National Energy Potentials, Strategies and the Roadmap for Next Decade

Cabinet Sub-Committee Report

December 2022

Abbreviations

Institutions/Organizations and Frameworks

ADB	-	Asian Development Bank
AF	-	Adaptation Fund
BSTA	-	Bulk Supply Transaction Account
CBSL	-	Central Bank of Sri Lanka
CEB	-	Ceylon Electricity Board
CIFs	-	Climate Investment Funds
COP	-	Conference of Parties
CPC	-	Ceylon Petroleum Corporation
G7	-	Group of Seven
GCF	-	Green Climate Fund
GEF	-	Global Environment Facility
GGGI	-	Global Green Growth Institute
IFC	-	International Finance Corporation
JICA	-	Japan International Cooperation Agency
KOICA	-	Korea International Cooperation Agency
LECO	-	Lanka Electricity Company (private) Limited
LIOC	-	Lanka India Oil Company
MDBs	-	Multilateral Development Banks
PUCSL	-	Public Utilities Commission of Sri Lanka
RPC	-	Regional Plantation Companies
SLSEA	-	Sri Lanka Sustainable Energy Authority
SLTB	-	Sri Lanka Transport Board
UDA	-	Urban Development Authority
UN	-	United Nations

UNDP	-	United Nations Development Program
UNFCCC	-	United Nations Framework Convention on Climate Change
US EPA	-	United States Environmental Protection Agency

Terms

BAU	-	Business-As-Usual
BMS	-	Building Management System
DC	-	Direct Current
DSM	-	Demand Side Management
DTB	-	Dolphin Tanker Berth
EEBC	-	Energy Efficient Building Code
EEI&C	-	Energy Efficiency Improvement & Conservation
E-LMS	-	E-Learning Management System
ETS	-	Emissions Trading System
EV	-	Electrical Vehicle
EVCS	-	Electric Vehicle Charging Stations
G2G	-	Government to Government
GHG	-	Green House Gas
GoSL	-	Government of Sri Lanka
GSS	-	Grid Substations
HS	-	Harmonized System
ICE	-	Internal Combustion Engines
ISIC	-	International Standard Industry Classifications
ISO	-	Independent System Operator
LCA	-	Life Cycle Analysis
LED	-	Light-Emitting Diode
LNG	-	Liquefied Natural Gas

LTGEP	-	Long Term Generation Expansion Plan
NDC	-	Nationally Determined Contributions
NEP&S	-	National Energy Policy and Strategies
NGI	-	Non-Grant Instrument
PPA	-	Power Purchase Agreement
PPP	-	Public Private Partnership
PSA	-	Power Sale Agreement
PV	-	Photovoltaic
REDMAP	-	Renewable Energy Development Master Action Plan
SDG	-	Sustainable Development Goals
SLEA	-	Sri Lanka Electricity Act
SPBM-1	-	Single Point Buoy Mooring 1
SPBM-2	-	Single Point Buoy Mooring 2
SRC	-	Short Rotation Coppice
UNDC	-	Updated Nationally Determined Contribution
VAT	-	Value Added Tax
VFD	-	Variable Speed Drive

Measurement Scales

B/D	-	Barrels per Day
GJ	-	Gigajoules
GWh	-	Gigawatt-hour
kg	-	Kilogram
kWh	-	kilowatt-hour
M	-	Million
M.S.	-	Maximum Sulphur
MT	-	Metric tons

MW	-	Megawatt
MWh	-	Megawatt-hour
RON	-	Research Octane Number
SLR	-	Sri Lanka Rupees
Unl	-	Unleaded
USD	-	United States Dollars

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Annexures –

Executive Summary

His Excellency the President has brought to the notice of the Cabinet of Ministers on August 30, 2022, the necessity of adopting appropriate policies and strategies and a Roadmap while identifying various challenges encountered by the energy sector at present, to enable the energy sector more efficiently towards economic development of the Country and the Cabinet of Ministers has decided to appoint a Cabinet Sub-Committee chaired by the Hon. Prime Minister Dinesh Gunawardena, comprised of six Cabinet Ministers. Secretary to the Prime Minister was appointed as the Secretary/Convener of the said Sub-Committee. Several Sub-Committee meetings were held with the participation of stakeholder institutions, practitioners and academia.

The Sub-Committee report compiled with the contribution of all the stakeholders mainly aimed in recognizing contemporary issues and existing potentials in Global and Local Context of Energy Sector intends to illustrate Sustainable Energy Solutions through National Energy Strategies and a definite Roadmap with the objective of strengthening the national economy in line with the United Nations Sustainable Development Goals (UNSDGs).

Proposed policy measures directly align with Sri Lanka's Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDCs) targeting to adopt a low carbon development pathway. The Sub-Committee recommends a clear Roadmap giving every stakeholder with responsibility and accountability to review and update the existing National Policies and adhering to International Commitments related to the Power and Energy Sector while paying due consideration on policy gaps, targets and milestones.

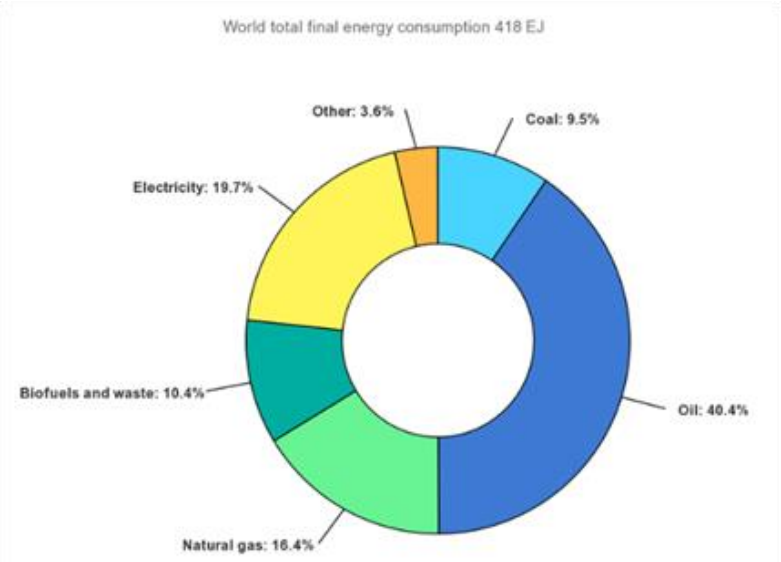
Further, it is decided that all the responsible government institutions should be instructed to compile with Short Term, Medium Term and Long Term Strategic Plans in line with the SDGs, and the Sub-Committee to continue to act in order to ensure achievement of each goal by evaluating and reviewing the progress of compiled sectoral strategic plans and also to act as a catalyst policy level instrument for intervening to resolve any issues arise as an inter-agency coordination entity. Furthermore, it was also decided that a periodic progress report to be submitted by the Cabinet Sub-Committee to the Cabinet of Ministers on quarterly basis to ensure the continuation of the responsibility delegated to the Sub-Committee for the development of Sustainable Energy Sector in Sri Lanka.

1.0. Introduction

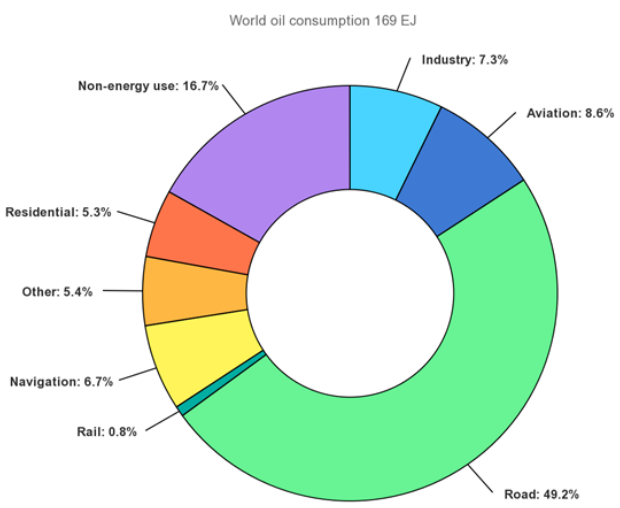
This document aims to present the potentials and strategies for establishing a Sustainable Energy Security strategic Plan and a procedure for next ten-year period (2023-2033) based on the *NEP&S* which has been gazetted no. 2135/61 and dated 09.08.2019. The three main sectors of energy consumption are: Industry, Transportation and Buildings. Industrial Sector encompasses power generation, manufacturing and services industries while Transportation Sector includes ground, water and air transportation, and relevant infrastructure systems, and the Buildings Sector comprised of energy demands of all commercial, manufactural, industrial and residential buildings. Under the broad umbrella of Energy, hydro, wind, solar, hydrogen, thermal energy sources to cater towards growing national demand of the aforementioned sectors are being considered.

1.1.Global Energy Industry

Energy that provides basic human development needs such as lighting, heating, cooling, electricity supply etc. has become essential and important as food production. In general, the energy industry is involved in the extraction, refining, production and distribution of primary energy sources such as crude oil, refine oil, natural gas, coal, hydro, wind and secondary energy sources such as electricity which is generated from various other means. Since there is a rapid population growth globally, which has also resulted in more urbanization and heavy consumption, the demand for both traditional and nontraditional sources of energy is expected to increase significantly in coming years.



Source: IEA, World Energy Balances, 2021



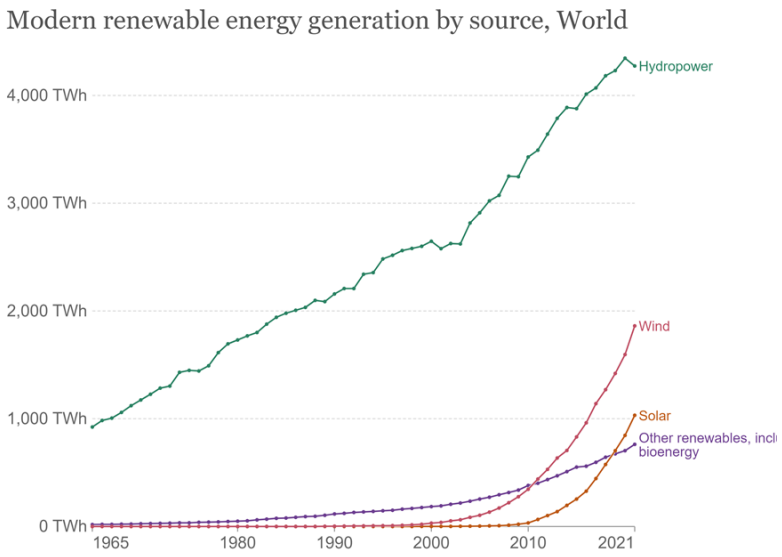
Source: IEA, World Energy Balances, 2021

According to Global Energy Perspective 2022 presented by M/s McKinsey Consultants, while the governments and businesses across the world are increasingly committed to steep global de-carbonization targets, vulnerable energy markets that are facing extreme volatility driven by geopolitical tensions and a rebound in energy demand. The conflict in Ukraine, along with other unpredictable factors, has triggered significant peaks in energy prices in the global market as uncertainties around supply security and affordability are paramount. Throughout 2021, global energy demand and emissions have increased by 5% compared to 2020, almost reaching pre-COVID-19 levels.

According to statistics, coal demand is also said to have peaked in 2013 and, after a temporary rebound in 2021, is projected to continue its downward trajectory. Peak oil demand is projected to occur between 2024 and 2027. It is also assumed that after the year 2035, gas demand will likely be subject to larger uncertainties, driven especially by the interplay with hydrogen.

It is predicted that the global demand of Electricity will be tripled by the year 2050 and electricity, enabling hydrogen and synfuels could account for 50% of the energy mix. The renewable generation is projected to reach 80–90% of the global energy mix by the year 2050.[1]

Increased usage of renewable energy has become a trend and the following graph shows that there has been a rapid increase in using solar, wind and other renewable energy sources during the last decade.

