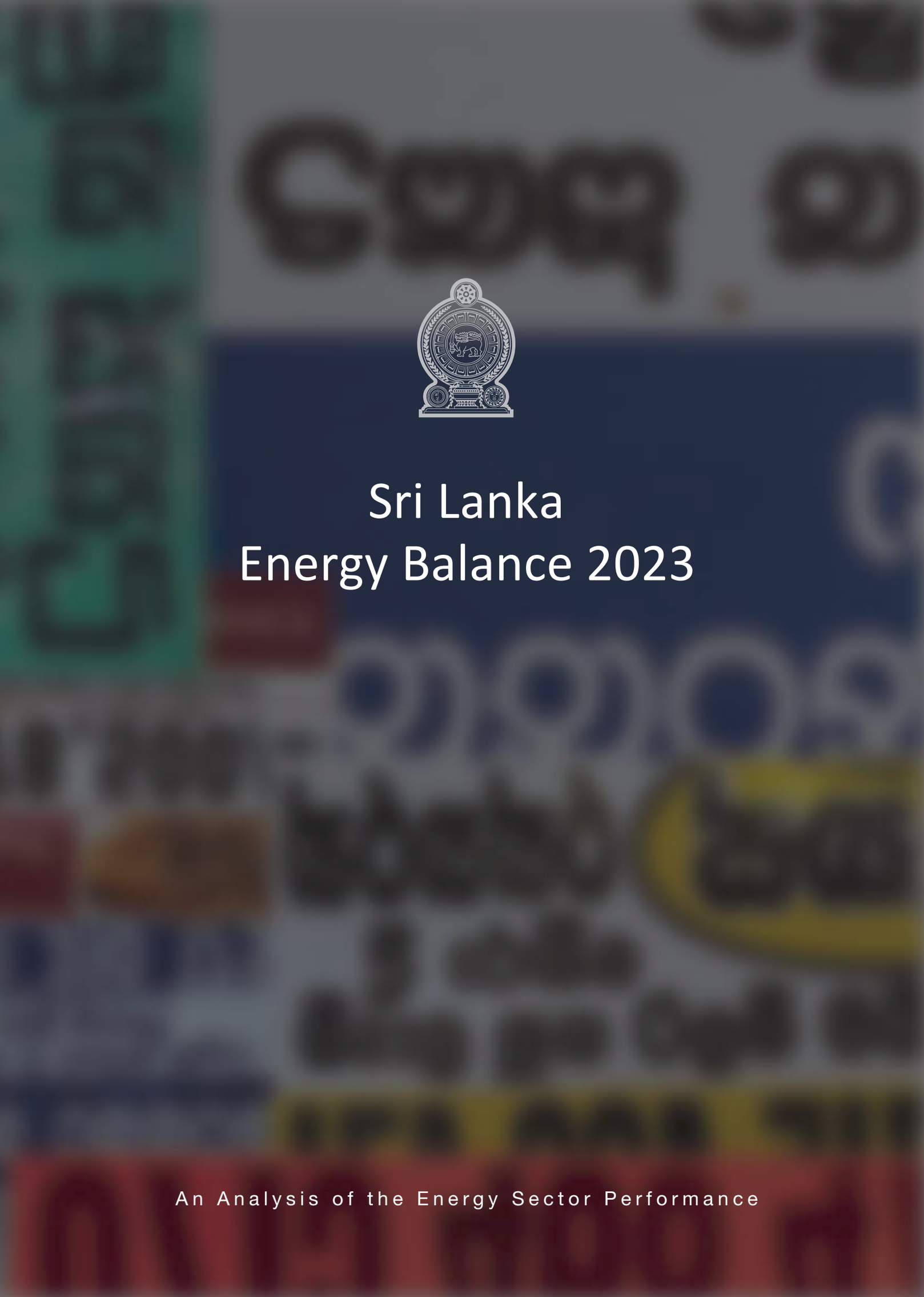

Sri Lanka
Energy Balance 2023

An Analysis of the Energy Sector Performance

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Sri Lanka Sustainable Energy Authority
No. 80, Sir Earnest De Silva Mawatha, Colombo 07, Sri Lanka.

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As 2023 began, the nation remained subdued, grappling with the aftermath of the severe economic crisis that unfolded in early 2022. The year opened with little sense of optimism, as households and businesses alike adjusted to a new and uncertain reality. Among the most visible consequences of the crisis was the recalibration of energy markets—particularly electricity, gas, and petroleum product prices. Consumers who had long benefited from heavily subsidised energy suddenly faced the financial ***burden*** of bills two to three times higher for comparable levels of use.

For nearly a decade, electricity tariffs had remained largely unchanged, sustained by government subsidies that masked the true cost of supply. Over time, however, the financial losses of the utility sector became untenable. In response, subsidies were reduced with limited prior notice, shifting a significant share of the ***burden*** directly onto consumers, increasing the average cost of electricity by a margin of 101.1% in 2023. While this adjustment contributed to easing fiscal pressures at the national level, it imposed immediate and severe ***burden*** on households and businesses. The transition brought into sharp focus a persistent tension in energy policy: the balance between economic stabilisation and social affordability, particularly in times of crisis.

The economic strain of 2023 was evident across the country. Many businesses scaled down operations or closed altogether, while a significant number of households experienced disconnection due to non-payment of electricity bills. Urban commercial centres, once characterised by vibrant small enterprises, saw a gradual thinning of activity. At the household level, financial coping mechanisms became increasingly constrained, with savings depleted and assets liquidated to meet daily expenses. Stagnant wages further compounded these pressures, eroding purchasing power and deepening economic vulnerability.

The collection of advertising signs featured on this year's cover offers a stark visual reflection of this period. Gathered along a short stretch of roadside and affixed—ironically—to electricity poles, these notices promote the redemption and re-pawning of pledged jewellery. The widespread reliance on informal pawning based debt financing reflects both the desperation of the public and the weight of their debt ***burden***. For many, personal valuables—often accumulated over years of careful saving—became the only collateral to offer. Yet this recourse, while immediate in its benefit, carried the risk of prolonged indebtedness, underscoring the difficult trade-offs faced at the household level adding to the ***burden***.

In the Sri Lanka Energy Balance 2023, the cover story is dedicated to the theme of ***burden***—both national and personal. It reflects a year in which the weight of economic adjustment was felt unevenly but deeply across society, even as the early contours of stabilisation began to emerge.

Executive Summary

The energy sector of the country faced many challenges in the year 2023 recovering from the economic crisis of 2022. The demand for petroleum products, which partially recovered after the COVID-19 pandemic, was however not met due to the severe economic crisis which continued in 2023. Further, with the significant devaluation of the Rupee and resultant escalation of prices, the demand for all energy services reduced in 2023. Petroleum fuel imports alone contracted by 16.4% in 2023, compared with the previous year.

The gross electricity generation in 2023 was 16,448.8 GWh. The generation from major hydro was 4,592.5 GWh in 2023, while the generation from coal was 5,150.8 GWh and the generation from oil was 3,232.8 GWh. The generation from NRE projects was 2,130 GWh and 397 GWh of the wind plant of the CEB. Out of the NRE generation technologies, mini hydro power plants contributed the highest percentage by adding 65% to the generation, which was followed by wind and solar, at 20% and 11%, respectively. In addition to these developments in the NRE industry, solar rooftop schemes resulted in a cumulative addition of 810 MW to the national grid, generating 945 GWh in 2023. Approximately 55,000 systems were connected to the grid by end-2023.

Global crude oil prices recorded a decline in 2023, while the average Brent crude oil price decreased by 17% to USD 82.22 per barrel in 2023. Petroleum sales however, increased in 2023, reflecting the gradual restoration of economic activity in the aftermath of the economic crisis. The sales volumes of petroleum products recorded a year-on-year growth of 7.1% in 2023, though it remained at a considerably lower level when compared to a normal year. The value for net oil imports as a percentage of non-petroleum exports was 38.9% in 2023.

The scarcity of fossil fuels and unmet demand for electricity eased to a certain extent with the substantial price increase and also the stringent demand management measures. The long queues at fuel stations quickly disappeared after the citizens embraced the quick recognition (QR) code-based fuel rationing scheme.

The implementation of the cost-reflective pricing formula rendered an improved for the CPC, recording a profit of LKR 120.3 billion in 2023.

In offshore petroleum exploration, PDASL secured Cabinet approval in July 2023 to call for Expressions of Interest (EOIs) for Joint Study Programs in the Mannar, Cauvery, and Lanka basins, revising key regulations and finalising a new Petroleum Resources Exploration and Development Block Map with the Survey Department.

The energy supply portfolio of the country was dominated by biomass in 2023, where the share of biomass in the energy supply in 2023 was 36.4%, followed by petroleum (30.5%). Coal accounts for 16.0% in the energy supply portfolio, while hydro power accounts for 9.8% and new renewable energy accounts for 7.2%.

The total energy demand of the country was 365.3 PJ, while the share from household. commercial and other sector was 36.4%, followed by the industry demand of 34.1% and transport demand of 29.5%.

Compared to previous years, the CEB reported a positive financial performance with a positive 4.5% return on assets. The LECO too, recorded a positive 8.0% return on assets. The electricity tariff which remained unchanged since 2014 was revised in 2022. The electricity tariff was revised on October 20, 2023.

The petroleum distribution continued with two parties; CPC and Lanka Indian Oil Company (LIOC) operating a widespread distribution network around the country. The players came under pressure, when the markets quickly returned to normalcy after a year which reported negative commodity prices. A third player, Sinopec Energy Lanka (Private) Limited (SEL), registered with in June 2023, and entered into an agreement with Board of Investment (BOI) in July. The CPC recorded a profit of LKR 120 billion after a series of losses in the previous financial years.

The Grid Emission Factors calculated for 2023 gives the Simple Operating Margin as 0.7049 kg-CO_2/kWh, the Build Margin as 0.6182 kg-CO_2/kWh and the Combined Margin as 0.6616 kg-CO_2/kWh. The Average Emission Factor for 2022 was estimated to be 0.4242 kg-CO_2/kWh.

Key Energy Statistics

Primary Energy (PJ)	2022	2023
Biomass	169.0	171.9
Petroleum	150.6	143.8
Coal	58.3	75.6
Major hydro	54.1	46.1
New Renewable Energy	31.4	34.2
Total	**463.5**	**469.6**

Imports (kt)	2022	2023
Crude Oil	**743.6**	**1,665.6**
Finished Products	**3,542.7**	**2,962.0**
LPG	290.0	365.2
Gasoline	1,106.2	1,105.0
Avtur	268.7	168.4
Auto Diesel	1,608.1	1,037.3
Fuel Oil	245.8	269.9
Avgas	0.1	-
Mineral Gas Oil	23.7	16.2
Coal	**1,707.00**	**2,496.7**

Refined Products (kt)	2022	2023
Crude Input	529.8	1,677.0
Naphtha	30.8	129.1
Petrol	38.7	171.2
Avtur	57.3	233.7
Kerosene	25.3	49.5
Diesel	128.2	505.7
Furnace Oil	194.2	482.1
Solvents	2.7	1.5

Grid Capacity (MW)	2022	2023
Major Hydro	1,413.4	1,413.4
Thermal Power	2,098.0	2,027.8
New Renewable Energy	847.6	873.9
Micro Power Producers (µPP)	659.9	809.6
Total	**5,018.8**	**5,124.6**

Gross Generation (GWh)	2022	2023
Major Hydro	5,382.7	4,592.5
Thermal (Oil)	2,513.6	3,232.8
Thermal (Coal)	5,732.4	5,150.8
New Renewable Energy	2,422.0	2,527.3
Micro Power Producers (µPP)	777.7	945.3
Total	**16,828.4**	**16,448.8**

Average electricity price (LKR/kWh)	21.9	43.9
Net oil imports as % of non petroleum exports	36.4	38.9

Total Demand (PJ)	2022	2023
Biomass	167.7	171.2
Petroleum	143.2	142.2
Coal	2.3	2.0
Electricity	52.8	51.8
Total	**366.0**	**367.2**

Demand by Sector (PJ)	2022	2023
Industry	126.2	124.4
Transport	106.4	107.8
Household & Commercial	131.4	133.1
Total	**364.0**	**365.3**

Industry Demand (PJ)	2021	2022
Biomass	85.0	89.4
Petroleum	22.4	16.6
Coal	2.3	2.0
Electricity	16.5	16.4
Total	**126.2**	**124.4**

Transport Demand (PJ)	2022	2023
Petroleum	106.4	107.8
Total	**106.4**	**107.8**

HH, Comm, Other (PJ)	2022	2023
Biomass	82.7	81.8
Petroleum	12.4	15.9
Electricity	36.3	35.3
Total	**131.4**	**133.1**

Electricity Demand (GWh)	2022	2023
Domestic	5,791.9	5,192.5
Religious	92.2	87.8
Industrial	4,584.9	4,562.4
Commercial	4,078.1	4,411.2
Agriculture	121.8	121.0
Streetlighting	2.0	2.0
Total	**14,670.9**	**14,376.9**

Grid Emission Factors ($kg\text{-}CO_2/kWh$)	2022	2023
Operating Margin	0.7123	0.7049
Build Margin	0.5841	0.6182
Combined Margin	0.6482	0.6616

Average Emission Factor	2022	2023
($kg\text{-}CO_2/kWh$)	0.4173	0.4242

GDP at 1982 factor cost prices (million LKR)	500,453	488,942
Commercial Energy Intensity (TJ/LKR million)	0.40	0.39
Electricity Sold (kWh/person)	661.4	652.4
Petroleum Sold (kg/person)	167.4	175.0

Acknowledgement

Sri Lanka Sustainable Energy Authority wishes to express its sincere thanks to the following institutions for their valuable cooperation in the compilation of the 'Sri Lanka Energy Balance 2023' and the Analysis of Energy Sector Performance.

Ministry of Power & Energy

Ceylon Electricity Board

Lanka Electricity Company (Pvt) Ltd.

Ceylon Petroleum Corporation

Petroleum Resources Development Secretariat

Sri Lanka Railways

Department of Motor Traffic

Department of Census and Statistics

Central Bank of Sri Lanka

State Timber Corporation

All institutions, which responded positively to our request to provide relevant data

Sri Lanka Energy Balance 2023 was compiled by the
Sri Lanka Sustainable Energy Authority

List of Abbreviations

C&F	Cost and Freight
CEB	Ceylon Electricity Board
CHP	Combined Heat and Power
CPC	Ceylon Petroleum Corporation
DG	Distributed Generation
ECF	Energy Conservation Fund
ESCO	Energy Service Company
FOB	Free On Board
GCal	Giga calorie
GDP	Gross Domestic Product
GEF	Grid Emission Factor
GWh	Giga Watt hour
IPP	Independent Power Producer
kCal	kilo calorie
kg	kilo gram
kJ	kilo Joule
kVA	kilo Volt Ampere
LA	Local Authority
LECO	Lanka Electricity Company
LIOC	Lanka Indian Oil Company
LKR	Sri Lankan Rupees
LNG	Liquid Natural Gas
LPG	Liquid Petroleum Gas
µPP	Micro Power Producer
MT	Metric Tonnes
MW	Mega Watt
NERD Centre	National Engineering Research and Development Centre
NRE	New Renewable Energy
NREL	National Renewable Energy Laboratory of United States
PJ	Peta Joule
RDA	Road Development Authority
RERED Project	Renewable Energy for Rural Economic Development Project
SEA	Sri Lanka Sustainable Energy Authority
SCADA	Supervisory control and data acquisition
SLSI	Sri Lanka Standards Institute
SPP	Small Power Producer
SPPA	Standardised Power Purchase Agreement
toe	Tonnes of Oil Equivalent
ToU	Time of Use
TJ	Tera Joule
VET	Vehicle Emissions Testing

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1 Introduction to the Energy Sector

1.1 Highlights of 2023

The demand for petroleum products which recovered after the COVID-19 pandemic to a certain extent in 2021 was not met due to the severe economic crisis which engulfed the country in 2022 and continued to shrink in 2023, constrained through the (quick recognition) QR code based national fuel pass rationing scheme. With the significant devaluation of the Rupee and resultant escalation of prices, the demand for all energy services reduced in 2023. A notable example of this was in the reduction of petroleum fuel imports of 2,962.0 kt by 16.4% in 2023, compared to 3,542.7 kt in 2022.

Global crude oil prices recorded a decline in 2023, when compared to 2022, owing to the subdued global demand offsetting voluntary production cuts by OPEC+ countries. Accordingly, the average Brent crude oil price decreased by 17% to USD 82.22 per barrel in 2023 from USD 99.06 per barrel in 2022. Petroleum sales increased in 2023, reflecting the gradual restoration of economic activity in the aftermath of the economic crisis. The sales volumes of petroleum products reported a year-on-year growth of 4% in 2023, though it remained at a considerably lower level when compared to a normal year.

The scarcity of fossil fuels and unmet demand for electricity eased to a certain extent with the substantial price increase and also the stringent demand management measures deployed by the authorities. The QR code-based fuel rationing scheme quickly became mainstreamed in 2023 and officially ended on the 1st September 2023. The cooking energy crisis which pushed the citizens to experiment with other cooking fuels such as charcoal too eased to a certain extent with the emergency assistance provided by certain development partners to import LP Gas consignments.

The Petroleum Development Authority continued its multi-client agreements ensuring ongoing data marketing efforts and reinforcing Sri Lanka's position in the global upstream exploration market. In offshore petroleum exploration, PDASL secured Cabinet approval in July 2023 to call for Expressions of Interest (EoIs) for Joint Study Programs in the Mannar, Cauvery, and Lanka basins, revising key regulations and finalising a new Petroleum Resources Exploration and Development. The PDASL also upheld its agreement with Greenstat India Ltd., supporting the company's ongoing initiatives, while Greenstat unveiled the country's green hydrogen roadmap in September 2023.

The new renewable energy programme continued in 2023, wherein new small hydro, ground mounted solar, biomass and wind power plants were commissioned. Five solar power plants of 6.0 MW, two hydro power plants of 5.4 MW, a single biomass plant of 4.0 MW and two wind power plants of 15.0 MW were added to the grid. Additionally, the year 2023 reported 810 MW of over 55,000 solar rooftop PV systems operating in the country.

1.2 Sector Governance and Organisations

1.2.1 Energy Sector Governance

The two Ministries, the Ministry of Power, the Ministry of Energy were amalgamated to form a Ministry of Power & Energy governed the energy sector. Biomass sector continued to operate independently and informally, with very little interaction with the energy sector governing structure.

In addition to the involvement of the Government, private organisations and the general public are also stakeholders of the energy sector. Public Utilities Commission of Sri Lanka (PUCSL) is responsible for regulatory oversight of sector operations, presently with powers to monitor and regulate the electricity industry operations.

1.2.2 Public Sector Institutions

Ministry of Power & Energy

The Ministry of Power and Energy is responsible for the whole energy sector. The Ministry of Power is the main body responsible for the management of the power sector. The Ministry comprises several divisions, discharging its functions in planning, and in the supervision of sub-sectoral state institutions. From time to time, the subject of Energy has been combined with others such as Business Development, in the establishment of the Ministry. The following state-owned energy institutions presently operate under the supervision of Ministry of Power and the State Ministry of Solar, Wind and Hydro Power Generation Projects Development.

Sri Lanka Sustainable Energy Authority (SEA)

The Sri Lanka Sustainable Energy Authority (SEA) established in 2007 by enacting the Sri Lanka Sustainable Energy Authority Act No. 35 of 2007, comes under the purview of the State Ministry of Solar, Wind and Hydro Power Generation Projects Development. The SEA continued to consolidate gains realised in the sustainable energy sector, in both renewable energy and energy efficiency spheres in 2023. With the strong commitment of the Government, towards sustainable energy, the SEA undertook to develop two major thrusts on developing renewable energy and increasing energy efficiency.

Ceylon Electricity Board (CEB)

Established in 1969, the CEB is empowered to generate, transmit, distribute and supply electricity in the country. The Electricity Act of 2009 caused CEB's businesses of (i) generation, (ii) transmission and bulk supply operations and (iii) distribution and supply to be separately licensed. In 2022, CEB generated 76% of electrical energy supplied through the national grid, while the balance was generated by private power plants.

The entire 220 kV, 132 kV and 33 kV network is owned and operated by the CEB. CEB directly serves about 92% of gird connected electricity consumers in the country. It operated 3,253 km of transmission lines and 197,586 km of distribution lines at the end of 2023, serving a total of 7,024,762 customers.

Lanka Electricity Company (Pvt) Ltd (LECO)

The LECO is an institution established in 1983 to distribute electricity in areas previously served by Local Authorities (Municipal Councils etc.). LECO receives electricity from CEB at 11 kV and distributes in LECO franchise areas. LECO serves about 8% of the electricity customers in the country. LECO's franchise area steadily expanded from 1983 to 1990, and the company implemented a major rehabilitation program in the newly acquired distribution networks, which has reduced losses substantially. It served 624,519 customers by end-2023, through a 4,809 km of distribution lines.

Ceylon Petroleum Corporation (CPC)

Established in 1961, CPC imports, refines and distributes petroleum products in the country. CPC owns and operates the only refinery in Sri Lanka, with a daily throughput of 50,000 barrels. The demand for petroleum products has significantly increased, with the sale of all petroleum products for all sectors recording an increase from 3,714.0 kt in 2022 to 3,855.8 kt in 2023.

Lanka Coal Company (LCoC)

With the commissioning of the first coal plant in Puttalam in 2011, a new company was established under the Ministry of Power and Energy to streamline the supply of coal required for the plant. This new organisation continues supplying coal to the 900 MW power plant, with a supply of 1,915.2 kt in 2023.

Ceylon Petroleum Storage Terminals Limited (CPSTL)

With the liberalisation of the petroleum industry in 2002 and the entry of Lanka Indian Oil Company, a necessity was felt to share storage infrastructure among downstream vendors. At the time there was an expectation of a third player entering the downstream petroleum business. A company was incorporated with equal share holdings of CPC, LIOC and the Treasury. CPSTL is now managing a major part of storage, pipeline and distribution facilities including two major terminals in Kollonnwa and Muthurajawela.

Petroleum Development Authority of Sri Lanka (PDASL)

This new agency was established in 2003 as a secretariat to manage the petroleum exploitation activities of the country. PRDS has successfully attracted oil exploring company to explore the Petroleum resources in the Mannar offshore region. This Secretariat was assigned to the Ministry of Petroleum Resources Development on 2015 September 21 after the upstream development activities were placed within the purview of this Ministry. This new authority came into being in 2021 after the elevation of this secretariat to a fully fledged authority with the name Petroleum Development Authority of Sri Lanka.

1.2.3 Private Sector Organisations

There are numerous private sector organisations participating in the supply, distribution and sale of electricity, petroleum and biomass. The private sector organisations in the electricity sector include Independent Power Producers (IPPs) supplying electricity to the CEB for resale and Small Power Producers (SPPs) producing power using renewable technologies. *Annex 1* provides a list of all IPPs and SPPs operational by end 2023. With the launch of the national solar programme "Sooryabala Sangramaya" in 2016, there is a significant increase in the Renewable Energy Service Providers (RESCos) in the country, taking the number of registrations to more than 800 entities by the end of 2023.

In the petroleum sector, in addition to the CPC, several private companies distribute and sell petroleum products, lubricants and LP gas. Details of these companies are given in *Annex 1*.

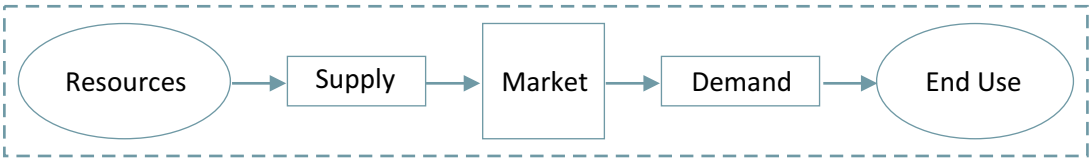
Stages in Energy Flow

Energy used in a country is found in different forms at different stages of its flow from the raw form found in nature to the actual end use form. Broadly, these stages can be categorised as;

- Energy Resources
- Energy Supply including conversion/production and distribution
- Energy Demand
- End Use

Energy sector is the combination of all the above stages of different energy forms which are interrelated, as illustrated below.

Energy Sector Composition



The above flow diagram explains that, owing to various end uses of energy, a demand exists in the market, which is fulfilled by the energy supply using the available resources. This follows the basic demand supply economic model valid for any scarce resource.

Energy Resources

A natural resource is considered an energy resource, if it can be converted to a usable form of energy. There are numerous forms of energy sources in the world and different countries use different resources, primarily selected on economic principles. However, environmental and political reasons also influence the selection of a country's energy portfolio.

Availability, either locally or globally, is not necessarily the only factor considered for using a particular resource as an energy supply source. More importantly, the use must be economical compared with other available sources. Hence, the technology available for converting the resource to a more usable form is important in the selection of an energy resource for energy supply. Change of technology and availability of resource over time can change the economics of using the resource for energy supply. Therefore, the resources used by a country for energy requirements also change with time.

Indigenous Resources

Attributed to geo-climatic settings, Sri Lanka is blessed with several types of renewable energy resources. Some of them are widely used and developed to supply the energy requirements of the country. Others have the potential for development when the technologies become mature and economically feasible for use. Following are the main renewable resources available in Sri Lanka.

- Biomass
- Hydro Power
- Solar
- Wind

In addition to the above indigenous renewable resources, the availability of petroleum within Sri Lankan territory is being investigated.

Global Resources

In the international market, many forms of energy sources are available for Sri Lanka to import and use for its energy needs. However, up to now, Sri Lanka has been largely using only petroleum fuels for this purpose. Increasing petroleum prices have prompted Sri Lanka to examine the feasibility of using other sources such as coal and Liquefied Natural Gas (LNG) to replace liquid petroleum in certain applications. Following are the most common energy sources globally available for energy supply on a commercial scale.

- Petroleum
- Coal
- Natural Gas
- Nuclear Energy

More recently, new energy supply technologies such as biofuels and energy carriers such as hydrogen and electricity storage have emerged as alternatives to the above conventional technologies and transfer options. However, use of these technologies for energy supply purposes is still limited in Sri Lanka.

Energy Supply

To understand the status of the energy sector of a country, what is more important is not the availability of different energy resources, but the extent of use of these resources. As explained earlier, mere availability of a resource within a country does not enable its utilisation. Therefore, it is more important to analyse the resources which are actually being used to meet the energy demand of the country. Following are the four main energy supply forms in Sri Lanka.

- Biomass
- Petroleum
- Coal
- Electricity

Energy supply is essentially the conversion of energy resources from one form to a more usable form. However, this conversion can vary from producing electricity from the potential energy in a hydro reservoir to refining crude oil into gasoline or diesel.

Transmission/Distribution

For each energy supply source, there must be a distribution mechanism through which it can be served to the points of end use. From the production or storage facilities of the energy supply system, the distribution system transports energy to the end user.

The biomass distribution network is quite simple, and in the case of most users, a formal network does not exist. The major use of biomass is in households, where the source and the point of use, both are within the same home garden. Even in industrial use, distribution is a one-to-one arrangement, which links the source to the user through a direct biomass transport. More recently, with large scale conversion of industrial thermal energy for petroleum fuels, to biomass, the emergence of a supplier is witnessed. Then suppliers are essentially middlemen, who felicitate the market by connecting the resource owners with uses.

In the case of petroleum, distribution is from the petroleum storage facilities up to end user points such as vehicles, power plants and industries, channelled through regional storage facilities and filling stations.

For electricity, distribution starts from the generating station (power plant) and ends at consumer points such as households and industries. The high voltage transmission network, medium voltage regional networks and low voltage local distribution networks are collectively considered as the energy distribution system of electricity. With the introduction of net-metering scheme in the country in 2010, some customers have installed small scale generators at the end-use point, changing this traditional supply architecture. With the broadening of on-site solar PV rooftop scheme in 2016, these micro power producers are becoming a formidable supply source as per the trends observed during the period up to end 2020.

Demand

For the energy sector, demand drives the market. Demand arises owing to energy needs of households, industries, commercial buildings, etc. According to the needs of the user, the supply of energy has to take different forms. For example, the energy demand for cooking is in the form of biomass in rural areas, while it is in the form of either LP gas or electricity in urban areas. Therefore, not only the quantity of energy, even the quality and the form it is delivered, is determined by the demand.

In this report, the demand is categorised in terms of end-use sectors and is not based on the actual usage or the application of energy at appliance level.

2 Energy Resources

2.1 Indigenous Energy Resources

2.1.1 Biomass

The Household Survey on the Usage of Electrical Equipment carried out in 2019, in collaboration with the Department of Census and Statistics, reveals that nearly half of the population depends on biomass to suffice the needs in residential cooking energy. Although large quantities of firewood and other biomass resources are used for cooking in rural households, lesser quantities are used in the urban households. With the steep increase of LP gas prices, the dependence on LP gas as the sole cooking fuel changed and many households started to reintroduce biomass as a cooking fuel, venturing into various cookstove types and cooking fuel ranging from saw dust to charcoal briquettes.

Even though a large portion of energy needs of the rural population is fulfilled by firewood, there are possibilities to further increase the use of biomass for energy in the country, especially for thermal energy supply in the industrial sector. Furnace oil prices remained without subsidies, sold at a cost of LKR 320 per litre. Therefore, the business case for large industrial thermal plants to be operational on biomass got further improved in 2023, consolidating the supply chains. With no sign of new fuel wood plantations, the biomass supply chain of industrial thermal plants continued to grow.

2.1.2 Hydro

Hydro power is a key energy source used for electricity generation in Sri Lanka. A large share of the major hydro potential has already been developed and delivers valuable low cost electricity to the country. Currently, hydro power stations are operated to supply both peaking and base electricity generation requirements. A substantial number of small hydro power plants which operate under the Standardised Power Purchase Agreement (SPPA) and many more are expected to join the fleet during the next few years. The momentum gained by the small hydropower industry from the streamlined approval process was somehow lost due to legal impediments to approve new projects. Figure 2.2 indicates SPP hydro cumulative capacities by district.

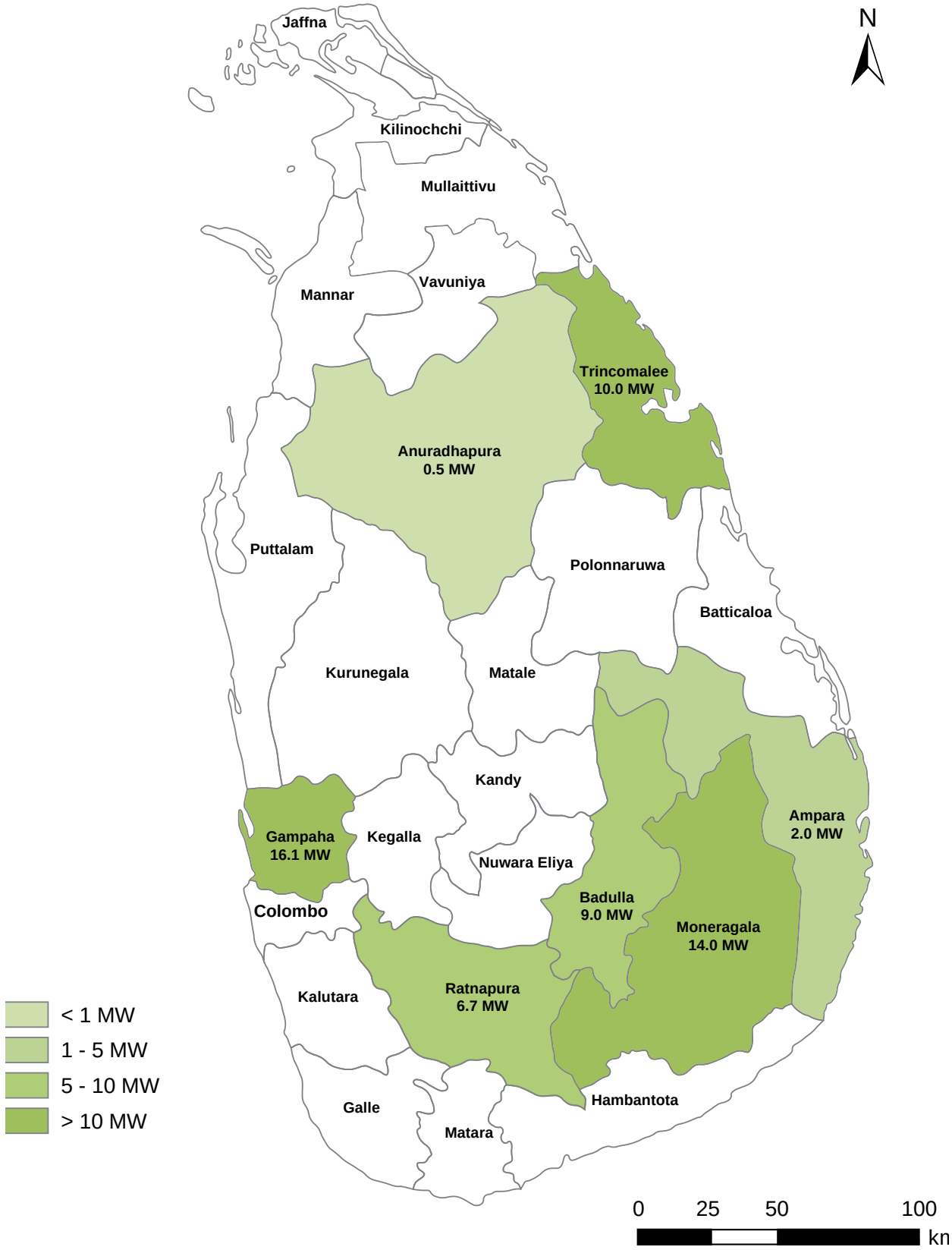


Figure 2.1 – Cumulative Capacity Additions of Biomass (2023)

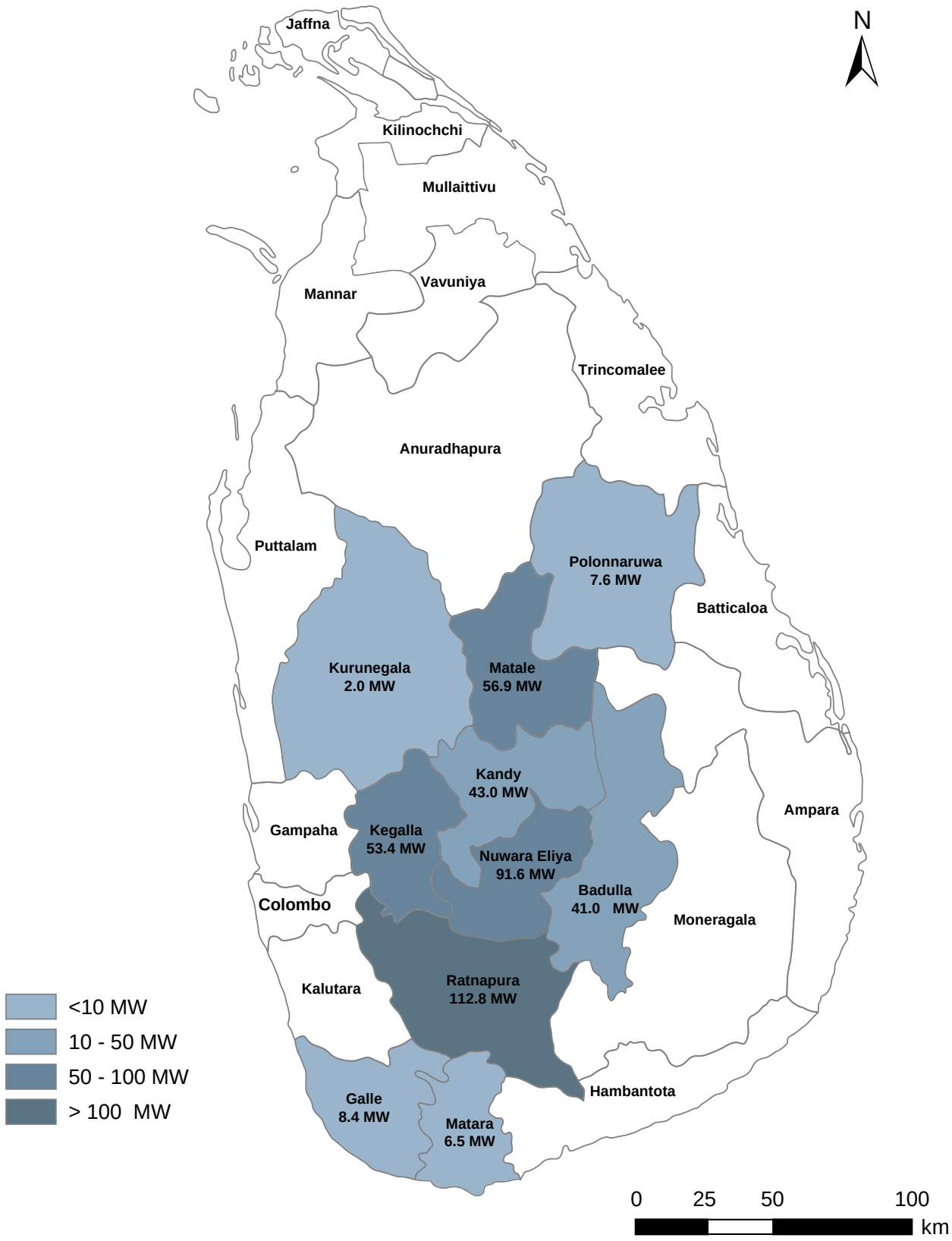


Figure 2.2 – Cumulative Capacity Additions of SPP Hydro (2023)

2.1.3 Solar

The two pilot projects operated by SEA realised annual plant factors of 14.06% for the 737 kW plant and 2.39% for the 500 kW plant. The 500kW plant developed a major technical fault and ceased to operate in early May 2023 and remained shut down for the rest of 2023. In the commercial development sphere, four solar power plants resulting from the competitive bidding process commenced commercial operations in 2023. Apart from the solar plants, two wind power plants, two small hydro plants and a biomass power plant joined the generation fleet in 2023, with a capacity increase of 29.4 MW. The capacity additions produced impressive results yielding an aggregate plant factor of 19.16%. 132.36 MW capacity available at the beginning of the year increased to 139.36 MW at the end of 2023. The capacity additions, energy yields and monthly plant factors are given in Figure 2.3 below.

