuradhapura Gs and Construction of Kesbewa, Kaluthara Old Anuradhapura GSS Lot B2: Construction of 132kV Transmission lines in Kappaithurai, Kalutara, Kesbewa and Old Anuradhapura.	5,923	Lot A: 91% Lot B1: 71% Lot B2: 100%	Lot A: 31.12.2020 Lot B1: 31.12.2020 Lot B2: Completed 15.02.2020
3		Green Power Development and Energy Efficiency Improvement Investment (Tranche 2)			
	3.1	Hambantota 220kV Development Lot A - Hambantota Grid Substation 220kV development Lot B - New Polpitiya-Hambantota 220kV, 150km transmission line	7,660	Lot A: Physical progress 45% Lot B: Physical progress 51%	Lot A: 03.12.2020 Lot B: 23.01.2021
	3.2	Mannar - Nadukuda Transmission Development Lot A - Construction of Nadukuda 220/33 kV Grid Substation, Augmentation at Mannar 220/33kV Grid Substation, Lot B1 - Mannar - Nadukuda 220kV, 30km transmission line Lot B2 A: (AFD)- Padukka - Horana 132kV, 25km transmission line Lot B2B: (AFD) 2nd cct stringing of Habarana-Valachcheai 132 kV Tra.line	5,172	Lot A: Physical progress 80% Lot B1: Physical progress 100% Lot B2A : 8% Lot B2B: Physical progress 23%	Lot A: 30.12.2020 Lot B1: 30.12.2020 Lot B2: April 2022

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	3.3	Construction of Colombo B GSS Single In & Out Connection from Colombo C - Kolonnawa 132kV 800mm ² Cable Augmentation at Colombo C and Kolonnawa Grid Substations (AFD)	1,261	Commencement on 15 Oct. 2019. Progress 26%	14 Oct. 2021
	3.4	Augmentation of Kotugoda Grid Substation, Kolonnawa Stanley GS, Padukka Switching Station, Horana GS, Dehiwala GS, Madampe GS	1,663	Commencement on 22 Oct. 2018. Progress 50%	21 December 2020
	3.5	Construction of Biyagama 220/33kV GSS Augmentation of Biyagama Grid Substation	1,434	Progress 49%.	20 January 2021
	3.6	Package 7 - Lot A1: Installation of 100 MVAR BSC at Pannipitiya Grid Substation Lot A2: Installation of Static Var System (SVS) at Biyagama Grid Substation	2,692	Lot A1: Progress :16% Lot A2: Contract Agreement was signed on 07th July 2020.	Lot A1: 2021 Lot A2:2022
	3.7	33 kV distribution Tower Lines and Gantries	5,330	Physical progress: 13%	June 2021
	3.8	300 kVA Micro Grid Pilot Project – LECO	277	Progress is 40%	December 2022
4	Electricity Supply Reliability Improvement Project				
	4.1	Construction of 300 km long 33kV tower lines and 13 no. of 33kV switching gantries	7,350	Physical Progress 19%	06 July 2021
	4.2	Supply and Delivery of Material for rural electrification network extended and distribution performance monitoring	1,646	Progress 94%	December 2020
	4.3	Construction of Wind, Solar and Diesel Hybrid renewable energy Power Plants in three islands (Nainativu, Analitivu, Delft)	1,980	Contract to be awarded	March 2022
	4.4	Awareness on energy saving for households in above 3 islands	112	Progress 70%	December 2020
	AFD Funded				
1		Renewable Energy Absorption Transmission Development Project (Construction of new Grid Substations at Maliboda, Wewalwatta, Nawalapitiya and Ragala)	6,228	Progress: 87%	December 2020
	JICA Funded				
1		Habarana - Veyangoda 220 kV Transmission Line Lot B: New Habarana Veyangoda 220 kV Transmission Line (JICA) Lot A: Construction of New Habarana 220/132/33 kV Switching Station	12,960	Lot B: Progress 82% Lot A: Progress 70%	March 2021
2		National Transmission & Distribution Network Development		13.4% completion.	December 2022

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5.1.4 Reliability and Efficiency Improvement of Power Sector

Ministry is facilitating CEB to carry out necessary activities to reduce the Technical & Commercial Losses of the System to 7.5% by 2025. Accordingly, necessary Grid Substation Augmentation work and reconstructions of existing transmission lines are carried out in order to enhance the reliability and efficiency of the Network.

Currently, Technical and Commercial losses of the power system have been reduced to 8.35% from 9%.

Several New Grid Substations are constructed and existing Grid Substations are being augmented to improve the system reliability.

Province	New Grid Substation	Augmentation of GSs
Western Province	Padukka Kesbawa Kalutara Kirindiwela Battaramulla	Pannipitiya Kosgama Rathmalana Veyangoda Pannipitiya Kerawalapitiya Katunayaka
Northern Province	Nadukuda	Mannar Chunnakum Vavuniya
North Central Province	Old Anuradhapura Habarana	New Anuradhapura
North Western Province	Madampe Tulhiriya Pannala Bolawatta	
Central Province	Polpitiya Nawalapitiya Wewalwatta	Naula Ukuwela Kothmale
Sabaragamuwa Province	Maliboda	
Eastern Province	Kappalturei	Trincomalee
Southern Province		Hambanthota Ambalangoda

5.2 Demand Side Management of Energy

Operation Demand Side Management Programme is carried out by the SLSEA. Progress of 2020 as follows,

Thrust Area	Work Carried Out
Efficient Air Conditioning	Specification and funding proposal for an AC test facility were prepared and submitted to several donor agencies. The proposal was sent to ERD approval.
Efficient Refrigerators	Bidding documents is being prepared for the procurement of refrigerant cylinders for the pilot study under the refrigerator replacement programme.
Efficient Chillers	TERMS OF Reference (TOR)s being prepared for the chiller survey.
Efficient Fans	Data validation of the household appliance survey was completed and data migration to Department of Census & Statistics is in progress.
Smart Homes	Booklet on Energy Efficient practices in the domestic sector is published.
Eliminating Incandescent Lamps	Phase 1 of the LED distribution programme is completed.

5.3 Development of Smart Grid

The development of Smart Grid has been a topic of much interest recently. It offers many advantages in terms of optimizing the performance of electricity networks, especially for more complex and decentralized networks. It is expected to use digital and other advanced technologies to monitor and manage the transmission of electricity from all generation sources to meet the varying electricity demands of end-users. This will minimize costs and improve system efficiency, reliability, resilience and stability.

The plans are underway for the expansion and modernization of grid as a smart grid to enhance reliability and to integrate large quantities of renewable energy. Already both CEB and LECO are implementing internet-based service delivery systems and plan to introduce an array of digital services to the customers within year 2021. The project for the introduction of Enterprise Resource Planning Systems for the CEB will commence the implementation by the end of the year.

Smart Grid Roadmap is prepared and Implementation is already in progress in reference to smart metering, advanced distribution management system, GIS mapping-based resource management, advanced forecasting technologies etc.

The Micro Grid pilot project has been initiated with grant support from the ADB and that will ensure enhanced reliability to the customers.



Diagram of a typical Smart Grid

5.4 Climate Change Activities

5.4.1 Nationally Determined Contributions (NDCs)

Green House Gas (GHG) in the power sector in Sri Lanka has recently been on an increasing trend due to the use of petroleum-based fuels for electricity generation. In accordance with COP 21 Paris Agreement, Sri Lanka committed to 4% unconditional and 16% conditional reduction of CO₂ emissions in the Power Sector from Business as Usual (BAU).

GHG emission reduction in the power sector is to be achieved by enhancing renewable energy contribution to the power generation mix and to promote energy efficiency through implementing Demand Side Management (DSM) measures, improving transmission and distribution networks and introduction of natural gas (NG) based power generation to the country. Ministry with relevant Institutions is in the process of updating the power sector National Determined Contributions (NDCs) in order to forward the same to the UNFCCC through Climate Change Secretariat of Sri Lanka this year.

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5.4.2 Carbon Partnership Facility (CPF Programme)

Ministry facilitated and coordinated the activities related to the CPF programme in order for CEB act as a seller of Carbon. World Bank has agreed to provide the Technical Assistance for this programme. As per the request of the World Bank, couple of discussions were held at the Ministry of Finance to develop a mechanism to obtain carbon credits. Accordingly, Ministry was able to finalize the mechanism to receive Carbon Credit in collaboration with the Ministry of Finance.

6 Projects Planned for 2021

6.1 Electricity Generation - RE plants, thermal and LNG power plants

- **Thermal Power Plants**

1. LNG Plants in Kerawalapitiya as IPPs

Sri Lanka's first LNG power Plant with 300MW capacity will be established in Kerawalapitiya in November 2020. Further, the contract will be awarded to the second 300MW LNG power Plant during 2021.

Further, it is expected to implement a 300MW LNG power plant with an identified investor from Japan. Currently, the CEB is in the process of holding discussions in this regard with relevant stakeholders.

The CEB is currently holding discussions to implement a Joint Venture Business between National Thermal Power Company of India and CEB to establish a 500MW LNG plant in Kerawalapitiya.

2. LNG Supply and establishment of the Infrastructure

Deployment of FSRU will be done using Built-Own-Operate (BOO) and the Mooring System using Built-Own-Operate-Transfer (BOOT) basis by the CEB. The RFP documents are prepared by CEB with the assistance of the ADB. It is expected to start the bidding process in December 2020.

3. 300 MW extension to Lakwijaya Coal Power Plant –

The Environmental Impact Assessment of the Project is in progress. It is expected to commence the project preparatory activities soon.

- **Renewable Energy Power Plants**

Together with the State Ministry of Solar, Wind and Hydro Power Development, the Ministry will be implementing the following renewable energy development projects

1. Major Hydro

It is expected to commence the commercial operations of 120 MW Uma Oya Hydropower plant and 35 MW Broadlands Hydropower Plant by 2021. The constructions of 31 MW Moragolla Power Plant will be carried out during 2021.

CEB is exploring the possibility of implementation of Seethawaka Power Plant as a Mini-Hydropower Plant, which is originally expected to be constructed as 20 MW HPP.

2. Wind

Mannar Wind Park

All 30 wind turbines are expected to add the total planned capacity of 100MW in Mannar Wind Power Park by the first quarter of 2021. Further, procurement will be completed and contracts will be awarded to construct 6 more wind turbines in the same location to enhance capacity by 20MW using the savings of a ADB loan. In addition to the above, during 2021, it is expected to complete the land survey and feasibility study to develop 200MW of additional wind power in the Mannar.

Pooneryne Hybrid RE Park

The land acquisition activities relevant to Hybrid RE Park in Pooneryne are expected to commence during 2021. The selection consultants for the Environmental and Social Impact Assessment (ESIA) and Geo-Technical Survey is expected to be commenced with ADB financing in early 2021 and complete within 2021.

Other Wind capacity additions

The contract awards are planned under the tenders floated this year to develop 60MW of wind power.

3. Solar

Siyambalanduwa Solar Park

The Environmental Impact Assessment to develop 100MW solar power Park in Siyambalanduwa will be completed in 2021. It is planned to get already identified lands for the project by making suitable arrangements to compensate the affected parties.

Hybrid RE Park in Pooneryne

In parallel to the Wind power development in Pooneryne Hybrid Park, it is expected to complete the Economic and Social Impact Assessment and land acquisition in 2021 to develop 150 MW Solar park.

Small Scale Solar Power Plants

It is expected to complete the construction of 10X1 MW power Plants and connect to the system by March 2021. And 35X 1 MW power Plants will be expected to complete the construction by December 2021.

It is planned to award the contracts for selected successful developers under the tender floated for a total of 150MW solar capacities in 2021 and commence the project constructions.

Solar Power Projects which will be implemented by using the Indian Credit Line

During the period 2021-2023, the US\$100 million of Indian Line of credit line will be utilized to install rooftop solar on Government buildings, experiment floating solar projects and introduce solar with energy storage for low income families.

4. Mini-Hydro

12.4 MW capacities of Mini- Hydropower Plants are under construction and expected to connect to the National Grid by December 2021. The Standard Power Purchase Agreement (SPPA) was signed for 82 MW (49 Projects) to connect to the system within the period of 2022-2024.

5. Biomass

During 2021, 5MW capacity of Biomass power Project has been planned to connect to the National Grid under the supervision of SLSEA.

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6.2 Access to Electricity & Reliability Improvement (Transmission & Distribution)

In order to strengthen the Transmission Network and to supply reliable, quality and uninterrupted power supply to all the consumers in the country, the following Transmission & Distribution Projects are planned for 2021.

