2023 ISO New England Electric Generator Air Emissions Report

OCTOBER 16, 2024

Figures

Oil and coal-fired generation was highest in February, which included a two-

Figure 3:

Figure 5: ISO New England average annual emissions, 2014 to 2023 (ktons)

Figure 6: ISO New England annual average emission rates, 2014 to 2023 (lbs/MWh)

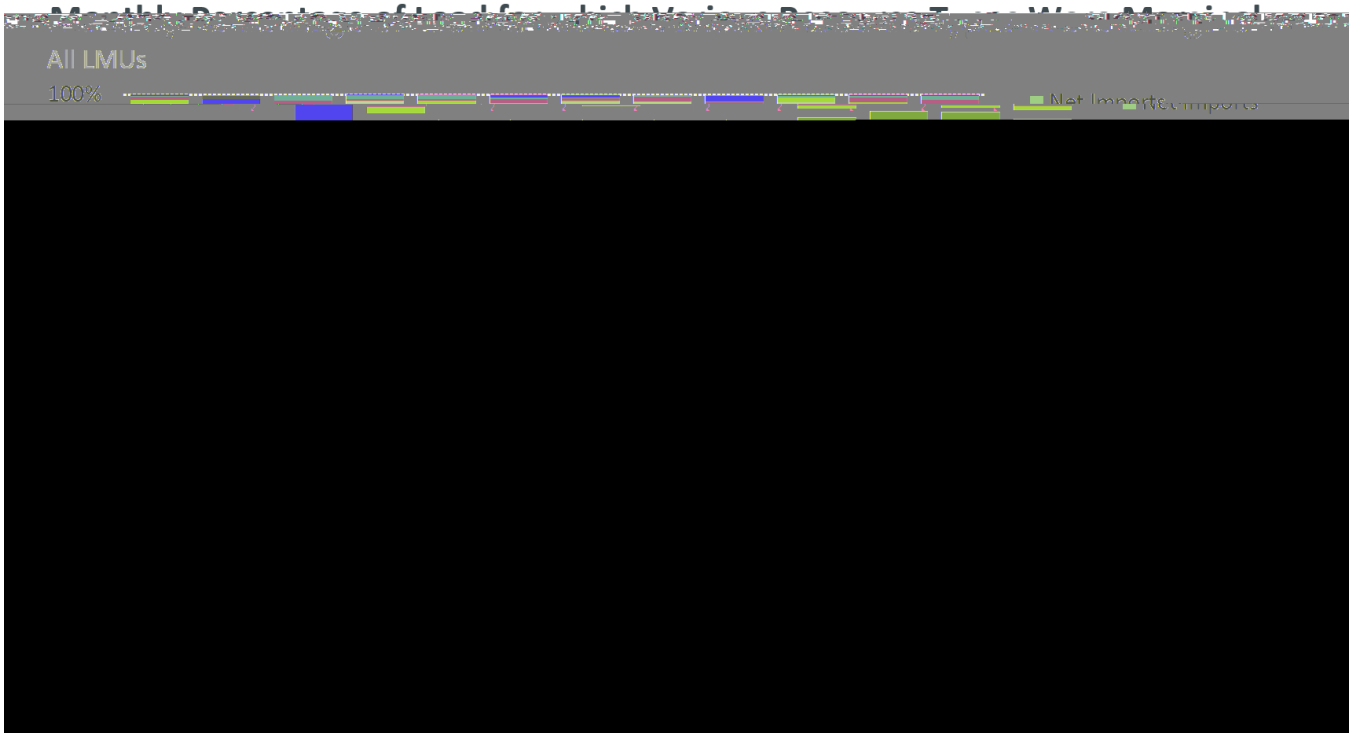

Figure 7: 2023 percentage of load for which various resource types were marginal —all LMUs