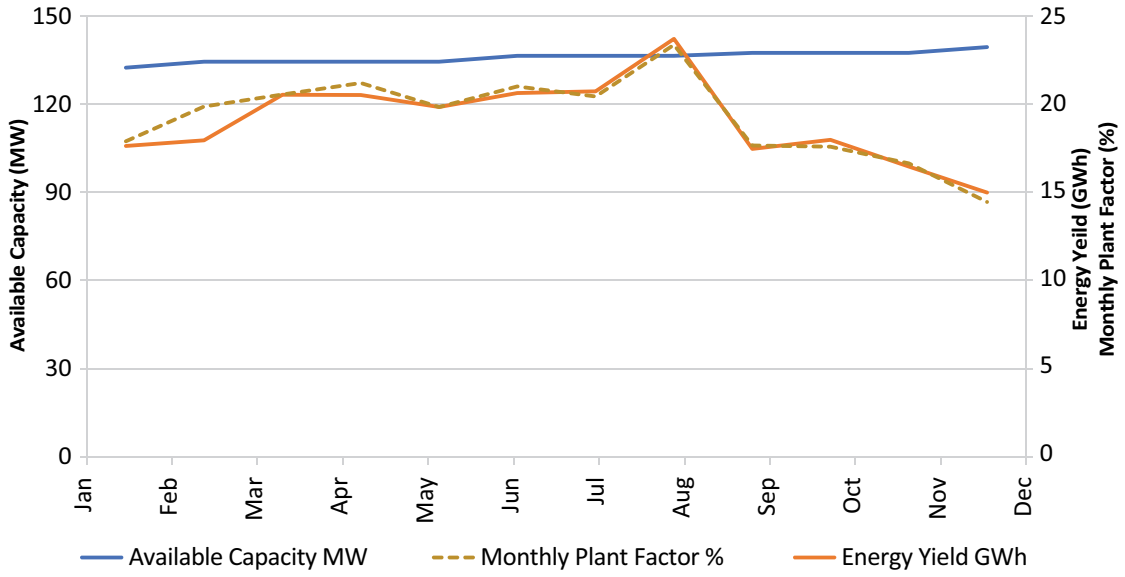


Figure 2.3 – Solar Power Generation

The installation of solar rooftop PV systems gathered momentum, and by end 2023, a total of 55,004 systems were in operation, with a total capacity of 810 MW generating 945.3 GWh. Generation statistics were estimated based on average energy yields expected in a Typical Meteorological Year (TMY), and will be linearly derated by an end of lifecycle capacity loss of 15% based on each project's age from 2021 to increase the accuracy of the estimate.

Figure 2.4 shows the SPP cumulative solar capacities by district.

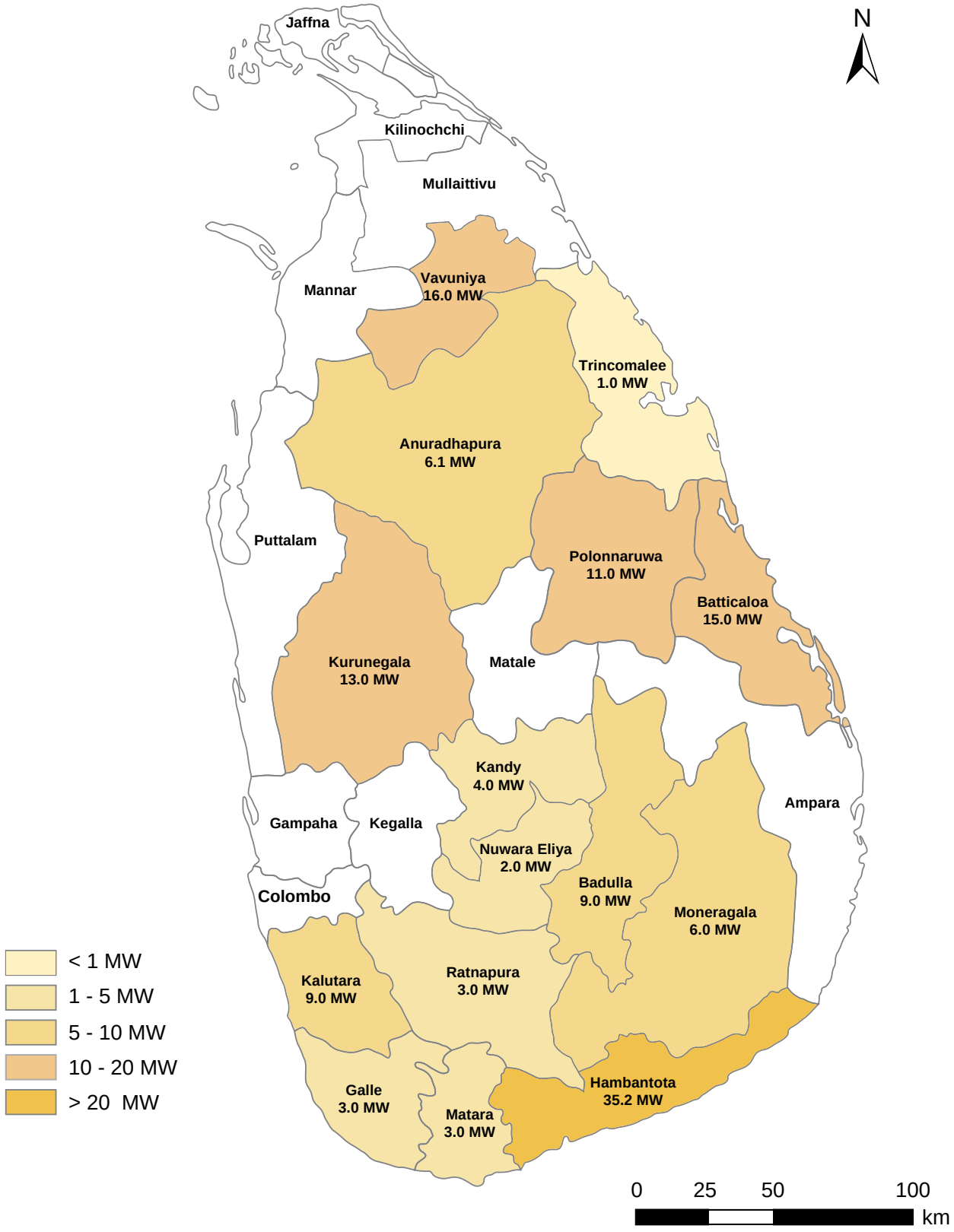


Figure 2.4 – Cumulative SPP Solar Capacity Additions (2023)

2.1.4 Wind

The ADB funded 100 MW Mannar Wind Project operated successfully for the second year.

The beginning-of-year capacity of 148 MW increased to 163 MW in the middle-of-year 2023, yielding an aggregate plant factor of 30.56%. The energy yields and monthly plant factors are given in Figure 2.6 below. Performance of the newly commissioned Mannar wind power plant was not added to this calculation, and will be depicted separately with the next issue of this publication

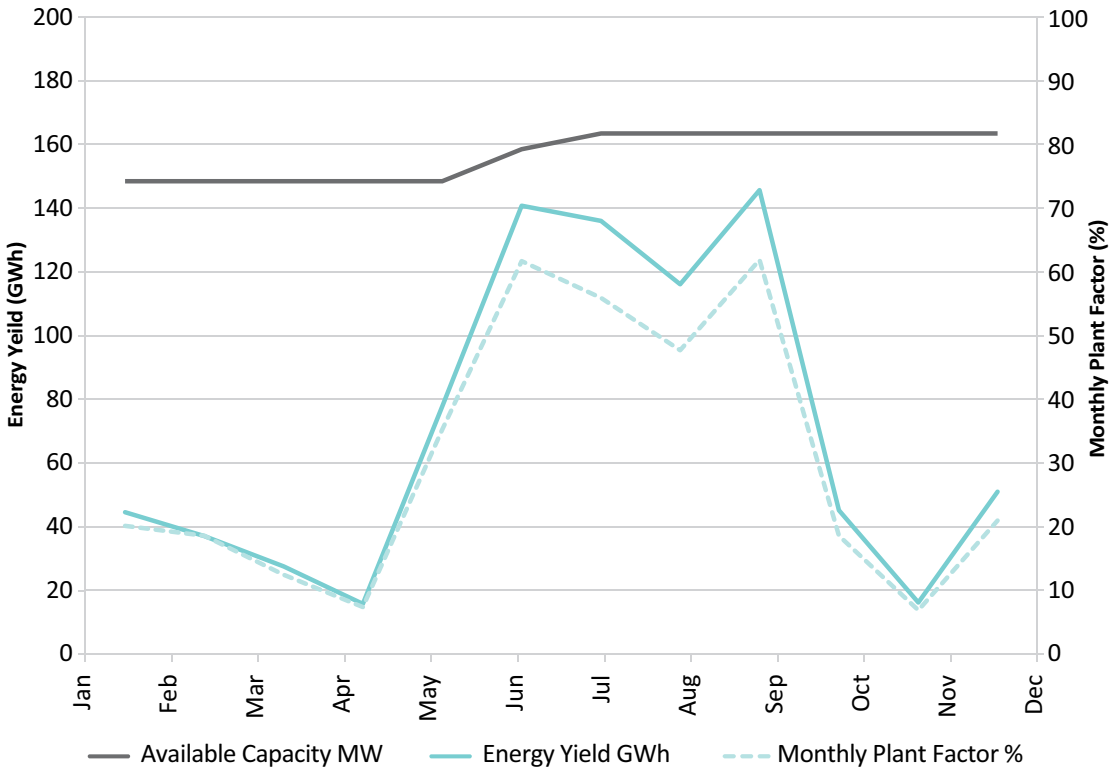


Figure 2.6 – Wind Power Generation

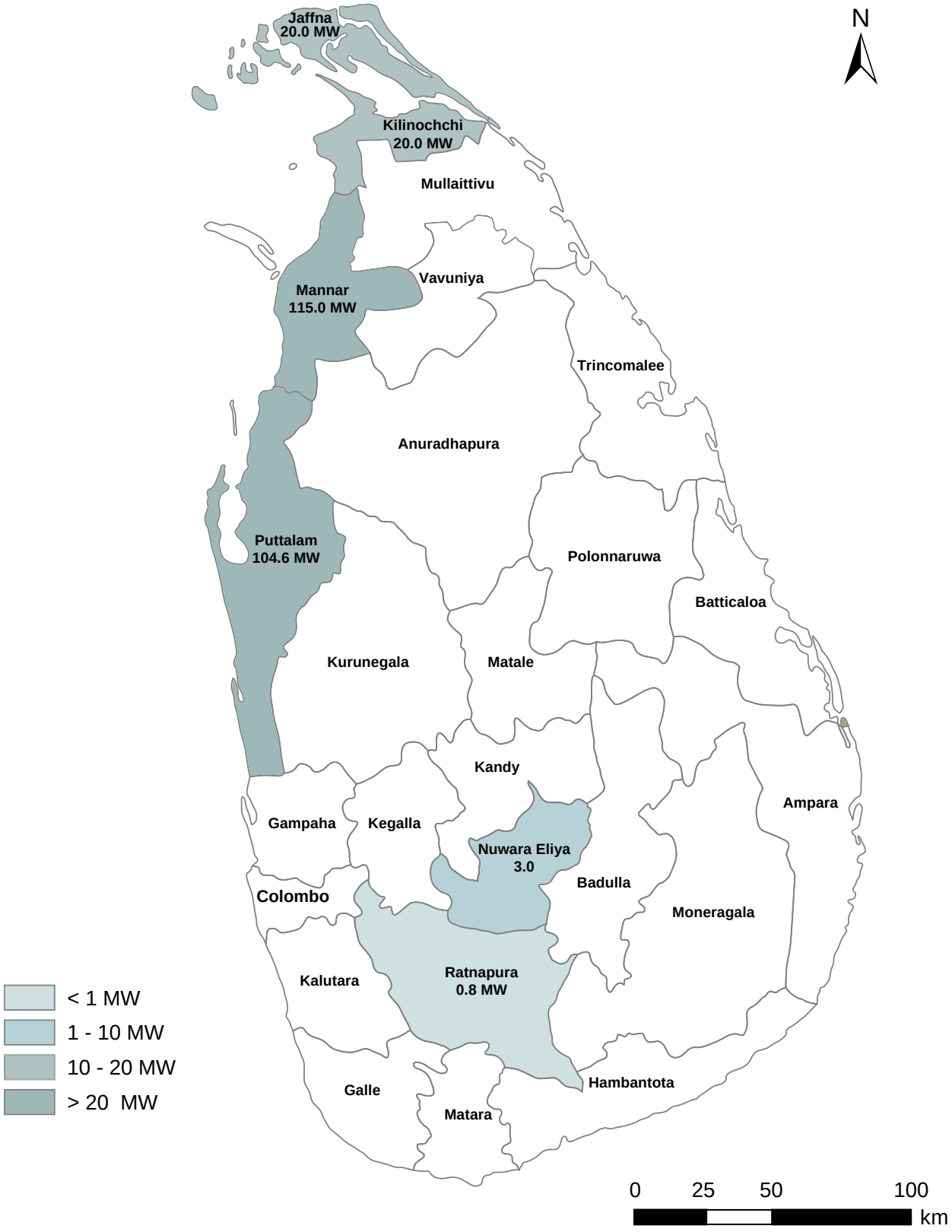


Figure 2.6 – Cumulative Capacity Additions of Wind (2023) **2.1.5**

Oil/Gas Exploration

The Petroleum Development Authority continued its multi-client agreements with both parties Eastern Eco DMCC (subsidiary of Schlumberger) and Bell Geo Enterprises, ensuring ongoing data marketing efforts and reinforcing Sri Lanka's position in the global upstream exploration market. Schlumberger subsidiaries continued marketing the acquired, processed, and reprocessed seismic data, accumulating 13,080 line km of 2D seismic data since 2016 and investing USD 18 million at no cost to the Government. Their targeted marketing and investor engagement strategies generated significant international interest, resulting in USD 684,000 in sales proceeds for Sri Lanka in 2022. Similarly, Bell Geospace actively marketed the multi-client airborne gravity and magnetic data covering 14,000 line kilometers in the Mannar and Cauvery basins, with an investment of USD 927,000.

Additionally, the PDASL upheld its agreement with Greenstat India Ltd., supporting the company's ongoing initiatives in Sri Lanka. Greenstat unveiled the country's green hydrogen roadmap in September 2023, advanced feasibility studies, and organised the National Energy Conference that same month to facilitate industry dialogue and drive stakeholder collaboration in the renewable energy sector.

In offshore petroleum exploration, PDASL secured Cabinet approval in July 2023 to call for Expressions of Interest (EoIs) for Joint Study Programs in the Mannar, Cauvery, and Lanka basins, revising key regulations and finalising a new Petroleum Resources Exploration and Development Block Map with the Survey Department. Strengthening regulatory frameworks was a key focus, leading to the publication of essential regulations on Joint Study Agreements and service provider licensing in early 2023.

The PDASL also prioritised institutional development, obtaining approval for 35 cadre positions and actively managing staffing requirements despite operational constraints. The PDASL facilitated a study by Pytheas, Germany, to assess the effectiveness of SDDT technology in evaluating hydrocarbon prospects in selected areas of the Mannar and Cauvery basins. Additionally, PDASL facilitated high-impact capacity-building programs, including methane abatement, carbon capture utilisation and sequestration (CCUS), and hydrogen technology workshops, in collaboration with international partners like Deloitte, the U.S. Department of State, and the International Technical Assistance Program. These initiatives underscore PDASL’s commitment to fostering investment, enhancing governance, and positioning Sri Lanka as a key player in sustainable energy development.

2.1.6 Indigenous Resources in Sri Lanka

Table 2.1 - Indigenous Primary Sources of Energy in Sri Lanka

Indigenous Energy Source	Typical User Groups	Typical Applications	Scale of Use by End 2023
Biomass	Household	Cooking	Widespread
	Commercial	Hotels, Bakeries	Widespread
	Industry	Tea drying, Brick and tile	Widespread
		Steam generation	Growing
	Private power plant	For sale to utility	14 power plants
		Own consumption	Several villages and factories
Hydro Power	Electricity utility owned large multipurpose systems	For retail to customers	Major power plants
	Commercial grid-connected	For sale to utility	217 power plants
	Village-level off-grid electricity	Household use	A few plants operating in the grid-connected mode, however, many now in disuse
	Industrial off-grid electricity	Tea industry	A few power plants
	Industrial mechanical drives	Tea Industry	Negligible, one or two remaining
Solar Power	Solar photovoltaic	Rooftop systems	55,004 installations
		Household lighting	No longer reported in large numbers.
	Grid connected PV	For sale to utility	83 power plants
	Solar Thermal	Hot water systems in commercial and domestic sectors	Widespread
	Informal use	Household and agricultural use	Widespread
Wind Power	Grid Connected Wind	For retail to customers	19 power plants
	Off-grid power plants	For residential use	A few dozens, most in disuse
	Water pumping	Agriculture	A few dozens, one or two in operation

2.2 Global Energy Resources

As explained previously, petroleum, coal, natural gas and nuclear energy are the four main energy sources used in other countries. However, in Sri Lanka, petroleum and coal are imported in large scale to the country as a source of energy while the use of other sources is still being at lower levels. The use of refined petroleum products and coal is described in Table 2.2.

Table 2.2 – Use of Global Energy Resources in Sri Lanka

Imported Energy Source	Typical User Groups	Typical Applications	Scale of use at Present
Crude Oil and refined products including LPG	Household	Lighting, cooking	Widespread
	Commercial	Hotels, bakeries	Widespread
	Industry	Furnaces, kilns, boilers	Widespread
	Power generation	Combined cycle, gas turbine, diesel engines, steam turbines	A number of thermal power plants
	Transport	Rail, road, air and sea	Widespread
Coal	Railways	Rail	Negligible
	Industry	Kilns	Cement industry and foundries
		Boiler	Two or more
	Power Generation	Boiler	3 units of 300 MW (900 MW)

3 Energy Supply

Energy needs of the country are fulfilled either directly by primary energy sources such as biomass and coal, or by secondary sources such as electricity produced using petroleum, biomass, hydro power and refined petroleum products.

3.1 Supply from Primary Energy Sources

3.1.1 Evolution of Energy Supply

The primary energy supply of Sri Lanka consists of biomass, petroleum, coal, major hydro and new renewable energy. Table 3.1 summarises the contribution of supply energy forms by source.

Table 3.1 – Primary Energy Supply by Source

PJ	2010	2015	2020	2021	2022	2023
Biomass	180.5	174.6	172.0	172.5	169.0	171.9
Petroleum	181.2	186.1	198.5	205.6	150.6	143.8
Coal	2.5	51.9	70.5	70.4	58.3	75.6
Major hydro	50.1	49.3	39.5	56.9	54.1	46.1
New Renewable Energy	7.5	15.3	20.7	30.8	31.4	32.2
Total	**421.9**	**477.2**	**501.2**	**536.1**	**463.5**	**471.6**
%						
Biomass	42.8	36.6	34.3	32.2	36.5	36.4
Petroleum	43.0	39.0	39.6	38.3	32.5	30.5
Coal	0.6	10.9	14.1	13.1	12.6	16.0
Major hydro	11.9	10.3	7.9	10.6	11.7	9.8
New Renewable Energy	1.8	3.2	4.1	5.7	6.8	7.2

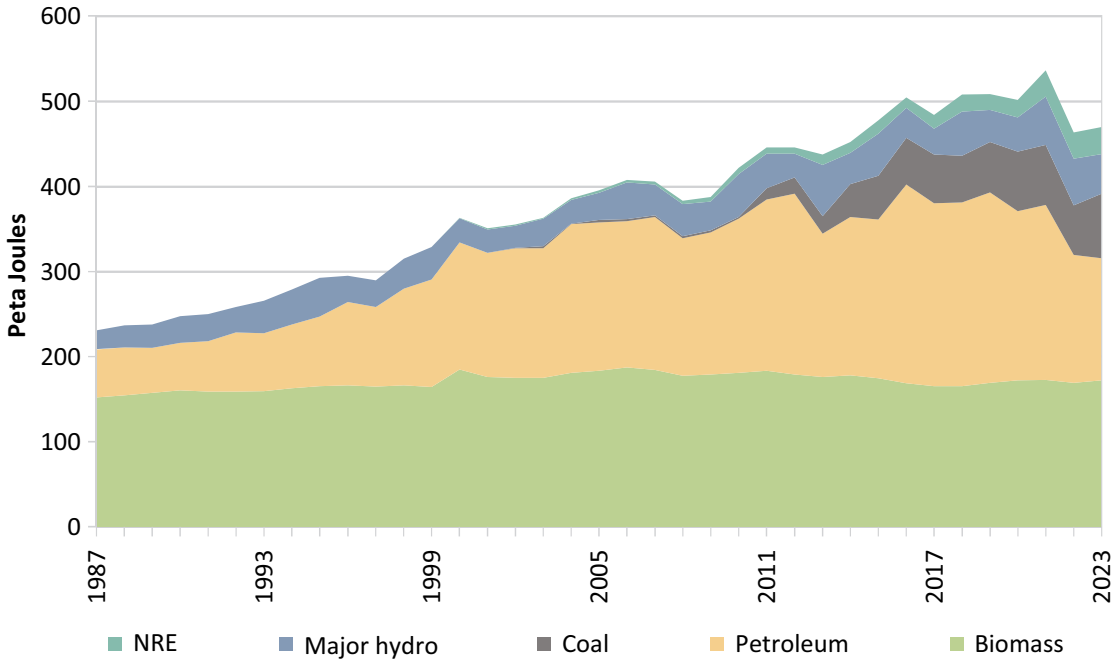


Figure 3.1 – Evolution of Energy Supply Forms

In early years (1970's, at which the earliest comprehensive energy accounts are available), the primary energy supply was dominated by biomass and petroleum. By end 2023, the share of biomass in the primary energy supply has increased marginally to 36.4%, compared to previous years, whilst the share of petroleum too has gradually decreased to 30.5%, over the years. The contribution of major hydro decreased marginally, owing to climatic conditions experienced in 2023. Figure 3.2 shows the variation on percentage shares of the Primary Energy Supply.

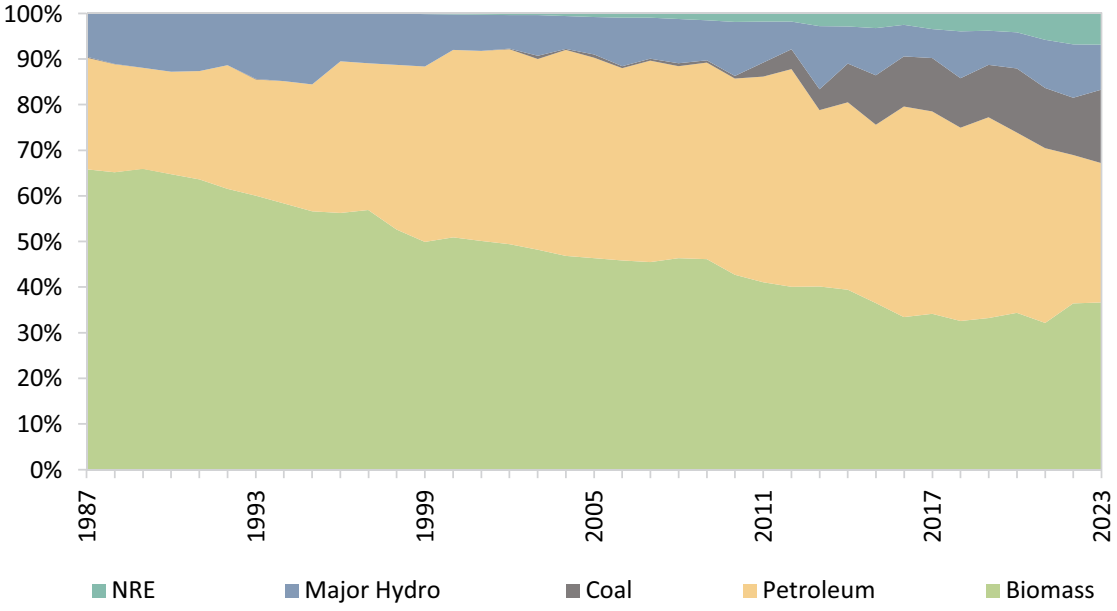


Figure 3.2 – Percentage Share of Primary Energy Supply

Biomass is the most widely available cooking fuel used by nearly half of the population in the residential sector for cooking purposes. Due to the widespread and abundant availability, only a limited portion of the total biomass use is channelled through a commodity market and hence the value of the energy sourced by biomass is not properly accounted. However, this situation is fast changing with many industries switching fuel to reduce the cost of thermal energy. There is a growing demand from the users to regularise the biomass market by way of introducing quality traceability and sustainability assurance schemes. However, the growing industrial demand sans an appreciable expansion of the supply sector is already causing shortages, eroding the economic gains enjoyed by the industrial users immediately after conversion. The biomass industry can look forward to a better future only if the regulatory instruments now available for adoption in Sri Lanka are fully implemented to ensure a sustainable supply.

Sources of Production of Biomass

Biomass comes in different forms. Following are the most common forms of biomass available in Sri Lanka.

- Fuel wood (unprocessed logs)
- Fuel wood (processed chips)
- Municipal Waste
- Industrial Waste
- Agricultural Waste

General biomass conversions are given in Table 3.2

Table 3.2 – Biomass Conversions

Primary Source	Conversions
Firewood (natural yield, home gardens, dedicated woodlots)	Thermal energy for boilers to generate steam for industry uses and electricity generation and combustible gases to drive Internal Combustion engines for electricity generation
Coconut Shell	Charcoal, activated carbon; mostly for export as a non-energy product
Bagasse	Thermal energy to generate steam for boiler-turbine units used for electricity generation
Wood	Charcoal; mostly for the hotels and household markets
Municipal waste	A single 10 MW capacity plant in operation

3.1.2 Energy Supply from Petroleum

As a country with no proven indigenous petroleum resources yet, Sri Lanka totally depends on petroleum imports, both in the form of crude oil and as finished products. Table 3.3 summarises the imported petroleum products.

Table 3.3 – Importation of Petroleum Products

kt	2010	2015	2020	2021	2022	2023
Crude Oil Import	**1,819.4**	**1,676.8**	**1,666.8**	**1,130.2**	**743.6**	**1,665.6**
Product Imports	**2,495.8**	**2,995.3**	**3,294.1**	**3,941.8**	**3,542.7**	**2,962.0**
LPG	137.1	277.0	437.0	422.0	290.0	365.2
Gasoline	451.8	899.0	1,057.0	1,186.5	1,106.2	1,105.0
Avtur	222.8	270.8	101.1	178.1	268.7	168.4
Auto Diesel	1,199.2	1,288.8	1,192.0	1,779.7	1,608.1	1,037.3
Fuel Oil	423.0	203.3	487.0	359.3	245.8	269.9
Avgas	0.3	0.1	0.1	0.2	0.1	-
Bitumen	44.7	32.2	-	-	-	-
Mineral Gas Oil	16.9	24.1	19.9	16.0	23.7	16.2

The importation of crude oil and finished products have increased substantially in 2023 compared to 2022 due to the increased process volumes in the refinery, whereas the importation of finished products decreased by a 16.4% in 2023.

3.1.3 Energy Supply from Coal

The demand for coal decreased in 2023 as the primary demand for coal is from the power generation sector (Figure 3.3 and Table 3.4) which rebound after the crisis.

Table 3.4 – Importation of Coal

kt	2010	2015	2020	2021	2022	2023
Coal Imports	108.1	1,881.5	2,543.6	2,204.4	1,707.0	2496.7

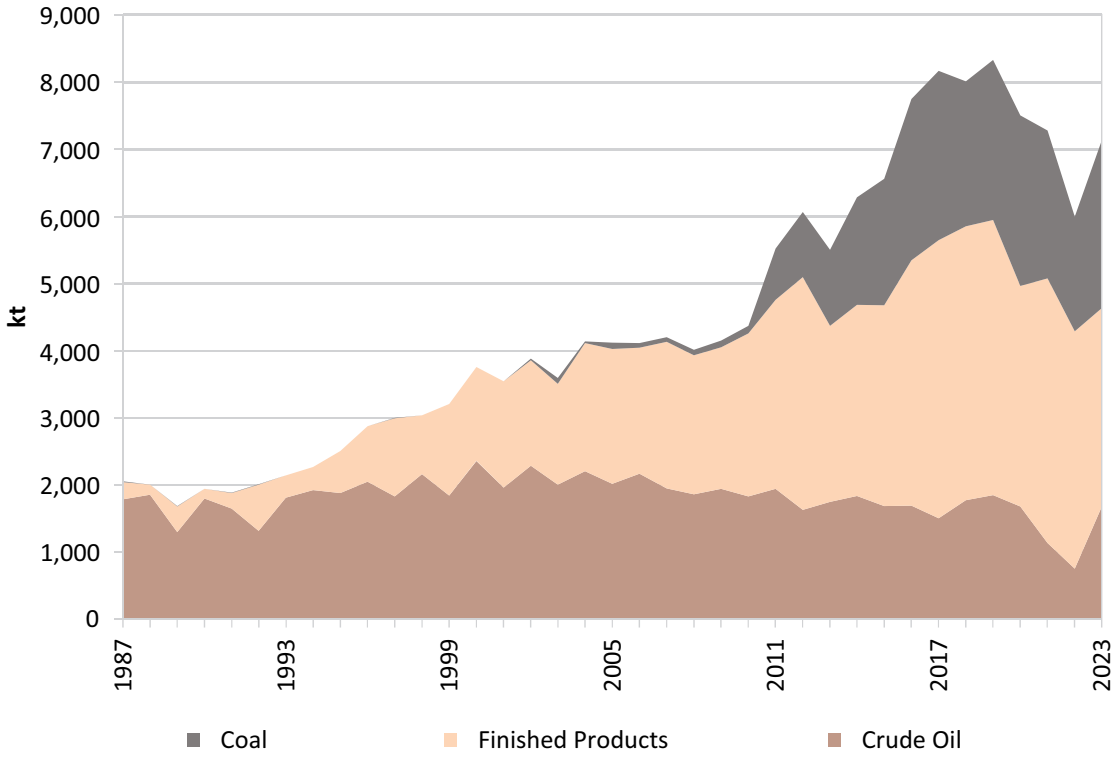


Figure 3.3 – Importation of Petroleum Products

3.1.4 Supply from Major Hydro

The topography of the country provides an excellent opportunity to harness the energy stored in river water which flows from the central hills of the country to the Indian Ocean surrounding the island. The contribution of hydro as an energy supply source is always through its secondary form, which is electricity. Having an early start in the hydro electricity generation, Sri Lanka has nearly exhausted the hydro power potential in its river systems. With the commissioning of the remaining four projects under construction the era of major hydropower development will come to an end. The other key hydropower project, namely, the Uma Oya (120 MW) was completed, and started test runs and is expected to be in commercial operation by early 2024. Work of the other projects like the Moragolla, Gin Ganga, and Thalpitigala, were in progress in 2023.

3.1.5 Supply from New Renewable Energy

The New Renewable Energy (NRE) is seen in many forms such as small hydro, solar, wind and biomass power plants. In 2023, four new solar power plants, two wind power plants, two hydropower plants and one biomass power plants were commissioned, signalling the resurgence of some activities in areas other than solar energy. Apart from the large scale orthodox use of solar energy in drying and crop processing, large scale deployment of solar hot water systems are seen in new home construction, health and hospitality sectors. Also, the interest in solar roof top systems is seen to be increasing at a rapid rate. By end 2023, there were 822 service providers engaged in this trade.

The contribution of major hydro and NRE to the primary energy supply is depicted in Table 3.1, Figures 3.1 and 3.2 above.

3.2 Petroleum Refinery Operations

3.2.1 Refinery Product Output

The country's petroleum product requirements are met partly by direct import of finished products and partly by processing imported crude oil. The only refinery in Sri Lanka, located in Sapugaskanda, converts imported crude oil to refined products to supply approximately half of the petroleum demand of the country. The refinery produces its output at a rate of 2.3 million tonnes per year (50,000 bbl/stream day) and the refinery process flow is illustrated in Figure 3.4.

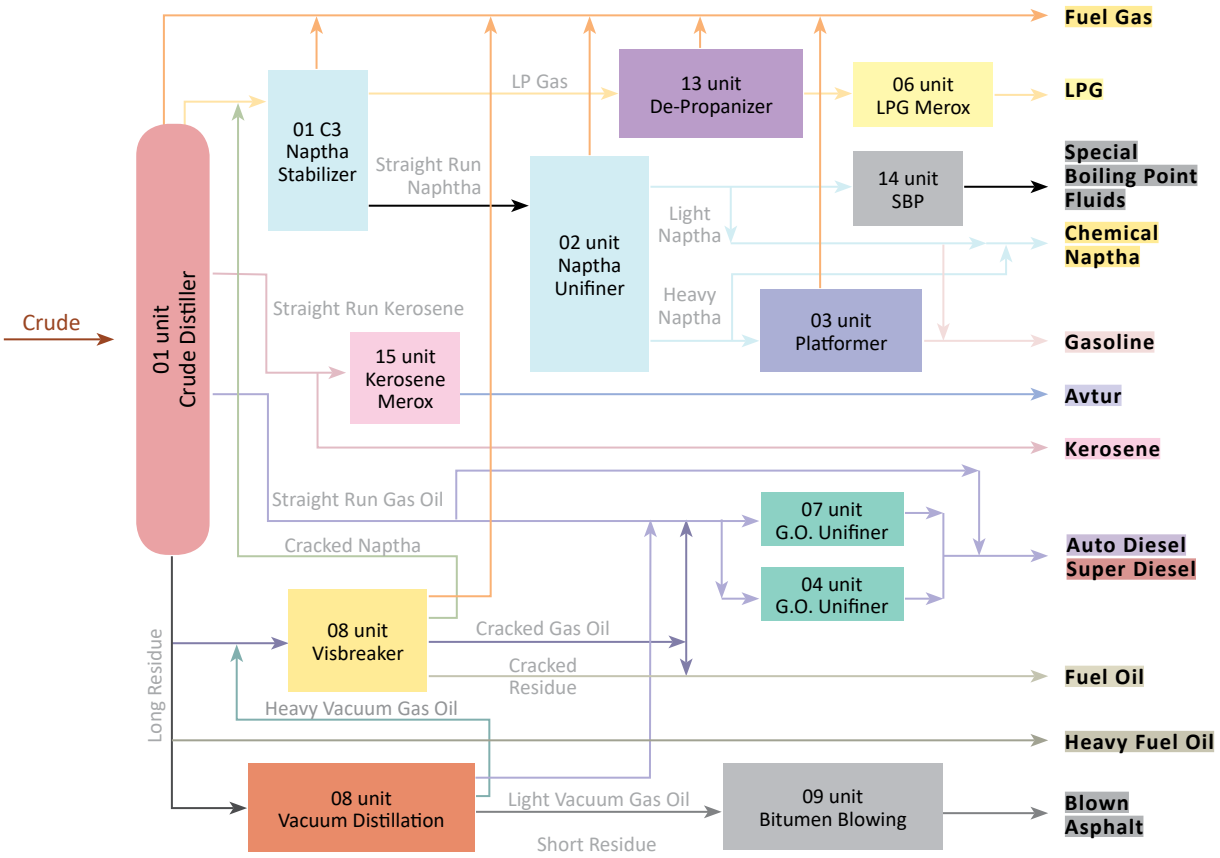


Figure 3.4 – Sapugaskanda Refinery Process Flow Diagram

Murban Crude oil, Siberian Light, URAL and ESPO were processed in the Sapugaskanda refinery in 2023. Details of crude refined are given in Table 3.5.

