Renewable Generation Report

Q2

April 2023 - June 2023

Public Utilities Commission of Sri Lanka

Introduction:

This report offers comprehensive insights into the quarterly performance of renewable energy generation in Sri Lanka. The data and analysis presented herein aim to guide investment decisions within the country's electricity sector. The main focus is on Non-Conventional Renewable Energy (NCRE) sources, including Mini Hydro, Wind, Solar PV, Biomass, and Municipal Solid Waste.

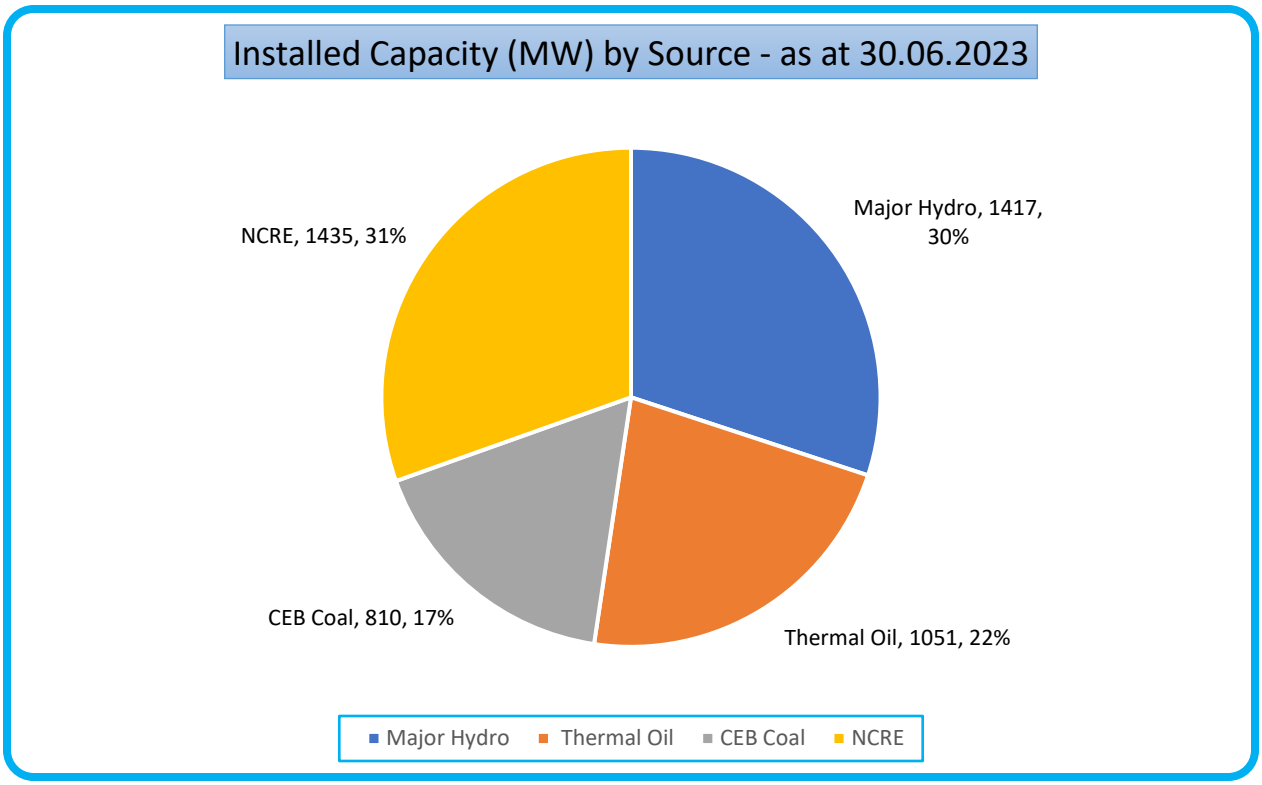
Most solar PV systems tend to be either utility-scale installations with a capacity usually above 1 megawatt (MW) or rooftop PV typically below 1 MW. Residences may be limited to small systems usually up to 20 kilowatts (kW), while larger public, commercial, and industrial buildings may have systems with a capacity as large as 1 MW or even more. Land based wind power projects have been implemented so far while offshore wind projects are considered in the pipeline.

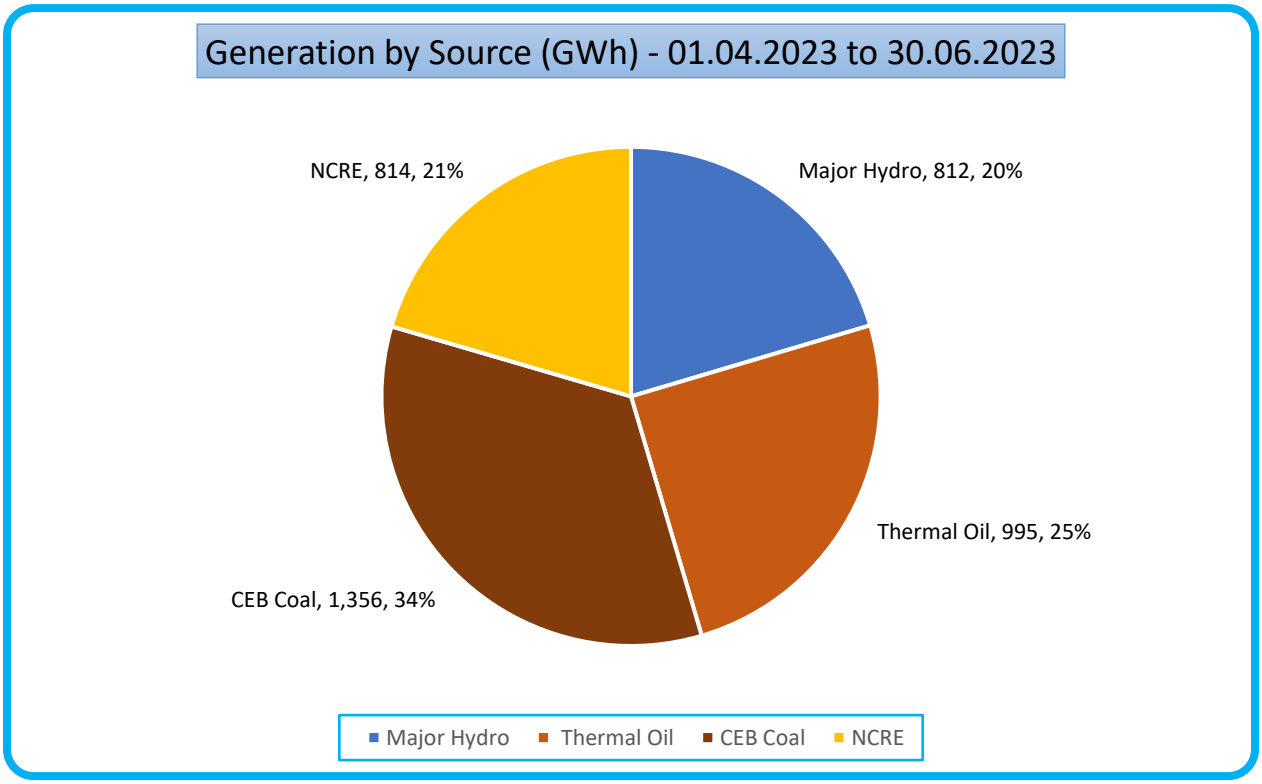
In 2019, the Minister of Power, Energy, and Business Development published the National Energy Policy & Strategies of Sri Lanka, prepared after reviewing and revising the National Energy Policy and Strategies of Sri Lanka published in the Gazette Extraordinary No. 1553/10 of 10.06.2008. The primary objective of the energy policy is to ensure energy security through supplies that are cleaner, secure, economical, and reliable, and to provide convenient, affordable energy services to support the socially equitable development of Sri Lanka.

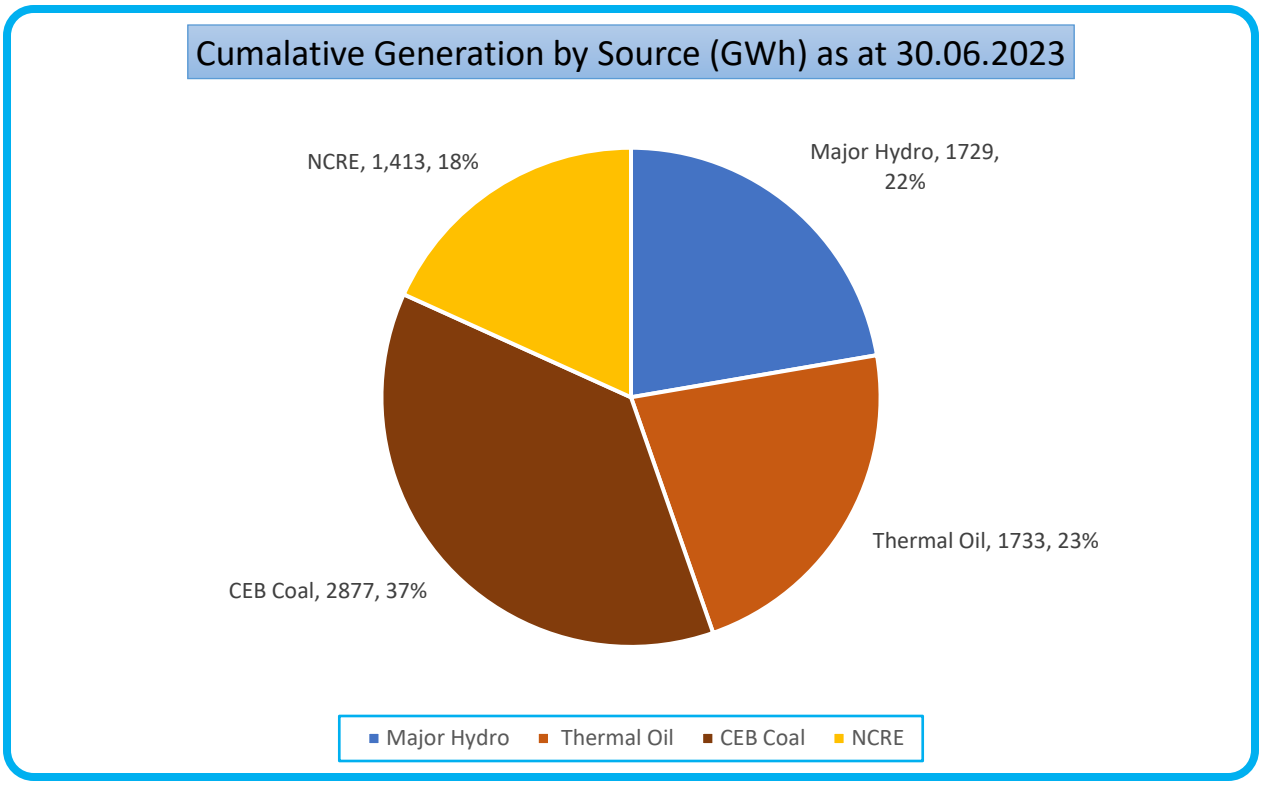
Policy guidelines such as the 'General Policy Guidelines on the Electricity Industry' as required under Sri Lanka Electricity Act No. 20 of 2009 statutorily required to be issued for each sub-sector, are expected to be prepared and issued, based on this national energy policy.

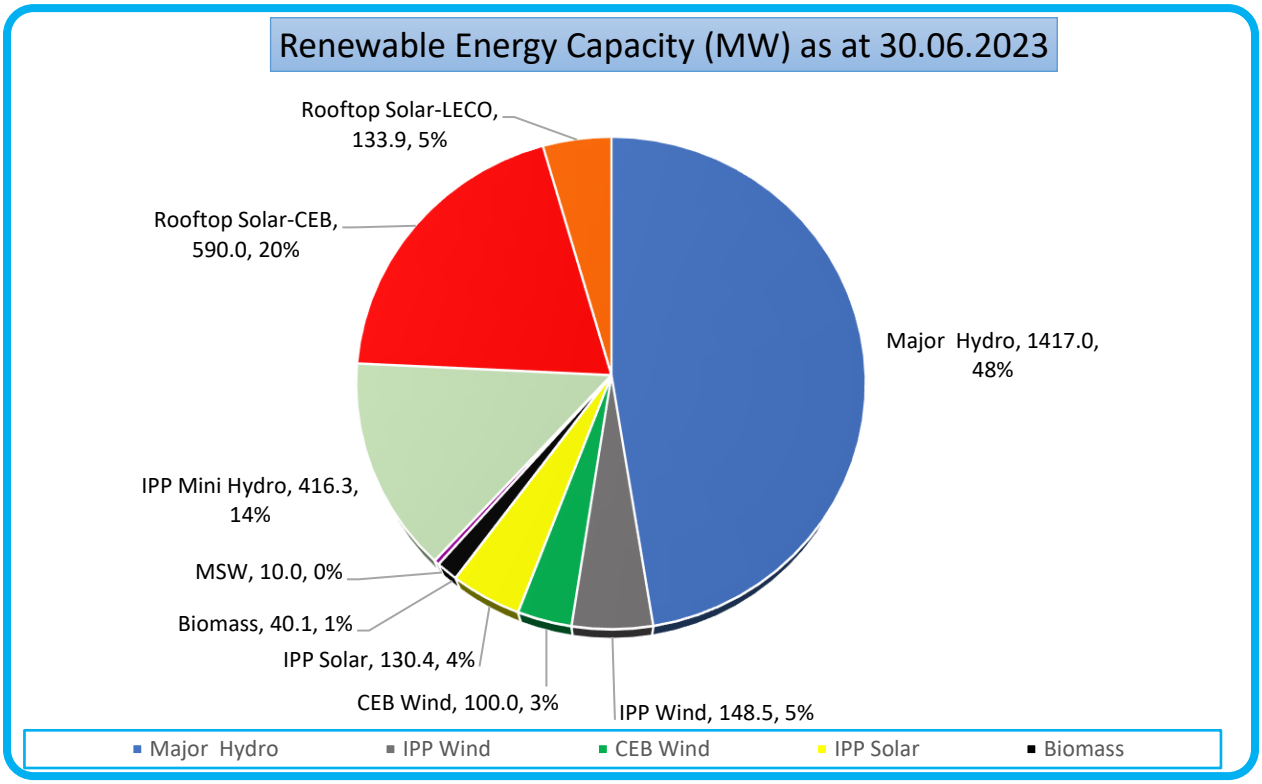
Sri Lanka's power sector development is carried out based on the Long-term generation expansion plan (LTGEP) prepared by the Transmission Licensee (ie. Ceylon Electricity Board (CEB)) and approved by the Public Utilities Commission of Sri Lanka (PUCSL). LTGEP is a rolling plan prepared in every two years incorporating the changes introduced by the varying economic and technical parameters used in the planning process.

