Renewable Generation Report

Q1

Jan 2023-Mar 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.

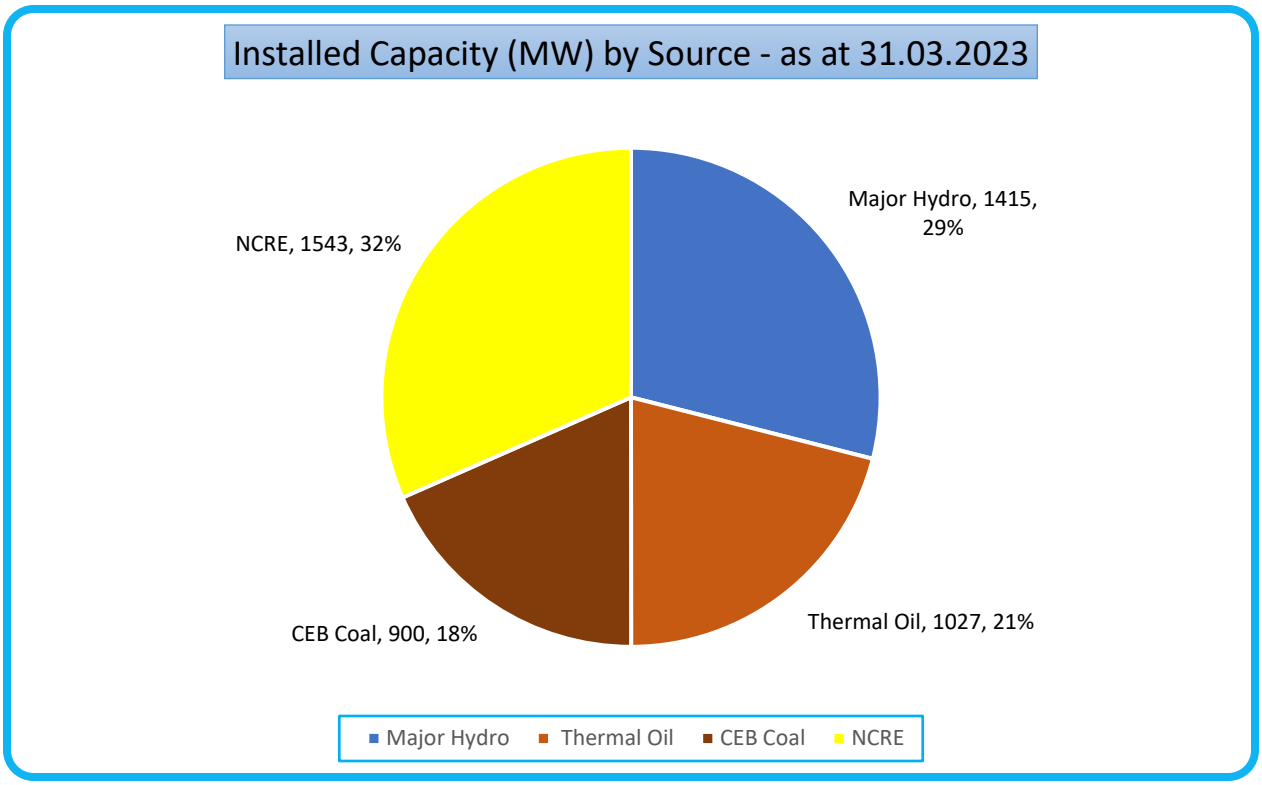
Most solar PV systems tend to be either utility-scale installations with a capacity usually above 1 megawatt (MW) or rooftop PV typically below 1 MW. Residences may limited to small systems usually up to 20 kilowatts (kW), while larger public, commercial, and industrial buildings may have systems with 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.

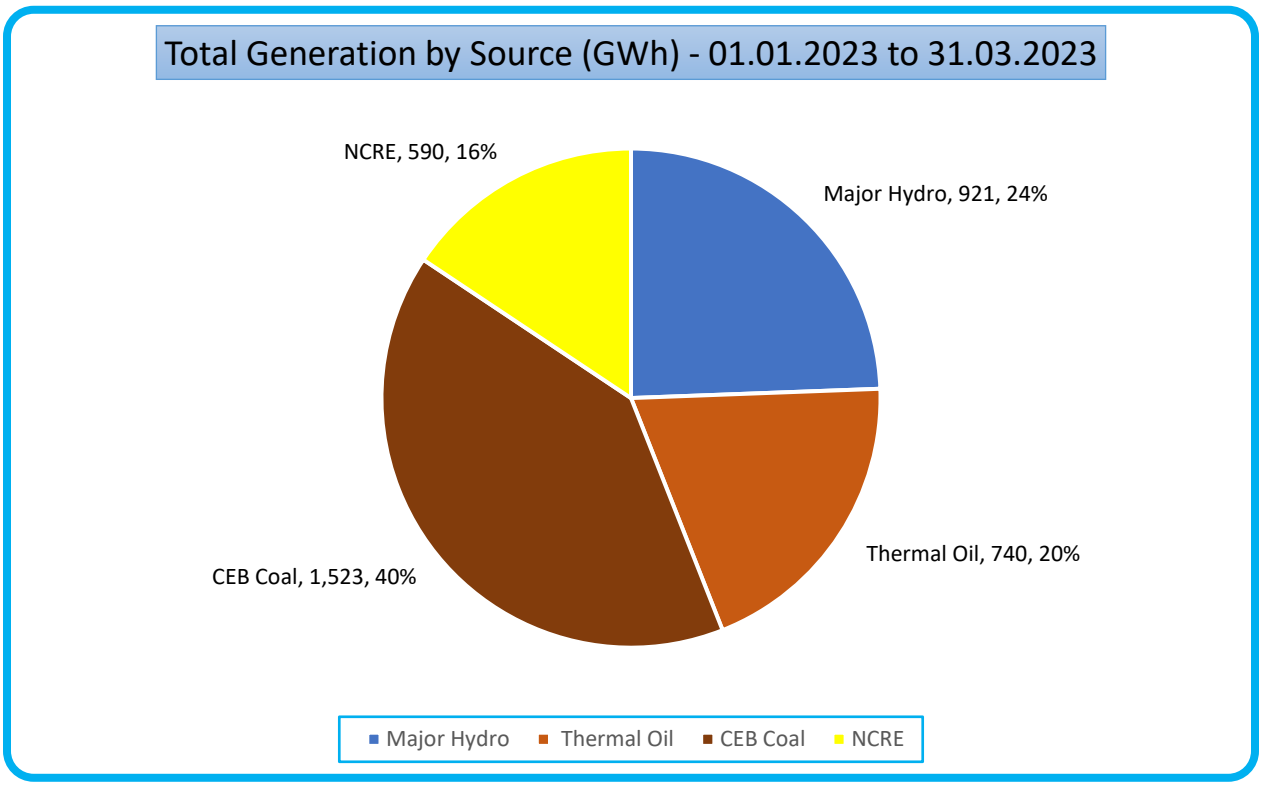
In 2019, the Minister of Power, Energy, and Business Development published the National Energy Policy & Strategies of Sri Lanka, prepared after reviewing and revising the National Energy Policy and Strategies of Sri Lanka published in the Gazette Extraordinary No. 1553/10 of 10.06.2008. The primary objective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

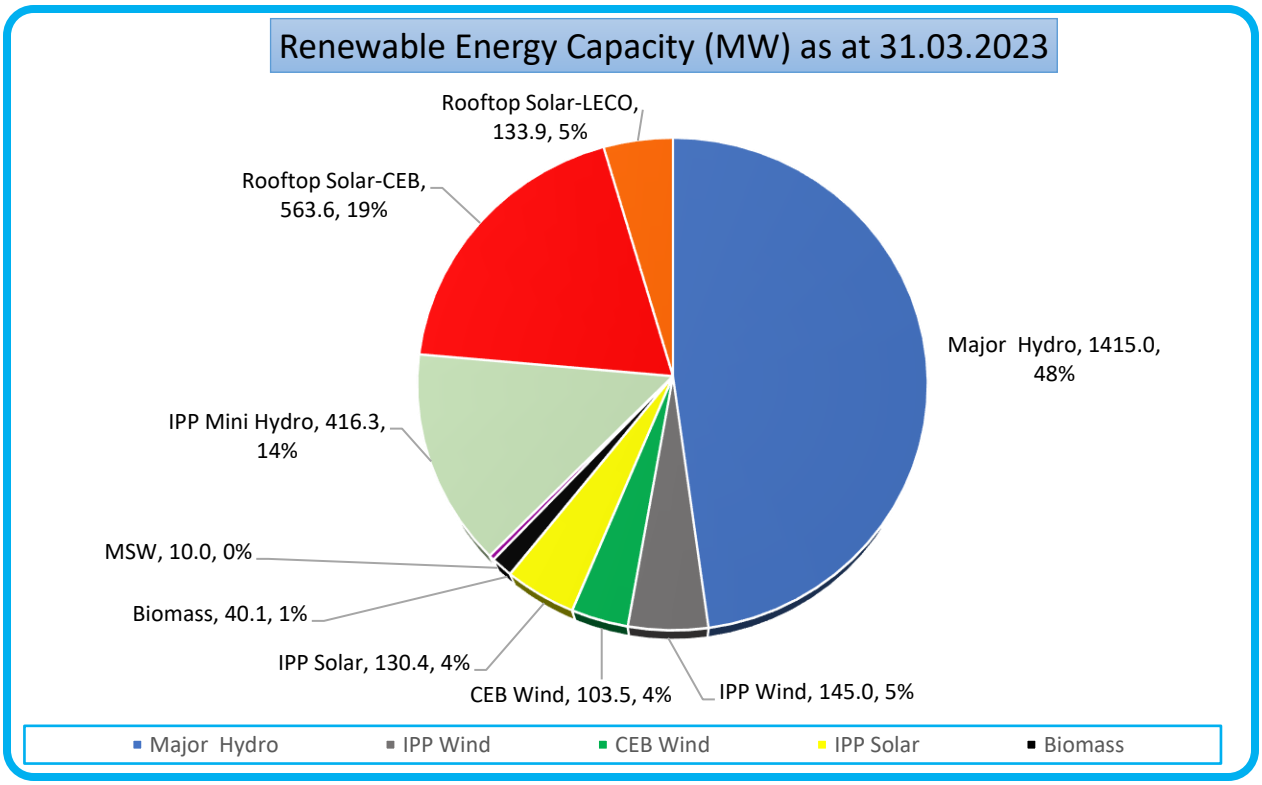
Policy guidelines such as the 'General Policy Guidelines on the Electricity Industry' as required under Sri Lanka Electricity Act No. 20 of 2009 statutorily required to be issued for each sub-sector, are expected to be prepared and issued, based on this national energy policy.