Project	Estimated Cost USDM
1 Construction of Kerawalapitiya - Port 2nd 220kV Cable	42.32
2 Construction of Colombo G 220/132/11 kV Grid substation	91.41
3 Construction of Sub K (Wellawatte)	27.66
4 Construction of Sub P (Narahenpita)	27.60
5 Construction of Sub Q (Town Hall)	11.27
6 Construction of Dehiwala - Ratmalana 132kV Underground Cable	14.74
7 Construction of Homagama 132/33 kV grid substation	10.84
8 Construction of Hambantota-Matara 132kV Transmission line	18.99
9 Construction of Kotugoda 220/33kV Grid substation	11.52
10 Distribution System Reliable Strengthening Project	54.86
11 Construction of Tissamaharama 132/33 kV grid substation	11.34
12 Construction of Kandy City 132/11 kV Grid substation	19.04
13 Construction of Mirigama 220kV Switching Station & Kotadeniyawa 220/33kV grid substation	26.91
14 Construction of Kalawana 132/33 kV grid substation	13.52
15 Construction of Wariapola 132/33 kV grid substation & Wariyapola-South 220/132kV Switching Station	38.35
16 Construction of Paliyagoda LECO 132/11 kV grid substation	9.75
17 Construction of Negombo 132/33 kV grid substation	12.63
18 Construction of Baddegama 132/33 kV grid substation	11.26
19 Reconstruction of New Habarana-New Anuradhapura 220kV transmission line	13.46
20 Construction of Biyagama Zone 132/33 kV grid substation	10.87
21 Construction of Welimada 132/33kV grid substation	7.96
22 Construction of Weligama 132/33 kV grid substation	8.22
23 Construction of Keeriyankalliya 132/33kV grid substation	24.77
24 Augmentation of Athurugiriya 132/33kV Grid Substation	2.80
25 Augmentation of Kesbewa 132/33kV Grid Substation	2.83
26 Augmentation of Valachchena 132/33kV Grid Substation	2.80
27 Construction of Yakkala 132/33 kV grid substation	11.67
28 Augmentation of Kalutara 132/33kV Grid Substation	2.83
29 Augmentation of Kirindiwela 132/33kV Grid Substation	2.83
30 Construction of Kerawalapitiya-Kirindiwela 400kV TL	34.44
31 Construction of Ethimale Solar Collector Grid Substation	25.98
32 Vavuniya Grid Substation 220kV Development	15.82
33 Development of N-Collector Grid Substation	61.09
34 Construction of Ginganga 132/33 kV grid substation	3.92
35 Power transmission facilities related to 2x300MW New Coal Plant – Trincomalee	111.82
36 Transmission Development for Interconnection of 100MW Solar at Pooneryn	11.06

6.3 Budget proposals 2021

i. 100 kW Solar Plant Programme connected to CEB Distribution Transformers.

There are about 30,000 number of distribution transformers in CEB and the majority of them having the capacity of 100 kVA. There is a possibility to utilize these capacities to connect solar plants to the system to get the maximum use of the transformers by absorbing solar energy. A new project for the construction of 10,000 Nos small scale ground base solar PV power plants of 100 kW in capacity in close proximity to the existing distribution substations in rural areas through private sector was also initiated during the year and the project will be launched towards the end of the year. Accordingly, 750 MW will be connected to the system during the period of 2021-2023. The local developers and investors will get opportunity for implementation of the project.

ii. Solar Power Generating Facilities for Low-income Households

It was proposed to provide rooftop solar systems for 100,000 low-income households. It is expected to provide 5kW capacity rooftop solar system to one family and thereby 500 MW can be generated within 100,000 households. Accordingly, the quality of life of low-income households will be improved by generating additional income through this programme. It is expected to implement the programme in 2021.

iii. Opportunity for Private Investors to install the solar rooftop systems on Government Buildings

The Ministry is expected to provide the opportunity for private investors to generate solar power by installing solar rooftop systems on Government buildings under the condition of providing 15% of the income generated by the solar power to the respective government Institutions. This programme can be implemented without any burden to the National Budget. It is planned to implement the programme in collaboration with CEB, LECO, SLSEA and government institutions from 2021.

iv. Solar Power for the Agricultural Sector

The cost of the Agro products is high due to the high cost of electricity which is used for the production process of the Agro products. Hence, this Ministry has planned to provide Solar water pumps having 1kW capacity for respective farmers. The suitable farmers will be identified by the respective Divisional Secretariats. It is proposed to provide a 50% subsidy out of the total cost of this solar system to farmers by the government and the balance has to be bear by the farmer. The Ministry has requested LKR 300 Million from the National Budget 2021 to implement the project.

V. Solar Systems with Energy Storage system Facilities for the Religious Institutions.

Religious Institutions are given subsidised electricity at a cost of Rs 9.40 for one electricity unit. CEB spends Rs. 23.64 for generating one electricity unit and CEB spends approximately another Rs. 6.00 as per transmission and distribution cos.

In this context, the Ministry has planned to provide solar rooftop systems with battery systems (ESS) for religious institutions to reduce the cost of supplying electricity. It is expected to provide a Solar Rooftop system with ESS to the 400 Religious Institutions. Thereby enable the Electricity to be stored in the ESS which is generated during the day time and make use of them during the night time. The Ministry has made a request to allocate LKR 500 Million from the National Budget 2021 to implement this project.

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7 Challenges Faced during 2020 and the strategies used to Overcome such Challenges

	Challengers	Strategies used to Overcome
1	Land issues in generation and transmission projects	
	Delay in the acquisition of land	Appointment of a land task force under the Ministry to obtain assistance of the Ministry of Land
	Difficult to resettle people due to insufficient compensation payment	Proposed to gazette the projects that are needed compensation payment under LARC and Super LARC, so that the compensation payment is more attractive
	Charging a Royalty by the Mahaweli lands /water bodies identified for power projects	Discussions held with the Ministry of Irrigation and arrive at amicable solutions
2	Financial Constraints of the CEB and the requirement of substantial Investment required for the Power Generation and Transmission projects	Instead of obtaining loans, to promote investments where possible (attract investors for the generation projects and seek bilateral and multilateral funds for the construction of transmission and distribution lines where investors cannot be attracted)
3	Minimize the cost of power in order to maintain the international competitiveness of the industrial production process	Diversification of Energy mix by scaling up of Renewable Energy, introducing LNG, developing Coal. Reduce transmission and distribution losses by strengthening Transmission Network. Timely implementation of generation projects
4	Issues related to implementation of Renewable Energy projects	
	Complicated approval process, with so many approvals needed (CEA, Forest Dept, Wildlife Dept, Coast Conservation Dept, MASL, GSMB, NBRO, Agrarian Services, Land Commissioner, Irrigation Dept) Although the Project Approving Committee under the SEA was established, it does not resolve the issue	Give a limited time to every organization to respond to the requests and, close monitoring. For large RE projects (mainly for RE Parks and floating solar projects) the State Ministry to get the sites clear with all necessary approvals and prepare the land/ water body for the bidders to come in. (To include a condition in the bid document that, whatever the fee has to be borne by obtaining such approvals to be borne by the selected bidder)
	Slow moving of RE Projects	CEB to publish grid availability regularly. Regular tendering for RE projects by the CEB and introduce feed-in tariff where appropriate, until the next tender is floated
	Reduce intermittence nature of solar power generation	Introduce battery- Started a pilot project with SL Nano Technology Institute and LECO to produce affordable prices producing batteries
	Scarcity of lands for RE projects	Requested Irrigation, Mahaweli Authorities to identify bear lands and water bodies (reduce evaporation, lower algae formation etc) suitable for RE development and inform us so that the approvals can be obtained for the entire land/ water body, by SEA

Ceylon Electricity Board

Introduction

Ceylon Electricity Board (CEB) is a state owned enterprise established by the Act No. 17 of 1969 dated November 1, 1969 and as amended by Act Nos. 31 of 1969, 29 of 1979, and 32 of 1988. Sri Lanka Electricity Act No. 20 of 2009 as amended by Act No. 31 of 2013 brought CEB under the regulatory purview of the Public Utilities Commission of Sri Lanka (PUCSL). CEB is empowered to generate, transmit and distribute electrical energy to all categories of consumers, to collect revenue as per a cost reflective end user tariff approved by the PUCSL and to perform its functions as provided under its Act and in accordance with the licenses issued by the PUCSL so to ensure that the total revenue of the Board is sufficient for all its activities.

Vision

Enrich Life through Power

Mission

To develop and maintain an efficient, coordinated and economical system of electricity supply to the whole of Sri Lanka, while adhering to our core values; Quality, Service to the Nation, Efficiency and Effectiveness, Commitment, Safety, Professionalism and Sustainability.

Goals

CEB recognizes eight goals for the Corporate Plan 2019-2023 by giving due consideration to the Sustainable Development Goals (SDG) issued by the United Nations. Following are the eight *Goals* formulated in order to realize the organization's long-term Vision and Mission.

- Making CEB Financially Stronger
- Enhancement of low cost energy generation
- Electricity to entire country at an affordable price
- High quality electricity supply and services to customers
- Stronger relationship with external stakeholders
- Enhanced employee engagement
- Operational excellence with state of art technology
- Optimizing integration of green energy

Environmental Sustainability

We are committed to be an innovative enterprise in Sri Lanka, whilst safeguarding our environment for the future generations. Best environmental management practices are adopted throughout the CEB to ensure its complete compliance with relevant environmental legislation and regulatory standards while building the trust and confidence of the community in CEB's operations. We conduct our business through a participatory approach involving the community and other stakeholders in all stages of our development projects to ensure the optimum benefit to the community in the long run.

1. Overview of Electricity Supply

CEB's annual expenditure on generation significantly varies with the amounts of electricity generated from thermal power plants of both CEB and Independent Power Producers (IPP) due to variations in available hydro reservoir capacities. The securing of fuel supplies both coal and liquid fuels, has a direct impact on the operation of thermal power stations and also very important in managing the finances of the CEB. However, the demand for electricity is growing at a rate of about 5 % per year which requires the addition of about 100 MW of capacity annually to the existing installed generation capacity. The CEB needs considerable investment for the development of its transmission and distribution network, for the expansion of CEB's present electrical network to cater to the increase in demand, due to expansion of economic activities and also to cater the demand due to new consumers. Rural Electrification, being directed towards improvement of the quality of life of rural people and economic development of rural areas, the GOSL need to continue to compensate the CEB through investment or operational support, whenever such projects become commercially non-viable.

2. Improved Reliability and Customer Care

With the scheduled conclusion of CEB's drive to electrify whole of Sri Lanka, (by the end of 2019 achieved 99.6%), CEB shifted its focus to improve the quality of services offered by CEB to win the hearts & minds of consumers. To instigate the transformation of CEB to be a more consumer friendly organization, a list of novel customer services initiatives was identified. This list included many mobile and Internet based services, aiming at the IT savvy and busy modern day consumer. CEB also launched a major training drive to train CEB's key customer interface staff on Customer Service.

2.1 Customer Care Activities

- Customer mobile phone numbers collection campaigns were commenced in 2016 to improve the reach of CEB SMS alert service; informing planned supply interruptions via SMS, pre warning consumers on disconnections (due to delay in bill payment) a day before the scheduled disconnection. At present, interruption CEB SMS alert service operates island wide.
- New improved Customer Information System named “*CEB Assist Solution*” was developed in-house and introduced in all provinces to improve outage management, interruption management, customer relationship, workforce management, Service Order Management etc. This solution ensures real-time information availability and empowers the customer with up to date information on their service request.
- “*CEBCare*” mobile application was introduced in 2019 for CEB Customers to improve the customer care service quality. This mobile application enables users to interact with CEB online, for their service requirements.

In addition, this app provides other facilities such as real-time alerts on interruptions & service request status, online bill payment etc.

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- Customer Relationship Management (CRM), service request handling workflow and customer complaint *LiveTrack* facility were introduced to CEB Assist Solutions during the year 2020. These facilities enable self-service options for customers to interact with CEB in real-time, avail services and track service request status.
- “*CEBAssist*” interruption planning module was introduced to digitize distribution maintenance and schedule interruption planning operations. This module enable CEB to optimize the frequency of interruptions and pre inform all effected customers in advance.
- “*DisconnectionAssist*” system was introduced to assist revenue management and disconnection operations. This system facilitates to ensure hassle-free disconnection operation with real-time payment information.
- “*MeterAssist*” mobile application was introduced for Meter Readers to collect and update meter readings. This was aimed to reduce the lead-time in updating readings to central billing systems and providing accurate billing information to customers.
- CEB Online payment system revamp with multiple payment gateways with instant payment options. In addition, online payment facility was extended to *CEBCare* Mobile App.
- More banks and supermarket chains were included to third-party payment collection system. Also, third-party payment collection system was revamped to accommodate online real-time account update for third-party payment collections.
- Customers can now pay their electricity bills using the major Mobile payment platforms operating in Sri Lanka. Payments can also be made via *CEBCare* mobile app at the convenience of the customer. All major mobile payment platforms now have integrated customer verification and bill settlement of CEB customers.
- New drive through payment counters were introduced to ease the bill payment facility. In addition CEB *Point of Sales* system and PIV system were revamped to accept PIV payments from People’s bank and update central systems in real-time.

