Renewable Generation Report

Q3

July 2023 - September 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.

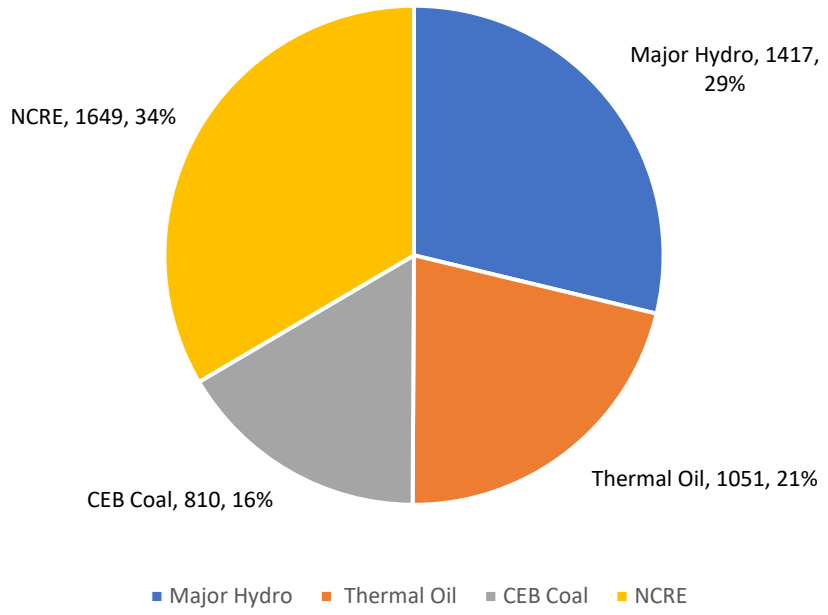
In 2019, the Minister of Power, Energy, and Business Development published the National Energy Policy & Strategies of Sri Lanka, prepared after reviewing and revising the National Energy Policy and Strategies of Sri Lanka published in the Gazette Extraordinary No. 1553/10 of 10.06.2008. The primary objective 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.

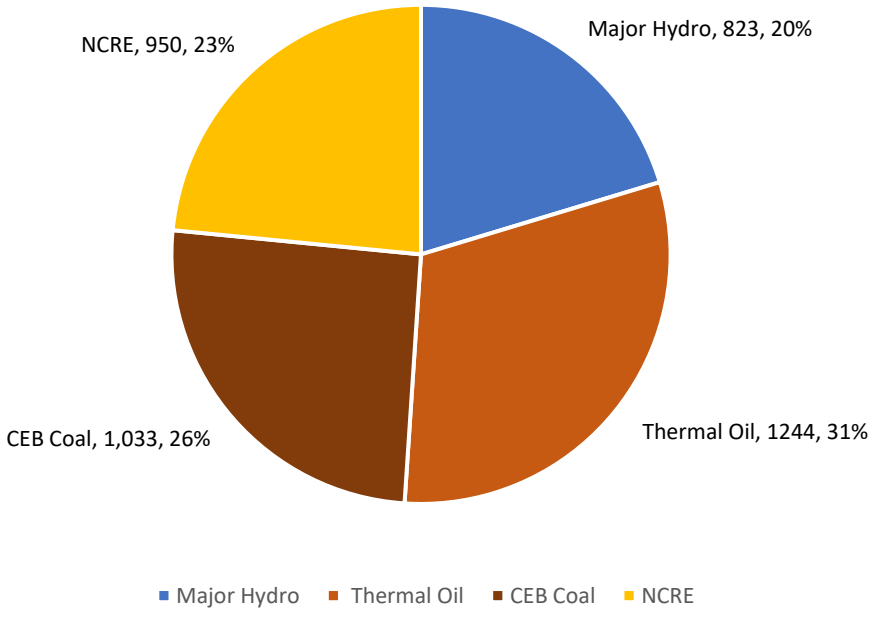
Sri Lanka's power sector development is carried out based on the Long-term generation expansion plan (LTGEP) prepared by the Transmission Licensee (ie. Ceylon Electricity Board (CEB)) and approved by the Public Utilities Commission of Sri Lanka (PUCSL). LTGEP is a rolling plan prepared in every two years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

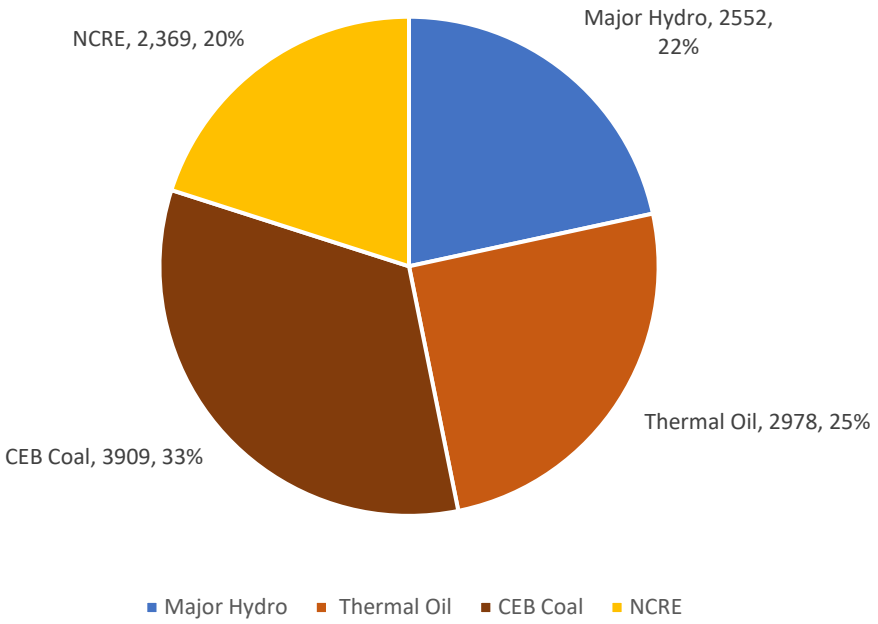
Installed Capacity (MW) by Source - as at 30.09.2023



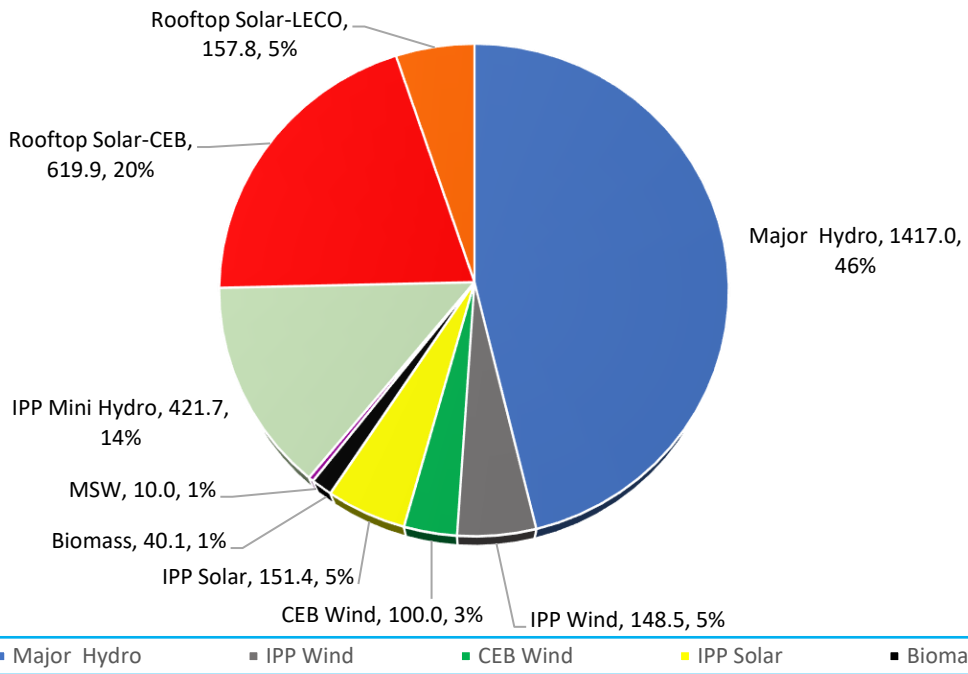
Generation by Source (GWh) - 01.07.2023 to 30.09.2023

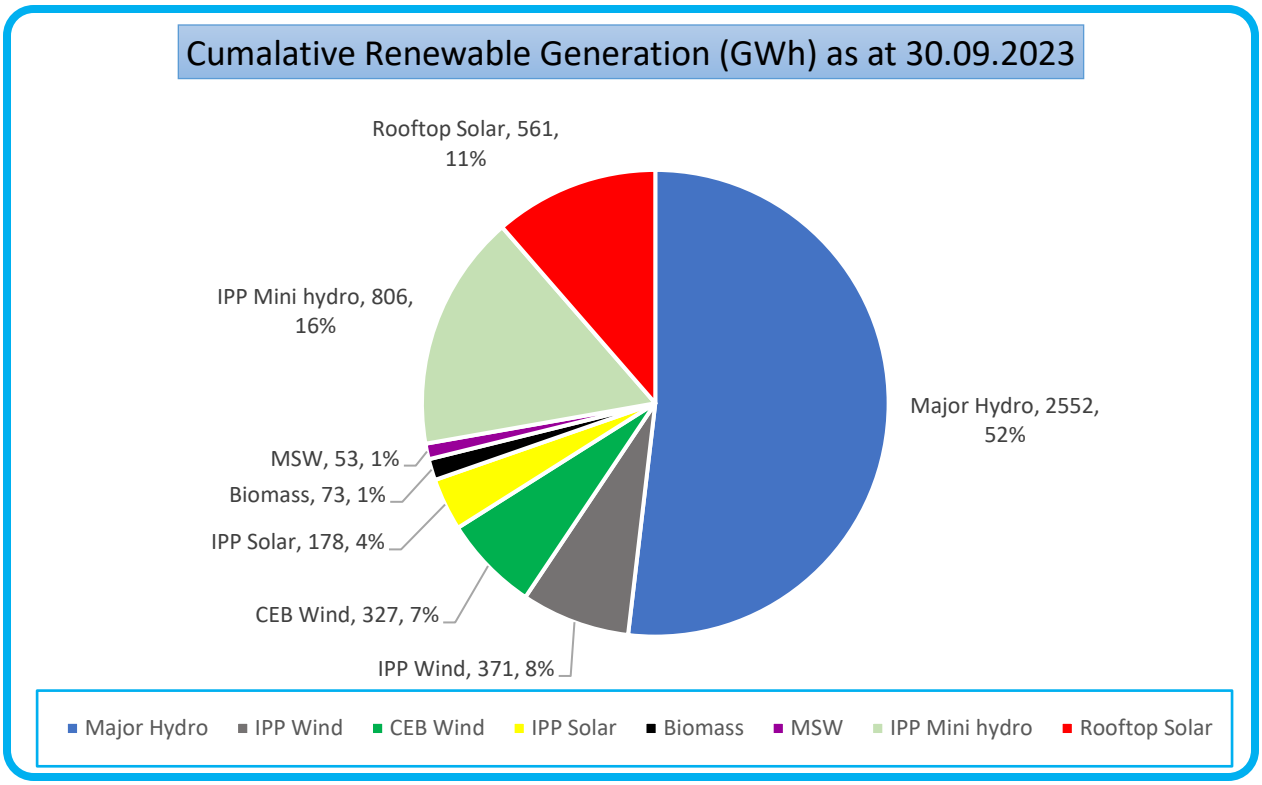


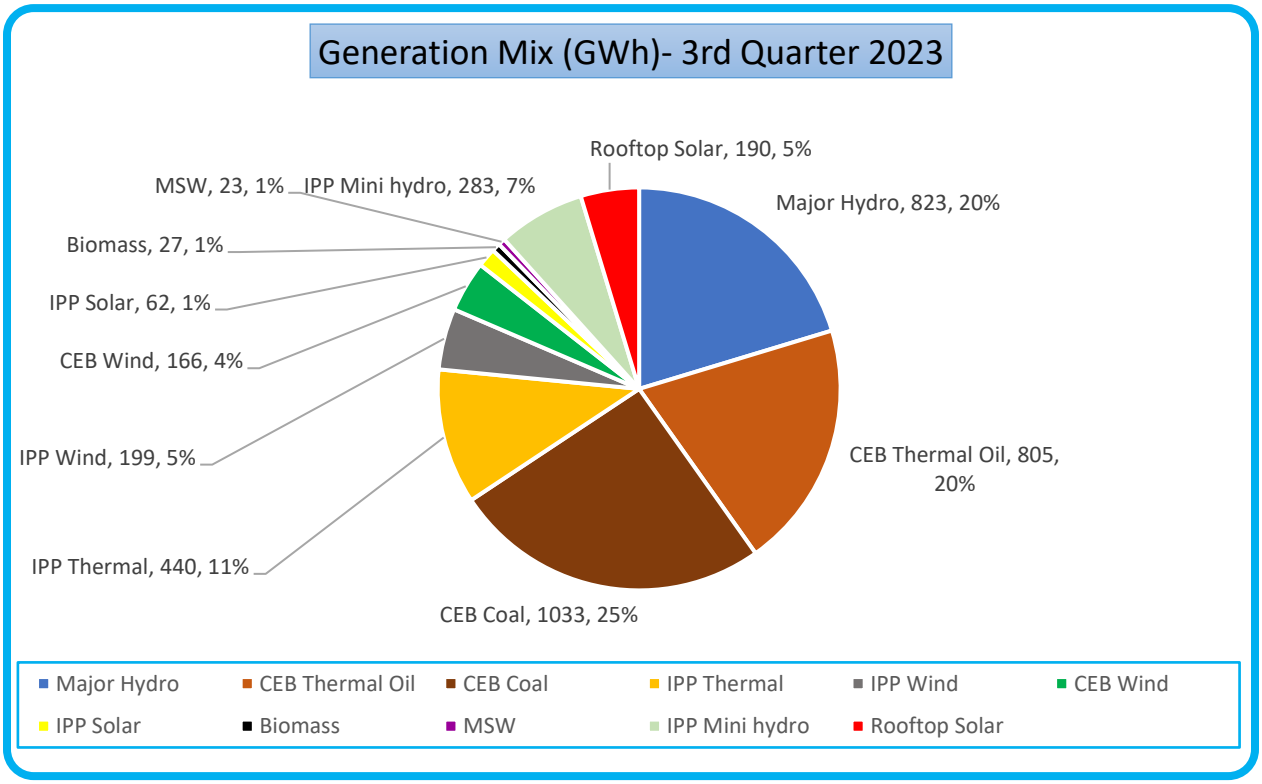
Cumalative Generation by Source (GWh) as at 30.09.2023