Table 3.5 - Types of Crude Oil Refined at Sapugaskanda Refinery

kt	2010	2015	2020	2021	2022	2023
Arabian light	134.61	-	-	-	-	-
Iranian light	1,618.10	-	-	-	-	-
Miri Light	-	-	-	-	-	-
Upper zakum	-	-	-	-	-	-
Oman Crude	-	304.30	-	-	-	-
Dubai Crude	-	-	-	-	-	-
Murban Crude	-	1,387.77	1,752.36	1,272.21	282.86	1,386.54
DAS	-	-	-	-	-	-
Saharan Blend Crude	-	-	-	-	-	-
Siberian Light	-	-	-	-	74.96	163.61
URAL	-	-	-	-	165.94	33.42
ESPO	-	-	-	-	6.02	93.47
Total	**1,752.72**	**1,692.07**	**1,752.36**	**1,272.21**	**529.77**	**1,677.03**

TThe refinery maximum throughput is far less than the country requirement for petroleum products. Besides, its production slate differs from the mix of product demand. Although the refinery is operated at maximum design capacity to meet the demand for middle distillates, petrol, kerosene, Jet A-1 and diesel are still in deficit with a need for supplementary imports. All petroleum products had to be imported to supplement refinery production in 2023. Details of refinery output are given in Table 3.6 and Figure 3.5.

Table 3.6 - Refined Products from the Refinery

kt	2010	2015	2020	2021	2022	2023
Crude Input	**1,752.72**	**1,692.07**	**1,752.36**	**1,272.21**	**529.77**	**1,677.03**
LPG	22.93	9.65	25.25	16.65	5.69	23.80
Chemical Naphtha	84.29	136.56	156.95	106.96	30.84	129.06
Naphtha Total	**84.29**	**136.56**	**156.95**	**106.96**	**30.84**	**129.06**
Super Petrol	-	-	-	-	-	-
Regular Petrol	157.97	154.24	164.42	124.09	38.67	171.19
Petrol Total	**157.97**	**154.24**	**164.42**	**124.09**	**38.67**	**171.19**
Avtur	126.41	154.57	157.28	130.57	57.35	233.65
Kerosene	92.78	75.23	109.17	98.28	25.29	49.48
Auto Diesel	441.55	516.65	537.65	370.59	128.17	505.68
Super Diesel	-	-	-	-	-	-
Diesel Total	**441.55**	**516.65**	**537.65**	**370.59**	**128.17**	**505.68**
Furnace Oil 500'	-	-	-	-	-	-
Furnace Oil 800'	47.92	336.28	465.42	359.02	87.20	379.02
Furnace Oil 1000'	-	-	-	-	-	-
Furnace Oil 1500'	396.03	204.85	-	-	-	-
Furnace Oil 3500'	241.93	11.37	-	-	-	-
Furnace Oil Total	**685.88**	**552.50**	**465.42**	**359.02**	**194.20**	**482.13**
S.B.P.	2.73	1.51	0.90	3.04	2.69	1.52
Solvents Total	**2.73**	**1.51**	**0.90**	**3.04**	**2.69**	**1.52**
Bitumen	34.94	-	-	-	-	-
Total Output	**1,649.47**	**1,600.91**	**1,630.59**	**1,216.09**	**482.88**	**1,596.51**
Crude Input	1,753	1,692	1,752	1,272	530	1,677
Own Use and Losses (kt)	101	92	86	71	34	93
Own Use & loss as Percentage of Input	5.8%	5.5%	4.9%	5.6%	6.4%	5.6%

In 2023, the total refinery output increased more than three folds in 2023, from 482.88 kt in 2022 to 1,596.51 kt in 2023, which is seen as a major turnaround of operations from the crisis ridden 2022.

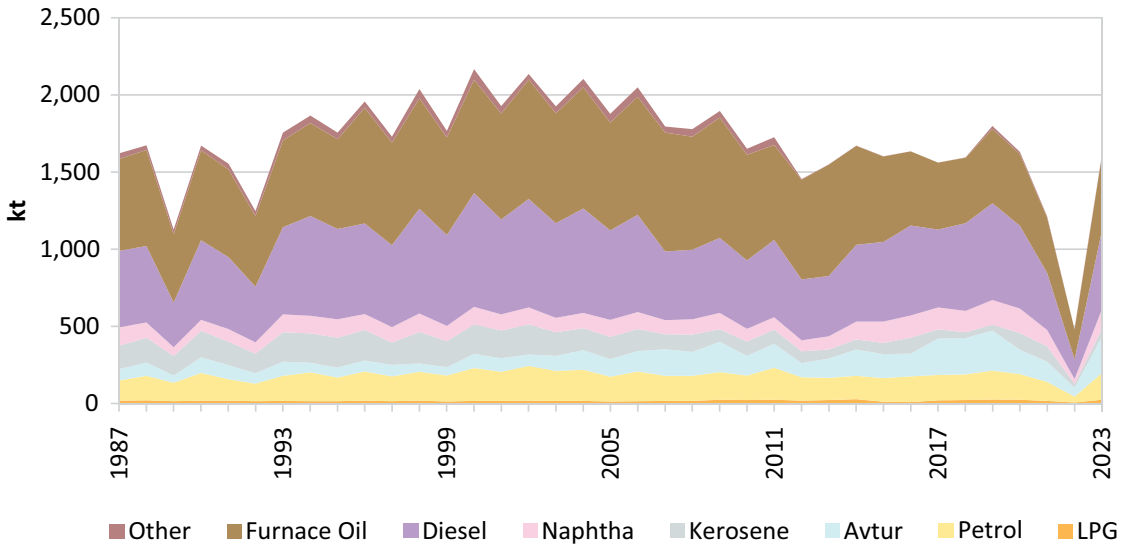


Figure 3.5 - Refined Product Output

3.2.2 Export of Surplus Products

Surplus production of the refinery is exported by the CPC, but the exported quantities are not significant in comparison with the imports. Table 3 7 summarises re-exported products, where bitumen was re-exported in 2023.

Table 3.7- Surplus Exports of Petroleum Products

kt	2010	2015	2020	2021	2022	2023
Naphtha	26.69	22.39	164.65	114.41	-	-
Fuel Oil	-	184.56	-	31.39	-	-
Bitumen	-	-	10.50	-	4.88	3.66
Total re-exported	**26.69**	**206.95**	**175.15**	**145.80**	**4.88**	**3.66**

4 Energy Conversion

4.1 Grid Electricity Generation

As far as the supply from secondary energy sources is concerned, conversion of primary energy in the form of hydro potential or petroleum to electricity is the most prominent. However, the conversion of petroleum fuel to steam which is used as an energy source in industries for their thermal application can also be considered a secondary form of energy. Though widely used, the quantum of steam generated, the quality and the end use is not recorded properly, which causes the discussion on supply from secondary energy sources to be limited to electricity.

Electricity generation in the country which was broadly divided into two parts based on whether they are connected to the national grid or whether they run isolated. Sri Lanka has a national grid, which now covers the whole country. It is very unlikely that further development of the off-grid sector will take place in the near term. However, the scope for the off-grid sector remains open in areas where grid electricity cannot be provided, such as the few inhabited islands.

Grid connected generation comprises of the following genre.

(i) CEB hydro power plants

(ii) CEB non-conventional power plants (only wind power at present)

(iii) CEB thermal power plants (oil fired and coal powered)

(iv) Independent Power Producers (IPPs) (presently oil-fired thermal power plants)

(v) Small Power Producers (SPPs) (presently mini hydro, one CHP plant, one solar power plant, wind power plants and biomass based power plants, all embedded in the distribution network)

(vi) Emergency Power Plants

(vii) Micro power producers (µPP), small scale power generators connected at the customer location, through one of the three schemes on offer.

Due to the significance of the grid supply compared with the diminishing role of off-grid supply, most of the analyses presented in the report will be for grid connected electricity supply.

4.1.1 Grid Connected Power Plants

As explained above, the electricity supply in Sri Lanka flows through the national grid and a brief description of the national grid is given in this section. Off-grid electricity generation is described in the next section.

Both CEB and private power producers generate electricity and supply to the national grid. All the large-scale hydro power plants in the country are owned by the CEB. Oil-fired thermal power plants and the coal power plant as well are owned by CEB. In addition to its own power plants, CEB as the single buyer of electricity, purchases electricity to the national grid from private Independent Power Producers (IPPs) who have entered into contracts with the CEB. All large IPPs are oil fired, while the mechanism to

purchase electricity from renewable based power plants has enabled many Small Power Producers (SPPs) to generate and sell hydro power to the national grid. With the increase of electricity demand and delays in construction of CEB's own power plants, the contribution from private power plants has increased significantly in the recent years.

Different Categories of Power Plants in the National Grid

CEB Power Plants

As the sole operator of the Sri Lankan power system, until 1997, the CEB owned and operated almost all the power plants in the national grid.

Independent Power Producers

Starting from 1997, many IPPs entered the electricity market, supplying electricity to the national grid. IPPs operate by entering into long term agreements with CEB. These contracts are individually executed under different terms and conditions. By 2023, three IPPs were in operation.

Small Power Producers

The number of small power producers increased rapidly over the period, under the enabling environment created by the Government, and implemented by the SEA through its facilitation of the project development through the newly introduced transparent resource allocation process. These power plants are operated by private sector investors and the installed capacity is limited to 10 MW since the plants are non-dispatchable. Attractive tariffs offered through the cost-based, technology-specific tariff scheme, a policy intervention of the Ministry of Power and Renewable Energy and the flow of commercial financing provided by commercial banks contributed to the development of the industry.

However, the great strides made by the industry caused several issues, which in turn re-affected the industry. Most of the small hydropower developers were confronted by activists opposing these projects on environmental and social grounds. This caused the environmental approval processes to become stricter, resulting in considerable delays. These delays affected the projects as most other time-restricted approvals realised by them expired before gaining the environmental approval. Lobbying against renewable energy projects escalated to unprecedented levels in 2023, causing more delays in project approval cycle.

On the regulatory front, suspension of purchase of electricity from producers at pre-determined feed-in-tariffs was resolved by changing the legislation, ending the long period in which Standardised Power Purchase Agreements remained unsigned. However, the CEB carried on with the projects developed from the tendering process and also restarted to work on projects with the Feed-in-Tariffs leading to the execution of nine PPAs adding 29.4 MW of capacity to the national grid.

Emergency Power Producers

These are power plants connected to the national grid on temporary basis to avoid electrical energy shortages for brief periods, especially during prolonged droughts. Sometimes, these generators are connected to bridge the capacity deficits resulting from dwindled hydropower resources.

Micro power producers (µPP)

The net-metering scheme, which was introduced in 2010 continued to serve the solar PV rooftop industry with large scale implementation across the country. However, it failed to encourage other renewable energy projects as envisaged. By end 2023, 55,004 systems were connected to the national grid, adding 810 MW of capacity.

Rooftop Solar PV Proramme under the theme 'Sooryabala Sangramaya' launched in 2016 progressed as expected. In this scheme, excess energy exported to the grid can either be carried forward (as originally done in the net-metering scheme) or encashed (this scheme is identified as net-accounting), at a tariff of LKR 22.00 per kWh during the first seven years and LKR 15.50 per kWh during the remaining thirteen years. The government increased the purchase power of rooftop solar to LKR 37.00 per kWh in 2023, causing a major stir in the industry. It is expected that large scale capacity additions will result in with this offer in the coming years. The programme attempts to encourage institutional users through a third scheme, known as the micro power producers scheme, where all generation is exported through a separate export meter without making any change to the electricity users metering method.

With the attractive price on offer, the service providers have quickly moved to tap large industrial customers who own large buildings with good roofs for solar PV systems.

Table 4.1 summarises the total grid connected capacity by type of power plant

Table 4.1 - Total Installed Capacity

MW	**2010**	**2015**	**2020**	**2021**	**2022**	**2023**
Major Hydro	1,207.45	1,376.95	1,382.85	1,382.85	1,413.40	1,413.40
Thermal Power Producers (CEB+IPP+Hired)	1,389.50	1,128.00	2,098.00	2,098.00	2,098.00	2,027.75
CEB Wind	3.00	3.00	31.05	103.50	103.50	103.50
New Renewable Energy	217.63	451.98	676.75	713.05	744.05	770.39
Micro Power Producers	-	27.71	353.61	515.57	659.88	809.56
Total Installed Capacity	**2,817.58**	**2,987.64**	**4,542.26**	**4,812.97**	**5,018.84**	**5,124.60**
%						
Major Hydro	42.9	46.1	30.4	28.7	28.2	27.6
Thermal Power Producers (CEB+IPP+Hired)	49.3	37.8	46.2	43.6	41.8	39.6
CEB Wind	0.1	0.1	0.7	2.2	2.1	2.0
New Renewable Energy	7.7	15.1	14.9	14.8	14.8	15.0
Micro Power Producers	-	0.9	7.8	10.7	13.1	15.8

Figure 4.1 depicts the total installed capacities serving the grid by type of power plant.

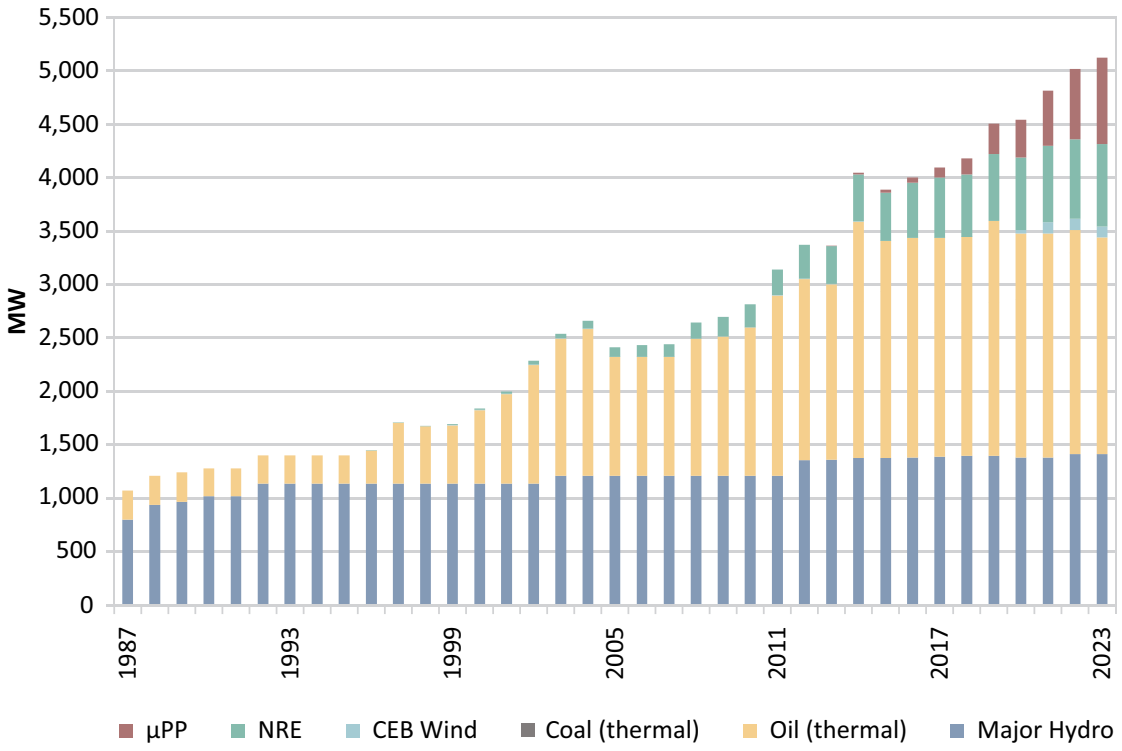


Figure 4.1 - Total Installed Capacity by Type of Power Plant

In the early stages, major hydro played a dominant role in power generation and continued until about 1996. Once the economically feasible major hydro schemes reached their saturation, the share of thermal plants in power generation increased. At present 51% of power generation is from thermal power.

4.1.1.1 Major Hydro

Sri Lanka has two main hydro power complexes; namely Laxapana and Mahaweli, each consisting of several power plants. Laxapana complex is based on Kelani River while Mahaweli complex is based on Mahaweli River. Other than these major schemes, there are two independent large scale hydro power stations, namely Samanalawewa and Kukule Ganga while small scale power plants such as Inginiyagala and Uda Walawa are also generating hydropower using their respective reservoir storages. For administrative purposes, these smaller hydropower plants are grouped together as a single complex identified by the CEB as the 'Other Hydro' Complex, although these plants are located in different river systems.

Table 4.2 provides a list of major hydro power plants and their corresponding water storage capacities.

Table 4.2 - Storage Capacities and Generation of Major Hydro Power Stations

Name of Hydro Power Station	Plant Capacity (MW)	Name of the Reservoir	Reservoir Live Storage (million m^3)	Generation in 2023 (GWh)	Share in Generation (%)
Laxapana Complex					
Wimalasurendra	50	Castlereigh Reservoir	44.8	127.2	2.8
Canyon	60	Maussakelle Reservoir	123.4	153.5	3.3
Laxapana	53.8	Norton Pond	0.4	274.6	6.0
Samanala	75	Laxapana Pond	0.4	431.2	9.4
New Laxapana	100	Canyon Pond	1.2	503.7	11.0
Broadlands	35	Canyon Pond	0.2	104.5	2.3
Mahaweli Complex					
Kotmale	201	Kotmale Reservoir	172.6	417.3	9.1
Nilambe	3.2	-	-	9.7	0.2
Ukuwela	40	Polgolla Barrage	-	193.8	4.2
Bowatenna	40	Bowatenna Reservoir	49.9	93.1	2.0
Victoria	210	Victoria Reservoir	721.2	628.7	13.7
Randenigala	122.6	Randenigala Reservoir	875	323.4	7.0
Rantembe	49	Rantembe Pond	21	163.7	3.6
Upper Kotmale	150	Upper Kotmale	0.8	422.7	9.2
Other Hydro Complex					
Inginiyagala	11.25	Inginiyagala Reservoir		19.6	0.4
Uda Walawa	6	Uda Walawa		9.7	0.2
Samanalawewa	120	Samanalawewa Reservoir	278	377.8	8.2
Kukule Ganga	70	-	-	338.3	7.4
Total	**1,397**	**-**		**4,592.5**	**100.0**

By the end of 2023, a total of eighteen hydro power plants were in operation under the ownership of CEB.

4.1.1.2 Thermal Power

There are seven oil-fired thermal power plants and three coal-fired plants that operate under the CEB, whereas five IPPs operate in private capacity.

Table 4.3 summarises thermal power generation in 2023.

Table 4.3 - Installed Capacities and Generation of Thermal Power Plants

Name of Power Station	Technology Type	Fuel Type	Capacity (MW)	Gross Generation (GWh)	Share in Generation (%)
CEB					
Kelanitissa Power Station	Gas Turbine (stg 2)	Auti Diesel	115	84.6	1.0
Kelanitissa Power Station	Gas Turbine (stg 3)	Auto Diesel	80	1.3	-
Sapugaskanda Power Station	Diesel Engine	Auto Diesel	80	2.3	-
		HSFO 380 cst (FO 3500)		211.4	2.5
Sapugaskanda Power Station Extension	Diesel Engine	Auto Diesel	80	3.9	-
		HSFO 380 cst (FO 3500)		376.7	4.5
Small islands	Diesel Engine, RE	Auto Diesel, solar, wind	-	2.7	-
Kelanitissa Power Station	Combined Cycle	Auto Diesel	165	59.3	0.7
		Naphtha		660.9	7.9
Uthuru Janani	Diesel Engine	HSFO 180 cst (FO 1500)	24	102.6	1.2
Barge Mounted Power Plant	Diesel Engine	HSFO 180 cst (FO 1500)	60	315.9	3.8
Kelanitissa Power Station - 2	Combined Cycle	Auto Diesel	157	174.7	2.1
Emergency Power	Diesel Engine	Auto Diesel	50	44.4	0.5
Puttalam Coal Power Station	Steam	Auto Diesel	900	3.0	-
		Coal		5,147.8	61.4
IPP					
Ace Power Matara	Diesel Engine	HSFO 180 cst (FO 1500)	20	13.8	0.2
Ace Power Embilipitiya	Diesel Engine	HSFO 180 cst (FO 1500)	100	14.6	0.2
Yugadhanavi-Kerawalapitiya	Combined Cycle	LSFO 180 cst	270	1,163.9	12.5
Total			**2,046**	**8,383.6**	**100.0**

The oil-fired CEB power plants generated 1,821.5 GWh, while the coal-fired power plant generated 5,150.8 GWh. The contribution of the coal power plant to thermal generation is 61.4%. The three IPPs generated 1,192.2 GWh in total.

4.1.1.3 CEB Wind Power

The Thambapavani Mannar wind power plant was in operation in 2023 as indicated in Table 4.4. It is owned and operated by the CEB.

Table 4.4 - Installed Capacity and Generation of the Mannar Wind Power Plant

Name of the Power Station	Plant Capacity (MW)	Generation in 2023 (GWh)
Wind Power - Mannar	103.5	397.4

4.1.1.4 New Renewable Energy

New Renewable Energy power plants are operated by private sector investors and the installed capacity is limited to 10 MW since the plants are non-dispatchable. At present, the number and variety of SPPs have increased by several folds, and is scattered countrywide. Table 4.5 summarises the installed capacities and generation of SPPs contributing to the NRE industry.

Table 4.5 - Installed Capacities and Generation of NRE Power Plants by end 2023

Type of Power Station	Number of Plants	Total Installed Capacity (MW)	Generation in 2023 (GWh)	Share in Generation (%)
Hydro	217	416.5	1,377.8	64.7
Combined heat and power	1	10.0	72.8	3.4
Biomass	14	44.1	25.1	1.2
Solar	83	136.4	227.4	10.7
Wind	19	163.5	426.8	20.0
Total	**334**	**770.4**	**2,129.9**	**100.0**

A total of two small hydro power plants (5.4 MW), five ground mounted solar power plants (6 MW), a single biomass power plant (4 MW) and two wind power plants (15 MW) were commissioned in 2023. Figure 4.2 depicts the cumulative capacity additions and number of SPPs up to end 2023.

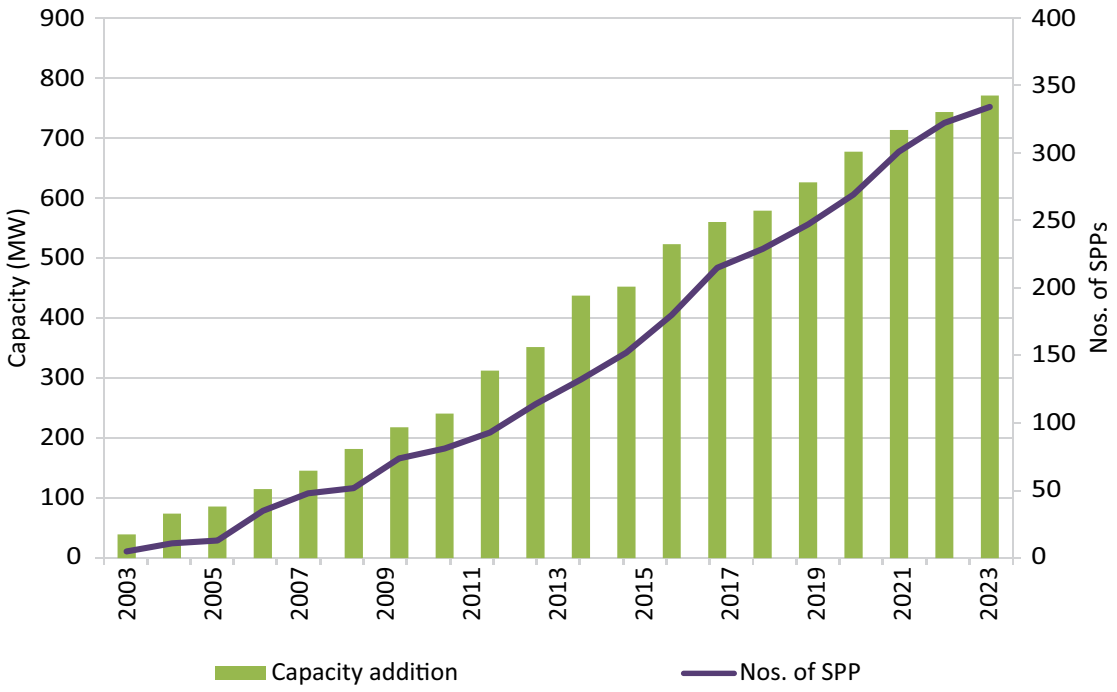


Figure 4.2 - Cumulative Capacity Additions and Number of SPPs

4.1.1.5 Micro Power Producers

By end 2023, 810 MW of µPP were in operation, generating approximately 945.3 GWh.

Table 4.6 - Cumulative Capacities and Generation of Net-metered Projects

Type of Net-metered Project	Number of Projects	Cumulative Capacity (MW)	Generation in 2023 (GWh)
Solar	55,004	810	945.3

4.1.2 Gross Generation of Grid Connected Power Plants

The total generation from major hydro plants, thermal plants, new renewable energy plants and net-metered project in 2023 was 16,448.8 GWh. Compared with the gross generation of 2022, which was 16,828.4 GWh, the generation in 2023 decreased as indicated in Table 4.7.

Table 4.7 - Gross Generation to the CEB Grid

GWh	2010	2015	2020	2021	2022	2023
Major Hydro	4,988.5	4,904.4	3,929.4	5,658.5	5,382.7	4,592.5
Thermal (Oil)	5,063.3	2,343.5	4,306.4	2,716.2	2,513.6	3,232.8
Thermal (Coal)	-	4,457.2	6,364.9	6,110.9	5,732.4	5,150.8
CEB Wind	3.0	1.1	7.7	325.9	361.9	397.4
New Renewable Energy	728.5	1,466.0	1,607.2	2,214.5	2,060.1	2,129.9
Micro Power Producers	-	38.8	445.9	592.4	777.7	945.3
Gross Generation to CEB Grid	**10,783.2**	**13,211.1**	**16,661.5**	**17,618.4**	**16,828.4**	**16,448.8**
Year-on-year growth rate	8.2%	2.9%	(0.5%)	5.8%	(4.5%)	(2.3%)

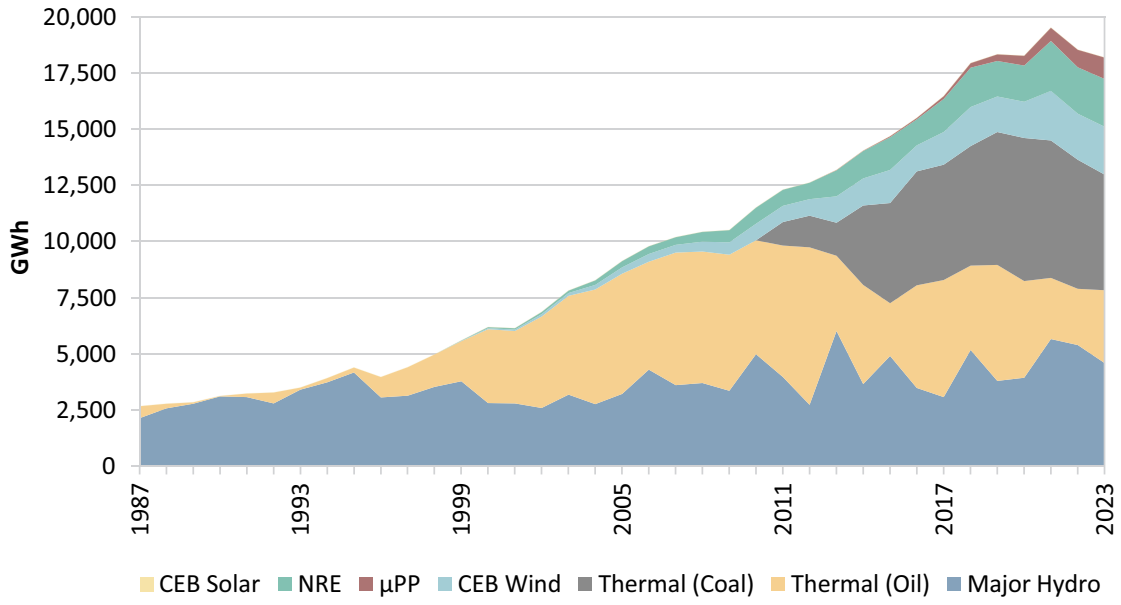


Figure 4.3 - Gross Generation to CEB Grid

In early stages, the energy mix included only major hydro plants and oil-fired thermal plants. The generation mix started diversifying from 1996 and this trend which continued for two decades is undergoing a gradual change. At present, the thermal share is marginally greater at 50.97% and the erosion of the thermal share in power generation will continue into the future, heralding the dawn of the energy transition.

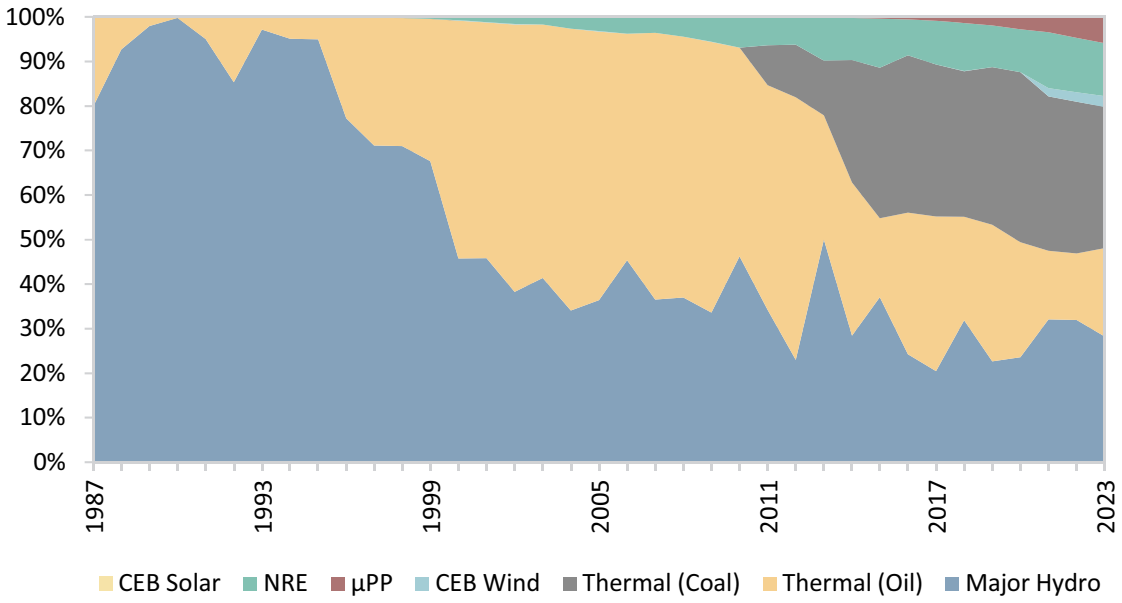


Figure 4.4 - Evolution of Generation Mix: 1985 to 2022

The NRE industry, which commenced in 1996 has progressed expeditiously, increasing in capacity each year. Figure 4.5 depicts the growth of the industry since inception to date.

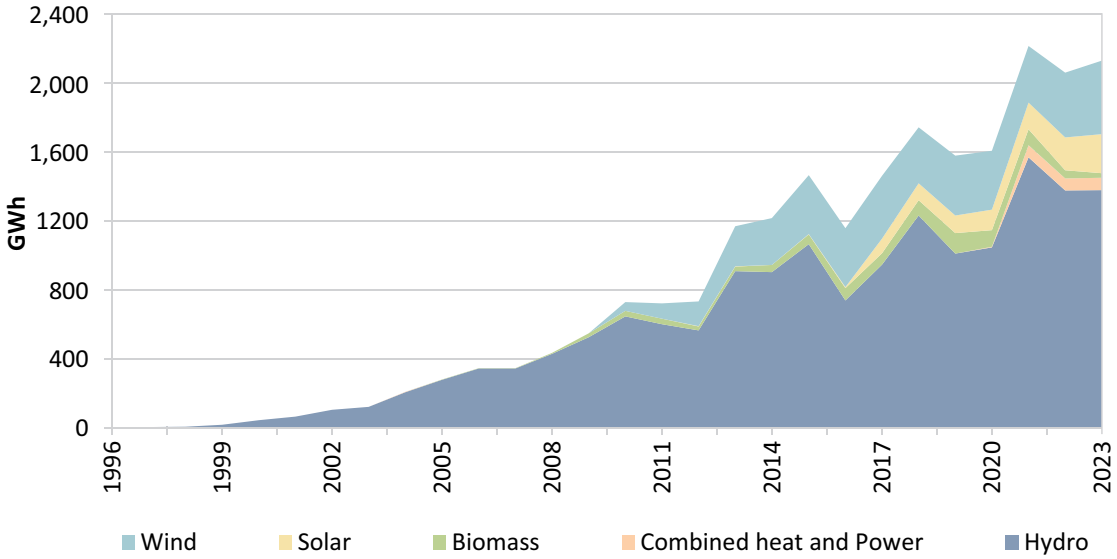


Figure 4.5 - Gross Generation of New Renewable Energy Power Plants

The share of NRE generation was 12.9% in the total gross generation to the CEB grid in 2023. The major contribution to NRE power generation is from small hydro power, which was 64.7% in 2023. Additions from solar power and wind power have increased in the latter the years, whereas the addition from small hydro is gradually declining, as indicated in Figure 4.5.

4.1.3 Different Technologies used by Power Plants in the National Grid

Table 4.8 - Grid Connected Power Plant Capacities (MW) by Technology Type

Technology	2010	2015	2020	2021	2022	2023
CEB Power Plants						
Major Hydro	1,207	1,377	1,383	1,383	1,413	1,413
Conventional Wind	3	3	31	104	104	104
Steam, Fuel Oil	-	-	-	-	-	-
Steam, Coal	-	900	900	900	900	900
Sub total, Steam	**-**	**900**	**900**	**900**	**900**	**900**
Diesel Engine, Residual Oil	160	160	160	160	160	160
Diesel Engine, Fuel Oil	-	24	24	24	24	24
Diesel Engine, Diesel Oil	8	-	50	50	50	40
Sub total, Diesel Engines	**168**	**184**	**234**	**234**	**234**	**224**
Gas Turbines, Diesel Oil	215	195	195	195	195	195
Sub total, Gas Turbines	**215**	**195**	**195**	**195**	**195**	**195**
Combined Cycle, Naphtha, Diesel	165	165	165	165	165	322
Sub total, Combined Cycle	**165**	**165**	**165**	**165**	**165**	**322**
IPP						
Diesel Engine, Residual Oil	51	51	51	51	51	-
Diesel Engine, Fuel Oil	343	100	120	120	120	117
Diesel Engine, Diesel Oil	15	-	-	-	-	-
Combined Cycle, Diesel, Fuel Oil	433	433	433	433	433	270
Sub total IPP	**842**	**584**	**604**	**604**	**604**	**387**
SPP						
Hydro	175.4	306.7	402.9	414	414	417
Combined heat and power	-	-	10.0	10	10	10
Solar	-	1.4	75.4	100	130	136
Biomass	12.0	20.1	40.1	40	40	44
Wind	30	123.9	148.5	148	148	163
Sub total SPP	**218**	**452**	**677**	**713**	**743**	**770**
µPP						
Solar	-	27.7	353.6	516	660	810
Sub total µPP	-	**28**	**354**	**516**	**660**	**810**

Table 4.9 - Fuel Usage and Generation by Technology Type

Technology Type	2010	2015	2020	2021	2022	2023
CEB Gross Generation (GWh)						
Steam, Coal	-	4,447.2	6,358.9	6,107.4	5,729.7	5,147.8
Steam, Diesel	-	10.0	6.0	3.6	2.7	3.0
Diesel Engine, Residual Oil	830.9	271.9	759.9	585.3	475.0	588.1
Diesel Engine, Fuel Oil	-	228.4	525.0	410.6	332.8	418.5
Diesel Engine, Diesel	16.8	22.5	174.4	60.1	54.0	53.2
Gas Turbines, Diesel Oil	53.3	25.1	133.9	90.7	88.4	85.9
Combined Cycle, Diesel Oil	255.7	119.5	-	63.3	262.0	234.0
Combined Cycle, Naphtha	237.6	540.3	-	73.0	171.8	660.9
CEB Fuel Use (million litres)						
Steam, Coal (million kg)	-	1,880.0	2,349.3	2,301.3	2,143.2	1,915.2
Steam, Diesel	-	3.0	2.9	2.7	2.0	2.6
Diesel Engine, Residual Oil	184.9	60.6	169.4	130.5	105.2	131.2
Diesel Engine, Fuel Oil	-	19.3	113.2	88.5	71.2	89.8
Diesel Engine, Diesel	5.3	6.7	50.9	21.3	15.6	15.3
Gas Turbines, Diesel Oil	21.6	9.2	50.1	33.8	32.0	31.2
Combined Cycle, Diesel Oil	59.3	26.7	-	16.6	58.8	53.4
Combined Cycle, Naphtha	78.0	144.7	-	22.5	45.9	172.4
IPP Gross Generation (GWh)						
Diesel Engine, Residual Oil	325.0	101.1	169.8	65.0	12.5	-
Diesel Engine, Fuel Oil	2,245.1	235.5	587.1	205.9	49.8	28.4
Diesel Engine, Fuel Oil (LSFO 180 cst)	87.8	-	-	-	-	-
Diesel Engine, Diesel Oil	-	-	-	-	-	-
Combined Cycle, Diesel Oil	464.1	264.0	441.9	275.2	576.3	-
Combined Cycle, Fuel Oil (LSFO 180 cst)	547.1	671.4	1,514.5	890.7	491.0	1,163.9
Combined Cycle, Fuel Oil (HSFO 180 cst)	-	-	-	-	-	-
IPP Gross Fuel Use (million litres)						
Diesel Engine, Residual Oil	72.6	23.0	38.8	14.2	2.7	-
Diesel Engine, Fuel Oil	490.7	51.5	130.5	42.8	11.6	8.9
Diesel Engine, Diesel Oil	24.9	-	-	0.2	-	-
Combined Cycle, Diesel Oil	99.1	56.0	92.9	69.5	115.0	-
Combined Cycle, Fuel Oil (LSFO 180 cst)	120.5	152.3	328.9	199.8	109.1	250.2

4.1.4 Fuel Usage and Conversion Efficiency in Thermal Power Generation

Thermal power plants operating in Sri Lanka primarily use petroleum fuels such as diesel, fuel oil, residual oil and naphtha. Table 4.10 details the total quantities of common fuels used in power generation by thermal power plants.