3. Electricity Demand

During the first seven months of 2020, the demand for electricity was decreased by 3.54%. Only the demand in the domestic sector shows an increase of 7.79%, while all other sectors show a decrease (Hotel sector- 26.75%, Industrial sector -10.20% and etc.) and this was mainly due to the Covid -19 Outbreak. The maximum demand recorded during this period was 2,717.46 MW (11th March 2020) as against 2,668.70 MW last year. During this 7 months’ period 8,925 million Units (GWh) were generated and 8,218 million Units (GWh) sold.

By end of July, the total generation stood at 8,925 GWh, of which 25% has come from Hydro generation (including mini hydro) with that of Coal power generation standing at 40%. Thermal Oil had contributed to 30% of total energy generation (total thermal power standing at 70%). Other renewable sources (excluding mini hydro) had a share of 5%. In comparison, by end July 2019, contribution from Hydro generation was 21%.

3.1 Electricity Demand Forecast for 2021

For year 2021 the electricity demand forecast based on approved CEB Long Term Generation Expansion Plan 2018-2037 is as follows:

Year	Demand		Generation		Peak (MW)
	(GWh)	Growth Rate (%)	(GWh)	Growth Rate (%)	
2021	17,478	5.0%	19,370	5.0%	3,208

It is projected an average growth rate of 5.0% for Electricity Demand up to 2021 and 5.0% average growth rate for the 20 year planning horizon.

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4. Energy Conservation

CEB engages with utility based Demand side Management (DSM) Programmes. A Load Research Program (LRP) was conducted in Eastern Province to develop end-use load profiles of retail consumers of CEB to understand the consumer consumption patterns. Necessary measures were taken to initiate Load Research Program (LRP) in selected Province(s) after analyzing data gathered from the LRP program conducted in Eastern Province to identify suitable DSM programmes to be initiated and to formulate end-user's tariffs effectively.

ADB funded smart metering pilot DSM project was commissioned in July 2019 and 1,000 Nos. smart meters were installed under the pilot project. DSM Unit is monitoring the data receive from the pilot project and is analyzing the monitored data. This project will be expanded to 10,000 smart meters in Katunayake geographical area.

CEB conduct energy audits and energy efficiency awareness programs among bulk customers. Further, CEB is conducting awareness programmes on Energy Efficiency for bulk customers to encourage rational use of energy. A training programme on energy auditing was conducted for the relevant staff of Central Province and a sample Energy Audit was conducted at Giragama Tea Factory, Pilimathalawa as a part of this training.

Following DSM activities are proposed to implement in CEB in year 2021:

- Free energy audit for 5 top most energy consumed customers
- Equipment load profile survey
- Implementation of Micro Grid

5. Power Generation

The Generation Division of Ceylon Electricity Board is responsible for the operation and maintenance of Thermal and Hydro Power Plants owned by CEB. Generation Assets consist of 17 large Hydro Power Plants totalling to an installed capacity of 1,399 MW, one (01) 900 MW Coal-fired Power Plant, Thermal Power Plants with an installed capacity of 654 MW consisting of seven large oil-fired power plants with 604 MW, and 50MW oil-fired plants of 1 MW each.

CEB also operates few power plants in the isolated networks in surrounding islands of Jaffna Peninsula. Thus the total installed Capacity of CEB-owned Power Plants as at 30th July 2020 were 2,953 MW.

Generation details of CEB and Private Power Producers up to 31st July 2020 is given below.

For the 07 months ended 31st July 2020; the total generation stood at 8,925 GWh, of which 21% has come from major hydro generation, while the share of Coal power generation standing at 40%. Thermal Oil had contributed to 30% of total energy generation (total thermal power standing at 70%). Other renewable sources had a share of 9%. In comparison, contribution from major hydro for the same period during 2019 was 16%.

	Description	Generation (GWh)
CEB	Hydro	1,853
	Thermal - Coal	3,559
	Thermal - Oil	930
IPP	NCRE (Small Hydro)	422
	Thermal	1,756
	Wind	128
	Solar (Grid Connected)	68
	Solar (Rooftop)	154
	Dendro & Bio Mass	55
	TOTAL	8,925

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6. Expansion of Generation Capacity

The implementation of the new Generation Projects is going ahead as envisaged in the CEB's approved Long Term Generation Expansion Plan (2018 – 2037).

The current status of Generation Expansion Projects is as follows.

6.1 Hydro Power Generation Expansion Projects

Uma Oya Hydro Power Project

The Uma Oya Multi-Purpose Development Project is being implemented by the Ministry of Irrigation and Water Resources Management in association with the Ministry of Power and Energy. The estimated capacity of the power plant is 120 MW (2x60MW) and the expected annual energy production is 290 GWh. This power plant will connect to the national grid through Badulla Grid Substation. The Project is expected to be completed in April 2021, total physical progress as at 30-06-2020 is 94.75%.



Figure 1: Spilling of Puhulpola Dam-Oma Oya Project

- Plant capacity : 120 MW
- Total Project Cost : USD 530 Million
- Expected Annual Energy Output : 290 GWh
- Expected date of completion : April 2021
- Current Progress : Total physical progress – 94.75%

Broadlands Hydropower Project

The Broadlands Hydropower Project is a run-of-the river type Project planned to build on the Kelani River, with the objective of harnessing the downstream hydro potential of the existing Polpitiya Power Station. The Project will have an installed capacity of 35 MW and is expected to generate 126 GWh of electrical energy annually. The Broadland Hydropower Project is the first large scale hydropower plant which obtained Clean Development Mechanism (CDM) registration in Sri Lanka.



Figure 2: Broadlands Power House

- Plant capacity : 35 MW
- Total Project Cost : Industrial & Commercial Bank of China (ICBC) USD 69,723,605 (85%)
: Hatton National Bank of Sri Lanka (HNB) USD 12,304,166 (15%)
- Expected Annual Energy Output : 126 GWh
- Expected date of completion : January 2021
- Current Progress : Total physical progress – 72.3%
Total Financial Progress – 67%

Moragolla Hydro Power Project

Asian Development Bank provided US\$ 125 million to this Project under loan no. 3146 (SF)/ 3147 SRI – “Green Power Development and Energy Efficiency Improvement Investment Program (Tranche 1)” for the construction of Moragolla Hydropower Project.

- Plant capacity : 30.5 MW
- Total Project Cost : Foreign Funds USD 113.86 Million & Local Funds (CEB) LKR 3,958 Million

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- Expected Annual Energy Output : 100GWh
- Expected date of completion : October 2023
- Current Progress : Overall progress – 25.5%

Seethawaka Ganga Hydropower Project

This project consist of a feasibility study , Environmental Impact Assessment, detail designing, preparation & Implementation of resettlement action plan, construction of 20MW power plant including all civil structures and construction of 6km 33kV double circuit line up to Maliboda GS for grid connection.

- Plant capacity : 24 MW
- Total Project Cost : USD 79 Million
- Expected date of completion : 2024
- Current Progress : Feasibility completed. EIA opened for public hearing on 2020.06.12, draft tender document ready, TEC & Tender Board appointed, Land acquisition Initiated.
Funding arrangement to be finalized by the Ministry of Power.

6.2 Thermal Power Expansion Projects by CEB

130 MW Gas Turbine Power Plant at Kelanitissa

The objective of this Kelanitissa New Gas Turbine Project Unit is to replace the existing Frame V gas turbines in Kelanitissa Power Station with new gas turbine to restore electricity supply to the Colombo City during emergencies and to supply peaking power. However, the Project Management Unit has been restructured under the Transmission Division.

- Plant capacity : 130 MW (3 or 4 units)
- Total Project Cost : USD 70 Million
- Expected date of completion : 2021
- Current Progress : Funding arrangement to be finalized by the Ministry of Power.

6.3 Thermal Power Expansion Projects by Private Sector

4X24MW Reciprocating Engine Power Plants at the Grid Substations of Habarana, Monaragala, Horana and Pallekelle

- Plant capacity : 100 MW
- Expected date of completion : 2022
- Current Progress : Technical Evaluation Committee appointed, preparation of Request for Proposal (RFP) is in progress.

First 300 MW Natural Gas fired Combined Cycle Power Plant –Kerawalapitiya

- Plant capacity : 300 MW
- Expected date of completion : 2023
- Current Progress : Pending approval for Draft PPA from PUCSL.

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Second 300 MW LNG Combined Cycle Power Plant - Kerawalapitiya

- Plant capacity : 300 MW
- Expected date of completion : 2023 (Open cycle operation)
- Current Progress : Pending approval for Draft RFP from PUCSL.

100 MW and 200 MW Short Term Basis Supplementary Power Plants

- Plant capacity : 300 MW
- Expected date of completion : 2020

i. 200 MW of Reciprocating Engines

- Plant capacity : 200 MW
- Expected date of completion : 2021
- Current Progress : Due to the reduced demand resulting from COVID 19 situation, CEB has not signed agreement with selected bidders. However, conditional LOI was issued to selected bidder. Cabinet approval is sought to fulfil the short-term supplementary capacity of 130 MW for one year (2021) either from this procurement or through a fresh tender.

ii. 100 MW Reciprocating Engine Power Plant at Galle

- Plant capacity : 100 MW
- Expected date of completion : 2022
- Current Progress : RFP document prepared. PUCSL informed that procurement under BOT model cannot be approved. Ministry of Power has requested technology and fuel option to be kept open and allow use capacity range 100-200 MW. Tender document to be amended and resubmitted for approval.

6.4 Renewable Energy Development Projects by CEB

100 MW Semi-Dispatchable Wind Power Project in Mannar Island

Project management Unit was set up for the proposed 100 MW semi-dispatchable wind farm project in Mannar Island to be built and operated by the CEB. The project includes construction of a 100 MW wind farm including power evacuation system and Control Centre with SCADA facilities. The operation of the plant is on semi-dispatchable basis. It is expected an average annual energy generation of 400 units (GWh) over 20 year operational life span of the wind farm. The project is expected to complete and commissioned in November 2020.

- Plant capacity : 100 MW
- Total Project Cost : USD 200 Million
ICG USD 13.6 Million
- Expected Annual Energy Output : 400 GWh
- Expected date of completion : November 2020
- Current Progress : 80%



Figure 3: Installation Works of Mannar Wind Power Project

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6.5 Renewable Energy Development Projects by Private Sector

The electricity generated from new sources of renewable energy (Non-Conventional Renewable Energy (NCRE)) such as small hydro, wind, solar, biomass etc., is absorbed in to the grid through Standardized Power Purchase Agreements. The details of these NCRE projects are given below:

Performance of the NCRE Sector (up to 31st August 2020)

Details of the Commissioned NCRE Power Projects as at 31st August 2020 is given below:

Project Type	No. of Projects	Capacity (MW)
Mini Hydro Power	209	410
Wind Power	17	148
Biomass-Agri. & Industrial Waste Power	04	13
Biomass – Dendro Power	09	27
Solar PV	21	64
Total	260	662

Programs for NCRE Sector

NCRE Projects which are expected to be commissioned in year 2020/2021

Project Type	No. of Projects	Capacity (MW)
Mini Hydro Power	48	81
Biomass-Agri. & Industrial Waste Power	01	2
Biomass – Dendro Power	10	56
Biomass Municipal Solid Waste Power	03	20
Solar PV	117	135
Solar Thermal Power	02	20
Wind Power	02	36
Total	183	350

6.6 Hydro Power Projects Developed by the Ministry of Irrigation

Thalpitigala Hydro Power Project

- Plant capacity : 15 MW
- Expected Avg. Annual Energy : 52.4 GWh
- Expected date of completion : 2024

Gin Ganga Hydro Power Project

- Plant capacity : 20 MW
- Expected Avg. Annual Energy : 66 GWh
- Expected date of completion : 2022

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6.7 Generation Rehabilitation Projects

The Generation Division of the CEB is implementing several rehabilitation projects through which several selected hydro and thermal power plants are to be refurbished. This will minimize their maintenance/repair costs and improve the efficiency and reliability of the machines. Obsolete equipment will be replaced with their modern counterparts using new technologies and this will enable to address issues arising from the non-availability of spares for old equipment and ensure their efficient performance in the years to come.

Performance of Rehabilitation works done in 2020 and planned for 2021 are as given below.

Project Name	Progress as at 31.08.2020	Remarks
Enhancing coal yard facility at LVPS	Project commenced. Advance payment done. Physical Progress-3%	Expected to complete in May 2022 Existing Capacity- 0.9 Million MT Enhanced Capacity- 1.21 Million MT
Frame –V gas turbine rehabilitation at KPS	Physical Progress- 80%	Expected to complete in November 2020
Rehabilitation of Inginiyagala Power Station	-	TEC report to be finalized
Rehabilitation of Udawalawa Power Station	-	TEC report submitted

7. Transmission of Electricity

CEB Transmission Division plans, develops, operates and maintains the whole of the transmission assets of the CEB, while providing services to other Divisions of CEB in certain areas of activities. The Transmission Division operates 220kV and 132kV grid substations, embracing all power stations and dispatches all electricity supplied to the grid through its System Control Centre. The System Control Centre plans and carries out the operation of generation and transmission systems in order to achieve reliability, quality and operational economy of the power supply. Archiving the generation and transmission data and the preparation of regular management information is also carried out by the Transmission Division.