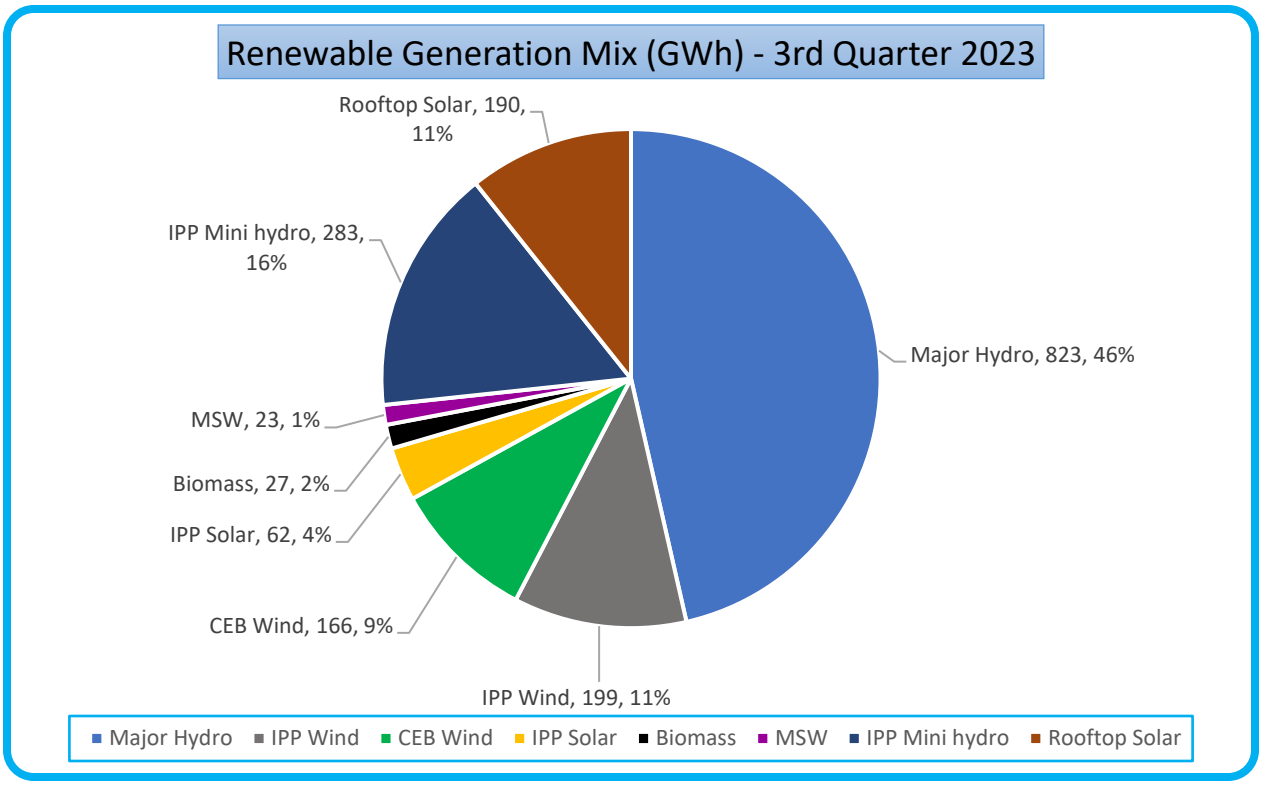


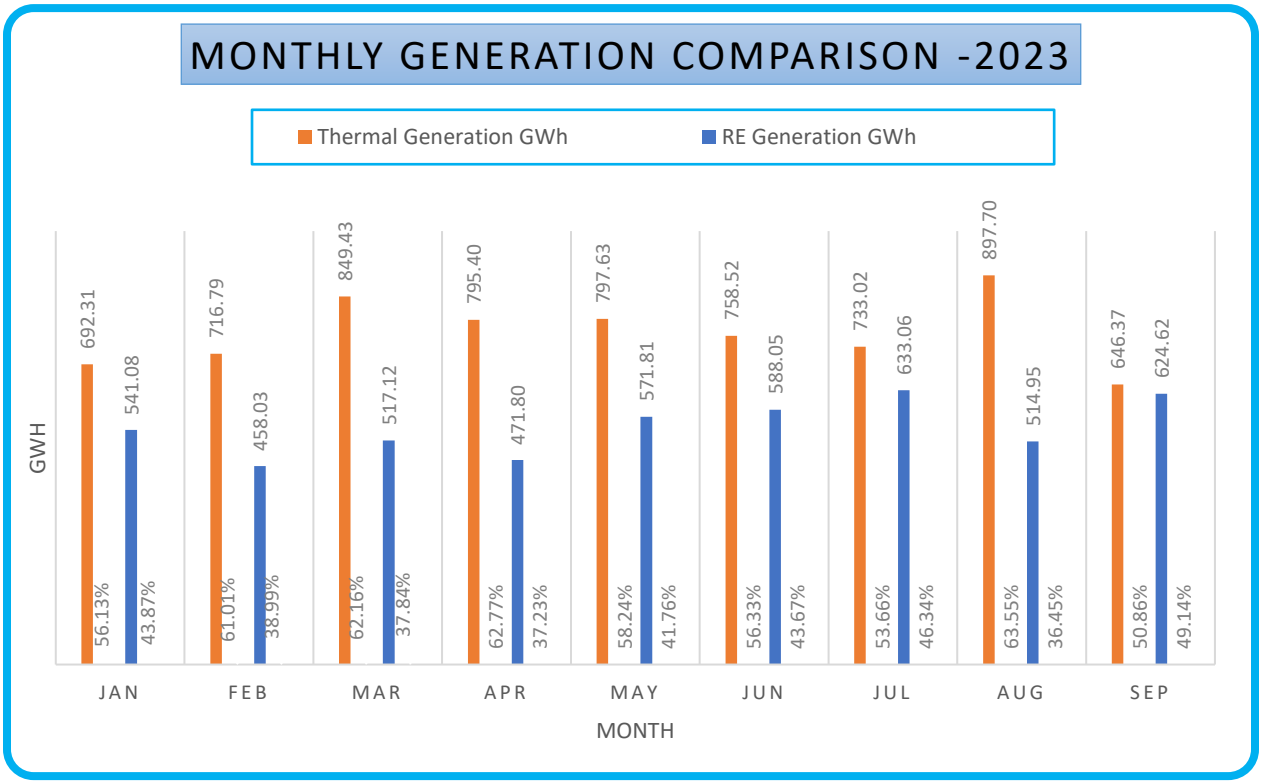
Renewable Energy Capacity (MW) as at 30.09.2023

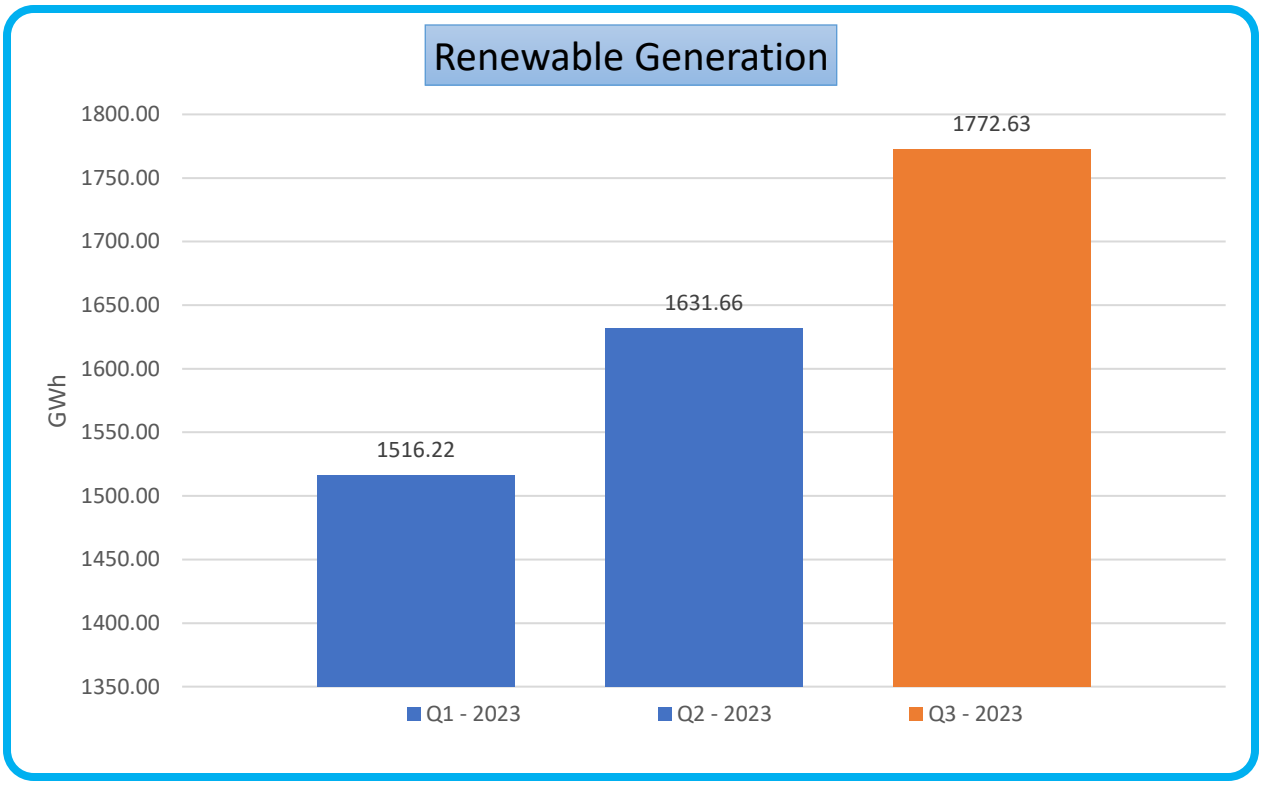



Cumalative Renewable Generation (GWh) as at 30.09.2023
Rooftop Solar, 561, 11%
IPP Mini hydro, 806, 16%
Major Hydro, 2552, 52%
MSW, 53, 1%
Biomass, 73, 1%
IPP Solar, 178, 4%
CEB Wind, 327, 7%
IPP Wind, 371, 8%
Major Hydro
IPP Wind
CEB Wind
IPP Solar
Biomass
MSW
IPP Mini hydro
Rooftop Solar


Generation Mix (GWh)- 3rd Quarter 2023
Rooftop Solar, 190, 5%
MSW, 23, 1%
IPP Mini hydro, 283, 7%
Major Hydro, 823, 20%
Biomass, 27, 1%
IPP Solar, 62, 1%
CEB Wind, 166, 4%
IPP Wind, 199, 5%
CEB Thermal Oil, 805, 20%
IPP Thermal, 440, 11%
CEB Coal, 1033, 25%
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) - 3rd Quarter 2023
Rooftop Solar, 190, 11%
IPP Mini hydro, 283, 16%
Major Hydro, 823, 46%
MSW, 23, 1%
Biomass, 27, 2%
IPP Solar, 62, 4%
CEB Wind, 166, 9%
IPP Wind, 199, 11%
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
GWH
692.31
541.08
56.13%
43.87%
716.79
458.03
61.01%
38.99%
849.43
517.12
62.16%
37.84%
795.40
471.80
62.77%
37.23%
797.63
571.81
58.24%
41.76%
758.52
588.05
56.33%
43.67%
733.02
633.06
53.66%
46.34%
897.70
514.95
63.55%
36.45%
646.37
624.62
50.86%
49.14%
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
MONTH