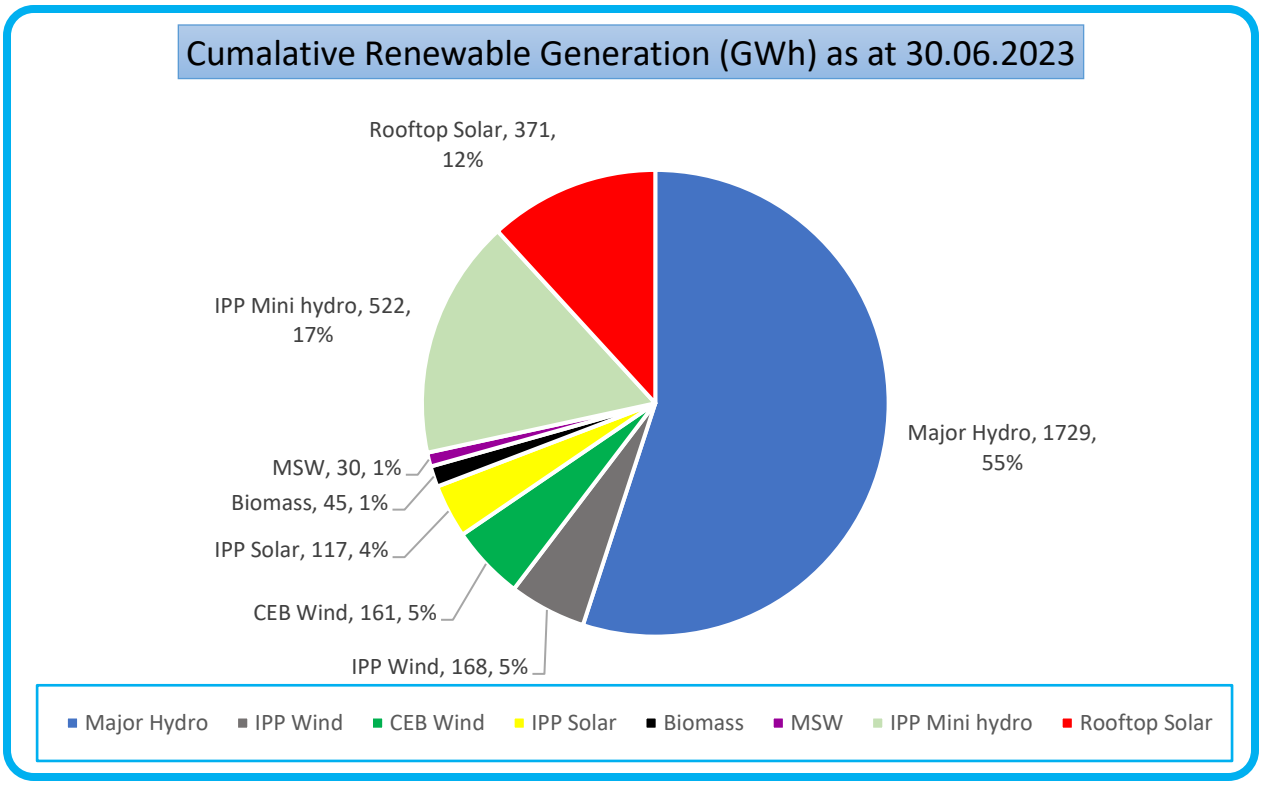
Target: To increase the renewable energy (RE) share from 50% to 70% by 2030.

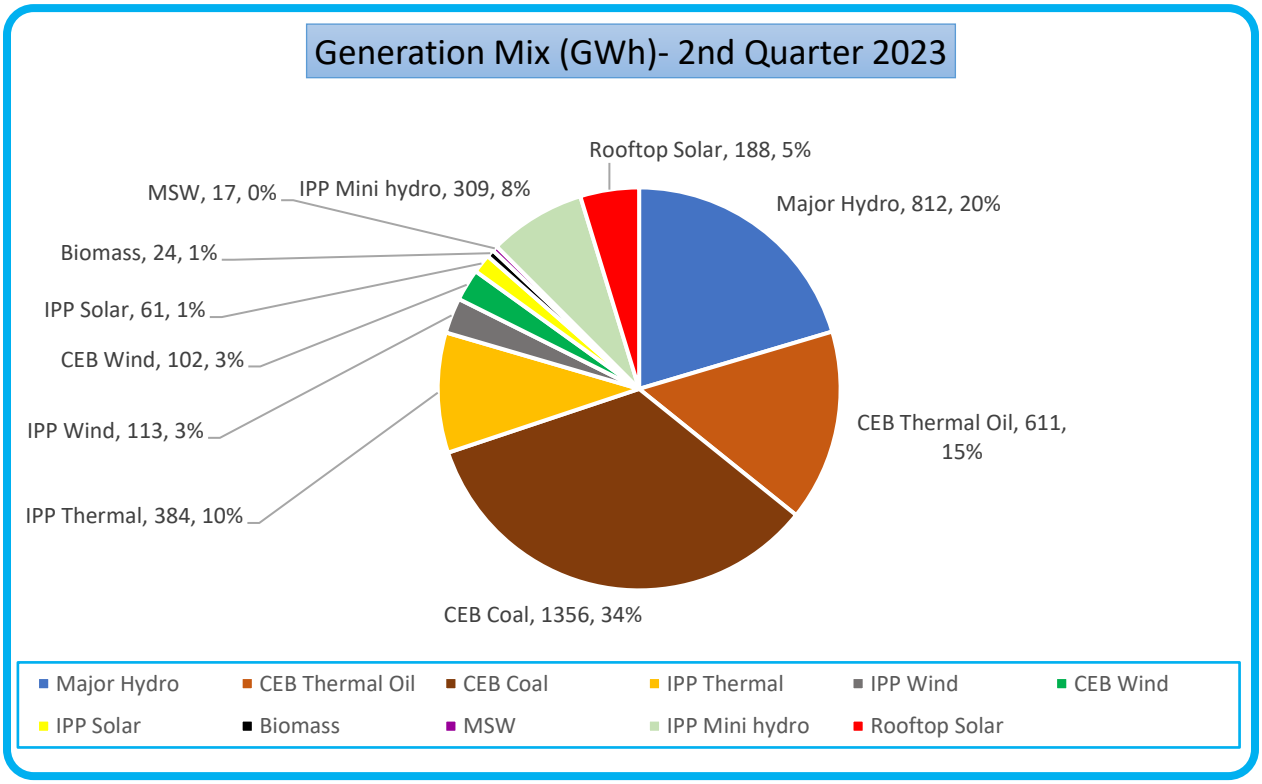

Installed Capacity (MW) by Source - as at 30.06.2023
Major Hydro, 1417, 30%
Thermal Oil, 1051, 22%
CEB Coal, 810, 17%
NCRE, 1435, 31%
Major Hydro
Thermal Oil
CEB Coal
NCRE

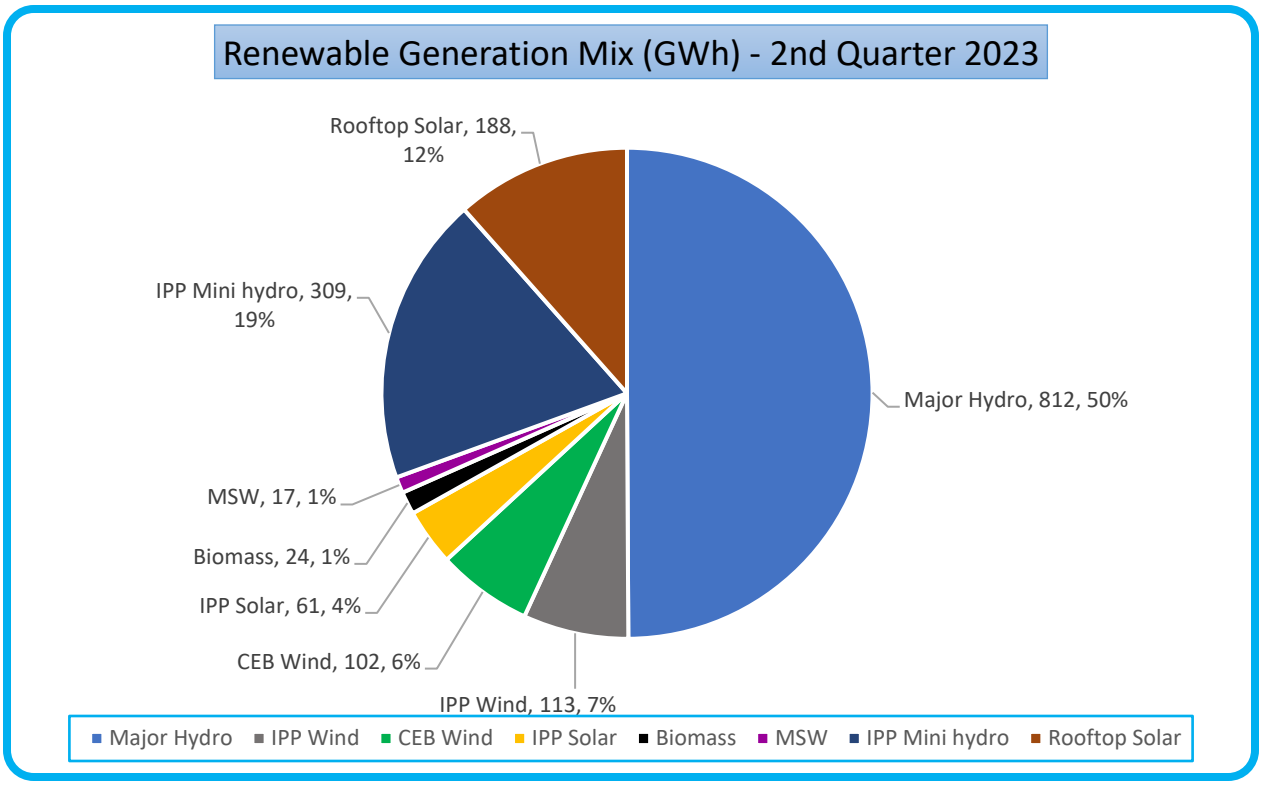

Generation by Source (GWh) - 01.04.2023 to 30.06.2023
Major Hydro, 812, 20%
Thermal Oil, 995, 25%
CEB Coal, 1,356, 34%
NCRE, 814, 21%
Major Hydro
Thermal Oil
CEB Coal
NCRE

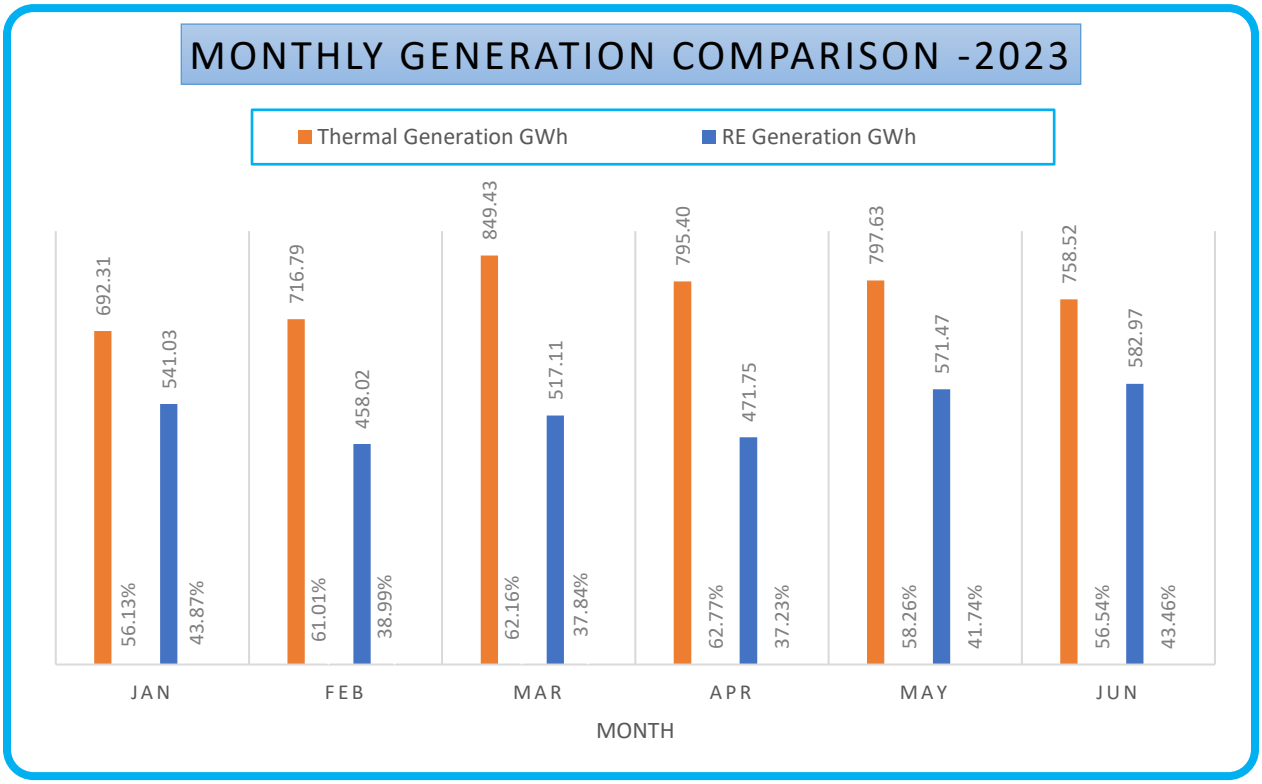

Cumalative Generation by Source (GWh) as at 30.06.2023
NCRE, 1,413, 18%
Major Hydro, 1729, 22%
Thermal Oil, 1733, 23%
CEB Coal, 2877, 37%
Major Hydro
Thermal Oil
CEB Coal
NCRE