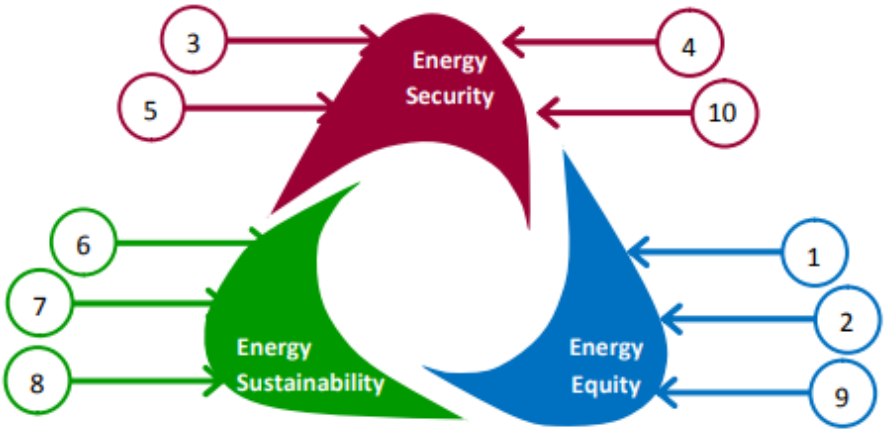


Source: Our world in Data based on BP Statistical Review of World Energy & Ember

[1]https://www.mckinsey.com/~/media/McKinsey/Industries/Oil%20and%20Gas/Our%20Insights/Global%20Energy%20Perspective%202022/Global-Energy-Perspective-2022-Executive-Summary.pdf

1.2.The National Energy Policy & Strategies – 2019

The National Energy Policy & Strategies of Sri Lanka was published in the Gazette Extraordinary No. 2135/61 of 09.08.2019 with an objective to ensure energy security through supplies that are cleaner, secure, sustainable, reliable and economical, to provide convenient, affordable energy services to support socially equitable sustainable development of Sri Lanka. The National Energy Policy is thus founded on ten pillars, rooted in the broad areas impacting the society, economy and the environment, in an effort to counter balance the forces through enhanced equity, security and sustainability, respectively.



The ten pillars are described in greater detail below:

1. **Assuring Energy Security**:

   Primary and Secondary energy supplies of the Country will be secured to ensure continuity, adequacy and reliability.

2. **Providing Access to Energy Services**:

   Providing due access to reliable, convenient, affordable, equitable and quality energy services to be provided to all citizens in order to improve their living standards and to engage in gainful economic activities.

3. **Providing Energy Services at the Optimum Cost to the National Economy**:

   Energy services to be provided at optimum long-term cost, to lower the burden on the National Economy and also to achieve competitiveness of locally produced goods and services in international markets.

4. **Improving Energy Efficiency and Conservation**:

   Efficient use of energy to be promoted in all sectors and across the energy value chain, engaging both the suppliers and users.

5. **Enhancing Self Reliance**:

   Indigenous energy resources to be developed to the optimum levels to minimize dependence on imported resources, subject to resolving technical, economic, environmental and social constraints, with the objective of minimizing the vulnerability of energy supplies to external situations.

6. **Caring for the Environment**:

   A meaningful contribution to climate change to be provided by maintaining the low carbon intensity of the Sri Lankan energy sector to minimize adverse environmental and social impacts of energy services with the intension of safeguarding the global and local environment.

7. **Enhancing the Share of Renewable Energy**:

   Indigenous renewable energy resources to be developed to the optimum level to attain sustainability and a higher degree of resilience in the energy sector.

8. **Strengthening Good Governance in the Energy Sector:**

   Governance of the energy sector to be strengthened to realize accountability, fairness and transparency to achieve investor and consumer confidence. A stable policy environment to be ensured and the regulatory

framework to be further strengthened to assure good governance in the energy sector.

9. **Securing Land for Future Energy Infrastructure**:

   Strategic locations for establishing energy facilities and corridors which interconnect such facilities to be earmarked and secured in advance to ensure timely implementation of such facilities and to minimize adverse social impacts.

10. **Providing Opportunities for Innovation and Entrepreneurship:**

    Considering the limitation to the scale of markets available in Sri Lanka to breed technology intensive local businesses, the relatively large size of the energy sector to be utilized to nurture local entrepreneurship and innovation[2].

The results delivery framework of the aforesaid NEP&S has been updated as some of the milestones are already outdated and given in *Annexure 01* of this report.

1.3. Sri Lanka Economy Linked to Energy

Being the state owned Oil Corporation in Sri Lanka, Ceylon Petroleum Corporation (CPC) is responsible for import, export, refine, supply and distribute the 80% petroleum & petroleum related products throughout the island assuring the energy security of the country. As the single largest importer of the Country, which consumes approximately 20% of the total annual imports value, CPC is directly connected to the Sri Lankan Economy.

Considering no commercially viable petroleum resources available in the country to date, total petroleum demand is being imported using large tankers/vessels as bulk

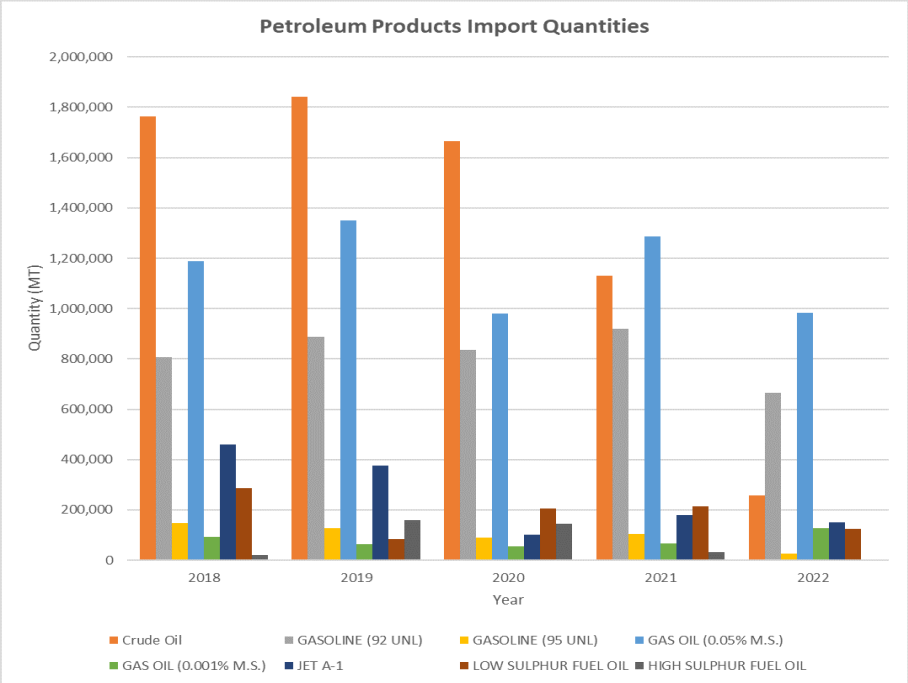
[2] https://www.energy.gov.lk/images/resources/downloads/national-energy-policy-2019-en.pdf

cargos. These bulk cargos are unloaded at four (04) main gateways namely Single Point Buoy Mooring 1 (SPBM-1), Single Point Buoy Mooring 2 (SPBM-2), Dolphin Tanker Berth (DTB) and Trincomalee Oil Unloading Jetty. Located about 9 km offshore from Colombo Port, SPBM-1 is specially reserved for crude oil unloading only. The SPBM-2 facility, located about 6 km offshore from Kerawalapitiya, is specialized for offloading petrol 92, auto diesel and fuel oil only. The DTB located inside Colombo Port is used for unloading all other petroleum products ranging from petrol 95, super diesel to fuel oil etc. The Trincomalee Oil Landing Jetty is currently operated by the Lanka India Oil Company (LIOC) and is used to land about 20% of all products imported by LIOC.

CPC currently imports the following petroleum products,

- Crude Oil
- Gasoline 92 (Unl) & Gasoline 95 (Unl) [Euro 4]
- Gas Oil (0.05% M.S.) and Gas Oil (0.001% M.S.) [Euro 4]
- Jet A-1
- Fuel Oil

Following figure depicts the quantity of Petroleum Products imported during last five year period to Sri Lanka



Source: CPC

The cost of importing petroleum products are as follows;

Products	2018	2019	2020	2021	2022 (January-September)
	USD M	USD M	USD M	USD M	USD M
Crude Oil	1,024.26	970.70	583.34	596.95	342.94
Other Bulk Products	1,954.99	1,858.41	949.83	1,755.07	2,115.13
Total Value	2,979.25	2,829.11	1,533.17	2,352.01	2,458.07

Source: CPC

CPC owns the only Oil Refinery in the Country which is located at Sapugaskanda, which could refine crude oil and produce 30% of the total Petroleum demand of the Country.

Refinery Production Cost are shown in the table

Year	2018	2019	2020	2021	2022 (January-September)
Refinery Production Value (SLR . M)	171,273.38	188,338.00	127,104.92	138,715.27	96,282.86

Source: CPC

Current economic crisis and forex issues are beyond the control of the CPC, hence it is becoming more and more difficult to import Petroleum Products to cater the country's full demand. Accordingly, following solutions are suggested to eliminate/mitigate the sever losses concerning CPC.

a) Enter into low premium term contracts for future fuel importations.
b) Negotiations on Government to Government Basis (G2G) oil procurements to minimize installments and the cost.
c) Search for Supplier Credit Facilities (at lower interest) for purchasing of fuel.
d) Continue with the cost reflective fuel pricing mechanism.
e) Seek for loan/financing facilities from external parties at a concessionary rate with sufficient grace periods.
f) Restructuring present loans portfolio to long term loans with sufficient grace periods and special rates.
g) Intervention of the government to reduce the interest rates charged by the Banks.
h) Increase the sales revenue generated through Dollar paying customers.
i) Intervention of the government to recover outstanding receivable balances from State institutions.
j) Import crude oil with a low percentage of bottoms, which will eventually improve refinery profitability and high value on products.
k) Uninterrupted crude oil supply to the refinery to avoid unplanned/sudden shutdown and to avoid start-up costs of the Refinery.
l) Refinery Capacity expansion of the Country with possible private sector capital intension in transparent manner.

The share of the “electricity industry" is as small as 13.8% of the overall energy demand of the Country. The Net generation of energy in 2021 was 16,716 GWh and only a 6.4 % increase compared to that of in 2020 which reported as 15,714 GWh. Electricity is an essential input for the industrial sector which directly contributes the economic growth. The amount of electricity consumed by the Industrial Sector,

General Purpose Sector and Hospitality Sector in year 2021 was respectively 5,127 GWh, 3,393 GWh and 265 GWh. Hence, said three sectors which directly contribute for national economy of the country have reportedly consumed approximately 53% of the net electricity generation in 2021. Electricity consumed by the domestic users directly or indirectly contributes to the national economy to a significant extent.

The average lost to the economy due to shortage of electrical energy has been estimated as 0.810USD/kWh (in 2022 prices). This value has been derived by escalating the ENS figure given by PUSL as 0.5 USD /kWh in 2011(LTGEP 2023 -2042). Therefore maintain of the reserve margin and keep the loss of load probability within the accepted level is extremely vital in terms of economic impacts.

1.4. Sectoral Energy Demand & Supply – Forecast

Based on the inputs obtained from the Industrial Sector and by using statistical projections in relation to domestic, general purpose, religious and government sectors, Ceylon Electricity Board (CEB) develops a 25-year electricity demand forecast which is subjected to revision every two years. The most recent demand forecast prepared by the CEB is attached as *Annexure 02*. In order to meet the electricity demand forecasted in such a manner, the CEB prepared the least cost "Long Term Generation Expansion Plan (LTGEP)" following the "General Policy Guidelines'' (*Annexure 03)* issued by the Ministry of Power and Energy which has the purview of the subject of power and Energy.