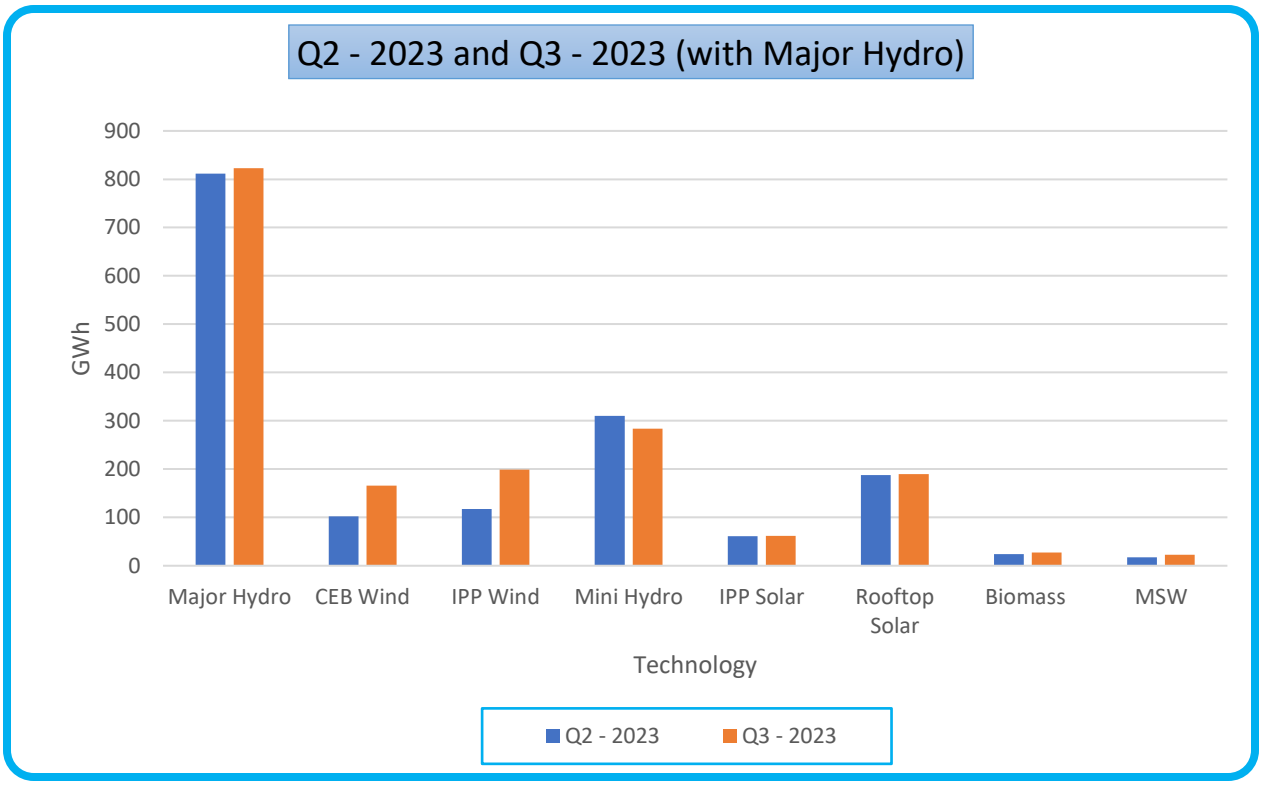


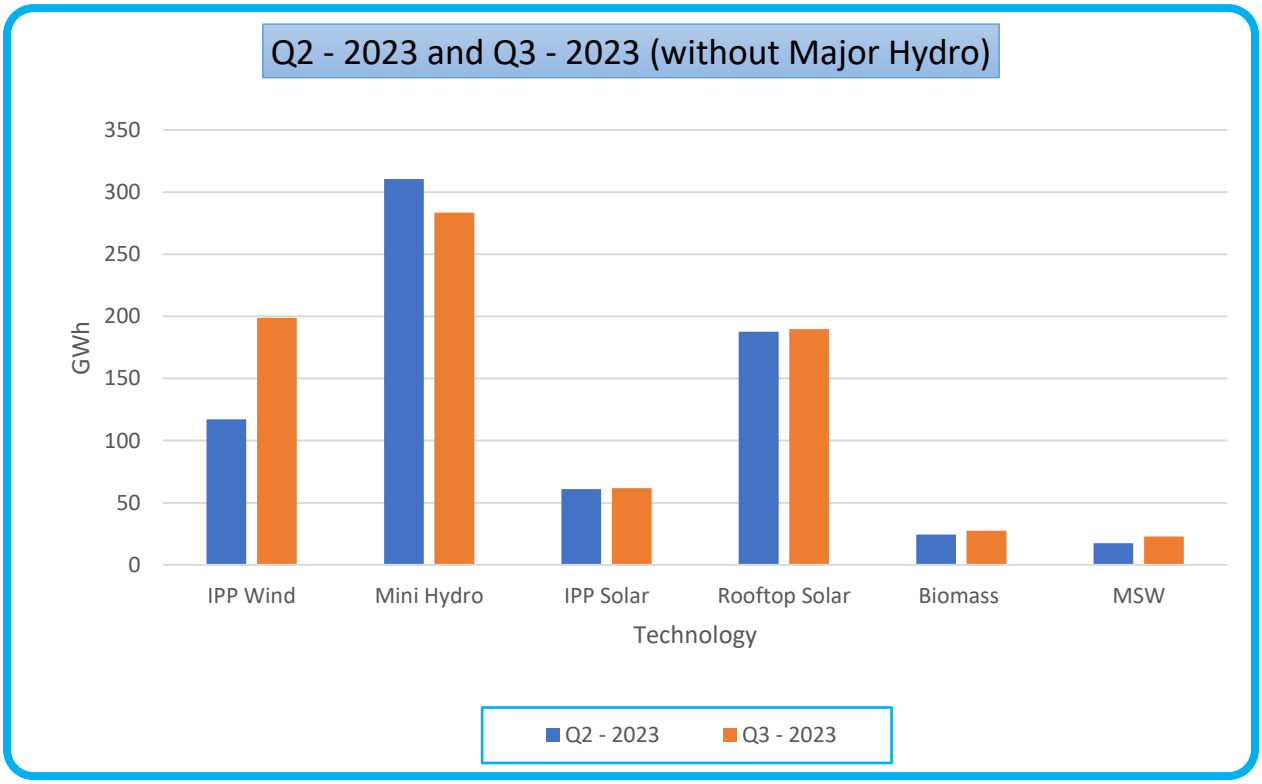
Increased by 15.6% as compared to Q1 2023

Increased by 8.2% as compared to Q2 2023

Renewable Generation (GWh) – 2nd Quarter 2023 Vs 3rd Quarter 2023

Technology	Q2 - 2023	Q3 - 2023	Deviation (%)
Major Hydro	812	823	1%
CEB Wind	102	166	62%
IPP Wind	117	199	70%
Mini Hydro	310	283	-9%
IPP Solar	61	62	1%
Rooftop Solar	188	190	1%
Biomass	24	27	13%
MSW	17	23	31%

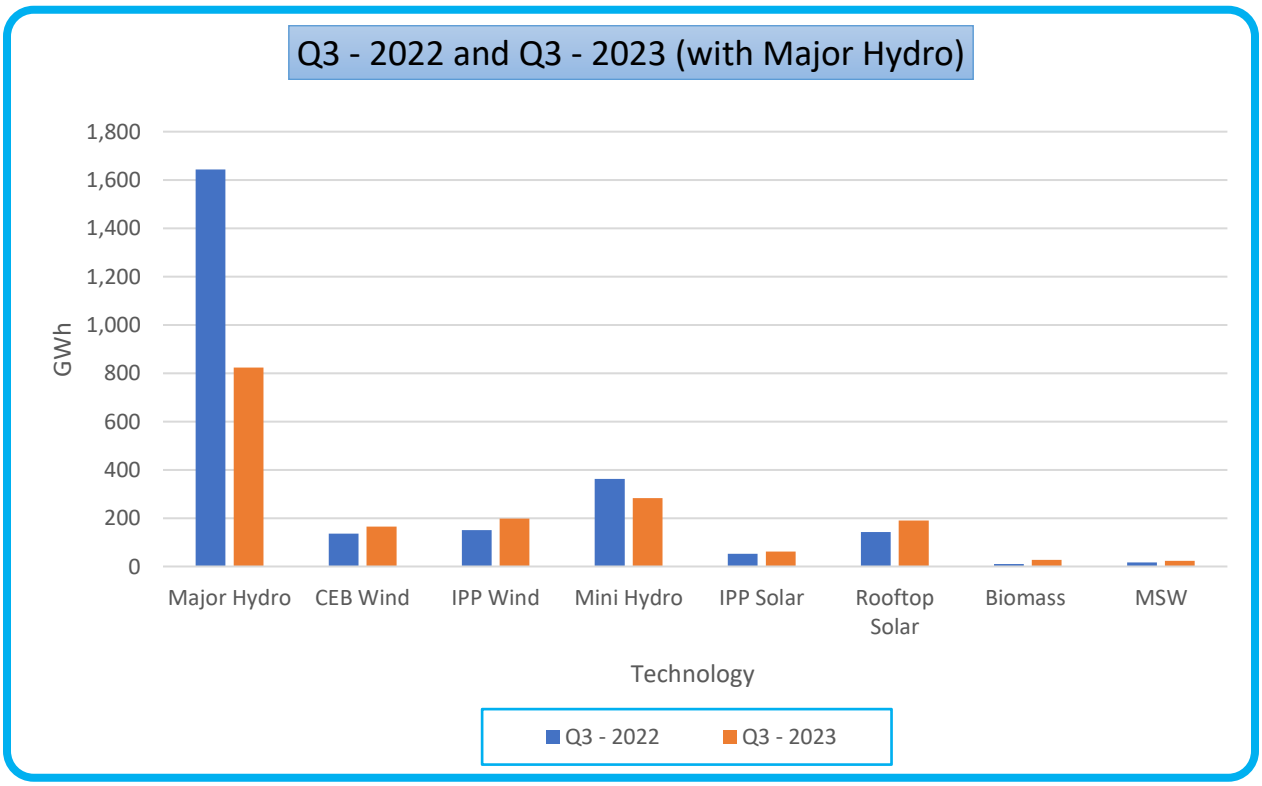

Q2 - 2023 and Q3 - 2023 (with Major Hydro)
900
800
700
600
500
400
300
200
100
0
GWh
Major Hydro
CEB Wind
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q2 - 2023
Q3 - 2023

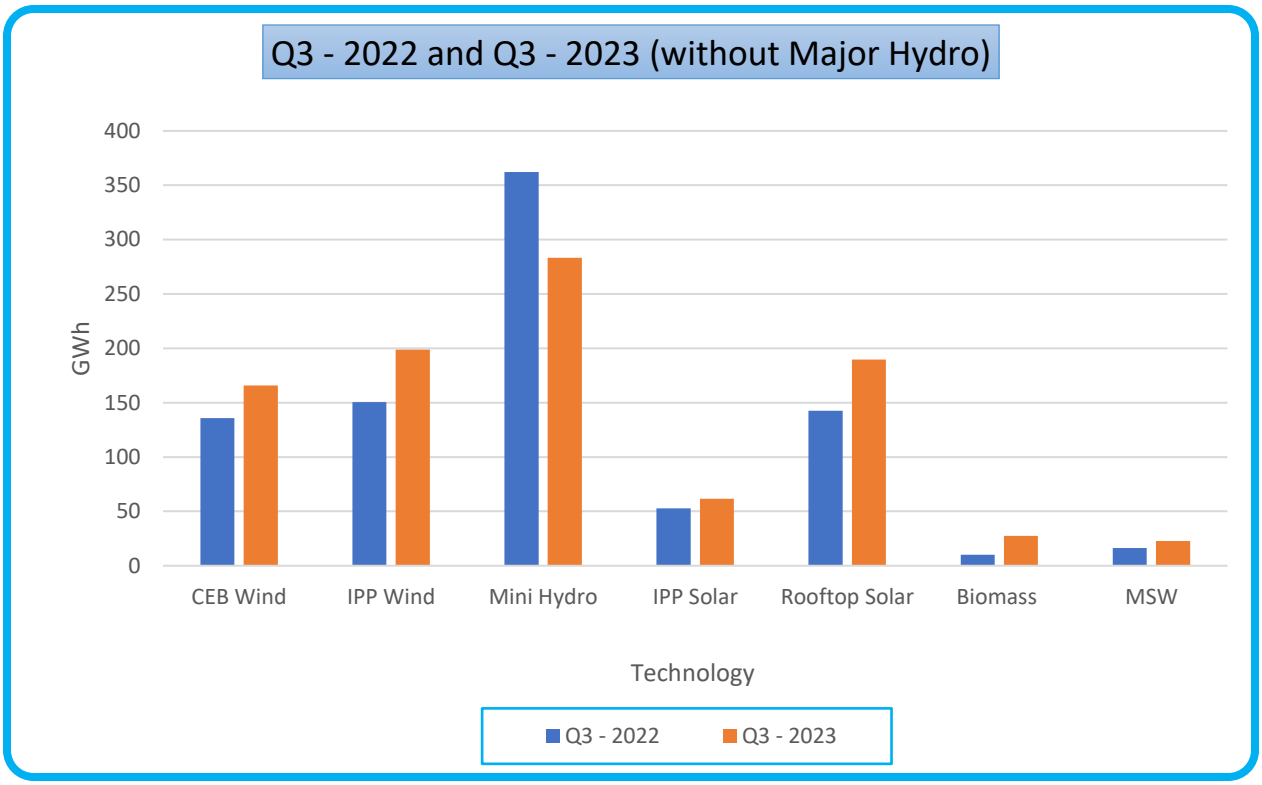

Q2 - 2023 and Q3 - 2023 (without Major Hydro)
350
300
250
200
150
100
50
0
GWh
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q2 - 2023
Q3 - 2023

