2023 Time-of-Use Analysis

2023 Electric Rate Case Phase II Filing

Prepared by:

Public Service Company of Colorado

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Commission Decision Regarding Updated Time-of-Use ("TOU") Analysis for Phase II Electric Rate Case

In its Decision approving Public Service Company of Colorado's ("Public Service" or the "Company") Secondary General Time-of-Use ("Schedule SG-TOU") pilot,[1] the Colorado Public Utility Commission (the "Commission") noted its concern "that expected increases in solar generation and storage suggest that the on-peak period should begin later than 3:00 p.m. and end later than 7:00 p.m." and an expectation for the Company "to include in its upcoming Phase II electric rate case, a comprehensive analysis of the on-peak, shoulder, and off-peak periods of its various Time-of-Use rates." In particular, the "analysis should include the most up-to-date forecasting of hourly load net of renewable generation and storage, and account for the actual generation the Company expects through 2030." In response to this expectation, Public Service Company of Colorado provides this time-of-use analysis ("TOU Analysis").

In this TOU Analysis, the Company primarily analyzes the hourly load net of renewable generation for years 2022, 2025, and 2030 to determine whether the TOU periods used in the Company's rates should be changed in response to the changing generation mix on the Company's system. The TOU Analysis shows that the current TOU periods are a good match for current system conditions (based on 2022 data), and it is premature to alter the TOU periods at this time. However, the TOU Analysis shows that a later on-peak period may be appropriate in future years. Additionally, seasonal changes in load and renewable generation show that seasonal energy charge differences may need to be re-evaluated in the future if more of the top hours of load net of renewable generation shift from summer to winter months.

Current Time-of-Use Rates

Public Service offers default TOU rates for its Residential and Small Commercial rate classes that utilize similar TOU periods in their rate design. These rates are the Residential Energy – Time-of-Use ("Schedule RE-TOU") rate schedule and Small Commercial – Time-of-Use ("Schedule C-TOU") rate schedule, respectively. Public Service also recently launched the SG-TOU pilot rate for its Commercial & Industrial – Secondary Voltage ("C&I Secondary") rate class.[2] These three rate schedules have similar definitions of on-peak, shoulder, and off-peak hours where the customers' energy charges vary based on the time of the day. All three have an on-peak period with the highest energy charges from 3 p.m. to 7 p.m. on non-holiday weekdays. Schedule C-TOU and Schedule SG-TOU have a shoulder or "mid-peak" with energy charges that are higher than off-peak but lower than on-peak from 1 p.m. to 3 p.m. and 7 p.m. to 9 p.m. on non-holiday weekdays. Schedule RE-TOU also has a shoulder period but only from 1 p.m. to 3 p.m. on non-holiday weekdays. The remainder of the hours for each rate schedule are

[1] Decision No. C22-0298 of Proceeding No. 22AL-0143E.

[2] Other Company rate schedules include time-based elements that differ from the TOU periods discussed in this paragraph. For example, Schedule PG utilizes a time-differentiated demand charge based on measured demands between 2 p.m. and 7 p.m. Schedules SPVTOU-A and SPVTOU-B use an on-peak energy period of 12 p.m. to 8 p.m. Schedules S-EV and S-EV-CPP use an on-peak period of 2 p.m. to 10 p.m. The Electric Commodity Adjustment ("ECA") includes some TOU rate options with an on-peak period of 9 a.m. to 9 p.m. These rate schedules were designed with different goals (e.g., avoiding higher energy cost hours in the ECA), and it may not be appropriate to align all TOU periods across all rate schedules.

classified as off-peak and have the lowest energy charges. This includes all hours of holidays and weekends. These TOU periods for non-holiday weekdays are shown in Table 1.

Table 1

Hour Beginning	RE-TOU	C-TOU	SG-TOU
12:00 AM	Off-Peak	Off-Peak	Off-Peak
1:00 AM	Off-Peak	Off-Peak	Off-Peak
2:00 AM	Off-Peak	Off-Peak	Off-Peak
3:00 AM	Off-Peak	Off-Peak	Off-Peak
4:00 AM	Off-Peak	Off-Peak	Off-Peak
5:00 AM	Off-Peak	Off-Peak	Off-Peak
6:00 AM	Off-Peak	Off-Peak	Off-Peak
7:00 AM	Off-Peak	Off-Peak	Off-Peak
8:00 AM	Off-Peak	Off-Peak	Off-Peak
9:00 AM	Off-Peak	Off-Peak	Off-Peak
10:00 AM	Off-Peak	Off-Peak	Off-Peak
11:00 AM	Off-Peak	Off-Peak	Off-Peak
12:00 PM	Off-Peak	Off-Peak	Off-Peak
1:00 PM	Shoulder	Shoulder	Shoulder
2:00 PM	Shoulder	Shoulder	Shoulder
3:00 PM	On-Peak	On-Peak	On-Peak
4:00 PM	On-Peak	On-Peak	On-Peak
5:00 PM	On-Peak	On-Peak	On-Peak
6:00 PM	On-Peak	On-Peak	On-Peak
7:00 PM	Off-Peak	Shoulder	Shoulder
8:00 PM	Off-Peak	Shoulder	Shoulder
9:00 PM	Off-Peak	Off-Peak	Off-Peak
10:00 PM	Off-Peak	Off-Peak	Off-Peak
11:00 PM	Off-Peak	Off-Peak	Off-Peak

Description of Data and Analysis

In response to Decision No. C22-0298,[3] the Company conducted an analysis using load and generation data for years 2022, 2025, and 2030 and loss of load probability ("LOLP") data based on a 2028 study year. LOLP is a resource adequacy metric that measures the probability of the utility being unable to serve the full load requirement during a given hour.

The Company included both historical and forecast data in this analysis, including historical and forecasted hourly load, renewable generation, load relief, storage charging and discharging, and LOLP. The Company included solar, wind, and hydro generation in the renewable generation of the analysis. These renewable generation resources are non-dispatchable and meet the definition of Renewable Energy Resource[4] in the Commission's Rules.

- **2022 Data:** The TOU Analysis includes *actual* hourly load and generation data for 2022. The load data is the Company's total Obligation Load which includes the Company's retail and wholesale load. The Obligation Load is adjusted for Cabin Creek's pumping load and the load relief from demand response to result in an adjusted load without either the additional load from Cabin Creek's pumping or the reduced load of demand response. The renewable generation data is the metered generation plus the estimated curtailed volumes by hour. The

[3] In addition to Decision No. C22-0298, there has been commentary in other proceedings and Commission Weekly Meetings about the relationship between the Company's TOU rates and resource adequacy.
[4] The Commission's Rules Regulating Electric Utilities, 4 Code of Colorado Regulations 723-3, Rule 3652 (aa).

Obligation Load includes the effects of behind-the-meter solar generation. Community solar garden generation is included in the hourly metered renewable generation.

- **2025 and 2030 Data:** This data is *forecasted* hourly load and generation data from the EnCompass[5] model from the SCC10-USA scenario from the Company's most recent Electric Resource Plan and Clean Energy Plan in Proceeding No. 21A-0141E ("2021 ERP & CEP"). The SCC10-USA scenario accompanied the Updated Settlement Agreement, which was filed on April 26, 2022, in that Proceeding. The load includes the Company's retail and wholesale load. The renewable generation includes the modeled generation and curtailment. Behind-the-meter solar and community solar garden generation are contained in the renewable generation.
- **2028 Data:** This data is *forecasted* loss of load probability hourly data from a 2028 Study Year. This is data out of the PLEXOS[6] model and is based on the SCC10-USA scenario in the 2021 ERP & CEP. This is the most up to date LOLP data available prior to the start of the Electric Resource Plan Phase II. The load includes the Company's retail and wholesale load. The renewable generation includes the modeled generation and curtailment. Behind-the-meter and community solar garden solar generation are contained in the renewable generation. The load and generation profiles are based on actual 2014-2019 load and generation scaled to a 2028 system.

SCC10-USA Expansion Plan

The Expansion Plan of SCC10-USA can be found in Attachment D to the Updated Settlement Agreement in Phase I of the 2021 ERP & CEP and is reproduced in Table 2.

Table 2

SCC-10USA Expansion Plan Plan Nameplate (MW)	2025	2026	2027	2028	2029	2030
Storage	200	-	-	-	-	200
Wind	1,000	250	150	550	200	200
Solar	-	-	800	50	-	750
Cumulative Plan Nameplate (MW)	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Storage	200	200	200	200	200	400
Wind	1,000	1,250	1,400	1,950	2,150	2,350
Solar	-	-	800	850	850	1,600

This expansion plan includes 2,350 MW of wind, 1,600MW of solar, and 400 MW of storage resource additions through 2030. This expansion plan is based on generic resource assumptions, while the actual expansion plan will be based on the outcomes of competitive solicitations of resources and is subject to Commission approval. The 2021 ERP & CEP competitive solicitation will consider electric-

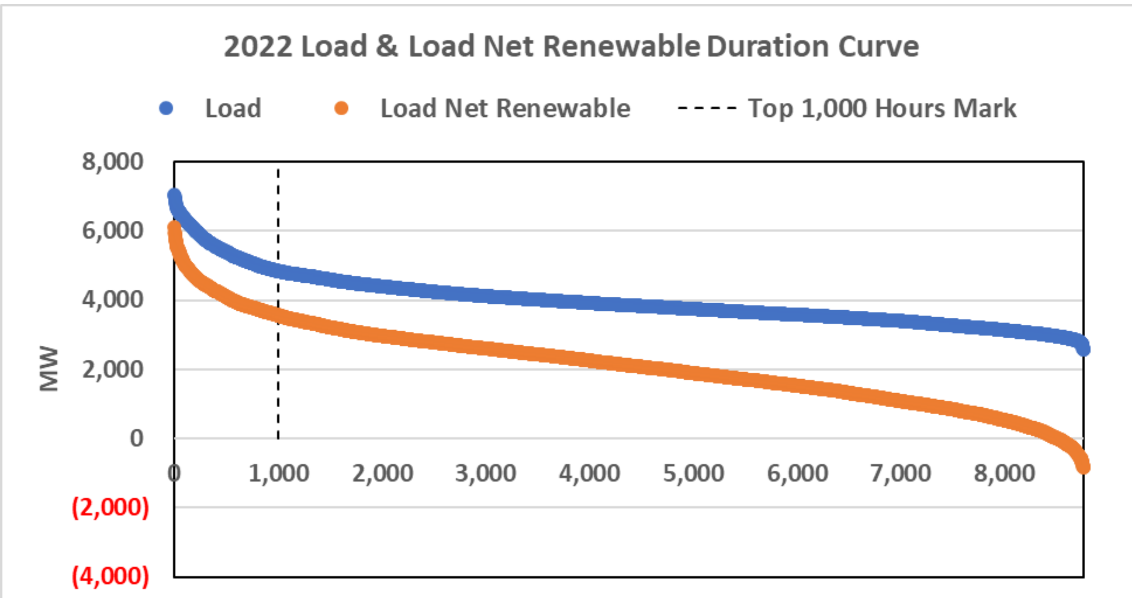
[5] EnCompass is a computer model used in the Company's resource planning process to forecast capacity expansion, unit commitment and dispatch, and related data.
[6] PLEXOS is a computer model used in the Company's operations, budgeting, and fuel clause processes to forecast unit commit and dispatch and related data.

supply resources with in-service dates prior to 2029 and will use generic resources to fill system needs from 2029 and later. Because the generic resource assumptions will not perfectly align with the actual competitively bid proposals, the actual expansion plan from the 2021 ERP & CEP and subsequent Electric Resource Plans could cause material deviation in the amounts and types of resources added as compared to the expansion plan of SCC10-USA.

Load Net of Renewable Generation

Load net of renewable generation is calculated by subtracting the hourly renewable generation from load for the same hour. Figures 1 and 2 below show duration curves for the load and load net of renewable generation in 2022 and 2030. Numbers below zero on the y-axis are hours where the renewable generation exceeds the load in the hour. Additional charts can be found in the Appendix to the Analysis.

Figure 1



With the levels of load and renewable generation on the Company's system in 2022, there were only 251 hours in which the renewable generation potential exceeded the load. As more renewable generation is added to the Company's system, consistent with the 2021 ERP & CEP portfolio discussed above, hours in which renewable generation potential exceeds load increase by 8-fold and 16-fold by 2025 and 2030 as shown in Figure 2 and Table 3.