Under the LTGEP different possible scenarios are been considered. Out such scenarios, the LTGEP recommends adoption of the most justifiable generation mechanism for the future that should comply with the government policy pertaining to the Electricity Industry.

The base case of the most recent LTGEP is attached as *Annexure 04* to this report as reference. The optimum energy mix of the LTGEP is determined by using a scientific methodology by CEB in consideration with many parameters such as system demand forecast, investment requirement, peak demand, maximum demand, intermittent nature and system stability etc.

Transportation, Industry, Buildings and Power Production Sector are the four (04) key sectors which the petroleum products are used as a source of energy. Developments in these four areas considering latest technologies and methodologies, the effective use of fuel will have a significant impact to the local economy as entire quantity is imported which have a significant forex outflow to Country's Economy. Optimum use of energy content in a unit will save the reserves, which can be achieved by improving required infrastructure in the aforementioned four areas in various aspects in consideration. CPC has already taken steps to improve its product standards to suite the latest requirements of equipment and machineries used in these key sectors.

Introduction and implementation of alternative energy sources such as renewable and clean energy in a feasible manner will certainly results in reducing the usage of petroleum based products and its demand which will ultimately result in a positive impact to the Country's Economy at large. Further, increasing the local production by optimum utilization of our refinery operations in an efficient manner, will certainly add more benefits to our Economy. The continuous operation of 24 tankers of 90,000 MT in capacity under competitive pricing mechanism per year will enable refinery throughout the year and it will contribute to a considerable portion of the product demand supplied locally.

The predicted demand for the next five year period from the year 2023 to 2027 is as follows:

Demand forecast for the period of Five years (2023-2027)							
	Products (in Metric Tons)						
Year	Auto Diesel	Super Diesel	Petrol 95 RON	Petrol 92 RON	Kerosene	JET A 1	Fuel Oil
2023	1,496,721	92,204	62,683	1,058,993	113,881	168,088	593,302
2024	1,429,805	96,515	51,667	1,064,349	112,346	126,405	567,522
2025	1,362,125	100,848	42,141	1,069,616	106,268	95,218	533,582
2026	1,296,382	105,197	34,112	1,074,847	100,479	70,383	501,913
2027	1,232,585	109,559	27,583	1,080,061	95,163	51,736	473,126

Source: CPC

1.5 Energy Sector Targets – 2025

Though setting Energy targets for the next four years with the present context of the country will become a challenging task, it is essential for securing the stability of the Country.

The primary challenge our Energy Sector face at present is our over dependence of fossil fuels and delay in developing of our own non-conventional renewable energy resources and lack of foreign exchange to import fossil fuels. Country energy requirement covering all of our demand sectors could be categorized as Transport 40%, Cooking and Housing 40% and Electricity Generation 20%. To ensure implement sustainable energy solutions, Sri Lanka has to convert all above three sectors possibly with green initiatives. Since transportation consume major portion, the key strategy should be mainstreaming the Transport Sector to alternative energy sources such as electricity and Hydrogen (H_2). The country may have to overcome the technical difficulties in the short term in using of H_2 as a fuel due to possible storage difficulties, high volume requirement and requirement of high amount of energy for

liquefaction etc. However, Department of Railway can consider initial steps taken in other countries to convert railway engine to use Hydrogen as a fuel.

Heavy reliance on foreign/imported energy sources, such as coal and fossil fuel needs to be minimize wherever applicable. Therefore, power generation industry needs to be fed in with locally generated renewable energy sources such as, solar, wind, hydro, hydrogen, biomass etc.

Roof Top solar power generation and mini hydro power generation e.g. from the Mahaweli System's canal network needs to be promoted in a larger percentage. Further, CEB has identified the potential of domestic value addition to the accessories of wind power plants. It is predicted that, a maximum of 40% of the investment could be minimized by way of promoting local value addition to the accessories of wind power plants by facilitating the domestic investors to start manufacturing required accessories needed. To ensure local private sector participation in this new investment area, it is needed to introduce new tariff specific for power plant installed with such value added equipment.

Public Railway System:

Since the railway has proved to be the most economical mode of transportation of both people and goods it is recommended to promote railway system for all segments of transport requirements within the next five years. The transportation of commodities such as rice, vegetables, fruits, coconuts, tea, rubber etc. from different parts of the Country to trading hubs and ports needs to be facilitated via the railway system. This will result in many side benefits to the society including the reduction of the fuel requirement for private vehicles and less road traffic and associated accidents, foreign exchange saved on fuel savings, elimination of financial waste etc.

Railway System need to be transformed in to the most favored mode for commuting between provinces, districts and even for leisure activities. The peripheral services for commuting via trains within sub areas too need to be made available. Within the

cities, rail tracks needs to be used for short distance passenger transportation by introducing rail cars and rail buses etc.

Bus Commuter Transportation:

Public and the Private fleets of Buses needs to be transformed to a system regulated by a common timetable along with common ticketing procedures and the government shall introduce an immediate mechanism to make bus transportation an effective and a profitable mode of transportation since it is an instant solution that does not incur an additional capital. The job of the Bus Driver and the Conductor needs to be re - defined and established as a HR skilled job with appropriate job hospitality, training opportunity and knowledge on law enforcement. Enforcement of good driving practices from the primary education as well as, the driving discipline, ethics and humanities needs to be inculcated into the attitudes of all vehicle drivers from the secondary and tertiary education.

Short Distance Travel:

Non-Motorized Transport modes such as "Riding Bicycles" and "Walking short distance" to be popularized as it promotes good health of the population which in turn facilitate development of the country's environment while saving fuel and foreign exchange. To reach this target, several factors to be introduced and infrastructure facilities to be established (i.e. Minimizing the Road Side Air Pollution by strengthening the Eco-Testing and Certification procedures for vehicles, introducing bicycle routes and walkways layout planning, provision of required parking facilities and shading road sides by trees etc.).

2.0 Understanding the Energy Sector Crisis and its Impact to the Economy and Environment

Under this chapter intend to provide an update of prevailing crisis face by the Energy Sector and to find solutions to address the situation to ensure minimize the possible negative impacts to National Economy and the environment.

2.1 Responding to Sri Lanka's Sustainable Development Goals and Nationally Determined Contribution targets towards adapting a Low – Carbon Development Pathway

Power Sector

Sri Lanka, as a signatory to the Paris Agreement, has updated NDCs to the United Nations Framework Convention on Climate Change (UNFCCC) through "Updated Nationally Determined Contribution" (UNDC) which reflects the progressive ambitions for climate action. In the UNDC it has been declared as a member nation that from the Power Sector a target is set to achieve emission reduction from Business-As-Usual (BAU) scenario 5% on Unconditional Basis and another 20% Conditional Basis. This would be equivalent to an estimated Mitigation Level of 9,819,000 MT Unconditionally and 39,274,000 MT Conditionally (A total of 49,093,000 MT) of carbon dioxide equivalent during the period of 2021-2030. Compared to the BAU targets of the Long-Term Generation Expansion Plan 2013-2032 of CEB published in October 2013, it is observed that approximately 39% of CO2 emission is from the Electricity Sector while major contributor for CO2 emission is the Transport Sector which accounts for approximately 48% (CEB LTGEP 2023-2042).

In global context, renewable energy resources are heavily contributing in reducing GHG emissions which is facilitated through various new conservation policies. Aligning with Global Trend, the Government of Sri Lanka (GoSL) has also planned to achieve 70% of electricity demand through Renewable Energy sources by the year

2030 and to achieve Carbon Neutrality by the year 2050. Energy sector must be directly involved in mitigation aspects of Climate Change and it must be considered the institutional system which should act as per the said new policy targets.

However, as per the envisaged policy goals on renewable energy development, 4,674 MW of Solar, 1,754 MW of Wind, 1,571MW of Major Hydro, 610 MW of Mini Hydro, 210 MW of Biomass, 700MW of Pumped Hydro projects and 1,125MWh of Standalone Battery Energy Storage is expected to be added to the System during the proposed period of 2020 to 2030.

Expected new aspects of the Transport Sector

It is paramount important to gradually replace the fleet of thermal fueled buses used for Public Transportation to low floor electric busses in order to provide improved and quality service thereby to attract commuters from present Private Transport modes to Public Transport mode. All major 5 Corridors using to enter the capital city of Colombo are to be introduced with **"Park and Ride"** bus services. Parking facilities have already been established in two corridors. Furthermore, main provincial cities like Kandy, Galle, Anuradhapura, are too to be introduced eventually with "Park and Ride" Services.

Inter-provincial, inter-city and short-distance transport services need to be connected at multimodel transport mode/ hubs along the proposed Corridors along with shuttle bus services to provide a comfortable transport service to commuters. A timed Shuttle services radiating from transport modes/ hubs will eventually pave the way for limiting the buses reaching to Colombo which is presently the ultimate destination for many buses traveling along these Corridors.

Country's Road System need to be improved to ensure to minimize the unwanted traffic congestion and road traffic accidents. Therefore, Bus Priority Lanes should be introduced to minimize the travel time. Since slow moving vehicles such as Three Wheelers create road traffic behind them and therefore, introducing a dedicated lane

for three wheelers and motor cycles has to be implemented. Construction of roads and installation of additional common infrastructure facilities such as Electricity and Water supply need to be properly plan & scheduled, thereby newly constructed roads will not be damaged for installing other infrastructure resulting waste of material, energy, time and labour.

Main reasons for Public to move away from using the Public Transport Systems is mainly due to unpleasant traveling experience. Overcrowding needs to be eliminated by introducing sufficient number of buses along with appropriate time tabling and improving the human relations skills of the bus conductor, introducing an online payment system or an appropriate prepaid card system at least in urban areas to reduce congestion, this situation can be quickly turned in the right direction. Commuters should be able to use maps such as Google Transit Maps to plan and connect their travel with major public transport modes. All public transport media systems should be equipped with GPS, CCTV etc. facilities so that their movements can be monitored like in other countries.

Effective use of vehicles and fuel, largely depends on driving patterns. Scientific and safe driving helps to minimize the wear and tear of the parts and efficient usage of fuel as well. Therefore, opportunities need to be provided for driver training. Having a Certification on scientific driving can be included in the criteria for selecting for job opportunities, promotions and salary increments. Further suggested Certification needs to be renewed along with the renewal of Driving License. In addition, the training programme for scientific and safe driving should also include a section on fundamentals of road worthiness of a vehicle, and vehicle maintenance.

Irrespective of the age, poorly maintained vehicles emit more harmful pollutants. It also leads to a higher rate of fuel consumption. This is most significant in the case of heavy vehicle fleets like buses and trucks which come with larger engine capacities. Therefore, vehicles running with higher emissions (smoke) especially in long distance

travelling within urban areas should be discouraged immediately imposing necessary rules and regulations.

In the country, number of three wheelers presently represents 14.2% of the total registered vehicles. Some of them driven by diesel and 4 stroke gasoline engines, while balance 3 wheeler fleet is comprised of 2-stroke gasoline engines. The import of this type of vehicles is currently banned due to the extent of high emission of environmental pollutants. As an attempt towards transition to low carbon mode, United Nations Development Program (UNDP) has recently given consent for extending its support to convert some of the existing 3 wheelers into Electric 3 wheelers. This effort will pave the way for emission reduction and also enable efficient use of fossil fuels.