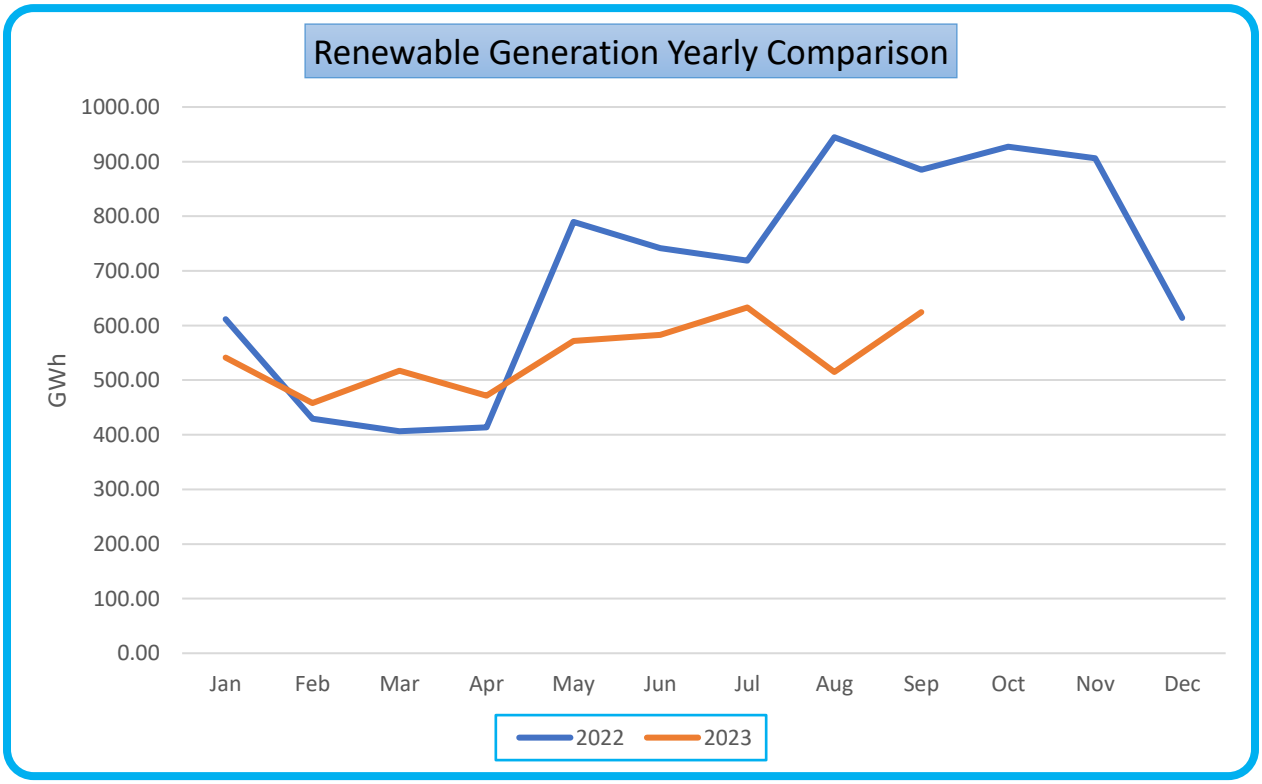
Renewable Generation Comparison

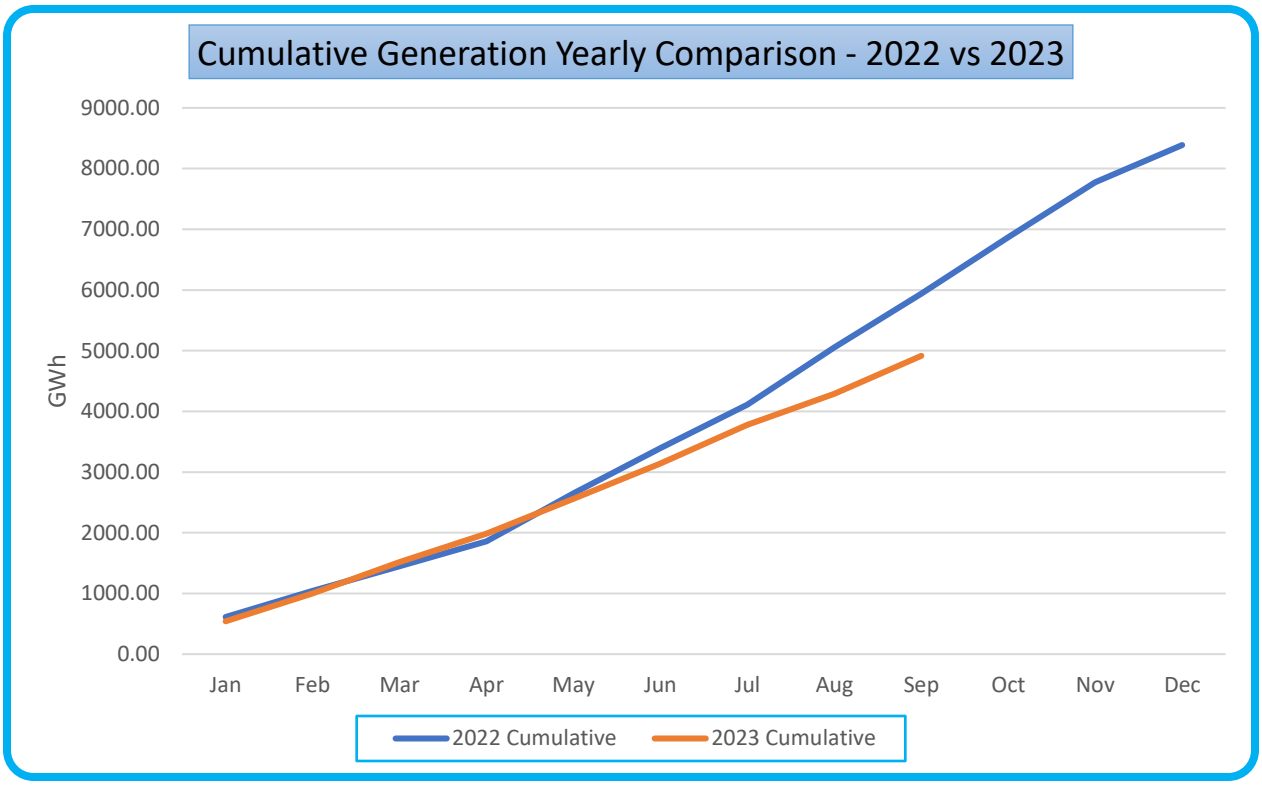
Renewable Generation (GWh) – 3rd Quarter 2022 vs 3rd Quarter 2023

Technology	Q3 - 2022	Q3 - 2023	Deviation
Major Hydro	1,644	823	-50%
CEB Wind	136	166	22%
IPP Wind	151	199	32%
Mini Hydro	362	283	-22%
IPP Solar	53	62	17%
Rooftop Solar	143	190	33%
Biomass	10	27	175%
MSW	16	23	39%

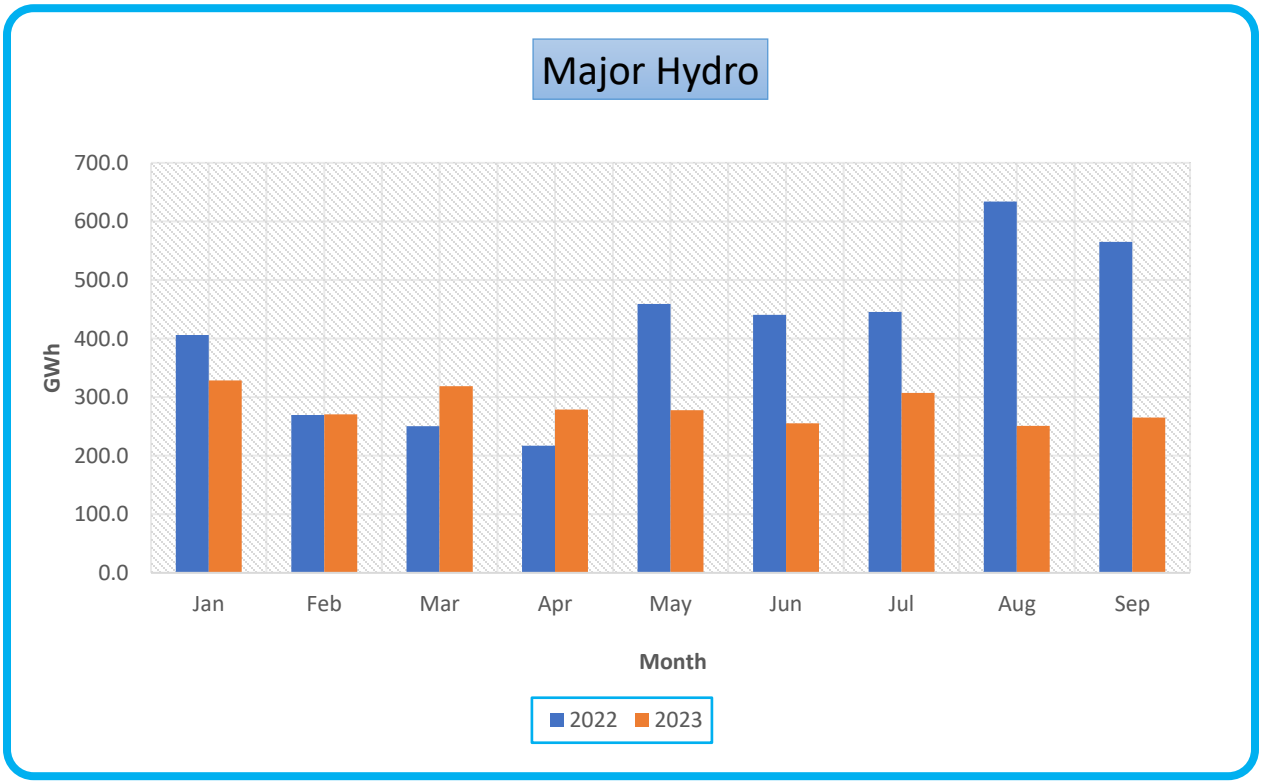


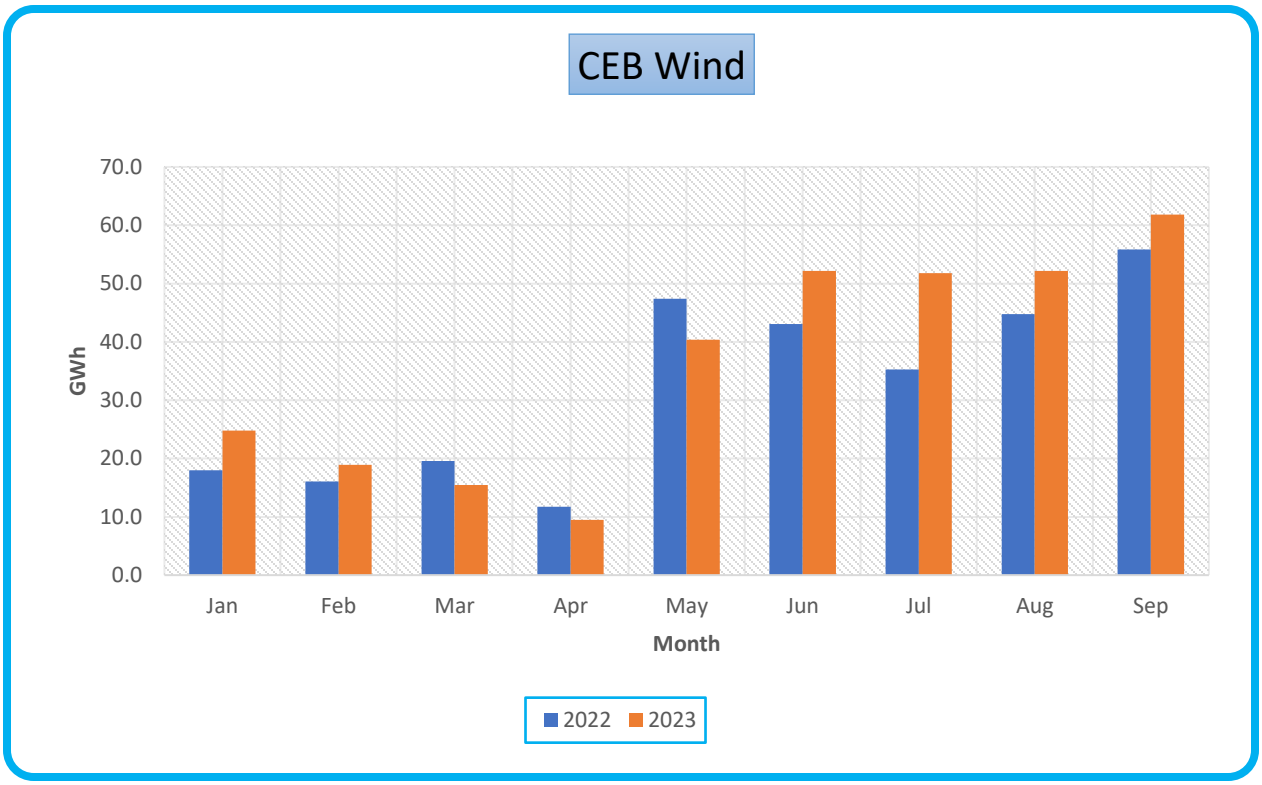

Q3 - 2022 and Q3 - 2023 (without Major Hydro)
400
350
300
250
200
150
100
50
0
GWh
CEB Wind
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q3 - 2022
Q3 - 2023