Figure 2

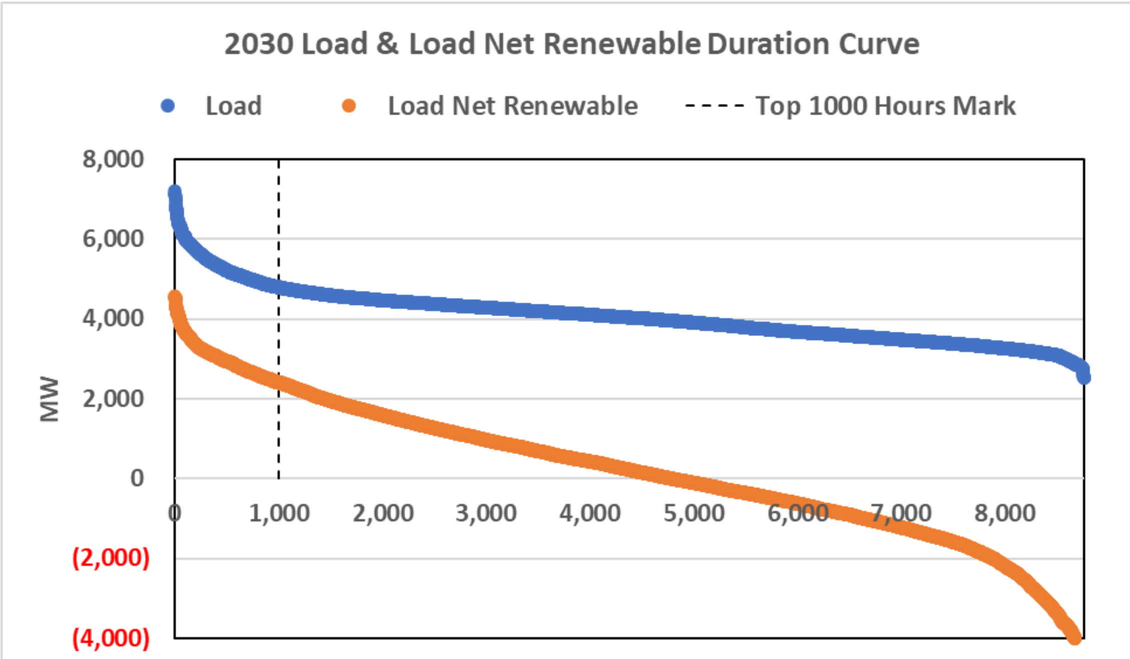


Table 3

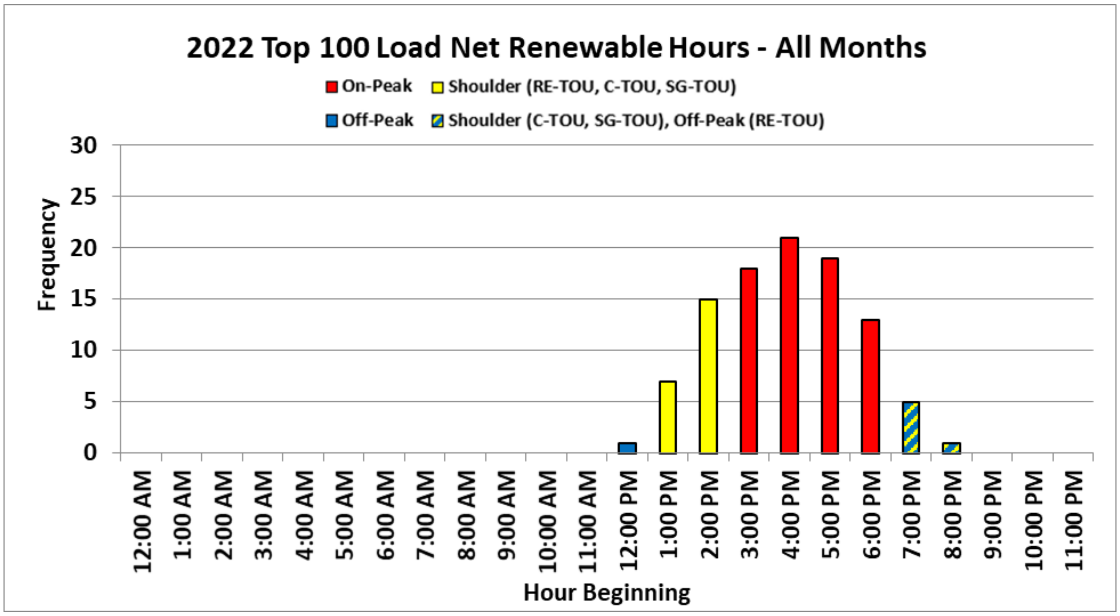
	Negative Load Net Renewable Hours	% of Year
2022	251	3%
2025	1,970	22%
2030	3,978	45%

Evening Shoulder Analysis

The terms of the Unanimous and Comprehensive Stipulation and Settlement Agreement ("RE-TOU Settlement"),[7] generally lock in the rate design of Schedule RE-TOU through 2025, but the RE-TOU Settlement does allow for the possibility of adding an evening shoulder period to the Schedule RE-TOU rate design. Specifically, it states "the Settling Parties agree that a threshold of 22 out of the top 100 load net of renewable hours between 7pm and 9pm in one year is permissible criteria to warrant filing for an evening shoulder period of one or more hours."[8] The Company determined the top 100 hours of load net of renewable generation for 2022, and Figure 3 below shows the count of when these hours occurred throughout the year.

[7] The Residential TOU Settlement was approved in Decision No. R20-0642 (Mailed Date: September 11, 2020).
[8] Residential TOU Settlement at 17-20, ¶26 (filed June 15, 2020).

Figure 3



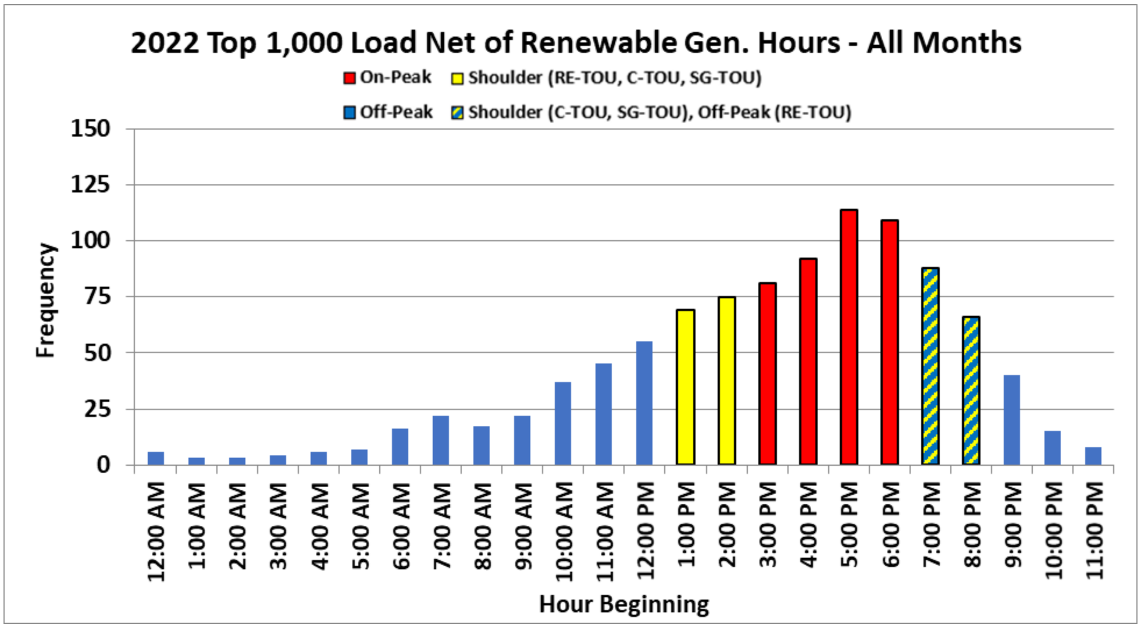
As shown in Figure 3, only six of the top 100 hours of load net of renewable generation occurred between 7 p.m. and 9 p.m. in 2022, short of the 22 hours required for the Company to propose an evening shoulder for Schedule RE-TOU. The top 100 load net of renewable generation hours in 2022 were very well aligned with the on-peak and shoulder periods for Schedule RE-TOU, Schedule C-TOU, and Schedule SG-TOU.

TOU Rate Design Analysis

For setting TOU periods, the Company primarily focuses on the top 1,000 hours of load net of renewable generation. This is because there are approximately 1,000 on-peak hours in the year based on current TOU rate designs.[9] Figure 4 shows the top 1,000 hours of load net of renewable generation for the same year. As the top 1,000 hours of load net of renewable generation are considered, many of those hours occur outside of the current on-peak and shoulder periods, but the on-peak and shoulder hours still show the highest concentration of high load net of renewable generation hours.

[9] 50 weeks of weekdays net of 10 holidays per year. 50 weeks * 5 days/week * 4 on-peak hours/day = 1,000 on-peak hours.

Figure 4



Looking forward to 2025 and 2030, the Company's current forecasting shows that evening hours still have the highest concentration of the top 1,000 hours of load net of renewable generation. However, fewer of these hours occur between 3 p.m. and 5 p.m., which is included in the current on-peak period, and more of these hours occur between 7 p.m. and 10 p.m.

Figure 5

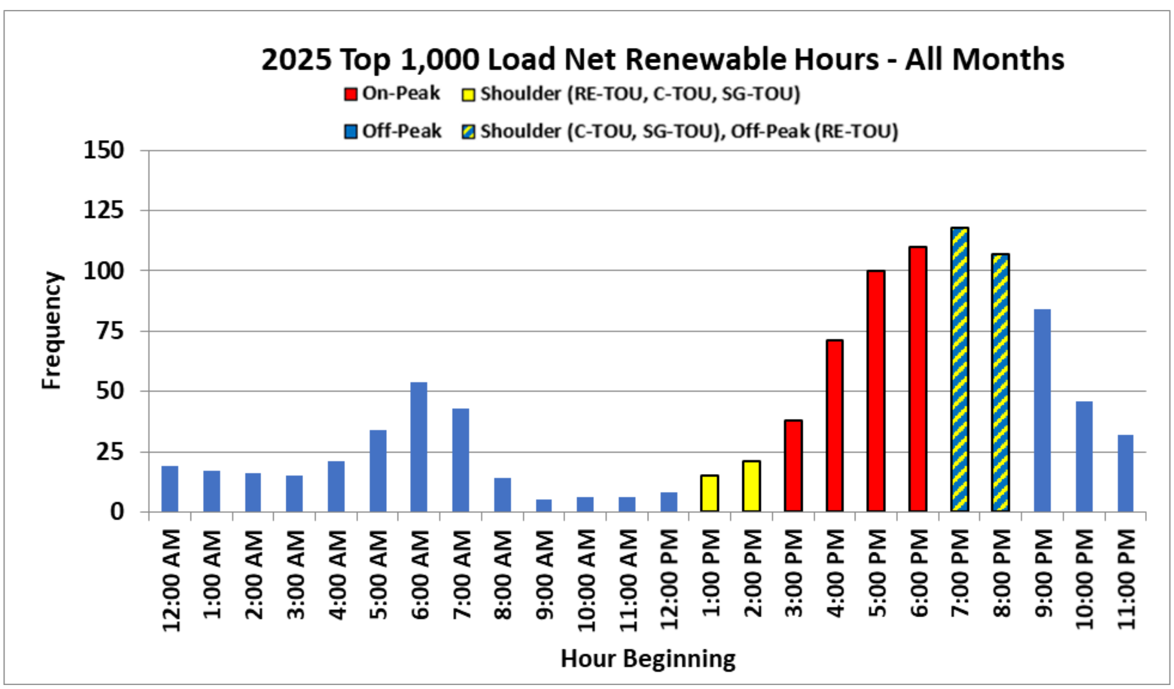
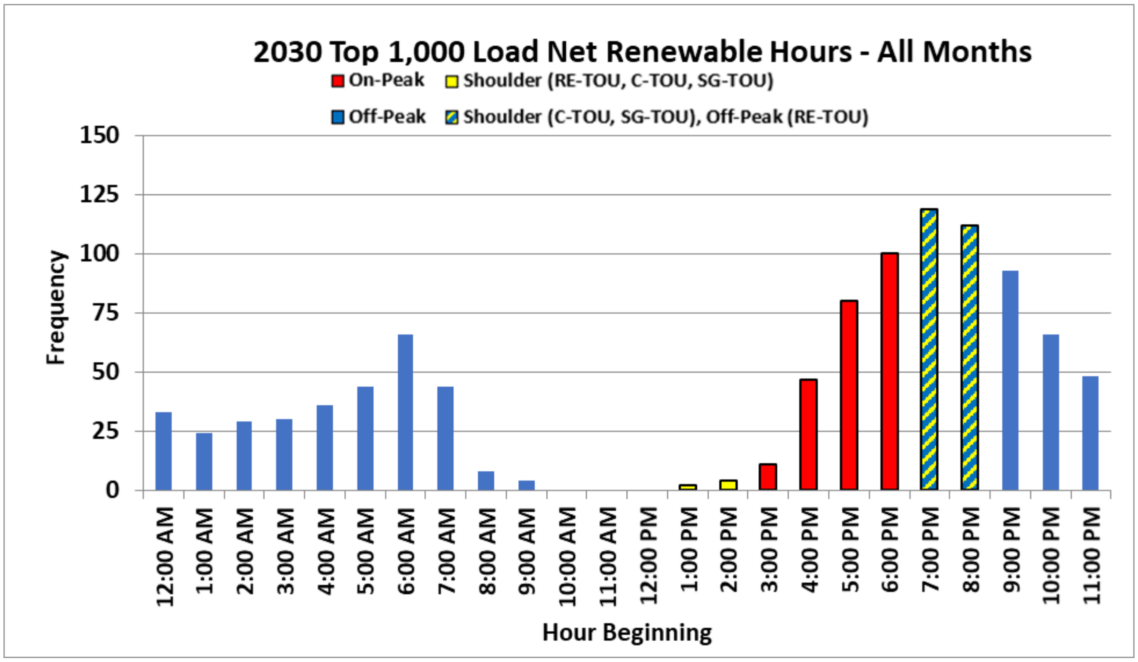


Figure 6



Seasonal Considerations

The Company's current TOU rates utilize seasonal variation in pricing (i.e., summer on-peak and shoulder energy charges are higher than winter charges), but the TOU periods do not differ between the summer and winter seasons. In other words, the TOU rates use the same definition of on-peak, shoulder, and off-peak hours year-round. Table 4 below shows that as more renewable generation is added to the Company's system in 2025 and 2030, that many of the top 1,000 hours of load net of renewable generation shift from summer to winter months. This indicates that in the future, TOU pricing may need to shift to higher energy charges in the winter months instead of the summer.