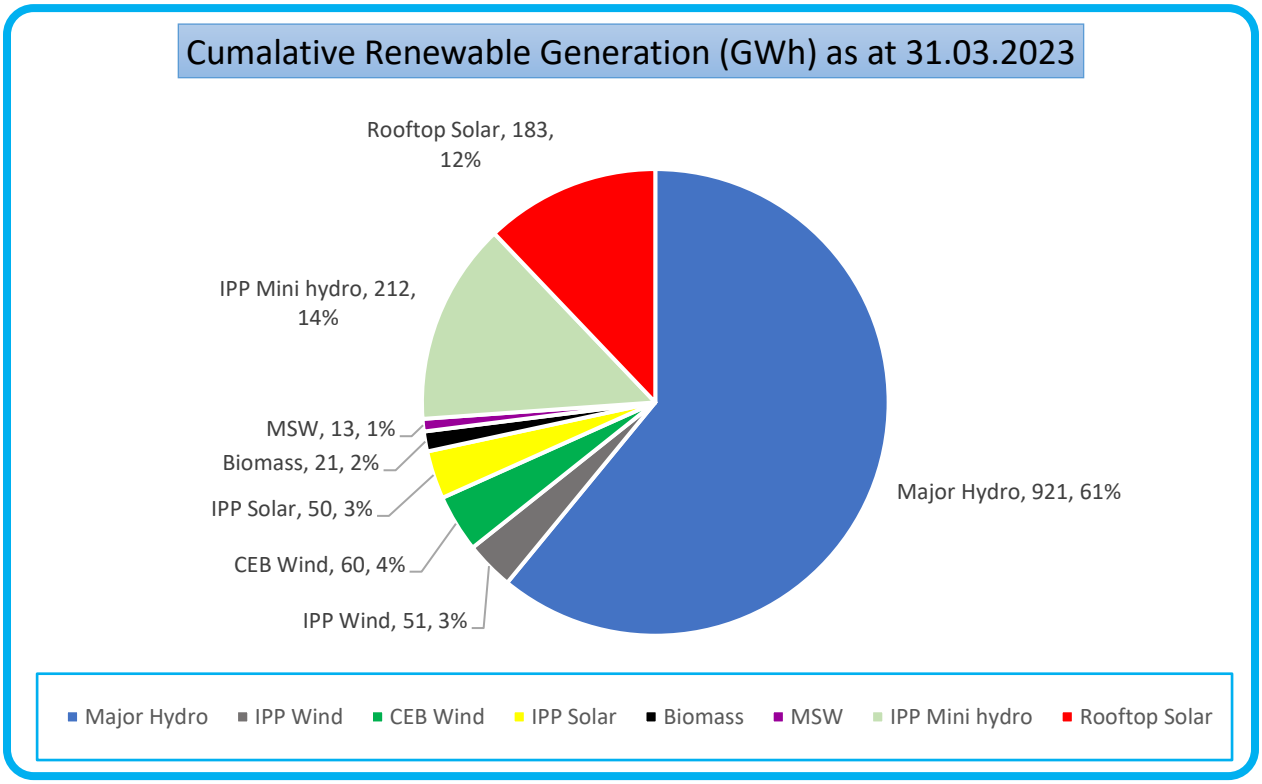
Sri Lanka's power sector development is carried out based on the Long-term generation expansion plan (LTGEP) prepared by the Transmission Licensee (ie. Ceylon Electricity Board (CEB)) and approved by the Public Utilities Commission of Sri Lanka (PUCSL). LTGEP is a rolling plan prepared in every two years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

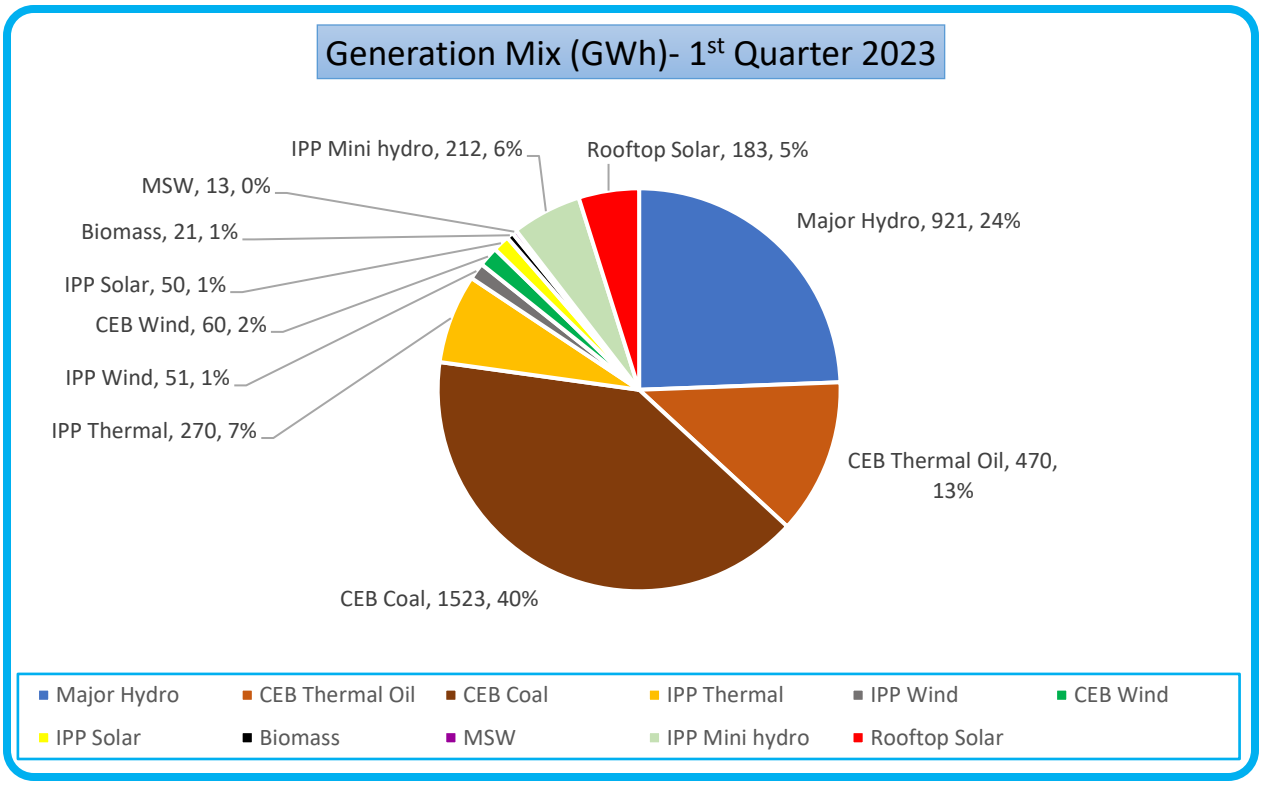
Target: To increase the renewable energy (RE) share from 50% to 70% by 2030.

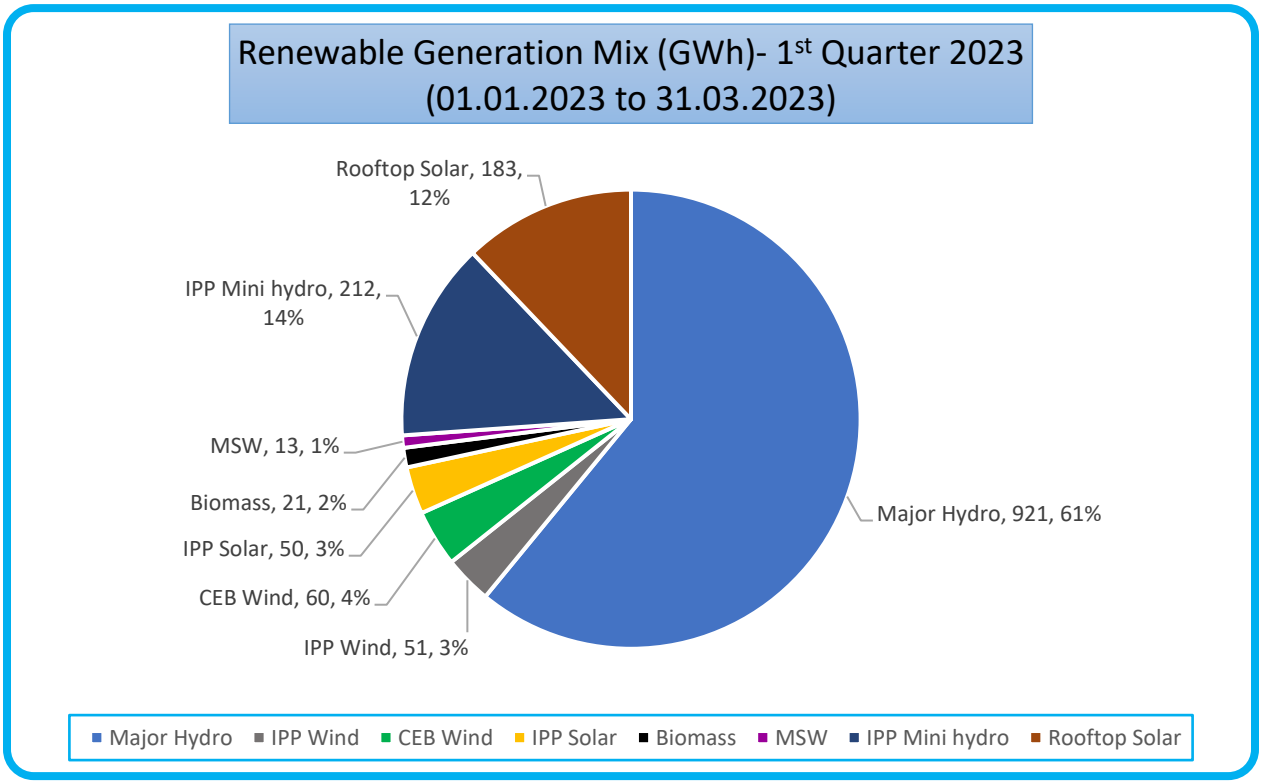

Installed Capacity (MW) by Source - as at 31.03.2023
Major Hydro, 1415, 29%
Thermal Oil, 1027, 21%
CEB Coal, 900, 18%
NCRE, 1543, 32%
Major Hydro
Thermal Oil
CEB Coal
NCRE