In line with improving System Efficiency, focus need to be made on developing Inland Freight Transport Corridors to which production centers and markets are to be connected. Linking the Corridors to Seaports and Airports Trading hubs ensures a continuous supply chain to meet emergency situations as well. Further, development of proposed centers into Logistic Centers will accrue more economic returns in the surrounding neighborhoods. Enhancing freight transportation facilities in the presently available railway stations will mainly encourage the movement of cargo trains during off peak night time and day hours under reasonable fares.

2.2 Global Energy Market Trend and Its Impact on Sri Lanka

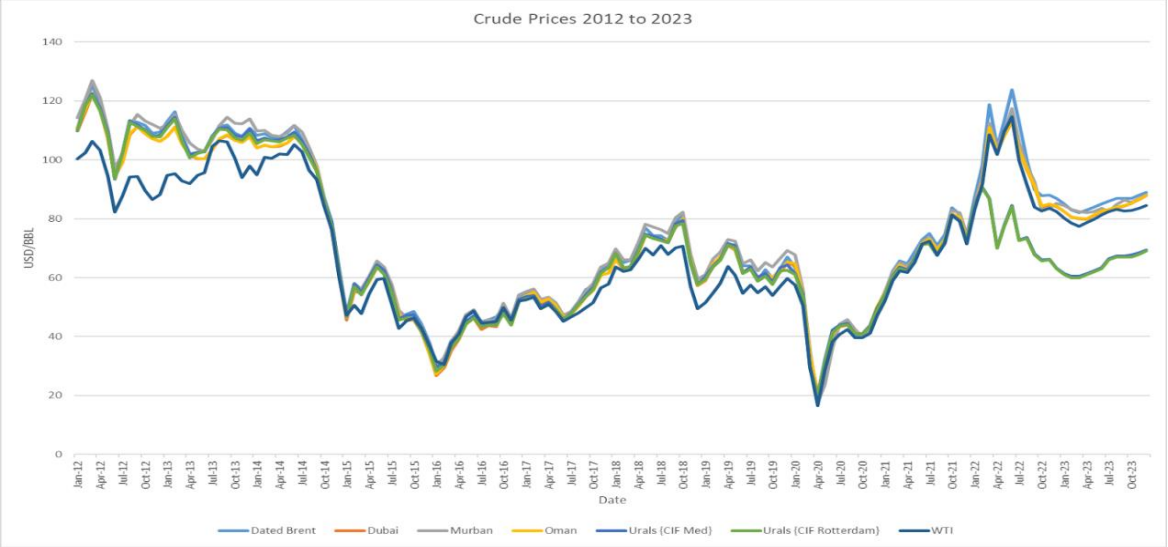
2.2.1 High Prices

Global energy prices are highly volatile to the market conditions. Especially when considering the Petroleum Sector, Energy markets are mainly controlled by the oil producing nations and the nations who possess buying power the most. With the product availability in the market, the prices suddenly subject to vary, by coursing immense hardships for consuming nations.

However, distillate cracks are likely to remain firm as they have been getting support from rising demand for diesel/gasoil and jet fuel across all regions (middle distillates to account for 58% global oil demand growth this year), the partial loss of Russian exports (and fear of impending loss/displacement out of region), and extremely low inventories in key hubs globally. With this outset the product prices will further increase.

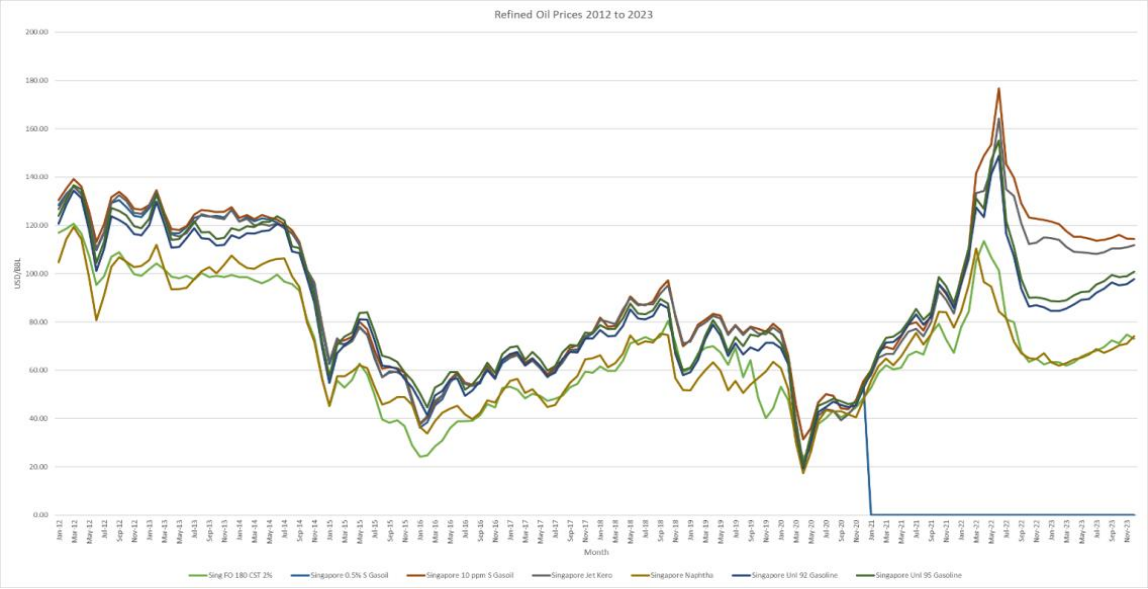
2.2.2 Rising Cost

With the price forecasted based on the historical prices, the following graphs have been developed separately for Crude Oil buckets and Refined product buckets.



Source -CPC

As per the price predictions, the prices will gradually rise throughout 2023, in terms of both Crude Oil and Refined Products.



Source: CPC

2.2.3 Economic Uncertainty

Sri Lanka is wilting under its worst financial crisis in seven decades, with foreign exchange reserves at record low, leaving it scrambling to pay for essential imports including fuel, food, and medicine. Hence, with this economic uncertainty the Government is compelled to find new ways and means to finance its massive fuel importation bill.

2.2.4 Forex Issues

The shortage of forex liquidity, which has arisen since the first quarter of the year 2022, has affected the provision of essential imports, including fuel. Though the CBSL imposed certain measures to ensure adequate foreign exchange liquidity in the banking system, the government is still struggling to find the forex needed to facilitate the energy imports smoothly.

Sri Lanka still relies on thermal energy that costs a higher amount of foreign exchange as its primary source of energy generation since the hydropower and Solar

generation capability so far only accounts for around 30% of the total energy required.

2.2.5 Impact on Economy

It is evident that the generation cost due to excessive use of fossil fuel has become a huge burden for the financial situation of the CEB. Despite receiving more rain than forecasted in 2021, the direct generation cost of CEB has been recorded as SLR 195,884 M which exhibited 69% against the total expenditure of SLR 283,364 M. However, the total income generation of CEB in 2021 was only a 261,914 M incurring a net loss of SLR 21,450 M. It is estimated that the direct generation cost of this year (2022) would be SLR 384,182 M showing 83% against the estimated total expenditure of SLR 463,394 M. The net loss of this year despite the tariff increase introduced in August is estimated to be SLR 151,937 M.

It is also estimated that the direct generation cost of CEB for 2023 would be SLR 721,907 M showing 88% against the estimated total expenditure of SLR 820,943 M under 'no power cut' scenario. In case the "three-hour power cut" scenario is adopted, the direct generation cost of 2023 would be approximately around SLR 639,000 M. However, the indirect impact on the national economy due to "power cut" scenario has not been calculated accurately. The income forecasted for 2023 under "no power cut" scenario would be SLR 477,509 M and that of with three-hour power cut would be SLR. 448,967 M.

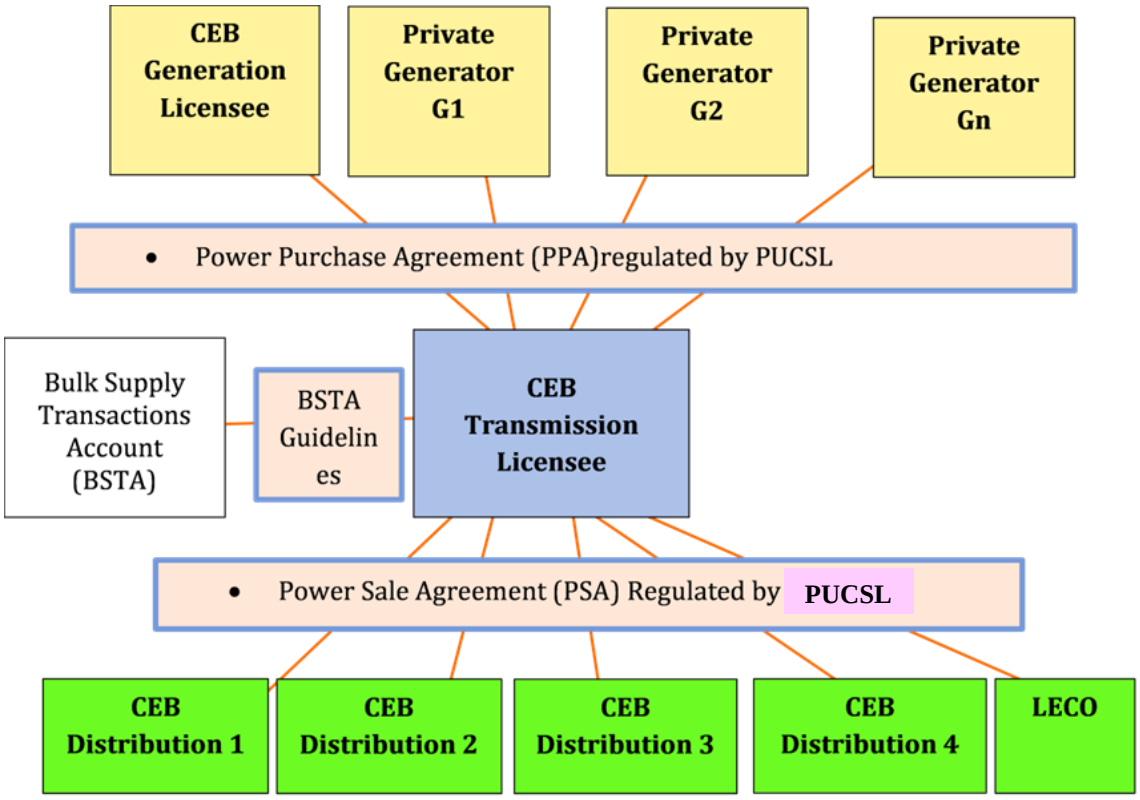
2.3. Organizational Reform

2.3.1 Ceylon Electricity Board (CEB)

The prelude of the Ceylon Electricity Board Act No 17 of 1969[3] indicates that the "Ceylon Electricity Board has been established for the Development and Coordination of the Generation, Supply and Distribution of Electricity Energy" along

[3] https://www.lawnet.gov.lk/ceylon-electricity-board-3/#:~:text=AN%20ACT%20TO%20PROVIDE%20FOR,THE%20ELECTRICAL%20UNDERTAKINGS%20OF%20LOCAL

with few other purposes. Due to the large expansion of the electricity production industry within the last few decades, improving the efficiency of that sector is an extremely urgent need, so we should immediately start reforms with a number of new business models that have been successfully introduced in the world in order to ensure a more reliable electricity supply for electricity consumers. As per the provisions stipulated in Subsection 9(2) of the Sri Lanka Electricity Act (SLEA) No. 20 of 2009[4], CEB is the only organization which could apply for "Electricity Transmission License" which is known as the "Single Buyer Model" in the electricity industry. The proposed business model of the electricity industry in Sri Lanka can be visualized in the following figure.