Table 4

2022 Top 1,000 Load Net Renewable Hours	Summer	Winter	All Months
between 1pm and 9pm	515	179	694
before 1pm and after 9pm	151	155	306
Total	666	334	1,000

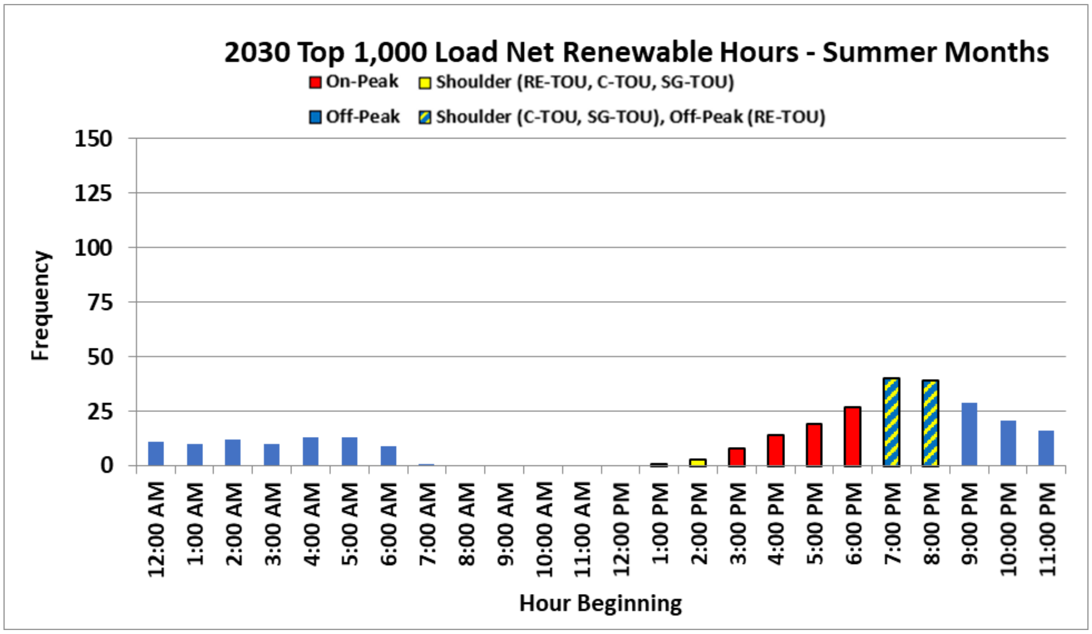
2025 Top 1,000 Load Net Renewable Hours	Summer	Winter	All Months
between 1pm and 9pm	264	316	580
before 1pm and after 9pm	122	298	420
Total	386	614	1,000

2030 Top 1,000 Load Net Renewable Hours	Summer	Winter	All Months
between 1pm and 9pm	151	324	475
before 1pm and after 9pm	145	380	525
Total	296	704	1,000

Table 4 also shows a shift in the top hours of load net of renewable generation from afternoon and evening (between 1 p.m. and 9 p.m.) to morning and nighttime hours. By 2030, the majority (525 hours) of the top 1,000 hours of load net of renewable generation are either before 1 p.m. or after 9 p.m., and most of those occur in the winter months. However, this is largely due to higher renewable generation in the afternoon and early evening hours. As shown in Figures 5 and 6 above, the hours of 5 p.m. to 10 p.m. still show the highest concentration of the top 1,000 hours of load net of renewable generation, which would continue to support the use of an on-peak period in the evening.

To determine whether TOU period definitions should differ seasonally, the Company compared annual, winter, and summer histograms of the top 1,000 hours of load net of renewable generation for 2030. Figures 6 above shows the top 1,000 hours across the entire year, while Figures 7 and 8 below show the summer and winter contributions to the annual totals. These histograms illustrate that evening hours in both winter and summer still generally have the highest count of the top 1,000 hours of load net of renewable generation, which supports the use of an evening peak period year-round. However, early morning hours in the winter months can be comparable with the evening and could merit use of a TOU price signal in winter mornings in the future. Similar figures for 2022 and 2025 are available in the Appendix.

Figure 7


2030 Top 1,000 Load Net Renewable Hours - Summer Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
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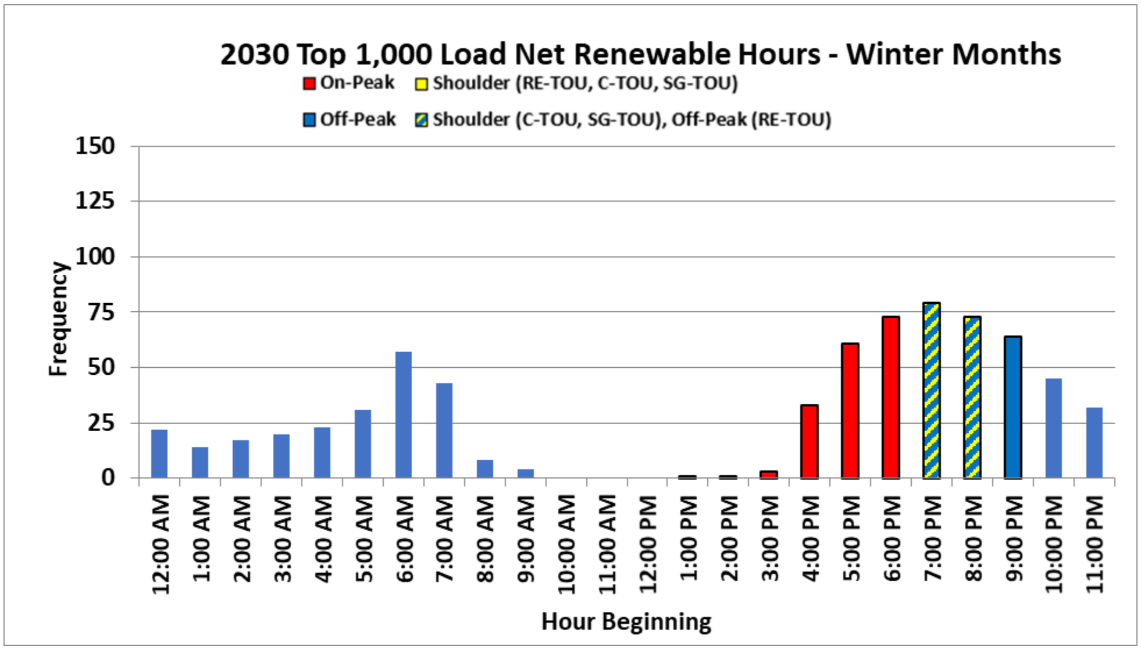
9:00 PM
10:00 PM
11:00 PM
Hour Beginning

Figure 8

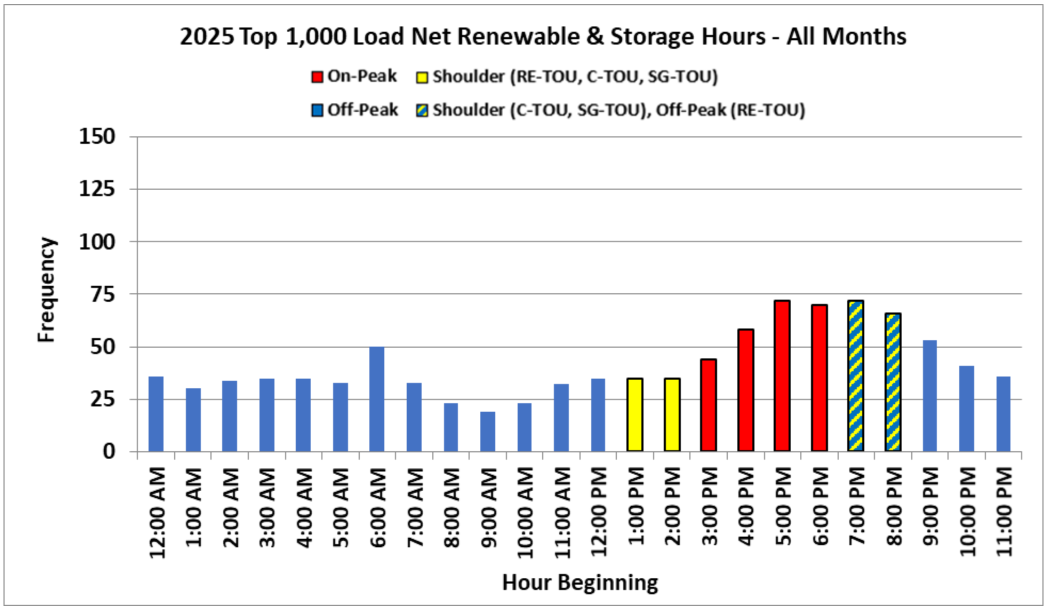


Energy Storage Considerations

The Company believes that the best way to set TOU rates is based on system load net of renewable generation *without* considering the effects of storage. System load net of renewable generation is a measure of the load that is needed to be served by dispatchable generation resources. In this context, energy storage resources are more akin to traditional dispatchable generation resources – tools that can be used to help serve the changing load net of intermittent or non-dispatchable generation. Excluding the effects of storage from the TOU Analysis more effectively separates the problem to be solved (net load) from the solution (dispatchable generation resources, including storage). However, the analysis below shows the effects of energy storage for informational purposes.

To present the effects of storage, the Company created histograms of the load net of renewable generation, including the effects of energy storage (charging and discharging of energy storage resources). The load net of renewable generation and storage is calculated for years by adding energy storage charging to the hourly load and energy storage discharging to the renewable generation, and then subtracting the discharge-adjusted renewable generation from the charge-adjusted load for each hour. Figures 9 shows the top 1,000 hours of load net of renewable generation, adjusted for energy storage effects, for 2025.

Figure 9



Figures 10 and 11 below show the impact of including storage in the 2025 analysis by comparing the top 1,000 hours of load net of renewable generation *and storage* to the top 1,000 hours of load net of renewable generation *without considering* storage. These figures illustrate some distinct charge and discharge patterns. First, storage in 2025 often charges (increasing load) during the middle of the day to discharge from 4 p.m. to 11 p.m. as shown in Figure 10. The second, predominantly in winter months, is storage charging during the early morning hours and discharging during the morning ramp from 5 a.m. to 8 a.m. as shown in Figure 10 and in Figure 11.

Figure 10

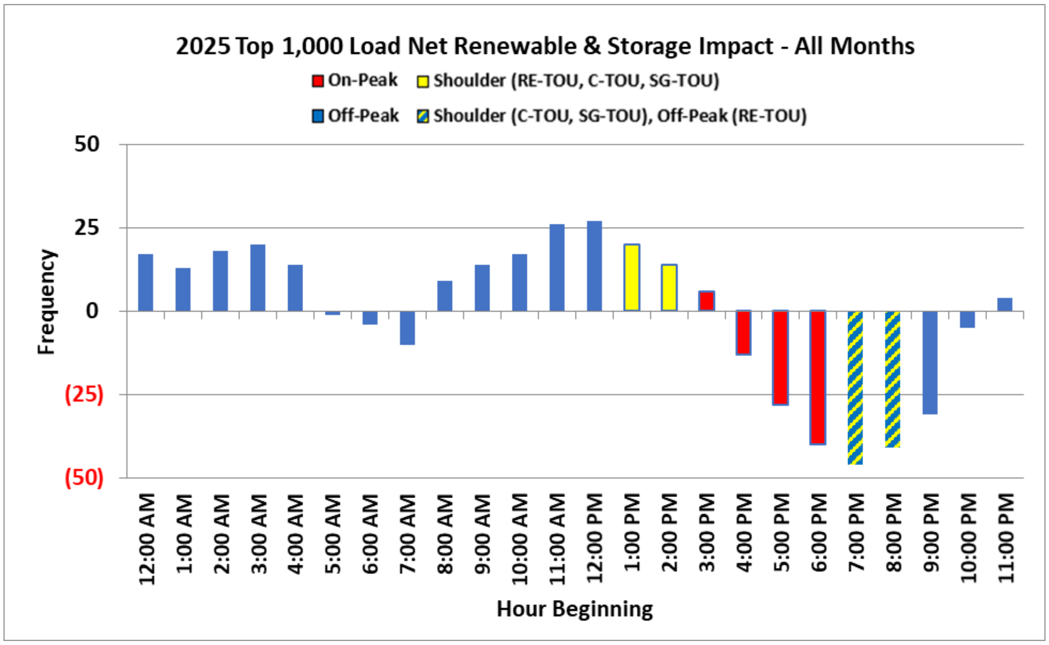
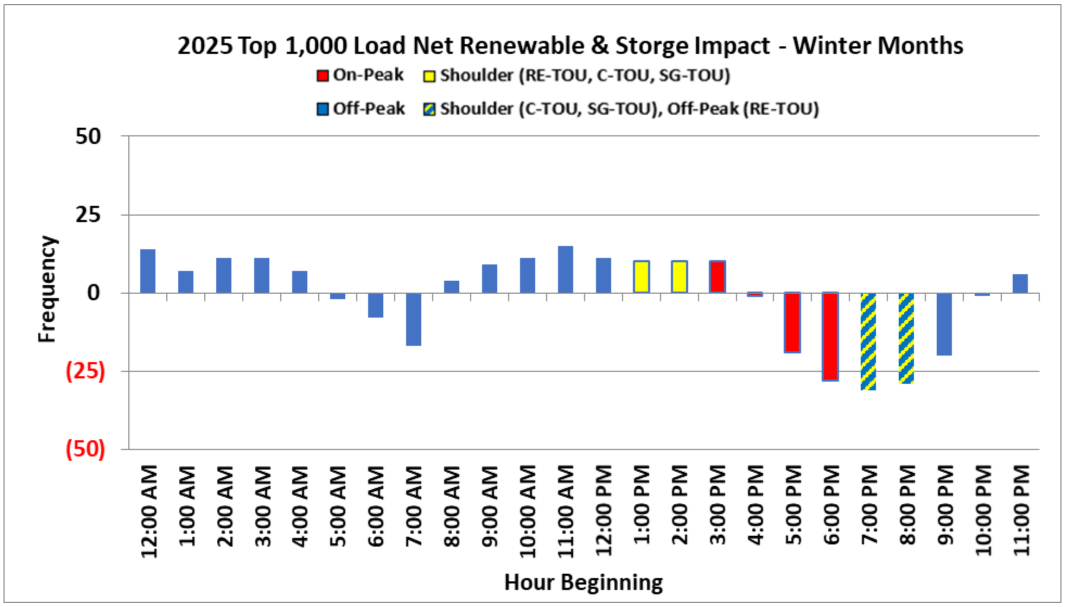


Figure 11

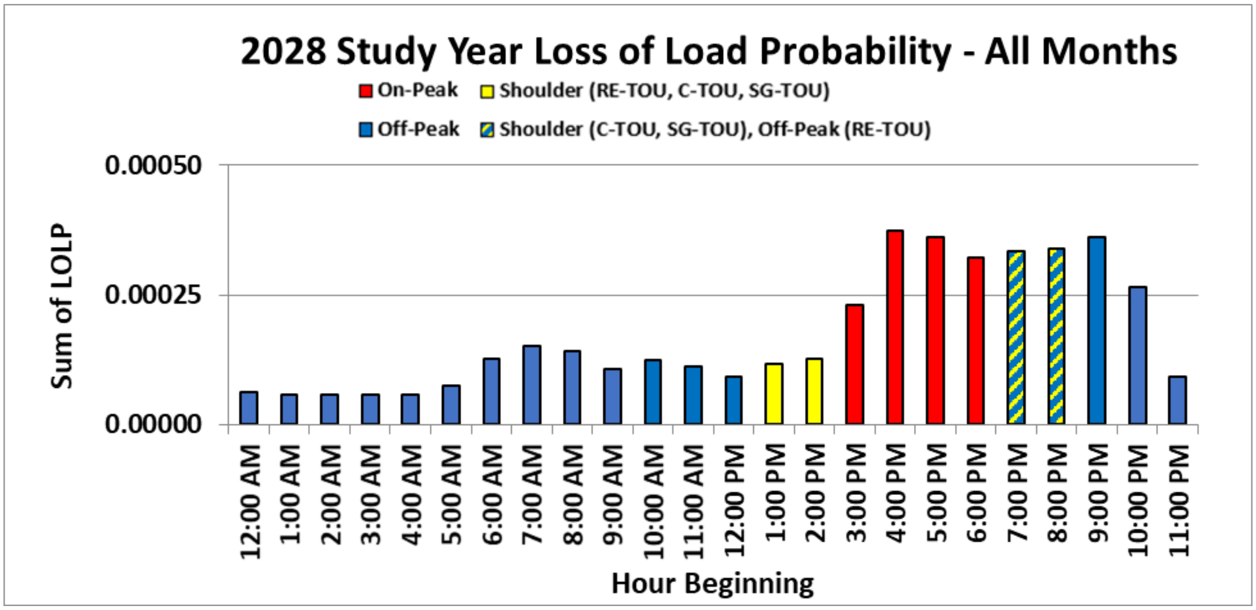


Loss of Load Probability Analysis

The Company has also used hourly LOLP data to produce a histogram based on a 2028 study year. Resource adequacy metrics such as LOLP generally align with load net renewable data because the probability of loss of load increases during higher load net of renewable generation hours. Figure 12 shows the LOLP histogram for study year 2028. The LOLP charts for study year 2030 can be found in the Appendix to the Analysis.