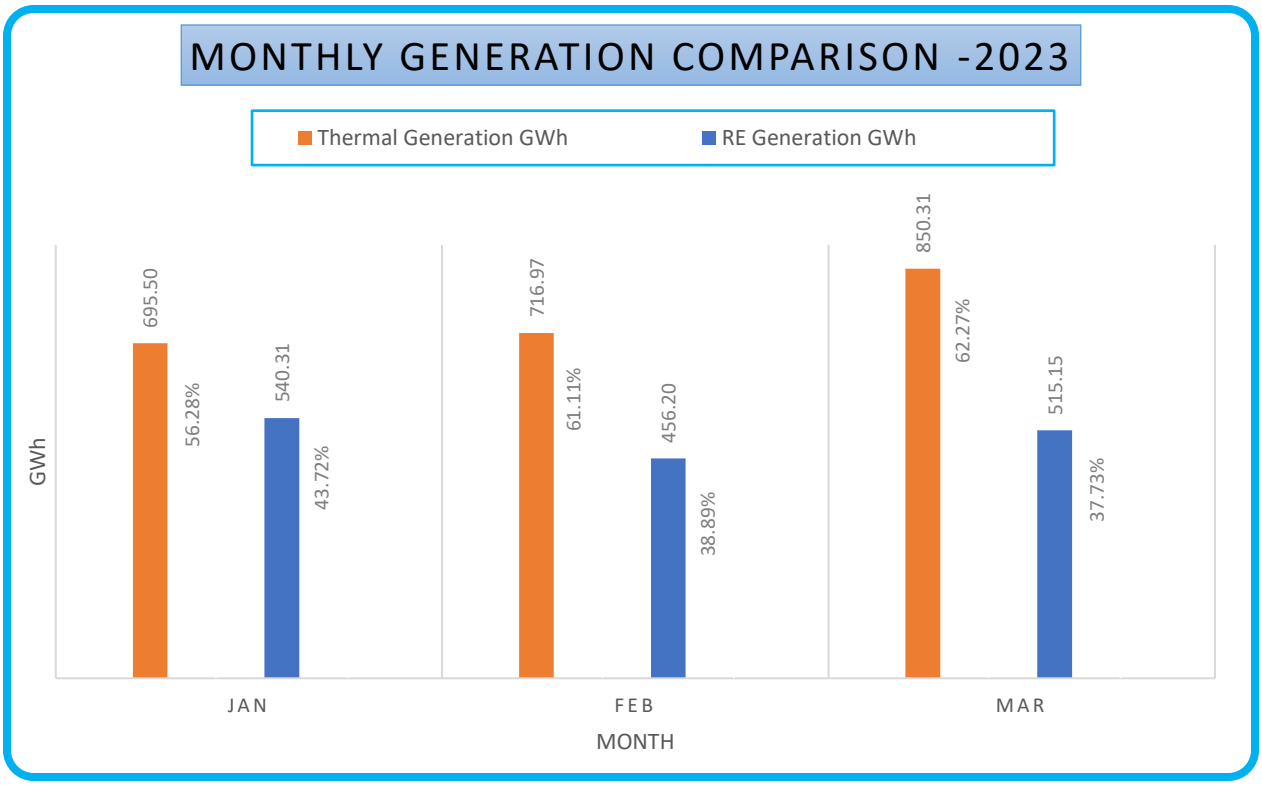

Total Generation by Source (GWh) - 01.01.2023 to 31.03.2023
Major Hydro, 921, 24%
Thermal Oil, 740, 20%
CEB Coal, 1,523, 40%
NCRE, 590, 16%
Major Hydro
Thermal Oil
CEB Coal
NCRE

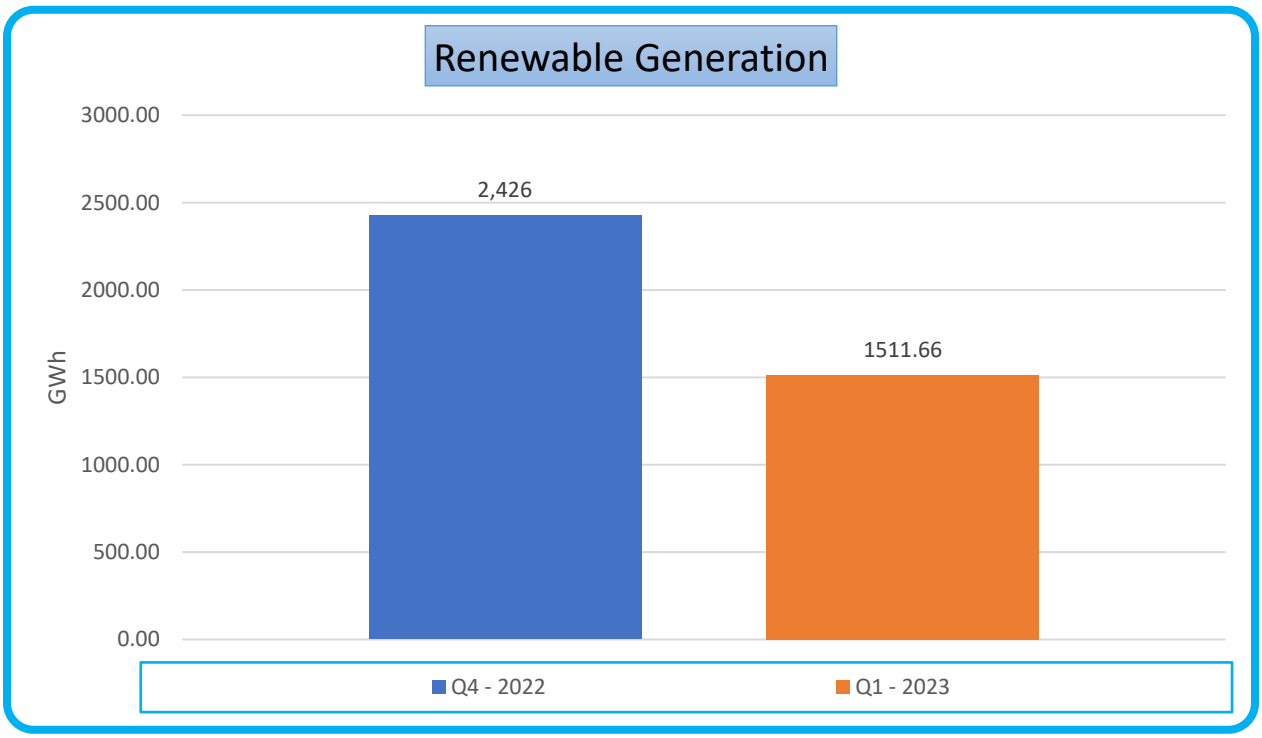

Renewable Energy Capacity (MW) as at 31.03.2023
Rooftop Solar-LECO, 133.9, 5%
Rooftop Solar-CEB, 563.6, 19%
Major Hydro, 1415.0, 48%
IPP Mini Hydro, 416.3, 14%
MSW, 10.0, 0%
Biomass, 40.1, 1%
IPP Solar, 130.4, 4%
CEB Wind, 103.5, 4%
IPP Wind, 145.0, 5%
Major Hydro
IPP Wind
CEB Wind
IPP Solar
Biomass


Cumalative Renewable Generation (GWh) as at 31.03.2023
Rooftop Solar, 183, 12%
IPP Mini hydro, 212, 14%
MSW, 13, 1%
Biomass, 21, 2%
IPP Solar, 50, 3%
CEB Wind, 60, 4%
IPP Wind, 51, 3%
Major Hydro, 921, 61%
Major Hydro
IPP Wind
CEB Wind
IPP Solar
Biomass
MSW
IPP Mini hydro
Rooftop Solar


Generation Mix (GWh)- 1st Quarter 2023
IPP Mini hydro, 212, 6%
Rooftop Solar, 183, 5%
MSW, 13, 0%
Major Hydro, 921, 24%
Biomass, 21, 1%
IPP Solar, 50, 1%
CEB Wind, 60, 2%
IPP Wind, 51, 1%
IPP Thermal, 270, 7%
CEB Thermal Oil, 470, 13%
CEB Coal, 1523, 40%
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)- 1st Quarter 2023 (01.01.2023 to 31.03.2023)
Rooftop Solar, 183, 12%
IPP Mini hydro, 212, 14%
MSW, 13, 1%
Biomass, 21, 2%
IPP Solar, 50, 3%
CEB Wind, 60, 4%
IPP Wind, 51, 3%
Major Hydro, 921, 61%
Major Hydro
IPP Wind
CEB Wind
IPP Solar
Biomass
MSW
IPP Mini hydro
Rooftop Solar