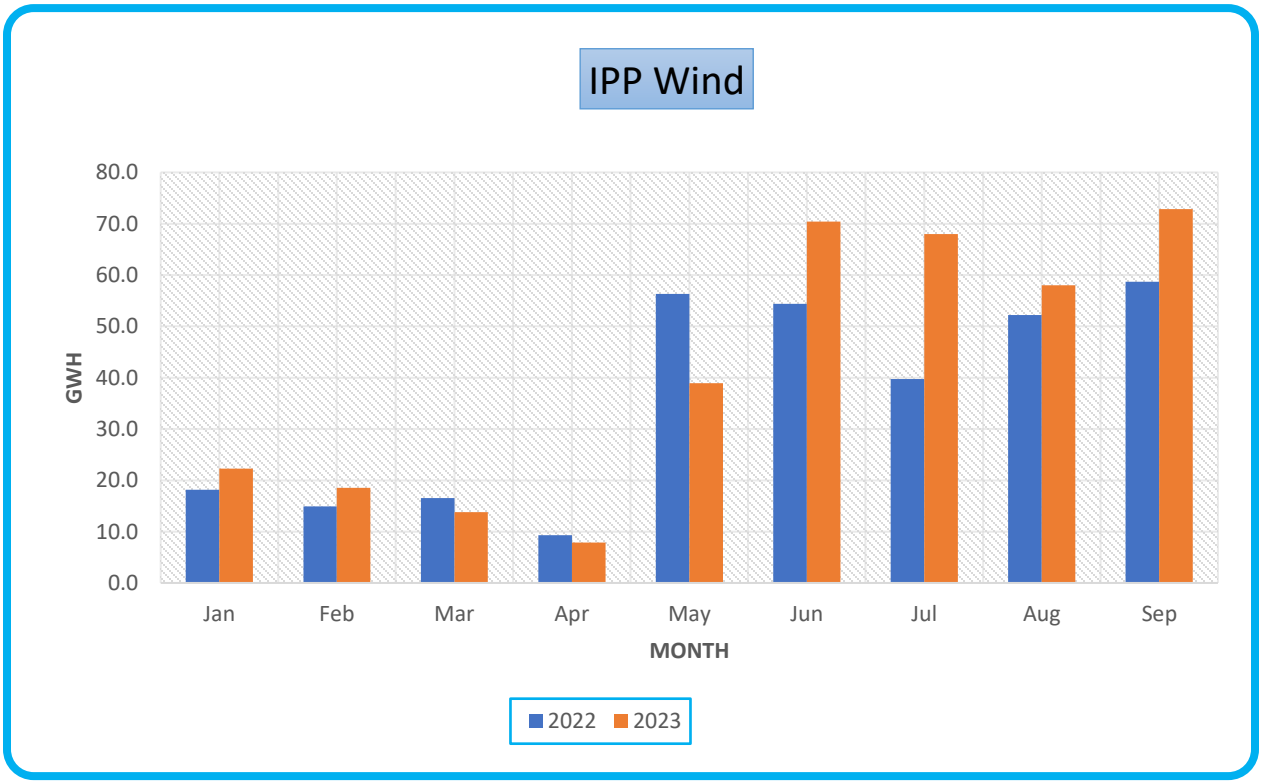

Renewable Generation Yearly Comparison
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
GWh
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2022
2023

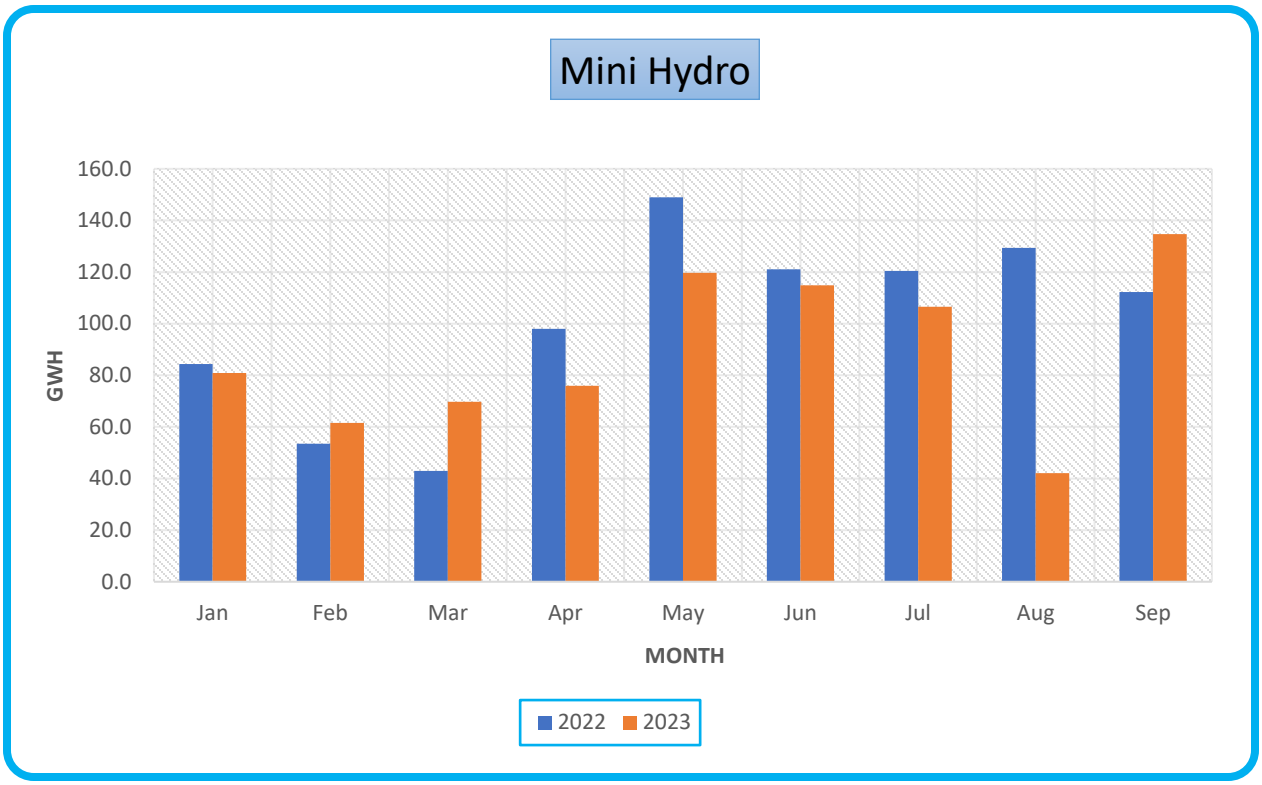


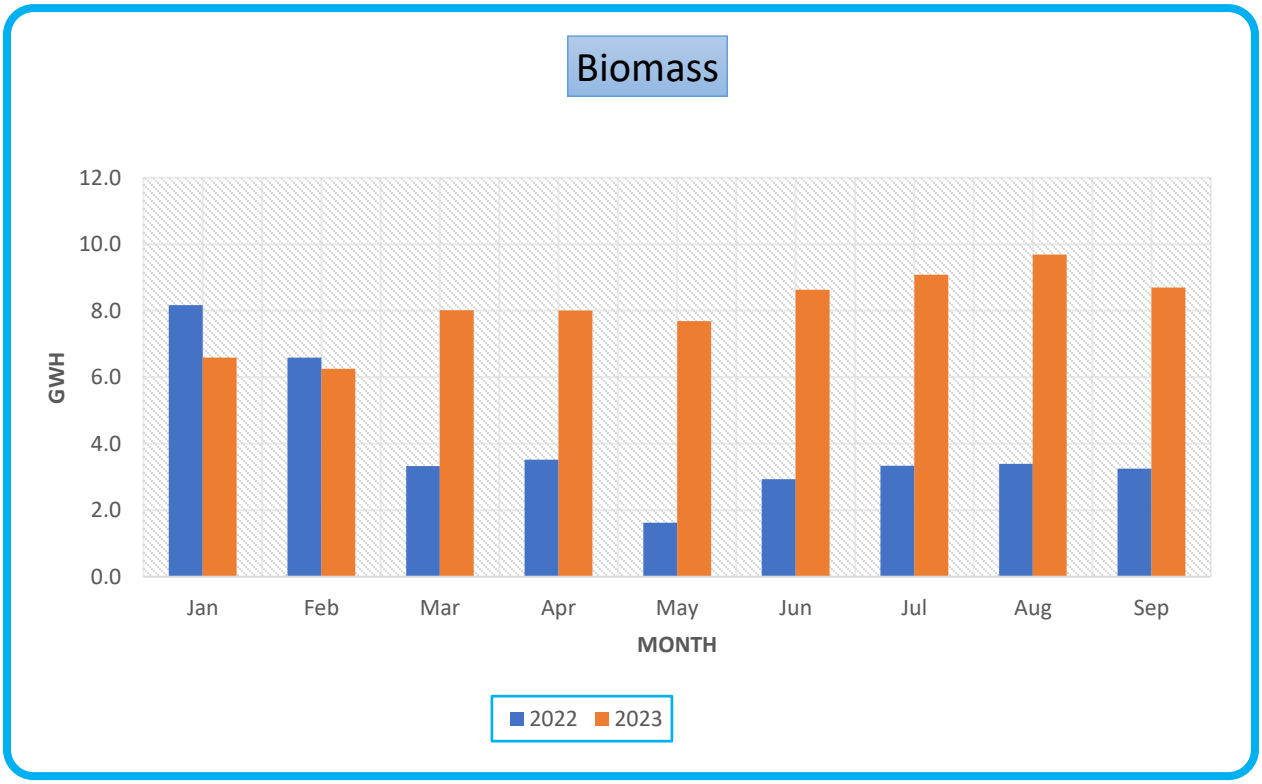
Variation of Renewable Generation – Technology Wise

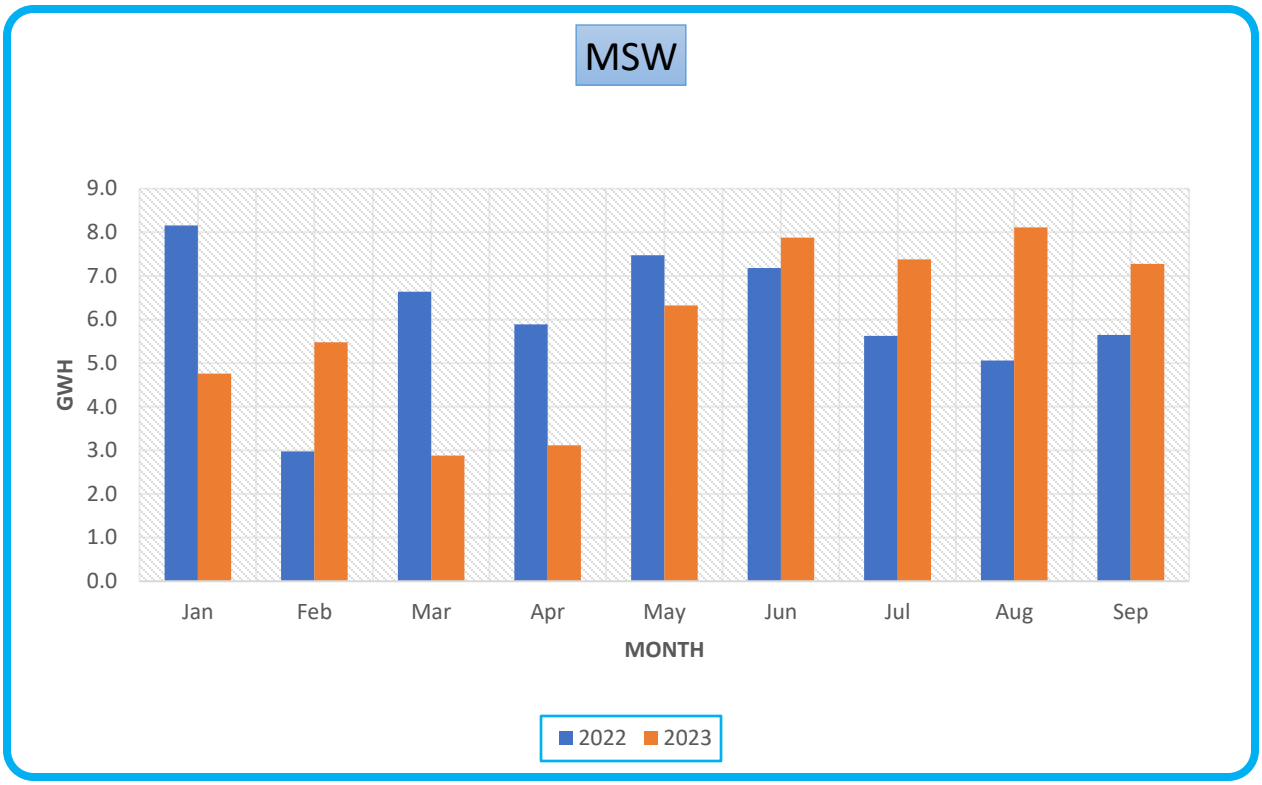


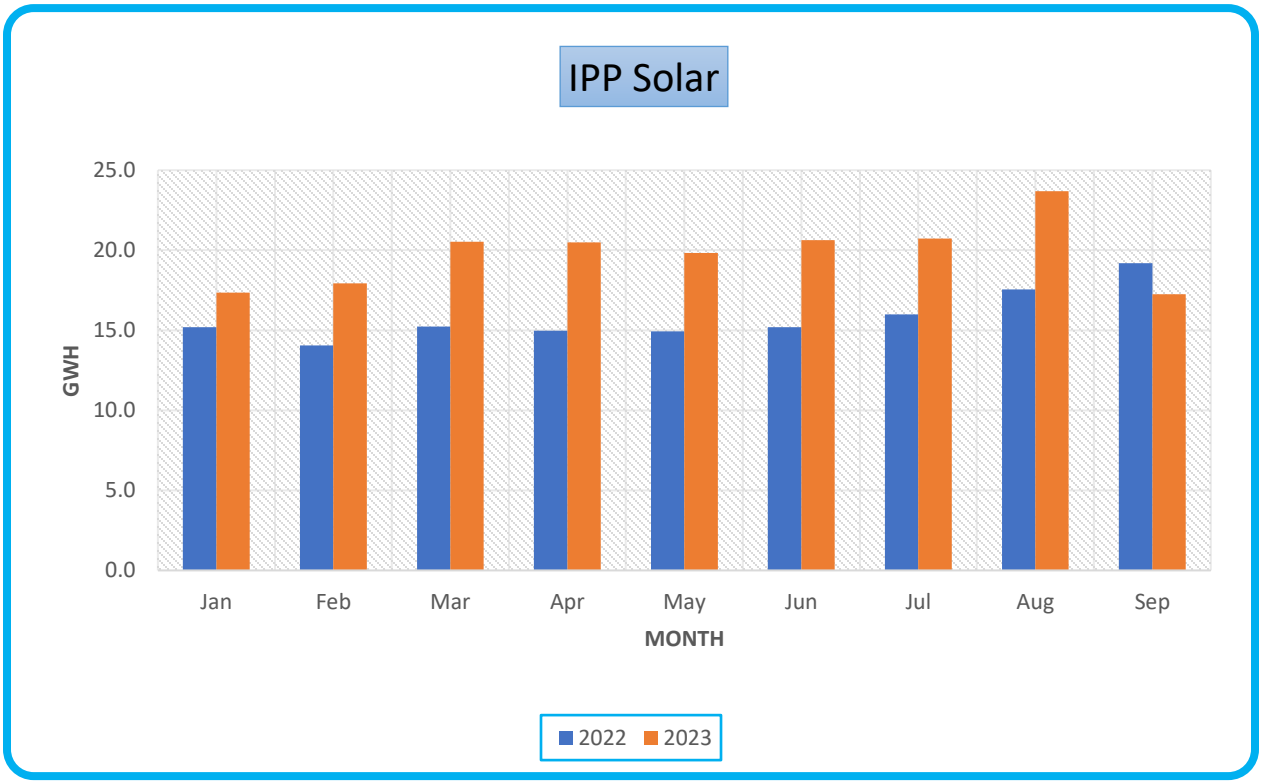

CEB Wind
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
GWh
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Month
2022
2023