While the LOLP chart uses a consistent resource expansion plan to the rest of the TOU Analysis, it is based on a different year than the earlier load net of renewable generation charts. 2028 is used for the LOLP analysis because it is the last year new resources will be considered within the 2021 ERP & CEP. To determine the LOLP, the PLEXOS model outputs an hourly probability value of loss of load for every hour of the year. The Company sums the probability by hour to produce the presentation of the histogram. The sum of the probabilities is equal to 0.004167, which is equal to loss of load in one hour in ten years. One hour in ten years is equal to 1/24 days in ten years, or 0.041667 days in ten years. The PLEXOS model uses 0.004167 days in one year as a reliability metric which is equal to 0.041667 divided by 10.

Figure 12



Similar to the top 1,000 hours of load net of renewable generation in 2025 and 2030 (shown in Table 4), the LOLP risk in 2028 occurs predominantly in the winter months. Figure 13 shows that very little of the LOLP occurs in summer months with a large majority in the winter months in Figure 14. Figure 7 (above), which shows the top 1,000 hours of load net of renewable for summer months, has a high concentration of the top 1,000 hours from 7 p.m. to 9 p.m., which aligns with the elevated LOLP in Figure 13, but the LOLP chart also shows elevated risk as early as 4pm.

Figure 13

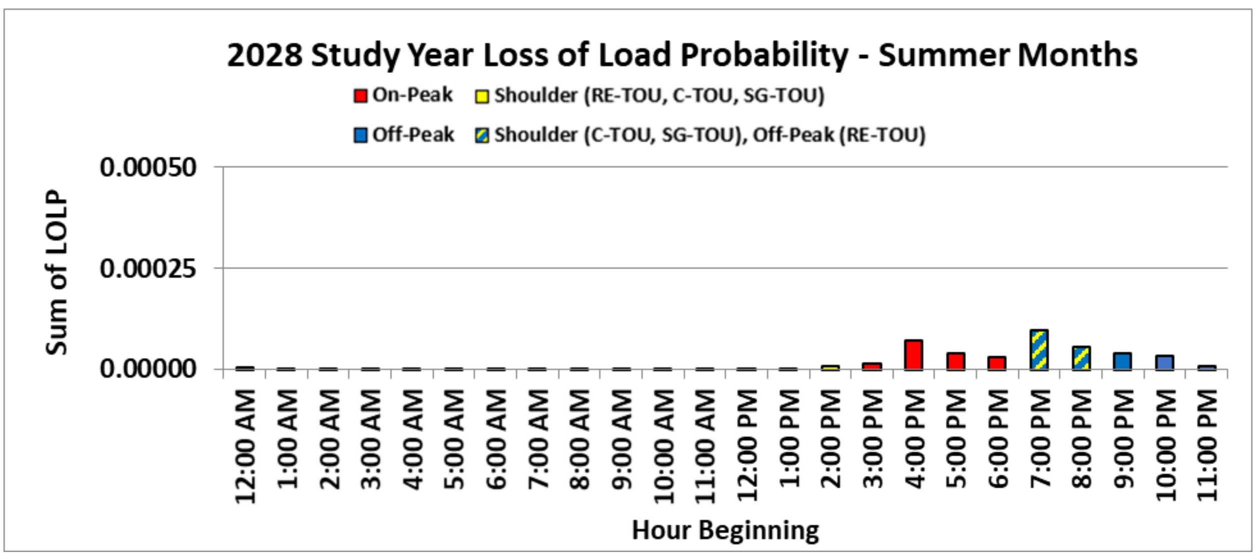
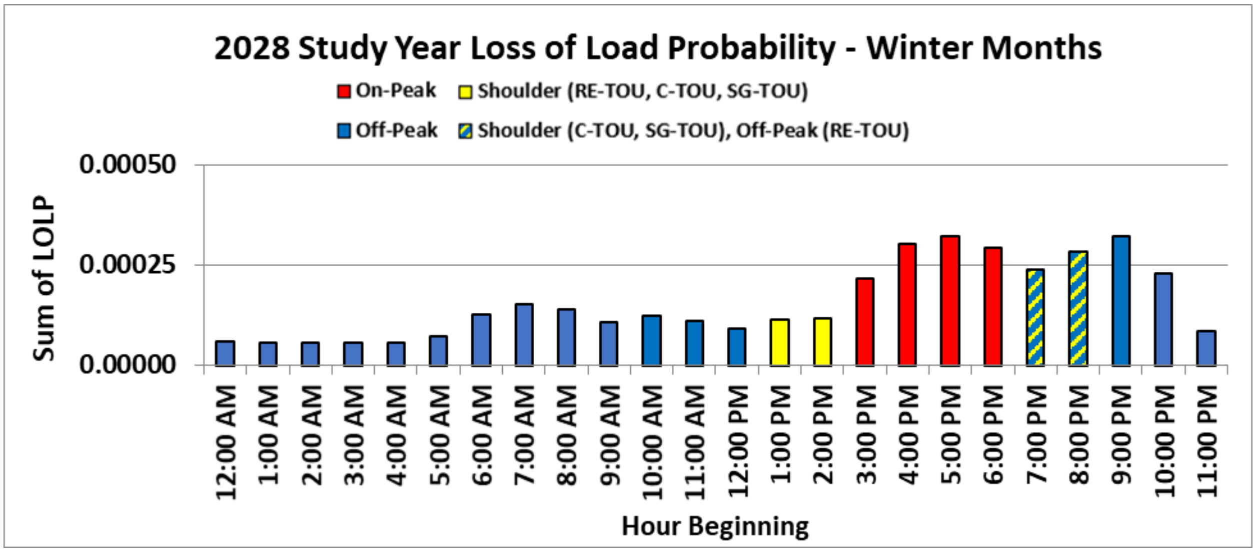


Figure 8 (above) shows the top 1,000 hours of load net of renewable generation for 2030 winter months, with higher frequencies of the top 1,000 hours during the morning ramp as well as from 5 p.m.

to 11 p.m. These same patterns are present in the LOLP data with elevated LOLP during the morning ramp as well as from 3pm-11pm.

Figure 14

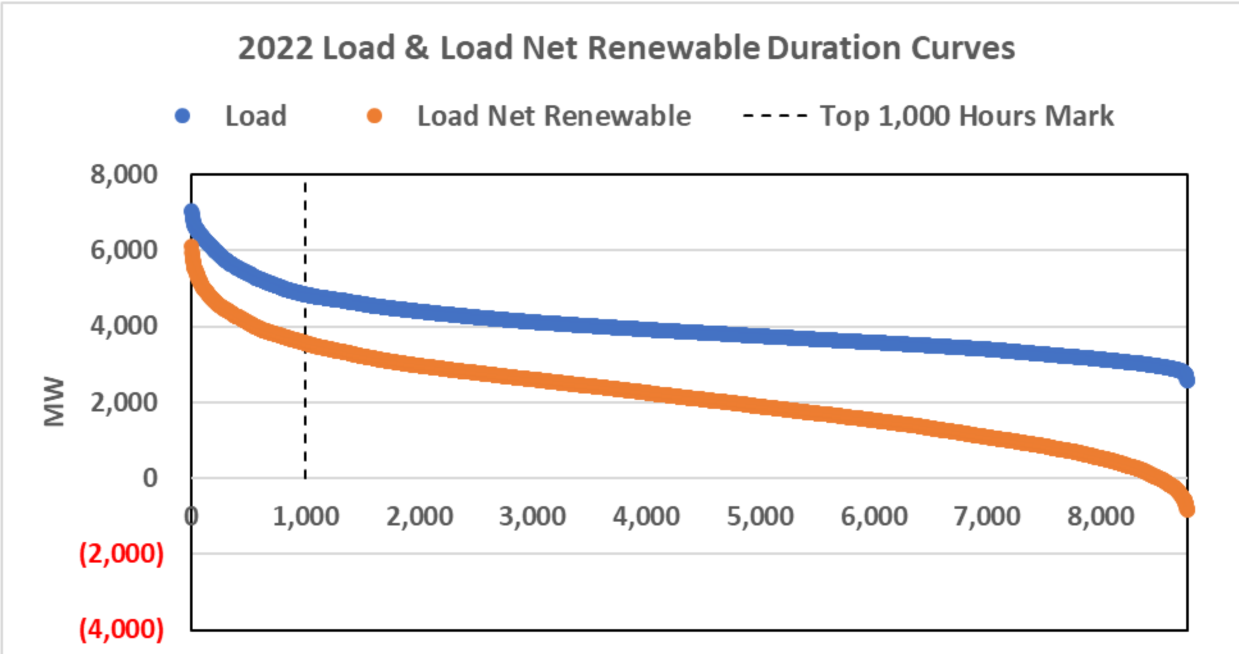


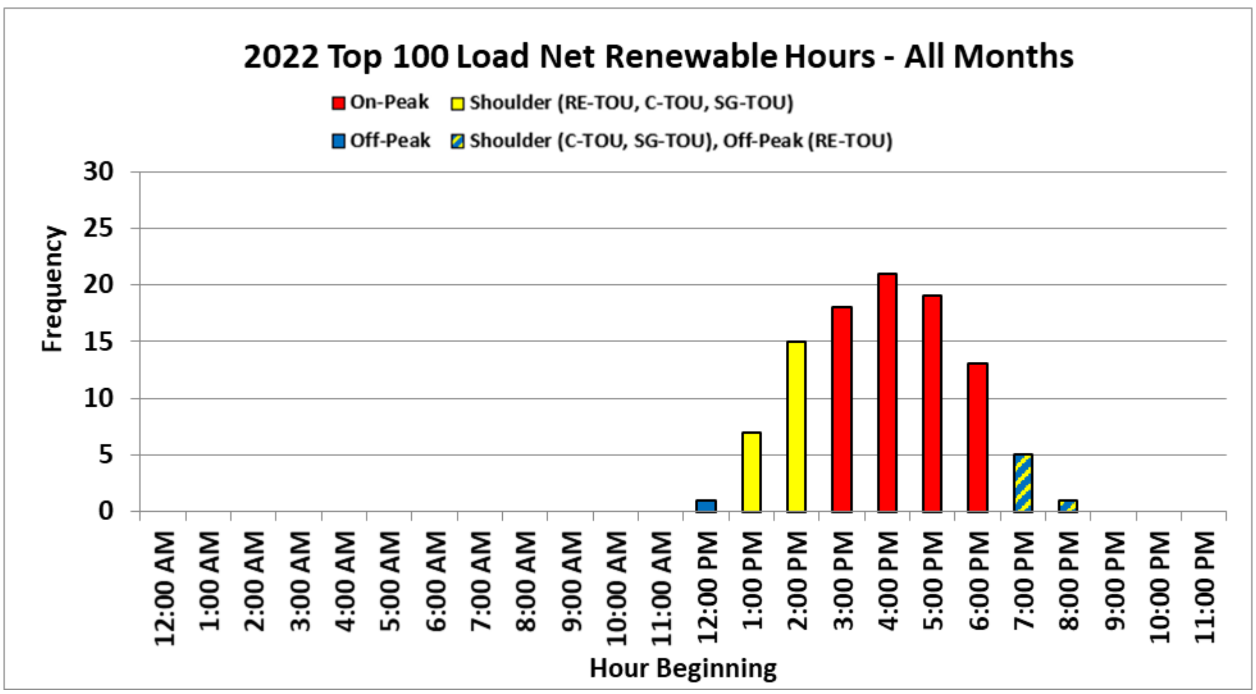
In general, the LOLP data is even more winter-focused than the top hours of load net of renewable generation data and is also dispersed over a greater number of hours. The top hours of load net of renewable generation are more predictable given the assumed load and renewable generation profiles, while the LOLP data has less predictability due to the variability inherent in the probability-based analysis. In other words, the forecasted load net of renewable generation data is based on expected, or normal, load and generation patterns, while the LOLP data includes more atypical patterns that can present some higher loss of load risk outside of the top hours of load net of renewable generation.