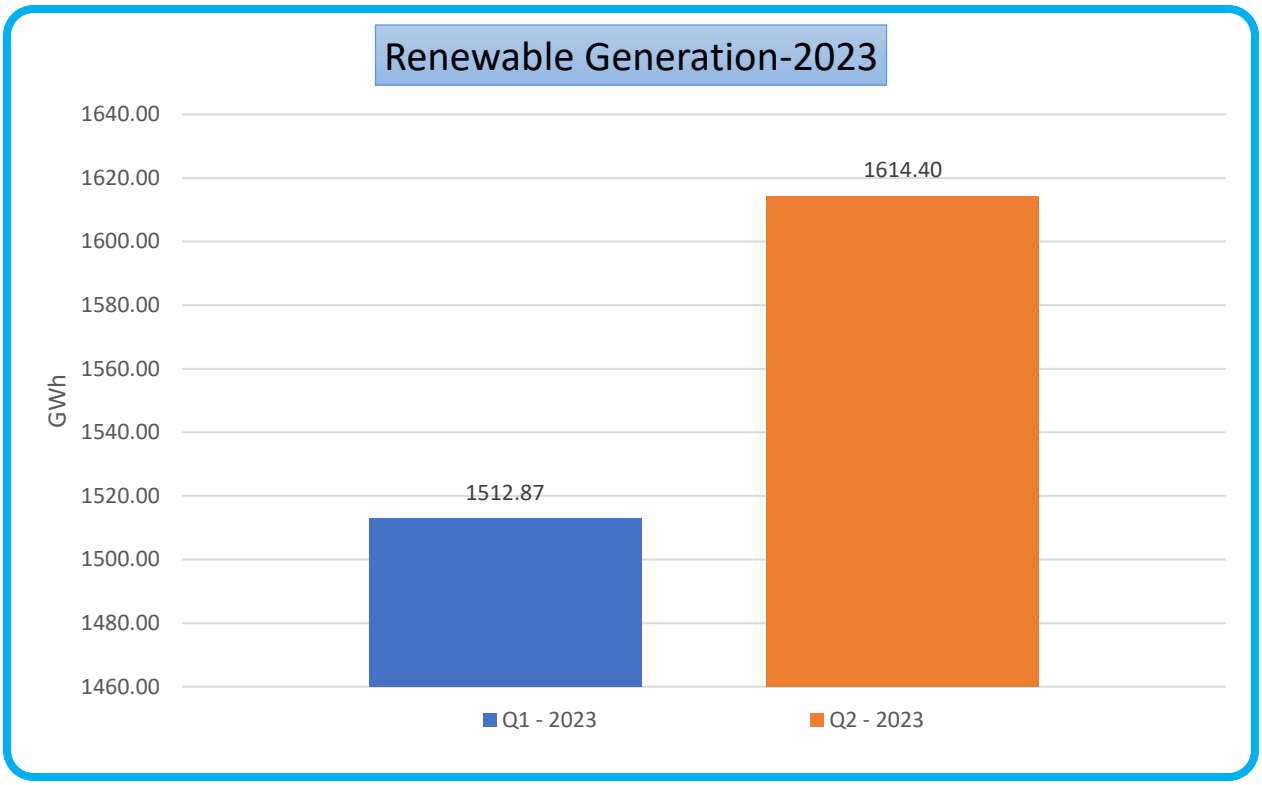

Renewable Energy Capacity (MW) as at 30.06.2023
Rooftop Solar-LECO, 133.9, 5%
Rooftop Solar-CEB, 590.0, 20%
Major Hydro, 1417.0, 48%
IPP Mini Hydro, 416.3, 14%
MSW, 10.0, 0%
Biomass, 40.1, 1%
IPP Solar, 130.4, 4%
CEB Wind, 100.0, 3%
IPP Wind, 148.5, 5%
Major Hydro
IPP Wind
CEB Wind
IPP Solar
Biomass


Cumalative Renewable Generation (GWh) as at 30.06.2023
Rooftop Solar, 371, 12%
IPP Mini hydro, 522, 17%
Major Hydro, 1729, 55%
MSW, 30, 1%
Biomass, 45, 1%
IPP Solar, 117, 4%
CEB Wind, 161, 5%
IPP Wind, 168, 5%
Major Hydro
IPP Wind
CEB Wind
IPP Solar
Biomass
MSW
IPP Mini hydro
Rooftop Solar


Generation Mix (GWh)- 2nd Quarter 2023
Rooftop Solar, 188, 5%
MSW, 17, 0%
IPP Mini hydro, 309, 8%
Major Hydro, 812, 20%
Biomass, 24, 1%
IPP Solar, 61, 1%
CEB Wind, 102, 3%
IPP Wind, 113, 3%
IPP Thermal, 384, 10%
CEB Thermal Oil, 611, 15%
CEB Coal, 1356, 34%
Major Hydro
CEB Thermal Oil
CEB Coal
IPP Thermal
IPP Wind
CEB Wind
IPP Solar
Biomass
MSW
IPP Mini hydro
Rooftop Solar


Renewable Generation Mix (GWh) - 2nd Quarter 2023
Rooftop Solar, 188, 12%
IPP Mini hydro, 309, 19%
Major Hydro, 812, 50%
MSW, 17, 1%
Biomass, 24, 1%
IPP Solar, 61, 4%
CEB Wind, 102, 6%
IPP Wind, 113, 7%
Major Hydro
IPP Wind
CEB Wind
IPP Solar
Biomass
MSW
IPP Mini hydro
Rooftop Solar

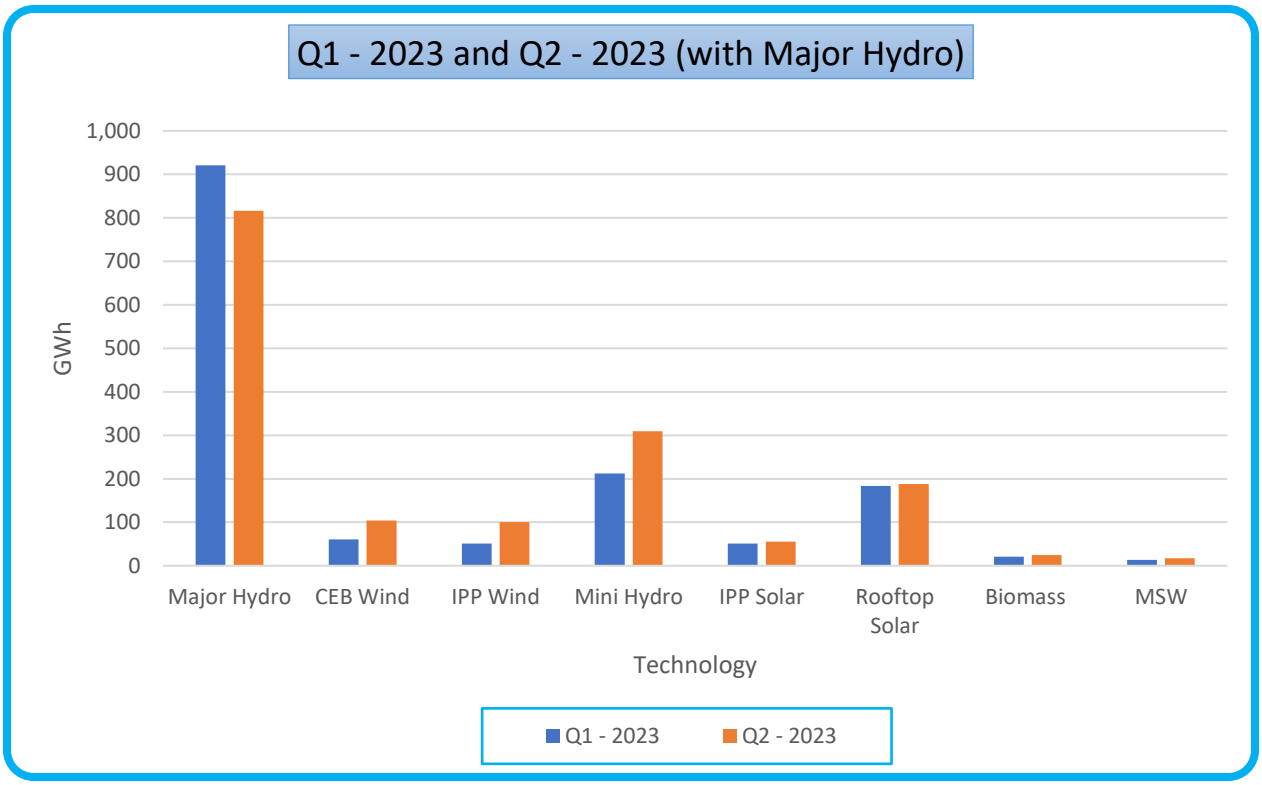

MONTHLY GENERATION COMPARISON -2023
Thermal Generation GWh
RE Generation GWh
692.31
56.13%
541.03
43.87%
716.79
61.01%
458.02
38.99%
849.43
62.16%
517.11
37.84%
795.40
62.77%
471.75
37.23%
797.63
58.26%
571.47
41.74%
758.52
56.54%
582.97
43.46%
JAN
FEB
MAR
APR
MAY
JUN
MONTH

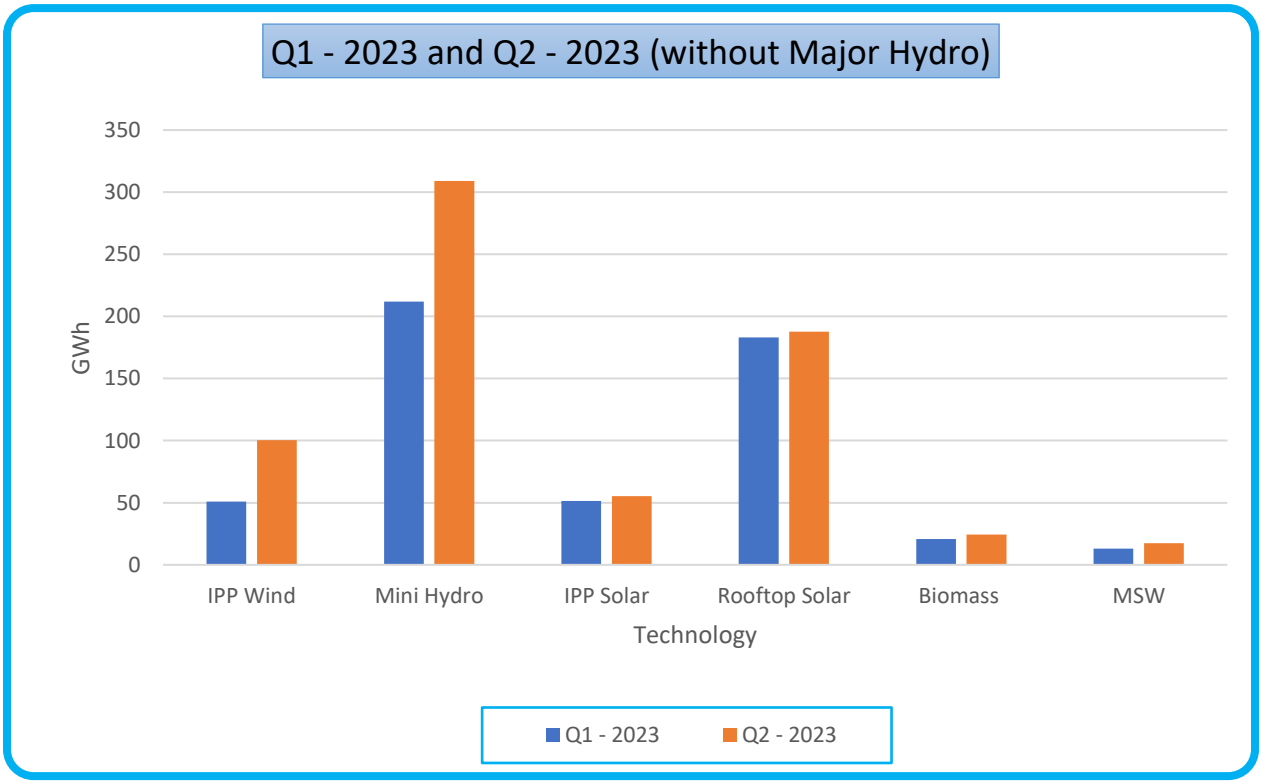


Increased by 7% as compared to Q1 2023

Renewable Generation (GWh) – 1st Quarter 2023 Vs 2nd Quarter 2023

Technology	Q1 - 2023	Q2 - 2023	Deviation (%)
Major Hydro	921	817	-11%
CEB Wind	60	104	72%
IPP Wind	51	100	97%
Mini Hydro	212	309	46%
IPP Solar	51	55	7%
Rooftop Solar	183	188	2%
Biomass	21	24	17%
MSW	13	17	32%

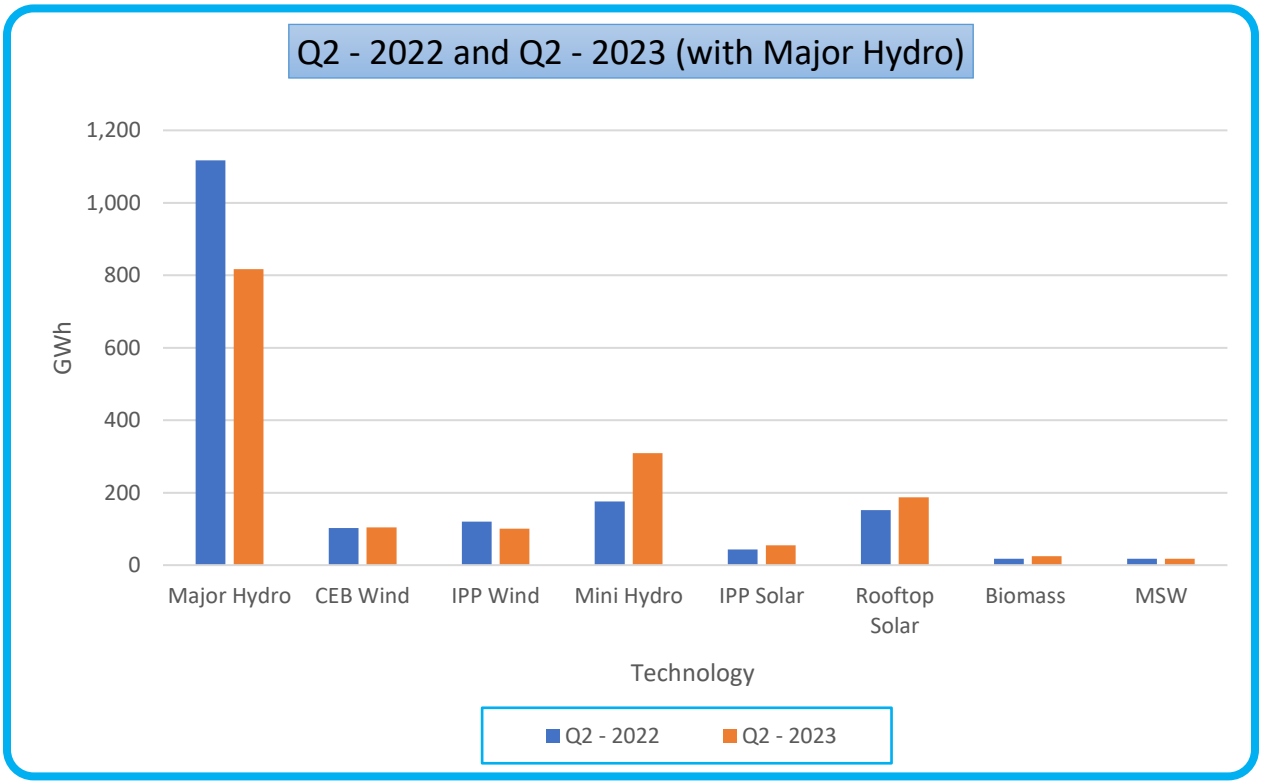

Q1 - 2023 and Q2 - 2023 (with Major Hydro)
1,000
900
800
700
600
500
400
300
200
100
0
GWh
Major Hydro
CEB Wind
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q1 - 2023
Q2 - 2023