Table 4.10 - Total Petroleum Fuels Used in Power Generation

	2010	2015	2020	2021	2022	2023
Fuel Oil (HSFO 180 CST, FO 1500) (million litres)	490.7	70.8	243.8	131.3	82.8	98.7
Coal (million kg)	-	1,880.0	2,349.3	2,301.3	2,143.2	1,915.2
Residual Oil (HSFO 380 CST, FO 3500) (million litres)	257.5	83.6	208.2	144.7	107.9	131.2
Diesel (million litres)	210.2	98.6	193.8	141.4	221.3	99.8
LSFO 180 CST (million litres)	120.5	152.3	328.9	199.8	109.1	250.2
Naphtha (million litres)	78.0	144.7	-	22.5	45.9	172.4

The consumption of liquid petroleum fuels for all fuels but diesel, had increased in 2023. The major share of thermal power generation was borne by coal power. At present, the types of fuel used in power generation have increased in variety, owing to the large share of thermal power, as shown in Figure 4.6. Liquid fuels have been converted into corresponding weights at 30^0C (ambient temperature).

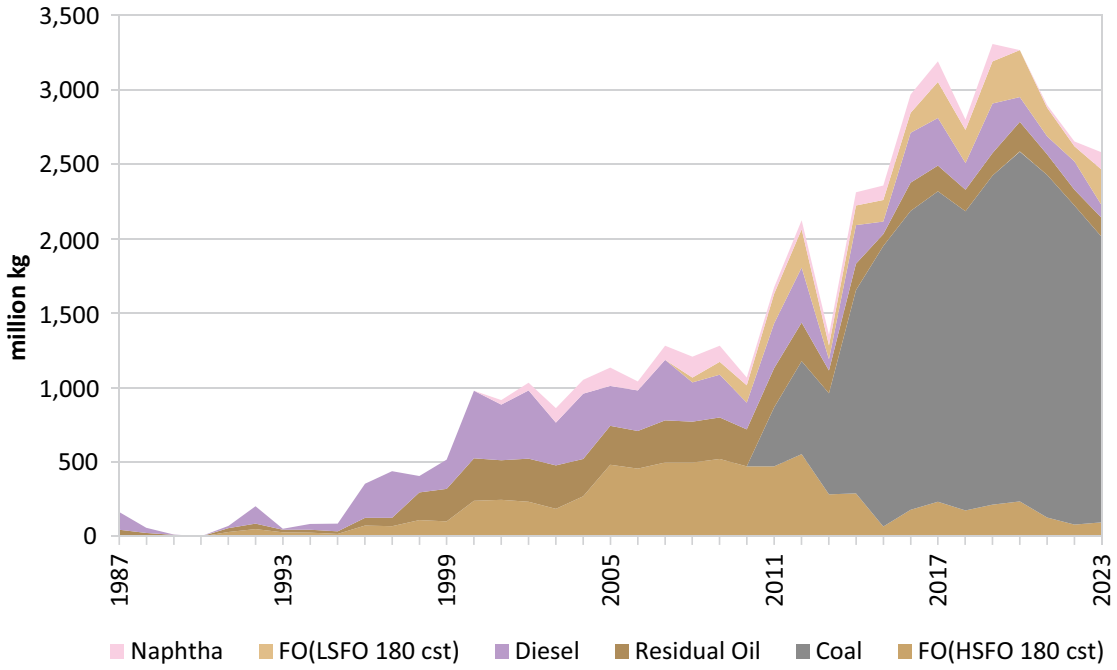


Figure 4.6 - Fuel Consumption in Thermal Power Generation by Type

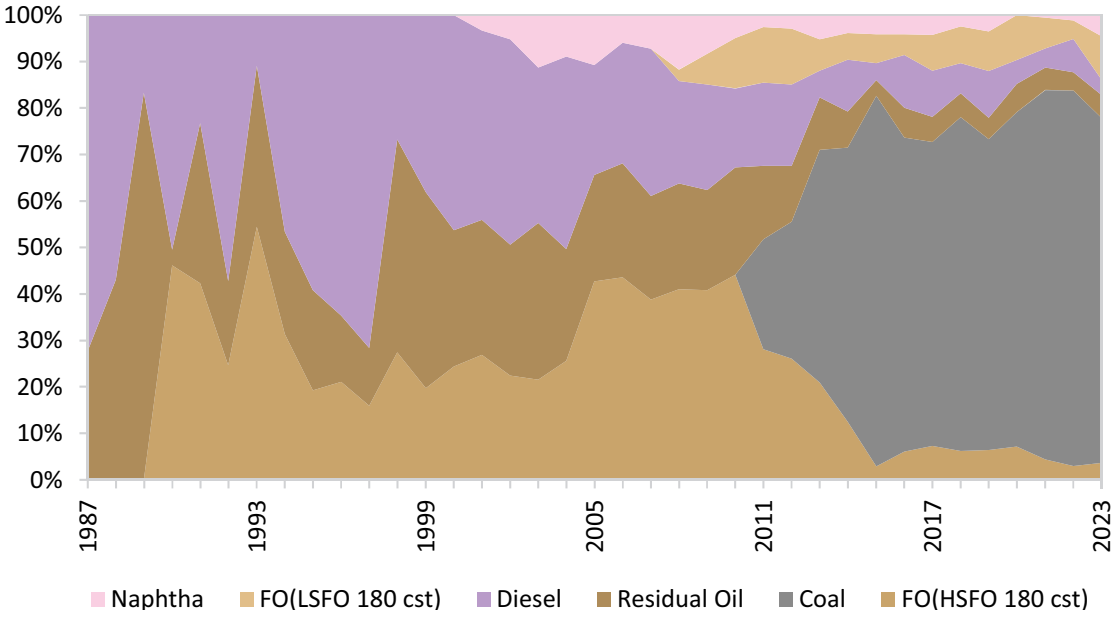


Figure 4.7 - Percentages of Fuel Mix in Thermal Power Generation

Table 4.11 summarises the efficiencies of thermal power plants by technology type.

Table 4.11 – Thermal Power Plant Efficiencies

Power Plant Efficiencies	2010	2015	2020	2021	2022	2023
CEB						
Steam, Coal	-	35.5%	40.6%	39.8%	40.1%	40.3%
Steam, Diesel	-	31.4%	19.5%	12.4%	12.6%	11.1%
Diesel Engine, Residual Oil	39.5%	39.4%	39.4%	39.4%	39.7%	39.4%
Diesel Engine, Fuel Oil	-	40.5%	40.7%	40.8%	41.1%	40.9%
Diesel Engine, Diesel	29.8%	31.9%	32.5%	26.7%	32.9%	33.1%
Gas Turbines, Diesel Oil	23.4%	25.8%	25.4%	25.4%	26.2%	26.1%
Combined Cycle, Diesel Oil	40.9%	42.5%	-	36.2%	42.3%	41.6%
Combined Cycle, Naphtha	33.7%	41.3%	-	35.9%	41.5%	42.4%
CEB Gross Thermal Generation (Gcal)	1,199,040	4,871,737	6,843,975	6,358,741	6,120,109	6,184,562
CEB Fuel Energy Input (Gcal)	3,198,724	13,370,308	17,156,043	16,166,862	15,338,988	15,391,808
CEB Power Plant Efficiency	**37.5%**	**36.4%**	**39.9%**	**39.3%**	**39.9%**	**40.2%**
IPP						
Diesel Engine, Residual Oil	39.3%	38.6%	38.4%	40.1%	40.3%	-
Diesel Engine, Fuel Oil	40.2%	40.2%	39.5%	42.2%	37.8%	28.1%
Diesel Engine, Diesel Oil	33.4%	-	-	-	-	-
Combined Cycle, Diesel Oil	44.4%	44.7%	45.1%	37.5%	47.5%	-
Combined Cycle, Fuel Oil (LSFO 180 cst)	0.40	38.4%	40.1%	38.8%	39.1%	40.5%
IPP Net Thermal Generation (Gcal)	2,684,904	516,533	1,030,934	469,631	549,212	24,422
IPP Fuel Energy Input (Gcal)	6,639,385	1,237,795	2,500,356	1,191,159	1,183,717	86,964
IPP Power Plant Efficiency	**40.4%**	**41.7%**	**41.2%**	**39.4%**	**46.4%**	**28.1%**

4.2 Off-Grid Electricity Generation

Isolated power generating facilities are available in some locations owing mainly to the unavailability of the national grid. In addition, standby power supplies are also available in most industries and commercial facilities, although their generation is very minimal due to the short-term nature of operation. The capacities and energy converted at these standby generators are not accounted for in this report.

Three main contexts in which off-grid electricity is used are as follows.

(i) Diesel generators are maintained only as a standby option and run only for short durations during grid failures, periodic testing and during generator servicing.

(ii) Renewable energy systems, such as small hydro (for industries and households), wind and solar photovoltaic systems for households are also operated off-grid due to unavailability of grid and technical reasons.

(iii) Four Northern islands which were provided with diesel generators, received utility level services from the CEB, were considered for hybrid solutions and the first island the Eluvaithivu Island operated successfully in 2022. The ADB funded project to electrify the three remaining islands with hybrid power was cancelled due to an administrative issue and the island continued with diesel plants in 2022.

The non-conventional off grid energy systems such as village and estate hydro plants and household solar photovoltaic systems are discussed separately in this report. Off-Grid generation broadly comprises the following genre.

(i) Self-Generation: Using own generating plants, even if the grid is available. Only a few locations, and they too are used sparingly.

(ii) Off-grid (Industrial): Industries using their own generation either as a matter of policy, keeping the grid supply only as backup or owing to non-availability of the grid in close proximity. Only a few locations, and they too are used sparingly.

(iii) Off-grid (non-industrial): Mostly rural systems of small micro hydro, wind, solar and other renewable energy based systems.

With the rapid expansion of the national grid, the role of off-grid electrification ceased in the country, except in certain inaccessible locations. The advent of energy storage solutions coupled with solar PV power generation now offers cost effective solutions to electrify far corners of the country. In time to come, rooftop solar PV/ESS solutions may become a serious contender for electrifying not only remote villages but also urban dwellings.

4.3 Total Generation

The bulk of electricity generation in Sri Lanka is from grid-connected power plants. Table 4.11 gives the summary of electricity generation from grid-based and off-grid, conventional and non-conventional sources.

Table 4.12 – Total Gross Generation in Sri Lanka

GWh	2010	2015	2020	2021	2022	2023
Major Hydro Power	4,988.5	4,904.4	3,929.4	5,658.5	5,382.7	4,592.5
Thermal Power	5,063.3	6,796.4	10,671.4	8,830.7	8,246.0	8,383.6
CEB Wind Power	3.0	1.1	7.7	325.9	362.0	397.4
New Renewable Energy	728.5	1,466.0	1,607.2	2,214.5	2,060.1	2,129.9
Micro Power Producers	-	38.8	445.9	592.4	777.7	945.3
Off-grid Non-Conventional (Off-grid Renewables)	17.5	18.8	-	-	-	-
Gross Generation	**10,800.7**	**13,225.5**	**16,663.6**	**17,621.9**	**16,828.5**	**16,448.8**
%						
Major Hydro Power	46.2	37.1	23.6	32.1	32.0	27.9
Thermal Power	46.9	51.4	64.1	50.1	49.0	51.0
CEB Wind Power	-	0.01	0.05	1.8	2.2	2.4
New Renewable Energy	6.7	11.1	9.6	12.6	12.2	12.9
Micro Power Producers	-	0.3	2.7	3.4	4.6	5.7
Off-grid Non-Conventional (Off-grid Renewables)	0.2	0.1	-	-	-	-

5 Energy Distribution and Pricing

Energy sources and energy demand are separated by vast swaths of time and space. Therefore, to provide a sound energy supply, vast transport/transmission network, storage and transaction elements are required. The supply of energy includes generation/conversion and distribution to end users. Distribution is the process of delivering energy from its source to the ultimate end use. For convenience, the terminal points of distribution are considered to be from the measuring point at generation/conversion to the measuring point at the end user.

5.1 Electricity Distribution and Prices

Distribution of electrical energy is through the transmission and distribution network, the main difference between the two being the voltage at which the power is delivered. Transmission is at voltages 132 kV and 220 kV, whereas distribution is done at 33 kV, 11 kV and 400V.

5.1.1 Transmission and Distribution Networks

5.1.1.1 Electricity Transmission Network

Sri Lanka has a single transmission network spanning the whole country with the exception of four small inhabited islands in the Northern Province. The national grid consists of overhead transmission lines interconnecting large scale power plants scattered mostly in the central region and the Western province, and grid substations where the distribution networks spread from. Apart from the most common transmission lines carrying power at 132 kV, a limited number of 220 kV transmission lines are also available in the network. These 220 kV transmission lines strengthen the network, especially between nodes having heavy power flows, such as Kotmale-Biyagama and Kotmale-Anuradhapura.

5.1.1.2 Electricity Distribution Network

Electricity distribution and sales in Sri Lanka is the responsibility of the following organisations;

- Ceylon Electricity Board (CEB)
- Lanka Electricity Company (Pvt) Ltd. (LECO)

At grid substations, the high voltage electricity in the transmission network is converted to 33 kV to be distributed within the locality. In some instances, the electricity at 33 kV is again converted to 11 kV at primary substations and then distributed to consumers. Distribution networks operated by LECO use 11 kV as the distribution voltage. However, both CEB and LECO step down the distribution voltage again to 400 V prior to delivering power to small scale consumers such as households and commercial buildings. For a limited number of industrial and commercial establishments, electricity is provided and metered at the distribution voltage itself. The distribution responsibility ends at the consumer metering point up to which the maintenance work is carried out by the corresponding service provider (*i.e.* CEB or LECO).

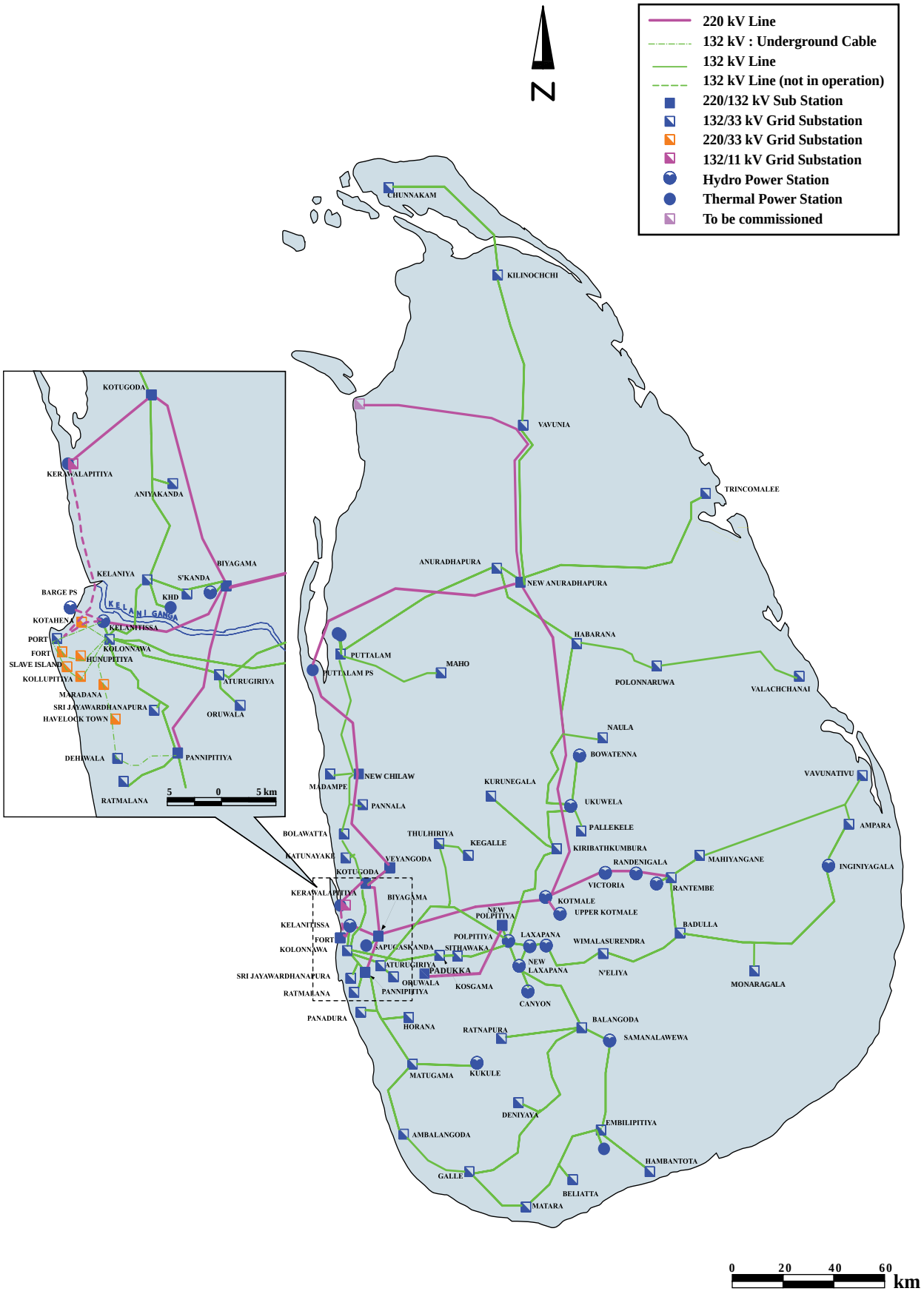


Figure 5.1 – Electricity Transmission Network (2023)

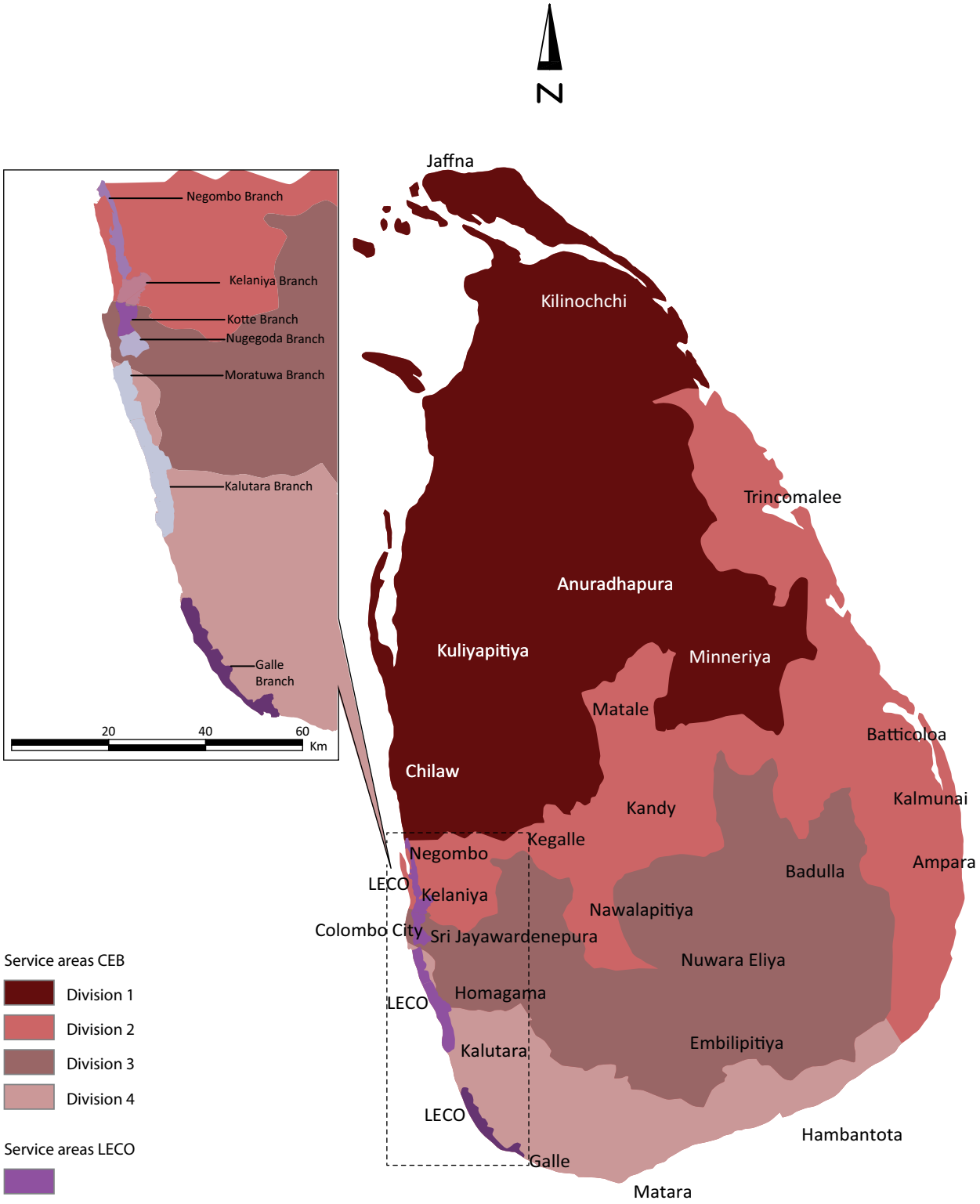


Figure 5.2 – Service Areas of the CEB and LECO

5.1.2 Electrification

All the categories of consumers but streetlighting increased in number in 2023. Consumers under the agriculture category were also reported from 2022. While Table 5.1 shows the number of electricity consumers in the grid, Table 5.2 shows the share of electricity consumers of CEB and LECO separately.

Table 5.1 – Electricity Consumers Served by the Grid

Total Number of Consumer Accounts	2010	2015	2020	2021	2022	2023
Domestic	4,363,324	5,407,644	6,243,246	6,374,253	6,477,322	6,548,505
Religious	29,050	37,201	44,491	45,325	45,922	46,508
Industrial	48,461	59,820	70,250	73,013	72,250	74,053
Commercial	514,292	666,475	875,343	921,695	953,201	974,563
Agriculture	-	-	-	-	2,767	3,563
Streetlighting	2,931	3,065	3,664	3,676	3,788	2,089
Total	**4,958,058**	**6,174,205**	**7,236,994**	**7,417,962**	**7,555,250**	**7,649,281**

The number of total accounts served by the grid has increased by 1% in 2023 compared with 2022.

Table 5.2 – Electricity Consumers in the Grid, CEB and LECO

Total Number of Consumer Accounts	2010	2015	2020	2021	2022	2023
CEB						
Domestic	3,958,829	4,966,395	5,750,281	5,875,558	5,970,326	6,035,632
Religious	26,763	34,710	41,805	42,638	43,199	43,782
Industrial	45,059	56,681	66,831	69,600	68,815	70,552
Commercial	449,733	590,344	777,347	821,730	851,626	871,232
Agriculture	-	-	-	-	2,767	3,563
Streetlighting	1	1	1	1	1	1
Sub total CEB	**4,480,385**	**5,648,131**	**6,636,265**	**6,809,527**	**6,936,734**	**7,024,762**
LECO						
Domestic	404,495	441,249	492,965	498,695	506,996	512,873
Religious	2,287	2,491	2,686	2,687	2,723	2,726
Industrial	3,402	3,139	3,419	3,413	3,435	3,501
Commercial	64,559	76,131	97,996	99,965	101,575	103,331

Total Number of Consumer Accounts	2010	2015	2020	2021	2022	2023
Streetlighting	2,930	3,064	3,663	3,675	3,787	2,088
Sub total LECO	**477,673**	**526,074**	**600,729**	**608,435**	**618,516**	**624,519**

Note: CEB considers street lighting as one account, while LECO counts the street lighting systems individually as separate accounts.

The total number of accounts of both the CEB and LECO increased by 1% in 2023.

5.1.3 Electricity prices

A major role in electricity generation is played by the CEB while the IPPs and the SPPs play supportive roles. Unlike generation, CEB has a monopoly over electricity transmission. The distribution business is shared by CEB and LECO. Hence, the role of the CEB in the electricity industry in Sri Lanka is significant. As a result, analysis of the electricity sector financial performance is dominated by its main player; the CEB. Being a subsidiary of CEB and having a key presence in electricity sales, LECO financial performance is also important. Table 5.3 shows the sales and revenue of the two electricity utilities CEB and LECO, their annual revenue and average selling prices.

Table 5.3 – Average Electricity Sales, Selling Prices and Revenue of CEB and LECO

	2010	2015	2020	2021	2022	2023
CEB						
Sales (GWh)	8,067	10,340	12,682	13,581	12,970	12,614
Revenue from sales (LKRM)	105,710	165,741	213,194	226,172	278,410	548,679
Other Revenue (LKRM)	3,063	9,679	10,155	12,597	12,975	33,810
Total revenue (LKRM)	108,773	175,420	223,349	239,147	291,385	582,489
Average Selling price (LKR/kWh)	13.10	16.03	16.81	16.65	21.47	43.50
LECO						
Sales (GWh)	1,124.00	1,382.15	1,607.04	1,598.93	1,565.70	1,582.68
Revenue from sales (LKRM)	14,035.00	26,193.59	32,369.77	36,664.62	39,252.20	75,138.04
Total revenue (LKRM)	14,035.00	26,193.59	32,369.77	36,664.62	39,252.20	75,138.04
Average Selling price (LKR/kWh)	12.49	18.95	20.14	22.93	25.07	47.48

The national average selling price of electricity is given in Table 5.4 and the growth of the price is depicted in Figure 5.3.

Table 5.4 – National Average Selling Price of Electricity

	2010	2015	2020	2021	2022	2023
Average Selling price (LKR/kWh)	13.03	16.37	17.19	17.03	21.85	43.94

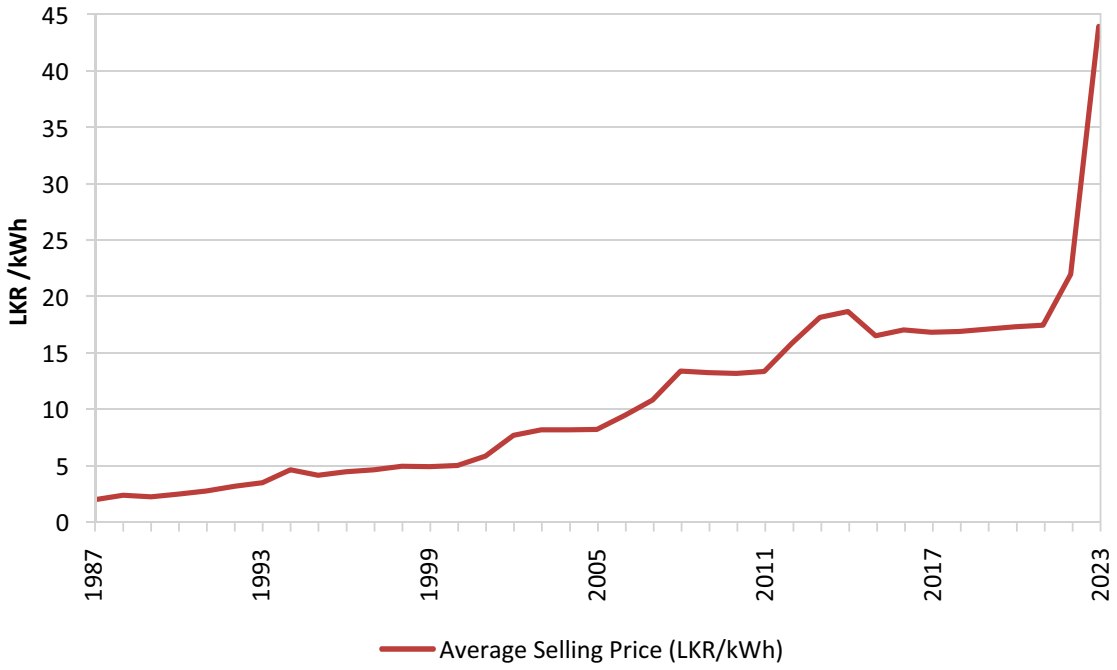


Figure 5.3 – National Average Selling Price of Electricity

The average selling price of electricity per kWh depends on the tariff structure and the sales to different consumer categories.

5.1.4 Electricity Tariff

As illustrated in Figure 5.3, the average selling price of an electricity unit in Sri Lanka increased by a very high percentage (101.10%) the highest increase recorded in the history of utility operations in Sri Lanka. The utilities reported that a total of 315 customers migrated to the Time of Use (ToU) tariff offered to encourage at specific electricity use, as the peak time tariff was quite high. Nevertheless, this offer will continue to benefit electric vehicle users in future.

Table 5.5 – Electricity Prices in Year 2023

Effective date : July 16, 2024

Domestic

Consumption 0 - 60 kWh per month			Energy charge (LKR/kWh)	Fixed charge (LKR/kWh)
Block 1	-	0 - 30	12.00	180.00
Block 2	-	31 - 60	30.00	360.00
Consumption above 60 kWh per month				
Block 1	-	0 - 60	38.00	N/A
Block 2	-	61 - 90	41.00	480.00
Block 3	-	91 - 120	59.00	1,180.00
Block 4	-	121 - 180	59.00	1,770.00
Block 5	-	above 180	89.00	2,360.00
Time of Use (ToU) Tariff for Domestic Consumers (Optional)				
Day (05.30 - 18.30 hrs)			83.00	
Peak (18.30 - 22.30 hrs)			106.00	2,360.00
Off peak (22.30 - 05.30 hrs)			35.00	
Religious and charitable institutions Category				
Block 1	-	0 - 30	12.00	180.00
Block 2	-	31 - 90	24.00	300.00
Block 3	-	91 - 120	41.00	710.00
Block 4	-	121 - 180	53.00	1,770.00
Block 5	-	181 kWh and above	59.00	2,360.00

Other Customer Categories		Energy Charge (LKR/kWh)			Fixed Charge (LKR/month)	Demand Charge (LKR/kVA)
		Day time	Peak time	Off Peak time		
Industrial Rate 1	IP 1-1 For VDMC <= 300 kWh/month	20.00			340.00	-
	IP 1-2 For VDMC > 300 kWh/month	28.00			1,120.00	-
Industrial Rate 2		38.00	41.00	32.00	5,600.00	1,800.00
Industrial Rate 3		37.00	40.00	31.00	5,600.00	1,680.00
Hotel Rate 1	H 1-1 For VDMC <= 300 kWh/month	20.00			340.00	-
	H 1-2 For VDMC > 300 kWh/month	28.00			1,120.00	-
Hotel Rate 2		38.00	41.00	32.00	5,600.00	1,800.00
Hotel Rate 3		37.00	40.00	31.00	5,600.00	1,680.00
General Purpose Rate 1	GP 1-1 For VDMC <= 180 kWh/month	43.00			750.00	-
	GP 1-2 For VDMC > 180 kWh/month	56.00			1,860.00	-
General Purpose Rate 2		58.00	68.00	48.00	6,200.00	2,000.00
General Purpose Rate 3		57.00	67.00	47.00	6,200.00	1,860.00
Government Rate 1	GV 1-1 For VDMC <= 180 kWh/month	43.00			750.00	-
	GV 1-2 For VDMC > 180 kWh/month	56.00			1,860.00	-
General Purpose Rate 2		58.00	68.00	48.00	6,200.00	2,000.00
General Purpose Rate 3		57.00	67.00	47.00	6,200.00	1,860.00
Street Lighting (LKR/kWh)		56.00			-	-
EV Charging of CEB Charging Stations						
DC Fast Charging		109.00	139.00	66.00	-	-
AC Level 2 AC Charging		87.00	112.00	50.00	-	-
Agriculture Rate 1 - Optional		38.00	41.00	32.00	1,120.00	-

Note: VDMC - Volume Differentiated Monthly Consumption

Rate 1- Supply at 400/230 V & Contract Demand <= 42 kVA

Rate 2- Supply at 400/230 V & Contract Demand > 42 kVA

Rate 3- Supply at 11 kV & above

5.2 Petroleum Distribution and Prices

As described previously, Sri Lanka meets the country petroleum demand entirely by imported petroleum brought in as either crude oil or refined products. Since the processing capacity of the CPC-owned refinery is not sufficient to meet the country demand, considerable amounts of petroleum products have to be imported and directly sold in the local market.

5.2.1 Distribution Structure

Until 2002, CPC was responsible for all aspects of petroleum supply, with the exception of retail marketing of LPG. By 2002, CPC owned and operated the refinery, all the import, storage and distribution terminals, and about 350 filling stations. In addition, there were about 700 privately-owned filling stations.

The refinery located in Sapugaskanda consists of 50,000 barrels/day processing plant and a 540,000 tonne crude oil tank farm. The refinery gets crude oil either directly from the Single Point Buoy Mooring (SPBM) facility installed about 10 km offshore or from the four crude oil storage tanks of 40,000 tonnes (each), located in Orugodawatta. Part of the refinery output is stored at Sapugaskanda storage facility for distribution and the balance is pumped to the Kolonnawa storage facility. The Sapugaskanda tank farm (mini-distribution facility) receives products only from the refinery. This has a total storage capacity of 60,000 tonnes in twelve tanks for diesel, kerosene and fuel oil.

Refined products from the refinery as well as imported products are received via a 5.5 km long pipeline to tanks at Kolonnawa. This aging pipeline transport system will be improved through a new pipeline installation by 2018. The Kolonnawa installation has a total capacity of 250,000 tonnes in 40 tanks for finished products and product loading facilities for loading railway bogies, which transport products to most of the bulk depots and to road tankers. Construction of a new tank with a capacity of 15,000 m^3 to cater to the increased gasoline demand commenced in late 2017, adding more capacity to Kolonnawa facility. Aviation fuel to the Katunayake airport is supplied from the Kolonnawa terminal through rail and road tankers.

The Muthurajawela tank farm commenced operations in 2004. With the construction of this tank farm, Sri Lanka's storage capacity for finished petroleum products increased by 250,000 tonnes. Muthurajawela tank farm consists of 21 tanks of 10,000 m^3 capacity and 8 tanks of 5,000 m^3 capacity. These tanks store and distribute diesel and kerosene. Along with the tanks, CPC installed a new SPBM system, where 60,000 DWT (deadweight tonnage) ships could use the buoy for discharging imported finished products direct from sea to tanks via a submarine pipeline. This terminal includes a loading facility to distribute products by road tankers. However, rail transportation of petroleum products stored in the Muthurajawela tank farm is constrained due to the absence of a railway line. A dual pipeline transport systems named the 'cross country pipeline' with a length of 6.5 km is expected to link Muthurajawela tank farm with the Supugaskanda facility in the near future.

Petroleum supply for retail sale is done at the following storage/distribution facilities

1. Muthurajawela
2. Kolonnawa
3. Sapugaskanda mini distribution facility
4. China Bay storage facility
5. 13 regional depots.

Of the thirteen regional depots, Kurunagala depot added a new fire pump house and a distribution gantry to its assets in 2017, expanding its capabilities further.

Lanka Marine Services (LMS) located at Bloemandhal in Colombo receives imported products directly as well as from the Kolonnawa terminal via pipelines, and provides bunker fuel to ships via pipelines connected to Dolphin pier and also from South jetty. LMS terminal has a storage capacity of 23,000 tonnes of fuel oil and 6,800 tonnes of diesel.

Some amount of LPG is produced at the CPC refinery for local consumption. However, most of the country's LPG requirement is met through direct imports. LPG is imported through the Colombo Port, and also via a conventional buoy mooring system (CBM) for Litro Gas Lanka Limited facilities at Muthurajawela.

Residual oil (heavy furnace oil) is transferred directly from the refinery to the 160 MW Sapugaskanda power plant owned by the CEB and to the 51 MW residual oil power plant owned by Asia Power to produce electricity for the national grid. The refinery LPG production is delivered to the private distributor by means of road tankers and then filled into bottles for onward distribution to consumers.

As previously explained in this report, Sri Lanka meets all its petroleum demand by imported petroleum brought in as crude oil or refined products. Since the refining capacity of the CPC-owned refinery is not sufficient to meet the country demand, considerable amounts of petroleum products have to be imported and directly sold in the local market. Whether locally refined or directly imported, petroleum is channelled through the same distribution network which consists of several tank farms located in Kolonnawa, Sapugaskanda and Trincomalee and the local depots and the distribution stations (filling stations) spread all around the country.

5.2.2 Petroleum Prices

5.2.2.1 Prices of Crude Oil and Imported Finished Products

Crude oil imports decreased further in 2023 compared with 2022 as shown in Table 5.6.