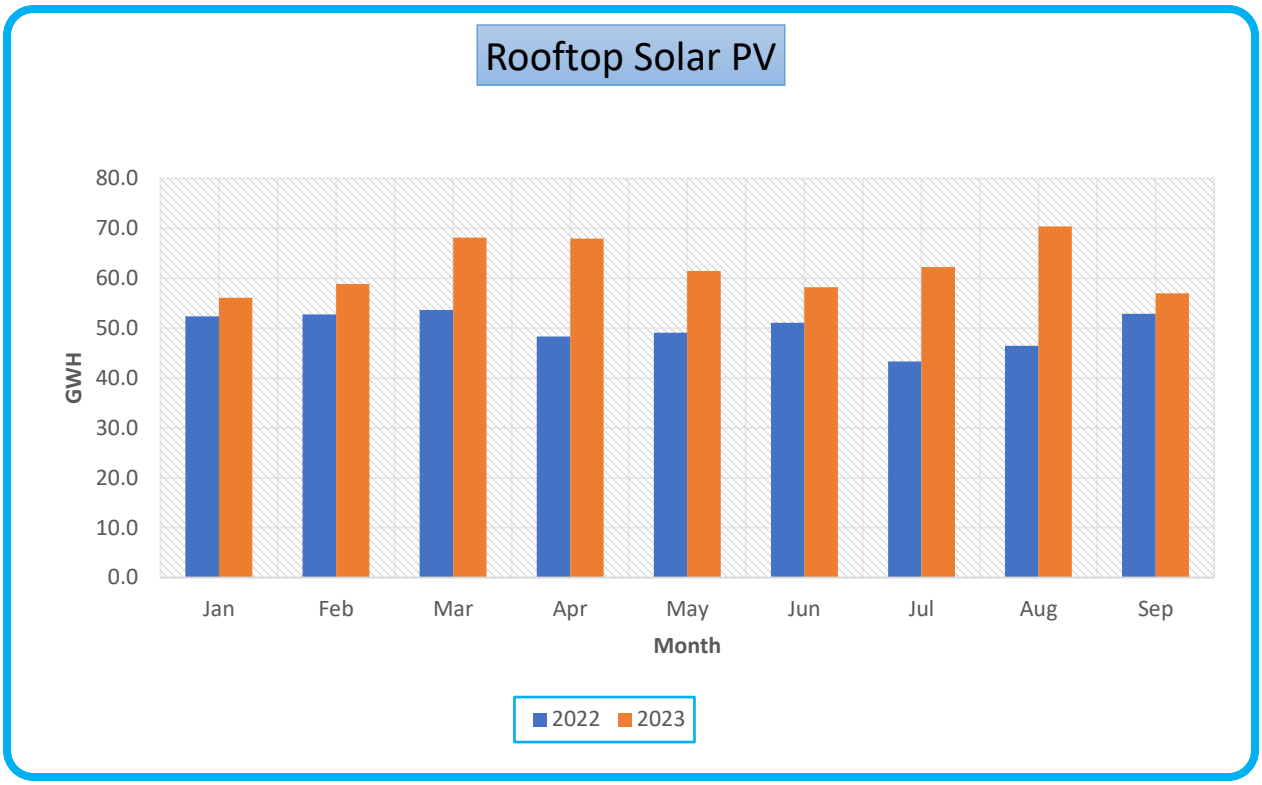

IPP Wind
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
GWH
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
MONTH
2022
2023


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
Jul
Aug
Sep
MONTH
2022
2023


Biomass
12.0
10.0
8.0
6.0
4.0
2.0
0.0
GWH
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
MONTH
2022
2023

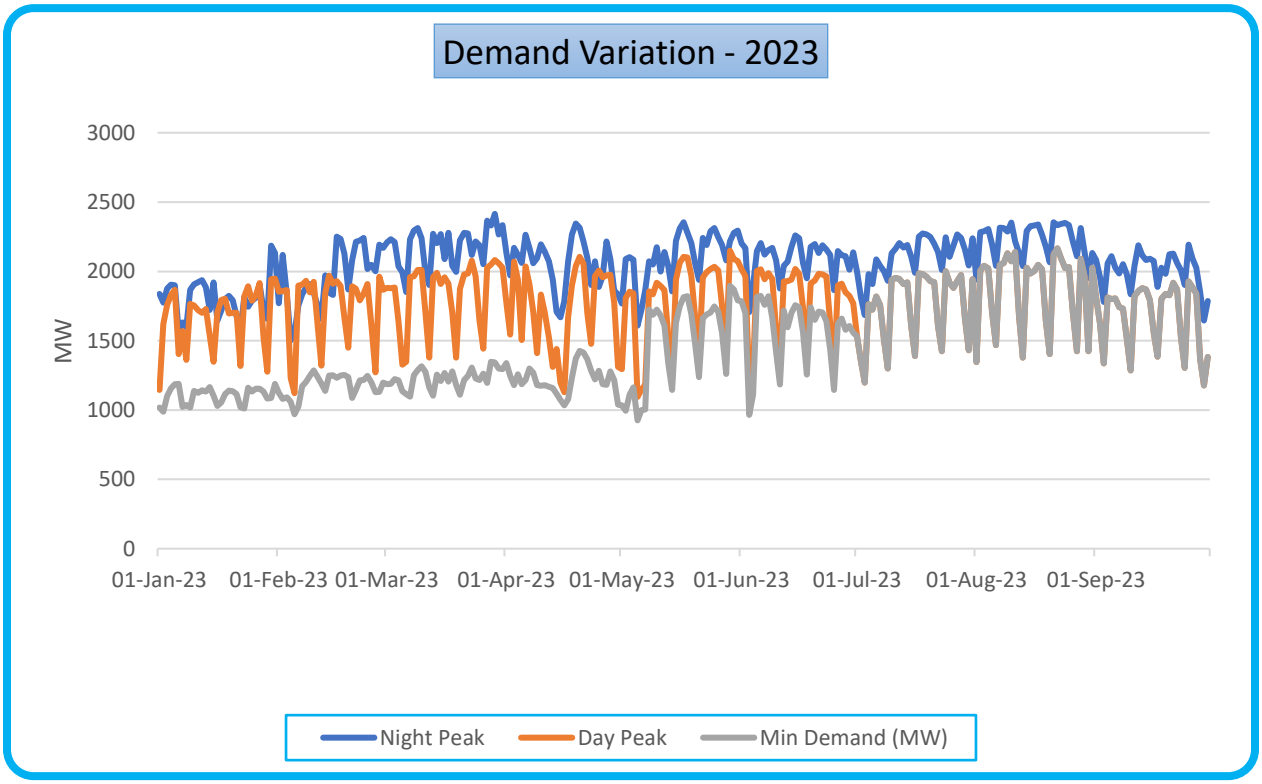

MSW
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
GWH
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
MONTH
2022
2023

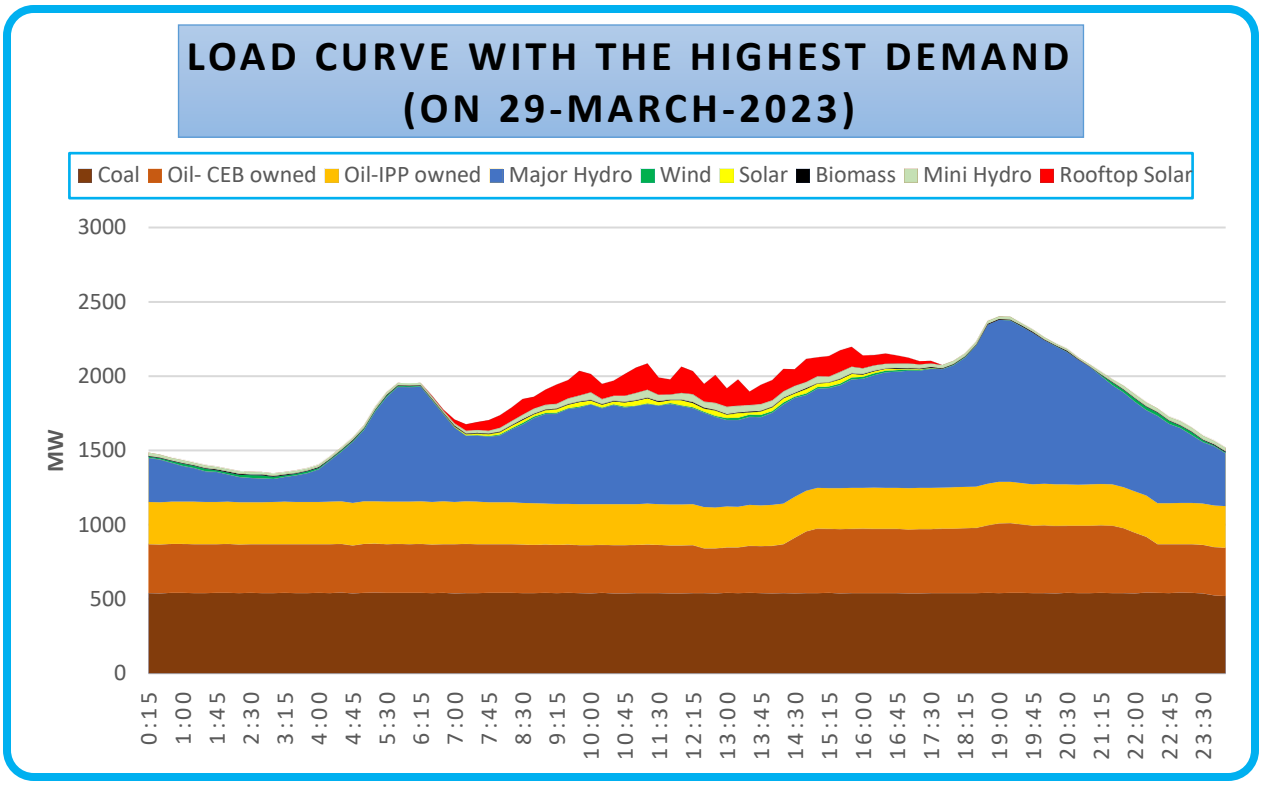

IPP Solar
25.0
20.0
15.0
10.0
5.0
0.0
GWH
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
MONTH
2022
2023