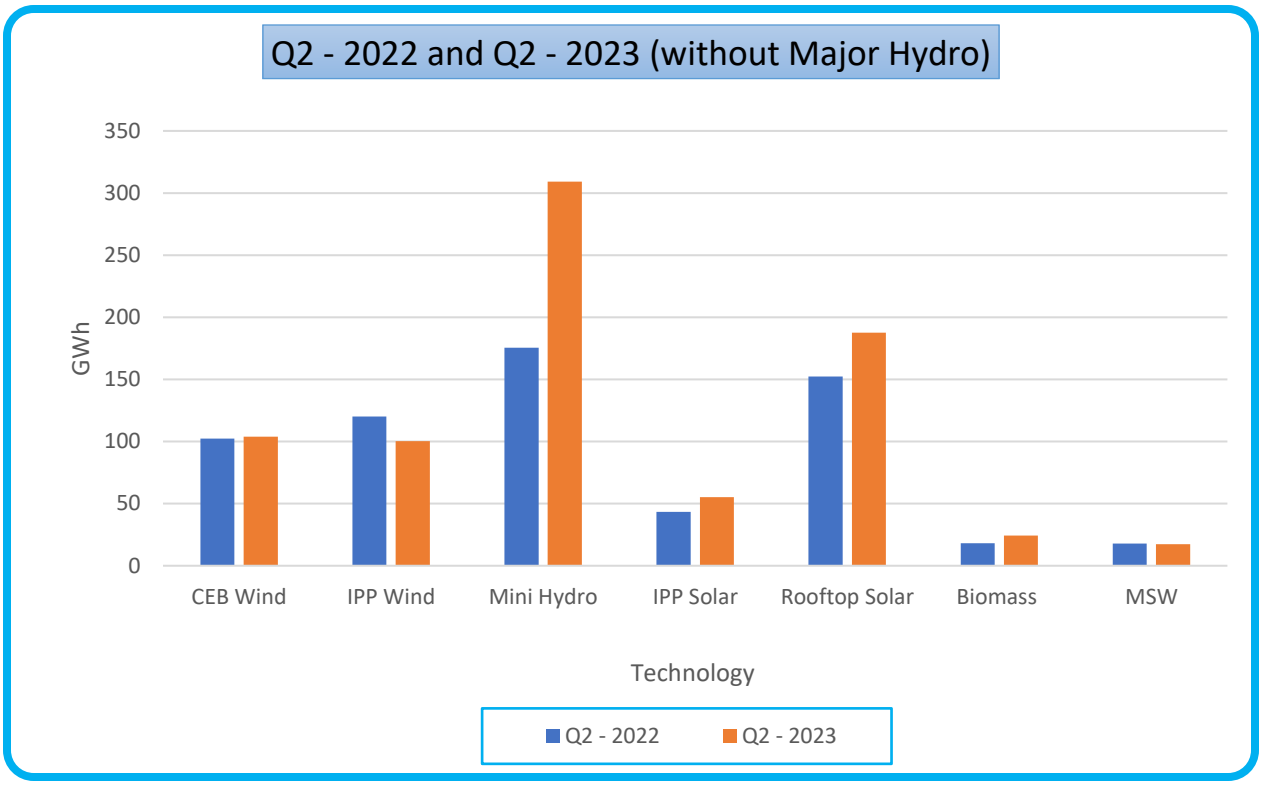

Q1 - 2023 and Q2 - 2023 (without Major Hydro)
350
300
250
200
150
100
50
0
GWh
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q1 - 2023
Q2 - 2023

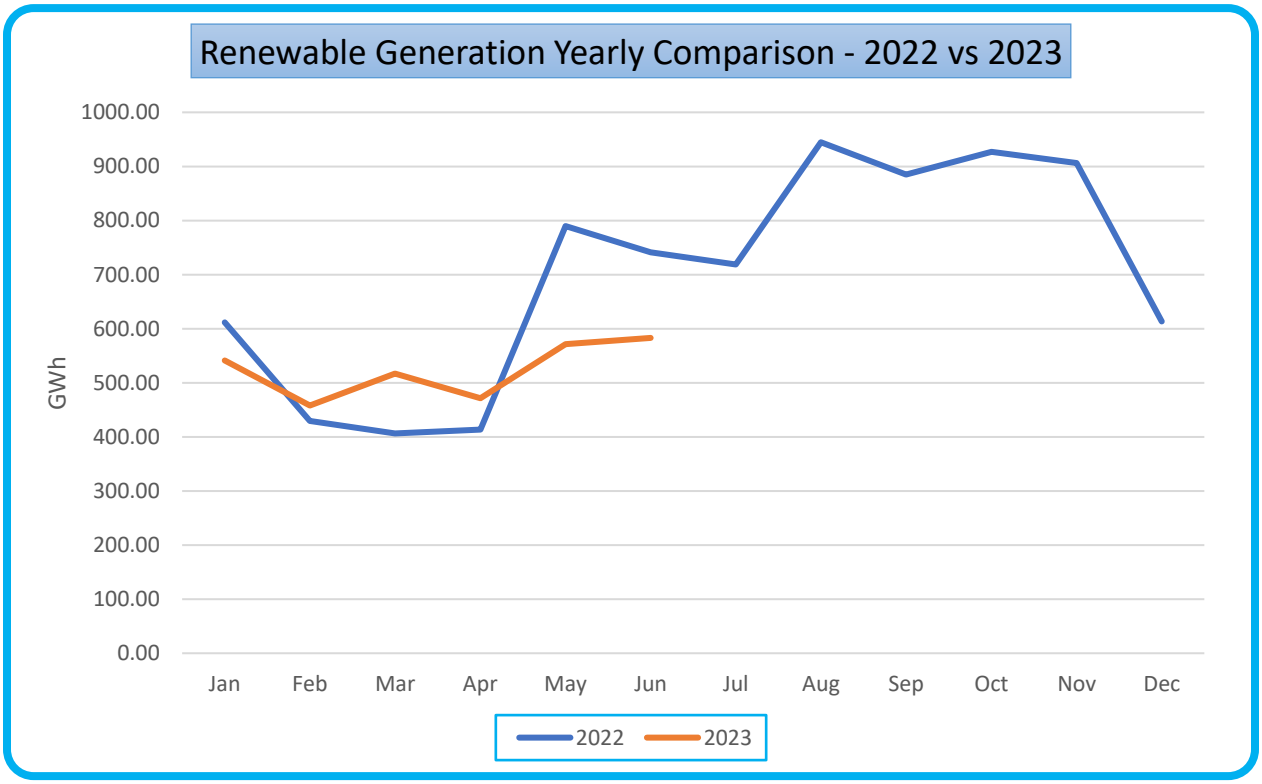
Renewable Generation Comparison

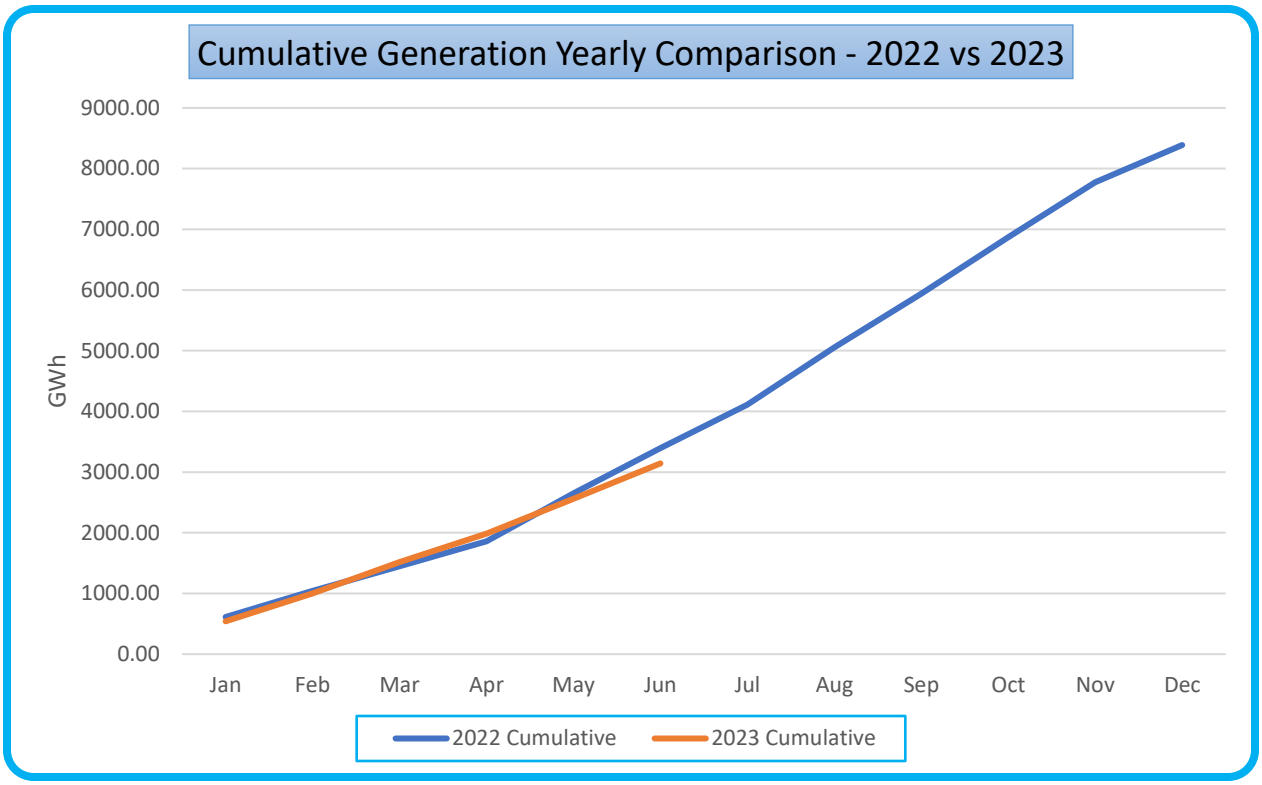
Renewable Generation – 2nd Quarter 2022 vs 2nd Quarter 2023

Technology	Q2 - 2022	Q2 - 2023	Deviation
Major Hydro	1,117	817	-27%
CEB Wind	102	104	2%
IPP Wind	120	100	-16%
Mini Hydro	175	309	76%
IPP Solar	43	55	27%
Rooftop Solar	152	188	23%
Biomass	18	24	34%
MSW	18	17	-3%