Source: Ministry of Power and Energy

However, many countries across the world have adopted highly efficient new business models particularly along with unbundling major functions of the Electricity Industry with a greater focus on "Generation", "Transmission" and "Distribution". In

[4] https://ceb.lk/front_img/img_reports/1532497620Act_No._20_(E)_of_2009_.pdf

the cabinet meeting held on 01.08.2022, the cabinet has decided that an expert committee should be appointed to work for the sustainable existence of the industry, providing reliable electricity supply to consumers and promoting investments. The Committee, within the scope and institutional framework laid down in Chapter VI of the Electricity Reforms Act No. 28 of 2002, shall study and review the current social, economic and governance needs of the country and focus on the present and future aspirations of the general public and for CEB in particular, for the electricity industry including Ceylon Electricity (Private) Company Limited (LECO) in general, a more active, lively, effective and efficient institutional framework should have been recommended to increase the level of business continuity in the country. The expert committee has recently fulfilled its responsibility and submitted its report for the consideration of the Council of Ministers.

In view of ensuring the efficiency of the utility sector reforms to the CEB is proposed. As per the proposed restructuring process the utility sector would be unbundled and there would be a comprehensive regulatory mechanism to ensure an efficient process of governance. Hence the following strategies will be adopted.

a. Unbundling the electricity sector utilities with necessary legal provisions.
b. Strengthening the Public Utilities Commission to ensure proper regulatory mechanism.
c. Transforming Revenue Regulation to Profit Regulation Regime with the unbundling process ensuring to promote efficiencies.
d. Unbundling the utilities based on the nature of the business / service.
e. Introduction of Professional Governance to the sector.
f. Establishment of a new unit dedicated to the restructuring process for energy planning under the line ministry or under the office of the President as it is proposed to undertake energy planning through the proposed restructuring and to act as the new Independent System Operators (ISOs) to be established.

g. Establishment of Data Interchange Platform while ensuring data security, data protection and interoperability with Enterprise Resource Planning software similar/same for all unbundled units.
h. Expand the usage of high tech facilities including smart metering in the electricity industry.
i. Opening up power utility transactions, particularly distribution, to the private sector as power generation has already been opened up to the private sector while retaining full ownership and operation of the broadcast network.
j. In order to ensure competition related to energy demand and supply, to introduce an electricity market mechanism in the power generation sector and to supply at least 25% of the total electricity demand in the country by the year 2026 through the proposed new market mechanism.

For this purpose, Energy Exchange Centre would be established in order to introduce Multi Buyer Model enabling distribution licensee to purchase energy.

3.0 Strengthening the potentials of Sustainable Energy Solutions

3.1 Renewable Energy, leading to a cleaner -future through Green Energy solutions

3.1.1 Expanding the country's Renewable Energy Generation up to 70% of the national requirement by 2030

As a developing country, Sri Lanka will continue to see a rising demand for electricity in the period of next two years. Fortunately, the island has abundant renewable energy potentials hence; this will help in finding the most optimal solutions for this increasing demand.

Renewable Energy Resources include Biomass, Geothermal, Hydropower, Solar, and Wind and Green Hydrogen. We call them renewable energy because their depletion over a short period of time is naturally replenished. In addition to the above indigenous renewable resources, the availability of Fossil Fuel/Natural Gas Deposits within the Sri Lankan territory is being explored and three deep liquid Natural Gas Deposits have been already discovered in the Northwestern offshore region of the Island.

The policy on achieving 70% Renewable Energy by the year 2030 was introduced after the declaration of the National Energy Policy and Strategies (NEP&S) in 2019. However, the activities needed to be complied with the new policy are mostly in relation to the generation of electricity. Hence, the CEB has formulated a separate generation plan up to 2030 (Annexure 05) indicating the capacity addition in each year both in terms of Renewable Energy and Thermal. Therefore, the CEB and SLSEA need to jointly identify activities towards developing a "Renewable Energy Development Master Action Plan (REDMAP) which should describe the potential technology of Renewable Energy (either Solar or Wind) along with site mapping, time

frames and tentative investments. CEB and SLSEA are to publish this information in their websites enabling the private investors to invest in the power sector.

Expected installed capacity for the journey towards achieving 70% Renewable Energy by 2030 is as follows;

Table: The installed capacity by the end of 2030

#	Source of Generation	Capacity (MW)
1	Major hydro power plant system	1571
2	Mini Hydro power plant system	610
3	Wind power plant	1754
4	Solar power plant	4674
5	Biomass power plant	210
6	Storage capacity	1825
7	LNG energy sources	1738
8	Coal energy sources	900
9	Diesel/Napta energy sources	50
10	Furness oil sources	24
	Total capacity	13,356

Source: CEB

Owing to the possibility of meeting the energy needs through carbon benign technologies, energy sector is receiving primary focus in the Climate Change Mitigation agenda globally. International trends in enhancing the competitiveness of renewable energy technologies as well as the geographical positioning of the country leading to high Solar and Wind potentials create a high-sounding platform for Sri Lanka to embrace renewable energy sources for meeting the future energy needs.

The government has duly given serious attention for the current global and national contexts related to the electricity demand and supply, and serious attention has been given to increase the Renewable Energy share in electricity generation, with a long-term goal of realizing Carbon Neutrality in the energy sector by the year 2050. Among the commitments that have been made in this respect, announcement of a No-Coal Policy and a medium-term target of achieving 70% electricity through renewable energy sources by the year 2030, are the key interventions in the current context. Government already entered in to Memorandums of Understanding and agreements with private sector investment companies to initiate Wind and Liquefied Natural Gas (LNG) power plants despite long delays for a long time. So it is observed that the immediate attention of the Government shall be paid on this since such delays will divert private sector investment attractions to the other parts of the world.

As far as the key attributes pertinent to this are concerned, primarily the prices of Renewable Energy have become in par with conventional energy resources, or even lower. The challenge is the inherent fluctuating nature of Renewable Energy sources, leading to difficulties in attaining firm power. Also, the peak electricity demand of the country occurs in night time, whereas the Solar these issues may be addressed by way of introducing battery energy storage. Hence, it is needed to have storage facilities as a basic requirement. Further, it is planned to have sophisticated resource forecasting methods, whereby it will be possible to get rid of the fluctuation constraint of resources in a more pragmatic and optimal manner.

The Renewable Energy resource base available in Sri Lanka is a major plus point for high renewable energy targets. It is required to get the maximum benefit of having a huge renewable energy resource base. By way of creating an icon for Sri Lanka that the country is fully committed to renewable energy targets could obtain ample international support, and develop its resource base. Value addition to local resources, obtaining technical support and cooperation from the **Green Climate Fund, (GCF) multilateral and by lateral donor funds, international research institutes**, and also the possibility of making use of the local expertise as well as the job

creation in a value-added market will also contribute to the overall economy in a great deal, through the development of renewable energy in the country.

In order to realize the target of 70% electricity by the year 2030, the country requires to add approximately 1,754MW from Wind Energy and 4,674 MW of Solar Energy. To accomplish the aforementioned amounts, it will be required to align at least 1,000 MW each year for initial studies and approval processes, which will result in achieving the said target keeping an average success level of project implementation of 50%. In meeting the policy target of realizing 70% electricity from Renewable Energy sources, the major area of project development should be large-scale projects of 50 MW and above, which are referred to as Energy Park projects. At present, the development of Siyambalanduwa 100 MW Solar Power Project, Mannar phase II Wind Power Project and Pooneryn Wind-Solar Hybrid Project are implemented under the category of Energy Park projects. Apart from land-based projects, there will be other modalities, such as Floating Solar, Off-Shore Wind etc.

According to the calculations of the energy potential that can be produced in the coastal region of Sri Lanka with the year-round wind generated in the Bay of Bengal, it is predicted that there is a production capacity of about 60,000MW, and with a well-planned investment, converting the future Sri Lanka to be one of the world's leading renewable energy exporters would not be a difficult matter.

The Solar Rooftop Programme is also a very important programme with a good progress at present, connecting more than 40,000 Rooftops to the system with a capacity addition of more than 600 MW. The target is to achieve 1000 MW by the year 2025, where more than 100,000 additional Rooftop Solar Photovoltaic (PV) systems are expected to be connected to the System. The success of the Solar Rooftop Programme will support towards reduction of central electricity generation capacity addition through large-scale power plants, and it will also support through facilitating the optimum use of transmission lines, in meeting the future renewable energy targets.

The Sustainable Development Goal No. 07 clearly defines the importance of the access to clean affordable energy. From the country's perspective the continuation of secured energy supply is identified as a major element of national security. Ensuring of energy security is difficult as long as the country is overly dependent on external sources, which are beyond the control of the country. Hence to develop indigenous renewable energy is vital for the energy security aspect of the country. Therefore, following has to be implemented immediately.

a. Obtaining the identified renewable energy capacity under the LTGEP through private sector investments while facilitating GOSL to get approvals.

b. Introduction of a new management to ensure provision of lands for Renewable Energy projects in a timely manner. As one of the key bottlenecks that has hampered the Renewable energy development is obtaining the lands for renewable energy projects as the renewable energy potential is site specific other alternative locations are not possible.

c. Enhancing the limit of absorption capacity of the grid to facilitate to absorb 4,674 MW of Solar and 1,754 MW of Wind to meet the envisaged national targets. It is an urgent requirement to prepare the grid to be able to absorb this level of variable Renewable Energy. Since the investment for development of the network investments from private sector through Public Private Partnership (PPP) mechanism should be facilitated.

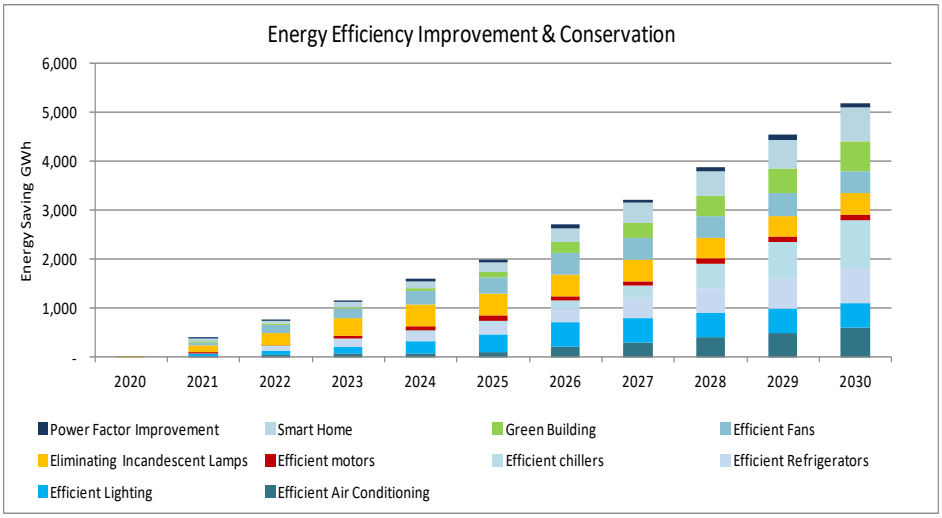
d. Leverage on the widely distributed national grid and the Grid Substations (GSS) to add grid level battery storage systems depending the capacity of the GSS, network, renewable energy etc. is proposed. This will greatly enhance absorption capacity of the grid to absorb all Renewable Energy projects and reduce the system losses. Initiation of a study to see the feasibility to add GSS level storage batteries is proposed.

It is an essential initiative to find sustainable solutions as well as to look at the technical, economic and social aspects of any renewable energy project without just considering the environmental aspects. In this regard, the following is proposed.

a) Developing storage facilities as most of the renewable energy is intermittent. Proper financial calculation to understand the actual cost of renewable energy should be done.
b) Providing proper financial incentives such as low-interest loan schemes.