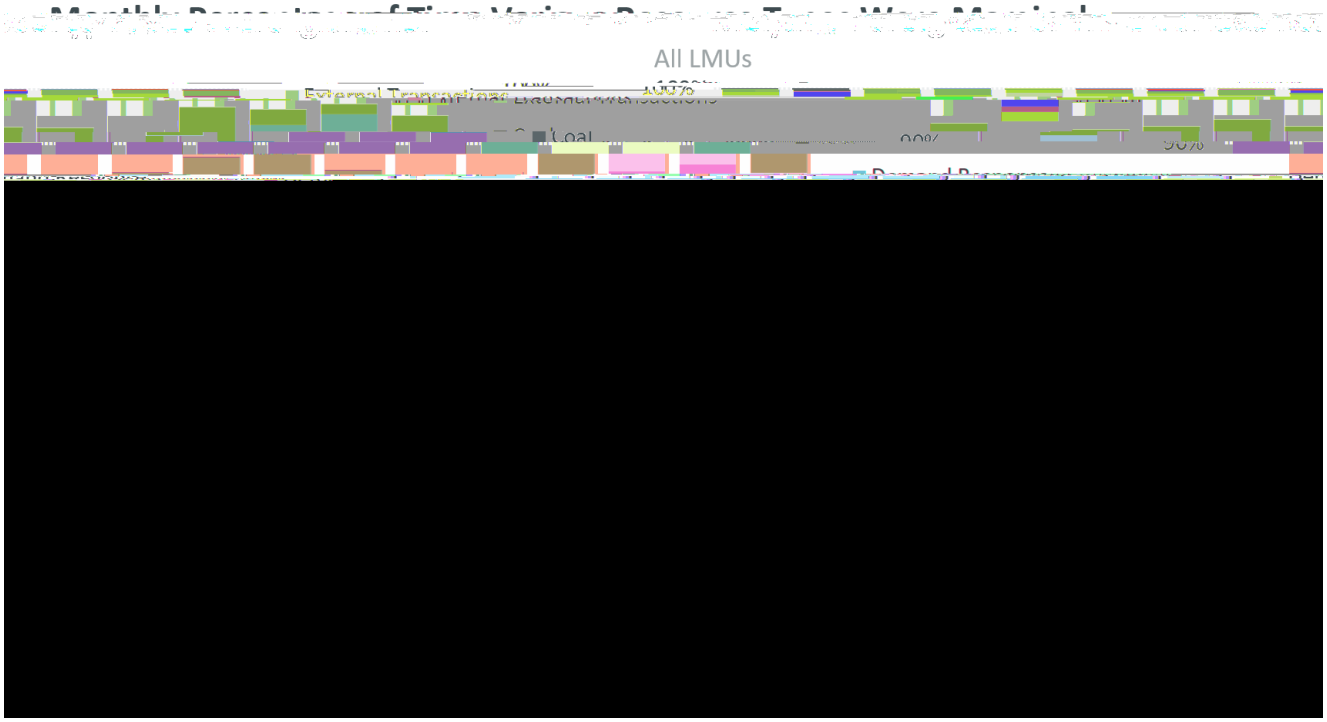

Figure 8: 2023 percentage of time for which various resource types were marginal —all LMUs

The marginality of Other Renewables differs between the load and time-weighted approach for emitting LMUs. Like wind resources, many biomass plants are located in export-constrained areas, and therefore, contribute less to load. As a result, the Other Renewables' load-weighted marginality was often less than the time-weighted. Figure 9 and Figure 10 highlight this difference, particularly during the months of April, August, and October.