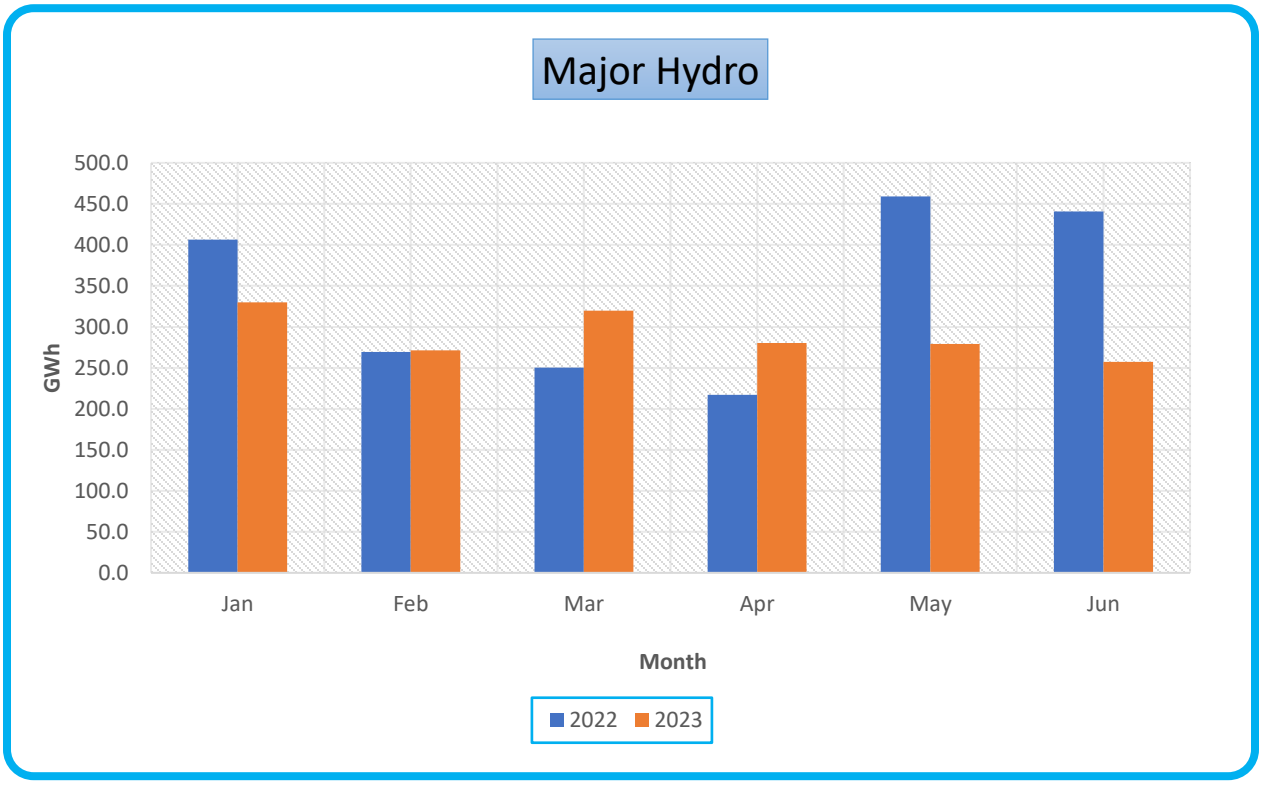


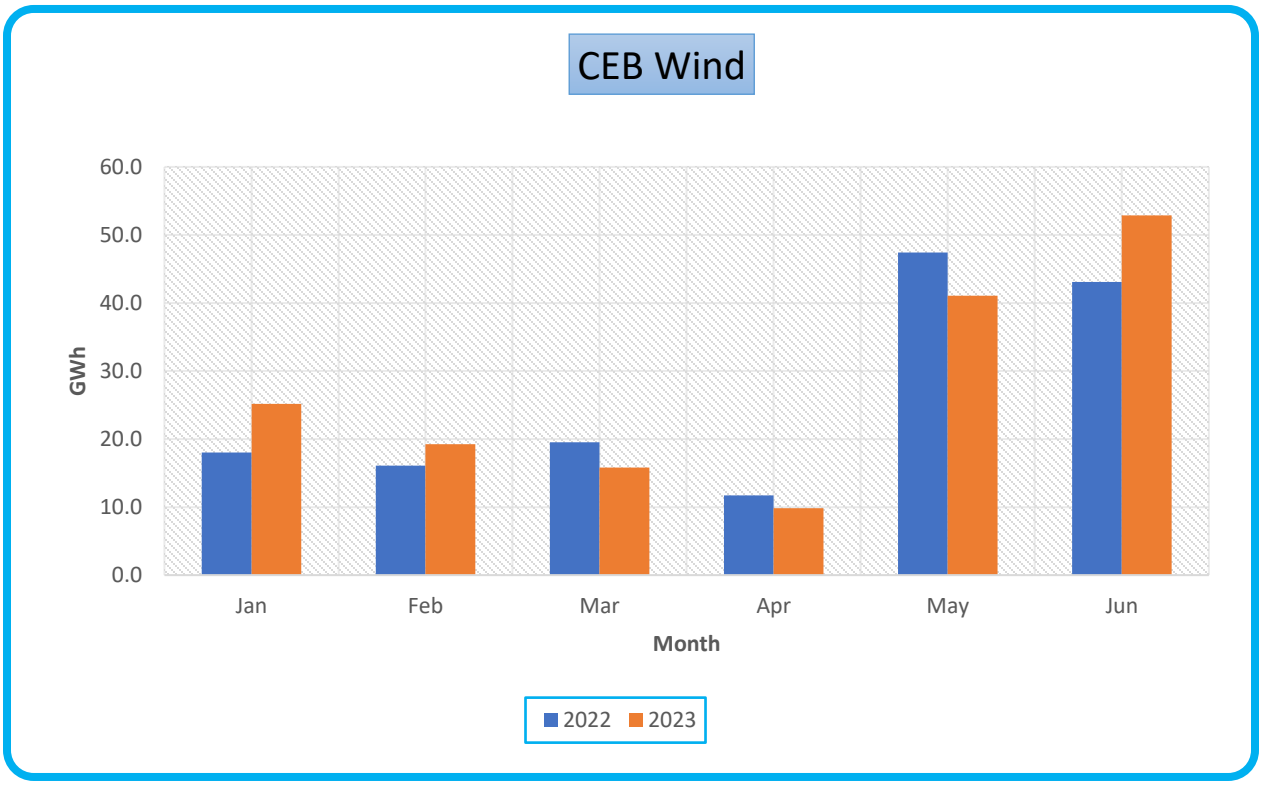

Q2 - 2022 and Q2 - 2023 (without Major Hydro)
350
300
250
200
150
100
50
0
GWh
CEB Wind
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q2 - 2022
Q2 - 2023

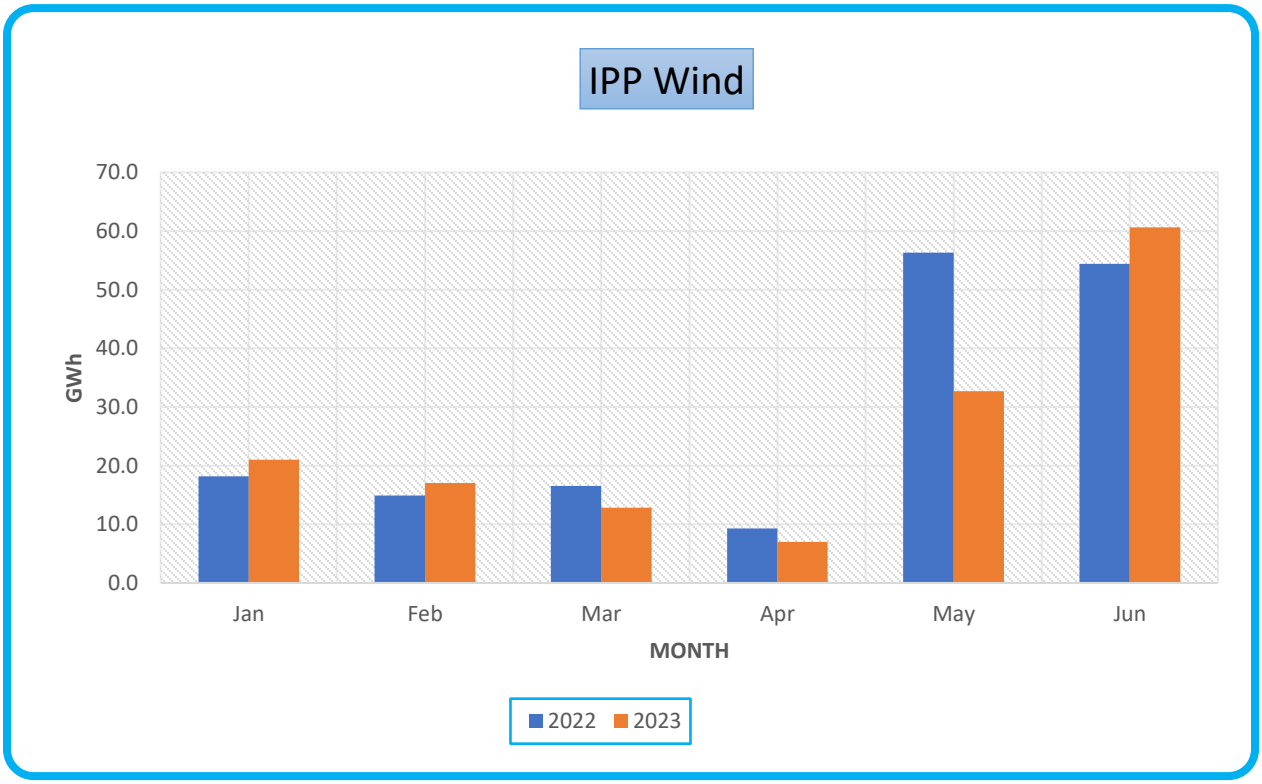

Renewable Generation Yearly Comparison - 2022 vs 2023
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
GWh
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2022
2023

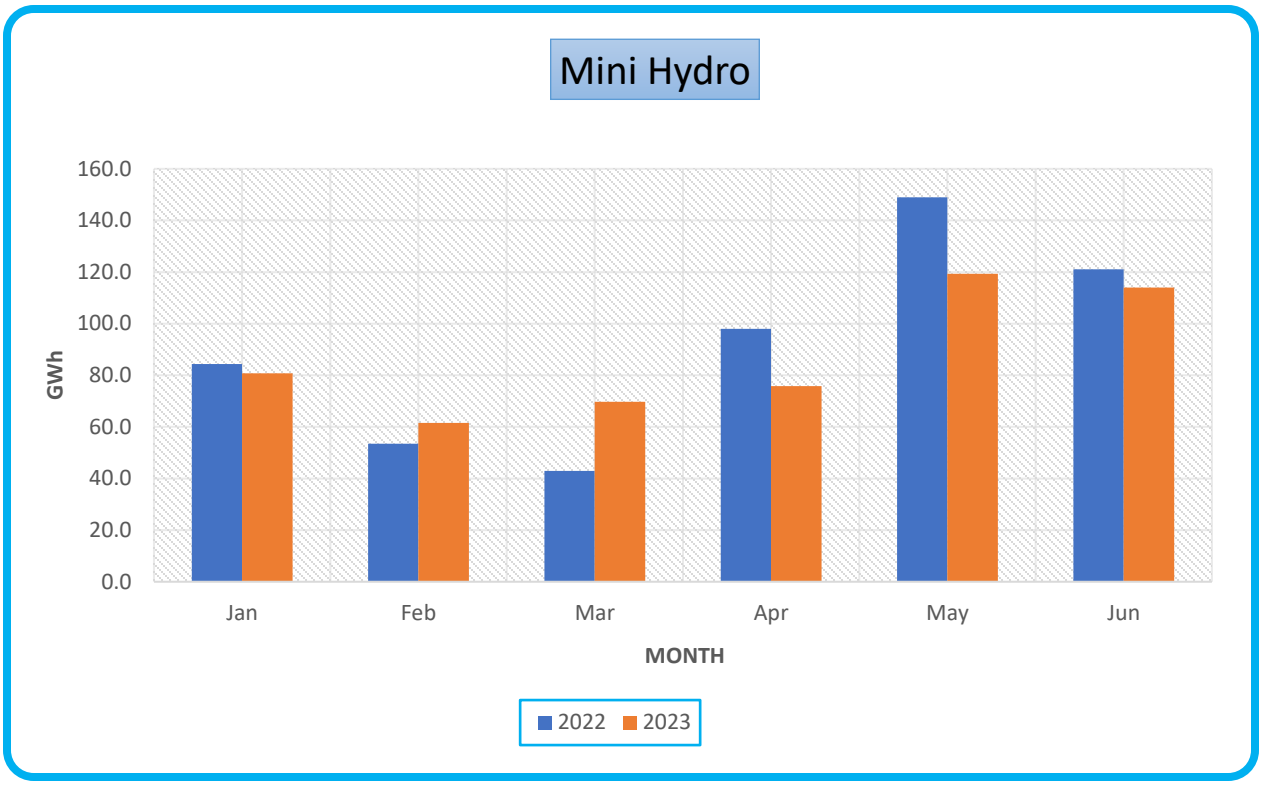


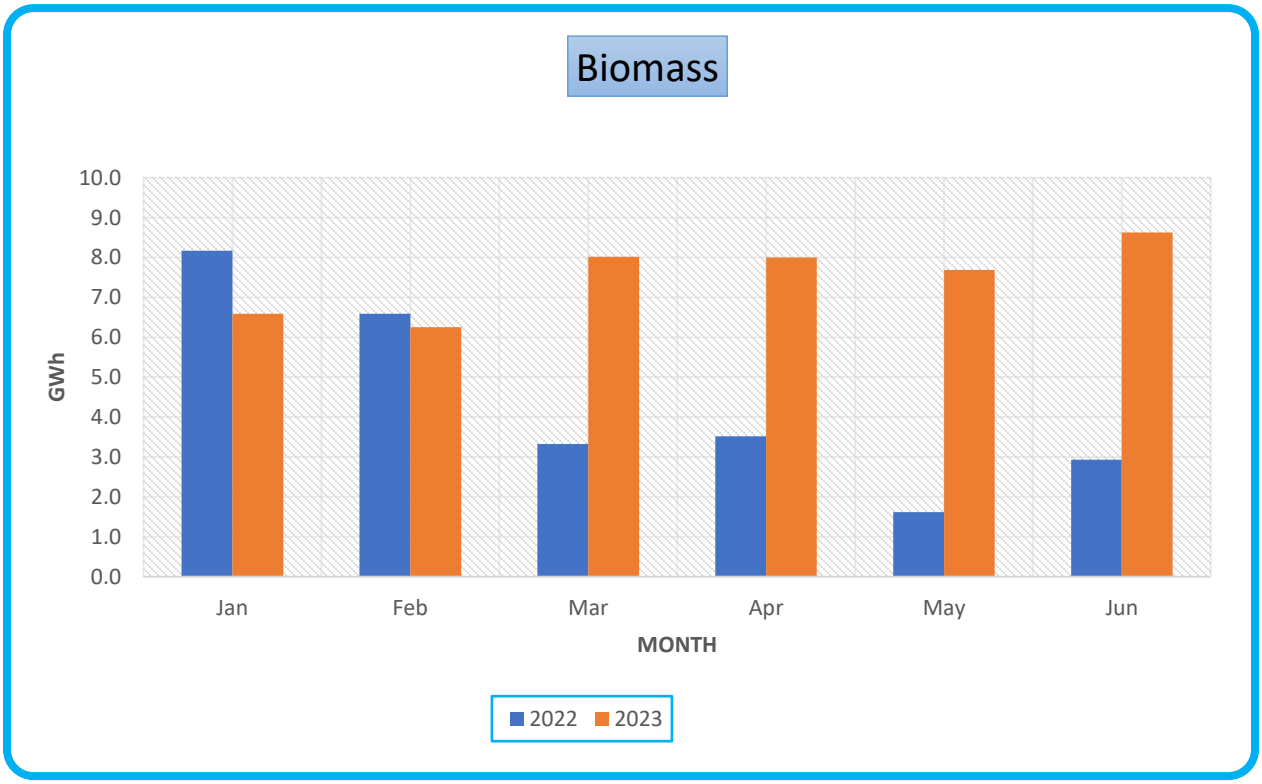
Variation of Renewable Generation – Technology Wise

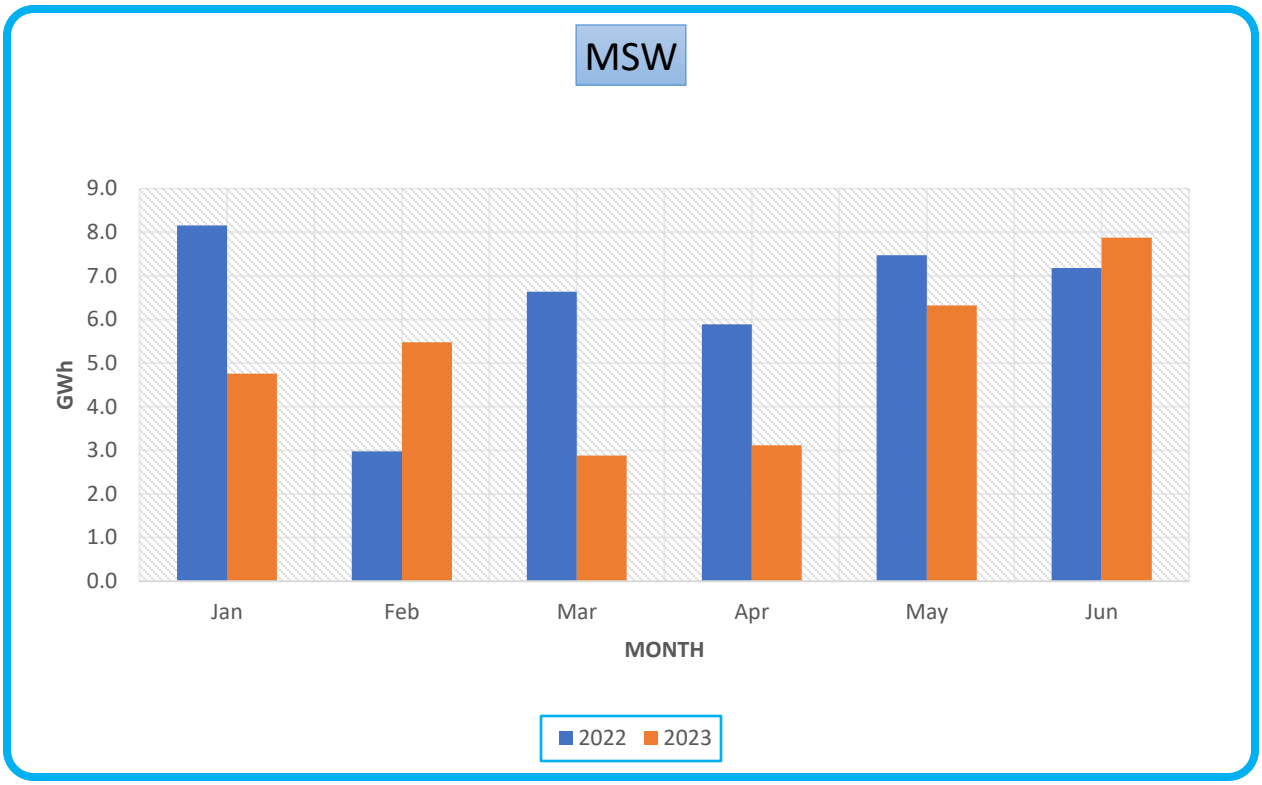



CEB Wind
60.0
50.0
40.0
30.0
20.0
10.0
0.0
GWh
Jan
Feb
Mar
Apr
May
Jun
Month
2022
2023