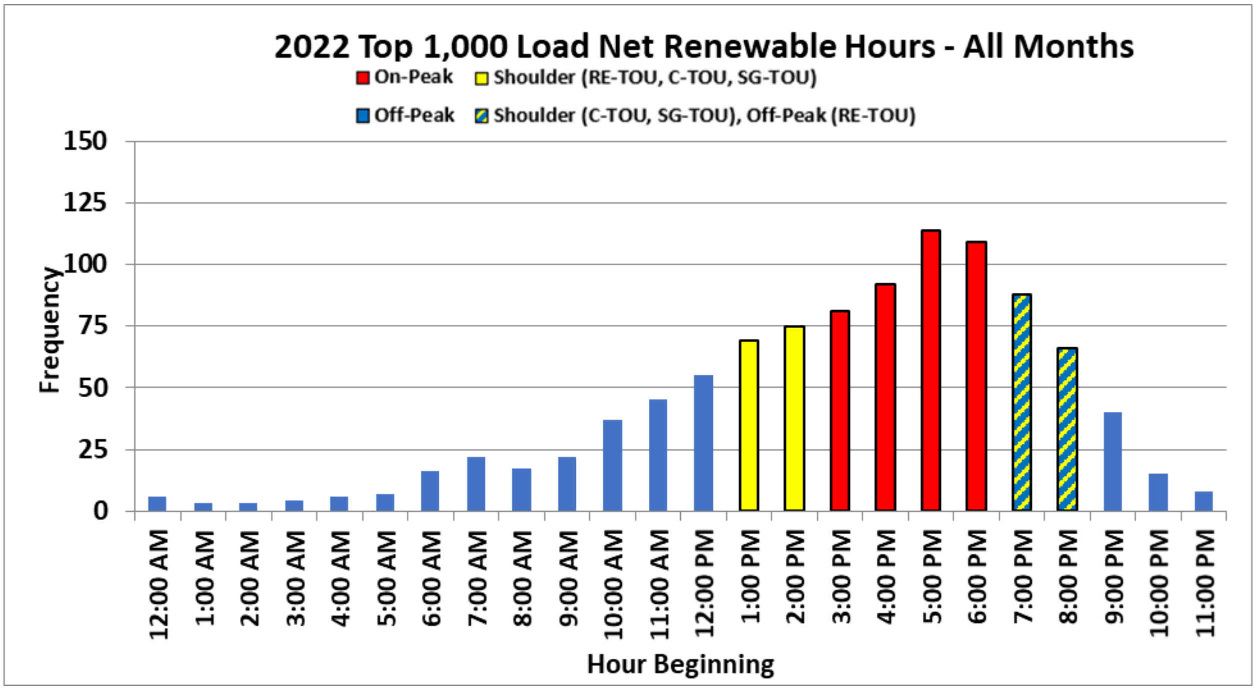
Appendix

The appendix has the complete set of charts and tables by year including Load Duration Curves, Load Net Renewable Hour histograms, and Load Net Renewable & Storage Hour histograms.

2022 Load Duration Curve and Load Net Renewable Hours Charts






2022 Top 1,000 Load Net Renewable Hours - All Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
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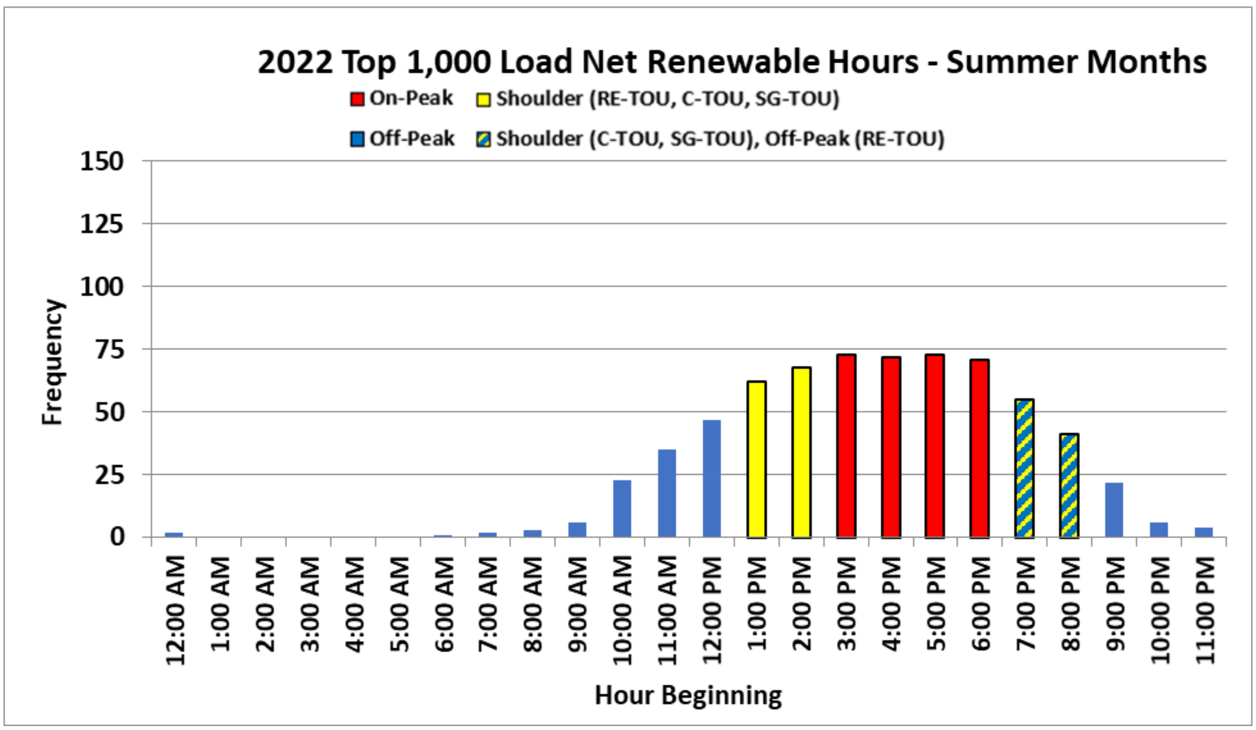
Hour Beginning


2022 Top 1,000 Load Net Renewable Hours - Summer Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
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12:00 PM
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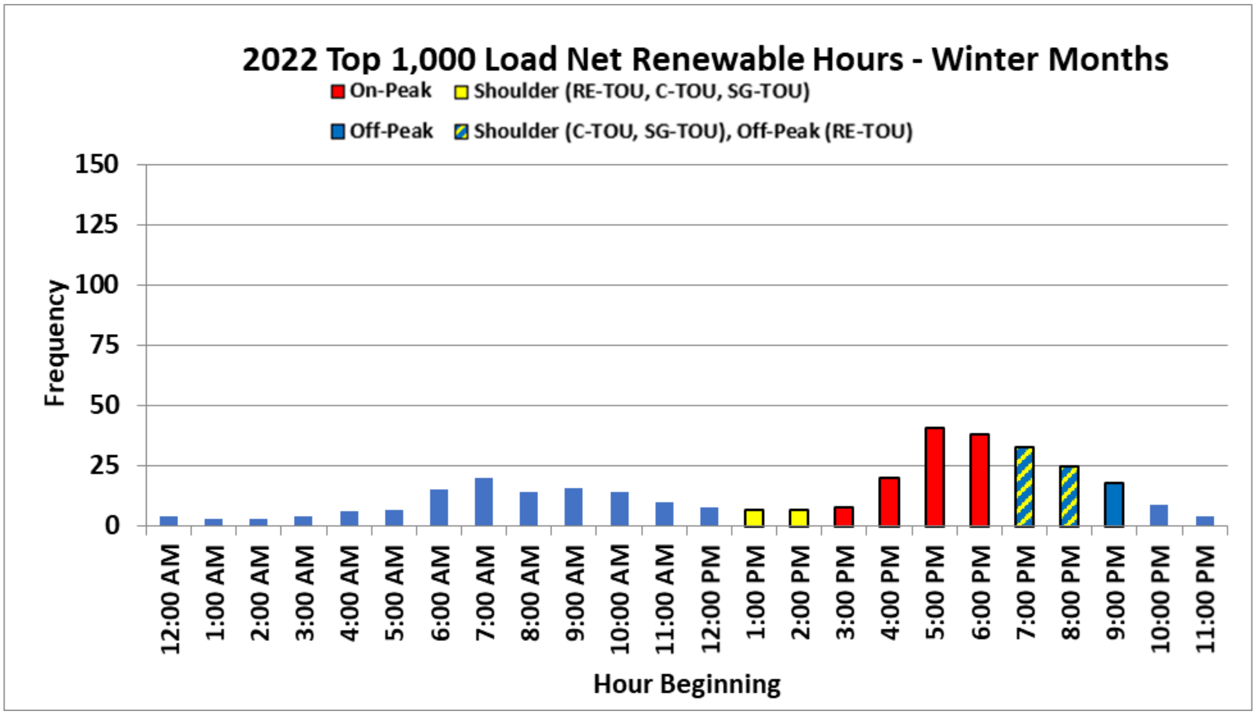
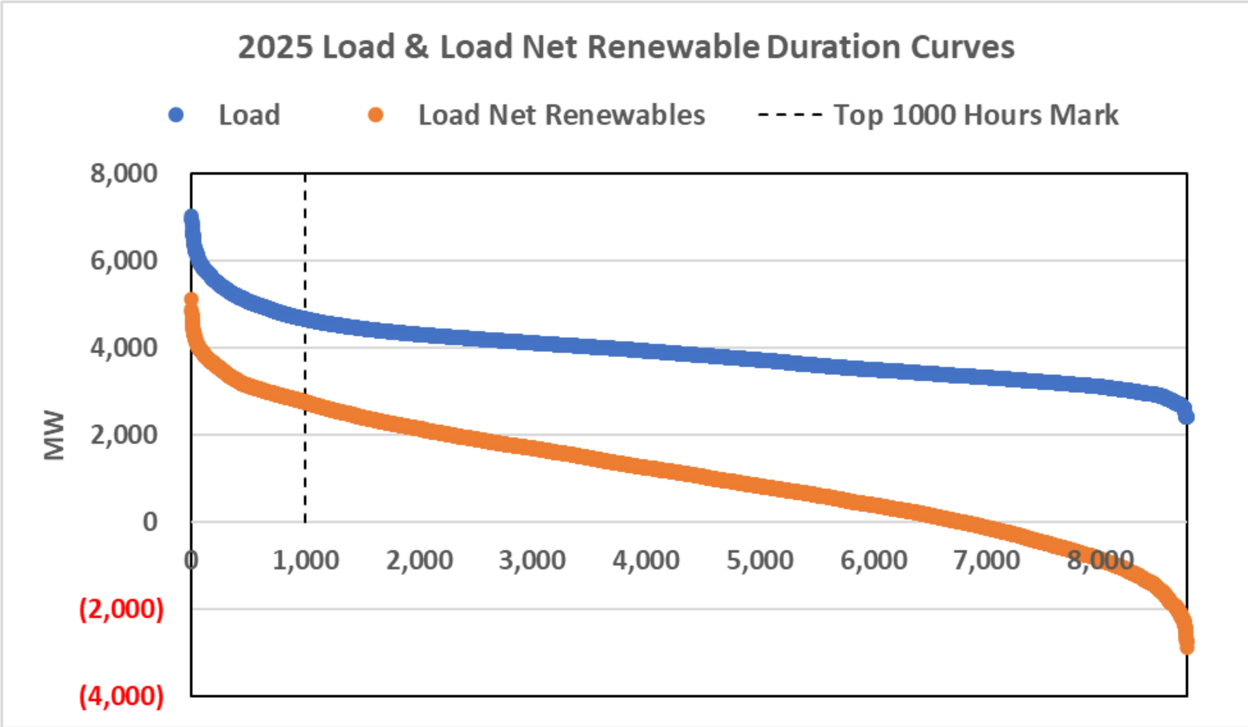
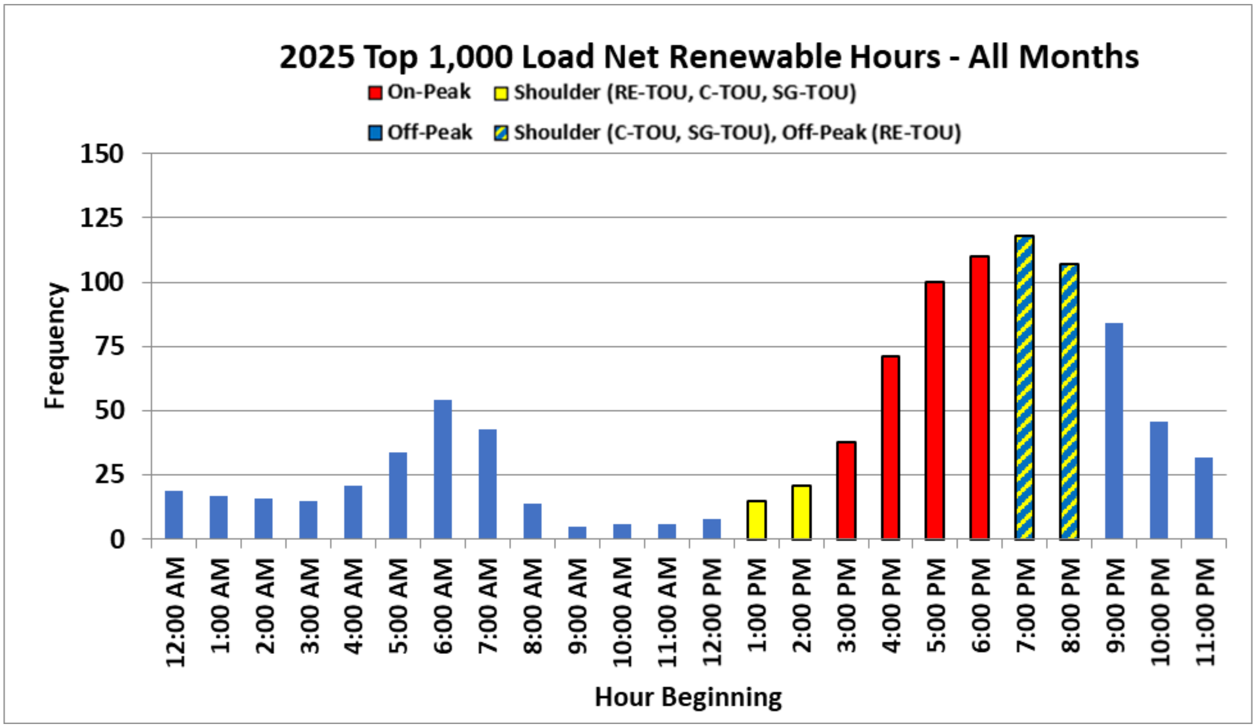
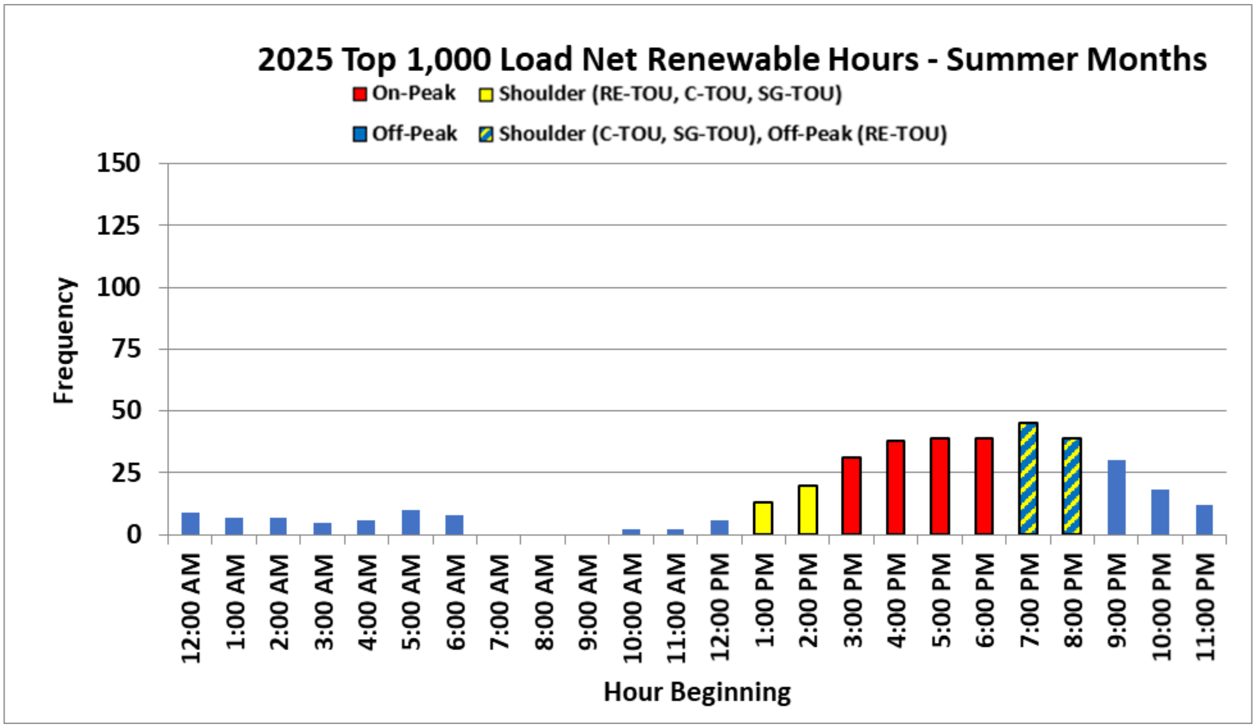
11:00 PM
Hour Beginning