The operational objectives of the Division are to:

- Develop and maintain an efficient, coordinated, reliable and economical transmission system.
- Procure and sell electricity in bulk to distribution licensees so as to ensure a secure, reliable and economical supply of electricity to consumers.
- Ensure that there is sufficient capacity from generation plants to meet reasonable forecast demand for electricity.
- Maintain transmission voltage variations within $\pm 10\%$ for 132 kV & 220 kV and frequency within $\pm 1\%$ of 50Hz of the system.

Transmission system development projects including all the transmission lines and grid substations in the country are carried out by specially formed Project Management Units (PMU) which comprise of experienced groups of engineers. These PMUs are established under Projects Division of CEB.

7.1 Committed Transmission Development Projects

Brief description of the committed transmission development projects, which are being carried out in 2020 and are expected to be continued in to the year 2021 is given below:

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Item No	Project Description	Funding Agency	Cost	Agreed Year of Commissioning	Current Progress
01	National Transmission & Distribution Network Development & Efficiency Improvement Project	JICA			
	Package 1: Construction of Transmission Lines		11.67 BLKR	January 2022	Profile design and route survey in progress.
	Package 2: construction of New 220/132 kV substation		7.42 BLKR	March 2021	Design and construction works are in progress.
	Package 3: Construction of 220 kV Transmission Lines		10.26 BLKR	August 2021	Physical -16% Financial – 17%
	Package 4: Construction of distribution SSs and 11kV cables		16.11 MUSD, 1.7 BLKR		Contract signed on 26 th February 2020.
02	Clean Energy & Network Efficiency Improvement Project	ADB/CEB	465 MLKR	-	-
03	Green Power Development & Energy Efficiency Improvement Project – Tranch II	ADB			
	Package 1 -Lot A : Hambanthota Grid Substation 220 kV Development		9.2 MUSD, 437 MLKR	December 2020	Physical -30% Financial – 21%
	Package 1 – Lot B : Construction of New Polpitiya – Hambanthota 220 kV, Transmission Line (150 km)		32.3 MUSD, 808.2 MLKR	January 2021	Physical -42% Financial – 33%
	Package 2- Lot A: Construction of Nadukuda 220/33kV Grid Substation and Augmentation at Mannar 220/33 kV Grid Substation		12.4 MUSD, 947.6 MLKR	August 2020	Physical -68.5% Financial – 57%
	Package 2-Lot B1: Mannar-Nadukuda 220 kV Transmission Line - 30km		6.6 MUSD, 438.5 MLKR	May 2020	Physical -94% Financial – 77%
	Package 2-Lot B2: Padukka-Horana 132 kV, 25km Transmission Line		378.8 MUSD	April 2022	Physical -2% Financial – 10%
	2 nd circuit stringing of Habarana – Valachchenai 132 kV Transmission Line		320.9 MUSD	November 2021	Physical -5% Financial – 10%
	Package3- Lot A1: Construction of Colombo B GSS, Single in & Out connection from Colombo C- Kolonnawa 132kV 800sqmm cable		8.16 MUSD	September 2021	Physical -22% Financial – 11%

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	Package3- Lot A2: Augmentation of Kotugoda, Kolonnawa, Stanley, Padukka, Horana, Dehiwala, Madampe GSS		14.25 MUSD	December 2020	Physical -44% Financial – 34%
	Package3- Lot B : Construction of Biyagama 220/33kV GSS Augmentation of Biyagama GSS		1.43 BLKR	March 2021	Physical – 42% Financial – 38%
	Package 7- Lot A1 : Installation of 100MVar BSC at Pannipitiya GSS		1,097 MLKR	January 2021	Physical – 14% Financial – 10%
	Package 7- Lot A2 : Installation of +100/-50 Mvar SVC at Biyagama GSS		1,595 MLKR	-	Tendering stage
	Construction of Capacitor banks in Colombo GSS and Thulhiriya GS	ADB Savings	863 MLKR	-	Tendering stage
	Augmentation of Nadukuda/Chunnakam / Aniyakanda /Pannala and Ambalangoda GSS	ADB Savings	2876 MLKR	-	Tendering stage
	Construction of New 220kV Kerawalapitiya SS		2629 MLKR		
04	Greater Colombo Transmission & Distribution Loss Reduction Project	CEB			
	Replacement of Line bay and Busbar CT's including existing busbar protection scheme with low impedance numerical busbar protection scheme at Colombo "E" & "F" GSSs		102 MLKR	February 2021	Contract was awarded. LC to be opened.
	Replacement existing busbar protection scheme Colombo "E" & "F" GSSs		27 MLKR	January 2021	Contract was awarded. LC to be opened.
05	Renewable Energy Absorption Transmission Development Project	AFD / ADB	30 MEUR 1,329MLKR	June 2020	Physical -89% Financial – 73%
	Lot A: Construction of Maliboda, Ragala, Wewelwatta, Nawalapitiya 132/33 kV Grid Substations				
	Lot B: Construction of associated Transmission Lines				
06	Green Power Development & Energy Efficiency Improvement Investment	ADB/ AFD			

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	Programme (Tranche1) Part 2				
	Lot A: Construction of Kappalturei GS and Augmentation of Kerawalapitiya, Katunayake and Trincomalee GSS		12.77 MUD 805.9 MLKR	December 2020	Physical – 91% Financial – 84%
	Lot B1 : Construction of Kesbewa and Kaluthara GSS and Augmentation of New Anuradhapura, Old Anuradhapura, GSS		11.76 MUSD 1,153 MLKR	December 2020	Physical – 71% Financial – 76%
	Lot B2 : Construction of associate transmission lines		2.03 MUSD, 394 MLKR	March 2020	Physical – 100% Financial – 89%
07	Power System Reliability Strengthening Project (PSRSP)	ADB	194 MUSD 11,649 MLKR		Preliminary works are in progress.
08	Habarana Veyangoda Transmission Line Project (HVTLP)	JICA	2.5 BUSD 797 MLKR 23 BUSD 1.78 BJPY 1.76 BLKR	September 2020	Physical -79%
	Lot A: New Habarana 220/132kV Grid Substations				
	Lot B & C: New Habarana to Veyangoda 220kV, 146km, New Habarana to Sampoor 400kV line			June 2020	Physical -85% Financial -68%
09	Supporting Electricity Supply Reliability Improvement Project (SESRIP)	ADB			
	Package 4: Construction of 33kV tower lines and 33kV 2SSBB gantries		7,218 MLKR	July 2022	Physical- 15%
	Package 6: Construction of Hybrid renewable energy systems		1,980 MLKR	September 2022	At Bidding stage. Price bid evaluation is in progress.

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7.2 Uncommitted Transmission Development Projects

Brief description of the uncommitted transmission development projects, which funds to be arranged in year 2020/2021 is given below:

Item No	Project Description	Cost Estimate	Proposed Year of Commissioning	Current Progress
01	Construction of Kerawalapitiya - Port 2nd 220kV Cable	8,518 MLKR	2021	Forwarded for JICA funds. Funding not confirmed from JICA. Proposal has been submitted to ADB funding.
	Construction of 220kV, Cu (XLPE) 1600mm ² , 16.2km cable between Kerawalapitiya Grid Substation and Colombo Port Switching Station			
	Augmentation of Kerawalapitiya Grid Substation by constructing 220kV double busbar cable bay			
	Augmentation of Colombo Port Switching Station by constructing 220kV double busbar cable bay			
02	Construction of Colombo K 220/132/11 kV Grid substation	20,127 MLKR	2022	Forwarded for JICA funds and Supplier Credit Scheme. Funding not confirmed from both.
	Construction of Colombo K 220/132kV Switching Station (2x250MVA 220/132kV indoor transformer, 2x220kV indoor double bus transformer bay, 2x220kV indoor cable bays, 220kV double bus arrangement with a bus coupler)			
	Construction of Colombo K 132/11kV Grid Substation (2x45MVA 132/11kV indoor transformer, 132kV double bus arrangement with a bus coupler, 3x132kV indoor double bus transformer bays, 1x 132kV indoor cable bay, 2x11kV indoor single bus transformer bays, 18x 11kV indoor cable bays, and 2x11kV indoor bus section bays with single bus arrangement)			
	Construct 132kV, Cu (XLPE) 800mm ² , 6.5km cable between Colombo E and Colombo K Grid Substations			
	Construct 220kV, Cu (XLPE) 1600mm ² , 9km cable between Colombo Port and Colombo K Grid Substations			
Construct 220kV, Cu (XLPE) 1600mm ² , 14km cable between Pannipitiya and Colombo K Grid Substations				

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	Construction of 220kV double bus indoor cable bay at Colombo Port Grid Substation, Construction of 220kV double bus cable at Pannipitiya Grid Substation and 132kV double bus indoor cable at Kolonnawa Grid Substation			
	Installation of 16Mvar Breaker Switched Capacitors at 22kV bus of Sub K GSS			
03	Construction of Sub P (Narahenpita)	4,979 MLKR	2022	Forwarded for JICA funds and Supplier Credit Scheme. Funding not confirmed from both.
	Construct 132kV, Cu (XLPE) 800mm ² , 6.5km cable between Colombo E and Colombo K Grid Substations			
	Construct 220kV, Cu (XLPE) 1600mm ² , 9km cable between Colombo Port and Colombo K Grid Substations			
	Construct 220kV, Cu (XLPE) 1600mm ² , 14km cable between Pannipitiya and Colombo K Grid Substations			
	Construction of 220kV double bus indoor cable bay at Colombo Port Grid Substation, Construction of 220kV double bus cable at Pannipitiya Grid Substation and 132kV double bus indoor cable at Kolonnawa Grid Substation			
	Installation of 16Mvar Breaker Switched Capacitors at 22kV bus of Sub K GSS			
04	Construction of Sub Q (Town Hall)	2,029 MLKR	2022	Forwarded for JICA funds and Supplier Credit Scheme. Funding not confirmed from both.
	Construction of Colombo Q GSS (2x45MVA 132/11kV indoor transformer, 2x132kV Single bus bar indoor transformer bays, 2x132kV Single bus bar cable bays, 1x132kV indoor bus section bay, 2x11kV indoor transformer bays, 18x11kV indoor feeder bays and 1x11kV indoor bus section bay)			
	Modification of existing 132kV protection and control facilities at Sub N and Kolonnawa GSS			
	Installation of 16Mvar Breaker Switched Capacitors at 11kV bus of Colombo Q GSS			
05	Construction of Victoria-Rantambe 220kV Transmission Line	1,718 MLKR	2020	This will be carried out through Board

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	Construction of Victoria-Rantambe, 2xZebra, 20km ,220kV single circuit transmission line			funds as it involves highly environmental sensitive area where the lending agencies will not fund.
	Construction of 1x220kV one-and-half breaker transmission line bay at Victoria Power station			
	Construction of 2x220kV single bus transmission line bays including a bus section at Rantambe Power station			
06	Vavuniya Grid Substation 220kV Development	3,533 MLKR	2020	Forwarded for new AFD Loan and initial discussions are being carried out
	Construction of Vavuniya 220/132kV Switching Station (2x150MVA, 220/132kV transformers, 220kV double bus bar arrangement including bus coupler, 2x220kV double busbar transformer bays, 4x220kV double busbar transmission line bays, 2x132kV transformer bays (without circuit breakers))			
	Augmentation of Vavuniya 132/33kV Grid Station (Replacement of 132kV current transformers and protection and control modification of existing New Anuradhapura line bays)			
	Construction of 132kV, 2xZebra, 0.5km, double circuit transmission line from Vavuniya 220/132kV Switching Station to Vavuniya 132/33kV Grid Substation			
07	Construction of Samanalawewa-Embilipitiya 132kV Transmission Line with Zebra	1,608 MLKR	2021	Forwarded for new AFD Loan and initial discussions are being carried out.
	Construction of Samanalawewa-Embilipitiya 38km, Zebra, 2cct, 132kV transmission line and removal of existing Lynx, 132kV transmission line			
	Replacement of 132kV Current Transformers in Samanalawewa&Embilipitiya Grid Substations related to Laxapana-Wimalasurendra 132kV transmission line			
08	Reconstruction of New Anuradhapura - Trincomalee 132kV Transmission Line with Zebra	4,362 MLKR	2021	Forwarded new AFD Loan and initial discussions are being carried out.
	Construction of New Anuradhapura - Trincomalee 104km, Zebra, 2cct, 132kV transmission line and removal of existing Lynx, 132kV transmission line			
	Replacement of 132kV Current Transformers in New Anuradhapura and Trincomalee Grid Substations related to New Anuradhapura - Trincomalee 132kV transmission line			

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09	Construction of Welimada 132/33kV grid substation	3,853 MLKR	2023	Forwarded for new AFD Loan and initial discussions are being carried out.
	Construction of Welimada 132/33kV Grid Substation (2x31.5 MVA 132/33kV transformer, 2x132kV single bus transformer bays, 2x132kV single bus transmission line bays, 132kV single bus arrangement including bus section, 2x33kV transformer bays, 8x33kV feeder bays and 1x33kV single bus arrangement including bus section)			
	Single In & Out Connection from Badulla-Nuwara Eliya T 132kV TL by constructing 0.5km Zebra, 2cct, 132kV transmission line			
	Augmentation of Badulla & Nuwara Eliya GSS			
10	Construction of Keeriyankalliya 132/33kV grid substation	5,188 MLKR	2024	Forwarded for new AFD Loan and initial discussions are being carried out.
	Construction of Keeriyankalliya 132/33kV Grid Substation (2x31.5 MVA 132/33kV transformer, 2x132kV single bus transformer bays, 2x132kV single bus transmission line bays, 132kV single bus arrangement including bus section, 2x33kV transformer bays (GIS), 8x33kV feeder bays (GIS) and 1x33kV single bus arrangement including bus section (GIS))			
	Reconstruction of Puttalam -New Chilaw 132kV, 61km TL with Zebra			
	Single In & Out Connection from Puttalam -New Chilaw 132kV TL by constructing 15km Zebra, 2cct, 132kV transmission line			
	Augmentation of Puttalam & New Chilaw GSS			

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Transmission Construction Projects (TCP) Branch in CEB implements Transmission Lines Construction Projects and Grid Substations Construction Projects which involve new constructions, augmentations, reconstructions and rehabilitation works of the CEB transmission network, which are not carried out by the specific PMUs.