3.1.2 Encouraging Investment to introduce high Energy Efficient machines (High energy performance standards for constructions / machinery)

Compared to the Renewable Energy development goals, 20% energy saving is a tougher challenge as not only it involves many stakeholders but many aspects which require close attention to details as well. Several programmes are designed to take the end user groups to a regulatory regime, away from the present voluntary approach and it incorporates a building Energy Reduction and Lighting Projects and an attempt to accelerate the tenfold thrusts of the national energy efficiency improvement and conservation (EEI&C) programme.



Source: Sustainable Energy Authority

Mandatory Energy Efficiency Improvement Conservation Programme

(M 2020 – 2025)

The amount of electricity that is wasted every day by the thousands of public and private sector buildings built across the island without any feeling about energy use, conservation or wastage is huge. To remedy this situation, it is proposed to introduce mandatory EEI&C programmes by introducing EEBC 2020 as a new energy efficiency code that will set precedents for proposed new construction in the future.

The said Code, enforced through a regulation will be supported by another regulation on Mandatory Energy Reporting. Energy demand from residential sector will be managed in the future using Mandatory Energy Labelling of appliances and introducing a voluntary guideline on energy efficient residences. Main elements of this programme are as follows:

a. Enforcement of mandatory energy reporting framework using Energy Benchmark Regulation 2020; for commercial, industries and service sectors.
b. Implement International Standard Industry Classifications (ISIC) on all utility services;
c. Enforce EEBC 2020 using Energy Efficient Building Code regulation 2020;
d. Launch public awareness campaign on energy saving;
e. Training and capacity building of stakeholders;
f. Energy Labelling of ten common appliances;
g. Launch of Green Procurement Guidelines for the State Sector;
h. Launch tax incentive driven building retrofit project;

Transformation of Lighting in to energy protection technologies (S 2020-2023)

Persistent market barriers in light sources market have prevented Sri Lanka from gaining efficiency benefits from efficient light sources such as LEDs. A project is designed to approach the most difficult sectors through forced interventions. The main elements of the programmes are as follows:

a. Accelerated distribution of ten million Light –Emitting Diodes (LED) s among low users (houses which consume less than 90kWh of electricity per month) homes;

b. Adopt the concept paper on Transformation of Public Place Lighting and incorporate a special purpose vehicle in the form of a public private partnership;
c. Launch Commercial Building Lighting Improvement project;
d. Develop funding proposals for projects;
e. Implement Transformation of Public Space Lighting and Commercial Building Lighting Improvement Project on full scale;

Operation DSM (M 2022 - 2030)

After conducting a careful barrier analysis on the failure of EEI&C market in Sri Lanka, a comprehensive programme focused on barrier removal has been formulated in 2017. The ten thrust programme was supposed to cutting across all electricity powered end use sectors.

a. Access development partners for finances;
b. Establish Vendor Networks and Local Financing Consortium;
c. Conduct feasibility studies;
d. Launch accelerated implementing programmes

Energy conservation programmes related to the Transport sector

Out of all the major energy demand sectors, most valuable yet fossil fuel dependent sectors is regarded as the **Transport Sector**. Apart from the small number of electric cars in the country, the whole transport system is dependent on liquid fossil fuels. As the living standards of the citizens has improved with the economic expansion, the Public Transport Services have either stagnated or deteriorated in standards, causing a massive exodus if users to adopt private modes of transport. This has created a large increase in demand for fossil fuels and contributed towards severe road congestion. A programme has to be designed promptly to attract passengers towards public transport and also to introduce economical electric mobility.

Pilot Initiatives planned at present

Promotion of Public Transport (S 2022 – 2025))

A mobile phone based User Platform will be created to increase the public access to road and rail mass transport. The Two-Way Platform will be also used to allow

planners to monitor passenger demands. The main activities of the project are as follows:

a. Conduct a fact finding mission on available public transport demand and assets;
b. Develop a project to enable a real time vehicle location service through a Mobile Phone Platform;
c. Launch the Vehicle Location Service and gather passenger information to improve the services;
d. Forge links with public transport entities and assist as appropriate to realize modal shift of passenger transport.

Citizen Empowerment

Success of any programme depends on the number of citizens who participate and depth of engagement of those who participated. In this respect, the SLSEA has paid emphasis on the citizen's participation. Advent of interactive digital platforms, mainly on smart phones are providing an opportunity to engage the citizens in unprecedented numbers and depth. Several programmes are designed to make use of this window of opportunity.

Household Productivity Focused Digital Assistant

Considering the fact that most Sri Lankans are overburdened with day-to-day struggles, a digital assistant which can be operated in both Sinhala and Tamil is supposed to be designed. The Android App will feature other attractive elements such as food waste reduction, home economy, thrift habits, an e-wallet, health monitoring and access to public services, a large community of tradesmen and vendors and a portal offering seasonal bonanzas etc. The main elements of the project are as follows:

a. Drafting of requirement specifications;
b. Development of bidding documents, procurement of services;
c. Development of pilot scale solution;
d. Pilot testing of App and improvement;
e. National scale development;
f. Integration of peripheral networks;

Energy R&D Network (S2020-2025)

As in many other sectors, Energy Sector too operate in sub optimal ways where the operating entities are isolated from the research community and both these parties having little or no connections between planners. In order to increase industry and policy relevance of research work, an R&D network will be connected by the Sustainable Energy Authority. Main activities to be undertaken under this programme are observed as follows:

a. Identification of energy research institutes and stakeholders;
b. Convening of initial Research Convention;
c. Short listing of Research Topics;
d. Selection of twenty sustainable energy projects for development;
e. Creation of Franchise Networks;
f. Deployment of Technologies;

3.1.3 Electrification of Transportation and Mobility

The present bus fleet has Internal Combustion Engines (ICE) and more than 50% of the fleet of buses is very old operating for more than 12 years and their fuel consumption and the GHG emissions are also relatively high. Therefore, there is a need to replace new ICEs having advanced technologies for those buses and the Sri Lanka Transport Board (SLTB) is currently looking to replace 500 buses in each year to mitigate energy consumption issues which are also associated with air pollution.

Meantime deploying electric buses is also in the planning stage and expected to be implemented on pilot basis by seeking financial assistance from Green Climate Fund and the Global Environment Facility (GEF), Global Green Growth Institute (GGGI) through the Ministry of Environment.

In addition, it is expected to implement a Public PPP Project for e-Bus Operation within the Colombo Metropolitan Area and its suburbs paying attention to certain proposals submitted by private sector investors.

Enabling to supply electricity for charging stations, a roof mounted solar panel project is also in the planning stage which will also reduce the current electricity consumption.

Among the modes of rail transport, electric traction is the most energy efficient. Railway electrification should be a future potential endeavor towards sustainable railway service. The Kelani Valley Railway Line has been identified as the first such railway electrification project for which feasibility studies are been already carried out with Asian Development Bank (ADB) assistance. This project is aimed to be launched as the first PPP investment project in the Railway Sector in Sri Lanka by the Ministry of Transport.

Many researches institutions in the world have proven that the overall benefit of using electric vehicles is more economical compared to the use of ICESLTB vehicles. US Environmental Protection Agency (EPA)[5] has facilitated the general public of US by providing necessary guidance for the use of electric vehicles in its website. The underline fact to be taken into great consideration is that the overall cost of an EV is cheaper than the overall cost of a conventional ICE vehicle when the "Life Cycle Analysis (LCA)" is carried out. However, the condition of the terrain, availability of charging stations, availability of technicians for maintenance and mechanism for the disposal of batteries are of the key concerns associated with the promotion of EVs. The amount of forecasted influx of EVs into the country depends on the government policy initiatives and the plans for the establishment of charging stations should align with the forecasted influx of EVs.

The studies being carried out by the Ministry of Environment and the Ministry of Transport will bring more insights over the promotion of EVs in the country. However, identifying in advance the need of promoting EVs in the country, CEB has taken initial actions to establish ten (10) charging stations in near future and the SLSEA has called proposals to establish charging stations by using RE sources.

[5] https://www.epa.gov/greenvehicles/

One of the main barriers to wider acceptance of Electric Vehicles in Sri Lanka is the absence of a Reliable Charging Infrastructure. Therefore public hotspots have to be recognized as the best locations by a proper analysis and feasibility study to establish electric vehicle charging stations (EVCSs) with modern high tech infrastructure charging facilities, enabling all modes of charging. Establishing Renewable Energy Charging Stations (Solar PV) instead of grid powered stations shall be given top priority. To arrest this situation, a franchise based network of charging stations are planned to be established throughout the country. Accordingly Electric Vehicle Promotion Project (S 2022 - 2025) is proposed.

The main elements of the programme are as follows:

a. Conduct region based demand survey;
b. Complete legal compliance requirements;
c. Establish pilot network of Charging Stations depending on the demand at first;
d. Integrate Solar PV to make the stations Zero Emission Charging Stations;
e. Expand network to 100 such stations by the year 2025.

Further, the public sector with large vehicle fleets and private sector (eg: Offices, Super Market Chains) could be encouraged to provide off grid charging for their employees/customers.

3.1.4. Encouraging private sector investments in energy storage

It is necessary to encourage electricity customers to make their investments for off grid solution with renewable energy generation option and battery energy storage systems. Further this strategy will ease the difficulties on making peak demand while enhancing energy generation capacity in peak time and peak shaving and time shifting power when needed most.

Hence, necessary guidelines should be introduced to ensure the safety and technical requirement. Further, battery disposal mechanism should be introduced to minimize environmental impact after the life span of the batteries.

3.2. Review Energy Consumption

3.2.1 Analyze Energy Usage (Energy Audit – Electricity, Petroleum Products, LP Gas)

Analyzing the energy usage of an entity is the key factor to identify energy conservation possibilities and to optimize the consumption. Condition Audits and Energy Audits are required to identify the healthiness and energy usage of all sectors, Buildings (residential, commercial, healthcare etc), Industries and Transportation.

With the process of condition audit the safety, security and the healthiness of all the services installed within the building could be examined and with an Energy Audit all types of energy consumed in an installation could be observed and analyzed.

The proposed energy audit is the first step in the implementation of a new approach to reduce energy consumption. By those energy audits, the level of current energy usage and information is essential for assessing future energy improvement actions, minimizing risk of accidents, saving energy expenses, reducing production and operational cost, energy quality improvements and many more benefits.

All the government sector buildings shall immediately comply with the Energy Efficiency Building Code of Sri Lanka 2021, published by SLSEA. Therefore, it is essential to analyze the energy usage by conducting Energy Audits to study the compatibility of the installations to this guideline and if not finding solutions for the improvements during energy audits.

SLSEA has also published Energy Consumption Benchmarks for key sectors of Tea, Apparel, Commercial Building, Hotel and Other Industries like porcelain, tire, food, beverage, glass etc. to follow. In order to achieve these goals, analyzing energy usage through auditing, systematic energy management, establishing action plans, implementing strategies and continuous improvement are essential.

3.2.2 Reduce Energy Usage (Lower Energy Consumption)

Energy efficient electrical appliances, lighting, heating and air conditioning applications and eco-friendly lifestyles will lead to reduction of energy usage.

Using LED Light Fixtures and Lighting Control Systems in offices and even in domestic applications are the best way to reduce energy usage. Use of Natural Lighting directly or indirectly in the buildings and thermal insulation shall always be encouraged.

Centralized Air Conditioning and Heating Systems with modern energy efficient technologies can be introduced for the multi-story residential and commercial buildings because the majority of the electrical energy, usually 60~70% is utilized by air conditioning and heating systems.

Modern type machineries and equipment with low power ratings and high efficiencies can be introduced to the industrial and health sector as well to reduce electrical power consumption and this kind of transformations should be encouraged.

Energy consumption in the Transportation Sector is significant. Improving public transportation methods rather than using individual transportation is the key factor. Good driving practices and proper maintenance of vehicles shall always be encouraged which will lead to conserving energy and also to reduce emissions.