Table 5.6 – Costs of Crude Oil Imports

Crude Oil Import Price Movements (F.O.B, Freight and C&F)	2010	2015	2020	2021	2022	2023
Quantity (kt)	1,819.43	1,676.76	1,667.00	1,130.00	743.60	1,665.55
Quantity (million bbl)	13.38	13.00	12.77	8.66	5.56	12.72
Crude Oil Import Unit Price (USD/bbl)						
F.O.B. Price	78.27	-	-	-	-	-
Freight Rate	0.97	-	-	-	-	-
C&F Price	79.24	105.38	45.66	62.06	99.06	82.22
Crude Oil Import Unit Price (LKR/bbl)						
F.O.B. Price	8,910.69	-	-	-	-	-
Freight	109.99	-	-	-	-	-
C & F Price	9,020.68	13,779.16	-	-	-	-

The import prices of finished petroleum products are shown in Table 5.7.

Table 5.7 – Finished Product Import Price Variation

Product Import Price Variation (F.O.B)	2010	2015	2020	2021	2022	2023
Mogas 92 Unl (USD/bbl)	86.23	71.147	50.91	80.05	106.30	95.23
Mogas 95 Unl (USD/bbl)	88.4	74.356	53.05	83.30	108.84	107.55
Naphtha (USD/bbl)	-	44.354	-	-	-	71.63
Kerosene (USD/bbl)	90.18	-	-	-	-	-
Gas Oil 0.05% S (USD/bbl)	90.35	68.491	50.49	76.86	131.60	105.79
Gas Oil 0.25% S (USD/bbl)	89.97	-	-	-	-	-
Gas Oil 0.5% S (USD/bbl)	89.55	68.269	-	-	-	-
Gas Oil 0.001% S (USD/bbl)	-	-	56.06	78.37	132.32	112.19
FO 180Cst (USD/t)	470.28	-	-	-	624.69	506.23
FO 380Cst (USD/t)	462.59	-	-	-	-	-
LSFO (US$/t)	-	-	351.77	504.85	-	-
HSFO (US$/t)	-	-	408.41	509.56	-	-
LPG (USD/t)	714.46	-	-	-	-	-
Jet A-1 (USD/bbl)	-	69.66	63.12	83.45	124.09	107.10

5.2.2.2 Petroleum Product Prices in the Local Market

Table 5.8 summarises the price variations of locally sold petroleum products.

Table 5.8 – Price Variation of Locally Sold Petroleum Products (Colombo Spot)

Month	Petrol (LKR/l)		Kerosene (LKR/l)		Diesel (LKR/l)		Furnace Oil (LKR/l)		LPG LKR/kg	
	90 Oct	95 Oct	Industrial	Domestic	Super	Auto	800 sec	1500 sec	Litro	Laugfs
2022-end Price	370.00	510.00	464.00	365.00	510.00	420.00	320.00	320.00	368.80	424.00
2023 prices										
January 1									352.72	
January 3						405.00		510.00		
January 6										406.40
February 1	400.00								379.44	
February 7										422.40
March 30	340.00	375.00				325.00		465.00		
April 1									299.04	
April 5										319.20
April 30	333.00	365.00				310.00		330.00		
May 1									291.04	
June 1	318.00	385.00						340.00	254.88	
July 1	328.00	365.00				308.00		346.00	238.56	
July 7										295.20
August 1	348.00	375.00				306.00		358.00		
September 1	361.00	417.00				341.00		359.00	250.16	
September 5										306.80
October 1									277.60	
October 2	365.00	420.00				351.00		421.00		
October 5										318.80
November 1	356.00	423.00				356.00		431.00	285.20	
December 1	346.00	426.00				329.00		434.00	285.20	

Figure 5.4 depicts the historical price changes of common petroleum products. The price indicated in the graph is the weighted average of monthly price revisions for a given year. The price of LPG is the average price of both Litro and LAUGFS.

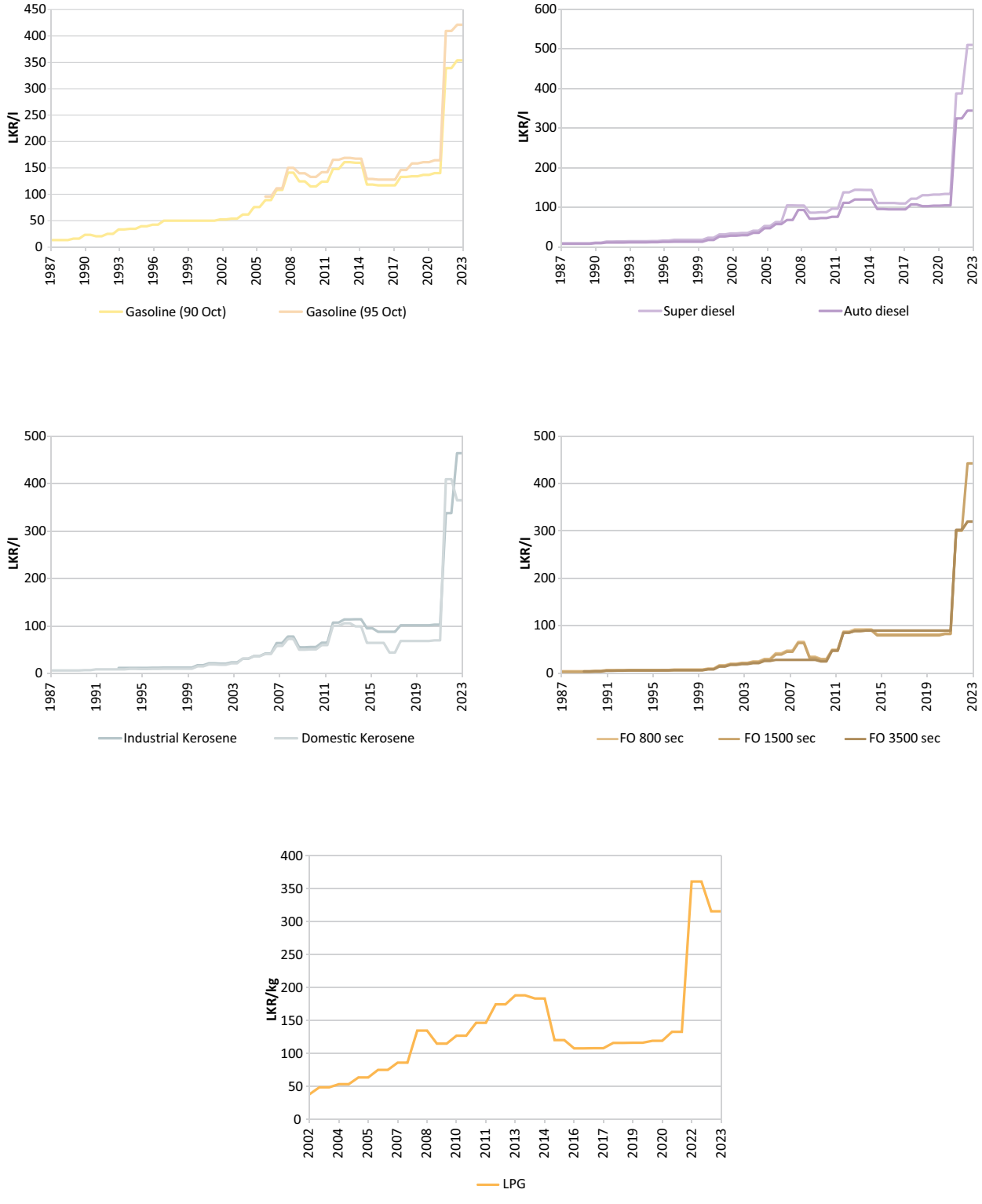


Figure 5.4 – Historical Price Variations of Petroleum Products

5.3 Coal Imports and Prices

The total quantities of coal imported are given in Table 5.9. Coal consumption has increased over time, with the commissioning of new coal power plants in 2014.

Table 5.9 – Coal Imports and Prices

	2015	2020	2021	2022	2023
Imported Qty (t)	1,881,462	2,543,582	2,204,413	1,706,571	2,496,685
Imported price (LKRM)	21,542	39,253	54,971	99,949	157,406
Price (LKR/kg)	11.45	15.43	24.94	17.07	15.86

5.4 Biomass Distribution and Prices

Biomass meets more than a third of the energy demand of the country. Abundant availability, especially in rural areas where the usage is most common, has simplified the distribution of biomass. The actual value of biomass is often misrepresented by its discounted price due to the simplified sourcing options. In terms of the cost of alternate fuels avoided, biomass has a significantly higher value to the economy.

With the increased household income levels, fuelwood used in cooking is reducing in volume. However, without a survey of the residential sector, the actual trends remain unreported. In contrast, with the advent of formal supply chains, biomass use in industrial thermal energy use is gaining rapid grounds, due to cost benefits. Table 5.10 gives the quantity of firewood produced and sold for industries.

Table 5.10 – Firewood Production and Sale for Industries

Firewood (m^3)	2010	2015	2020	2021	2022	2023
Quantity Produced	118,544	87,159	82,856	86,971	93,785	36,947
Quantity Sold	129,502	83,041	60,671	70,075	75,710	50,319

6 Energy Demand

Energy is a vital building block for economic growth, and energy demand provides vital signs for better management of an economy. Supply of energy discussed up to now is a direct consequence of the demand for energy, which is analysed in detail in this chapter. This chapter presents the analyses of energy demand from electricity, petroleum and biomass.

6.1 Electricity Demand

6.1.1 The System Demand

Electricity demand has two aspects. The first being the energy demand where the cumulative electrical energy requirement is met by the supply system. The peak demand is the other criterion to be fulfilled in meeting the national electricity demand. The generating system needs to be able to meet the peak demand of the national grid. Since the national demand profile has an evening peak, the capability of the supply system in meeting the demand during the evenings (i.e. peak period) is important. Figure 6.1 shows the hourly demand profiles of March 29, 2023, the day the system recorded the maximum peak and of September 30, 2023, the day the system recorded the lowest valley.

In spite of being equipped with state of the art supervisory control and data acquisition (SCADA) systems, some of the newly connected wind and solar power plants are not reporting real time data to the system control centre. Accordingly, the demand estimates are continued to be based on monthly energy data provided by the small power producers.

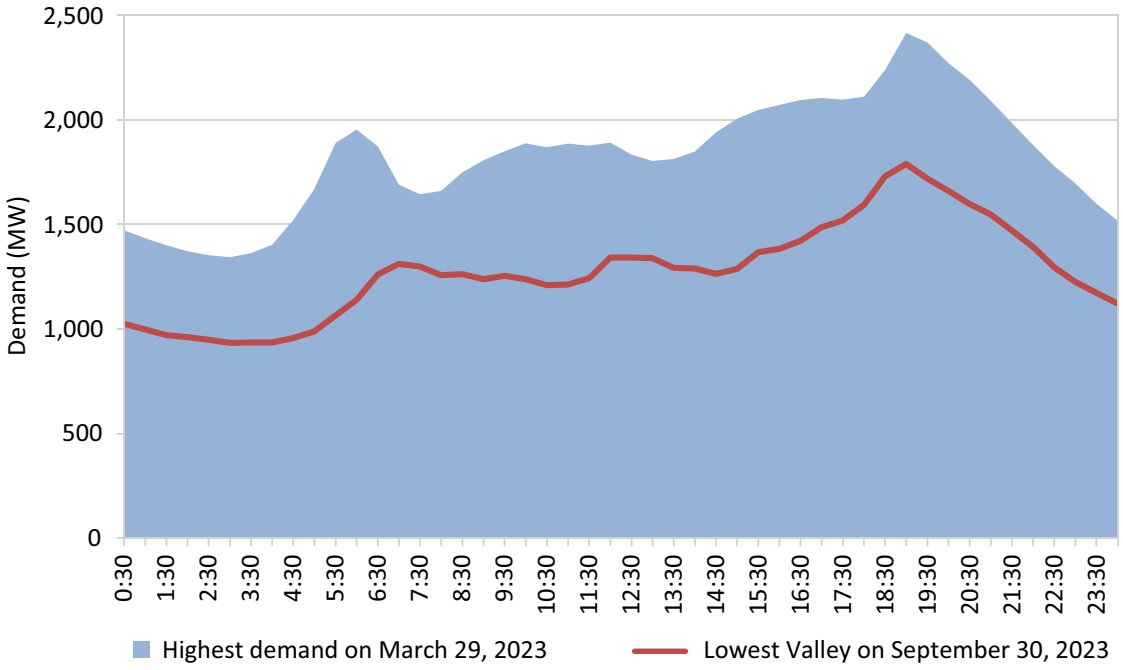


Figure 6.1 – System Demand Profile of 2022

Table 6.1 shows the development of the system peak demand over the years.

Table 6.1 - The Growth in System Capacity and Demand

System Parameters	2010	2015	2020	2021	2022	2023
Total Gross Generation (GWh)	10,800.7	13,226.6	16,663.6	17,621.9	16,828.5	16,249.4
Total Grid Connected Capacity (MW)	2,817.6	3,888.4	4,542.3	4,814.8	5,017.8	5,124.6
Maximum Demand (MW)	1,954.7	2,283.4	2,707.2	2,801.6	2,708.1	2,414.8
Reserve Capacity	862.9	1,605.0	1,835.1	2,013.2	2,309.7	2,709.8
System Load Factor	63.0%	66.0%	70.3%	71.8%	70.9%	76.8%
System Reserve Margin	44.1%	70.3%	67.8%	71.9%	85.3%	112.2%

System load factors in the range 60% - 70% are typical of a customer mix dominated by households with a high demand for electricity used for lighting in the evening. The peak demand in 2023 was 2,414.8 MW, reported at 1900 hrs. on March 29, 2023. The lowest demand valley for the year was reported at 0315 hrs. on 2023 September 30, which stood at 928.38 MW. The system reserve margin however, increased by 26.9% in 2023. Figure 6.2 depicts the development of the system load factor, reserve margin and peak demand from 1979 to present.

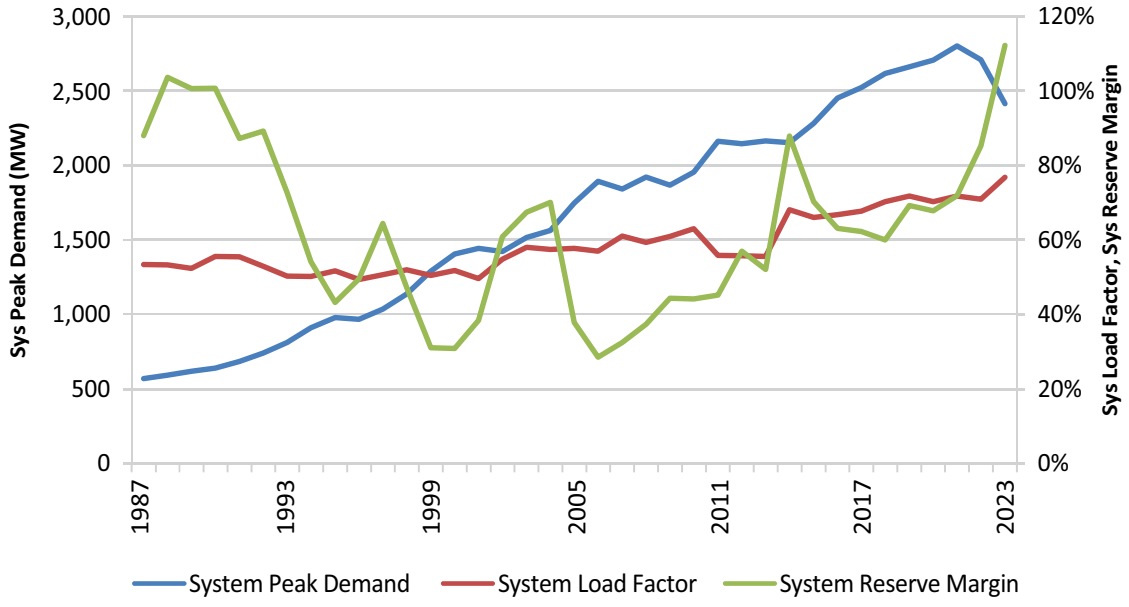


Figure 6.2 – Development of System Load Factor, Reserve Margin and Peak Demand

Figure 6.3 depicts the historic growth of the load curve.

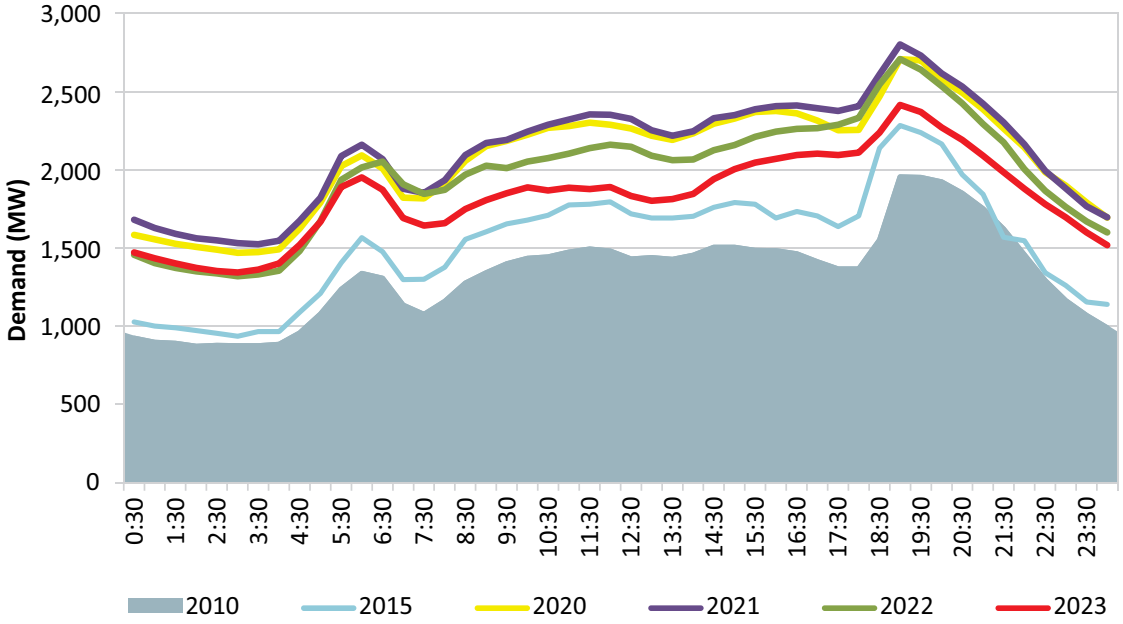


Figure 6.3 – The Growth in System Peak Demand

6.2 Petroleum Demand

6.2.1 Demand for Different Petroleum Products

The demand for different petroleum products varies primarily on their potential usage. For instance, auto diesel is widely used for transportation and power generation; in contrast to kerosene, which is used only for rural household energy needs, some industrial applications, agriculture and fisheries. Therefore, the demand for auto diesel is substantially higher than for kerosene. The refinery production process is adjusted to produce more of the high demand products while some products are directly imported to bridge the gap between refinery output and the demand.

The demand for LP gas, naphtha, gasoline and furnace oil have increased in 2023 compared to 2022, whereas the demand for kerosene and diesel types have decreased. Table 6.2 summarises the demand for different petroleum products.

Table 6.2 – Demand for Different Petroleum Products

kt	2010	2015	2020	2021	2022	2023
LPG	187.5	293.4	437.0	422.0	294.1	393.7
Naphtha	54.1	97.2	-	10.6	32.3	120.1
Gasoline	616.5	1,009.0	1,250.6	1,353.6	1,176.1	1,232.0
Kerosene	165.1	130.2	176.7	188.2	101.8	82.7
Auto Diesel	1,696.8	1,996.0	1,576.8	1,875.0	1,693.3	1,467.3
Super Diesel	12.2	46.4	68.9	74.6	59.2	36.8
Furnace Oil	994.5	956.4	825.8	823.7	357.2	523.2
Total	**3,726.7**	**4,528.4**	**4,335.7**	**4,747.7**	**3,714.0**	**3,855.8**

Figure 6.4 depicts the evolution of the demand for different petroleum products through time. The demand for LP gas, naphtha, gasoline and furnace oil increased, whereas the demand for diesel fuels and kerosene decreased.

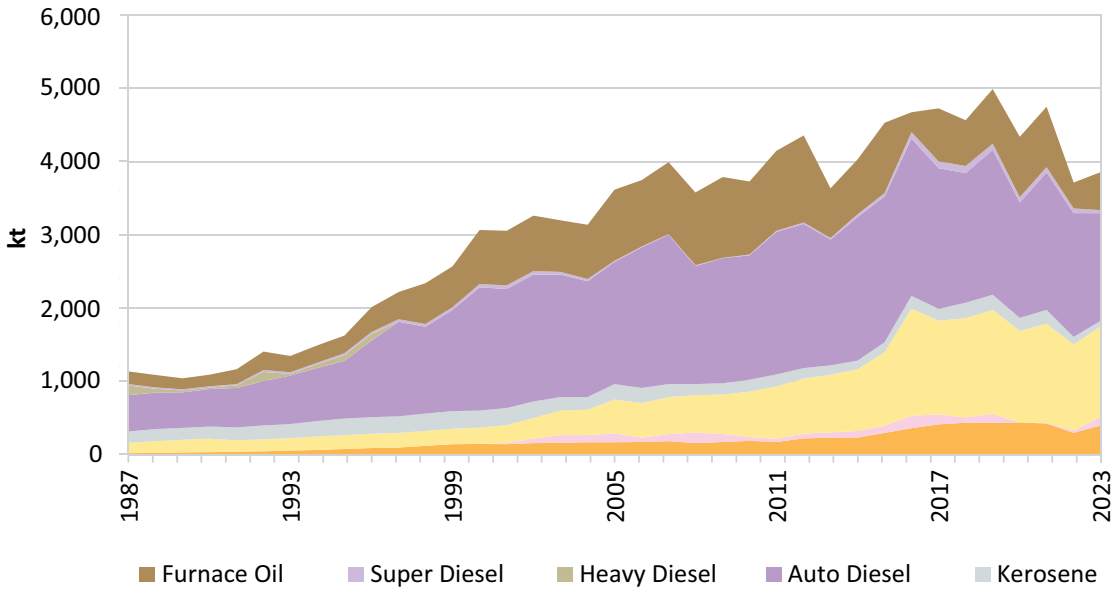


Figure 6.4 – Evolution in the Demand for Different Petroleum Products

6.2.2 Demand for Petroleum by District

Table 6.3 details the district-wise retail and consumer sales of petroleum products, of the CPC and LIOC in 2023. Figure 6.5 depicts the distribution of the petroleum demand by district in TJ.

Table 6.3 – Demand for Petroleum by District

District Sales (kl)	Petrol (90 Octane)	Auto diesel	Super diesel	Kerosene	Industrial kerosene	Petrol (95 Octane)	Fuel oil 800 sec	Fuel oil 1500 sec (HS)	Fuel oil 1500 sec (LS)	Fuel oil super	Chemical Naphta	LP Gas	AV Gas	Jet A1
Kandy	81,830,610	71,034,567	2,402,552	2,290,280	33,000	2,435,743	-	310,200	-	785,400	-	-	-	-
Matale	22,160,741	23,924,132	336,725	1,122,000	-	290,436	-	-	-	-	-	-	-	-
Nuwara Eliya	14,012,288	22,809,819	422,492	930,600	-	217,932	-	843,930	-	145,200	-	-	-	-
Batticaloa	27,930,445	29,335,991	409,292	4,398,000	-	224,525	-	-	-	-	-	-	-	-
Ampara	37,802,615	43,777,971	442,292	3,785,100	-	158,516	-	-	-	277,200	-	-	-	-
Trincomalee	19,575,283	27,073,091	290,443	7,207,200	-	112,246	-	59,400	-	316,800	-	-	215,000	211,200
Anuradhapura	60,825,973	70,199,263	858,125	3,085,500	6,600	693,139	-	-	-	6,600	-	-	-	184,800
Polonnaruwa	27,963,921	40,651,138	508,200	1,188,000	6,600	310,203	-	66,000	-	396,000	-	-	-	567,600
Jaffna	37,405,910	37,666,515	475,414	10,154,100	13,200	330,013	-	23,938,200	-	-	-	-	-	118,800
Mannar	6,290,486	9,590,764	138,600	6,025,800	-	33,000	-	-	-	-	-	-	-	-
Mulalativu	7,749,205	9,623,816	33,033	3,504,600	-	13,200	-	-	-	-	-	-	-	-
Vavuniya	10,599,263	17,236,369	277,203	1,534,500	-	59,400	-	-	-	-	-	-	-	-
Killinochchi	8,837,940	13,431,617	297,000	2,527,800	-	85,800	-	-	-	178,200	-	-	-	-
Kurunegala	116,192,843	114,874,731	2,323,329	3,392,400	52,800	1,821,857	-	4,006,200	-	1,115,400	-	-	-	-
Puttalam	59,433,640	69,077,827	1,867,925	15,803,700	19,800	1,115,661	-	-	-	481,800	-	-	-	-
Ratnapura	53,004,976	62,390,229	1,174,876	1,676,400	297	759,155	-	-	-	191,400	-	-	-	-
Kegalle	40,292,512	37,017,094	653,400	1,386,000	13,200	567,600	-	-	-	39,600	-	-	-	-
Galle	66,513,242	62,622,522	1,181,506	4,560,600	19,800	1,478,608	-	-	-	1,320,000	-	-	-	6,600
Matara	39,743,345	56,341,342	706,497	4,006,200	158,400	798,861	-	-	-	2,659,800	-	-	-	-
Hambantota	34,461,075	51,868,546	488,803	3,696,000	6,600	257,578	-	811,800	-	46,200	-	-	-	39,600
Badulla	34,411,604	47,435,501	679,909	1,178,100	-	369,663	-	-	-	19,800	-	-	-	-
Moneragala	24,655,600	34,797,523	468,722	1,485,000	-	283,916	-	-	490,000	2,138,400	-	-	-	-
Colombo	240,072,476	329,738,073	12,132,875	6,652,770	-	17,926,289	13,200	-	-	13,629,000	174,136,250	3,877,744,000	490,000	26,808,360
Gampaha	206,843,589	189,706,933	6,713,240	9,028,800	-	7,421,202	-	-	87,000	99,158,120	-	-	-	44,180,680
Kalutara	75,487,889	70,365,619	2,059,738	4,689,300	-	2,410,020	-	-	-	739,200	-	-	87,000	-
Total	**1,354,097,471**	**1,542,590,993**	**37,342,191**	**105,308,750**	**330,297**	**40,174,563**	**13,200**	**30,035,730**	**577,000**	**123,644,120**	**174,136,250**	**3,877,744,000**	**792,000**	**72,117,640**

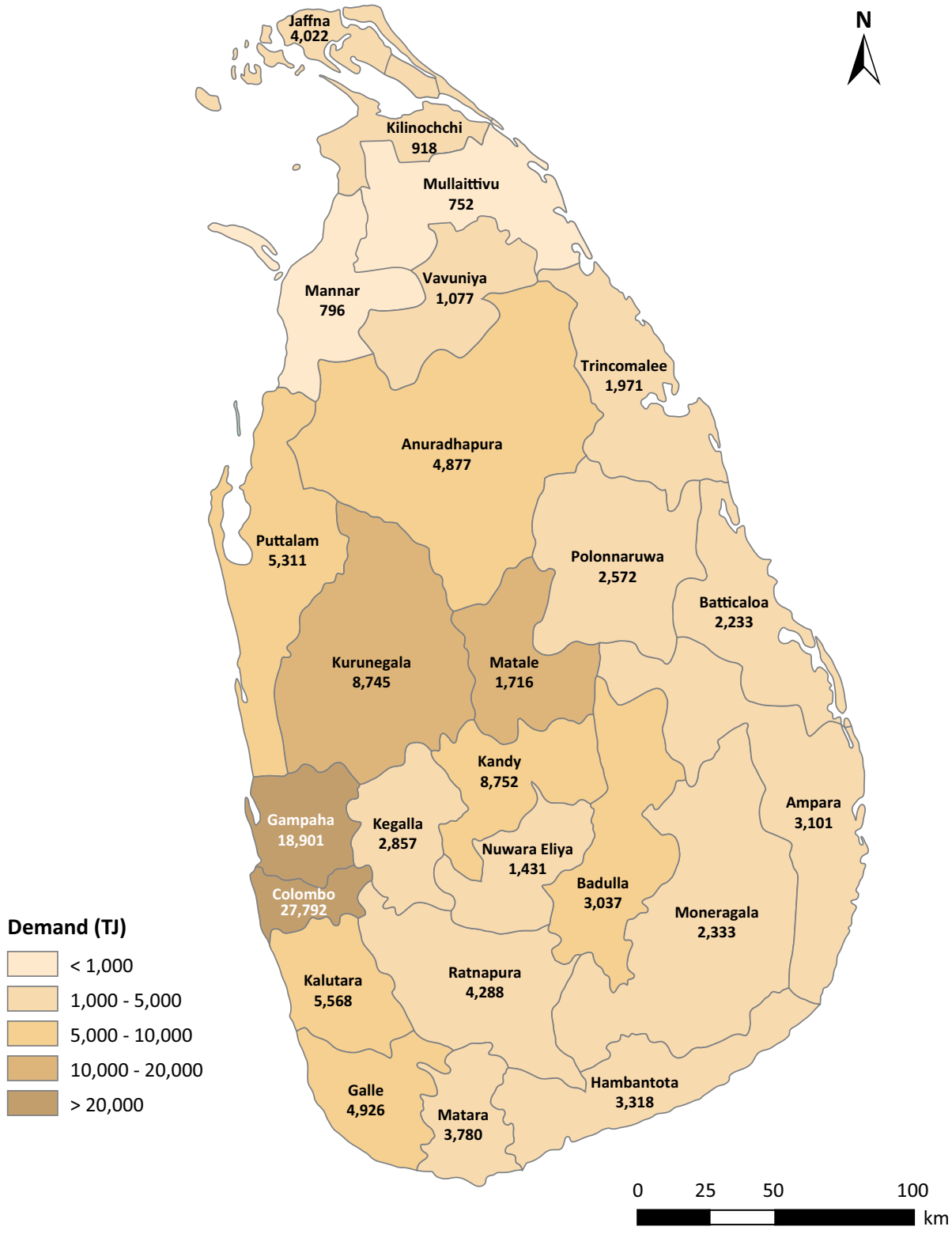


Figure 6.5 – Districtwise Demand for Petroleum (TJ) - 2023

The highest demand for petroleum fuels in 2023 was in the Colombo district, whereas the least demand was from the Mullaitivu district.

6.3 Coal

Coal is an energy resource used in industries and power generation, but predominantly for power generation. Volume of coal imported to the country is given below (Table 6.4).

Table 6.4 – Demand for Coal

Coal Consumption (kt)	2010	2015	2020	2021	2022	2023
Industries	86.6	86.6	79.3	80.1	88.5	76.6
Power Generation	1,880.0	1,880.0	2,349.3	2,301.3	2,143.2	1,915.2
Total Consumption	**1,966.6**	**1,966.6**	**2,428.7**	**2,381.4**	**2,231.7**	**1,991.8**
%						
Industries	4.4	4.4	3.3	3.4	4.0	3.8
Power Generation	95.6	95.6	96.7	96.6	96.0	96.2

6.4 Biomass

As the most significant primary energy supply source in the country, biomass has a widespread demand for both commercial and non-commercial applications. However, the informal nature of supply, mainly through users' own supply chains, has prevented accurate and comprehensive usage data being compiled for biomass. Therefore, estimation methods are used to develop reasonable information based on available data. Mid-year population data and LPG consumption are used to estimate household firewood consumption. Meanwhile, industrial biomass consumption is estimated based on the industrial production data and surveys. Most of the information on biomass presented in this report is based on estimates and sample surveys. The sample survey carried out in 2019 on the energy aspects of households will shed more light into the biomass energy supply and demand in the country.

Table 6.5 – Demand for Biomass

kt	2010	2015	2020	2021	2022	2023
Firewood	3,788.5	4,532.7	5,191.2	5,343.0	5,052.4	5,344.0
Bagasse	137.8	196.4	300.5	406.0	394.5	349.9

Bagasse is the waste form of sugar cane, which is used in sugar factories for combined heat and power generation. By 2023, the bagasse production was 349.9 kt, generated from the Pelawatta, Hingurana, Ethimale and Sevanagala sugar factories. Charcoal is produced mainly from coconut shell and wood. A major portion of the production of coconut shell charcoal is exported as a non-energy product.

6.5 Sectoral Demand

6.5.1 Electricity Demand by Different End Use Categories

Based on the usage type, electricity consumers are separated into the following categories.

- Domestic
- Religious purpose
- Industrial
- Commercial
- Street Lighting

Amounts of electricity used by different customer categories are given in Table 6.6, which also includes off-grid electricity generation using conventional and non-conventional sources. Although the electrical energy demand of different end users is established using electricity sales data, individual power demand of different categories cannot be established due to the lack of a monitoring system or regular load research. Nevertheless, by analysing the typical load profiles of different user categories, it is visible that the Residential category is most influential in the morning and evening peaks and the consequent low load factor of the system.

Table 6.6 – Electricity Sales by End Use Category

GWh	2010	2015	2020	2021	2022	2023
Domestic	3,651.4	4,444.7	5,856.9	6,007.9	5,791.9	5,192.5
Religious	55.0	76.4	93.3	92.1	92.2	87.8
Industrial	3,148.1	3,880.1	4,443.4	5,109.0	4,584.9	4,562.4
Commercial	2,224.0	3,178.9	3,875.3	3,970.2	4,078.1	4,411.2
Streetlighting	130.0	160.7	131.2	120.2	121.8	121.0
Agriculture	-	-	-	-	2.0	2.0
Total	**9,208.5**	**11,740.9**	**14,400.1**	**15,299.5**	**14,670.9**	**14,376.9**
%						
Domestic	39.7	37.9	40.7	39.3	39.5	36.1
Religious	0.6	0.7	0.6	0.6	0.6	0.6
Industrial	34.2	33.0	30.9	33.4	31.3	31.7
Commercial	24.2	27.1	26.9	26.0	27.8	30.7
Streetlighting	1.4	1.4	0.9	0.8	0.8	0.8

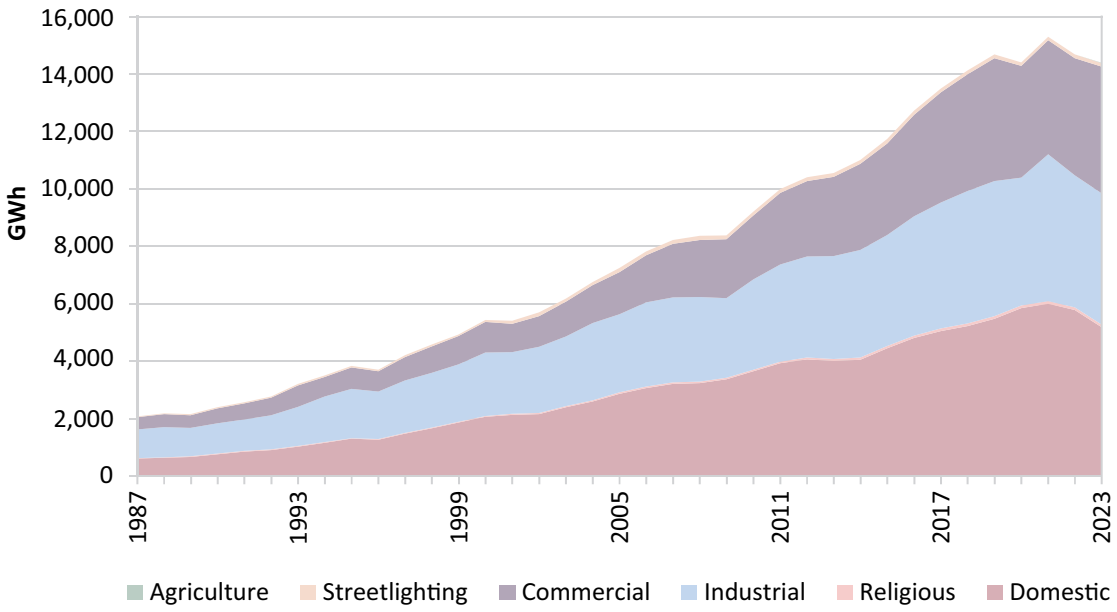


Figure 6.6 - Electricity Sales by Consumer Category

Following the tariff revisions in 2023, the sales in the residential sector and all other sectors than the commercial sector have deceased, when compared to the pre-economic crisis demands. The decrease in these sectors could be assigned to the substantial price increases which took effect after a spell of eight years of stagnant prices. (Table 6.6)

6.5.2 Petroleum Demand in Different Sectors

Petroleum has a wide range of applications as a convenient energy source. Transport, power generation, industrial thermal applications, residential lighting and cooking are the most common uses of petroleum in Sri Lanka. In addition, due to the strategically important geographic location of Sri Lanka in terms of maritime and aviation movements, foreign bunkering and aviation fuel sales also create a demand for petroleum in the country. Petroleum demand to meet the non-domestic needs such as bunkering and aviation fuel is discussed separately in this report.