Brief description of the transmission development / rehabilitation /reconstruction activates being carried out in 2020 and are expected to be continued in to the year 2021 under TCP branch is given below:

Item No	Project Description	Funding Agency	Cost	Year of Commissioning	Current Progress
01	Installation of 100 MVAr Reactor at New Anuradhapura GS and 50 MVAr Reactors at Mannar GS	ADB	MLKR 1,430	June 2021	Physical progress 63%
02	Construction of Wagawatta Grid Substation	BOI	MLKR 1,898	December 2021	Physical progress – 47%
03	Construction of 02 Nos. of 220kV double bus bars Transmission Line Bay at New Polpitiya Grid Station	ICG	MLKR 291	March 2021	Physical progress – 65%
04	Construction of Two (02) 33kV Feeder Bays at Ratmalana Grid Substation	ICG	MLKR 148	October 2020	Physical progress – 72%
05	Reconstruction of Badulla – Madagama 132kV Transmission Line (29km)	ADB/CEB	MLKR 786	September 2020	Physical progress – 67%

Brief description of the planned development / rehabilitation /reconstruction activates to be commenced in year 2021 is given below:

Item No	Project Description	Funding Agency	Cost	Commissioning	Current Progress
01	Reconstruction of Madagama - Ampara 132kV Transmission Line (72.5km)	ADB loan savings requested for procurement of materials	MLKR 3606	2027	Profile Survey & profile Design completed
02	Augmentation of Athurugiriya – Kolonnawa 132kV Transmission Line	CEB ICG	MLKR 147	2022	Foundation construction started
03	Construction of 132kV Interconnection Transmission Line for Seethawaka Ganga Hydro Power Project	CEB ICG	MLKR 280	2024	Preliminary works to be started
04	Construction of Victoria - Rantabe 220kV Transmission Line	Not yet finalised	MLKR 1057	2027	Contract awarded for profile survey

8. Distribution of Electricity

CEB is responsible for over 88% of electricity distribution in the country while the rest is taken care by Lanka Electricity Company Ltd. (LECO), a subsidiary of the CEB. The electrification level in the country is calculated as 99.6 % as at end of December 2019.

The Distribution Network System consists of 33kV and 11kV Medium Voltage (MV) lines and 400V Low Voltage (LV) lines absorbing power from 132kV and 220kV Transmission System via Grid Substations (GSS).

Distribution system of CEB consists of four Divisions. The main objectives of the formation of four divisions are to achieve benchmark competition to improve efficiency and quality of supply to the consumers. Each Division is headed by an Additional General Manager who is directly reporting to the General Manager. It has been decided to reorganize the distribution divisions to improve the supply reliability and service quality. Reorganization of distribution divisions proposed for year 2020 and 2021 are given below:

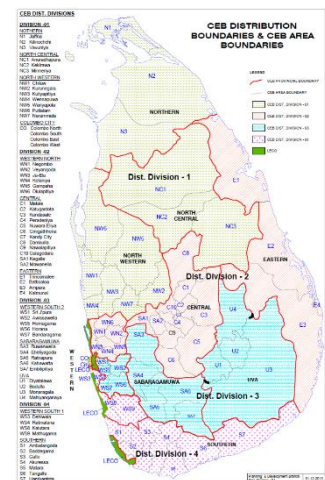
Divisions	Provinces	
	Year 2020	Year 2021
DD1	Colombo City, North Western Province-I, North Western Province-II , North Central Province, Northern Province	Colombo City, North Western Province-I, North Western Province-II, North Central Province, Northern Province
DD2	Western Province North, Central Province I, Central Province II , Eastern Province.	Western Province North- I, Western Province North- II Central Province, Eastern Province.
DD3	Western Province South-II, Uva, Sabaragamuwa	Western Province South-II, Uva, Sabaragamuwa
DD4	Western Province South-I, Southern Province -I, Southern Province-II	Western Province South-I, Southern Province -I, Southern Province-II

Note: Newly introduced Provinces are highlighted

8.1 Operational Structure

The Distribution Divisions are divided into provinces and each Province is headed by a Deputy General Manager. The Province is sub-divided into several Areas, which are managed by Area Electrical Engineers. The Area is further subdivided into several Consumer Service Centres (CSC) headed by an Electrical Superintendent.

In addition to the Provincial Deputy General Managers, there are three Deputy General Managers to look after Projects and Heavy Maintenance, Planning and Development and Commercial and Corporate functions of the Division. Division 1 has special Branch for Rural Electrification (RE) and Projects which is headed by a Deputy General Manager.



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8.2 Distribution Infrastructure as at 01st January 2020

Description	Units	DD1	DD2	DD3	DD4	Total
33kV Distribution Lines (Overhead & Underground)	km	11,070	9,768	7,240	4,604	32,682
11kV Distribution Lines (Overhead & Underground)	km	1,374	580	45	313	2,312
No. of 33/11kV Primary Substations	Nos.	48	34	12	40	134
LV Distribution lines (Overhead & Underground)	km	47,425	42,348	32,189	28,207	150,169
No. of LV Distribution Substations	Nos.	11,734	10,240	6,339	5,163	33,476

8.3 Operational Statistics as at 31st July 2020

Description	Unit	DD1	DD2	DD3	DD4
Energy sold	GWh	2,288	2,518	1,391	1,085
Billed Revenue	Rs. Million	41,856	40,485	22,785	18,444
New connections	Nos.	20,821	23,436	12,428	8,775
Retail Consumers (New added)	Nos.	20,260	23,344	12,368	8,666
Bulk Supply Consumers (New added)	Nos.	561	92	60	109

According to above statistics, the CEB 's distribution system comprises of more than 33,000 Substations fed by a network of around 35,000 km of medium voltage lines.

At the beginning of 2020, there were 231 Customer Service Centres and 78 Point of Sale (POS) centres for collection of bill payments.

The transmission and distribution losses have been brought down to 7.92% by the end of July 2020.

8.4 Programmes for Year 2021

Following programmes are planned to be done during year 2021 under each Distribution Division.

Distribution Division 1

Development	Cost Estimate (MLKR)
System augmentation programmes	7963
New service connections	1415
Loss Reduction Programmes	577
Geographic Information System Implementation	13

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Distribution Division 2

Development	Cost Estimate (MLKR)
System augmentation programmes	4000
New service connections	1000
Loss Reduction Programmes	1200
Geographic Information System Implementation	70
Research and Development Activities	80

Distribution Division 3

Development	Cost Estimate (MLKR)
System augmentation programmes	2400
New service connections	70
Loss Reduction Programmes	20
Geographic Information System Implementation	20
Research and Development Activities	20

Distribution Division 4

Development	Cost Estimate (MLKR)
New constructions and augmentations	1390
New service connections	65
Loss Reduction Programmes	20
Geographic Information System Implementation	10
Research and Development Activities	0.25
Rural Electrification Programmes	15

9. Financial Performance for year 2020

The year 2020 was forecasted with budgeted loss of Rs.90 Billion, mainly due to non-cost reflective tariff and non-implementation of power generation projects as planned. Nevertheless, in the mid-year 2020, the dispatch was re-forecasted with reduction of fuel price by the Ceylon Petroleum Corporation for Heavy Fuel & Naphtha as Rs.70/- per liter which was at Rs.96/- & Rs.74 respectively.

Further, energy demand for the year 2020 was re-assessed due to COVID-19 epidemic which was negatively affected on energy consumption. Accordingly, forecasted energy demand for the year 2020 was reduced by 9% against its initial forecasted demand. Furthermore, the Ceylon Petroleum Corporation has given a fuel price reduction to Independent Power Producers (IPP) as well with effect from 08th April 2020.

As a mitigation it has been decided to curtail overhead expenditure (exclusive of Finance Cost) by 20% against the Approved OPEX Budget in order to overcome sever cash flow difficulties faced by CEB due to COVID-19 pandemic. Ultimately, with the combination of all above factors the revised budgeted loss has decreased to Rs.67 Billion for the year 2020.

The operating losses were recorded consecutively which was attributable to substantial reliance on thermal oil sources. At the end of Quarter 01, Covid-19 epidemic disturbed CEB operations. However,

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for the period ended 31st July 2020 the recorded loss was Rs.23 Billion and the loss has decreased by 57% compared to July 2019. Change in Generation Mix mainly affected in aforesaid decrease along with minor reduction in Sales units.

Increase in contribution from CEB-Hydro & CEB-Coal in the generation mix (61% from total net generation) was constructively affected on financial performance against the previous year. With the decrease in commodity prices, namely fuel (w.e.f. 19.03.2020) and coal, including fuel prices to IPP-Thermal, CEB was able to reduce its direct generation cost, when compared to July 2019, which caused reduction in Cost per Unit by 55%. Further, drop in reliance on purchased power by 11% was positively affected on decrease in Net Loss for the period ended 31st July 2020.

For the seven-month period ended July 2020, sales in units has decreased by 4 % compared to year 2019 with low demand in Bulk Supply categories of Industrial, General Purpose and Hotels. The decrease in Bulk Supply consumption has lessen the increase in Domestic consumption during the lockdown period.

Further, according to the Cabinet Decision dated 17th July 2020, Rs.5.47 Billion amount of Rebate to Domestic Consumers was granted as at 31st August 2020.

However, the financial position of CEB as of today has been impaired remarkably to the extent of having a negative retained earning balance in the Statement of Financial Position. The cost is escalating with heavy dependence on high cost thermal oil power generation sources and increasing price of other material while there is no increase of electricity prices during last seven years (since year 2013) to reflect the cost of generation.

CEB being a public enterprise involves in a major economic activity, it is compelled to provide uninterrupted electricity to end consumer at an affordable price. Thus, low end consumers in the domestic category as well as the consumers in industrial, hotel, religious and government category are heavily subsidized as CEB provides electricity at a price which is considerably less than the cost of production which bring the financial viability of the CEB to predicament. As at 31st July 2020, the total Government policy loss was Rs.27.6 Billion (Subsidy) excluding other income and any unbilled revenue.

9.1 Borrowings and Major Creditors

As collection process is disturbed, working capital of CEB has severely affected causing problems in paying major suppliers including Ceylon Petroleum Corporation (CPC) and Independent Power Producers (IPP) and financing of coal procurement.

Accordingly, during the year 2020, CEB borrowed Rs.22 Billion from commercial banks and subsidiary company (LECO Pvt Ltd). CEB received Rs.48 Billion of revenue grant in the month of March 2020 from Treasury to settle outstanding amounts to CPC. Due to financial aid received from the Treasury, payable to CPC as at 31st March 2020, decreased to Rs.54 Billion. However, outstanding amounts are getting increased due to insufficient cash flows and payable to Ceylon Petroleum Corporation & IPPs as at 31st August 2020 was stated at Rs.65 Billion and Rs.58 Billion respectively. As at 31st August 2020, the total bank borrowings including overdraft amounted to Rs.117 Billion to finance working capital requirements. Additionally, total project borrowings as at 31st August 2020 amounted to Rs.256 Billion. In order to mitigate financial burden Ceylon Electricity Board is planning to issue debenture for a value of Rs.10 to 20 Billion and proposed to obtain Rs.5 Billion loan from NSB by providing Treasury Guarantee as sources of low cost financing to facilitate short term and mid-term working capital requirement.

Lanka Electricity Company (Pvt.) Ltd.

INTRODUCTION

LECO was incorporated in 1983 under the Companies Act no. 17 of 1982 and the Companies Act No 07 of 2007 with the primary objective to carry out the business of maintenance, improvement, supply, distribution and sale of electrical energy in LECO franchise area laid along the coastal belt of the Western Province and part of the Southern Province.