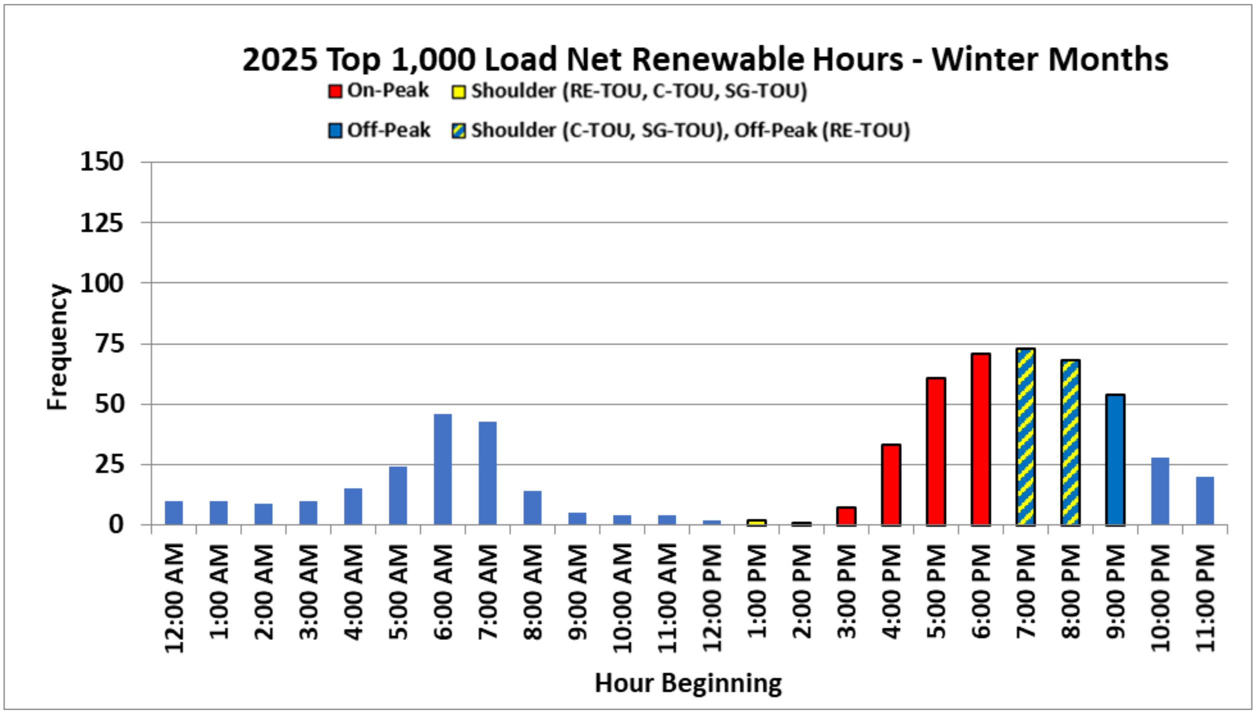


2025 Load Duration Curve and Load Net Renewable Hours Charts

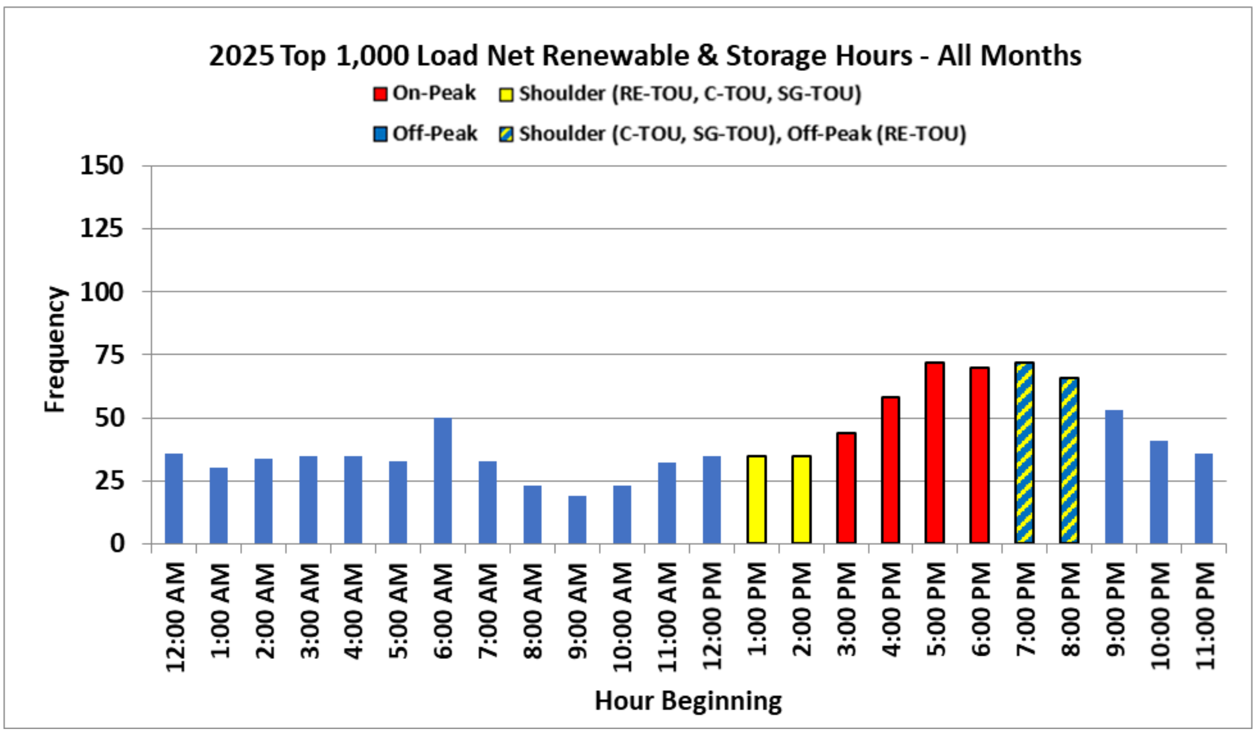


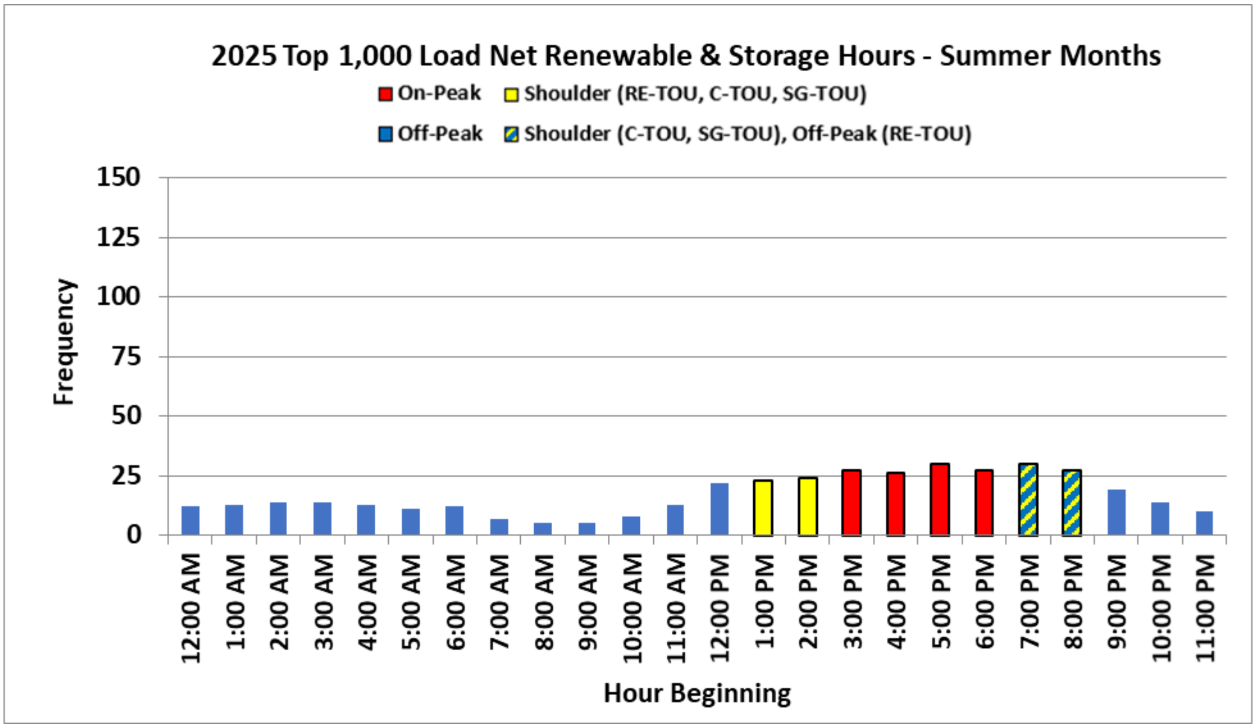

2025 Top 1,000 Load Net Renewable Hours - All Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Hour Beginning


2025 Top 1,000 Load Net Renewable Hours - Summer Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Hour Beginning



2025 Load Net Renewable & Storage Hours Charts




2025 Top 1,000 Load Net Renewable & Storage Hours - Summer Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
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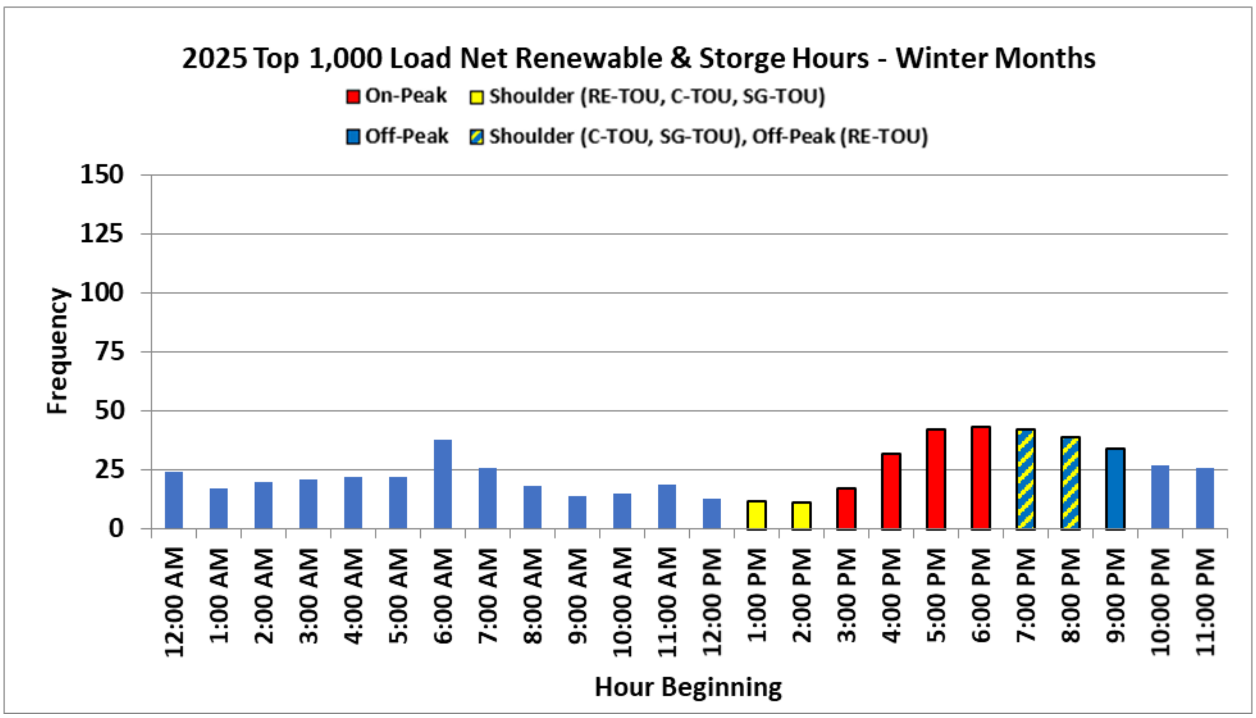
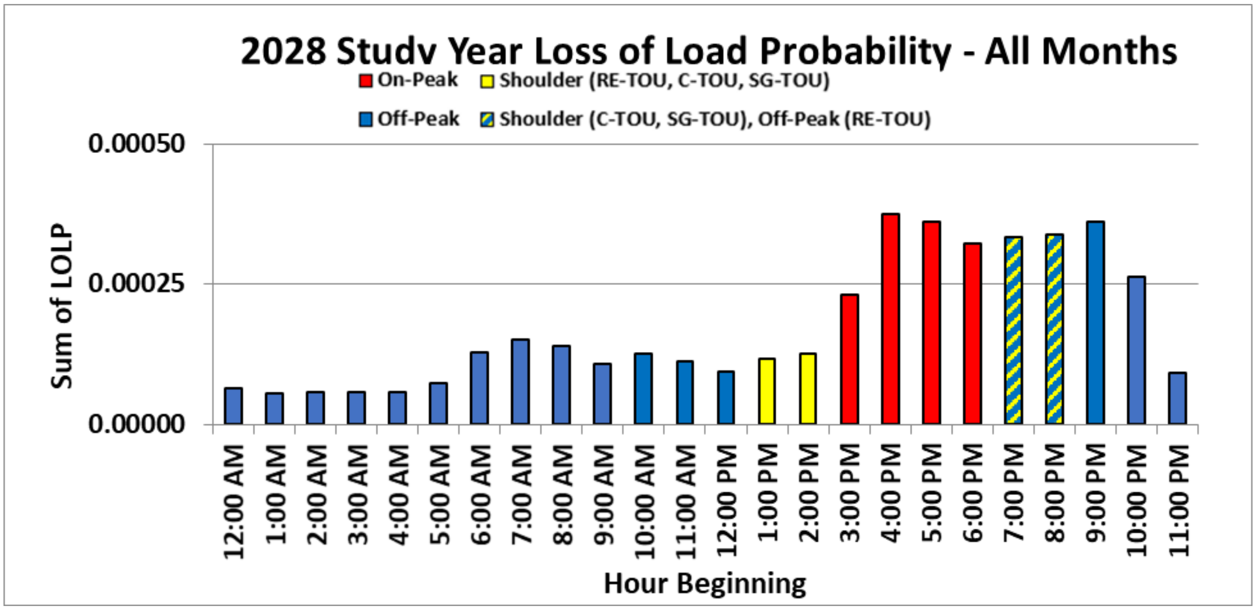
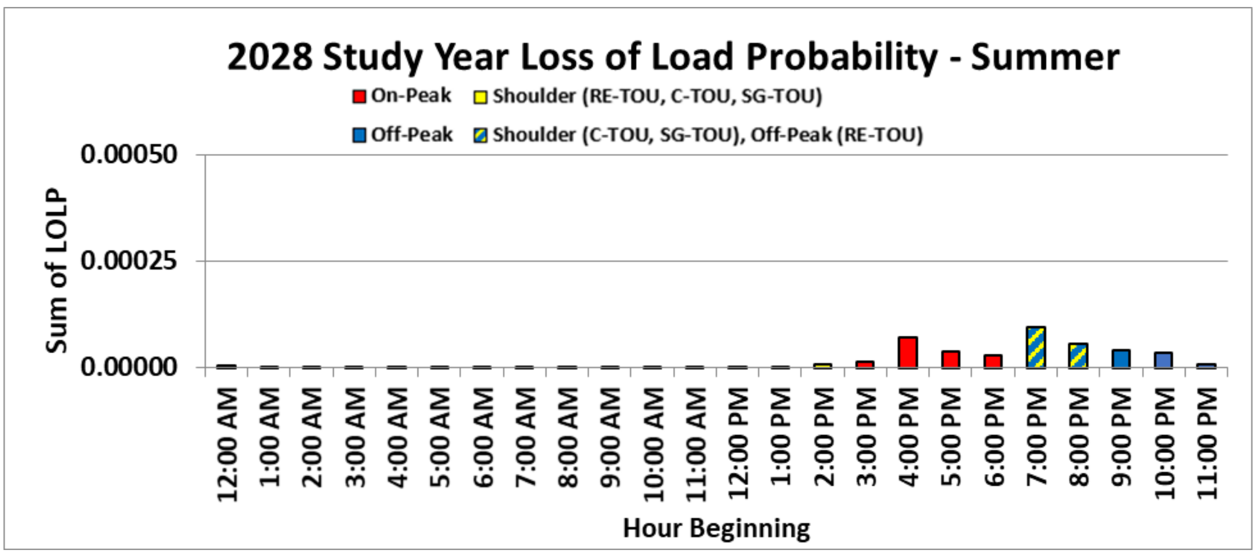
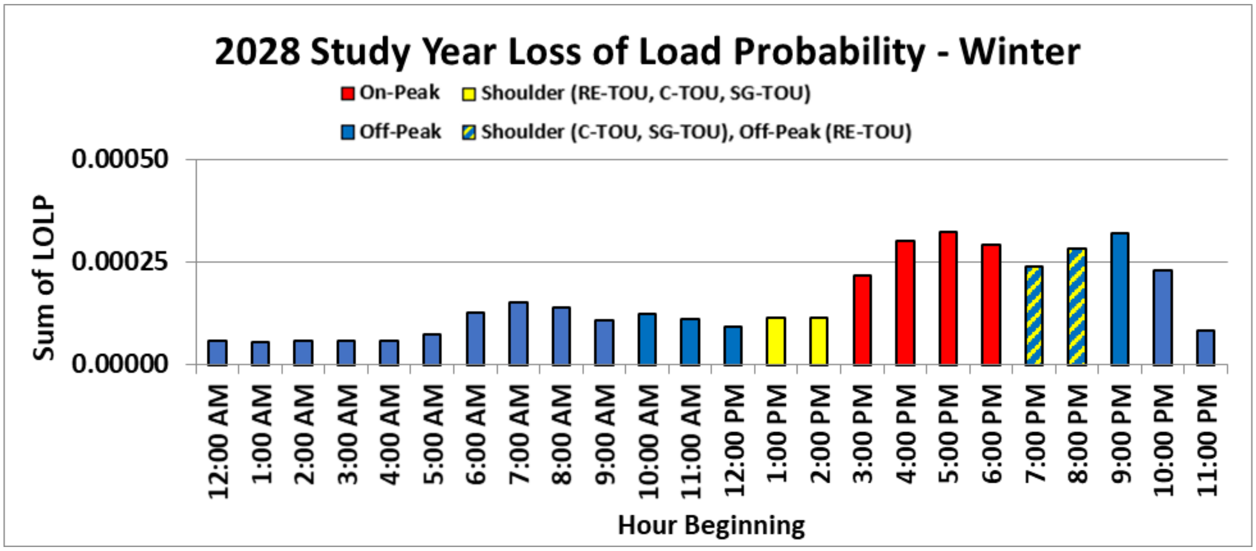
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Hour Beginning


2025 Top 1,000 Load Net Renewable & Storge Hours - Winter Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Hour Beginning

