



Filing Receipt

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January 5, 2023

Public Utility Commission of Texas
Chairman Peter Lake
Commissioner Will McAdams
Commissioner Lori Cobos
Commissioner Jimmy Glotfelty
Commissioner Kathleen Jackson
1701 N. Congress Ave.
Austin, Texas 78711

Re: PUC Project No. 54335, *Review of Market Reform Assessment Produced by Energy and Environmental Economics (E3)*

Analysis of Different Methods for Identifying Hours of Highest Reliability Risk

Dear Chairman and Commissioners:

In response to requests from Commissioners Glotfelty and Cobos, Electric Reliability Council of Texas, Inc. (ERCOT) conducted an analysis to identify the 30, 60, and 100 “hours of highest reliability risk” for each year from 2019 to 2022 under various methods for identifying this risk. At the Commissioners’ request, ERCOT is filing this information in this project.

ERCOT evaluated the four following methods for identifying the hours of highest reliability risk:

1. “Peak Net Load” method (proposed in the E3 Report) = load – wind – solar – storage injection
2. “Net Load” method = load – wind – solar
3. “Committed Capacity Margin” method = committed capacity – load
4. “Real Time Margin” method = committed capacity – load + Physical Responsive Capability from Load Resources

Note that the first three of these methods were specified by Commissioners Glotfelty and Cobos; ERCOT identified the fourth method as a potential alternative to the first three methods. Please also note that, for purposes of the third and fourth methods, “committed capacity” refers to the sum of the High Sustained Limits for all Generation Resources and Energy Storage Resources that were online or that could be started within 30 minutes (i.e., Quick-Start Generation Resources with a status of OFFQS or OFF and other Resources with a status of OFFNS, which indicates that the Resource is offline and providing Non-Spinning Reserve Service).

In addition to identifying the top 30, 60, and 100 hours under each method for each year, ERCOT also identified the top 25 hours in each *season* for each of these same four years under these same methods. For the purposes of this analysis, the spring season includes March through May, summer includes June through August, fall includes September through November, and winter includes December of the previous year through February of the specified year, except for 2019, in which the winter data does not include data from December 2018.

ERCOT has provided the responsive data in the attached spreadsheet. The first tab in the spreadsheet shows the hours that were identified under each method. The second tab shows the top 25

hours in each season for each year under each method. The third tab provides the total value of forced outages for each hour of 2019-2022 for all Generation Resources other than Intermittent Renewable Resources. The fourth tab provides the total level of forced outages that corresponds to each of the 30 hours of greatest risk in each year under each of the four methods described above. Please note that, for purposes of this analysis only, “forced outages” includes all outages that were entered into ERCOT’s Outage Scheduler as “Forced Outages,” “Maintenance Level Outages,” and “Unavoidable Extension Outages.” Finally, at the Commissioners’ request, ERCOT is also including a fifth tab that shows the peak net load for each of the past 12 months. Please note that the identification of the hours of reliability risk is based on telemetered Resource or load data and does not include subsequent adjustments that may have been made based on settlement metering. Finally, you should be aware that ERCOT’s data collection occurred in early December, so the last date evaluated in the data was December 1, 2022.

At the Commissioners’ request, ERCOT has also created the attached slide deck showing the highest-risk hours as a “heat map” for each hour in each year under each method. The slides also include heat maps that correspond to the seasonal analysis described above, as well as “zoomed” heat maps that focus in more closely on the highest-risk hours identified under the annual analysis for each method.

Please let me know if you have any further questions. We would be happy to provide the Commission any further information it may need in connection with its evaluation of market design proposals.

Sincerely,

/s/ Dan Woodfin

Dan Woodfin
Vice President, System Operations
dan.woodfin@ercot.com

Attachments: PUC Data Request Response Spreadsheet
PUC Data Request Heatmaps

The following files are not convertible:

Spreadsheet.xlsx	PUC Data Request Response
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Please see the ZIP file for this Filing on the PUC Interchange in order to access these files.