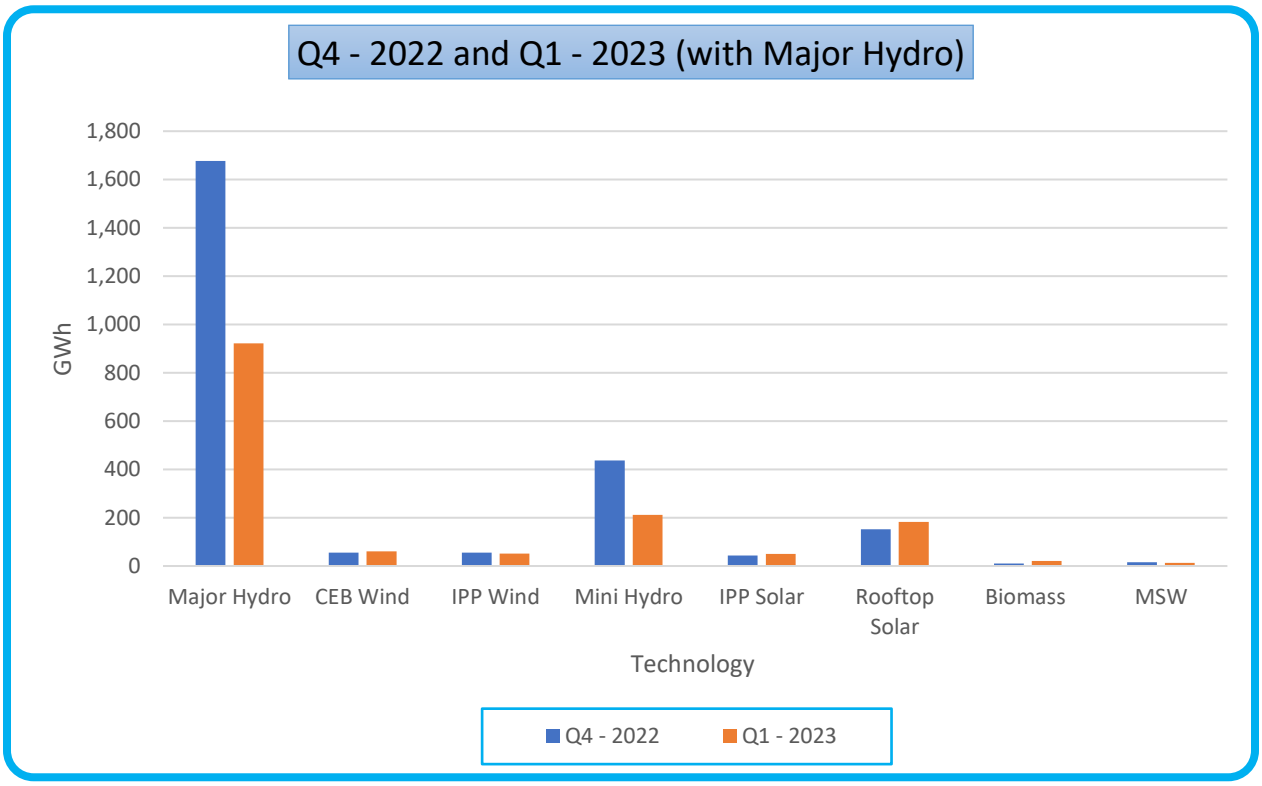


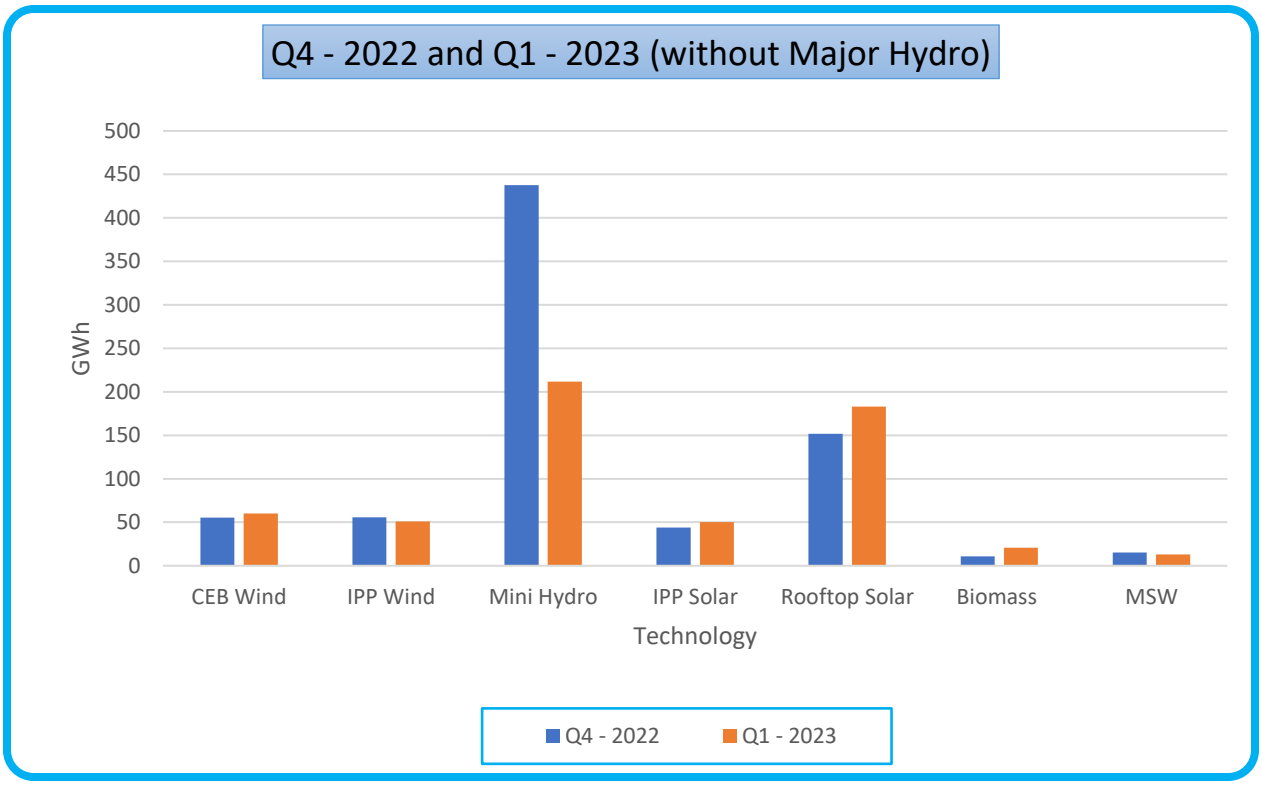


Decreased by 38% as compared to Q4 2022

Renewable Generation – 4th Quarter 2022 Vs 1st Quarter 2023

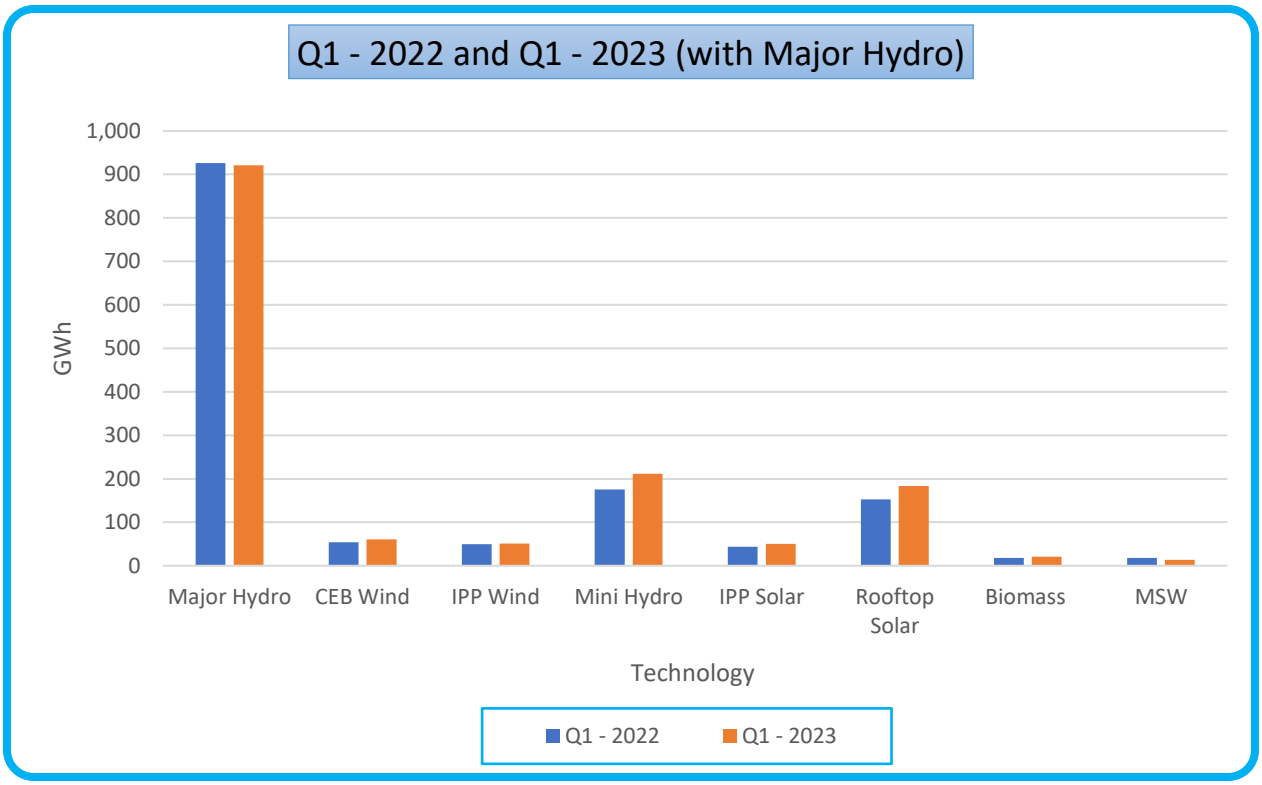
Technology	Q4 - 2022	Q1 - 2023	Deviation (%)
Major Hydro	1,677	921	-45%
CEB Wind	55	60	9%
IPP Wind	56	51	-8%
Mini Hydro	438	212	-52%
IPP Solar	44	50	15%
Rooftop Solar	152	183	21%
Biomass	11	21	91%
MSW	15	13	-14%