6.5.2.1 Transport Sector

Transport is the most important sector as far as petroleum is concerned. The majority of vehicles in Sri Lanka are powered by either diesel or gasoline. Both, road and rail transport are entirely fuelled by liquid petroleum fuels. In the distant past, rail transport was fuelled by coal, and today, only a single coal powered rail is operated as a tourist attraction. The Internal Combustion (IC) engines in all these vehicles intrinsically introduce considerable energy wastage in terms of conversion efficiency from petroleum energy to motive power. Use of electricity to at least energise the train transportation can be an efficient and economical alternative to burning petroleum fuels in the transport sector. Table 6.7 summarises the demand for fuels in the transport sector.

Table 6.7 – Transport Fuel Demand by Type

kt	2010	2015	2020	2021	2022	2023
Gasoline	616.5	1,009.0	1,250.6	1,353.6	1,176.1	1,232.0
Auto Diesel	1,433.8	1,815.1	1,388.5	1,658.4	1,139.9	1,133.6
Super Diesel	11.5	46.1	67.8	74.6	59.2	36.8

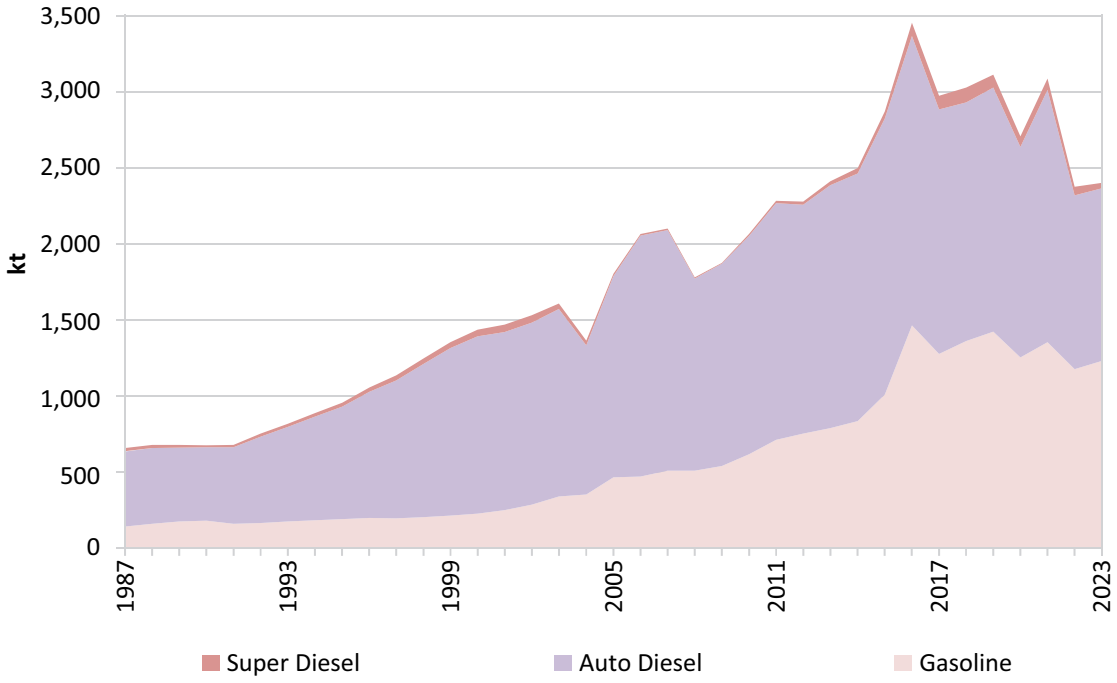


Figure 6.7 – Transport Demand by Fuel Type

Table 6.8 summarises the auto diesel demand in road transport and rail transport.

Table 6.8 – Auto Diesel Demand in Road and Rail Transport

kt	2010	2015	2020	2021	2022	2023
Road Transport	1,419.7	1,815.1	1,430.5	1,713.7	1,163.7	1,128.5
Rail Transport	26.2	38.4	25.8	19.3	35.3	42.0
Total	**1,445.9**	**1,853.5**	**1,456.3**	**1,733.0**	**1,199.0**	**1,170.4**
%						
Road Transport	98.2	97.9	98.2	98.9	97.1	96.4
Rail Transport	1.8	2.1	1.8	1.1	2.9	3.6

Only a marginal share of 3.6% of the total transport diesel demand is consumed by rail transport. The transport fuel mix is dominated by auto diesel. The demand for transport fuels have decreased marginally in 2023 compared with 2022. These reductions can be attributed to the severe price escalations and also the QR code based fuel rationing scheme which operated throughout 2023, before officially ending on September 01, 2023.

Electricity usage in both plug-in hybrid electric vehicles (PHEV) and electric vehicles (EV) has reached noticeable levels, especially with the large volume import of electric scooters and SUVs. Given the fact that energy drawn from public charging stations is much less than home charging, estimation of electricity usage in transport sector remain unreported. It is also causing the energy use in residential and commercial sectors to be over estimated. The Authority is planning to conduct a survey to increase the reporting accuracy.

Figure 6.8 gives a snapshot of the cumulative vehicle fleet. Importation of vehicles remained frozen, due to the stringent exchange controls leading to a marginal increase of the fleet in 2023, resulting from importations done under special permission. Motor cycles still account for the highest number of registrations each year.

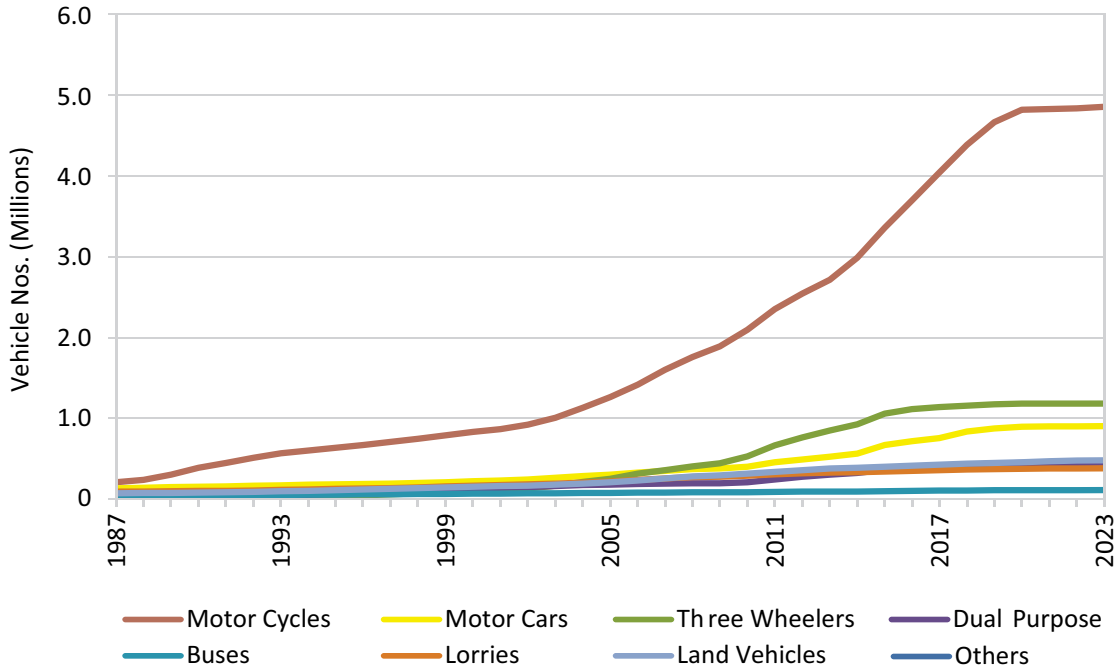


Figure 6.8 – Growth Pattern of Road Vehicle Fleet

Data on the active vehicle fleet was extracted from the publication 'Economic and Social Statistics 2023' of the Central Bank of Sri Lanka. Motor vehicles with valid revenue licences were considered to build the active fleet. The active fleets are illustrated below (Figure 6.9).

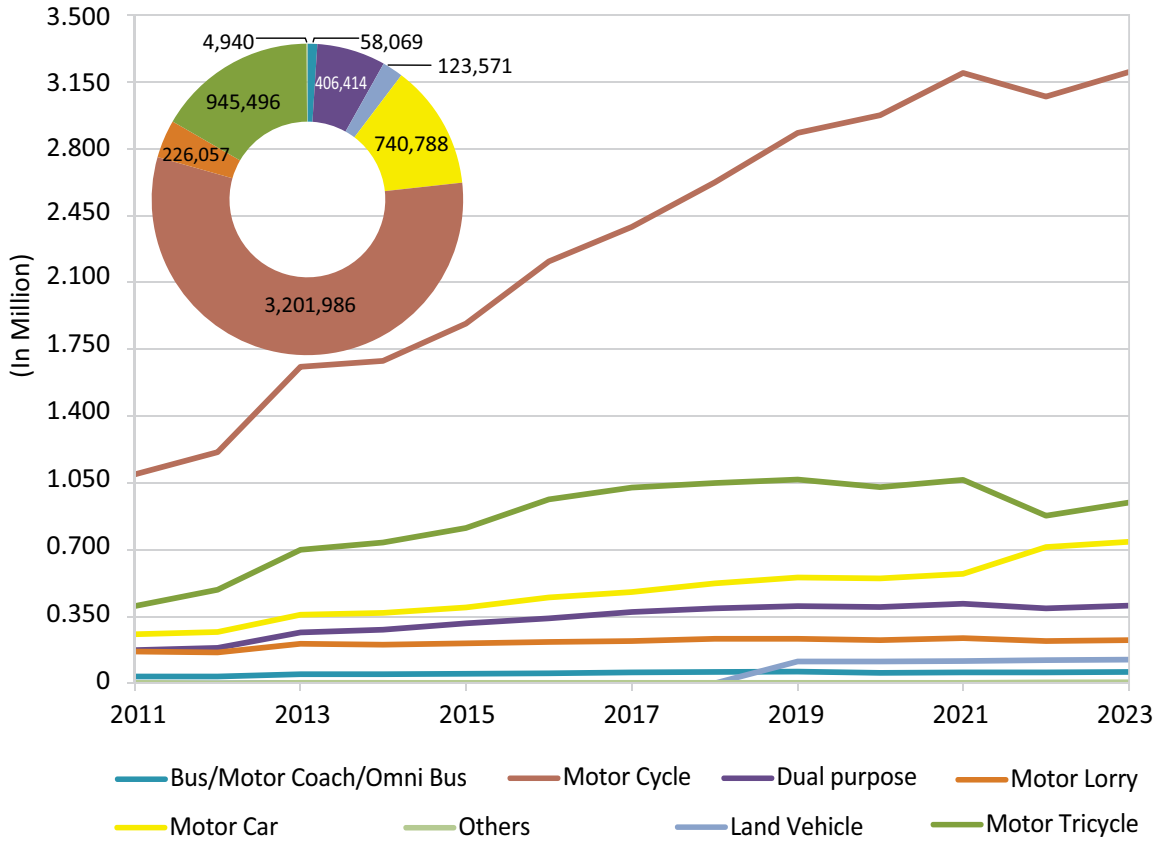


Figure 6.9 – Active Vehicle Fleet

Sri Lanka's active fleet in 2023 was 5,707,318 vehicles. It is characterised by an increased population of motor cycles (56%) and motor tricycles (17%). The share of public transport is very low (1%). Undoubtedly, this is a clear sign of worsening public transport services in the country, which must be arrested early, to avoid a severe transport crisis in the medium term.

6.5.2.2 Petroleum Usage in Other Sectors

Transport and power sector are the largest petroleum consuming sectors. Fuel consumption of the power sector by type, technologies and quantities has been detailed in Chapter 4, under energy conversions in thermal power plants.

Residential sector petroleum consumption is limited to kerosene and LPG. However, with the increased use of LPG, especially in urban households for cooking purposes, the demand for petroleum by the residential sector has also become significant. Industrial sector petroleum usage is mostly for thermal applications where diesel and fuel oil is used to fire industrial steam boilers and air heaters. LP gas usage is also increasing in industrial thermal applications where the quality and control of heat generation is important for the industry operation. LP gas fired kilns in the ceramic industry is one such example. The commercial sector including the service sector organisations such as hotels also contribute to the national petroleum demand, but to a lesser degree than the above-mentioned high-volume petroleum consumers.

Table 6.9 details LP gas demand by sector. Although total LP gas demand was on an increasing trend in the past, but had decreased in 2021 and 2022 and increased again in 2023. Sector wise, the demand in the household, commercial and other sectors has decreased, while it had marginally increased in the industrial sector in 2023.

Table 6.9 – Demand for LPG by Sector

kt	2010	2015	2020	2021	2022	2023
Household, Commercial and Other	159.8	234.5	413.0	394.6	227.5	320.6
Industries	24.8	57.6	59.7	62.4	66.6	73.0
Transport	0.1	1.2	0.1	0.1	0.05	0.04
Total	**184.8**	**293.4**	**472.8**	**457.0**	**294.1**	**393.7**

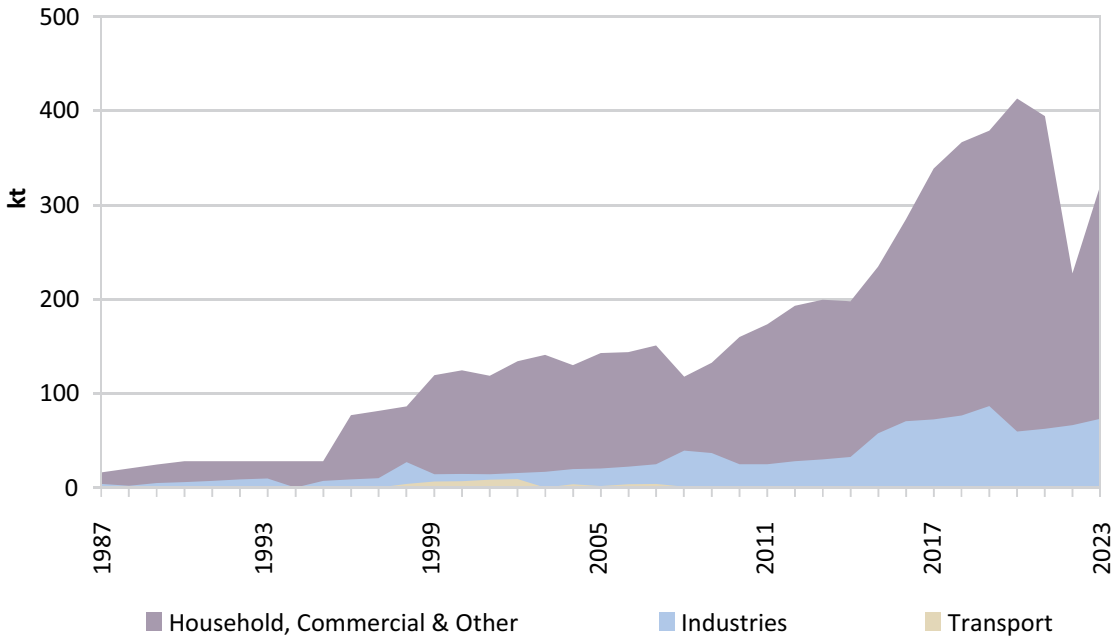


Figure 6.10 - LPG Demand by Sector

The residential demand for LPG is increasing rapidly. This is often attributed to the improved per capita income levels. If the prices of LP gas remain at low levels, many high temperature industries might switch back to LP gas, to better control their processes.

Agriculture based petroleum demand in Sri Lanka is reported as considerably low, despite the fact that it is broadly an agricultural economy. This is also attributed to the difficulty in separating fuel dispersed for agricultural purposes and transport, as they are done through the same fuel station. Estate sector is one division which shows a fair usage of petroleum for crop drying purposes, but its energy use is accounted under industrial usage.

Kerosene used in fisheries is another substantial consumer category with regard to the petroleum demand. Engine powered boats commonly used in the fishing industry are fuelled by either diesel or kerosene. It is therefore, important to understand that kerosene, which is a subsidised petroleum product in Sri Lanka, is not entirely used by the poorest segment of the society as envisaged in petroleum pricing policies. Table 6.10 summarises the kerosene consumption.

Table 6.10 – Demand for Kerosene by Sector

kt	2010	2015	2020	2021	2022	2023
Industrial	20.2	8.0	3.5	2.9	2.9	0.8
Household, Commercial and Other	-	122.2	173.2	102.1	51.6	39.1

Figure 6.11 indicates that the residential kerosene consumption generally follows a declining trend, mainly owing to the realisation of universal access to electricity in 2016. Kerosene in the residential sector is mainly used as a lighting fuel. Although a marginal increase in the residential use could have resulted from a population under a lockdown, the kerosene demand followed a sharp decline resembling the industry or the transport demand trend.

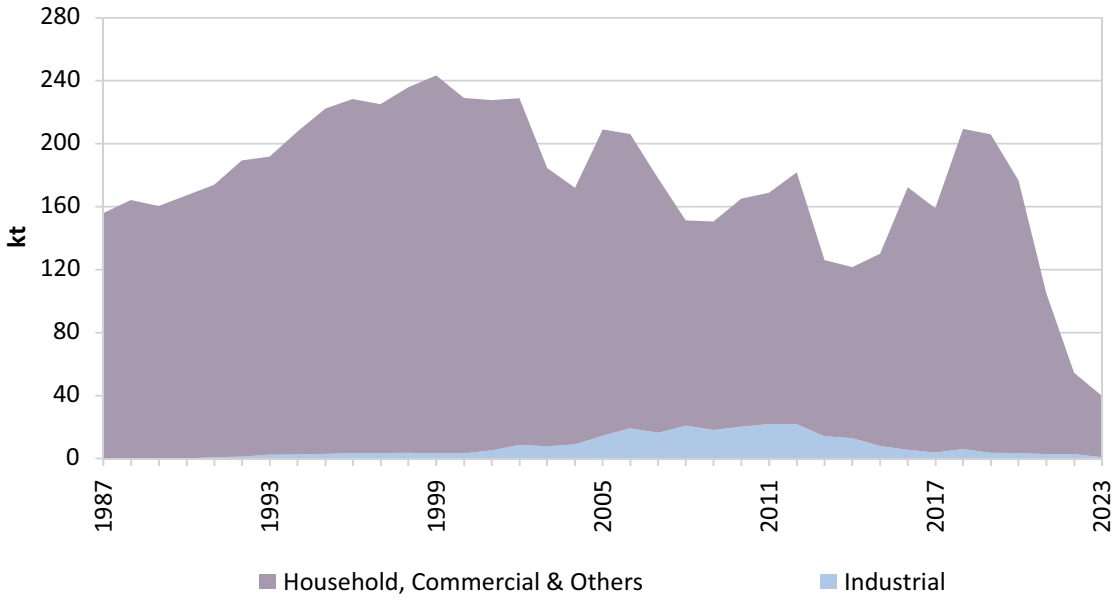


Figure 6.11 – Demand for Kerosene by Sector

In the early stages, the demand for kerosene has been only in the household and commercial sector. However, since the 2000s, the demand for kerosene in the industrial sector has gradually increased, but is in a decreasing trend at present.

6.5.2.3 Bunkering and Aviation Sales

Table 6.11 – Bunkering and Aviation Sales

kt	2010	2015	2020	2021	2022	2023
Domestic Bunkers						
Furnace Oil	22.1	40.1	38.8	52.4	50.4	77.3
Marine Lubricants	0.2	0.1	-	-	-	-
Sub total	28.5	40.2	38.8	52.4	50.4	77.3
Foreign Bunkers						
Marine Gas Oil	55.3	46.7	75.7	63.5	106.9	140.5
Furnace Oil	199.0	360.6	349.0	471.4	453.3	695.6
Marine Lubricants	1.8	0.9	-	0.1	-	-
Sub total	**256.1**	**408.1**	**424.7**	**534.9**	**560.2**	**836.1**
Domestic Aviation						
Jet A1	169.5	2.4	4.3	26.1	1.1	3.1
Avgas	0.2	0.1	0.2	0.1	0.1	0.6
Sub total	**169.7**	**2.6**	**4.4**	**26.2**	**1.2**	**3.6**
Foreign Aviation						
Avtur	111.0	370.5	186.7	222.4	248.3	478.1
Naphtha	26.7	-	-	-	-	-
Sub total	**137.7**	**370.5**	**186.7**	**222.4**	**248.3**	**478.1**

6.5.3 Coal Demand in Different Sectors

In the past, the total demand for coal had been in the transport sector or industries. But with the commissioning of coal power plants, there has been an increased demand for coal in power generation. In 2023, the demand for coal in power generation alone was 96%.

The total coal demand is given in Table 6.12.

Table 6.12 – Demand for Coal by Sector

kt	2010	2015	2020	2021	2022	2023
Industries	95.13	86.58	79.34	80.12	88.50	76.59
Power Generation	-	1,880.01	2,349.34	2,301.32	2,143.22	1,915.24
Total Consumption	**95.13**	**1,966.59**	**2,428.68**	**2,381.44**	**2,231.72**	**1,991.83**
%						
Industries	100.0	4.4	3.3	3.4	4.0	3.8
Power Generation	-	95.6	96.7	96.6	96.0	96.2

6.5.3.1 Coal Demand in Industries

The coal demand in industries declined marginally as given in Table 6.13.

Table 6.13 – Coal Demand in Industries

kt	2010	2015	2020	2021	2022	2023
Industries	95.1	86.6	79.3	80.1	88.5	76.6

6.5.3.2 Coal Demand in Power Generation

The demand for coal in the power generation in 2023 was 1,915.2 thousand tonnes.

6.5.4 Biomass Demand in Different Sectors

6.5.4.1 Biomass Demand in Industries

The demand for bagasse has marginally decreased in 2023, while the demand for firewood has increased in 2023, compared to 2022.

Table 6.14 – Biomass Demand in Industries

kt	2010	2015	2020	2021	2022	2023
Firewood	3,788.5	4,532.7	5,191.2	5,343.0	5,052.4	5,344.0
Bagasse	137.8	196.4	300.5	358.8	394.5	349.9

6.5.4.2 Biomass Demand in Household, Commercial and Other Sector

Firewood is a main source of cooking fuel in many parts of the country. Table 6 14 gives the total firewood requirement in the residential and commercial sector. Energy demand data from the residential and commercial sector were hitherto estimated using formulae derived a long time ago, which reflected the socioeconomic context of that era. With improved living standards and higher household income levels, however, these parameters have undergone a considerable change. In 2019, the SEA, in association with the Department of Census and Statistics conducted a survey on residential energy use involving a representative sample of more than 6,000 households. Using the preliminary results of this survey, the biomass usage estimates were calculated for the year 2019, and was found to be substantially lower than the previously estimated value. Using a reducing weighting factor, the past data on biomass demand from the year 2000 were recalculated and the respective data series was updated.

The total bagasse generated by the sugar plants was 349.9 kt in 2023, which was used in a captive generation plant for industrial purposes, amounting to a capacity of 9.9 MW generating 24.3 GWh.

Table 6.15 – Demand for Firewood in Household, Commercial and Other Sector

kt	2010	2015	2020	2021	2022	2023
Firewood	7,349.4	6,130.1	5,239.2	5,187.6	5,197.6	5,140.0

6.6 Total Energy Demand

Table 6.16 summarises the total energy demand by source.

Table 6.16 – Total Energy Demand by Energy Source

PJ	2010	2015	2020	2021	2022	2023
Biomass	179.6	173.0	169.3	169.9	167.7	171.2
Petroleum	126.0	158.1	154.8	177.9	143.2	142.2
Coal	2.5	2.3	2.1	2.1	2.3	2.0
Electricity	33.2	42.3	51.8	55.1	52.8	51.8
Total	**368.1**	**375.6**	**378.1**	**405.0**	**366.0**	**367.2**
%						
Biomass	48.8	46.0	44.8	41.9	45.8	46.6
Petroleum	34.2	42.1	41.0	43.9	39.1	38.7
Coal	0.7	0.6	0.6	0.5	0.6	0.6
Electricity	9.0	11.3	13.7	13.6	14.4	14.1

The petroleum demand figures presented are only in terms of final energy use and this does not include the fuels consumed in electricity generation. The share of biomass consumption in the total energy demand had marginally increased (46.6%) in 2023, compared with 2022. The share of petroleum had decreased to 38.7% and electricity to 14.1% in 2023.

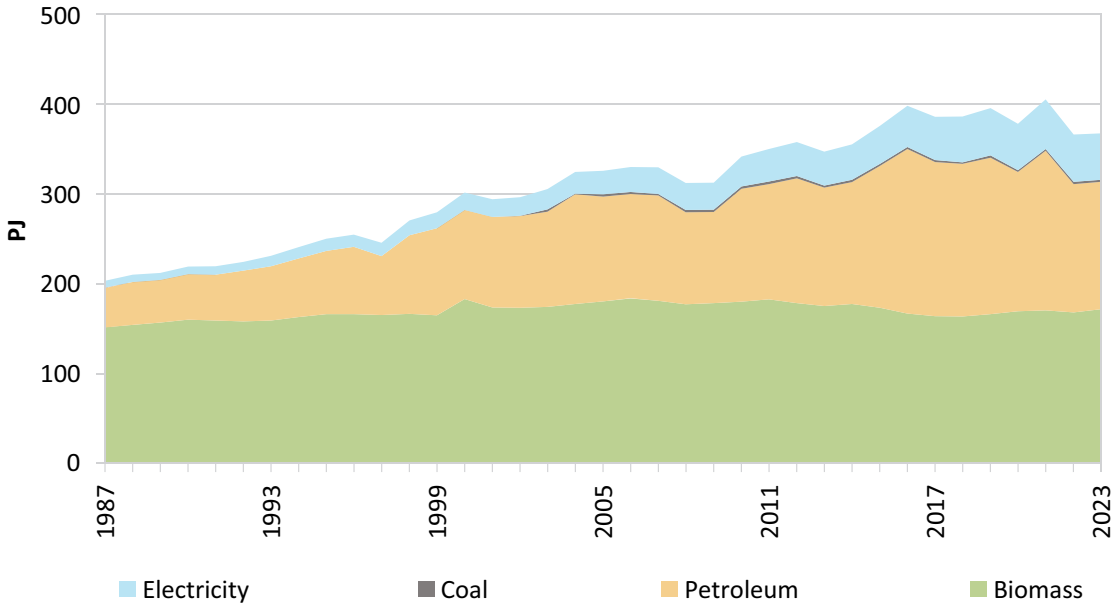


Figure 6.12 – Total Energy Demand by Energy Source

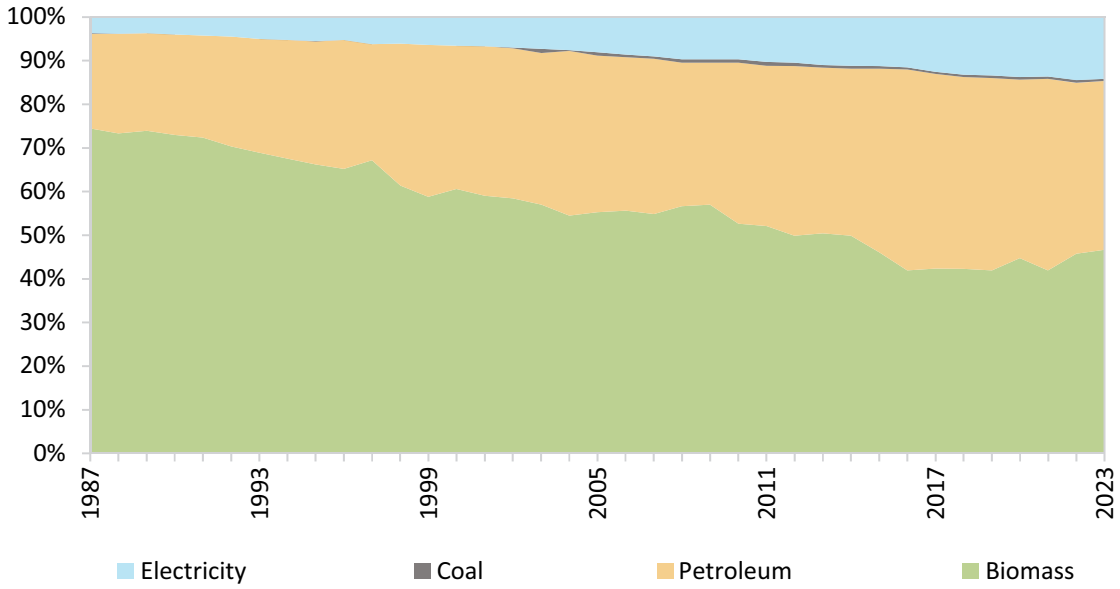


Figure 6.13 – Evolution of Energy Demand by Energy Source

As can be expected from any growing economy, the share of biomass in the energy demand portfolio was on a generally decreasing trend, while the share of electricity was on an increasing trend. Under the COVID-19 pandemic conditions and the economic crisis in the country, these trends reversed, due to lower use of petroleum products due to both non-availability and unaffordability. However, it is expected that the long-term trends will resume after the post crisis recovery.

6.6.1 Total Industrial Energy Demand

Table 6.17 – Total Energy Demand of Industries by Energy Source

PJ	2010	2015	2020	2021	2022	2023
Biomass	62.7	75.5	85.9	87.4	85.0	89.4
Petroleum	10.2	14.6	7.6	13.2	22.4	16.6
Coal	2.5	2.3	2.1	2.1	2.3	2.0
Electricity	11.3	14.0	16.0	18.4	16.5	16.4
Total	**86.8**	**106.3**	**111.8**	**121.2**	**126.2**	**124.4**
%						
Biomass	72.3	71.0	77.0	72.2	67.3	71.9
Petroleum	11.8	13.7	6.8	10.9	17.7	13.3
Coal	2.9	2.1	1.9	1.7	1.8	1.6
Electricity	13.1	13.1	14.3	15.2	13.1	13.2

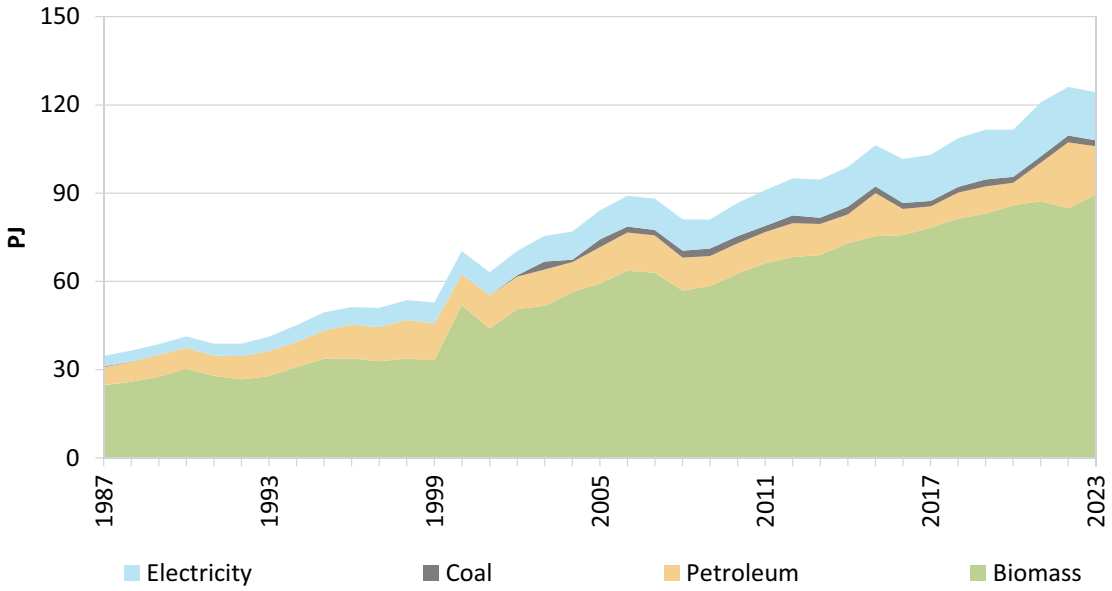


Figure 6.14 – Total Energy Demand of Industries by Energy Source

6.6.2 Total Transport Energy Demand

The transport demand declined sharply in 2020, owing to the mobility-restrictions imposed with the COVID-19 pandemic, but bounced back to the former levels in 2021. It decreased again in 2022, mainly owing to the economic crisis, fuel shortages and increased prices.

Electricity used in transport is not reported, and a survey of the available fleet is necessary to estimate the usage levels.

Table 6.18 – Total Transport Energy Demand by Energy Source

PJ	2010	2015	2020	2021	2022	2023
Petroleum	100.4	127.7	121.3	139.1	106.4	107.8

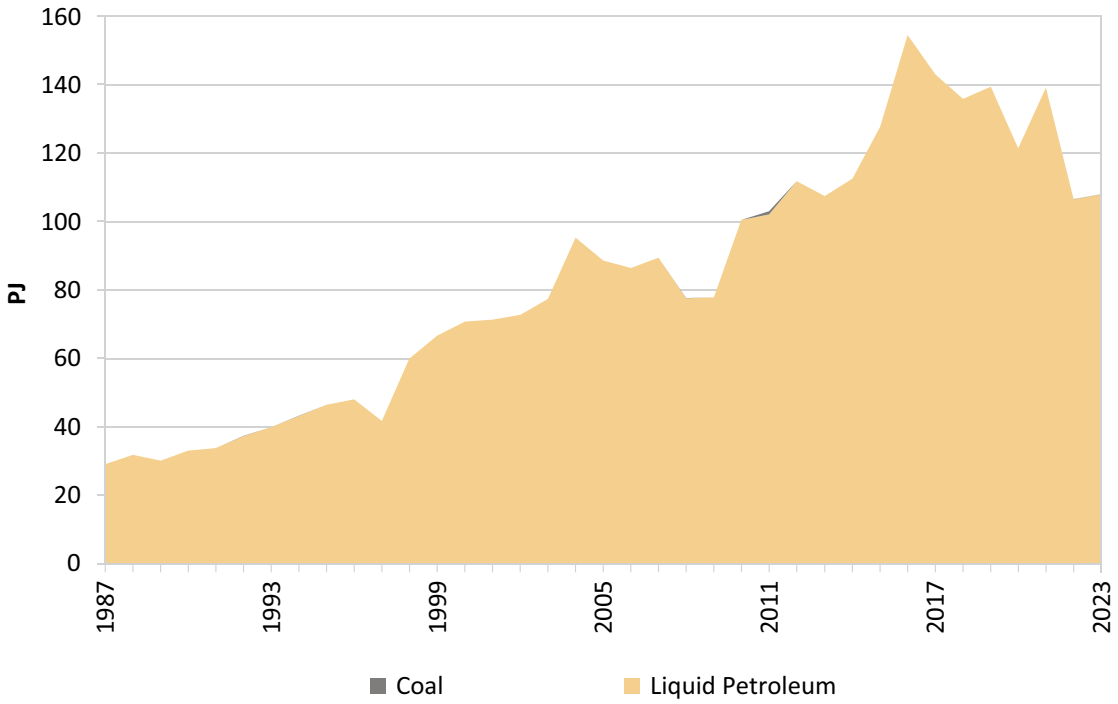


Figure 6.15 – Total Energy Demand of Transport by Energy Source

6.6.3 Total Energy Demand in Household, Commercial and Other Sectors

Table 6.19 – Total Energy Demand in Household, Commercial and Other Sectors by Energy Source

PJ	2010	2015	2020	2021	2022	2023
Biomass	143.8	97.5	83.4	82.5	82.7	81.8
Petroleum	14.9	15.8	25.9	22.0	12.4	15.9
Electricity	21.8	28.3	35.9	36.7	36.3	35.3
Total	**180.6**	**141.6**	**145.1**	**141.2**	**131.4**	**133.1**
%						
Biomass	79.6	68.9	57.4	58.4	62.9	61.5
Petroleum	8.3	11.1	17.9	15.6	9.4	12.0
Electricity	12.1	20.0	24.7	26.0	27.6	26.6

Biomass accounts for approximately 61.5% of the total residential, commercial and other sector's energy demand. The share of petroleum indicates a decrease, while the share of and electricity indicates an increase. The expansion of the electricity share could be attributed to the growth of households served by the grid and the tariff which remained unchanged since 2014 until 2022.