3.2.3 Encouraging the use of Energy Efficient Machinery and Equipment

It would be mutually beneficial for the energy service providers as well as consumers, to use Energy Efficient Machinery in industries; thereby minimizing the electricity burden. Compliance with relevant sustainable energy policies requires suitable means for utilizing strategies for energy optimization. Preference shall be given for commercially available, off-the-shelf products and devices, which comply with energy efficient performances.

Therefore, entrepreneurs have to be encouraged to use energy efficient machinery through reduction or exemption of imposed taxes. A comprehensive analysis on tax formation needs to be considered on this aspect to promote such Energy Efficient Machinery which is recognizable accreditation on relevant energy efficient regulations.

Introduction of regulation to control of import and manufacturing of inefficient machinery and equipment is needed. Then the Minimum performance standard can be checked to grant import or manufacturing such machinery and equipment under the Demand Side Management (DSM) program.

a. The customers who enjoy concessional Industrial tariff locally should be made aware that if they do not follow better energy performance practices such as **energy audit** and implementation of the recommendation of the energy audit report they will be disqualified for concessional industrial tariff.
b. Introduction of special Harmonized System (HS) codes for Solar PV invertors and off grid invertors and removal off 10% PAL. Allocation of special HS codes for Direct Current (DC) cables with zero custom duty, VAT, PAL & CESS (1000v and 1500V) too should be considered.
c. Allocation of special HS code for Lithium-Ion batteries used for solar PV applications and provide a tax concession is an essential task. One of the technical difficulties encountered with the renewable energy development is the inherent nature of intermittence of the sources and in such circumstances, it is very much essential to store energy by batteries when there is large Renewable Energy capacity addition. An expert committee should be appointed to study the battery disposal mechanism after completion of life span.

These proposals should be implemented as soon as possible, as the above (a) and (b) tax concessions will provide several times more benefits to the economy in the long run than the tax revenue lost in the short term.

3.2.4 Efficient Energy Consumption Plans for Large Offices, Hotels and Apartment Buildings

Studies conducted on energy management in large scale Office and Commercial Buildings indicate that the main factors affecting the energy consumption of buildings are the building envelope, lighting equipment, office equipment, and vertical transportation and air-conditioning system.

The technical audits on improvements of energy efficiency of large scale Office Buildings/Hotel/ Apartment Buildings have proposed the following factors to be taken into consideration.

a. Minimize the heat transfer coefficient of the exterior walls and windows, an appropriate reduction of the heat transfer between the indoor environment and the outdoor air.
b. It is observed that using lighting with Energy Saving Lamps and to reduce the Lamp Power Density, optimum daylight harvesting, occupancy sensing, scheduling and dimming can save the energy in a considerable amount required for the lighting system.
c. It is observed that building Management System (BMS) is very effective on energy management, because the monitoring of each system and analyzing data may lead for improvements in electrical systems as well as the air conditioning and other systems.
d. It is observed that introducing Power Factor Correction Capacitor Banks to improve the power factor of the electrical system can reduce the apparent power consumption.
e. It is observed that raising awareness of the staff and encouraging them to turn off the Computers, Printers, and other Office Equipment in a timely manner, in order to reduce their power consumption.
f. It is observed that if it is possible to choose a suitable type of air conditioning system, try to avoid high energy consumption (split type) air conditioning systems as much as possible, and we can observe that a great energy conservation as well as a great financial burden can be reduced.

g. It is observed that while energy is conserved based on function and usage, we observe that small energy savings can also be realized by strategically managing the use of space to achieve maximum efficiency.
h. It is observed that in order to improve the performance of the electro-technical equipment, we will also monitor the introduction of proper maintenance mechanisms by creating new posts at the office level.
i. It is observed that implementing Green Energy Concepts such as Rooftop Solar PV systems to reduce the net energy consumption of buildings would be beneficial.

Though it may not be practical to implement everything listed above in the existing apartment building at once, certain items such as (b), (h) and (i) could be considered for implementation in existing building as well. However, in new constructions, all the aspects can be easily achieved by proper designing and planning. It is observed that the Ministry of Environment together with Urban Development Authority (UDA) has already developed "Green Building Guidelines" which includes a separate component on energy efficiency.

It is observed that the Generator System in a Large Office or Apartment Complex consumes a huge amount of energy/fuel at their operations and not providing standby power for non-essential loads during power interruptions can reduce the fuel consumption of generators. Proper maintenance will also conserve energy and improve performance.

It is observed that this concept is also ideal for Hospital Buildings as energy reduction strategies. However these installations shall be considered as special entities as uninterrupted power and services are essentially significant / important.

It is also recommended that immediate intervention of the Tea Board to conduct technology audits in relation to all the tea factories and adapt them to specific energy conservation methodologies.

3.2.5 Energy Efficiency Improvements in the Tea Processing Sector

Tea industry is one of the energy intensive food-processing sectors in Sri Lanka. Tea Processing Industry has much significance on energy consumption because of its high demand on production output. Since, the Tea Industry has a considerable role in the export economy, suitable measures need to be addressed on reduction of energy consumption and hence the cost of production. Electrical and Thermal Energy are the major contributors for most of the Tea Processing activities. Therefore, efficient usage of the resources shall be ensured and available energy saving opportunities shall be pursued. 250,000x10^3 kWh of electrical energy and 6,700,000 GJ of thermal energy is consumed annually to produce an average of 300 million kg of Made tea in 704 tea factories. Details of active tea factories in different regions/ sectors and type of management are given in the following Table.

	Ownership of the factories			
Region/sector	**RPC**	**Private**	**State**	**Total**
Low	47	357	4	408
Uva High	43	10	nil	53
Uva Medium	15	16	nil	31
Western High	89	19	1	109
Western Medium	27	72	4	103
Total	**221**	**474**	**9**	**704**

Source: Tea Research Institute.

Electricity is used in all tea processing stages where machineries & conveyors used to move materials are operated using motors. Electricity is obtained mainly from national grid and 0.75 -0.94 kWh of electrical energy is needed to produce 1 kg of made tea (De Silva, 1994). High variation in the electrical energy consumption is due to use of inefficient machinery, over-size or rewound motors, poor energy saving investments & practices, etc. This shows the need of regular conduct of energy audits and effective implementation of the findings.

Most of Tea Factories in Sri Lanka still use older machinery and their performances are also not being assessed for a long while. Therefore high tech new machinery with high efficiency ratings shall be introduced to the factories. Migrating towards new technologies like Variable Speed Drives (VFDs), Efficient Motors and Drives, Process Controls and Factory Automation are essential for an optimal energy conservation.

Power Factor Correction Technology shall be added for the Tea Factory Power System in order to reduce maximum demand that saves electricity for the National economy.

Solar PV Systems would be another Smart Green Solution and solar can be installed on Tea Factory Roof Tops easily. Power generation via mini hydro power plants as well as Wind Power plants is also considered as viable in some of the areas.

Thermal energy is required in huge capacities for withering and drying processes in tea manufacturing. Main source of thermal energy is fuel wood which is the most suitable source in terms of technological acceptance and economic reasons. Annual fuel wood requirement for processing tea is about 545,000 tones (Samaraweera, 2020). Fuel wood is sourced by different systems. Main sources of supply as identified in the study conducted in 2019 are home gardens (particularly from non-tea regions such as Hambantota district), rubber plantations, dedicated fuel wood plantations particularly in Regional Plantation Companies (RPC) estates and pollard branches from the shade trees. Corporate sector estates at present source 23% of the requirement by sustainable cultivations (Jayasinghe et. al., 2012). The private factory sector processes nearly 75% of the tea production in the country and depends entirely on fuel wood from unknown sources. Further, shortage of fuelwood is already realised in many tea factories. Therefore, sustainable sourcing of this essential input is vital for overall sustainability of production of tea. It requires cultivation of species of fuel wood following correct silvicultural practices and harvesting in a planned manner.

Activities for efficient use of electrical & thermal energy in tea manufacturing and sustainable sourcing of fuelwood through establishment of energy plantations are as follows;

1. **Efficient use of electrical & thermal energy**
    a. Create awareness on energy saving opportunities/strategies.
    b. Conduct frequent **energy audits** as required and implement appropriate recommendations.
    c. Use modern and energy efficient machineries & systems for tea processing and follow energy saving practices.
    d. Provide subsidies/incentives for modernizing tea factories with energy efficient machineries & systems.
    e. Diversify and promote other renewable energy sources (solar/wind/hydro/other biomass/agricultural wastes)
    f. Establish gravity granting mechanism to motivate the factory owners who accomplish benchmarks through frequent monitoring and rewarding mechanism for achieving benchmarks.

2. **Sustainable sourcing of fuel wood through establishment of energy plantations**

Support plantation companies should embark on an urgent and time targeted program for the establishment of fuel wood plantations and create suitable avenues of concessionary credit facilities by;

    a. Making Fuelwood planting a mandatory activity in annual plans of plantation companies.
    b. Encouraging planters to shade planting and management and removal of excessive shade without external approval.
    c. Converting unproductive tea lands into fuelwood plantations.
    d. Establishing nurseries/planting material on a regional basis under the state facilities.
    e. Collation and sharing of information on agronomic and financial aspects.

f. Encouraging capital investment with support from the State and from donor agencies.
g. Creating awareness on economic/financial feasibility of investment on energy plantations towards plantation companies.

Evolving a program for the bought leaf factories to join hands with corporate sector estates and smallholders to grow fuelwood plantations too should be considered by;

a. Allocating unproductive lands in corporate sector tea estates and bought leaf factories for collaborative projects on energy plantations.
b. Identifying hitherto underutilized land in areas not too far away from tea growing areas and develop a mechanism for long term leasing of such lands to bought leaf factories for the exclusive purpose of growing fast growing species suitable for Firewood.
c. Creating an efficient collection mechanism for purchasing fuelwood (eg. Gliricidia) from smallholders with attractive rates.
d. Making smallholders aware of the benefits of Gliricidia which is an important green manure, rich in nutrients and carbon.
e. Obtaining the commitment of the relevant state agencies to facilitate the planting of Short Rotation Coppice (SRC) species and regulate the sale in lines similar to that of bought leaf.
f. Providing incentives for leaf suppliers to become energy suppliers as well as providing planting materials

Relaxation or removal of the undesirable regulations on harvesting and transport of cultivated firewood lots should be done by;

a. Elimination of time-consuming approval processes for transportation of fuel wood.
b. Prevention of arbitrary restrictions enforced by local authorities on transportation of fuel wood.

Investment that is required for the establishment energy plantation is estimated considering the available lands for energy plantation in Regional Plantation company estates, State owned estates and tea smallholdings and suitable plant species.

3.2.6 Energy Efficiency Improvements in the Rubber Processing Sector

Rubber Industry also consumes both electrical and heat energy heavily where the nature of production of Tea and Rubber is similar (Both are using rotating machineries, heating and ventilation equipment for production process), the points discussed under item 3.2.5 shall be taken into consideration as applicable for this sector as well.

3.2.7 Energy Efficiency Improvements in Transport Sector

As far as energy efficiency in Transportation is concerned, 60% to 70% of fuel efficiency totally depends on the driver's Fuel-Efficient Driving techniques as well as timely maintenance practices of the driver. Fuel efficient driving or Eco driving is about adopting Driving Techniques that maximize modern engines' efficiency. Using less fuel when driving also means that carbon emissions and air pollution from vehicles are reduced.

Eco Driving contributes to Safety due to the strong focus on greater anticipation. It is worth emphasizing at the start of the journey that it is not about sacrificing performance, it is about a more professional approach and becoming a better driver. Evidence shows that driving more efficiently does not necessarily increase journey times.