IPP Wind
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
GWh
Jan
Feb
Mar
Apr
May
Jun
MONTH
2022
2023


Mini Hydro
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
GWh
Jan
Feb
Mar
Apr
May
Jun
MONTH
2022
2023


Biomass
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
GWh
Jan
Feb
Mar
Apr
May
Jun
MONTH
2022
2023


MSW
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
GWh
Jan
Feb
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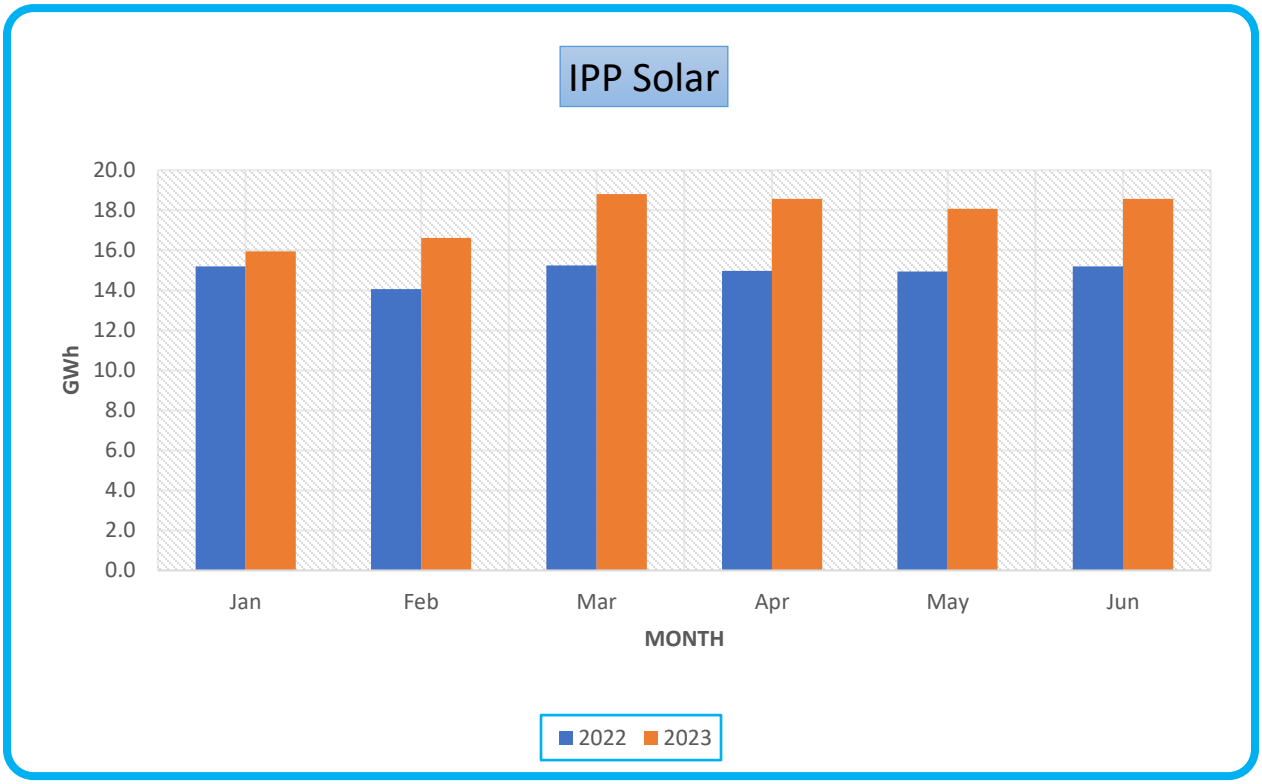
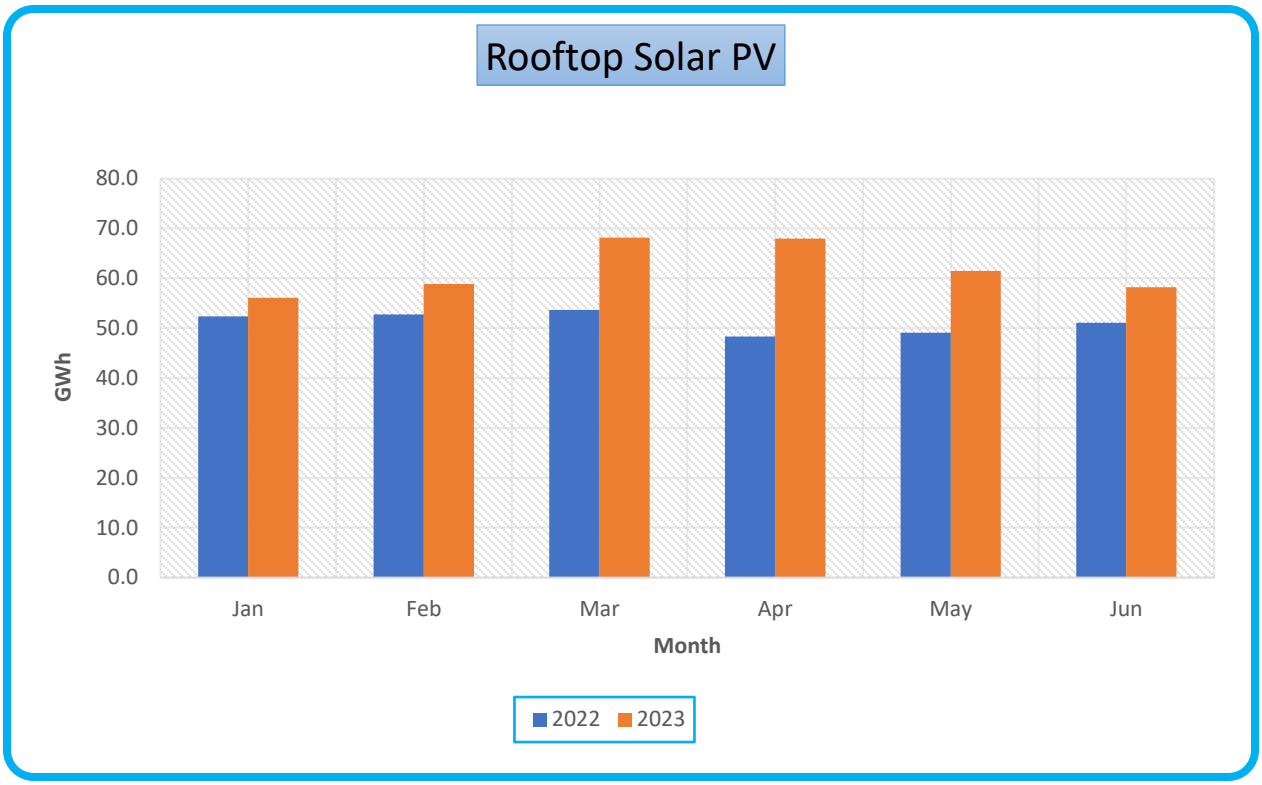
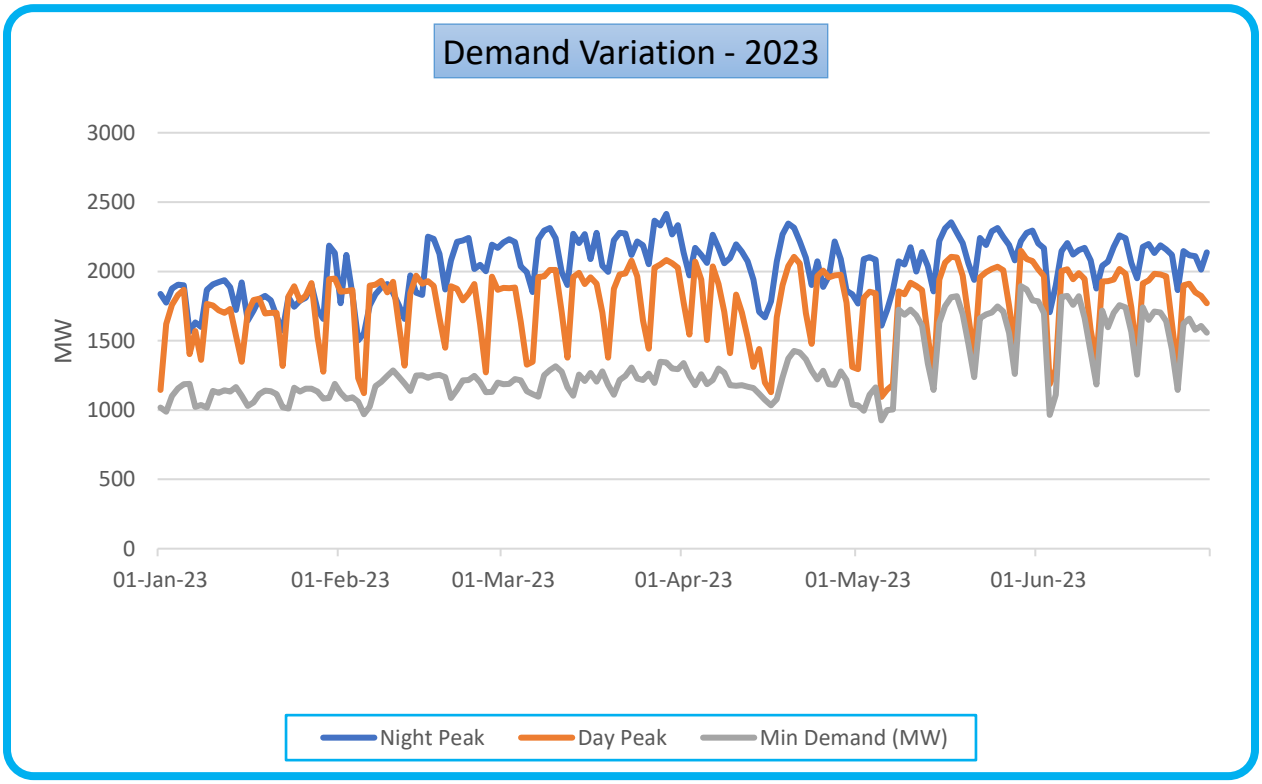
MONTH
2022
2023

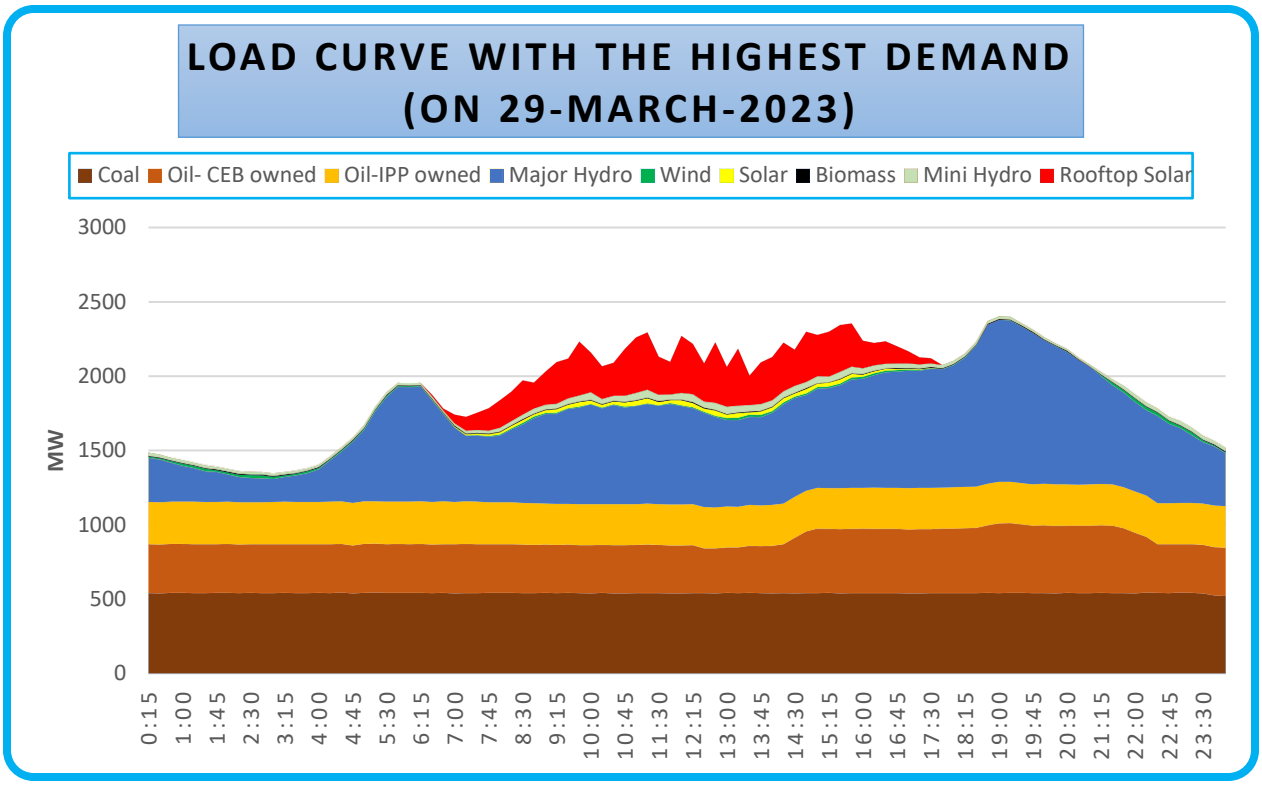

IPP Solar
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
GWh
Jan
Feb
Mar
Apr
May
Jun
MONTH
2022
2023