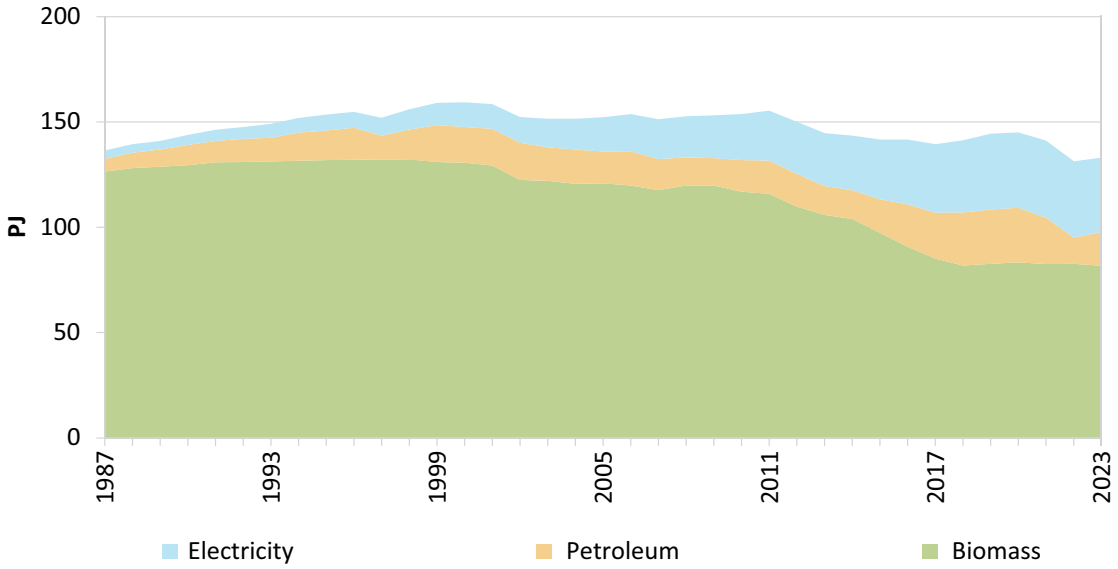


Figure 6.16 – Total Energy Demand of Household, Commercial and Other Sector by Energy Source

6.6.4 Total Energy Demand by Sector

Table 6.20 – Total Energy Demand by Sector

PJ	2010	2015	2020	2021	2022	2023
Industry	86.8	106.3	111.6	121.0	126.2	124.4
Transport	100.4	127.7	121.3	139.1	106.4	107.8
Household, Commercial & Others	153.7	141.6	145.1	141.2	131.4	133.1
Total	**367.7**	**375.6**	**378.1**	**401.4**	**364.0**	**365.3**
%						
Industry	23.6	28.3	29.5	30.2	34.7	34.1
Transport	27.3	34.0	32.1	34.7	29.2	29.5
Household, Commercial & Others	41.8	37.7	38.4	35.2	36.1	36.4

In 2023, residential, commercial and other sectors accounted for the largest share of energy being 36.4%. The transport and industry sector accounted for 29.5% and 34.1%, respectively.

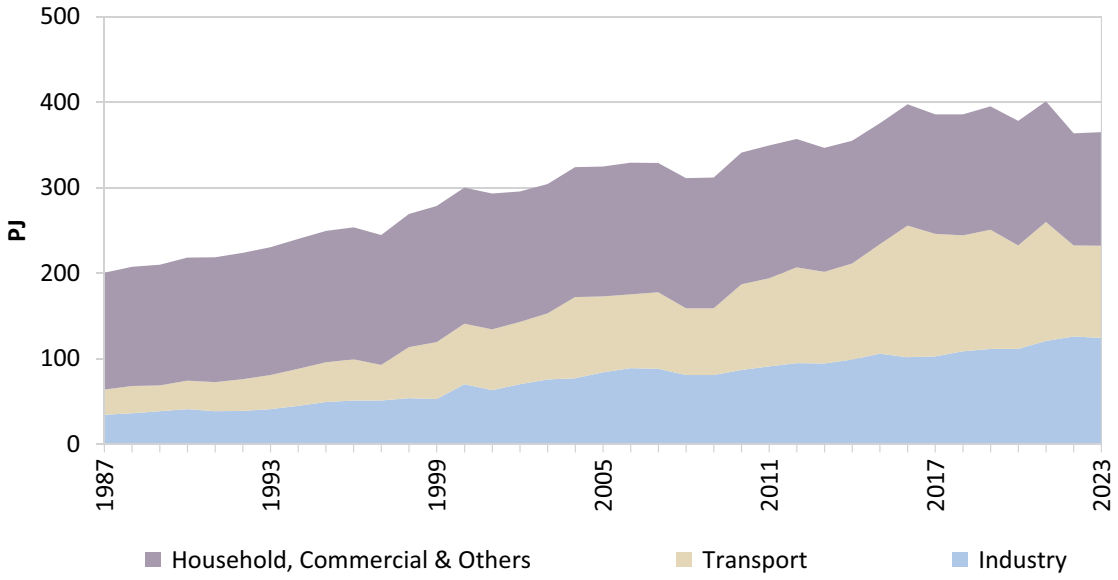


Figure 6.17 – Total Energy Demand by Sector

Figure 6.21 depicts the growth of energy demand in the three main Sectors.

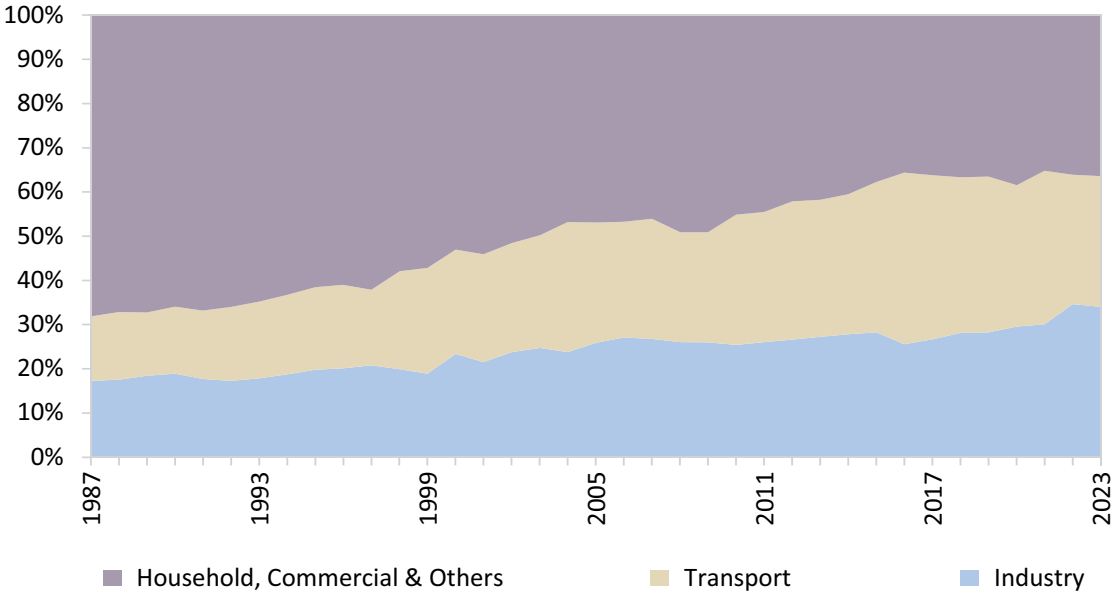


Figure 6.18 – Evolution of Total Energy Demand by Sector

7 Energy Balance

The performance of the entire energy sector is summarised in the National Energy Balance shown in the following pages, in original commodity units and in SI Units of PJ (Peta Joules). The Energy Balance illustrates the energy supply, energy conversion, losses and energy consumption (demand) within the year. Figure 7.1 gives the Energy Balance for 2023 in PJ. Relevant conversion factors are given in *Annex II*.

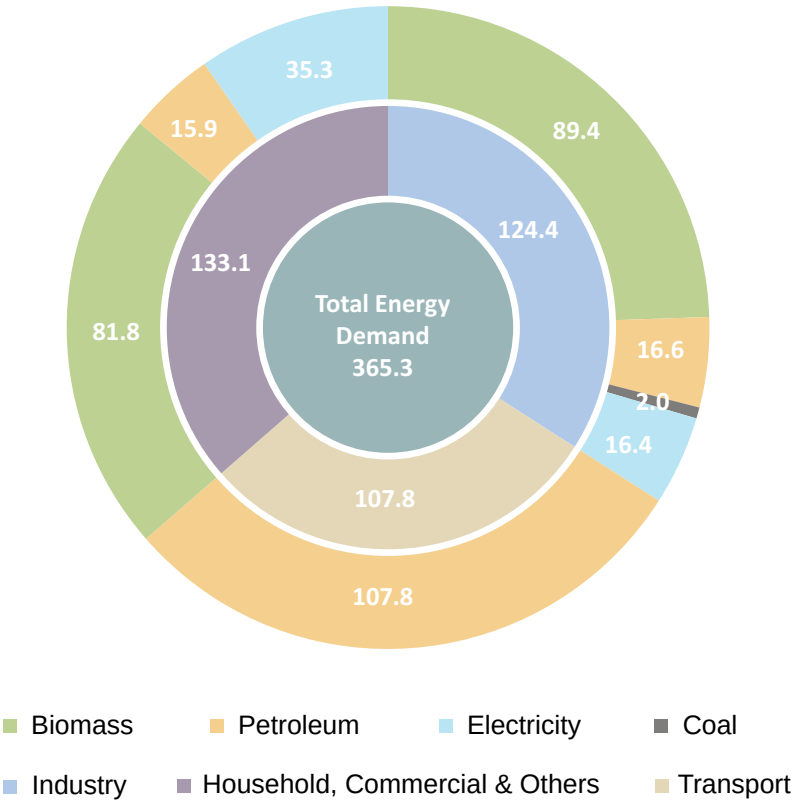


Figure 7.1 – Energy Balance 2022 (in PJ)

The total energy demand of the residential, commercial and other sector was 133.1 PJ, out of which 81.8 PJ came from biomass, 15.9 PJ came from petroleum and 35.3 PJ came from electricity. The total energy demand in the industrial sector was 124.4 PJ. Biomass accounted for 89.4 PJ, petroleum for 16.6 PJ, coal for 2.0 PJ and electricity accounted for 16.4 PJ. In the transport sector, the total demand of 107.8 PJ was sourced by petroleum.

Table 7.1 – Sri Lanka Energy Balance: 2023 (in original units)

	Renewables (GWh)	Electricity (GWh)	LPG (kt)	Gasoline (kt)	Naptha (kt)	Av. Gas (kt)	Kerosene (kt)
Supply							
Primary Energy	8,065.2	-	-	-	-	-	-
Imports	-	-	365.2	1,105.0	-	-	-
Direct Exports	-	-	-	-	-	-	-
Foreign Bunkers	-	-	-	-	-	-	-
Stock Change	-	-	4.7	(69.1)	(44.6)	0.1	(1.8)
Total Energy Supply	**8,065.2**	**-**	**369.9**	**1,035.9**	**(44.6)**	**0.1**	**(1.8)**
Energy Conversion							
Petroleum Refinery	-	-	23.8	171.2	129.1	-	49.5
Conventional Hydro Power	(4,592.5)	4,592.5	-	-	-	-	-
Thermal Power Plants	-	8,383.6	-	-	(116.6)	-	-
Small Hydro Power	(1,377.8)	1,377.8	-	-	-	-	-
Wind Power	(824.2)	824.2	-	-	-	-	-
Biomass Power	(25.1)	25.1	-	-	-	-	-
Solar Power	(227.4)	227.4	-	-	-	-	-
Waste Heat	(72.8)	72.8	-	-	-	-	-
Net-metered Power Plants	(945.3)	945.3	-	-	-	-	-
Self Generation by Customers	-	-	-	-	-	-	-
Off-grid Conventional	-	-	-	-	-	-	-
Off-grid Non-Conventional	-	-	-	-	-	-	-
Charcoal Production	-	-	-	-	-	-	-
Own Use	-	(628.4)	-	-	-	-	-
Conversion Losses	-		-	-	-	-	-
Losses in T&D	-	(1,244.1)	-	-	-	-	-
Non Energy Use	-	-	-	-	-	-	-
Total Energy Conversion	**(8,065.2)**	**14,576.3**	**23.8**	**171.2**	**12.5**	**-**	**49.5**
Energy Use							
Agriculture	-	-	-	-	-	-	42.8
Industries	-	4,562.4	73.0	-	-	-	0.8
Road Transport	-	-	-	1,232.0	-	-	-
Rail Transport	-	-	-	-	-	-	-
Domestic Aviation	-	-	-	-	-	0.6	-
Household, Commercial & Other	-	9,814.5	320.6	-	-	-	39.1
Total Energy Use	**-**	**14,376.9**	**393.7**	**1,232.0**	**-**	**0.6**	**82.7**

Table 7.1 – Sri Lanka Energy Balance: 2023 (in original units)

Jet A1 (kt)	Diesel (kt)	Fuel Oil (FO 1500) (kt)	Residual Oil (kt)	Solvents (kt)	Coal (kt)	Baggase Agro Residues (kt)	Firewood (kt)	Charcoal (kt)	Crude Oil (kt)
-	-	-	-	-	-	349.9	10,484.0	-	-
168.4	1,037.3	269.9	-	-	2,496.7	-	-	-	1,665.6
-	-	-	-	-	-	-	-	-	-
(478.1)	(140.5)	(695.6)	-	-	-	-	-	-	-
8.5	(21.2)	(58.5)	12.9	(0.1)	368.6	(46.6)	-	-	104.9
(301.2)	**875.6**	**(484.2)**	**12.9**	**(0.1)**	**2,865.3**	**303.4**	**10,484.0**	**-**	**1,770.4**
233.7	505.7	482.1	-	1.5	-	-	-	-	(1,677.0)
-	-	-	-	-	-	-	-	-	-
-	(85.7)	(334.9)	(125.9)		(1,915.2)	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	(41.1)	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	(93.4)
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
233.7	**419.9**	**147.2**	**(125.9)**	**1.5**	**(1,915.2)**	**(41.1)**	**-**	**-**	**(1,770.4)**
-	-	-	-	-	-	-	-	-	-
-	240.6	66.0	-	-	76.6	262.3	5,344.0	-	-
-	1,128.5	-	-	-	-	-	-	-	-
-	42.0	-	-	-	-	-	-	-	-
3.1	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	5,140.0	-	-
3.1	**1,411.0**	**66.0**	**-**	**-**	**76.6**	**262.3**	**10,484.0**	**-**	**-**

Table 7.2 – Sri Lanka Energy Balance: 2023 (in Tera Joules)

	Renewables	Electricity	LPG	Gasoline	Naptha	Av. Gas	Kerosene	Jet A1
Supply								
Primary Energy	81,041.8	-	-	-	-	-	-	-
Imports	-	-	16,206.8	50,429.6	-	-	-	7,403.8
Direct Exports	-	-	-	-	-	-	-	-
Foreign Bunkers	-	-	-	-	-	(1.2)	-	(21,017.1)
Stock Change	-	-	208.3	(3,153.6)	(2,033.7)	5.7	(77.8)	374.1
Total Energy Supply	**81,041.8**	**-**	**16,415.1**	**47,276.0**	**(2,033.7)**	**4.6**	**(77.8)**	**(13,239.3)**
Energy Conversion								
Petroleum Refinery	-	-	1,056.2	7,812.3	5,889.7	-	2,175.4	10,271.7
Conventional Hydro Power	(46,147.2)	16,536.1	-	-	-	-	-	-
Thermal Power Plants	-	30,186.4	-	-	(5,319.8)	-	-	-
Small Hydro Power	(13,844.3)	4,960.9	-	-	-	-	-	-
Wind Power	(8,282.1)	2,967.7	-	-	-	-	-	-
Biomass Power	(252.0)	90.3	-	-	-	-	-	-
Solar Power	(2,285.3)	818.9	-	-	-	-	-	-
Waste Heat	-	-	-	-	-	-	-	-
Net-metered Power Plants	(9,499.0)	3,403.8	-	-	-	-	-	-
Self Generation by Customers	-	-	-	-	-	-	-	-
Off-grid Conventional	-	-	-	-	-	-	-	-
Off-grid Non-Conventional	-	-	-	-	-	-	-	-
Charcoal Production	-	-	-	-	-	-	-	-
Own Use	-	(2,262.7)	-	-	-	-	-	-
Conversion Losses	-	-	-	-	-	-	-	-
Losses in T&D	-	(4,479.4)	-	-	-	-	-	-
Non Energy Use	-	-	-	-	-	-	-	-
Total Energy Conversion	**80,309.9**	**52,221.9**	**1,056.2**	**7,812.3**	**569.9**	**-**	**2,175.4**	**10,271.7**
Energy Use								
Agriculture	-	-	-	-	-	-	1,883.0	-
Industries	-	16,427.6	3,239.4	-	-	-	35.9	-
Road Transport	-	-	1.8	56,222.8	-	-	-	-
Rail Transport	-	-	-	-	-	-	-	-
Domestic Aviation	-	-	-	-	-	25.6	-	134.8
Household, Commercial & Other	-	35,338.7	14,230.1	-	-	-	1,718.7	-
Total Energy Use	**-**	**51,766.3**	**17,471.4**	**56,222.8**	**-**	**25.6**	**3,637.6**	**134.8**

Table 7.2 – Sri Lanka Energy Balance: 2023 (in Tera Joules)

Diesel	Fuel Oil (FO 1500)	Residual Oil	Solvents	Coal	Baggase Agro Residues	Firewood	Charcoal	Crude Oil	Total
-	-	-	-	-	5,860.7	166,798.3	-	-	251,697.4
45,600.1	11,074.4	-	-	65,854.7	-	-	-	71,825.4	268,394.7
-	-	-	-	-	-	-	-	-	-
(6,175.7)	(28,542.2)	-	-	-	-	-	-	-	(55,736.2)
(931.4)	(2,401.0)	527.6	(2.4)	9,722.5	(779.6)	-	-	4,522.2	5,980.8
38,493.1	**(19,868.8)**	**527.6**	**(2.4)**	**75,577.2**	**5,081.1**	**166,798.3**	**-**	**76,347.6**	**470,336.8**
22,230.2	19,781.9	-	56.8	-	-	-	-	(72,320.4)	(3,046.3)
-	-	-	-	-	-	-	-	-	(29,611.1)
(3,769.1)	(13,743.1)	(5,167.7)	-	(50,518.0)	-	-	-	-	(48,331.3)
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	(688.9)	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	(2,262.7)
-	-	-	-	-	-	-	-	(4,027.1)	(4,027.1)
-	-	-	-	-	-	-	-	-	(4,479.4)
-	-	-	-	-	-	-	-	-	-
18,461.1	**6,038.8**	**(5,167.7)**	**56.8**	**(50,518.0)**	**(688.9)**	**-**	**-**	**(76,347.6)**	**(91,757.9)**
-	-	-	-	-	-	-	-	-	1,883.0
10,575.7	2,708.8	-	-	2,020.3	4,392.2	85,022.2	-	-	124,422.1
49,608.3	-	-	-	-	-	-	-	-	105,832.9
1,846.1	-	-	-	-	-	-	-	-	1,846.1
-	-	-	-	-	-	-	-	-	160.4
-	-	-	-	-	-	81,776.1	-	-	133,063.6
62,030.1	**2,708.8**	**-**	**-**	**2,020.3**	**4,392.2**	**166,798.3**	**-**	**-**	**367,208.3**

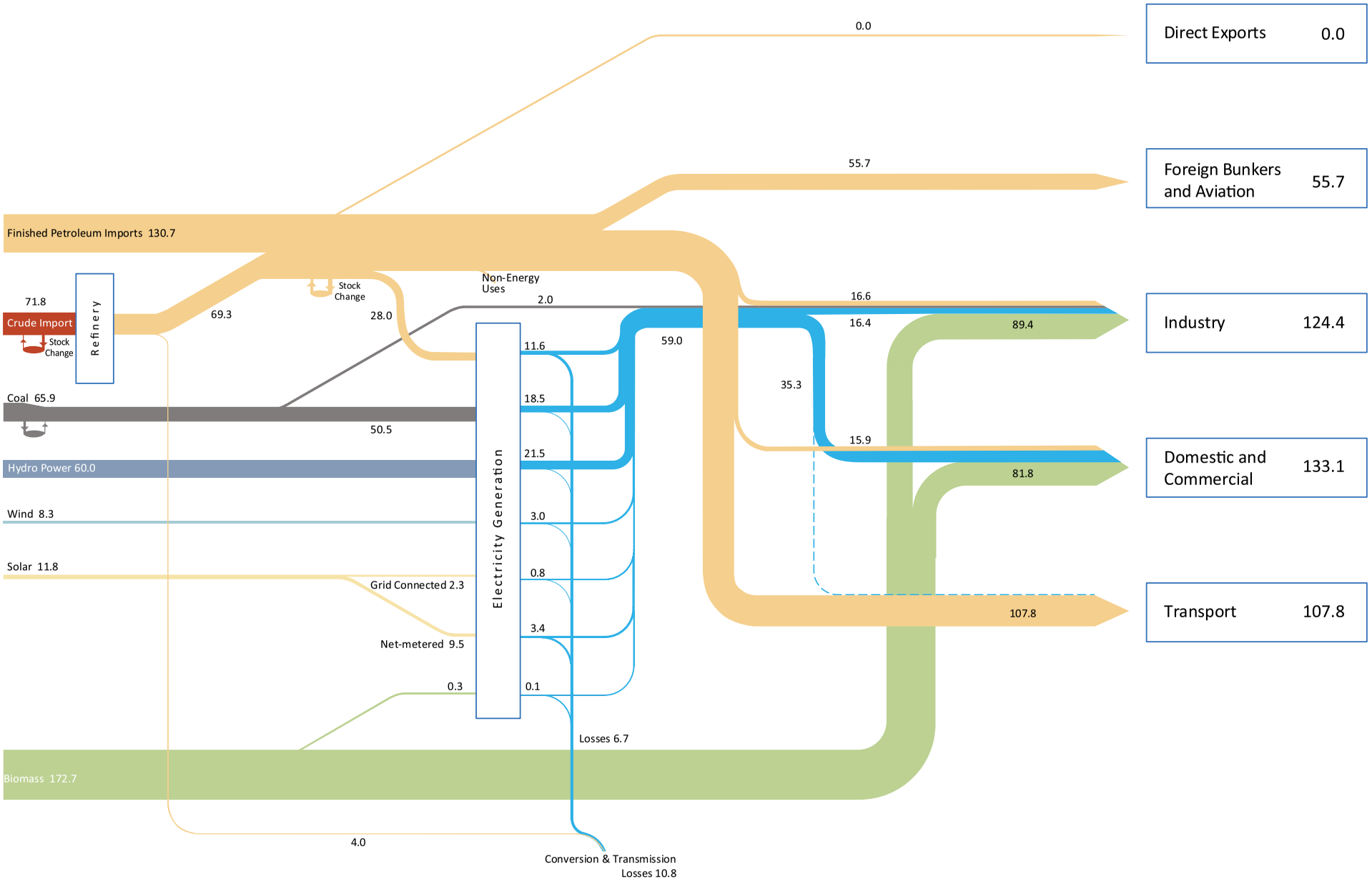


Figure 7.2 – Energy Flow Diagram - 2023 (PJ)

8 Energy and Economy

8.1 Electricity Sector Financial Performance

The year 2023 recorded a positive financial performance for the CEB. The return on assets (RoA) was negative for several consecutive years, but was 4.5% in 2023. The LECO recorded an improved financial performance with an RoA of 8.0%, compared with the previous year. Table 8.1 summarises the financial performance of CEB and LECO.

Table 8.1 – Financial Performance of CEB and LECO

	2010	2015	2020	2021	2022	2023
CEB						
Net assets in Operation (LKRM)	378,207	616,154	819,086	851,938	894,718	911,933
Return on assets (%)	0.1	2.0	(5.7)	(2.7)	(19.8)	4.5
LECO						
Net assets in Operation (LKRM)	8,420	10,911	13,675	14,180	14,972	18,953
Return on assets (%)	(1.9)	4.5	7.5	16.0	5.0	8.0

8.2 Financial Performance of the Petroleum Sector

8.2.1 Impact on Macro Economy

The average crude oil price (Brent price) stood at USD 82.22 per barrel in 2023, and recorded a 17% reduction compared to the Brent price in 2022 which stood at USD 99.06 per barrel. The net petroleum import bill was USD 4,965 million, a 3% decrease from the USD 5,131 million in 2022. With the demand for petroleum increasing over the past years, expenditure on oil imports as a percentage of non-petroleum exports stood at a staggering 38.9% in 2023. Table 8.2 shows the historic trends of the petroleum import costs.

Table 8.2 – Petroleum Import Costs and its Impact on the Macro Economy

million USD	2010	2015	2020	2021	2022	2023
Total Exports	8,626	10,546	10,047	12,499	13,106	11,911
Total Imports	13,451	18,935	16,055	20,637	18,291	16,811
Petroleum Imports	3,183	2,864	2,778	4,067	5,131	4,965
Petroleum Re-exports	263	374	374	506	568	539
Net Oil Imports	2,920	2,490	2,404	3,561	4,563	4,426
Non Petroleum Exports	8,363	10,172	9,673	11,993	12,538	11,372
Net Oil Imports as % of Non Petroleum Exports	34.9	24.5	24.9	29.7	36.4	38.9

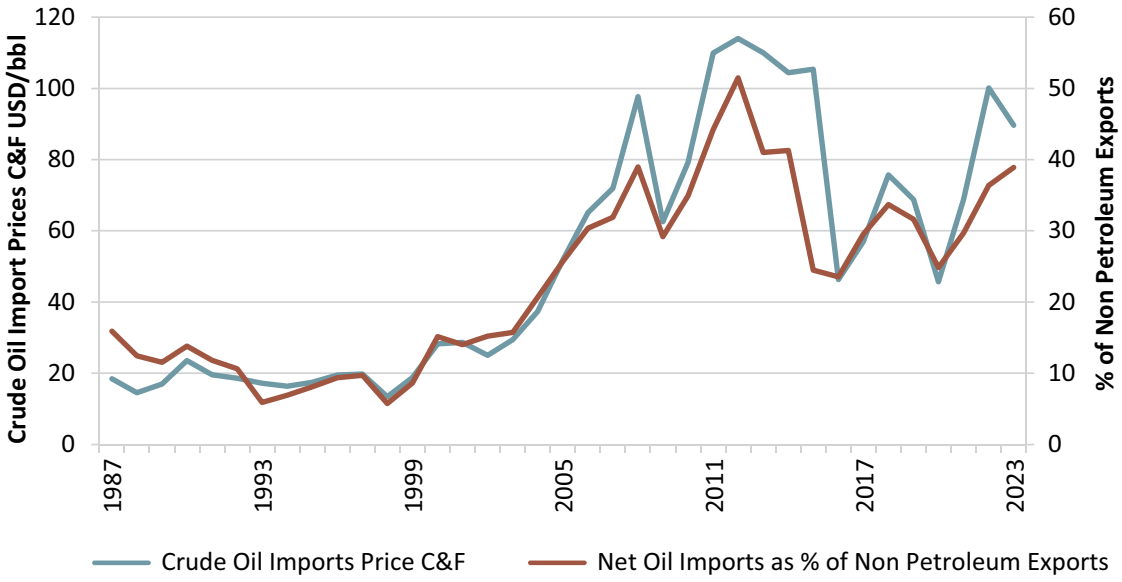


Figure 8.1 - Net Oil Imports as a Percentage of Exports

The impact of oil import bill on the national economy is clearly presented in the above graph, as the cost of net oil Imports as a percentage of all non-petroleum export earnings. This has two important points in history, first being in 1982, where it climbed to 44.8% and more recently in 2012 when it reached the highest ever value of 51.5%. This value for net oil imports as a percentage of non-petroleum exports climbed steadily over the consecutive years, declined in 2020, but rose sharply to 38.9% in 2023.

8.2.2 Petroleum Sector Financial Performance

Ceylon Petroleum Corporation (CPC) dominates the petroleum sector of the country. However, the role of Lanka Indian Oil Company (LIOC) and the LP Gas companies also have a reasonable bearing on the overall sector performance. Several bunkering companies were also active in the petroleum sector. a third player entered business in 2023, namely, Sinopec Energy Lanka (Private) Limited (SEL), which was registered in June 2023, and entered into an agreement with Board of Investment (BOI) on July. Sinopec Energy Lanka (Private) Limited, is a subsidiary of China's Sinopec, operates in Sri Lanka, importing and distributing fuel through a growing network of retail stations. In 2023, the SEL managed around 150 franchise and 50 new fuel stations, offering petroleum products and lubricants. Table 8.3 presents financial performance details of the CPC and LIOC.

Table 8.3 – CPC and LIOC Financial Performance

LKR million	2010	2015	2020	2021	2022	2023
CPC						
Total Revenue	277,084	423,741	530,877	613,732	1,193,288	1,343,193
Total Cost	(304,007)	444,422	528,506	695,548	1,808,341	1,222,846
BTT/GST/VAT	20,222	37,761	8,740	9,079	5,648	51,226
Income Tax	-	634	-	-	-	-
Cost of Sales	-	-	454,880	588,823	1,108,952	1,101,488
Crude & Product Import Cost	(265,604)	337,119	-	-	-	-
Estimated other Cost	(18,181)	68,908	64,886	97,647	696,263	70,132
Profit/ Loss	**(26,923)**	**(20,681)**	**2,371**	**(81,816)**	**(615,053)**	**120,347**
LIOC *						
Total Revenue	51,423	68,728	68,268	81,126	242,254	257,189
Total Cost	(49,376)	69,114	68,709	78,713	208,367	242,761
VAT, ESC, Debit,Payee & other taxes	(998)	134	42	44	1,122	304
Income Taxes	(17)	286	(60)	371	6,236	3,693
Import Duty	-	-	-	-	-	-
Product Cost	-	65,986	66,244	75,575	193,444	228,537
Estimated other costs	-	2,709	2,484	2,722	7,565	10,228
Profit/ Loss	**1,032**	**(386)**	**(441)**	**2,412**	**33,887**	**14,427**
LIOC *						
Total Revenue	-	-	-	-	-	40,687
Total Cost	-	-	-	-	-	38,173
VAT, ESC, Debit,Payee & other taxes	-	-	-	-	-	512
Duty	-	-	-	-	-	16,669
Estimated other costs	-	-	-	-	-	932
Profit/ Loss	-	-	-	-	-	**1,070**

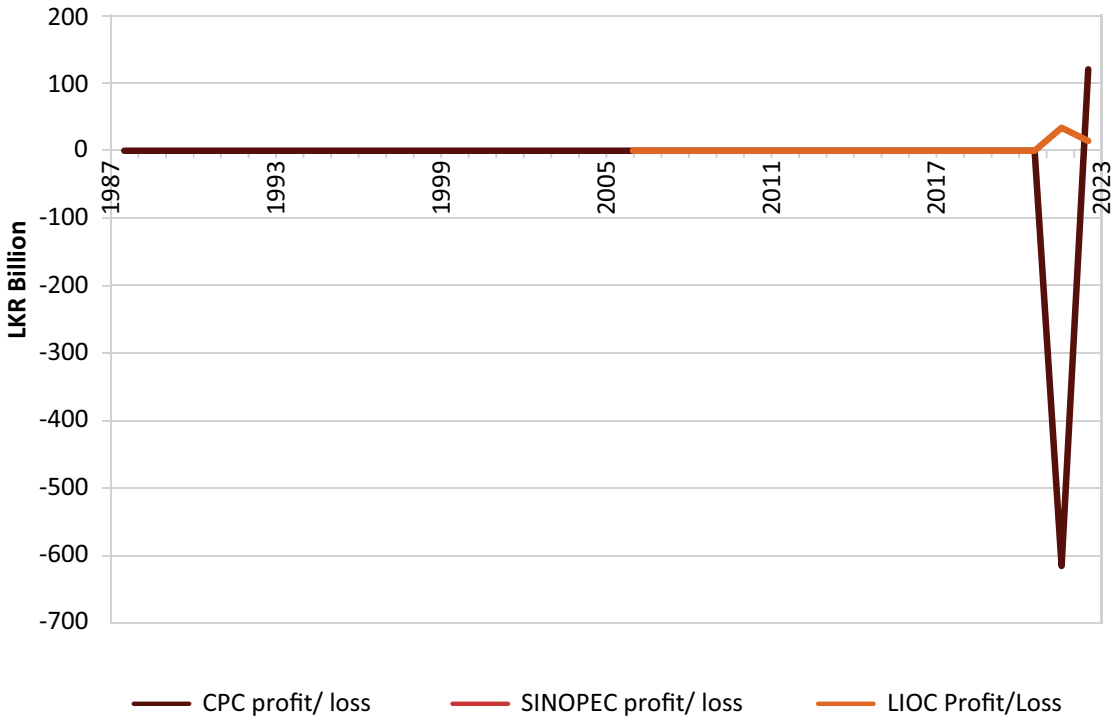


Figure 8.2 – Profit/Loss of CPC and LIOC

The CPC recorded a profit of LKR 120 billion in 2023, compared to the historical loss of LKR 615 billion in 2022.

8.3 Energy-Economy Indicators

Commercial energy (petroleum, electricity and coal) intensity is an indicator of a country's energy utilisation with respect to the national output (measured in terms of Gross Domestic Product-GDP). The commercial energy intensity decreased marginally from 0.40 TJ/GDP million LKR in 2022 to 0.39 TJ/GDP million LKR in 2023. This is attributable to the much lower economic output of the country and reduced demand for energy services from the population affected by the steep increase of prices.

Table 8.4 – Sri Lanka Energy Indices

	2010	2015	2020	2021	2022	2023
Electricity (TJ)	33,156.4	42,274.8	51,849.8	55,088.1	52,817.6	51,766.3
Petroleum (TJ)	125,958.2	171,363.1	154,818.4	177,921.2	143,234.6	142,231.1
Coal (TJ)	2,509.2	2,283.7	2,092.7	2,113.2	2,334.4	2,020.3
Total commercial energy (TJ)	**161,623.9**	**215,921.5**	**208,761.0**	**235,122.5**	**198,386.5**	**196,017.7**
GDP at 1982 factor cost prices (million LKR)	352,878	473,954	520,601	539,863	500,453	488,942
Commercial Energy Index	2.58	3.44	3.33	3.75	3.16	3.12
GDP Index (Index 1984=1.0)	3.38	4.54	4.99	5.17	4.79	4.68
Commercial Energy Intensity (TJ/LKR million)	**0.46**	**0.46**	**0.40**	**0.44**	**0.40**	**0.40**
Commercial Energy Intensity Index (1984=1.0)	0.76	0.71	0.67	0.72	0.66	1.66

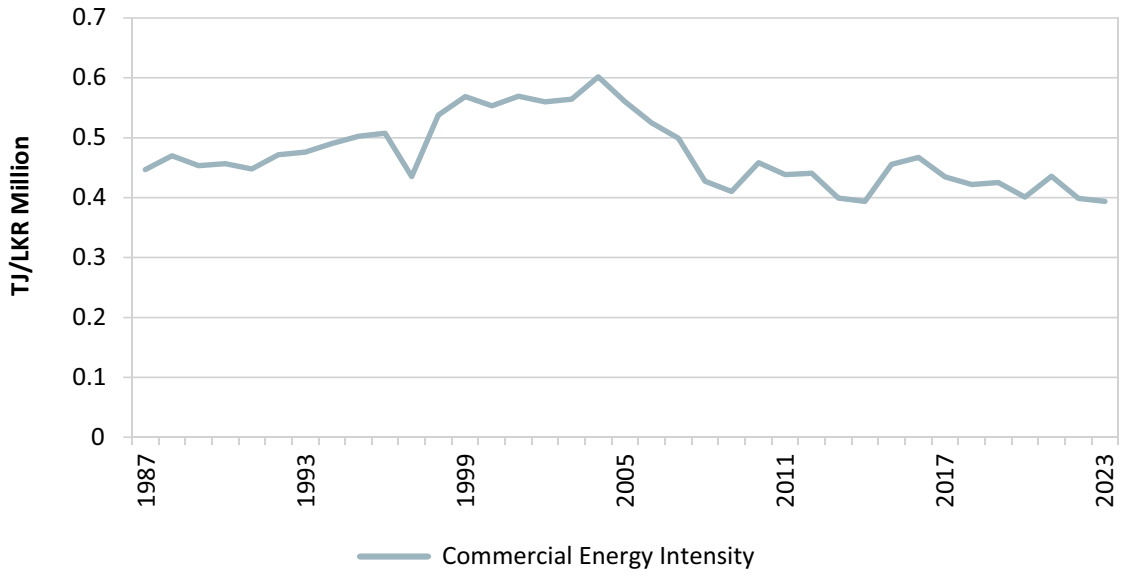


Figure 8.3 – Commercial Energy Intensity

9 Environmental Impacts

9.1 Grid Emission Factor

The 'Average Emission Factor (AEF)' is used mainly for reporting carbon footprint of electricity users. This emission factor is calculated by dividing the total emissions from the power sector from the total units of electricity used in the country in a given year. If the emission reductions due to any sustainable energy intervention are to be calculated, the appropriate emission factor would be the Grid Emission Factor (GEF).

Table 9.1 – Average Emission Factor

	2010	2015	2020	2021	2022	2023
Emission Factor (kg CO_2/kWh)	0.3158	0.4753	0.5309	0.4357	0.4173	0.4242

The survey on the usage of electrical appliances in the residential sector conducted in 2019 also provided an insight to the usage of cooking energy fuels. The survey found out that the cooking energy sphere is dominated by three cooking fuels, and based on this preliminary data, the emissions from cooking in the residential and commercial sector were estimated, using IPCC emission factors. The results for 2023 are given in Table 9.2.

Table 9.2 – CO_2 Emissions from Cooking in the Domestic and Commercial Sector

Fuel (kt per annum)	2023
Fuel wood	2,080
LPG	320
Kerosene	5

The GEF indicates the amount of CO_2 avoided, if a specific intervention is made either through the introduction of a renewable energy project to a grid or through the introduction of an energy saving project in the grid. The GEF also represents the quantity of CO_2 emitted by a power system during a year. The GEF pivots on three factors, *viz*., Operating Margin, Build Margin and Combined Margin. 'Margin' refers to the happenings of renewable energy based power or an energy saving project.

The Grid Emission Factor for 2023 was calculated using the Methodological Tool 07 'Tool to calculate the emission factor for an electricity system' (Version 07.0).