The awareness of "Fuel-Efficient Driving Techniques" and "Preventive Maintenance Best Practices" can be provided to all drivers through the E-Learning Management System (E-LMS). Presentations, live videos, pre-recorded videos and interactive sessions whenever necessary can be shared in-order to enhance their knowledge levels. Further expressive guidelines could be issued indicating the expected levels of

standards of a driver, and this can be distributed as an industry norm. Surveillance audits could be conducted annually in-order to measure the fuel efficiency.

3.3. Introduce wide range of Investment Strategies in Energy Sector

3.3.1 Accelerating Development of Infrastructure Energy Sector

As per the provisions of Sri Lanka Electricity Act 20 of 2009 Transmission Business cannot be done by any person other than CEB and to absorb Renewable Energy sources to the System, there is a requirement to strengthen the Transmission Network and to construct new transmission lines to facilitate renewable energy capacity addition.

In that context, the investment in Energy Sector products is significantly high and need to think about different models to place the transmission requirement to meet the targets. As the Government is now not in a position of making such investments in conventional way like obtaining loans from multilateral, Bilateral and Private lending agencies a system could be introduced to attract Private Sector Investments for Electricity Transmission Sector. A methodology could be developed to facilitate private sector investors to construct the transmission lines, grid substations etc. and under such program the lines infrastructure could be developed as per the standards of CEB and transfer for the operation and maintenance by CEB. It is recommended that the payment shall be on the basis of usage of the transmission line and minimum amount of electricity has to be determined by CEB and declare it at the outset.

Regional networks largely benefit for the countries to ensure energy security, improve competitiveness through energy markets, share excess energy particularly during peak solar generation and to facilitate energy wheeling and to gain maximum benefits, many countries to maintain grid interconnections in between different geographical regions in the world. Sri Lanka carried out a feasibility study in year 2019 to establish a grid interconnection between Sri Lanka and India and found the

same to be technically feasible. It is recommended to undertake further studies by MoP & E on feasibility of financial and regulatory aspects before proceeding with the proposal.

3.3.2 Green Energy Financing

The 21st session of the Conference of Parties (COP) to the UNFCCC (Paris 2015) introduced a new set of Climate Finance, Policies, and Markets. The Paris Agreement adopted there defined a global action plan to put the world on track to avoid dangerous Climate Change by limiting global warming to well below 2°C above preindustrial levels. It includes Climate Financing mechanism channeled by national, regional, and international entities for Climate Change Mitigation and Adaptation Projects and Programs. They include climate specific support mechanisms and financial aid for mitigation and adaptation activities to spur and enable the transition towards low-carbon, climate-resilient growth and development through capacity building, R&D and economic development.

Types of Green Financial Mechanisms and Financial Instruments:

Multilateral Climate Funds to obtain Grants/Loans/Technical Assistance

Multilateral Climate Funds (i.e., governed by multiple national governments) are important for paying out money in climate finance. The largest multilateral and bilateral climate funds are;

a. Global Environment Facility (GEF)
b. Adaptation Fund (AF)
c. Green Climate Fund (GCF)
d. Climate Investment Funds (CIFs)
e. Asian Development Bank (ADB)
f. The World Bank
g. International Finance Corporation (IFC)
h. Carbi Credit Funds

i. Global Green Growth Institute (GGGI)

j. JICA

k. KOICA

l. USAID

Global Environment Facility (GEF)

The GEF-8 Climate Change Focal Area Strategy

Objective: Support developing countries to make transformational shifts towards net-zero GHG emissions and climate-resilient development pathways.

Pillars:

1. Promote innovation, technology development and transfer, and enabling policies for mitigation options with systemic impacts
2. Foster enabling conditions to mainstream mitigation concerns into sustainable development strategies

GEF-8 Integrated Programs related to Sri Lanka

a. Food Systems

b. Sustainable Cities

c. Circular Solutions to Plastic Pollution

d. Blue and Green Islands

e. Clean and Healthy Ocean

f. Net-Zero Nature Positive Accelerator

g. Wildlife Conservation for Development

h. Greening Transportation Infrastructure Development

i. Elimination of Hazardous Chemicals from Supply Chains

Net-Zero Nature-Positive Accelerator Integrated Program

Objective: Accelerate the adoption of strategies toward net-zero emissions, which are also nature-positive, and in line with the ambition of national climate plans with the 1.5°C scenarios.

Key features:

a. Strengthen capacities and (generate information) on deep decarbonization plans' socio-economic costs and benefits.
b. Support the adoption and implementation of net-zero emission strategies and policies, coordinated with national biodiversity conservation and land degradation strategies and objectives.
c. Develop and promote investments in project portfolios that generate multiple global environmental benefits.

Non-Grant Instruments (NGI) Program

Private sector participation through the use of NGIs on concessional terms, such as loans, equity or guarantees, provides unique benefits as the GEF is able to support innovation through non-emergency capital, risk-free financing structures, extending the maturity of financing facilities, etc.

GEF Project Financing:

Full-sized Project (> USD 2 million)

Medium-sized Project GEF project financing ≤ USD 2 million

Large Projects – Partnering with Multilateral development agencies

Private Sector Support – through accredited local banks

Green Climate Fund (GCF)

Access to GCF funding

Project Preparation Facility - Cap: $1.5 million / project

Focus Areas

- **Reduced Emissions from:** Energy generation and access, Transport, Buildings, cities, industries and appliances, Forests and land use
- **Increased Resilience of:** Livelihoods of people and communities, Health, food and water security, Infrastructure and the built environment, Ecosystems and ecosystem services

There is flexible range of instruments: Loans, Equity, Guarantees, Grants

Climate Investment Funds (CIFs)

CIFs is one of the world's largest and most ambitious multilateral Climate Finance Mechanisms for developing countries seeking to shift to low carbon and climate resilient development, and to accelerate climate action. Its launch in 2008 emerged from recognition by world leaders that climate change and development are inextricably intertwined, and that climate-smart investment is needed at scale to deliver on the opportunities for green growth identified in the UN's SDG's.

Working in partnership with governments, the private sector, civil society, local communities, and six major Multilateral Development Banks (MDBs), CIF provides highly competitive financing that reduces risk for investors, lowering barriers to piloting new technologies, scaling up proven solutions, opening up sustainable markets, and mobilizing private sector capital for climate action. Rallying stakeholders behind increasingly ambitious climate goals and complementary action, CIF draws in diverse partners who might otherwise be deterred from investing alone.

Independent evaluations have shown that CIF has succeeded in accelerating progress in the areas of clean technologies, energy access, climate resilience, and sustainable forests. After widespread consultation to identify next-frontier climate challenges, CIF is pioneering investments in five new areas. They are the transition from coal, climate-smart cities, nature-based solutions, de-carbonization of industries, and renewable energy integration. In 2021, recognizing the urgency of this mission and strong demand from developing countries, the G7 committed up to $2 billion in additional resources for CIF.

Private Climate Finance

Public Finance has traditionally been a significant source of infrastructure investment in Sri Lanka. However, public budgets are often insufficient for larger and more complex infrastructure projects, particularly in lower-income countries. Climate-Compatible Investments often have higher investment needs than

conventional (fossil fuel) measures and may also carry higher financial risks because the technologies are not proven, or the projects have high upfront costs. If countries are going to access the scale of funding required, it is critical to consider the full spectrum of funding sources and their requirements, as well as the different mechanisms available from them, and how they can be combined. Therefore, there is a growing recognition that private finance will be needed to cover the financing shortfall.

Private Investors could be drawn to sustainable urban infrastructure projects where a sufficient return on investment is forecast based on project income flows or low-risk government debt repayments. Bankability and creditworthiness are therefore prerequisites to attracting private finance. Potential sources of climate finance include commercial banks, investment companies, pension funds, insurance companies and sovereign wealth funds. These different investor types will have different risk-return expectations and investment horizons, and projects will need to be structured appropriately.

4.0 Recommendations to formulate a Roadmap to be followed by the responsible stakeholders towards the achievement of National Energy Policy targets

The Ministry of Power and Energy has published the "National Energy Policy and Strategy (NEP&S)" in 2019 and the Energy Sector is already armed with required policy directions, strategies along with certain Action Plans. However, the said policy document needs to be updated and aligned with the current policy guidelines, strategies and activities in line with the current economic crisis faced by the country while addressing, the changing world order after post COVID 2019 new normal economic environment.

Therefore, following recommendations and Roadmap with milestones are presented to ensure sufficient energy security in the country while strengthening national economy in line with SDG Goals.

1. To review the current national policy related to the power and energy sector within the next six months, paying special attention to the policy gaps, goals, new responsibilities created internationally and new trends in the international market between the year 2019 and the present period. Providing clear instructions to relevant government agencies through a Finance Ministry circular to carry out an updated restructuring process directly under the supervision of the Secretary as the Chief Accounting Officer.

2. To provide clear instructions through a Public Administration Circular issued with the consent of the Ministry of Finance to all the Ministries including all Public and Statuary Institutions which comes under each ministry to identify all energy related activities and compile separate Short Term (For next 12 months - 2023), Medium Term (For 2023 – 2025) and Long Term (For 2023 – 2030 in compliance to SDGs) Clear Strategic Plans of compliance as recommended by this Cabinet

Sub-Committee while adhering to National Energy Policy and Strategy (NEP&S) issued in the year 2019. (Annex 01)

3. To implement the recommendations submitted by the Cabinet Appointed Expert Committee Report forwarded by the Minister of Power and Energy through 62/2022/PE dated 06.11.2022 to the Cabinet of Ministers based on Cabinet memorandums dated 29.07.2022, 15.08.2022 and 02.09.2022 on proposed Institutional Reforms for the Power Sector. (Annex 07)

4. To appoint one officer who is currently employed as a full-time energy manager in relation to each major government agency, and assign the responsibility of reaching specific goals of measurable energy savings identified by an Energy Conservation Audit.

5. To promptly arrange the necessary foreign exchange facilities to carry out a renewable electricity transmission of 120 MegaWatt capacity to the national grid by completing the work of the Uma oya Multi-Purpose Development Project, which is already in the final stages of construction.

6. In relation to the tea industry, to be directed to energy conservation process within the next 06 months by conducting Energy Conservation Audit with the intervention of the Sri Lanka Tea Board in the 704 old tea factories across the country in order to direct the relevant companies towards reviewing their old machinery and outdated methods to make them more economically and technically effective. (Annex 06)

7. To continue the responsibility assigned by the Cabinet to the Cabinet Sub-Committee to monitor, evaluate and review the progress of the implementation of the recommendations made by the Cabinet Sub-Committee in its report through a new national energy potential, strategy and road map and to facilitate the role of the Sub-Committee and to carry out a regular inter-agency

coordination process by the Prime Minister's Office by providing necessary facilities.

8. To empower the Cabinet Sub-Committee as a facilitating mechanism to ensure that long-delayed large-scale wind, solar, liquid nitrogen, liquefied natural gas (LNG) and petroleum and gas exploration projects are expedited and minimize delays.

9. To submit Cabinet Memorandums time to time in necessary occasions through the Prime Minister and present a periodic Progress Report to the Cabinet of Ministers by the Cabinet Sub-Committee on quarterly basis.

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Prime Minister (Chairman) .....

Hon. Nimal Siripala de Silva (M.P.)
Minister of Ports, Shipping and Aviation .....

Hon. Susil Premajayantha (M.P.)
Minister of Education .....

Hon. (Dr.) Wijeyadasa Rajapakshe (M.P.)
Minister of Justice, Prison Affairs and
Constitutional Reforms .....

Hon. Ali Sabry (M.P.)
Minister of Foreign Affairs .....

Hon. Kanchana Wijesekara (M.P.)
Minister of Power and Energy .....

Hon. Nazeer Ahamed (M.P.)
Minister of Environment .....

Date: 08 .12.2022