Vision

Enjoy being the light for lives of people through innovative eco-friendly business.

Mission

Providing best energy solution to the society through continuous innovations.

Values

Amazing our customers through innovation driven by consistent effort, sustainability and staff

Core Competencies

Engineering, research, development and innovation enhanced through diverse experience in energy sector are the core competencies the company will invest in diversified activities as long as in line with our vision and goals .

Company's objectives

- To ensure stakeholder awareness of the company operations duly and transparently and to embark upon strategic diversification
- To enhance distribution services in line with regulatory benchmarking and internal service standards
- To enhance the technological capability of the company through research, development and innovation
- To enhance business profitability, efficiency, internal process control and strategic investment while reducing waste
- To ensure productive, skilled, motivated and mutually respecting workforce through healthy working environment benchmarked by national and international norms.

The Company's achievement exhibit our performance and the commitment made towards the high quality of service to the stakeholders.

	2016	2017	2018	2019	2020 Forecast	2021 Budget
Consumers	539,829	551,123	562,412	568,250	582,016	612,054
Sales GWh Mn	1,466	1518	1,570	1,646	1,662	1,740
Revenue Rs Mn	28,793	29,930	30,947	32,461	33,478	37,347
Distribution Losses (11 Kv) %	3.48	2.7	2.27	1.61	2.3	2.3
Consumers /Employee Ratio	347	351	358	370	370	375
Reliability of performance measurement Indices(SAIDI) (Hrs/Consumer /year)	43.1	41.9	39.1	34.7	35.0	35.0

MINISTRY OF POWER

Record of Distribution of Assets as at July 2020 is as follows

Asset Category	Unit	Beginning 2020	Target for 2020	Actual Performance July'2020	Balance to be completed
11KV UG	km	71	7	0.23	6.87
11KVOH+ LV	km	846,260	47	-	47.00
Dist Sub 11 kv	Nos	2,464	134	1	133.00
Bulk Sub 11kv	Nos	1,962	122	5	117.00
Switching LBS and LBC	Nos	1,091	99	3	96.00
LV Dist Sys	km	3,485	67	2	64.89
Consumer Service Lines	Nos	590,691	15,250	934	14,316.00
11kv Auto Reclosures	Nos	28	150		150.00
11 Kv Sectionalisers	Nos	18	296		296.00

Projects and Progress

Operations

- Expansion and rehabilitation work in LECO is based on the geographical demand .It is a continuous process handled by each Branch.
- LECO provides a better and reliable supply to customers through an efficient distribution system.
- Minimize power outages and duration in the ensuing years
- Reduce processing time for new connection of electricity.
- Minimize the time to restore ad hoc electricity breakdown.

Developments

- Paperless office concept is being introduced where all the processes including customer inquiries to internal document approvals will be transferred to digital platforms with zero papers.
- Already initiated the integration of all the data and process management systems through a cloud base common platform such that integrity of each system would be enhanced with the achieved transparency.
- Introduction of API gateway which orchestrates and coordinates all systems like Enterprise Resource Planning (ERP) System, Billing System, Human Resource Information System (HIRS), General Leger, Energy Management System (EMS), Advance Distribution Management System (ADMS), Vehicle Management System, Management Information System (MIS) is underway.

MINISTRY OF POWER

- All the national and international procurement activities are being shifted to the national e-procurement platform called PROMISE developed by the Department of Public Finance.
- Execution of the Micro grid Project funded by Asian Development Bank under the Green Power Development and Energy Efficiency Improvement Investment Project is initiated.
- Nugegoda Pilot Underground Cabling Project was designed, constructed and commissioned which converted the Nugegoda Town Center overhead medium voltage network in to an underground network.
- Distribution System Reliability Strengthening Project for LECO supply reliability and source capacity enhancement has been initiated. It is anticipated to introduce 33kV as a distribution voltage of LECO and introduce direct 132/33 kV Grid Substations to source the LECO network to improve the reliability.
- State of art cloud based geographic information system is launched and in operation.
- MyLECO Mobile application which provides various spectrum of services was launched to improve efficiency and effectiveness of the consumer related interactions. Breakdown App also launched to get breakdown alerts, responses and customer complaints real time while the operational gangs are working in the field.
- ISO/IEC 27000 which is part of a growing family of ISO/IEC Information Security Management Systems (ISMS) standards were implemented within LECO
- To embark on new research and development (R & D) projects, thereby to provide a satisfactory service to our consumers.
- To find new investment projects in line with our goals. Diversification of the business which is in line with regulatory framework.

LTL Holdings (PVT) Ltd.

Introduction:

LTL Holdings (PVT) Ltd, formerly known as the “Lanka Transformers Limited” is a public private partnership between the Ceylon Electricity Board and the employees of LTL Holdings (PVT) Ltd. The Group recorded Rs.17 Billion Revenue for financial year 2019/2020 of which 52% had been derived from overseas.



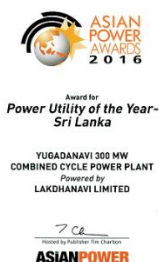
In its corporate journey over the past 37 years, LTL Holdings (PVT) Ltd had achieved healthy growth to become a leading Engineering Organization in the Power Sector having gained exemplary engineering excellence in Sri Lanka and Overseas. The Company, over the years, had diversified its business into various aspects, such as Power Generation, Electricity Infrastructure Development, Power Distribution Transformers and Hot Dip Galvanizing thus covering the entire value chain of the power sector in Sri Lanka.

Backed by the professionally qualified and well knitted team of young engineers coupled with vast experience gained through innovative modern technology over 3½ decades in the field of Power Sector engineering works with international exposure, the Company has now grown significantly and penetrated successfully into international markets, over the last 15 years, investing in Power Plants construction, operation and maintenance including providing Engineering Procurement and Construction (EPC) contracts in Sri Lanka and Overseas, such as Bangladesh, Tanzania, Uganda, Kenya, Ethiopia, India, Nepal and Australia. The transformer facility of the company, meets the entire requirement of power distribution transformers of the CEB and other local markets whilst exporting over 50% of its productions to many countries in the world.

LTL Holdings has a fully automated Galvanizing Plant provides Hot Dipped Galvanizing for transmission towers and other industries and capable of producing an output of 6.2 metric tonne per hour to the highest international standards.

The Company has been bestowed upon with various awards for engineering excellence over the years for its extra ordinary performance including the prestigious Gold Award for best Independent Power producer (IPP) in the Asian Region, with others including:

- Winning Engineering Excellence Award in 2015 from the Institution of Engineers, Sri Lanka.
- Winning the Asian Power Awards 2016 for the excellent performance held in South Korea.



MINISTRY OF POWER

Dividend Income from Foreign Subsidiaries – 2019/20

The dividend income earned from foreign investments during the year under review, amounts to a sum of USD followed by successful operation of the subsidiaries of the company, which are tabulated below:

1. Asiatic Electrical & Switchgear (PTE) Ltd, India	.. USD. 12,615.00.
2. Bright International Power PTE Ltd, Singapore	.. USD. 20,000.00.
3. Lakdhanavi Bangla Power Ltd, Bangladesh	.. USD. 448,894.47.
4. Raj Lanka Power Ltd, Bangladesh	.. USD. 421,785.30.
Total	<u>USD. 903,294.77.</u>

PERFORMANCE FOR 2020 AND PROGRAMMES FOR 2021

Performance of LTL Holdings Group of Companies during the Financial Year including Financial Highlights for 2020

Tabulated below is a summary of the Financial Performance on major operations in comparison to the previous years are shown below:-

PERIOD	F/Year 2019/2020	F/Year 2018/2019	F/Year 2017/2018
TURN OVER	(Rs.Million)	(Rs.Million)	(Rs. Million)
Manufacturing Misc. Services	5,001.00	6,825.00	5,573.00
Power Generation	12,509.00	12,374.00	11,815.00
Construction Services	-	158.00	218.00
TOTAL	17,510.00	19,357.00	17,606.00
GROSS PROFIT			
Manufacturing Misc. Services	1,192.00	1,360.00	976.00
Power Generation	6,431.00	5,088.00	4,921.00
Construction Services	-	9.00	26.00
TOTAL	7,623.00	6,457.00	5,923.00

Though the overall consolidated Turn Over had declined in comparison to last year, the Gross Profit of the Company has recorded an excellent improvement showing an increase of 18.06%, equivalent to Rs.1,166 Million for the period under review, in comparison to the corresponding period last year.

The outbreak of Covid 19 Pandemic worldwide, too has somewhat disturbed the productions/trading etc., owing to the curfew enforced by the Government as a precautionary protective measure to curb the disease from spreading.

The year could have been much better had the effects of Corona not surfaced in the last few months of the financial year which marred all the efforts which were made to beat the previous year's record.

1.0 Operations and Maintenance of Power Plants

1.1 Yugadhanavi Power Plant at Kerawalapitiya

Installation	Yugadhanavi Power Plant, Kerawalapitiya, Sri Lanka
Total Plant Capacity	300 MW
GT/ST Supplier	GE France/USA
Engine Model	GT – Frame 9E, ST SC5
Alternator Type	GE 9A5
Configuration	2:2:1
Machine Output	100 MW each
Number of Machines	2 GTs & 1 ST
PPA Period	25 Years start from May 2010



Annual Energy sale for the year 2020 upto 31st August, is 1,048 GWh and achieved availability is 87.88 %. The annual availability target for the year 2021 has been based at 70%.

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1.2. Raj Lanka Power Plant, Natore, Bangladesh (RLPP)

Installation	RajLanka Power Plant, Natore , Bangladesh
Total Plant Capacity	52.2 MW
Engine Supplier	Wartsila Finland
Engine Model	W20V32
Machine Output	8.9 MW
Number of Machines	6
PPA Period	15 Years starts from , January,2014



Annual Energy sale of RLPP for the year 2020 upto August is 35.39 GWh and achieved availability is 95.94%. The annual availability target for the year 2021 has been based at above 90%. This Thermal Power Plant is the first Sri Lanka owned plant outside Sri Lanka.

1.3 Lakdhanavi Bangla Power Plant, Comilla, Bangladesh (LBPP)

Installation	Lakdhanavi Bangla Power Plant, Comilla, Bangladesh
Total Plant Capacity	52.2 MW
Engine Supplier	Wartsila Finland
Engine Model	W20V32
Machine Output	8.9 MW
Number of Machines	6
PPA Period	15 Years starts from December,2014



Annual Energy sale of LBPP for the year 2020 upto 31st August is 44.83 GWh and achieved availability is 99.23%. The annual availability target for the year 2021 has been based at above 90%.

1.4 Feni Lanka Power Plant, Feni, Bangladesh

Installation	Feni Lanka Power Plant, Feni, Bangladesh
Total Plant Capacity	114 MW
Engine Supplier	Wartsila Finland
Engine Model	Six 18V50 and one W20V32
Machine Output	18.415*6 + 9.78*1 MW
Number of Machines	7
PPA Period	15 Years starts from November, 2019



Annual Energy sale for the year 2020 up to 31 August is 70.84 GWh and achieved availability 100.00%. The annual availability target for the year 2021 has been based at above 90%.

1.5 Pawandhanavi Wind Power Plant, Norochholai

Installation	Pawandhanavi Wind Power Plant, Ianthadiya, Norochhole
Total Plant Capacity	9.8 MW
Turbine Supplier	Gamesa
Turbine Model	G58
Turbine Output	850kW
Number of Turbines	12
PPA Period	20 Years starts from September,2012



MINISTRY OF POWER

Annual Energy sale for the year 2020 upto 31st August is 6.60 GWh and achieved Plant Factor is 11.11%. The annual availability target for the year 2021 has been based at 75.%. This plant was subject to the periodical maintenance service, during the year under review.

1.6 BelihulOya Mini hydro Power Plant

Installation	BelihulOya Mini Hydro Plant, BelihulOya
Total Plant Capacity	2.2 MW
Turbine Supplier	Wasserkraft Volk AG, Germany
Turbine Type	Horizontal Turbo Impulse
Turbine Output	1.1 MW
Number of Turbines	2
PPA Period	15 Years starts from May,2003



Annual Energy sale for the year 2020 upto August is 3.5 GWh and achieved Plant Factor is 27.46 %. The annual availability target for the year 2021 has been based at 50.00%. The damage caused to the penstock and Penstock Trail of the plant have been satisfactory repaired and the operations resumed at its full capacity.

1.7 Assupini Ella Mini hydro Power Plant

Installation	Assupiniella Mini Hydro Plant, Aranayake
Total Plant Capacity	4 MW
Turbine Supplier	VA Tech
Turbine Type	Horizontal Pelton
Turbine Output	2 MW
Number of Turbines	2
PPA Period	15 Years starts from November,2005



Annual Energy sale for the year 2020 upto August is 6.69 GWh and achieved Plant Factor is 29 % .The annual availability target for the year 2021 has been based at 50.70%. The penstock trail/pipeline etc., of the completely rehabilitated brought into successful operations, followed by severe flood damage owing to the landslide during the last year.