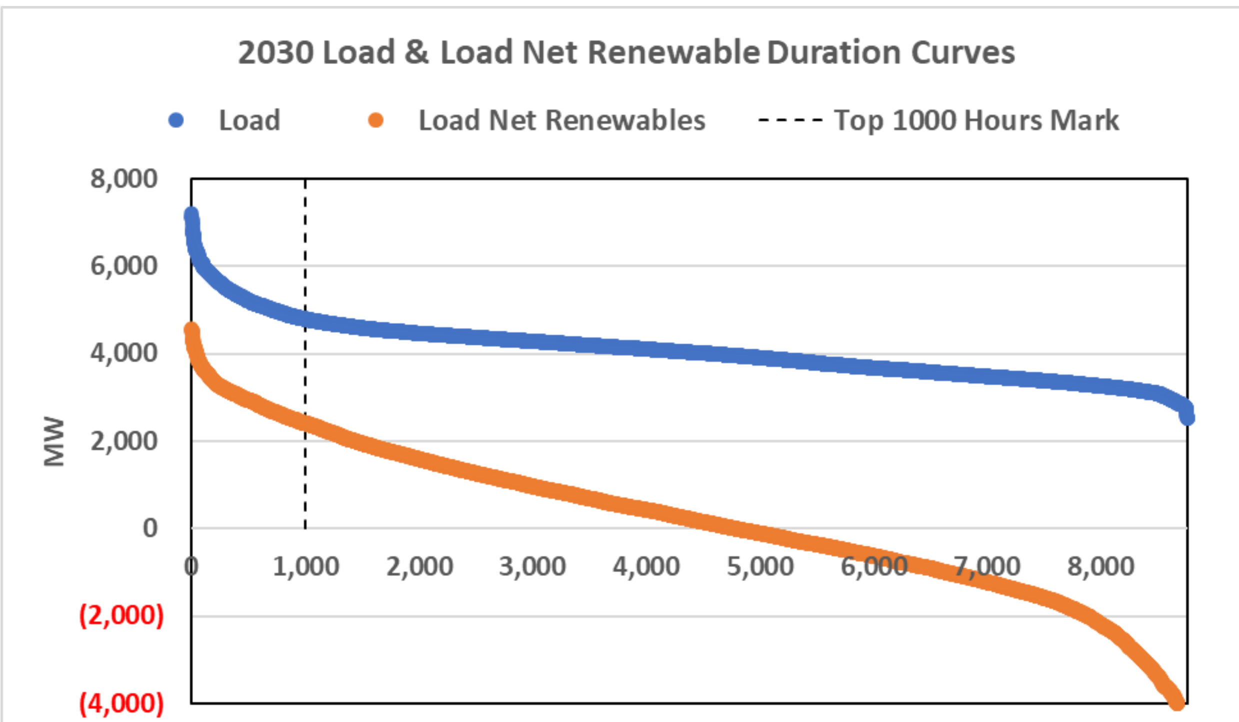
2028 Loss of Load Probability Charts

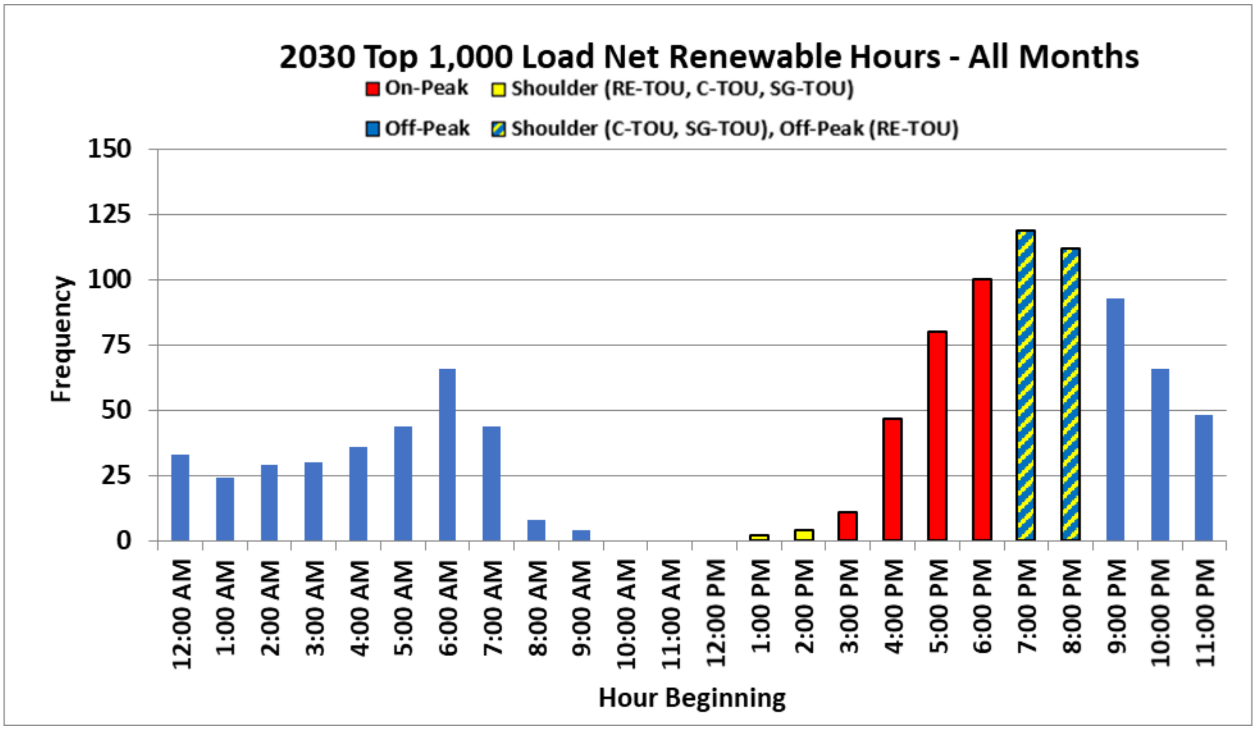


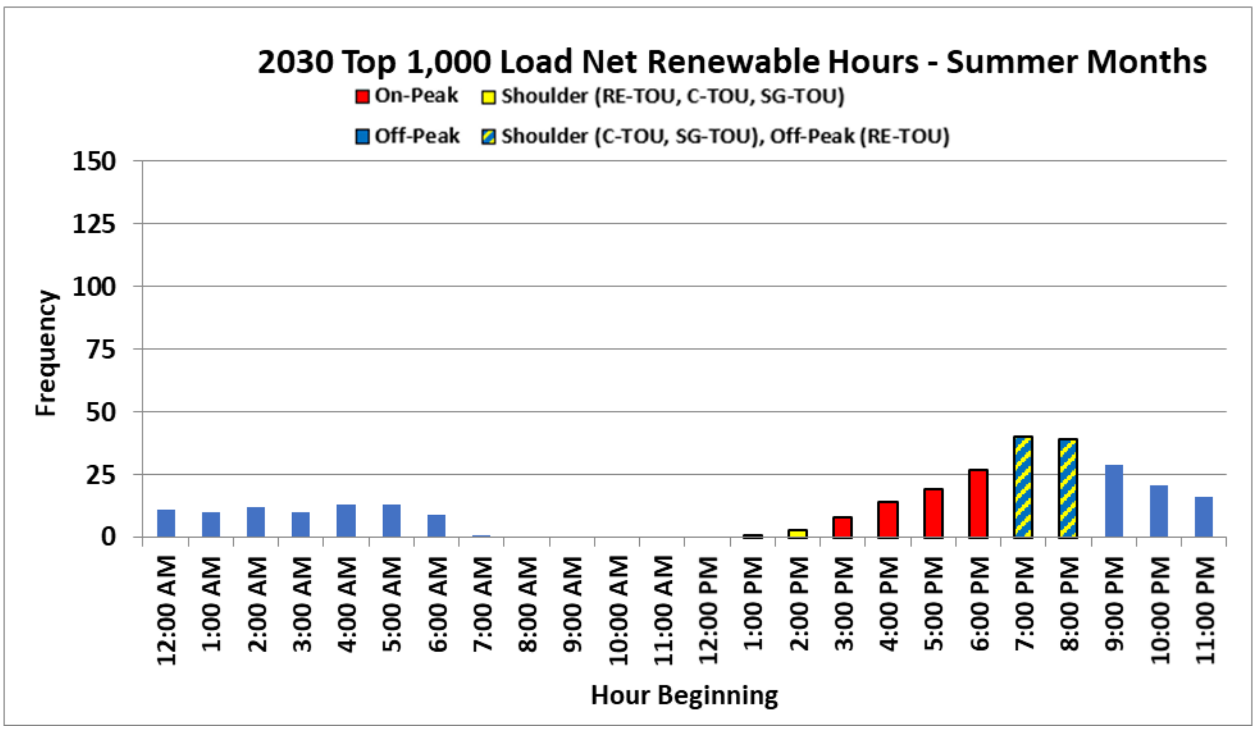




2030 Load Duration Curve and Load Net Renewable Hours Charts




2030 Top 1,000 Load Net Renewable Hours - All Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Hour Beginning


2030 Top 1,000 Load Net Renewable Hours - Summer Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
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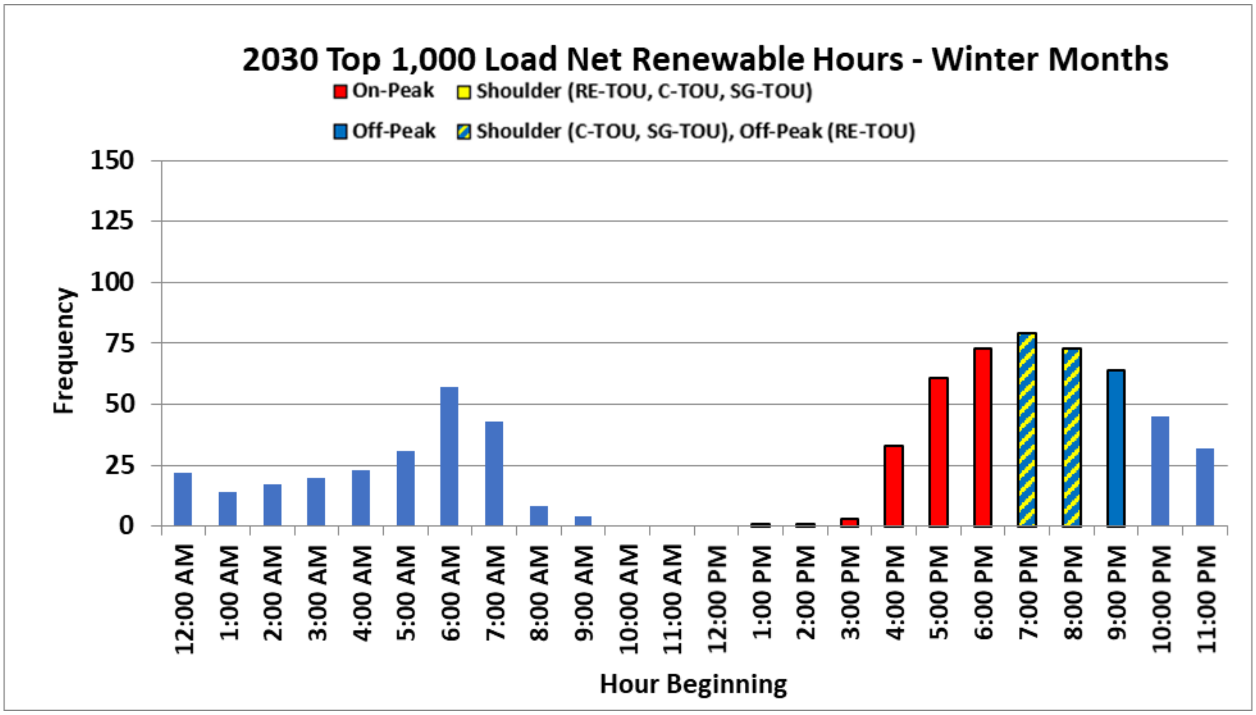
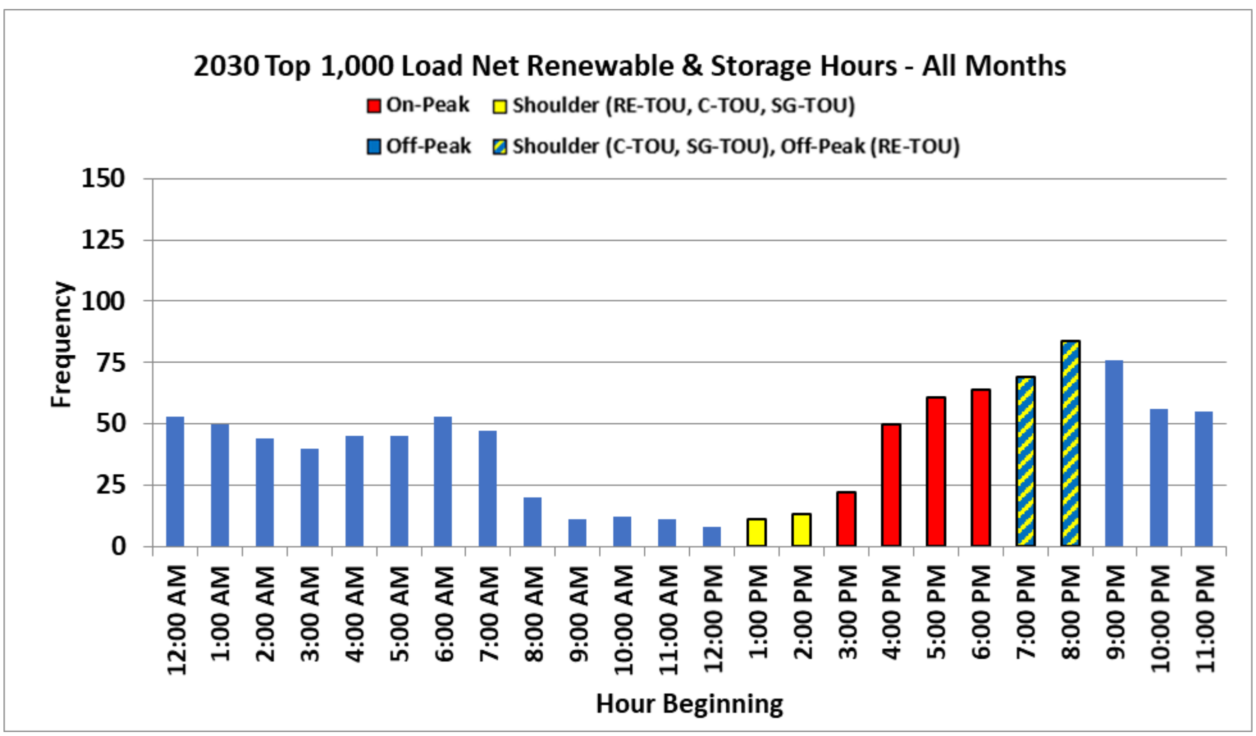
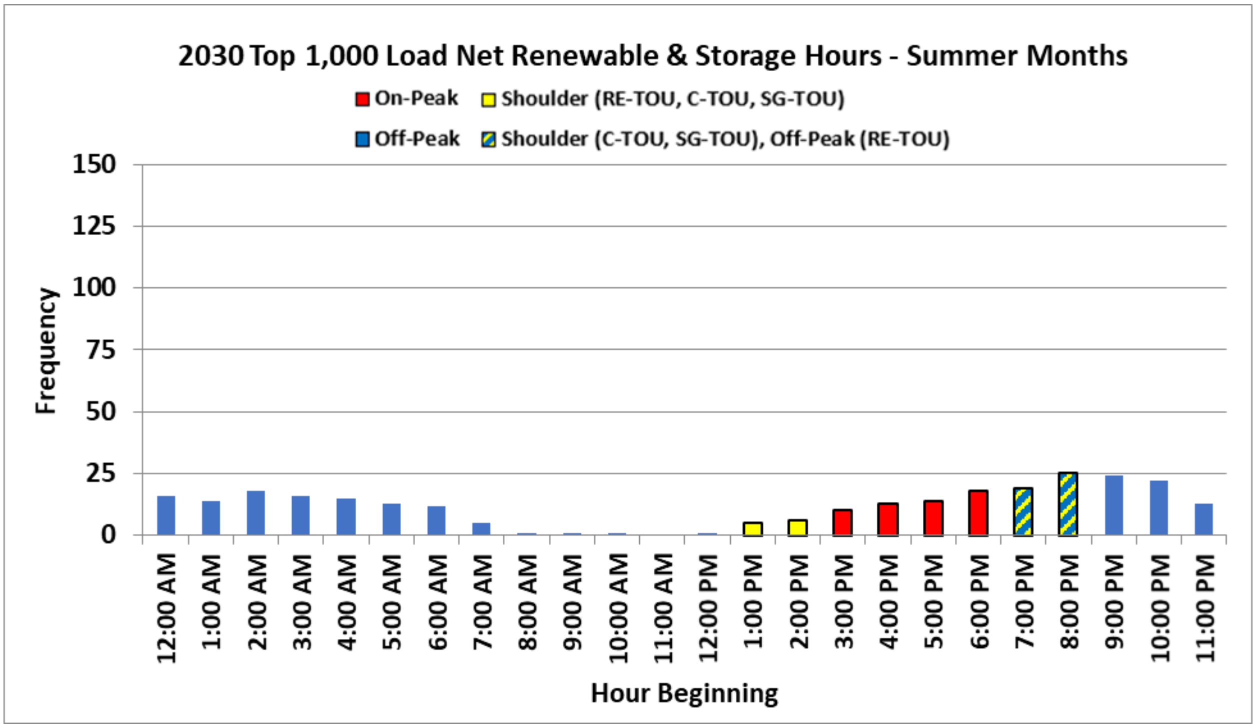