Contact centralrecords@puc.texas.gov if you have any questions.



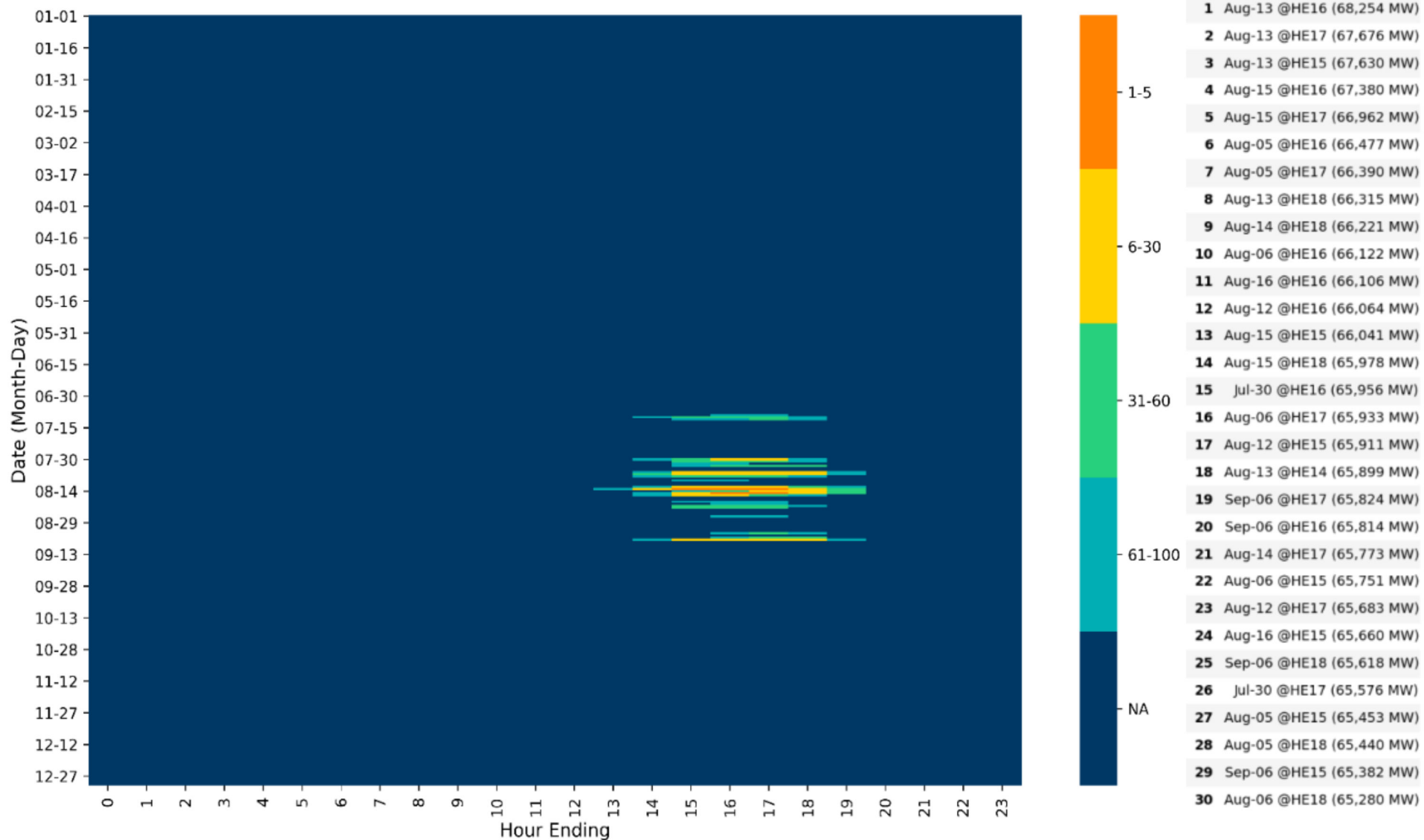
Heat Maps of Different Methods for Identifying Hours of Highest Reliability Risk