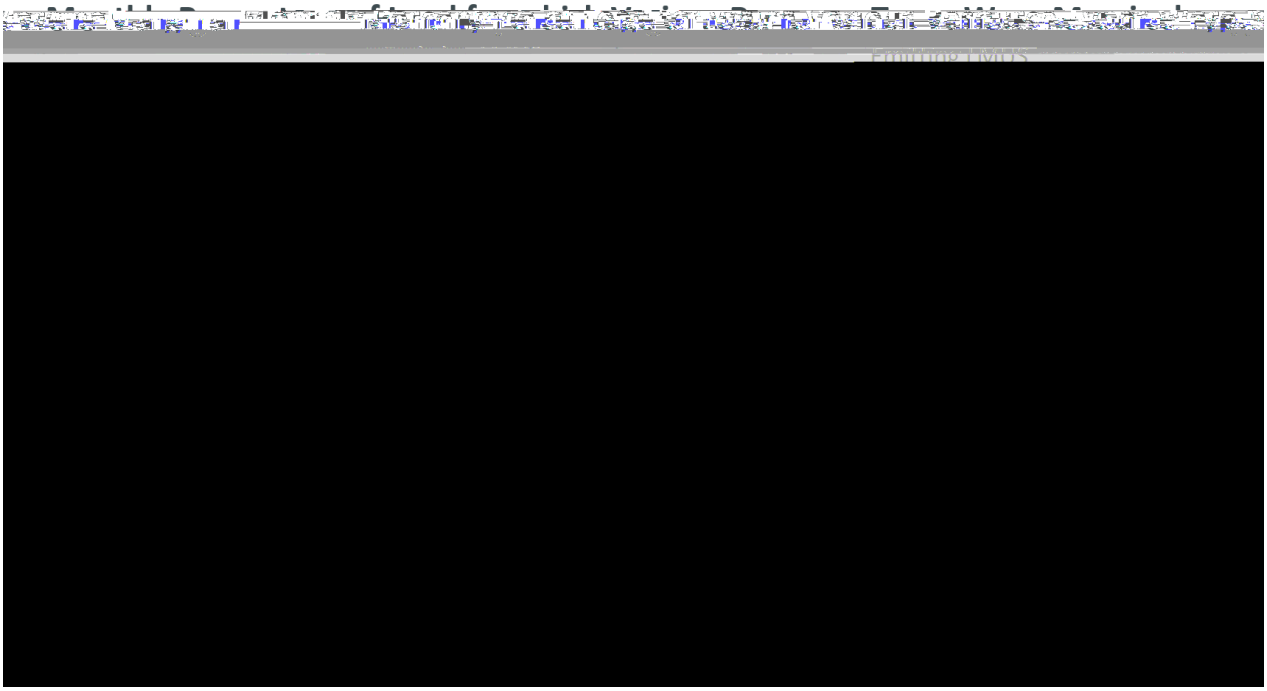

Figure 9: 2023 percentage of load for which various resource types were marginal — emitting-LMUs

Figure 10: 2023 percentage of time for which various resource types were marginal — emitting-LMUs

Figure 11, Figure 12 and Figure 13 show the monthly variations in marginal emission rates (lbs/MWh) for CO_2, NO_X, and SO_2. The three prominent peaks in marginal emission rates coincided with months when coal and oil were marginal more frequently and for more of the load. February's cold snap and the resulting natural gas pipeline constraints typical of tight winter conditions made oil and coal resources more marginal that month. The heat waves in July and September also

Figure 13: 2023 time- and load-weighted monthly LMUs marginal SO2 emission rates

Under both LMU scenarios, the 2023 time-weighted and load-weighted marginal emission rates for NO_X and SO_2 were lower by approximately 40% and 80% respectively compared to the previous year. However, the time-weighted CO_2 marginal emission rates fl.7 i te ll (me)]TJ0 Tc 0 4Tw 0.323 0 Td(-)Tj-9.036 T