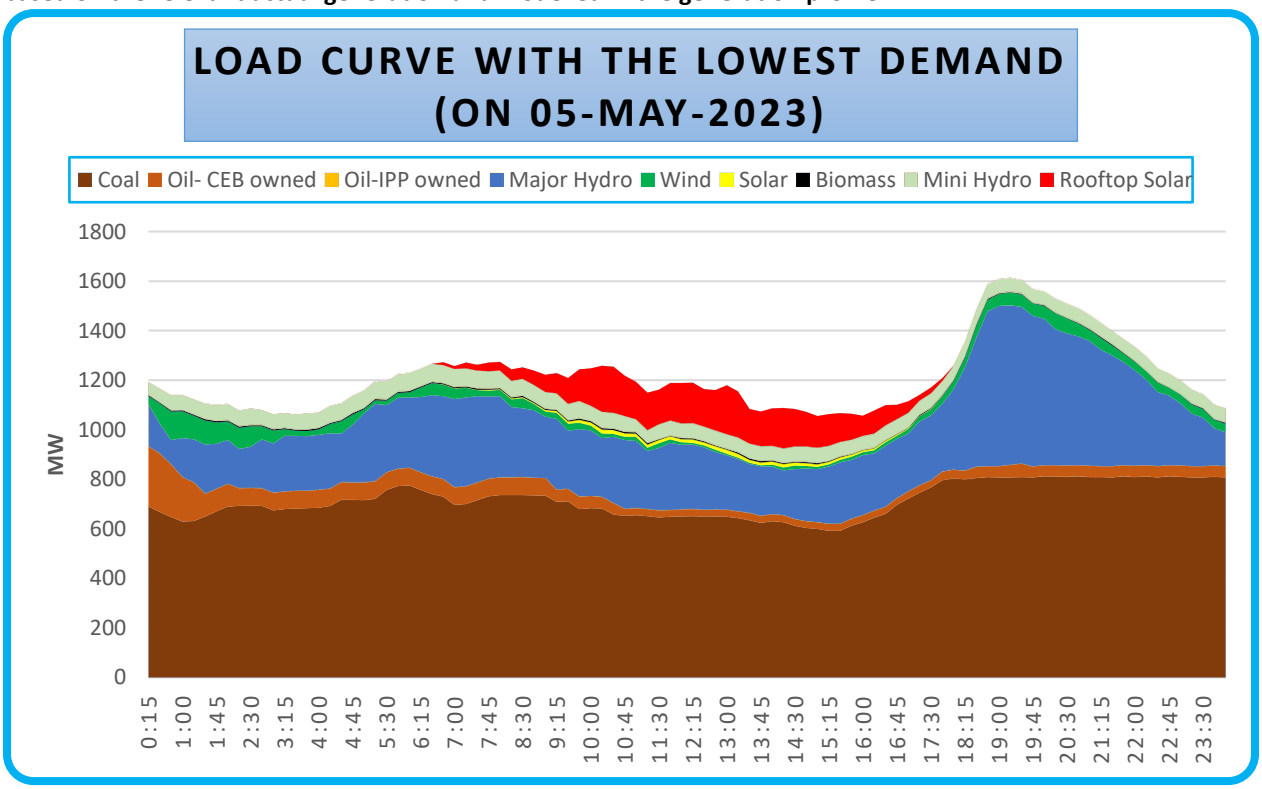
Source: CEB monthly Review Report

Daily Demand Variation

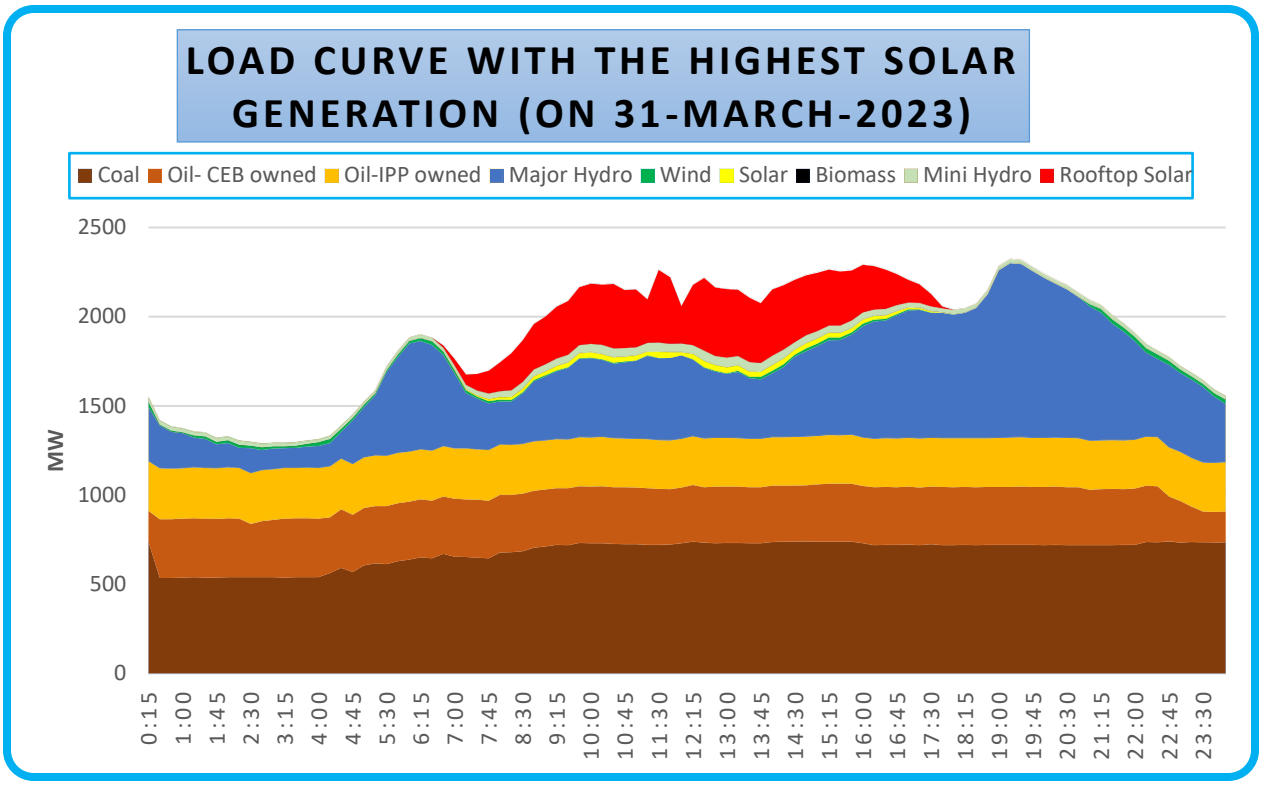




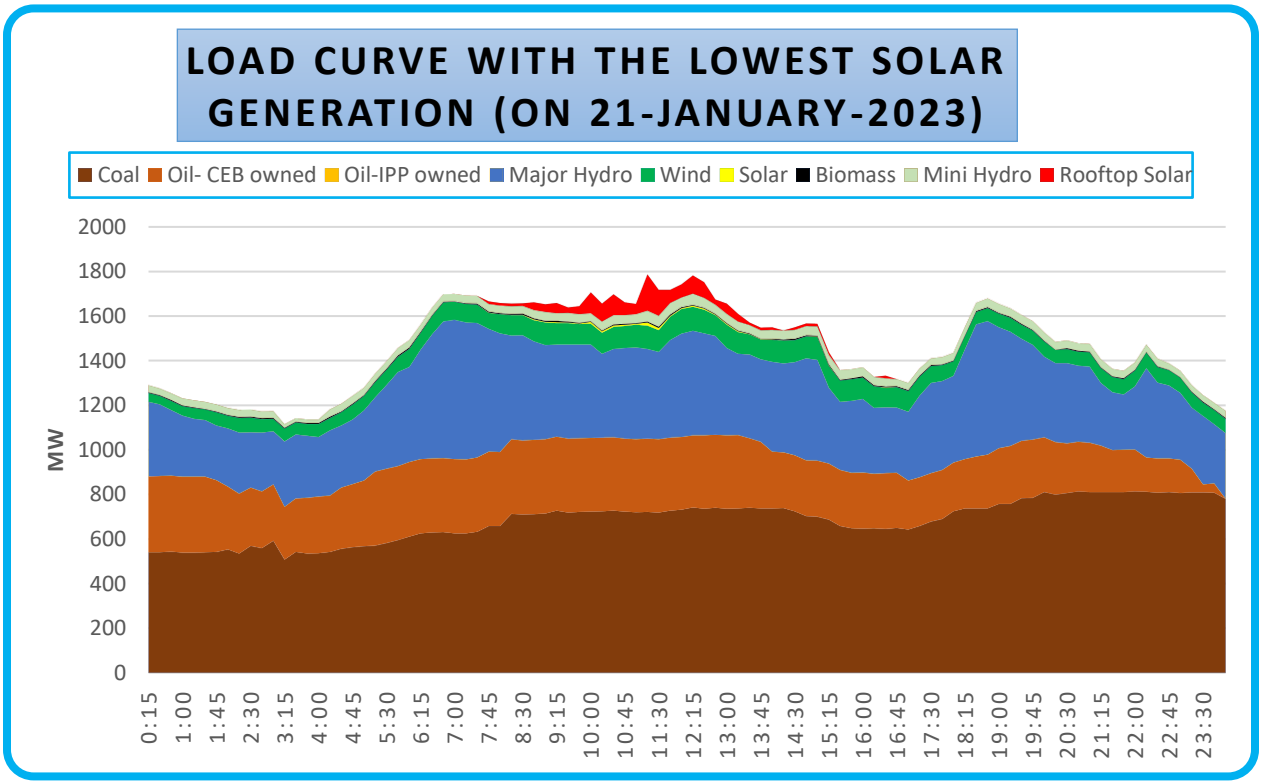
Note: Contribution from Rooftop Solar PV, IPP Solar (1MW), and Non-telemetered Mini Hydro is estimated based on the relevant actual generation and modelled in the generation profile



Note: Rooftop Solar PV, IPP Solar (1MW), and Non-telemetered Mini Hydro daily generation for Load Curves are calculated relative to actual monthly generations.

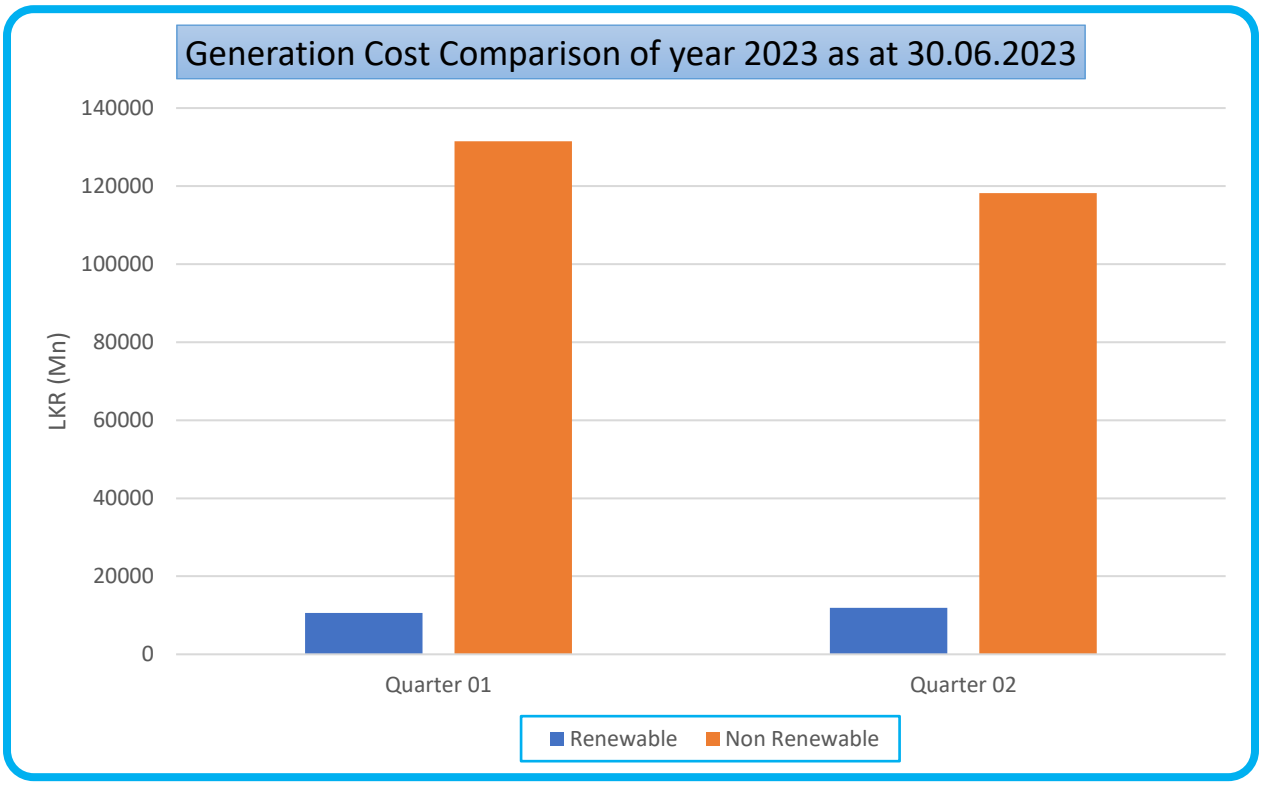


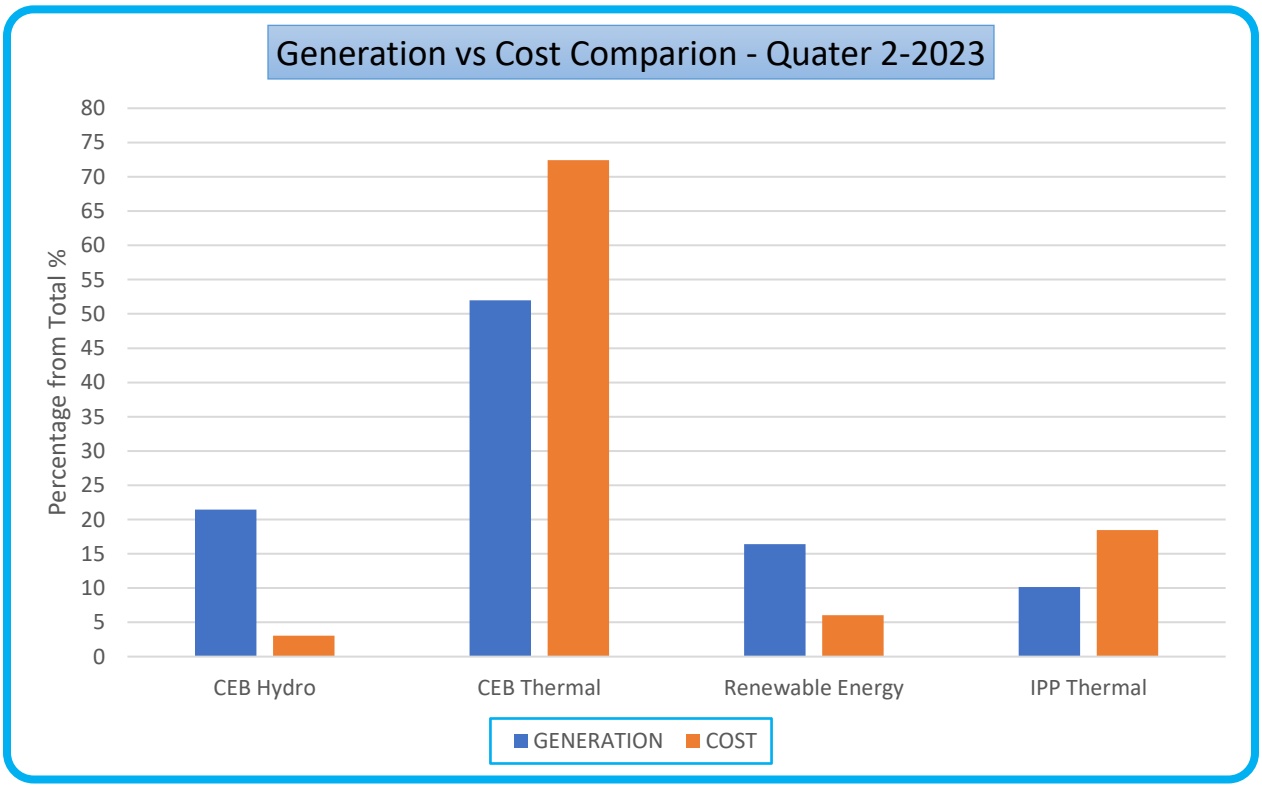
Note: Rooftop Solar PV, IPP Solar (1MW), and Non-telemetered Mini Hydro daily generation for Load Curves are calculated relative to actual monthly generations.