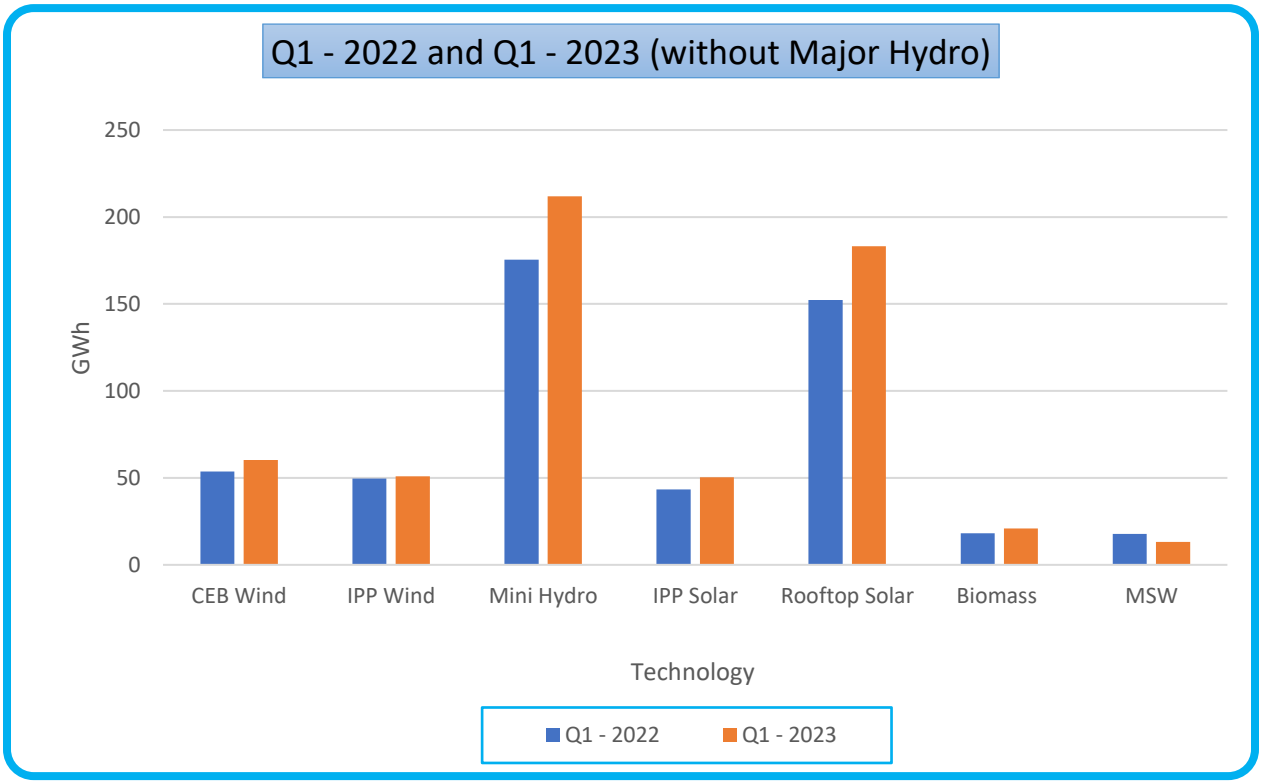




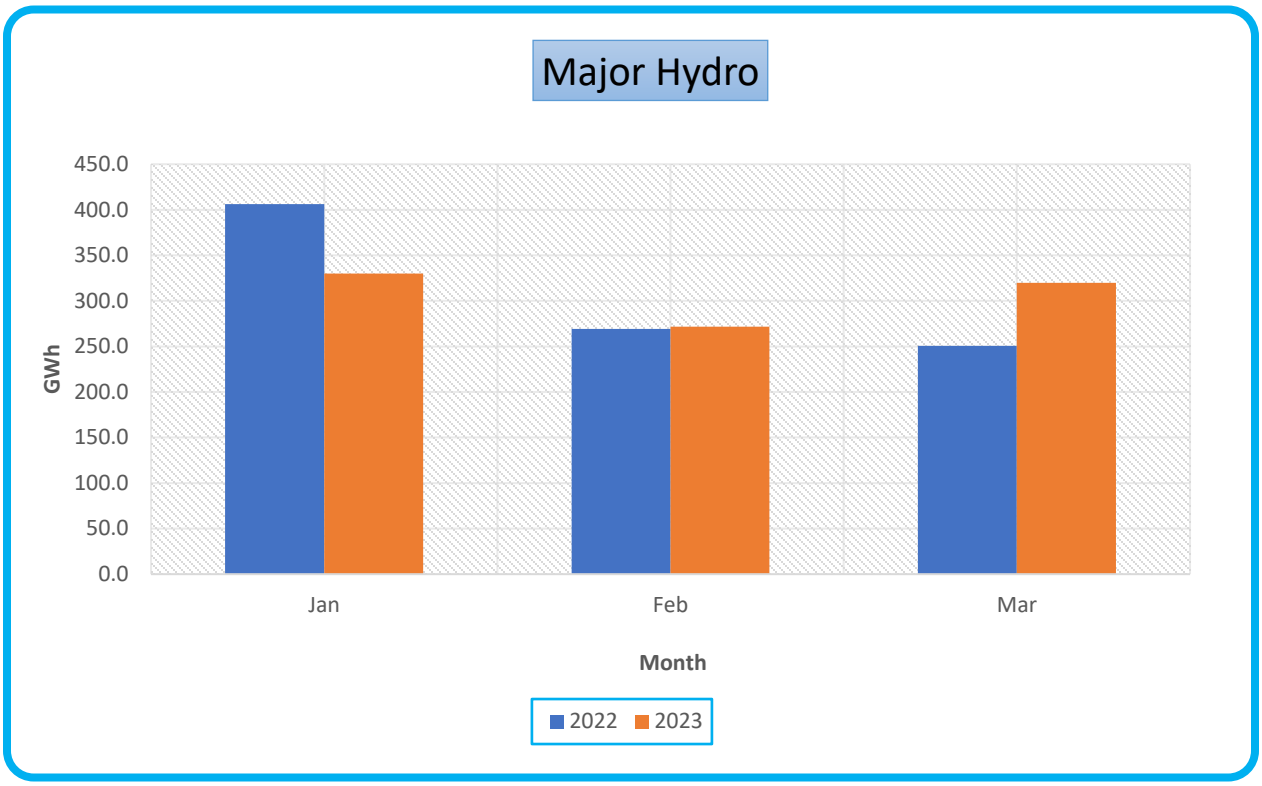
Renewable Generation – 1st Quarter 2022 vs 1st Quarter 2023

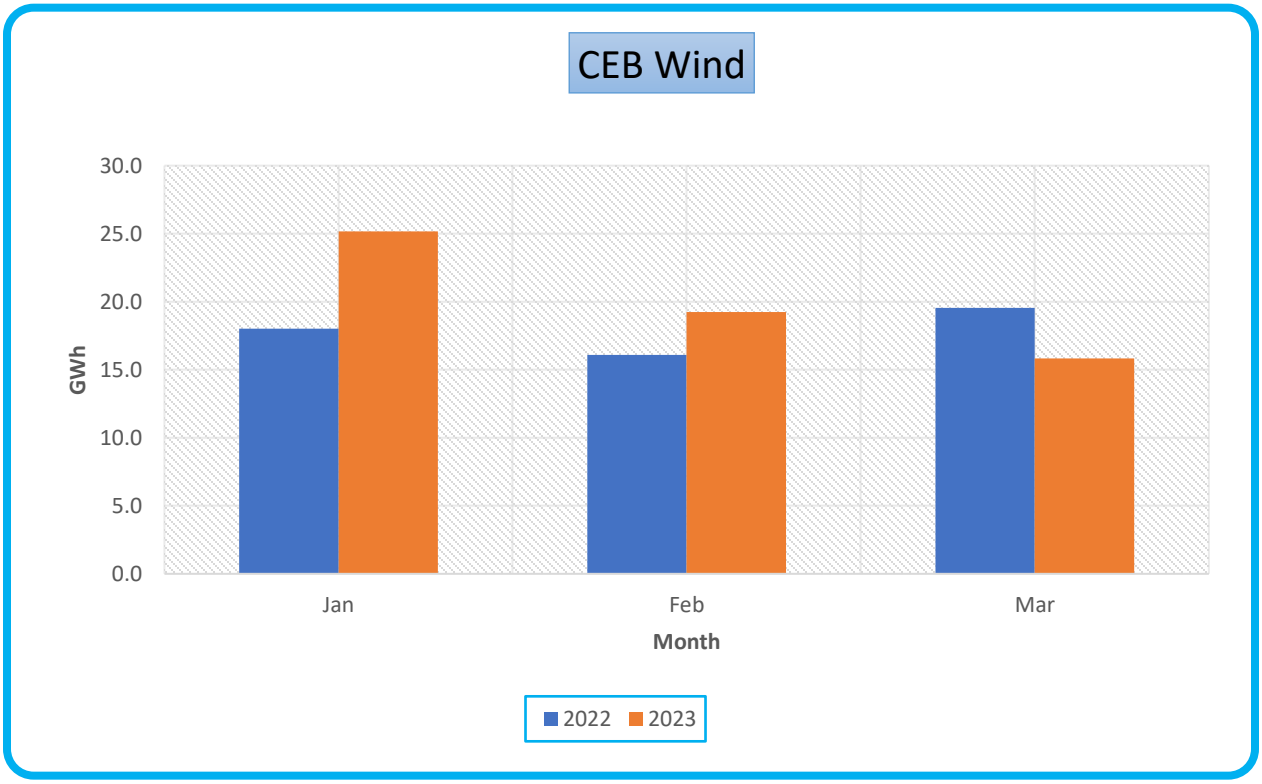
Technology	Q1 - 2022	Q1 - 2023	Deviation
Major Hydro	926	921	-1%
CEB Wind	54	60	12%
IPP Wind	50	51	3%
Mini Hydro	175	212	21%
IPP Solar	43	50	16%
Rooftop Solar	152	183	20%
Biomass	18	21	15%
MSW	18	13	-26%

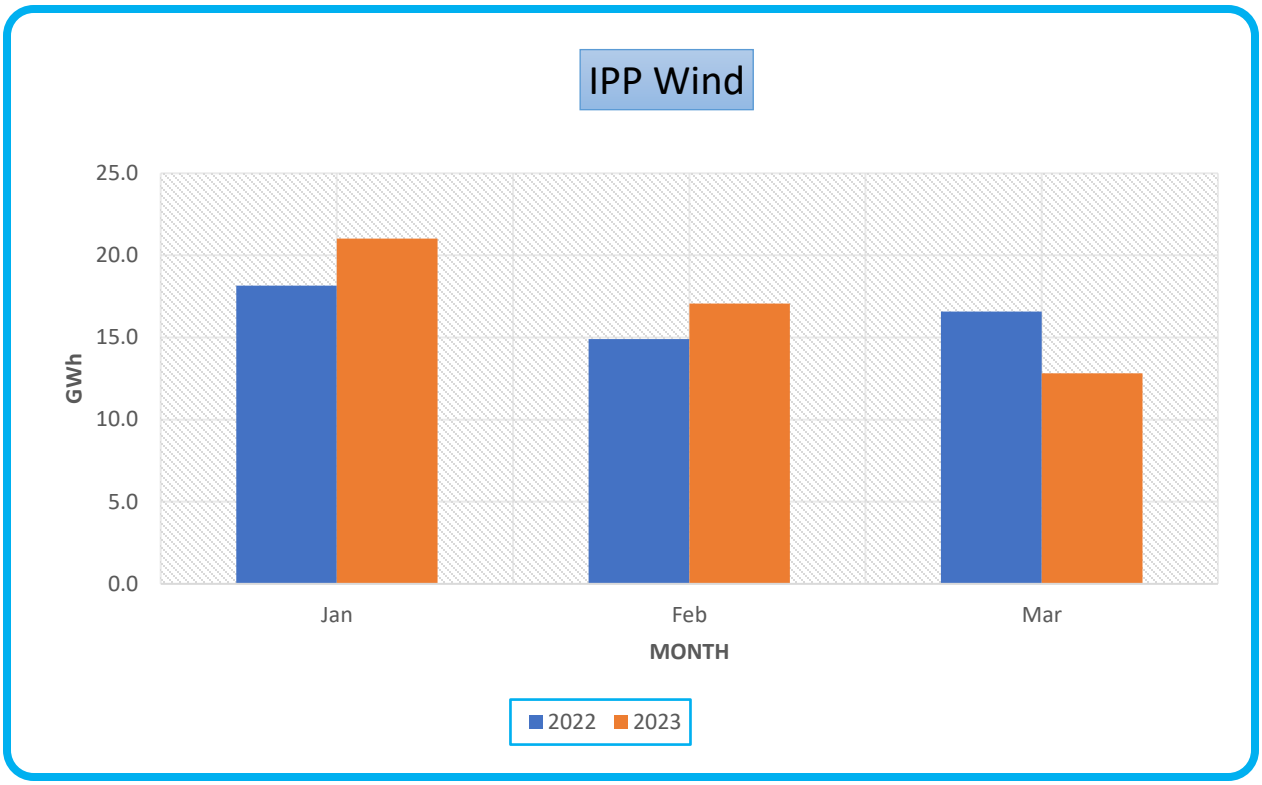

Q1 - 2022 and Q1 - 2023 (with Major Hydro)
1,000
900
800
700
600
500
400
300
200
100
0
GWh
Major Hydro
CEB Wind
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q1 - 2022
Q1 - 2023