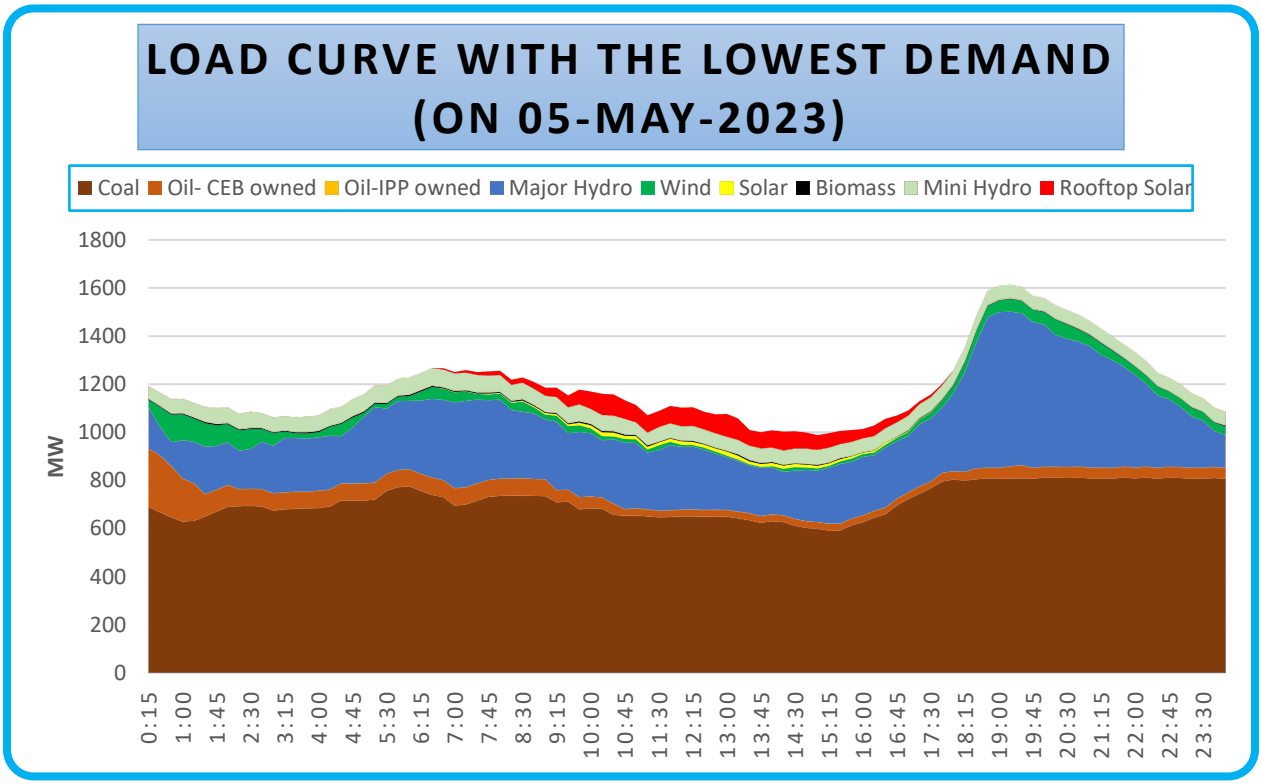
Source: CEB monthly Review Report

Daily Demand Variation

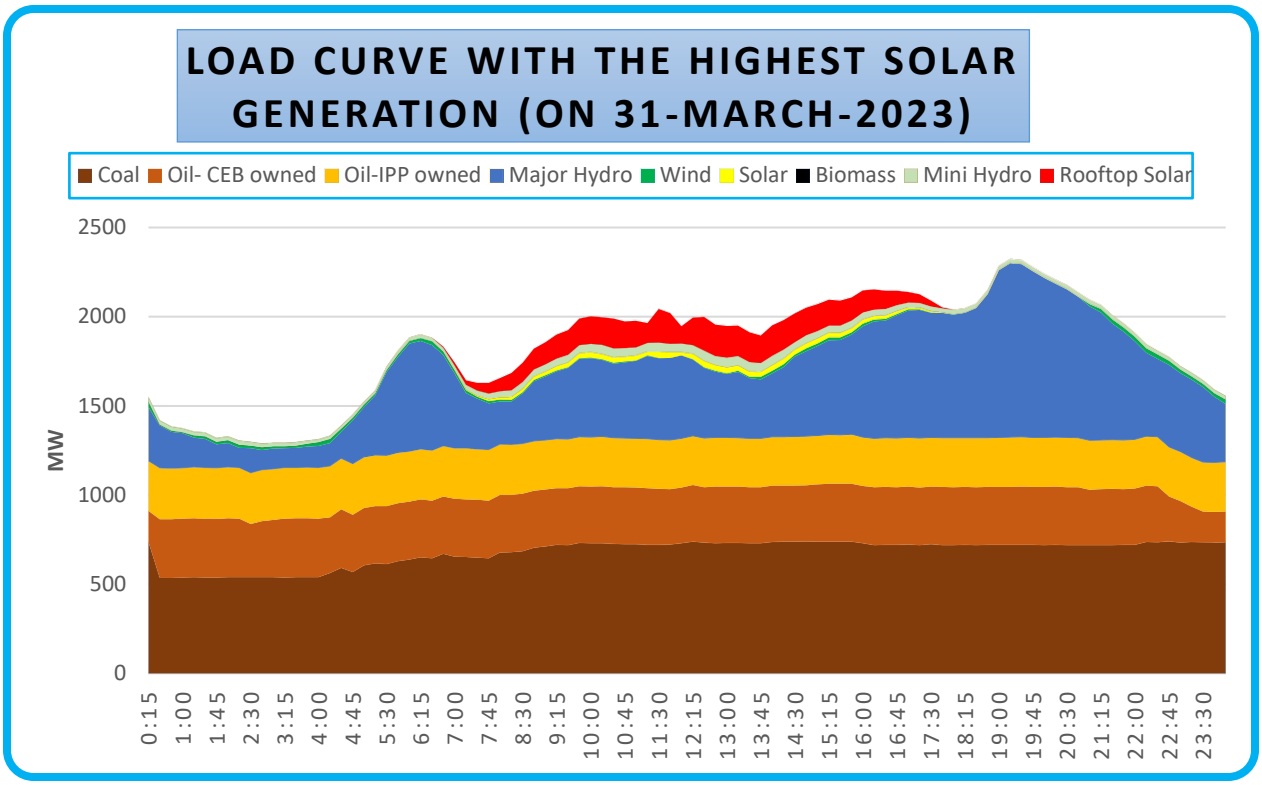




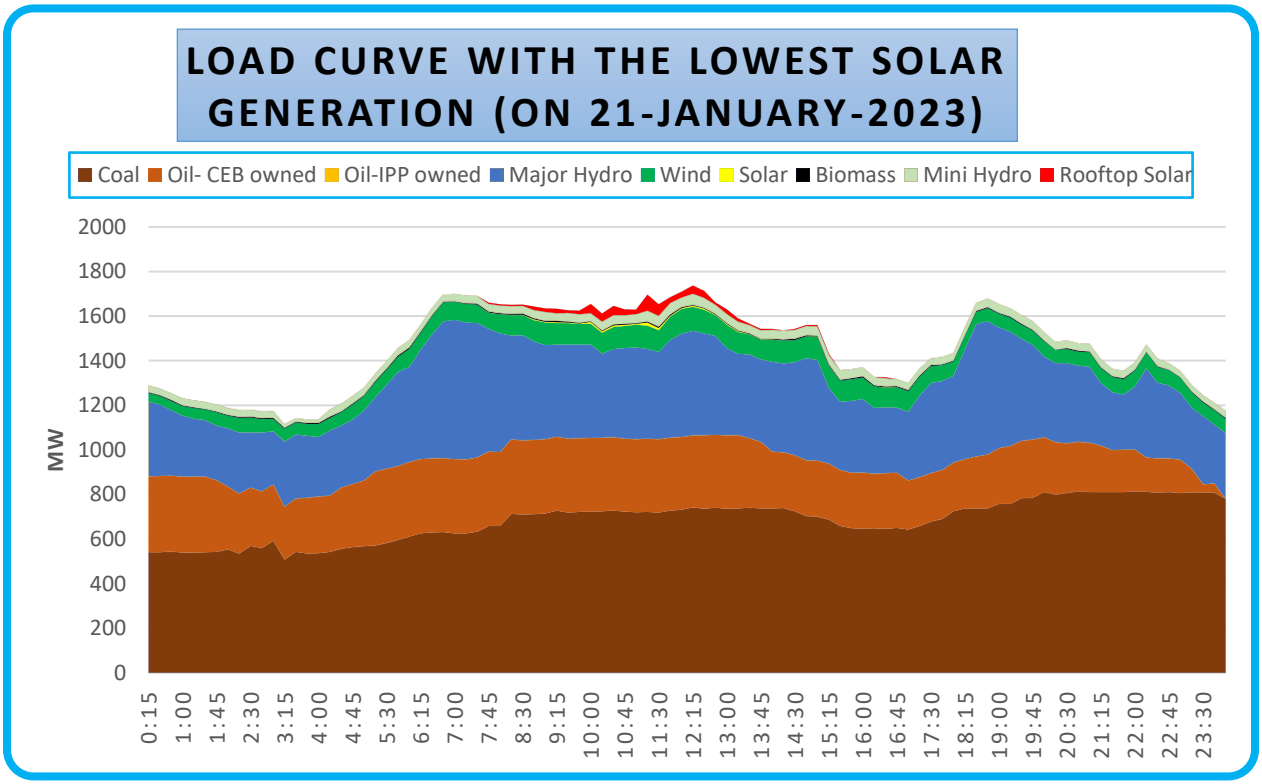
Note: Contribution from Rooftop Solar PV, IPP Solar (1MW), and Non-telemetered Mini Hydro is estimated based on the relevant actual generation and modelled in the generation profile



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

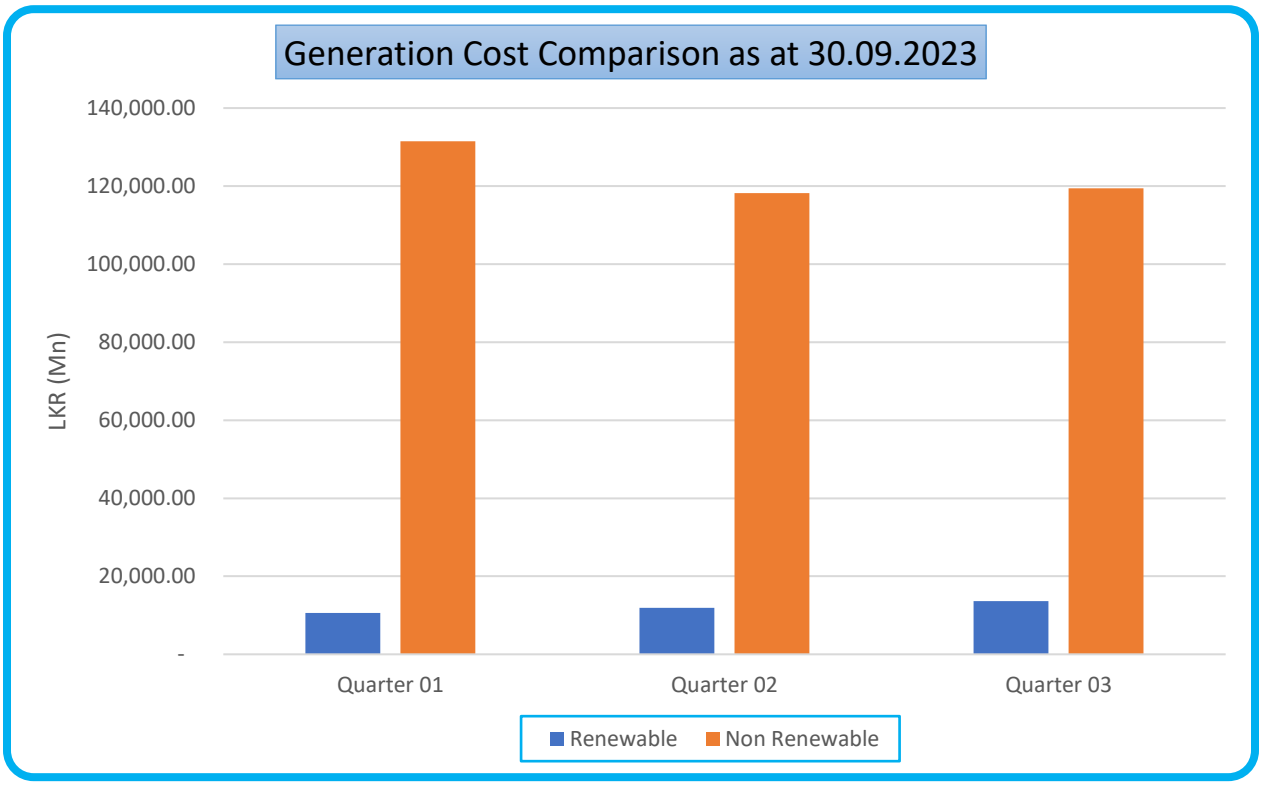


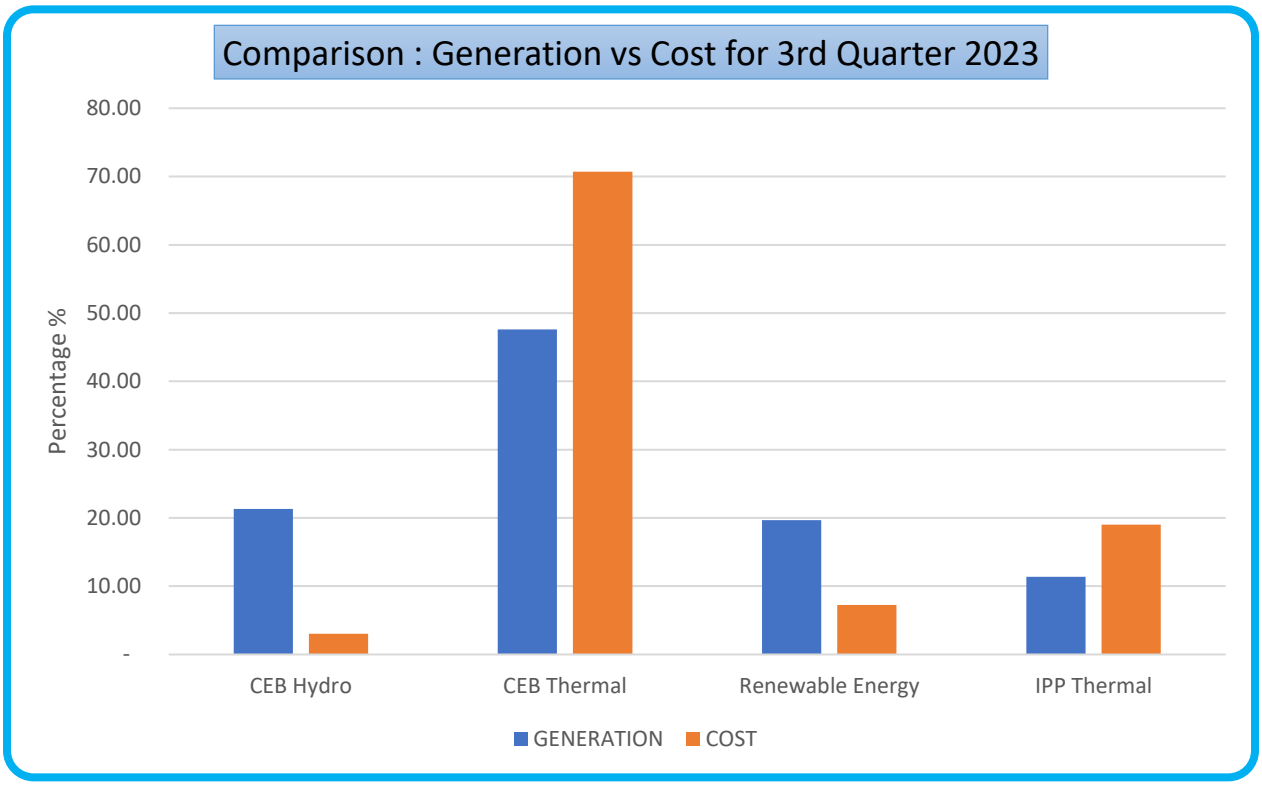
Note: Rooftop Solar PV, IPP Solar (1MW), and Non-telemetered Mini Hydro daily generation for Load Curves are calculated relative to actual monthly generations.