1.8 10MW Makarigad Hydro Power (PVT) Ltd, Nepal

Location	Water Source, Makari Gad, a tributary of the Chemeliya Riverin Khandeswari and Gujar Village of Darchula District in Far Eastern Nepal
Total Plant Capacity	10 MW
Energy – Saleable	74.1 MU
- Contracted	69.8 MU
PPA	Signed
Turbine Supplier	Wasserkraftm Volg AG - Germany
Turbine Type	Horzibine 2 Jet Pelton
Hydrology	Rain & snow fed perennial stream



The required land for the construction of Power plant has been acquired from private owners and Government. A site office has been established. Transmission line route has been finalized after having

MINISTRY OF POWER

obtained the approval of the Department of National Park and Wildlife Conservation to prepare the Feasibility Study Report followed by the EIA study. The access Road of 08 Kms. was completed. Bank Loan arrangements already planned was completed.

2.0 Manufacturing and Marketing of Transformers



Transformer Plant at Angulana

2.1 New Machinery, Equipment and Facility at Angulana Transformer Plant

1. HV Winding Machine -WHCF- TUBOLY - 3 Nos./ Automatic Winding Machines – 3 Nos.

These automatic winding machines controlled by an Industrial PC, increase the production capacity and immensely help in timely execution of large contracts while ensuring economical usage of raw material



2. George Core Cutting Machine – 1 No.

This is a high speed and automatic core cutting line that saves valuable time. This can precisely cut step lap stacked transformer cores, which result in transformers with lower No-load losses, No - load Current and low Noise level.



3. LV Winding Machine - 02 Nos.

Capable of winding Copper and Aluminum foils to round, oval or rectangular windings. The feature of controlling of foil tension permits to obtain quality windings and very strong transformer against short circuit condition of power system.

4. HV Winding Machine CNC-2 Nos./Horizontal Winding Machines -2 Nos.

MINISTRY OF POWER

5. Oil Filter Machine (Vokes SL 20) - 01 Unit

These machines are capable of doing winding up to 5 MVA and come out with accurate and proper windings of better quality.

The machine helps to ensure the proven quality of our outdoor services and repairs by enhancing the dielectric properties of insulating oil on site.



(HV Winding Machine CNC-2 Nos)



(Oil Filter Machine (Vokes SL 20))

6. MG Set for Testing Department- 1 Set

7. Stores Building

This MG set upgraded the Testing Department with the capability of testing transformers up to 5 MVA capacity. This help to increase the quantitative and qualitative aspects of the testing process.

The Stores Building is a properly planned space for storage and handling of materials, to facilitate the yearly increasing production quantities. With the newly installed racking system and the ERP system stores operation become efficient and accurate.



(MG Set for Testing Department)



(Stores Building)

8. Vacuum Chamber

The Vacuum chamber is used to create an air free surrounding for transformers during oil filling process. This eliminates the risk of any air bubbles being trapped inside the transformer and any remaining moisture, which can be very injurious to the transformer during operation and reduce the life time.

9. Rooftop solar system

Newly commissioned 475 kW rooftop solar system generate 55000-60000 kWh per month. This is a major step towards the green production concept.



(Vacuum Chamer)



(Rooftop Solar System)

MINISTRY OF POWER
2.2 The production recorded for the year under review (2019/2020) are as follows:

		2019/20	2018/19
a)	No. of Transformers supplied to CEB/LECO	2,131	3,235 Nos.
b)	No. of Transformers supplied Other Local customers	80	64 Nos.
c)	No. of Transformers exported to other countries	143	1,275 Nos.
Total Production		2,354	4,574 Nos.

As the country has achieved 100% electrification, the supply of Distribution Transformers to the CEB has declined by 1104 Nos., equivalent to 34%. Similarly, the supply of Distribution Transformers to Local Clients and exports to foreign countries too shows a decrease over the corresponding period same date last year, by 1,116 Nos. However, order have now been received for exports for the ensuing season, especially to Mozambique and Ethiopia, as indicated below.

Export orders in hand to be supplied during 2020/2021

Country of Export	Utility Department	No. of Transformers	Total Value in USD
Mozambique	Electricidade de Moçambique (EDM)	1,318	3.4 M
Ethiopia	Ethiopian Electric Utility (EEU)	40	
TOTAL		1,358	

2.3 Some special projects completed and Achievements:
a. Installation of New Winding Machines

One sophisticated LV winding machine, 3 Nos of HV automated machines and 02 Nos of horizontal winding machines have been introduced to the production line to increase the production capacity and ensure timely execution of projects.

b. Upgrading of Power Supplying Transformers to the factory

A newly manufactured smart transformer by LTLT with on-load tap changer and a monitoring system has been installed in our factory itself as the power supplying transformer to its' operations.

In addition, a new transformer for solar applications has been installed for the Solar system at the factory. Since this transformer is having lower losses, the company will be benefited in the long run.



MINISTRY OF POWER

c. Upgrading of Distribution panels and LV wiring in the factory.

The main distribution panel of the factory has been upgraded with modern system which provides for



the additional energy requirement for the new machinery. The new panel incorporates state of the art online energy monitoring system and a protection system.

Along with the upgrading of the main distribution panel, sub distribution panels were also upgraded to ensure the uninterrupted service and protection.

A bus duct system was introduced to connect each sub distribution panels to the main distribution panel which assure added protection and easy expansion. The entire LV wiring has also been upgraded in order to ensure the safety of both man and equipment.

d. Test laboratory has been relocated by adding more space and facilities for customers.

Testing laboratory of the factory has been relocated inside the premises by adding more space to increase the capacity of the laboratory. The two storey new testing lab, consists of many facilities for customers, including an observation deck, monitoring wide screen, resting room, prayer room, lunch room etc.

e. An order for 1,318 Nos of transformers received from Republic of Mozambique.

LTL Transformers (Pvt) Ltd, has been awarded with an order for design, manufacture and supply of 1,318 Nos. of 75kVA/33 kV distribution transformers, to the value of USD 3.019 million to Electricidade de Moçambique (EDM) in Republic of Mozambique. Under the order, 1,318 Nos. of transformers will be manufactured in Sri Lanka and be delivered to five different locations in Moçambique to utilize for the project of “Mozambique Energy for All (ProeEnergia)”, which is funded by World Bank. It is the first ever export order procured by the company, from the Southern African nation of Republic of Mozambique.



f. LTLT participated for “Middle East Energy 2020 (MEE 2020)” Exhibition.

This year, LTL Transformers (Pvt) Ltd, successfully participated in MEE 2020 international energy exhibition as an exhibitor for the first time. MEE exhibition is known as a global energy event with exhibitors and attendees converging from all over the world, which brings together energy manufacturers and suppliers to showcase new technologies and innovative solutions. The 2020 version of MEE exhibition was held in Dubai, United Arab Emirates. The aim of this participation is to increase the visibility of LTLT, in international market and also to find new business leads.



MINISTRY OF POWER

2.4 Improvements Programmed for 2020/2021

1) Low Frequency Heating (LFH) oven

Low Frequency Heating (LFH) technology (Hedrich Germany) is about to be introduced to LTLT's production process. A new oven with LFH technology will be commissioned soon within the coming year. With this introduction, LTLT will become the first manufacturer in the region to equip the factory with this technology. This LFH system is equipped with automatic Oil filling and pressure testing facility which increases the efficiency and accuracy of the process drastically. LFH process heats the transformer HV and LV windings uniformly from the inside by applying a low frequency current at low voltage levels through the HV winding while the LV windings remain short circuited. The Vacuum level of the chamber is precisely controlled throughout the process while monitoring the winding resistance through which the temperature of the winding is estimated.



2) Installing New sophisticated testing facility.

Orders have been placed to a new automatic state of the art testing equipment from Phoenix USA. The complete routine testing process will be automated enhancing the efficiency of testing process.

3) New Office Building

A new office is under construction which will provide more spacious environment for staff and customers. This renovation consists of well facilitated meeting rooms, entertainment room, reception area, rest room, lobby etc.

4) Quality improvements projects to give 10 years warranty.

Management decisions already been taken to allocate budget for special projects to improve the product quality to a very high level within couple of years' time to special warranty period of 10 years. Required training to workers and changes to existing production methods are being started.

5) Starting Dry Type Transformer Production

Current Dry Type Transformer assembly line will be improved to full-fledged production line with the intension of catering the exponentially increasing demand for Dry Type Transformers in Sri Lanka. This will contribute not only to grasp the advantage of this new market trend but also to avoid the potential loss of opportunities due to customers moving away from Oil Type Transformers. In addition, this will enable us to fulfill any customer requirement for transformers.

3.0 Galvanizing & Fabrication Plants at Sapugaskande



3.1 Monthly Production Details – Galvanizing Plant

3.2 Monthly Production – Galvanizing Plant (2019/20)

Description	Production (kg)		Variance (kg)
	2019/20	2018/19	
Total	10,707,738	12,194,303	-1,486,566
CEB	2,090,103	2,865,904	-775,801
Exports	1,055,551	549,165	506,386
Others	7,562,084	8,779,234	-1,217,151

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Year	Month	CEB	Exports	Other	Total Production (kg)
2019	April	37546	48279	326,475	412,300
	May	186227	85847	568,073	840,147
	June	300315	119518	653,766	1,073,599
	July	196998	81346	758,524	1,036,868
	August	186372	125111	729,250	1,040,733
	September	223297	205071	528,235	956,603
	October	130917	144433	573,515	848,865
	November	49325	112479	666,665	828,469
2020	December	256120	28309	982,265	1,266,694
	January	115179	52546	799,129	966,854
	February	233192	48531	651,523	933,246
	March	174615	4081	324,664	503,360
Total		2,090,103	1,055,551	7,562,084	10,707,738

The production for the current year fell short of the corresponding period of the previous year by 1,486,566 Kgs. Although the production levels of exports have increased considerably by 506,386 Kgs., the requirement of the CEB and other local clients have dropped considerably by 775,801 Kgs and 1,217,151 Kgs respectively.



(Finished Products loaded for Exports)



(Finished Products ready for Export)

3.3 Business Development

a) BuidEx exhibition – Maldives

LTL Galvanizers (Pvt) Ltd participated for the BuildEx Maldives 2019 exhibition at Male, Maldives from 22nd to 24th August 2019 as one of an exhibitor. It has created some business opportunities in Maldives with some valuable contact points globally.



b) Architect 2020 Exhibition

LTL Galvanizers participated for the Architect 2020 exhibition which was held from 20th to 23rd February 2020.



4. Achievements

a) CNCI Achiver Awards

LTL Galvanizers (Pvt) Ltd bagged the merit award in the national level manufacturing sector – Extra-large category at CNCI Achiver awards 2019 for industrial excellence.



b) Anti-microbial Paint in response to COVID-19

A research was done with the consultation of University of Peradeniya to develop a pigment with antimicrobial properties from waste sludge. First lot of paint was prepared with the help of SLINTEC and it was applied on outer walls of the Homagama Hospital. A joint research is in progress with Multilac (Macksons paints) in order to manufacture anti-microbial paints in commercial scale.



Anti-microbial activity of prepared Iron Oxide against *Escherichia coli*

5. ASIATIC ELECTRICAL & SWITCHGEAR PVT. LTD, NEW DELHI, INDIA

Asiatic Electrical & Switchgear PVT Ltd, a subsidiary of the Company has made steady progress during the period under review. The Financial year 2019-20 saw a turnover which was similar in comparison to the previous year's figure and ended at **INR 616.10 million**.

Asiatic saw an excellent flow of orders from our most prestigious customer – **DEWA, Dubai** from where we got substantial contracts for our regular products like 12 Way LV Dist. Boards, 8way Flange connected Dist. Boards and Mini Pillars totaling to **INR 147.77 Million** and a major portion of these items were dispatched in this year.

This year, Sri Lankan business (from CEB) grew rapidly and Asiatic won two consecutive contracts against participation in global tenders totaling to **USD 191,000.00** for Pole mounted Fuse Switches. The goods against these contracts were dispatched as well in this year.

An equally strong flow of orders was received from Rajasthan- India wherein Asiatic acquired major contracts from **JVVNL- Jaipur & AVVNL- Ajmer** for a sizable qty of 11 kV VCB panels with its own breaker totaling to **INR 130 Million**. Both the projects were successfully accomplished in FY 19-2020. Towards the end of financial year, Asiatic received another contract from **JdVVNL-Jodhpur** worth **INR 110 Million**.

Asiatic added several new customers locally during this period and efforts are being made to add more of them on international level as well.

Towards the end of the year, **Corona Pandemic** emerged as one of the biggest challenge mankind has ever seen in the last 100 years as a result of which entire world economy rapidly slipped into recession and our business was severely impacted, consequent upon the extensive lockdown enforced by the Government.