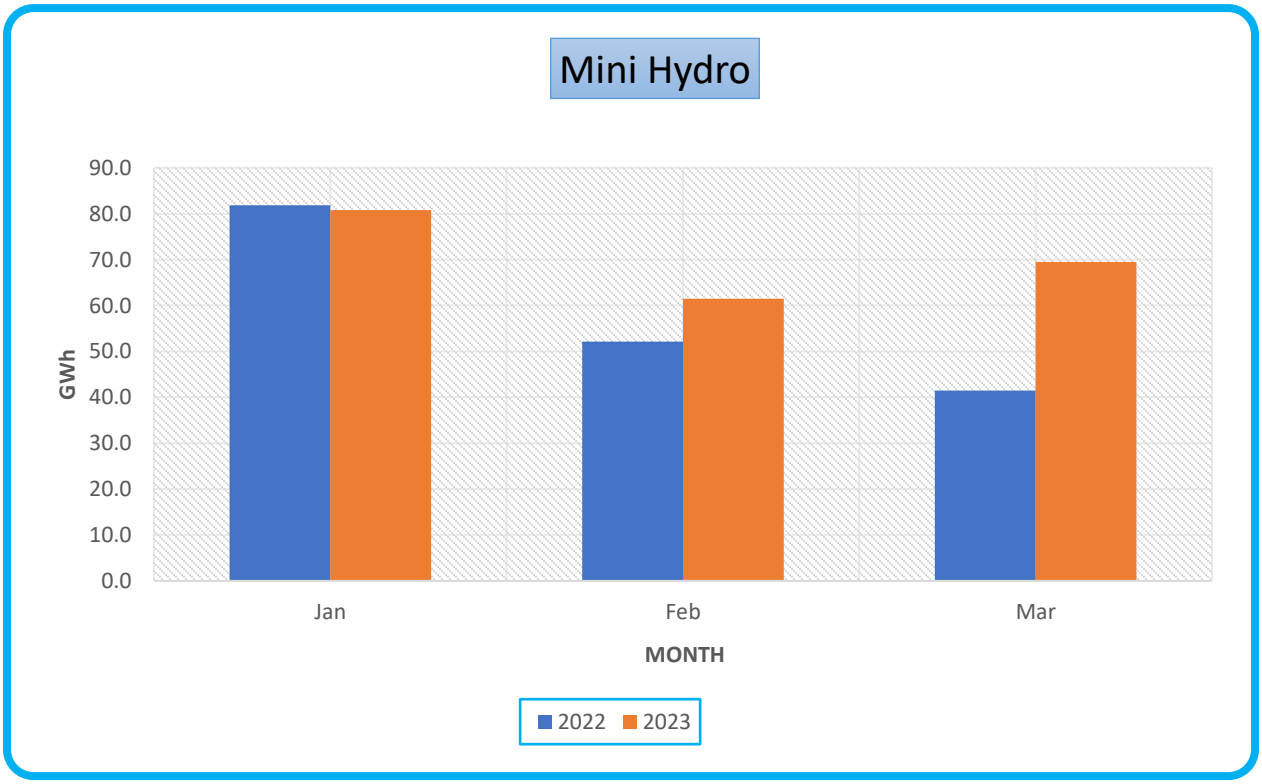

Q1 - 2022 and Q1 - 2023 (without Major Hydro)
250
200
150
100
50
0
GWh
CEB Wind
IPP Wind
Mini Hydro
IPP Solar
Rooftop Solar
Biomass
MSW
Technology
Q1 - 2022
Q1 - 2023

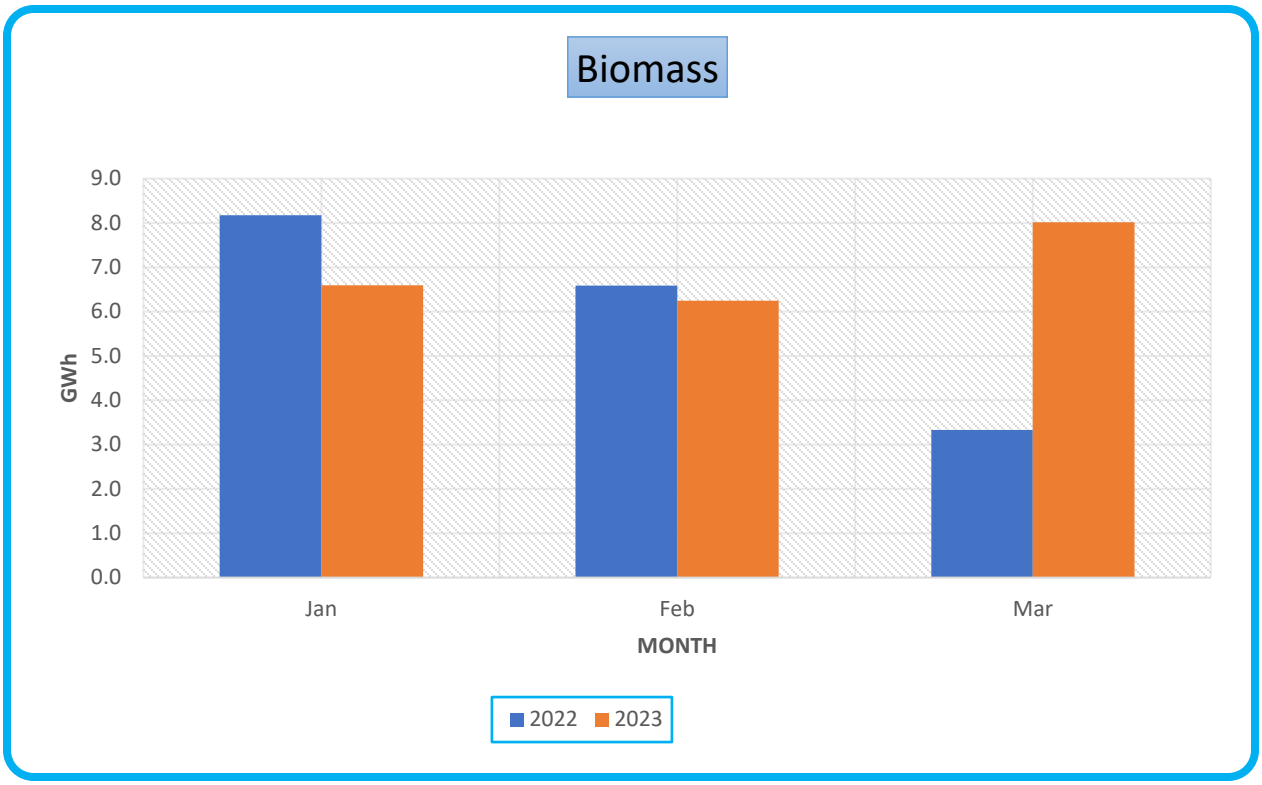
Variation of Renewable Generation – Technology Wise