Note: Rooftop Solar PV, IPP Solar (1MW), and Non-telemetered Mini Hydro daily generation for Load Curves are calculated relative to actual monthly generations.

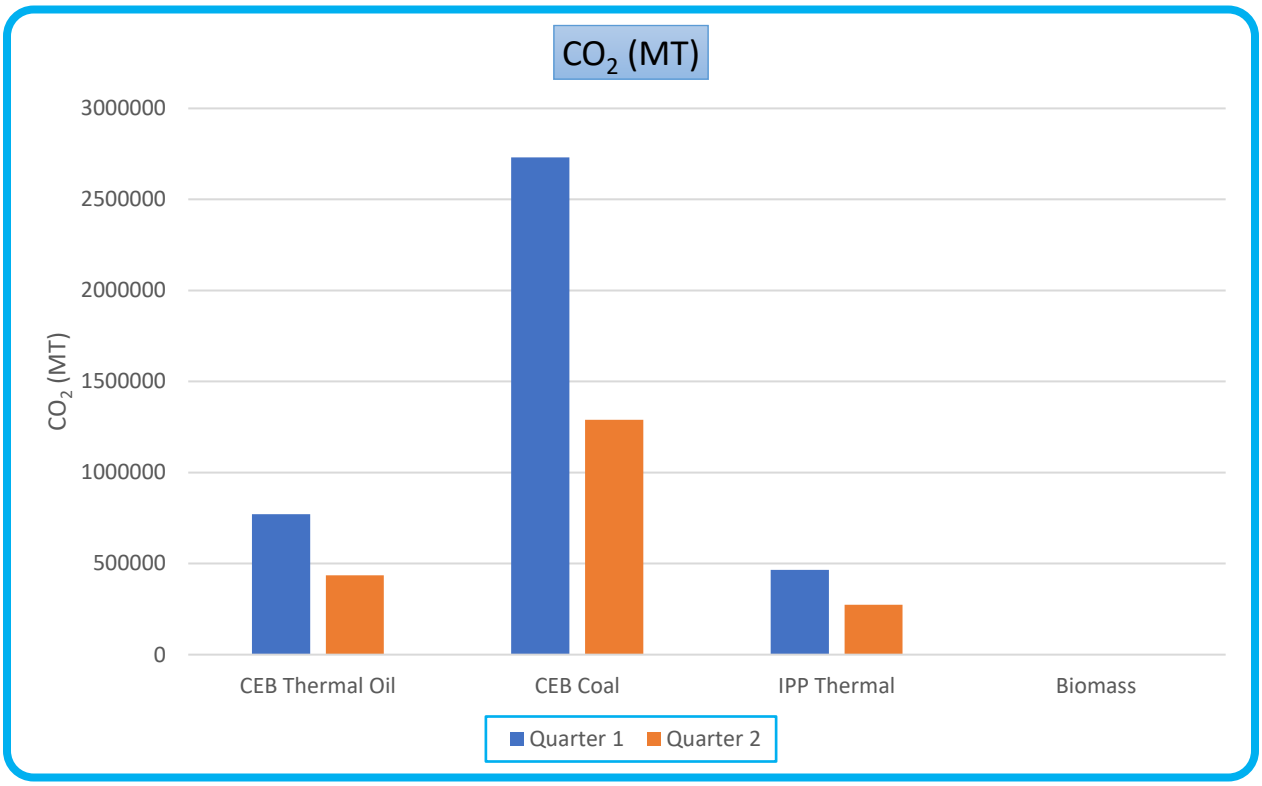
Generation Cost

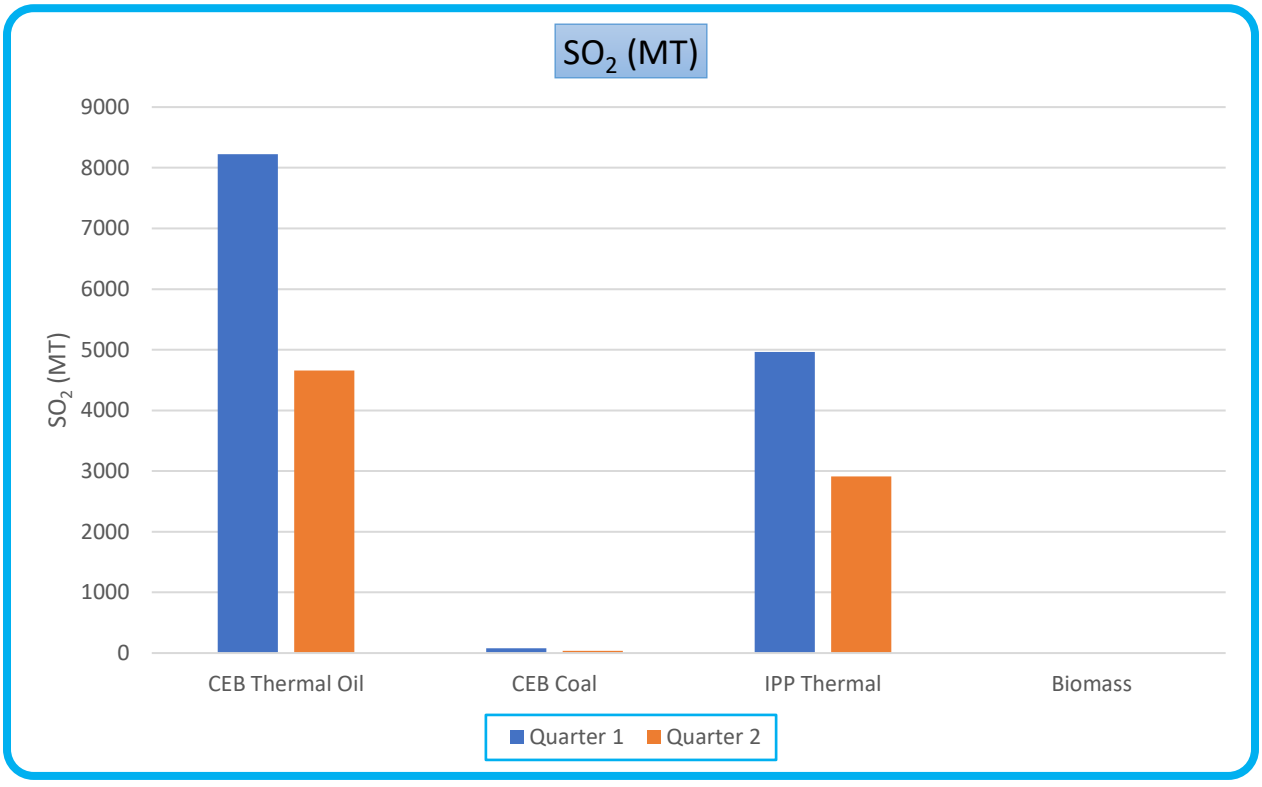


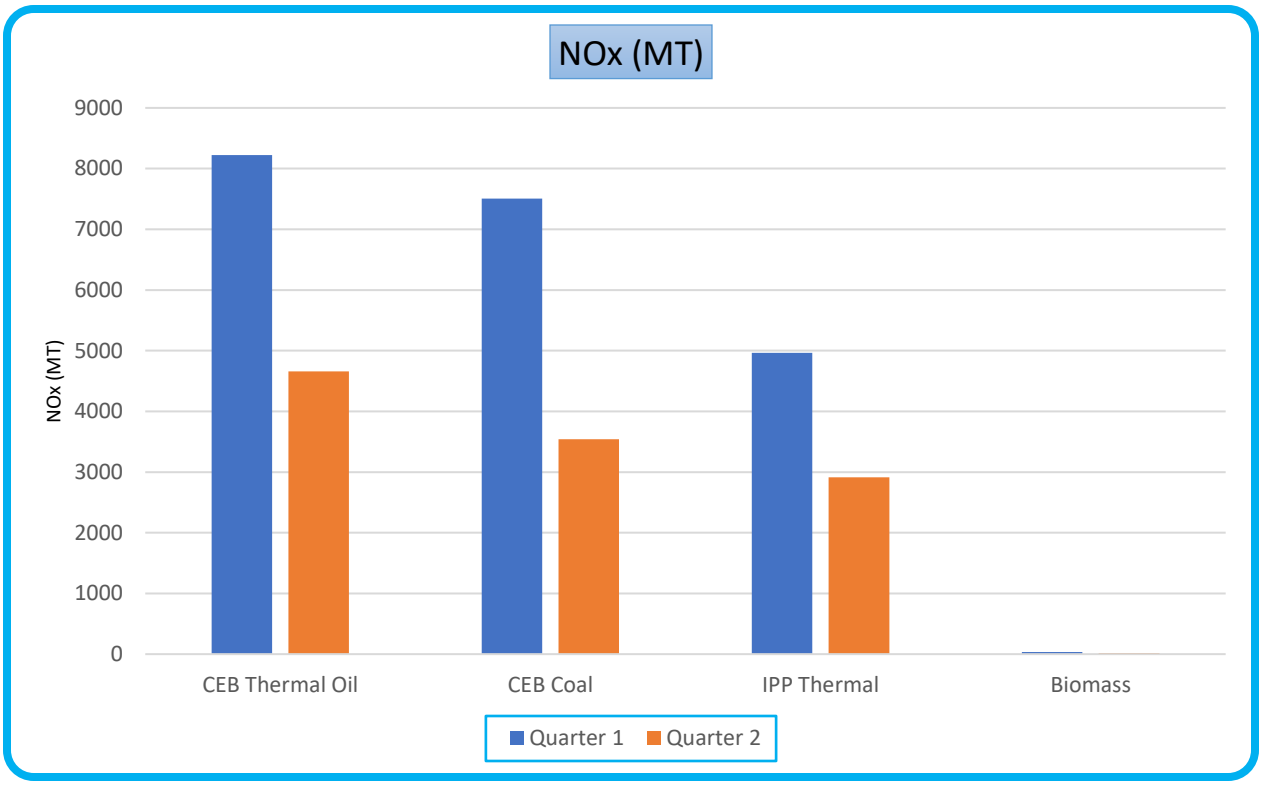


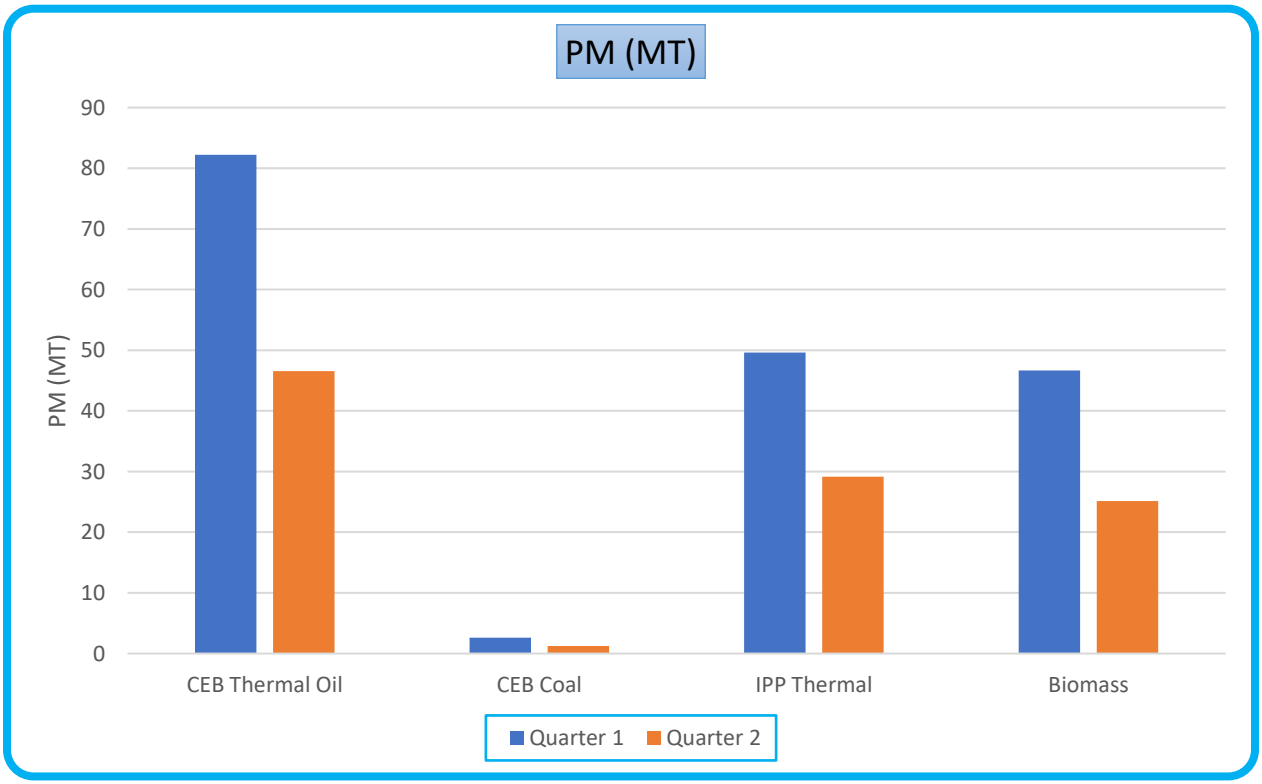
Source: CEB monthly Review Report

Generation Source wise Emission 2023









Source: Estimated base on actual generation

Renewable Generation Power Plants in Sri Lanka

Locations of the Renewable Power plants can be found via the following link.

https://www.pucsl.gov.lk/electricity/quality/environment-and-renewable-energy/