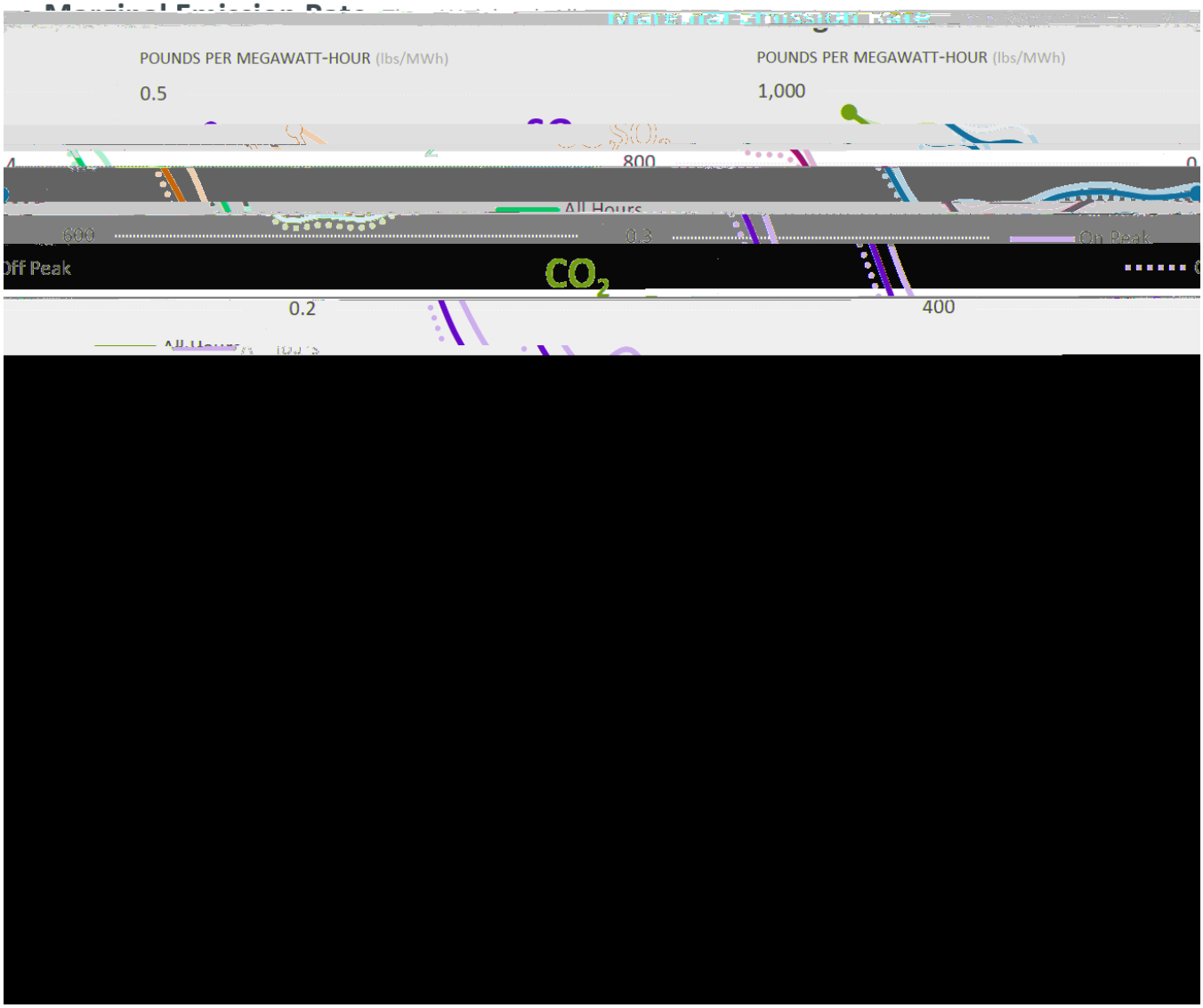

Figure 14: Time-weighted LMU marginal emission rates, 2014-2023 - all LMUs (lbs/MWh)

the 2019 retirement of the Pilgrim Nuclear Power and the 2019 addition of several new gas-fired generators that consistently offered energy at a lower price than pumped-storage generators throughout 2020. Due to their lower price, they displaced pumped-storage generators as the marginal units more frequently.[3]

Marginal heat rates have not changed significantly since 2020. In 2023, the time-weighted all-LMUs marginal heat rate was 5.96 MMBtu/MWh, up slightly from 5.74 MMBtu/MWh in 2022. The load-weighted marginal heat rate was 6.43 MMBtu/MWh in 2023 compared to 6.33 MMBtu/MWh in 2022. Under the emitting-LMUs scenario, the 2023 marginal heat rate for the time-weighted and load-weighted approach was 7.50 MMBtu/MWh and 7.51 MMBtu/MWh, respectively. These values were slightly less than the 2022 time-weighted and load-weighted marginal heat rate of 7.67 MMBtu/MWh.

While the recent year-over-year changes in marginal heat rates have been minimal, overall efficiency in the region's fleet has Tc 0.0e re29 0 Td[Tw 9.839 0 (m)-p2.9 (t)3 fe

1.6 Conclusion