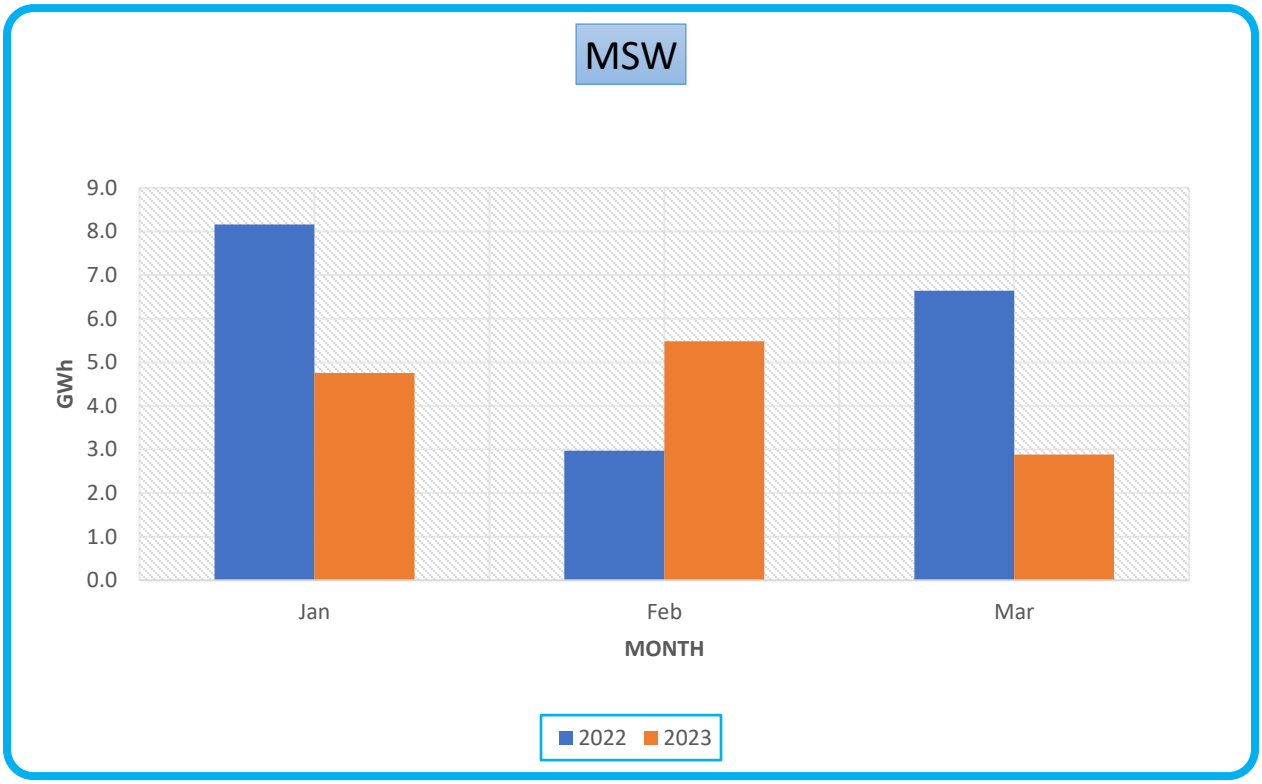


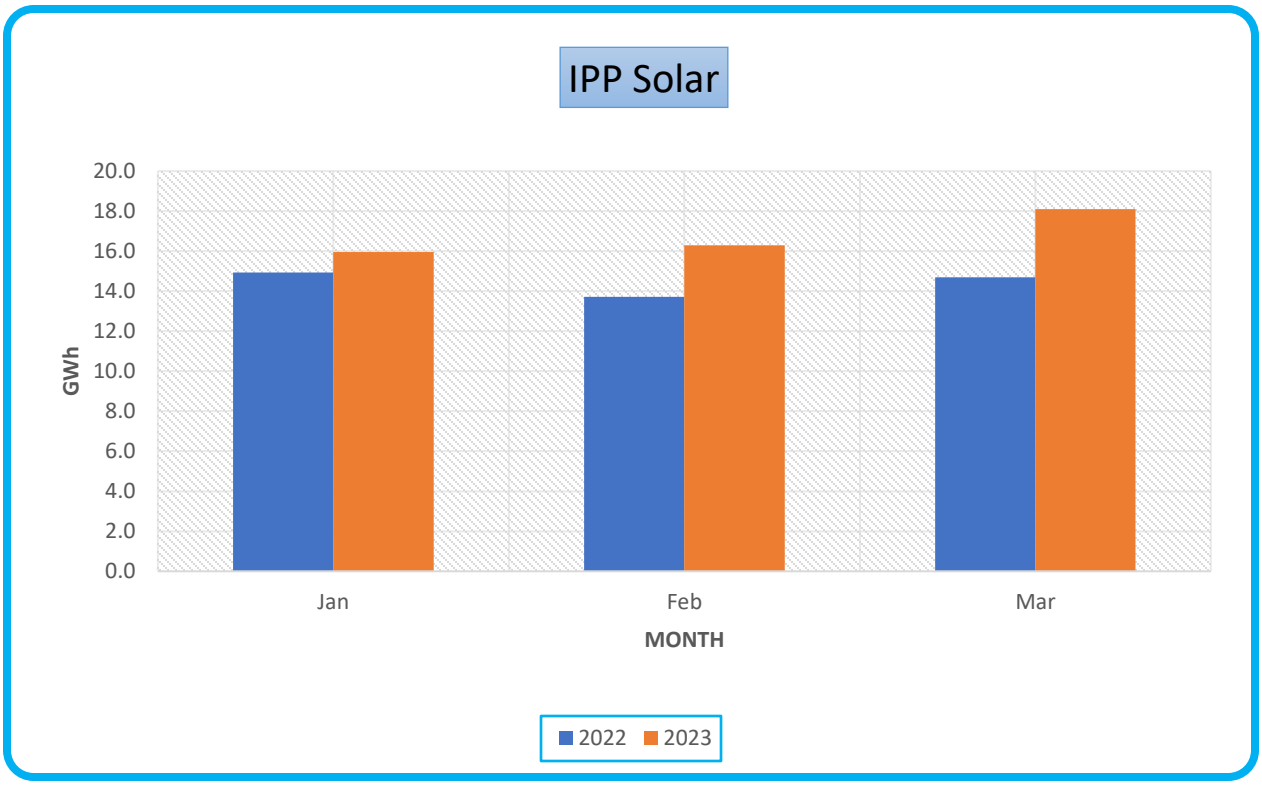


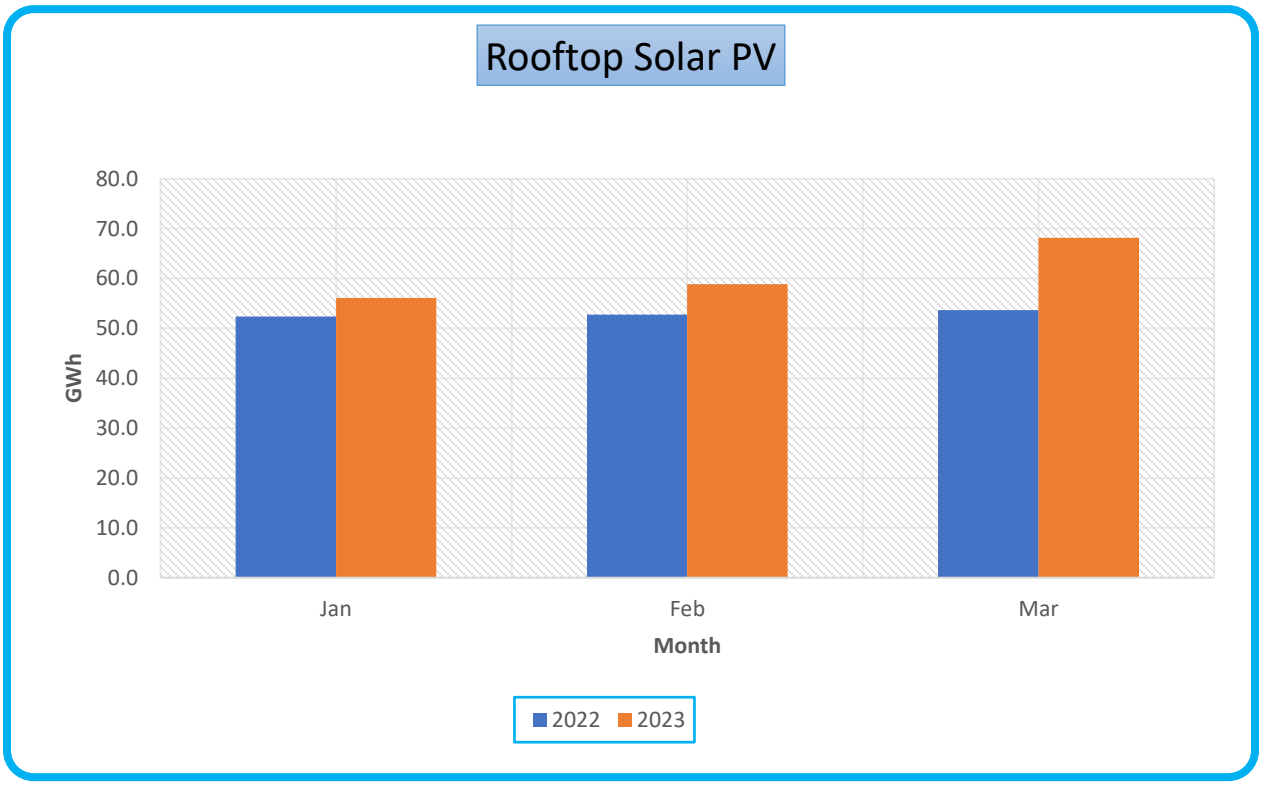

IPP Wind
25.0
20.0
15.0
10.0
5.0
0.0
GWh
Jan
Feb
Mar
MONTH
2022
2023


Mini Hydro
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
GWh
Jan
Feb
Mar
MONTH
2022
2023


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

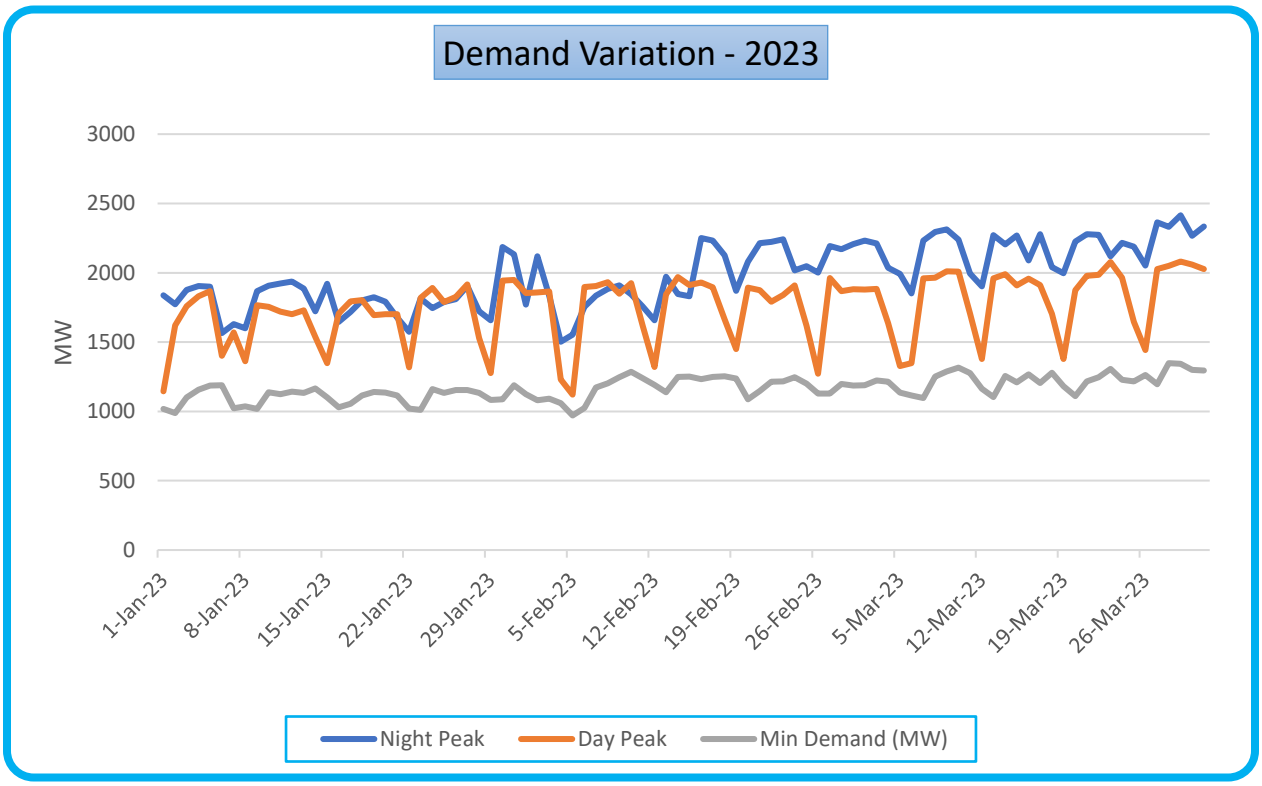

MSW
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
GWh
Jan
Feb
Mar
MONTH
2022
2023