10:00 PM
11:00 PM
Hour Beginning



2030 Load Net Renewable & Storage Hours Charts




2030 Top 1,000 Load Net Renewable & Storage Hours - Summer Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
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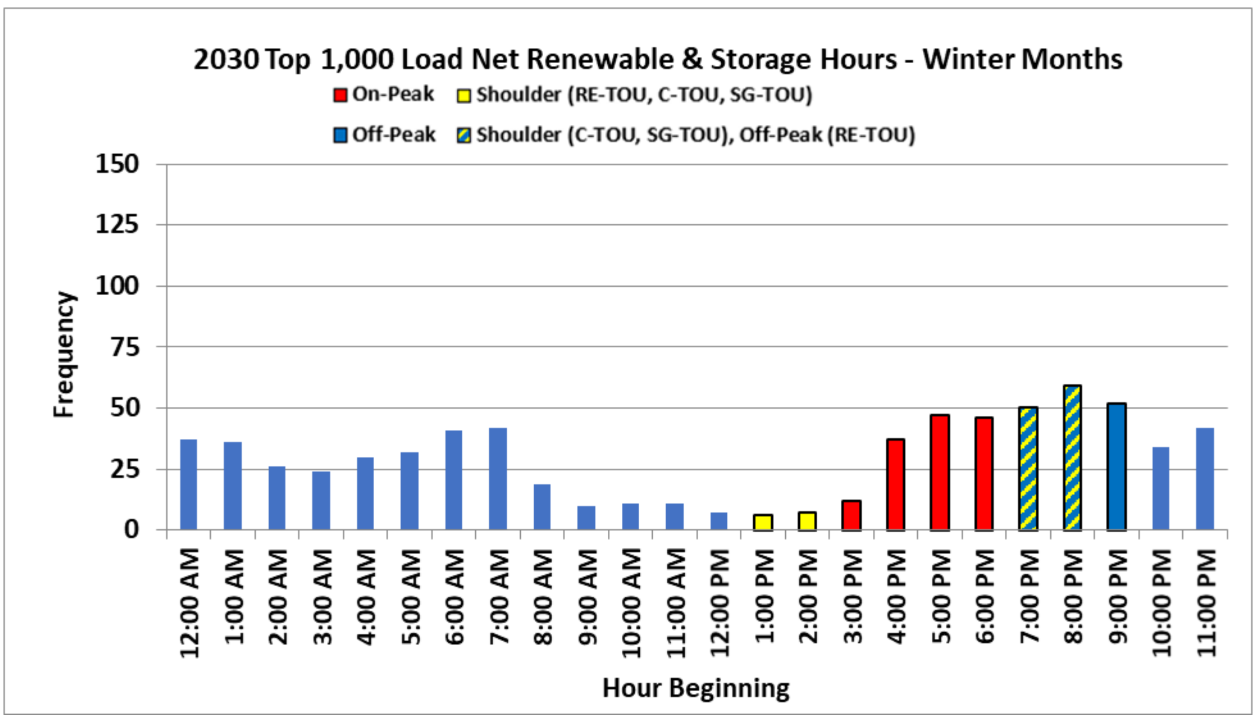
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Hour Beginning


2030 Top 1,000 Load Net Renewable & Storage Hours - Winter Months
On-Peak
Shoulder (RE-TOU, C-TOU, SG-TOU)
Off-Peak
Shoulder (C-TOU, SG-TOU), Off-Peak (RE-TOU)
Frequency
150
125
100
75
50
25
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Hour Beginning