Programme for 2020/2021

As the world economies are now seem to be growing strongly against **China** and thereby that many countries will now look forward to India as their sourcing hub. Many Indian utilities are also drawing up extensive plans to ban Chinese products and Asiatic is all set to see an increase in business opportunities from India / across the world once the economies are back to their optimal levels.

It is expected that once the lockdowns are gradually eased, Indian government is expected to announce a big stimulus package for the economy in the year **2020-21** and it may help Asiatic to boost its business as massive emphasis will be laid on expansion of infra structure, electrification of villages / towns and augmentation of existing network with modern equipment.

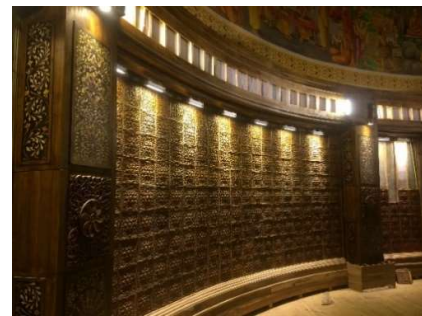
6. Restructuring of the Ownership of LTL Holdings (PVT) Ltd

Extensive meetings are being held with the Hon. Prime Minister and other governmental officials and the Ministry of Finance with regard finding a solution for restructuring the ownership of LTL Holdings (PVT) Ltd. In accordance with the suggestion reached, it has been decided request the Employees' Provident Fund (EPF) to evaluate the potential of this investment with a view to to take up a stake in the share capital of LTL Holdings (PVT) Ltd. As an initial step, it has been made to understand to submit an investment proposal by way of an information memorandum on the Investee Entity to the Monetary Board of Sri Lanka

7. Performance under Social Responsibilities

LTL Holdings (PVT) Ltd continues to extend and share its goodwill by providing the voluntary services towards the Social Responsibility and carried the following works during the season under review.

- Providing job oriented industrial training facilities to University undergraduates in the Engineering Fields, comprising, Electrical, Mechanical, Civil, Management Accountant and offering job opportunities to trainees upon successful completion of training, in accordance to placements available.
- A sizeable amount has been spent on various Lighting Projects for Buddhist Temples in Sri Lanka and continue to provide required rehabilitation and maintenance of the earlier projects undertaken.



Asgiriya Buddhist Temple in Kandy

Ruwanwalisaya Buddhist Temple

Lanka Coal Company (PVT) Ltd.

INTRODUCTION

Lanka Coal Company (Pvt.) Ltd (LCC), is a fully government owned business undertaking. The Company was incorporated solely for the purpose of import and supply of coal to the Lakvijaya Power Plant (LVPP) at Norochcholai, Which operates under Ceylon Electricity Board (CEB). Our Shareholders consist of following;

- Ceylon Electricity - 60%
- Treasury Department - 20%
- Ceylon Shipping Corporation - 10%
- Sri Lanka Ports Authority - 10%

LCC procuring 2.25 million tons of coal for the Norochcholai power plant for 2021/2022 season as an annual requirement of CEB Due to the southwest monsoon season on the west coast, coal supply is limited to seven months from the month of September to month of April next year. But the power plant must be operational throughout the year and therefore storage of coal is essential to ensure a continuous supply of coal to the national grid.

Therefore, the procurement and operation of the coal supply has always been spread over a period of 2 years and the procurement process has been planned and the action plan has been prepared accordingly. The LVPP notifies the LCC of their seasonal coal requirement in June each year after considering the shutdown of the plant due to any repairs (overhaul). Accordingly, the LCC will prepare a procurement schedule for the next coal season.

PERFORMANCE OF LCC 2020

At the outset, we must acknowledge that the following achievements were made possible due to synergies of a well-knit leadership headed by Ministry Secretary and Board of Directors. All stakeholders have been acting with collective responsibility and team spirit and that made it possible to reach the targets with ease.

1. Coal Procuring by Tender Process

- i. By notifying the foreign mission through Foreign Ministry we have managed to increase number of registered suppliers to 17. Documentations and agreements were vetted and modified on the advice of a legal professional. We completed deliveries of the two previous seasons smoothly without any controversy or displeasure among competing suppliers.
- ii. As per the guidelines given by the Secretary, Ministry of Power through the Indian High Commission we were able to obtain the services of NTPC of India and advice from international consultancy to streamline and avoid any ambiguities in the bidding documents. Accordingly, we have amended our previous bidding document as per the comments and recommendations given by the NTPC team.
- iii. The treasury guarantee for issuance of LC's by LCC was only Rs. 11 Billion which was effectively our LC limit. LCC's turnover for a season of 6 months is about Rs. 40 Billion on FOB terms with a lead time of around 50 days. This means LCC's outstanding LC value would be approximately 12 Billion at any time. LCC effectively managed the mismatch between LC limit and LC's outstanding with a minimum incidence of costs such as interest, demurrage etc.

2. Reduction of Discharge port Lightering charges

Coal is discharge to barges from the ship at the anchorage of port of Puttalam and transported to the jetty. Originally lightering (barging) rate was USD 4.75/MT this rate has been reduced to USD 2.22 per MT at present.

MINISTRY OF POWER

3. Calling first Spot Tender on CFR basis

Since, the calling first Spot Tender basis changed from FOB to CFR and gave the opportunity to match the freight rates by CSC accordingly LCC could save to CEB about USD 2.90 (12.90-10.05) which is approximately totaling to USD 870,000. This was a collective effort with the direction of Secretary to the Ministry of Power and the SSCAPC.

4. Cost of custom clearance was bought down over the years from Rs.1 million to Rs. 85,000 per shipment.

Description	Rate per Shipment (Rs)	of Shipments	Total amount (Rs. million)
CSC 2011 -2017	1,000,000.00	154	154
CSC 2017 - 2019	500,000	67	33.5
CHA	85,000	40	3.4

PROGRAMS FOR SEASON 2021- 2022**A. Coal Procurement Schedule**

According to the requirement of Lakvijaya Power Plant (CEB) the supply season will be planned. The coal annual requirement is provided by June or July in every year. As the assumption, annual requirement is taken as 2.25 million MT for the following calculation. This assumption based on the previous letter of requirements.

The proposed coal supply schedule for the season 2021- 22 is tabulated below.

Description	Tender	Quantity MT $\pm 10\%$	No of Shipments
Season 2021-22 - estimated quantity required by LVPP		2,250,000	38
Proposed Term Tender (70%)	TT	1,650,000	28
Proposed 2 spot tenders for season 2021-22	ST-1	300,000	5
	ST-2	300,000	5
Estimated Total for the season 2020-21		2,250,000	38

The shipment 38 will be supplied from Mid-September 2021 to Mid-April 2022. The tentative delivering schedule as tabulated below;

Month	No of Shipments	The Quantity (MT) $\pm 10\%$
1 September	3	180,000
2 October	5	300,000
3 November	6	360,000
4 December	6	360,000
5 January	6	360,000
6 February	5	300,000
7 March	5	300,000
8 April	2	120,000

B. Coal Transportation Up to the LVPP Jetty (freight + Lightering + Insurance)

I. Freight from the port of Loading to the Puttalam Anchorage

LCC will be Called Coal Term Tender and the spot tenders on CFR basis to procure the quantity required by Ceylon Electricity Board from Mid May 2021. The Freight compartment of the lowest selected bidder will be provided to Ceylon Shipping Corporation to match.

II. Lightering / barge operation from mother vessel to the Jetty CEB

Lanka Coal Company is going to call a tender for lightering operation under International competitive bidding process. Through this operation, LCC will be converted in to profit making entity and LCC management fee will be borne by itself.

III. Marine Insurance for Coal Transportation

The insurance coverage for the cargo will be done local calling from the companies who are listed under the Insurance Regulatory Commission of Sri Lanka (IRCSSL).

IV. The Independent Testing Agency

For Draft Surveying, Sampling and Analysis of coal at the discharging Port has already been awarded to Cotecna Inspection India (Pvt.) Ltd. by LCC for three years from September 2019.

C. Supply of Coal to the Private Sector

LCC is looking forward to obtain a sole authority or a regulation body for coal imports to Sri Lanka. A board paper LCC/BM75/02/08/2020/ has tabled on 27/08/2020 and the board recommended getting the AG's opinion on the same.

D. Submission of Annual Report

LCC has scheduled to prepare Quarterly Financial Reports in order to submit its Annual Reports by February of each year.

Introduction

Sri Lanka Energies (Pvt) Ltd is a company incorporated in 1st quarter 2011 and operate as a 100% owned subsidiary of Ceylon Electricity Board.

SLE is with a vision of **Development of Renewable Energy**, among the other objectives of **Associated Transmission Asset Development, Manpower Resource Provision and Procurement**.

Performance 2020 and Programs for 2021

a. Kumbalgamuwa Mini Hydro Power Plant

Using the leakage water more than 20 years from Samanalawewa Reservoir Sri Lanka Energies (Pvt) Ltd has constructed **Kumbalgamuwa Mini Hydro Power Plant**.

The Commissioning of 1.2MW Francis Turbine in Kumbalgamuwa Mini Hydro Power Plant was completed on 2016 February 19 and connected to the national grid.

Kumbalgamuwa Mini Hydro Power Plant supplied 13.95 GW energy to the national grid during the last 30 months of operation.



During the construction



Power House

Plant Summary		
Installed Capacity	1.3	MW
Cumulative Energy Generated	27.071	GWH
Cum Income	475.55	mn LKR
Capital Investment by CEB	115	mn LKR
Period of operation	4.5	Yrs



Fore bay Area



Turbine and Generator

b. Managing the Manpower Required by CEB

The Company managed 2800 manpower force that required to cater the CEB man power requirement from April 2015 and currently 115 contract employees who are with SLE are providing the services to CEB and has the capacity of handling 10000 labnors.

c. Meter Enclosure Manufacturing Plant.

The construction of the Plastic Single Phase Meter enclosure Manufacturing factory was started on 05th of September 2016 in order to fulfill the requirement of Plastic Meter Enclosures of Ceylon Electricity Board and Lanka Electricity Company (Pvt) Ltd.

Completing the construction and machine installation, the factory was declare opened on 05th of September 2017. An annual requirement of 250,000 meter enclosures will be manufactured and supplied to the Ceylon Electricity Board and Lanka Electricity Company (Pvt) Ltd by this factory.

The factory is running its capacity to fulfill the entire Meter Enclosure requirement of CEB and LECO by now.



Opening



Factory Front



3 Injection Machine



Assembly Line

MINISTRY OF POWER

a. Development of Daduruoya Mini Hydro Power Plant,

Under the directions given by the Secretary MOP, Sri Lanka Energies has started the construction of a 1.5 MW Mini Hydro Plant at Daduruoya Dam. This Dam was newly constructed by Dept of Irrigation and the entire Dam Project has been designed as a multipurpose project including power generation. The Provisional approval for this project has been issued to Dept of Irrigation by SEA and Dept of Irrigation has transferred the site and the relevant approvals were obtained after that.

Further the detail project feasibility study was done by Sri Lanka Energies and signing of a SPPA with Ceylon Electricity Board done. Construction of the project was started on September 2019 and expected to complete within this year.



Initiating construction works

3 penstocks to power house

Penstock Construction

Coffer Dam of Daduruoya

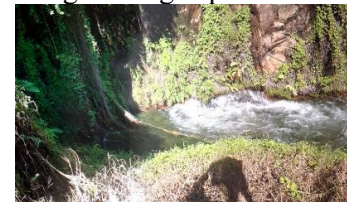
b. Upper Samanalawewa Mini Hydro Power Plant

According to the study done by SLE there is a water head from the point of leakage to the existing Kumbalgamuwa weir at 28m height. 600kw plant with 4.8GWh annual energy plant can be constructed from this water head.

This energy is wasted for more than 21 years without utilizing to any productive use.

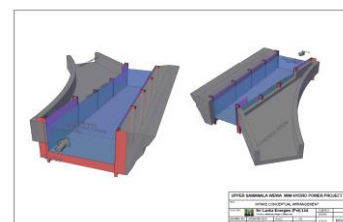
SLE did a detailed feasibility study in constructing a power plant as stated above without doing any disturbance to the existing leakage point or the surrounding area with Civil Engineering experts.

Draft TOR was issued by Central Environmental Authority and they asked for CEB views/observations over this proposal on 13th July 2016. Up to now that letter (CEA letter) has not been replied and if replied the project can be constructed and connected to the grid within a year, from the date of replied.



Proposed Intake Position for Power Plant

Project Summary		
Plant Capacity	700	kW
Expected Energy per Year	4.8	GWH
Exp Annual Income	86	mn LKR
Annual Income in terms of Emergency Power (Rs 35 /KWh)	171.84	mn LKR
Estimated project Cost	227	mn LKR



Proposed Intake Structure

c. Broadland Mini Hydro Power Plant

Subjected to the Board decision taken by Board of Directors of CEB, SLE has planned to construct a mini hydro power plant with a capacity of 1.5 MW at Broadland to utilize the water released for water rafting.

Environmental approval FROM Environmental Authority and supplementary EIA for Mini Hydro is pending.