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

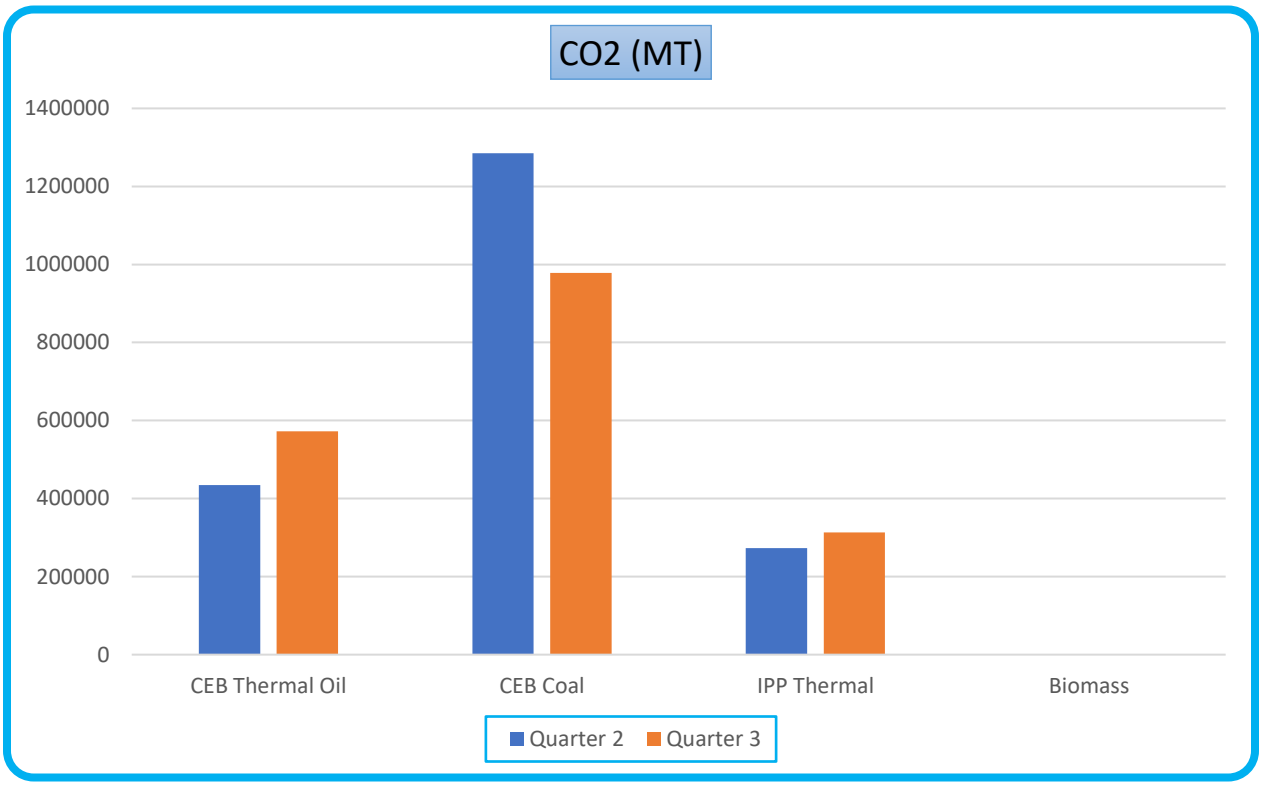
Generation Cost

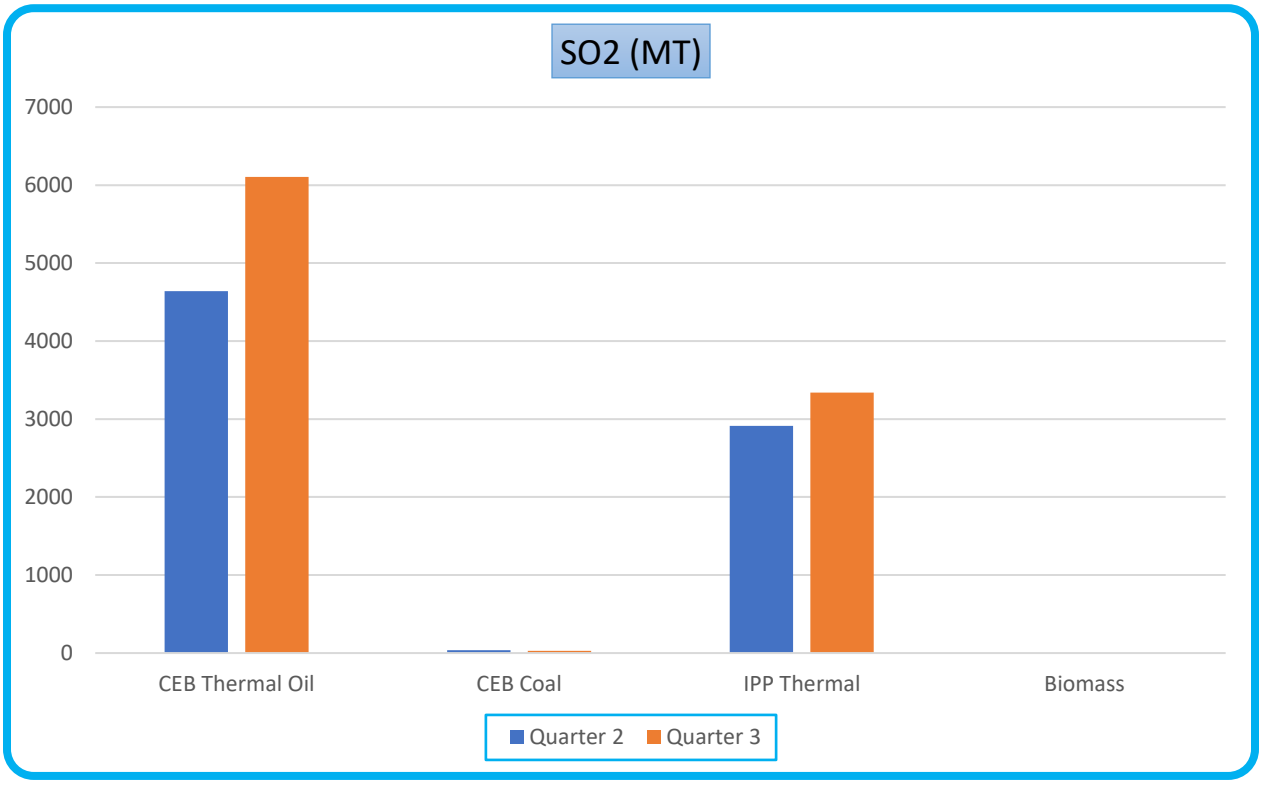


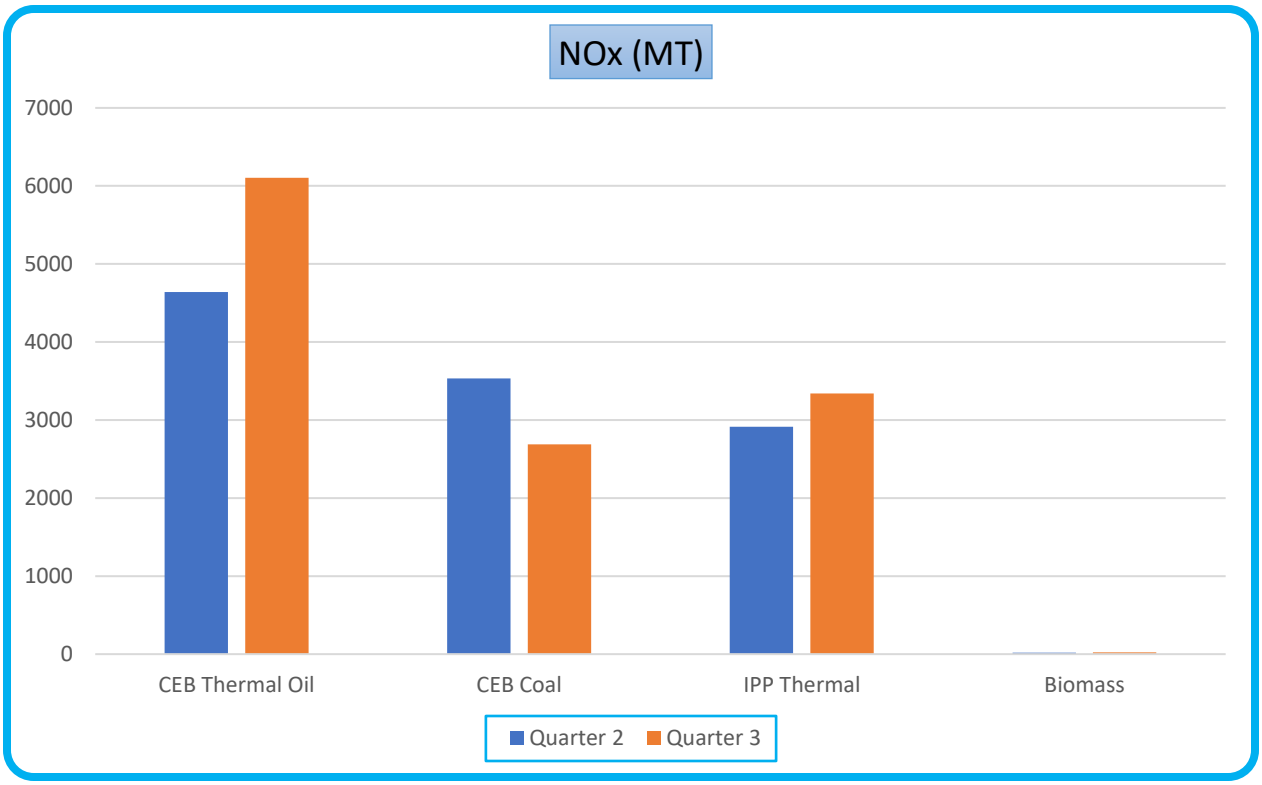


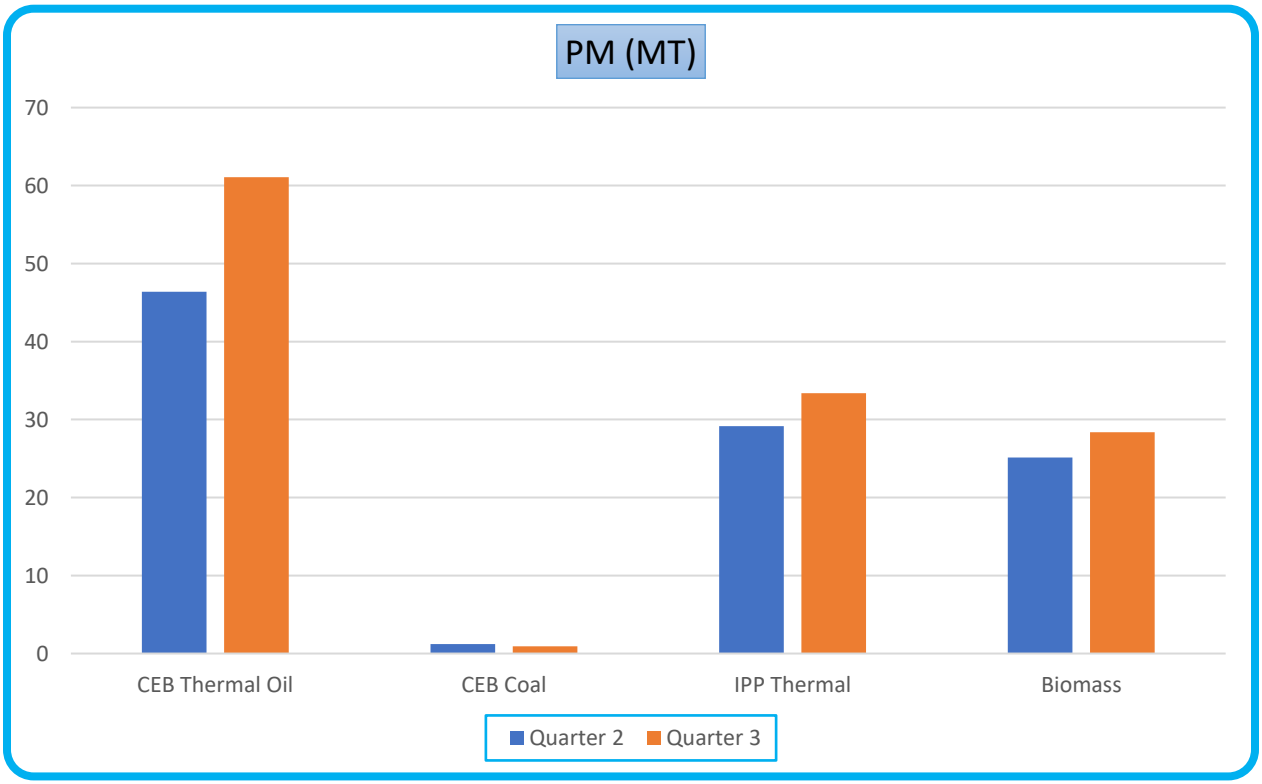
Source: CEB monthly Review Report

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/