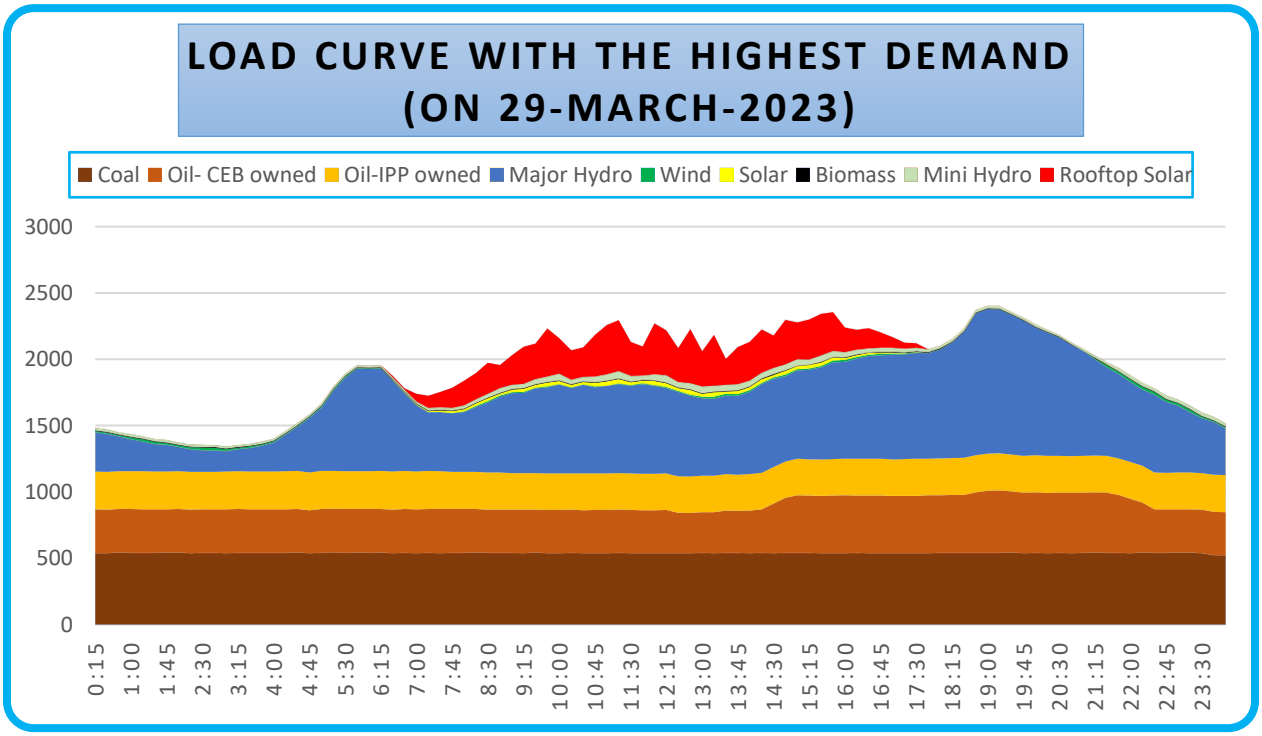




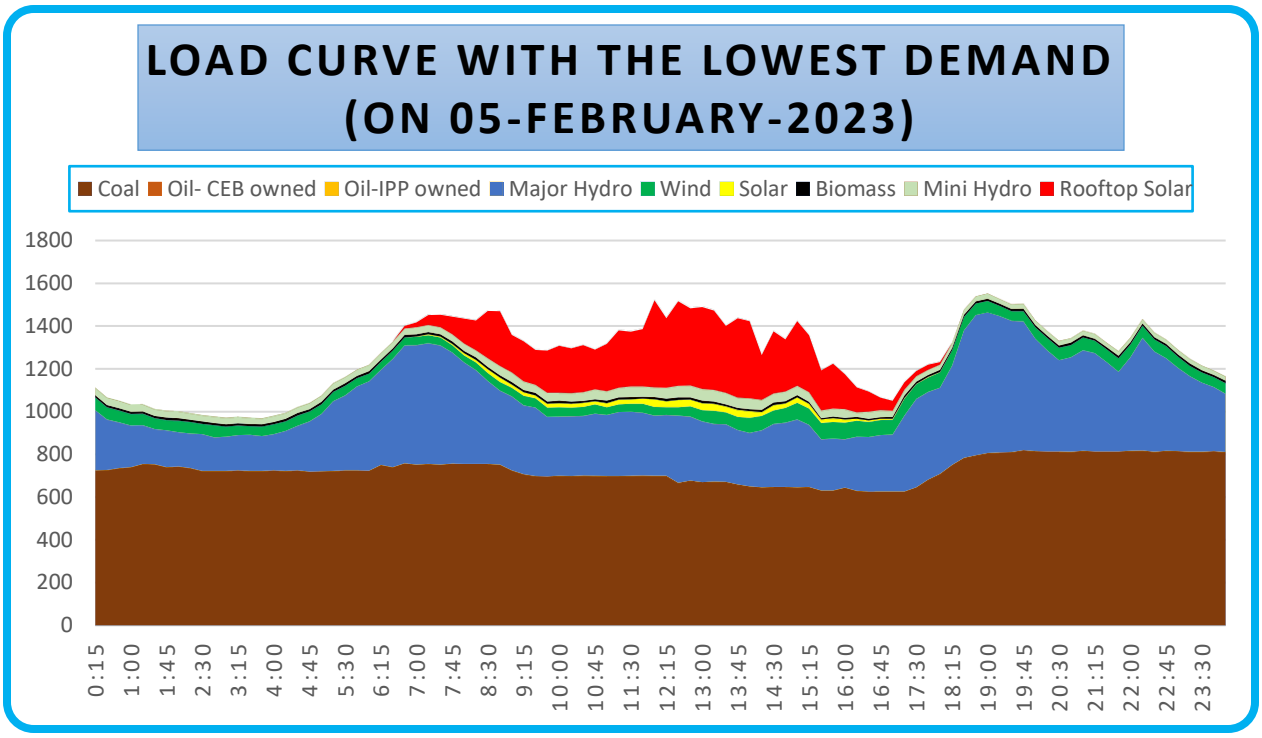
Source: CEB monthly Review Report

Daily Demand Variation





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



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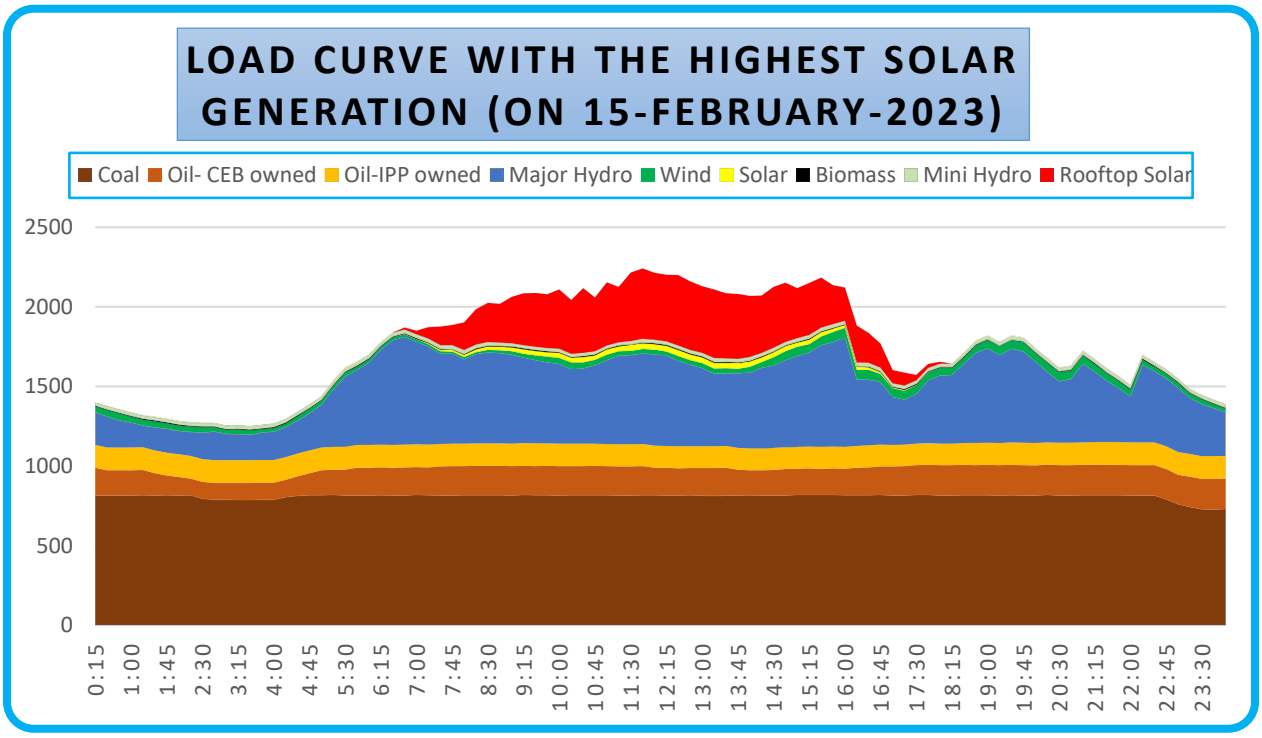

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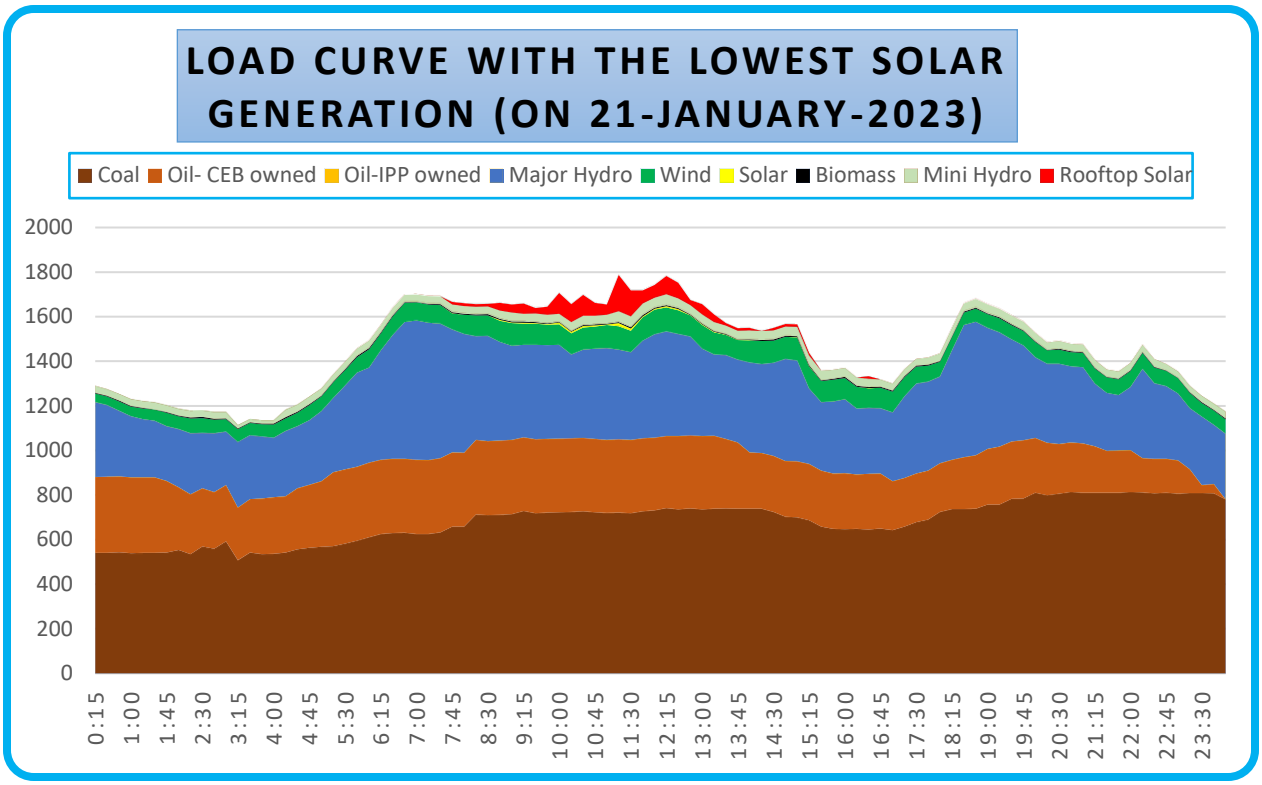

Note: Rooftop Solar PV, IPP Solar (1MW), and Non-telemetered Mini Hydro daily generation for Load Curves are calculated relative to actual monthly generations.

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/