9.1.1 Operating Margin

The Operating Margin (OM) is a concept which includes all power plants which can have reduced outputs due to a project. It specifically excludes 'low cost, must run' power plants, implying that with or without the project, such generation will continue. Table 9.3 gives the Simple Operating Margin (OM).

Table 9.3 – Operating Margin

	2020	2021	2022	2023
Emissions from Power Plants (t-CO_2)	2,960,912	1,908,745	1,642,648	2,154,970
Net Electricity Generation (GWh) excluding low-cost must run power plants	4,179.3	2,498.4	2,464.5	3,132.3
Operating margin CO_2 emission factor (kg-CO_2/kWh)				
Three-year generation based weighted average	0.7084	0.7208	0.7123	0.7049

9.1.2 Build Margin

The Build Margin (BM) is a concept which attempts to foretell the happenings of a generation system in future, during the crediting period of a project, considering the recent additions to a generation system.

Table 9.4 – Build Margin

	Unit	2020	2021	2022	2023
Emissions of power plants considered for the BM	tonnes of CO_2	4,111,940.3	3,922,524.3	3,290,087.8	3,235,173.3
Generation of power plants considered for the BM	GWh	5,381.3	5,863.0	5,632.3	5,233.2
Build margin emission factor	kg-CO_2/kWh	0.7641	0.6690	0.5841	0.6182

9.1.3 Combined Margin

The Combined Margin (CM) is a weighted average of OM and BM and is commonly known as the Grid Emission Factor (Table 9.5).

Table 9.5 – Combined Margin (kg-CO_2/kWh)

	2015	2020	2021	2022	2023
For solar, wind Projects	0.7663	0.7224	0.7079	0.6803	0.6832
All other Projects; 1st crediting period	0.8429	0.7363	0.6949	0.6482	0.6616
All other Projects; 2nd - 3rd crediting period	0.9195	0.7502	0.6820	0.6162	0.6399

The OM, BM and CM are required for the assessment of CO_2 emission reductions for projects claiming carbon credits under UNFCC guidelines. The GEF is indicated in Figure 9.1.

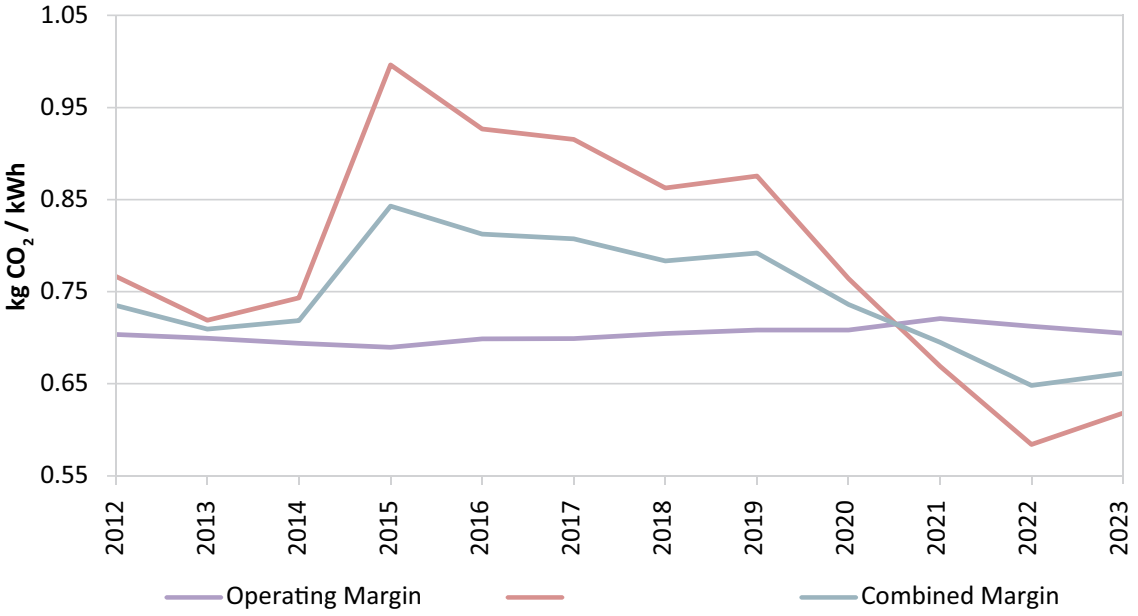


Figure 9.1 – Grid Emission Factors

The emission of CO_2 from power plants are depicted in Figure 9.2. The emission of CO_2 per kWh decreased in 2023 owing mainly to fuel supply shortages in power generation and load shedding.

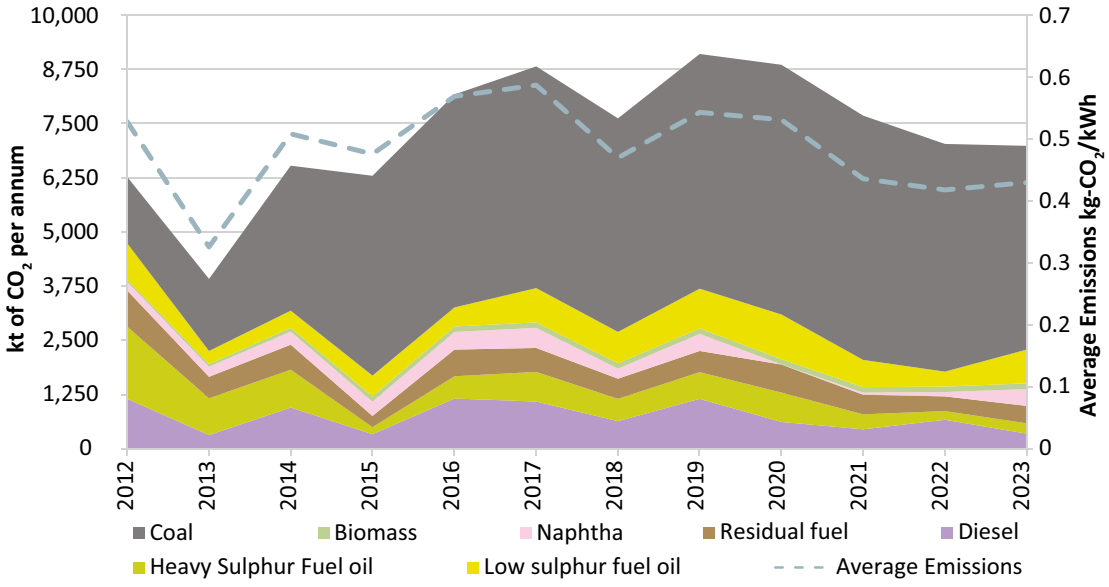


Figure 9.2 – Emissions from Power Plants by Type of Fuel

10 Energy Sector Performance and Future Outlook

The energy sector of the country faced many challenges in the year 2023 recovering from the economic crisis of 2022.The severity of the energy crisis subsided in the second half of 2022 and this favourable trend continued throughout the year 2023. The QR code based fuel rationing system for transport fuel supply was officially ended on 2023 September 01 as the government was confident about the foreign exchange situation and the regained balance of supply and demand for petroleum fuels. Domestic retail prices of petroleum products were revised several times in 2023, based on a pricing formula introduced in May 2022. Electricity tariffs were also revised upward twice in February and October, and downward once in July 2023.

Improvements that took place in 2023 in the financial performance of CPC and CEB have helped reduce the burden on the fiscal sector to some extent. The improved financial performance in these key State Owned Enterprises (SOEs), however, reduced their excessive reliance on the financial system. Further, the Government's commitment to the continued implementation of cost-reflective pricing along with continued reforms towards diversification, improved competition, and transparency across the power and energy sectors is deemed important in preventing future crises in these sectors in the future.

10.1 Electricity

EElectricity generation decreased by 3.4% in 2023, compared with the generation of 2022 recording the total generation in 2023 as 16,448.8 GWh. The generation from major hydro was 4,592.5 GWh in 2023, which recorded a decrease of 15% compared with the generation of 2022. The generation from coal was 5,150.8 GWh in 2023, which marked a decrease of 10%, while the generation from oil was 3,232.8 GWh in 2023, which marked an increase of 29%.

The share of power generated by the CEB stood at 75% in 2023, while the balance was provided by IPPs, new renewable energy plants and micro power producers. The daily scheduled power cuts that commenced in February 2022 were phased out by mid-February 2023. These power cuts were undertaken as a demand management strategy amidst fuel and coal shortages on account of foreign exchange scarcity and the poor reservoir levels, but were phased out with the sufficient availability of thermal sources for electricity generation. The electricity generation therefore, decreased by 3.4% in 2023 compared with 2022, reflecting the weak energy demand in the economy, stemming from the combined impact of cost-reflective electricity tariffs and subdued economic activity. The power sector faced pressures during the second and third quarters of 2023 due to the delayed onset of the South-West monsoon. This resulted in an increased usage of expensive thermal sources for electricity generation. This negative trend, however, reversed towards the end of the third quarter of 2023, with improved reservoir levels amidst unusually high rainfall reported from the latter part of September 2023.

The cost-reflective pricing in electricity resulted in improvements in the financial performance of CEB. In 2023, the Government established a semi-annual tariff revision mechanism to address the financial woes of CEB through cost-reflective pricing. Further, owing to the volatility in the generation mix, electricity tariffs were revised three times during the year, with two upward revisions in February and October, and a downward revision in July 2023. Accordingly, the average electricity tariff was revised upward by around 66% and 18%, respectively, in February and October 2023, while it was revised downward by around 14% in July 2023. Based on these developments, the Government also decided to reduce the tariff revision cycle to three months, commencing from the first quarter of 2024.

Accordingly, electricity sales too, decreased by 2% in 2023, compared with 2022. Sales in the residential sector alone, contracted by 10% followed by 5% in religious places. The decrease in sales in the industrial sector was marginal (0.5%). The sales in commercial sector however, increased by 8%.

Regular tariff revisions contributed to a notable improvement in CEB's cash flow, leading to a sizeable profit of LKR 61.2 billion in 2023, subsequent to recording continuous losses for nearly seven years since 2016. This improved financial performance of CEB in 2023 was also supported by the increased share of hydro in total generation, particularly in the latter part of 2023.

The Government initiated several policy measures to reform the power sector with a view to improving its competitiveness and efficiency to cater to emerging demand. Amid the ongoing reforms of State Owned Enterprises (SOEs), the proposed new legislation for the power sector is expected to catalyse necessary reforms within the sector, thereby paving the way for an efficient and financially viable sector that will ensure energy security. The Government's commitment to diversify energy sources and expand generation capacity, especially through new renewable energy initiatives, is expected to facilitate 70% in renewable energy by 2030.

10.1.1 New Renewable Energy Development

Power generation in the NRE sector increased by 6% in 2023, compared with 2022. The generation of NRE projects and the wind plant of the CEB in 2023 was 2,129.9 GWh and 397.4 GWh, respectively. The NRE generation increased from 2,060 GWh in 2022 to 2,130 GWh in 2023, while the generation of the utility owned wind power plant increased from 362 GWh to 397 GWh. Out of the NRE generation technologies, mini hydro power plants contributed the highest percentage by adding 71% to the generation, which was followed by solar and wind (12% each).

Capacity additions of NRE technologies increased from 744 MW in 2022 to 770 MW in 2023. The capacity of the utility owned wind power plant remained unchanged at 103.5 MW.

In addition to these developments in the NRE industry, solar rooftop schemes resulted in a cumulative addition of 810 MW to the national grid, generating 945 GWh in 2023. Approximately 55,004 systems were connected to the grid by end-2023.

10.2 Petroleum

Global crude oil prices recorded declines in 2023, compared with 2022. However, although geopolitical tensions exerted upward price pressures during the latter part of the year, the overall downward trend in global prices of crude oil in 2023, coupled with the appreciation of the Sri Lanka rupee translated into lower domestic prices of petroleum products, compared to 2022. Accordingly, the average Brent crude oil price decreased by 17% to 82.22 USD per barrel in 2023 from 99.06 USD per barrel in 2022. In accordance with the decline in global crude oil prices, the annual average import price of crude oil of the CPC decreased to 89.60 USD per barrel in 2023, while the gradual appreciation of the Sri Lanka rupee also supported the decline in import prices in rupee terms. Throughout the year, monthly adjustments were made to domestic prices of petroleum products in line with the cost-reflective pricing formula.

The sale volumes of domestic petroleum products recorded a year-on-year growth of 7.1% in 2023. Sales increased in 2023, reflecting the gradual restoration of economic activity and the increased accessibility

to fuel with the improved foreign currency liquidity status. Moreover, with the abatement of supply constraints, the Government took measures to relax demand management strategies, which were in place since mid-2022, by increasing the weekly quotas under the National Fuel Pass QR code system, in April and May, before being ended in September.

The implementation of the cost-reflective pricing formula rendered an improved financial position for the CPC, recording a profit of LKR 120.3 billion in 2023, compared with the staggering loss of LKR 615 billion recorded in 2022. Further, the Government decided to transfer government guaranteed foreign currency debt stock of CPC amounting to around USD 2.5 billion to the Government balance sheet as a measure to improve the financial viability of CPC. The CPC's outstanding trade receivables from Government entities decreased by LKR 206.0 billion to stand at LKR 17.7 billion by December 2023, with the restructuring of the CPC's trade debt receivables from the Sri Lankan Airlines (SLA) and the CEB in December 2023. Meanwhile, the settlement of dues from SLA and CEB enabled CPC to settle its liabilities in relation to the Indian credit line by end December 2023.

Several reforms were undertaken in 2023 to liberalise the domestic petroleum market with the view of improving the competitiveness and efficiency of the petroleum sector in Sri Lanka. Apart from the CPC and the LIOC, a third player, Sinopec Energy Lanka (Private) Limited (SEL), entered into business in July 2023.

Under the new arrangement, retail prices of petroleum products sold by the CPC, which were determined by the Ministry of Power and Energy through the cost-reflective pricing formula, served as a ceiling price in the market and new suppliers determined their prices subject to the same.

Annex I

Independent Power Producers (IPPs)

Starting from 1997, many IPPs entered the electricity market, supplying electricity to the national grid. CEB has separate power purchase agreements with these private sector companies.

1. ACE Power Embilipitiya (Pvt) Ltd
2. ACE Power Matara (Pvt) Ltd
3. Yughadhanavi (Pvt) Ltd

Small Power Producers

Many new small power producers came into existence as a result of the attractive tariffs offered by the CEB and the lending facilities provided by the RERED project. A total of 280 SPPs were operational by the end of 2022. CEB has signed Standardised Small Power Purchase Agreements (SPPAs) with these companies.

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
1	Dick Oya	1996	0.96	2.2
2	Seetha Eliya	1996	0.07	0.4
3	Ritigaha Oya	1997	-	-
4	Rakwana Ganga	1999	0.76	2.0
5	Kolonna	1999	0.78	1.6
6	Ellapita Ella	1999	0.55	2.1
7	Carolina	1999	2.50	11.7
8	Weddamulla	1999	-	-
9	Delgoda	2000	2.65	12.1
10	Mandagal Oya	2000	1.28	3.0
11	Glassaugh	2000	2.53	6.5
12	Minuwnella	2001	0.64	2.1
13	Kabaragala	2001	1.50	4.3
14	Bambarabatu Oya	2001	3.20	14.1
15	Galatha Oya	2001	1.20	2.7
16	Hapugastenna I	2001	4.60	27.1
17	Belihuloya	2002	2.50	8.6
18	Watawala (Carolina II)	2002	1.30	4.0
19	Niriella	2002	3.00	10.4
20	Hapugastenna II	2002	2.30	10.7
21	Deyianwala	2002	1.50	3.3
22	Hulu Ganga 1	2003	6.50	19.8
23	Ritigaha Oya -II	2003	0.80	2.9
24	Sanquhar	2003	1.60	4.4

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
25	Karawila Ganga	2004	0.75	2.6
26	Brunswic	2004	0.60	0.3
27	Sithagala	2004	0.80	3.1
28	Way Ganga	2004	8.93	23.4
29	Alupola	2004	2.52	11.8
30	Rathganga	2004	3.00	13.8
31	Waranagala	2004	9.90	41.9
32	Nakkawita	2004	1.01	1.3
33	Walakada	2004	4.21	17.4
34	Miyanawita Oya	2004	0.60	1.6
35	Atabage Oya	2004	2.20	4.7
36	Batalagala	2004	0.10	0.2
37	Hemingford	2005	-	-
38	Kotapola	2005	0.60	2.2
39	Wee Oya	2005	6.00	26.0
40	Radella	2005	0.20	0.4
41	Kumburuteniwela	2005	2.80	7.6
42	Asupini Ella	2005	4.00	15.5
43	Kalupahana	2005	0.80	2.6
44	Upper Korawaka	2005	1.50	4.6
45	Badalgama (Biomass)	2005	1.00	0.8
46	Delta Estate	2006	1.60	5.5
47	Gomala Oya	2006	0.80	4.2
48	Gurugoda Oya	2006	4.45	13.3
49	Coolbawan	2006	0.75	2.0
50	Henfold	2006	2.60	7.5
51	Dunsinane	2006	2.70	9.7
52	Nilambe oya	2006	0.75	1.2
53	Kolapathana	2006	1.10	1.6
54	Guruluwana	2006	2.00	8.8
55	Kuda Oya	2006	2.00	6.7
56	Labuwewa	2006	2.00	6.1
57	Forest Hill	2006	0.30	0.4
58	Batatota	2007	-	-
59	Kehelgamu oya	2007	3.00	10.6
60	Kotankanda	2007	0.15	0.5
61	Lower Neluwa	2007	1.45	3.6
62	Barcaple	2008	2.00	0.1
63	Kadawala 1	2008	4.85	10.5
64	Blackwater	2008	1.65	0.2
65	Koswatta ganga	2008	2.00	1.3
66	Kadawala ii	2008	1.32	3.4

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
67	Loggal oya	2008	4.00	8.7
68	Manelwala	2008	2.40	5.0
69	Somerset	2008	0.80	2.7
70	Sheen	2008	0.56	1.8
71	Palmerston	2008	0.60	1.9
72	Giddawa	2008	2.00	5.5
73	Magal ganga	2008	9.93	37.4
74	Soranathota	2008	1.40	2.7
75	Tokyo	2008	10.00	23.7
76	Lower Atabage	2009	0.45	0.6
77	Halathura Ganga	2009	1.30	4.4
78	Nugedola	2009	0.50	1.0
79	Pathaha Oya	2009	5.80	3.3
80	Badulu Oya	2009	1.00	22.2
81	Amanawala	2009	1.00	3.9
82	Adavikanda	2009	6.50	20.4
83	Bogandana	2009	3.00	13.1
84	Gangaweraliya	2009	0.30	1.2
85	Watakella	2010	1.00	4.9
86	Ganthuna Udagama	2010	1.20	3.6
87	Aggra Oya	2010	1.50	3.7
88	Mampury I	2010	10.00	22.8
89	Seguwanthivu	2010	10.00	19.8
90	Vidatamunai	2010	10.00	19.7
91	Willpita	2010	0.85	0.2
92	Denawak Ganga	2011	1.40	6.8
93	Maduru Oya	2011	5.00	17.9
94	Laymasthota	2011	1.30	3.3
95	Kalupahana Oya (Pahala)	2011	1.00	4.2
96	Bowhill	2011	1.00	4.1
97	Kirkoswald	2011	4.00	18.1
98	Kiriwan Eliya	2011	4.65	14.6
99	Gnnoruwa - II	2011	0.50	0.1
100	Thiruppane	2011	0.12	0.0
101	Gnnoruwa - I	2011	0.74	0.9
102	Nirmalapura	2011	10.00	30.2
103	Watawala B	2012	0.44	1.8
104	Denawak Ganga MHP	2012	7.20	28.0
105	Waltrim	2012	2.00	5.6
106	Branford	2012	2.50	9.1
107	Upper Ritigaha Oya	2012	0.64	2.1
108	Koladeniya	2012	1.20	5.7

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
109	Upper Magalganga	2012	2.40	6.8
110	Kokawita MHP I	2012	1.00	3.1
111	Upper Hal Oya	2012	0.80	1.6
112	Kalugala Pitawala	2012	0.80	0.8
113	Bambarabotuwa MHP III	2012	4.00	13.3
114	Nandurana Oya	2012	0.35	0.7
115	Kaduruwan Dola Athuraliya	2012	0.02	-
116	Barcaple Phase II	2012	4.00	17.7
117	Bopekanda	2012	0.35	1.5
118	Falcon Valley	2012	2.40	5.1
119	Indurana	2012	-	-
120	Punagala	2012	3.00	10.8
121	Ambewala	2012	3.00	2.3
122	Madurankuliya	2012	10.00	35.7
123	Uppudaluwa	2012	10.00	9.7
124	Kalpitiya	2012	9.80	22.2
125	Green Energy	2013	0.25	1.3
126	Rakwana Ganga	2013	1.00	4.2
127	Wembiyagoda	2013	1.30	5.8
128	Pathanahenagama	2013	1.80	1.4
129	Wellawaya	2013	1.20	4.2
130	Lenadora	2013	1.40	6.1
131	Mulgama	2013	2.80	9.1
132	Rajjammana	2013	6.00	31.1
133	Kandadola	2013	0.18	0.6
134	Waverly	2013	1.20	3.9
135	Bambatuwa Oya	2013	3.00	7.6
136	Baharandah	2013	0.36	0.8
137	Gampola	2013	1.00	1.0
138	Gonagamuwa	2013	0.75	1.6
139	Kadurugaldora	2013	1.20	4.7
140	Werapitiya	2013	2.00	5.9
141	Madugeta	2013	2.50	9.9
142	Malpel	2013	0.01	-
143	Dunsinane cottage	2013	0.90	1.5
144	Mile Oya	2013	1.20	3.4
145	Maduru Oya 2	2013	2.00	7.0
146	Mul Oya	2013	3.00	5.1
147	Embilipitiya (Dendro)	2013	-	-
14	Ermbukkudal	2013	4.80	12.3
149	Stellenberg	2014	1.00	3.0
150	Devituru	2014	1.20	4.1

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
151	Bulathwaththa	2014	3.80	9.7
152	Ranmudu Oya	2014	0.50	1.7
153	Ninthaur	2014	-	-
154	Bathalayaya	2014	5.00	34.74
155	Mampury II	2014	10.00	20.4
156	Mampury III	2014	10.00	25.4
157	Monaraella MHP	2014	1.80	6.3
158	Lower Kotmale Oya MHP	2014	4.30	16.6
159	Gammaduwa MHP	2014	0.90	3.2
160	Ritigaha Oya MHP - I	2014	0.40	2.3
161	Ross Estate MHP	2014	4.55	16.6
162	Maa Oya MHP	2014	2.00	4.1
163	Maha Oya MHP	2014	3.00	7.1
164	Bowhill MHP	2014	0.60	1.2
165	Kudawa Lunugalahena	2014	0.05	0.1
166	Puloppalai	2014	10.00	32.1
167	Vallimunai	2014	10.00	34.8
168	Musalpetti I	2015	10.00	23.8
169	Owala	2015	2.80	13.0
170	Naya Ganga	2015	1.60	7.5
171	Rideepana	2015	1.75	6.4
172	Thebuwana	2015	0.80	2.9
173	Maduru Oya II	2015	0.60	2.6
174	Demodara	2015	1.00	3.1
175	Lower Atabage Oya II	2015	1.25	3.1
176	Kehelwatta	2015	1.00	4.5
177	Theberton	2015	1.30	3.1
178	Ranmudu Oya	2015	0.55	1.6
179	Andaradeniya	2015	0.80	2.8
180	Jannet Valley	2015	0.95	2.1
181	Gawaragiriya MHP	2016	0.99	3.6
182	Samanalawewa MHP	2016	1.20	6.2
183	Upper Lemastota MHP	2016	1.00	3.1
184	Kurundu Oya Ella MHP	2016	4.65	14.9
185	Maskeli Oya MHP	2016	2.00	6.4
186	Hittaragewela MHP	2016	0.46	0.7
187	Ginigathhena Thiniyagala MHP	2016	0.80	1.2
188	Dolekanda MHP	2016	0.35	1.5
189	Gomale Oya	2016	1.40	2.8
190	Mawanana	2016	4.30	18.1
191	Ethamala Ella MHP	2016	2.00	11.5
192	Upper Waltrim MHP	2016	2.60	9.2

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
193	Urubokka MHP	2016	1.00	4.2
194	Ebbawala MHP	2016	4.00	11.3
195	Hulkiridola MHP	2016	0.75	2.3
196	Dambulu Oya MHP	2016	3.25	11.9
197	Saga (Baruthankanda)	2016	10.00	15.4
198	Solar One Ceylon Power	2016	10.00	19.1
199	Loluwagoda DPP	2016	-	-
200	Kiruwana Ganga MHP	2017	0.63	2.3
201	Ruhunu MHP	2017	0.35	0.9
202	Winsor Forest MHP	2017	0.40	1.7
203	Nahalwathura MHP	2017	0.40	2.2
204	Hapugahakumbura MHP	2017	1.60	5.1
205	Padiyapelella MHP	2017	3.50	14.3
206	Moragaha Oya MHP	2017	1.50	5.2
207	Campion MHP	2017	1.00	3.2
208	Demodara MHP	2017	1.60	7.7
209	Berannawa MHP	2017	0.50	1.3
210	Loggal Oya DPP	2017	2.00	9.4
211	Iris (Baruthankanda) SPP	2017	10.00	17.6
212	Anorchi Lanka (Baruthankanda) SPP	2017	10.00	17.6
213	Nedunkulam SPP	2017	10.00	20.3
214	Udawela MHP	2018	1.40	3.7
215	Mossville Estate MHP	2018	0.90	3.6
216	Loggal Oya MHP - Phase I	2018	1.60	5.2
217	Bambarapana MHP	2018	2.50	11.5
218	Manakola MHP	2018	2.50	8.9
219	Moragahakanda Phase I	2018	10.00	21.2
220	Moragahakanda Phase II	2018	7.50	3.4
221	Muruten Ela MHP	2018	0.50	1.3
222	Moragahakanda Phase III	2018	7.50	27.1
223	Polgaswaththa MHP	2018	0.30	2.3
224	Maliyadda MHP	2018	0.90	0.8
225	Ankanda MHP	2018	6.50	31.4
226	Thannewatha MHP	2018	1.00	2.2
227	Ranwala Oya MHP	2018	0.70	3.6
228	Binathura Ela MHP	2018	0.70	1.7
229	Panamure DPP	2018	-	-
230	Kalawa Aragama DPP	2018	-	-
231	Loinorn MHP	2019	1.00	3.2
232	Koswathu Ganga MHP	2019	3.00	15.2
233	Elgin MHP	2019	2.40	5.8

List of Small Power Producers

hydro solar biomass/dendro wind waste heatt

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
234	Denipalle Oya MHP	2019	0.75	2.2
235	Deegalahinna Cascade II MHP	2019	0.55	0.5
236	Loggal Oya MHP	2019	1.35	3.2
237	Upper Hulu Ganga MHP	2019	1.90	5.3
238	Marukanda MHP	2019	1.80	5.7
239	Ganthuna MHP	2019	1.30	1.9
240	Kitulgala MHP	2019	1.00	4.4
241	Beramana MHP	2019	1.20	5.9
242	Dehiattakandiya DPP	2019	3.00	24.6
243	Vavuniya 2 SBSPII SPP	2019	1.00	1.8
244	Vavuniya 3 SBSPII SPP	2019	1.00	1.8
245	Beliatta 1 SBSPII SPP	2019	1.00	1.4
246	Embilipitiya 2 SBSPII SPP	2019	1.00	1.4
247	Embilipitiya 3 SBSPII SPP	2019	1.00	1.4
248	Pallekelle 1 SBSPII SPP	2019	1.00	1.7
249	Koskulana	2020	0.60	2.2
250	Halgran Oya MHP	2020	2.00	3.8
251	Chunnakam I	2020	10.00	38.8
252	Chunnakam II	2020	10.00	38.6
253	Pannala I	2020	1.00	1.4
254	Mathugama I	2020	1.00	1.4
255	Anuradhapura 2	2020	1.00	1.4
256	Anuradhapura 3	2020	1.00	1.4
257	Panadura I SBSP II	2020	1.00	1.4
258	Vaunia I	2020	1.00	1.4
259	Embilipitiya I	2020	1.00	1.4
260	Maho 2 SBSP II	2020	1.00	2.2
261	Maho 3 SBSP II	2020	1.00	2.2
262	Ampara I SBSP II	2020	1.00	1.5
263	Mathugama I SBS II 90	2020	1.00	1.5
264	Mathugama I SBS II 91	2020	1.00	1.8
265	Ampara 2 SBSP II	2020	1.00	1.5
266	Mahiyanganaya 1	2020	1.00	2.1
267	Mahiyanganaya 2	2020	1.00	2.1
268	Mahiyanganaya 3	2020	1.00	2.1
269	Galle 2 SBS II 90	2020	1.00	1.7
270	Galle 3 SBS II 91	2020	1.00	1.7
271	Colombo Waste to Energy Waste (Municipal) PP	2020	10.00	72.8
272	Deduru Oya MHP	2021	2.00	3.9
273	Karapalagama MHP	2021	2.00	7.0

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
274	Madapitiya MHP	2021	0.60	2.4
275	Polonnaruwa 1 SBSPII SPP	2021	1.00	2.0
276	Horana 2 SBSPII SPP	2021	1.00	1.3
277	Horana 3 SBSPII SPP	2021	1.00	1.3
278	Mathugama 2 SBSII(90) SPP	2021	1.00	1.6
279	Anuradhapura 1 SBSPII SPP	2021	1.00	1.5
280	Kilinochchi 1 SBSPII SPP	2021	1.00	2.3
281	Kilinochchi 2 SBSPII SPP	2021	1.00	2.3
282	Kilinochchi 3 SBSPII SPP	2021	1.00	2.3
283	Mathugama I SBS II 90	2020	1.00	1.6
284	Mathugama I SBS II 91	2020	1.00	1.7
285	Ampara 2 SBSP II	2020	1.00	1.7
286	Mahiyanganaya 1	2020	1.00	0.5
287	Mahiyanganaya 2	2020	1.00	1.4
288	Mahiyanganaya 3	2020	1.00	1.2
289	Galle 2 SBS II 90	2020	1.00	1.4
290	Galle 3 SBS II 91	2020	1.00	1.7
291	Valachchenai 2 SBSPII SPP	2021	1.00	1.7
292	Valachchenai 3 SBSPII SPP	2021	1.00	1.8
293	Monaragala 2 SBSPII SPP	2021	1.00	1.3
294	Monaragala 3 SBSPII SPP	2021	1.00	1.4
295	Galle 1 SBSII (90) SPP	2021	1.00	1.8
296	Beliatta 3 SBSII (90) SPP	2021	1.00	1.5
297	Maho 1 SBSII (90) SPP	2021	1.00	1.7
298	Beliatta 1 SBSII (90) SPP	2021	1.00	1.4
299	Anuradhapura 2 SBSII(90) SPP	2021	1.00	1.6
300	Habarana 3 SBSII(90) SPP	2022	1.00	1.8
301	Pannala 1 SBSII(90) SPP	2022	1.00	1.6
302	Anuradhapura 3 SBSII(90) SPP	2022	1.00	1.8
303	Anuradhapura 4 SBSII(90) SPP	2022	1.00	1.7
304	Pallekele 4 SBSII(90) SPP	2022	1.00	1.3
305	Pallekele 5 SBSII(90) SPP	2022	1.00	1.5
306	Maho 5 SBSII(90) SPP	2022	1.00	1.5
307	Maho 6 SBSII(90) SPP	2022	1.00	1.5
308	Maho 7 SBSII(90) SPP	2022	1.00	1.6
309	Pallekele 1 SBSII(90) SPP	2022	1.00	1.4
310	Mahiyanganaya 2 SBSII(90) SPP	2022	1.00	1.5
311	Mahiyanganaya 3 SBSII(90) SPP	2022	1.00	1.5
312	Mahiyanganaya 4 SBSII(90) SPP	2022	1.00	1.5
313	Mahiyanganaya 5 SBSII(90) SPP	2022	1.00	1.5

List of Small Power Producers

hydro solar biomass/dendro wind waste heat

	Name of Power Plant	Yr commissioned	Capacity (MW)	Generation (GWh)
314	Mahiyanganaya 6 SBSII(90) SPP	2022	1.00	1.5
315	Mahiyanganaya 7 SBSII(90) SPP	2022	1.00	1.5
316	Horana 1 SBSPII SPP	2022	1.00	1.5
317	Pallekele 2 SBSII(90) SPP	2022	1.00	1.1
318	Pallekele 3 SBSII(90) SPP	2022	1.00	1.1
319	Vavunathivu SPP	2022	10.00	19.5
320	Pannala 2 SBSII(90) SPP	2022	1.00	1.6
321	Pannala 4 SBSII(90) SPP	2023	1.00	1.2
322	Pannala 5 SBSII(90) SPP	2023	1.00	1.2
323	Vavuniya 5 SBSII(90) SPP	2023	1.00	1.4
324	Vavuniya 4 SBSII(90) SPP	2023	1.00	1.4
325	Horana 2 (2019/001/C-150) SPP	2023	2.00	2.0
326	Upper Rathganga II	2023	1.00	2.9
327	Diggala	2023	4.40	11.7
328	Mannar 1 (2019/002/C-60)	2023	10.00	28.2
329	Mannar 2 (2019/002/C-60)	2023	5.00	9.8
330	Ethimale Madugama Co-Generation PP	2023	4.00	0.6
Total			**751.32**	**2,198.7**

Litro Gas Lanka Limited

Liquefied Petroleum Gas (LPG) industry was privatised in 1995, when Shell Gas purchased a stake in the previously Government-owned Gas Company, under a five-year concession. Over 1995-2000, Shell Gas purchased LPG available in the CPC refinery and also imported LPG, and marketed in Sri Lanka. The monopoly status ended in late 2000. The Company markets LPG to all customer segments, in all provinces of the country.

The full ownership of Shell Gas Lanka (Pvt) Ltd was handed over to the Government in November 2010, forming Litro Gas Lanka Limited (LGLL). Sri Lanka depends on imported LPG to bridge the growing gap between demand and the limited local production by Ceylon Petroleum Corporation's (CPC) Refinery in Sapugaskanda. To meet this demand, the Government also took steps to purchase the Shell owned LPG Storage Terminal situated in Kerawalapitiya. The LPG Storage Terminal was re-named Litro Gas Terminal Lanka (Private) Limited (LGTLL). Litro Gas also owns a modernised LPG bottling plant situated in Mabima, Sapugaskanda which is one of the largest in the region and a fleet of modernised LPG tanker trucks.

LAUGFS Gas PLC

Established in the year 1995, LAUGFS Holdings is a Sri Lankan diversified business conglomerate covering most of the commercial spectrum of industries. LAUGFS Gas PLC is a subsidiary of Laugfs Holdings Limited. It plays a key role in the importation, storage filling, distribution and sale of Liquefied Petroleum Gas (LPG) for domestic, industrial and auto gas users. LAUGFS hold one of the state-of-art storage and filling facility at Mabima, with a storage capacity of 2,500 tonnes, equipped with a strong dealer network in the country.

Lanka Indian Oil Company (LIOC)

LIOC is a subsidiary of Indian Oil Company, which is owned by the government of India. It operates about 150 petrol & diesel stations in Sri Lanka, and has a very efficient lube marketing network. Its major facilities include an oil terminal at Trincomalee, Sri Lanka's largest petroleum storage facility and an 18,000 tonnes per annum capacity lubricants blending plant and state-of-the-art fuels and lubricants testing laboratory at Trincomalee.

Annex II

Conversion to Uniform Energy Units

For comparison, energy products expressed in their respective units used for ordinary transactions need to be converted to a common equivalent unit. Similar to most other countries, Sri Lanka used tonnes of oil equivalent (toe) as the common denominator for this purpose (1 toe = 10 GCal = 41868000 kJ). Sri Lanka is contemplating using Joules as the common unit in future. Shown below are the conversion factors used for converting each energy product to equivalent toe. After two more years, this publication will cease to report toe as the common energy denominator.

Conversion Factors and Calorific Values

Primary Energy	toe/t	kJ/t
Bagasse	0.40	16,747,200
Charcoal	0.65	27,214,200
Coal	0.70	29,307,600
Crude Oil	1.03	43,124,040
Fuel wood	0.38	15,909,840
Hydro electricity (thermal equivalent) (toe/GWh)	240.00	10,048,320,000

Products	toe/t	kJ/t
Aviation Gasoline	1.06	44,380,080
Aviation Turbine Fuel	1.05	43,961,400
Ethane	1.18	49,404,240
Fuel Oil	0.98	41,030,640
Gas Oil /Diesel Oil	1.05	43,961,400
Kerosene	1.05	43,961,400
LPG	1.06	44,380,080
Motor Gasoline (Petrol)	1.09	45,636,120
Naphtha	1.09	45,636,120
Refinery gas	1.15	48,148,200
Residual Oil	0.98	41,030,640
Solvent	0.89	37,262,520

Electricity	kJ/kWh
Electricity	3,600

Compiled by

Sri Lanka Sustainable Energy Authority
No. 80, Sir Earnest De Silva Mawatha, Colombo 07, SRI LANKA
e-mail : info@energy.gov.lk, Web : www.energy.gov.lk
+94 11 2575203 (Voice), +94 11 2575089 (Facsimile)

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