ERCOT Staff

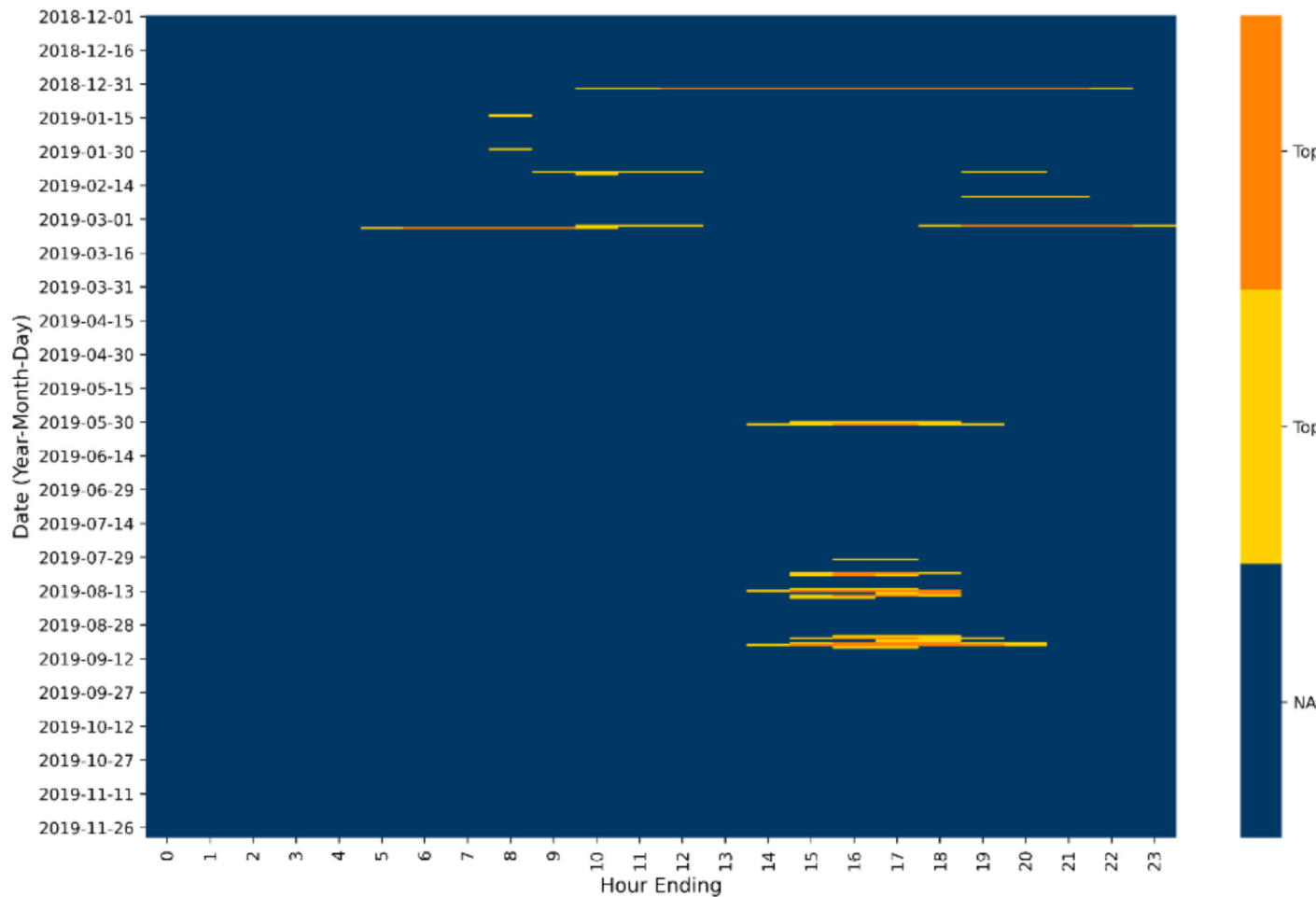
December 2022

“PEAK NET LOAD” METHOD

2019 Peak Net Load

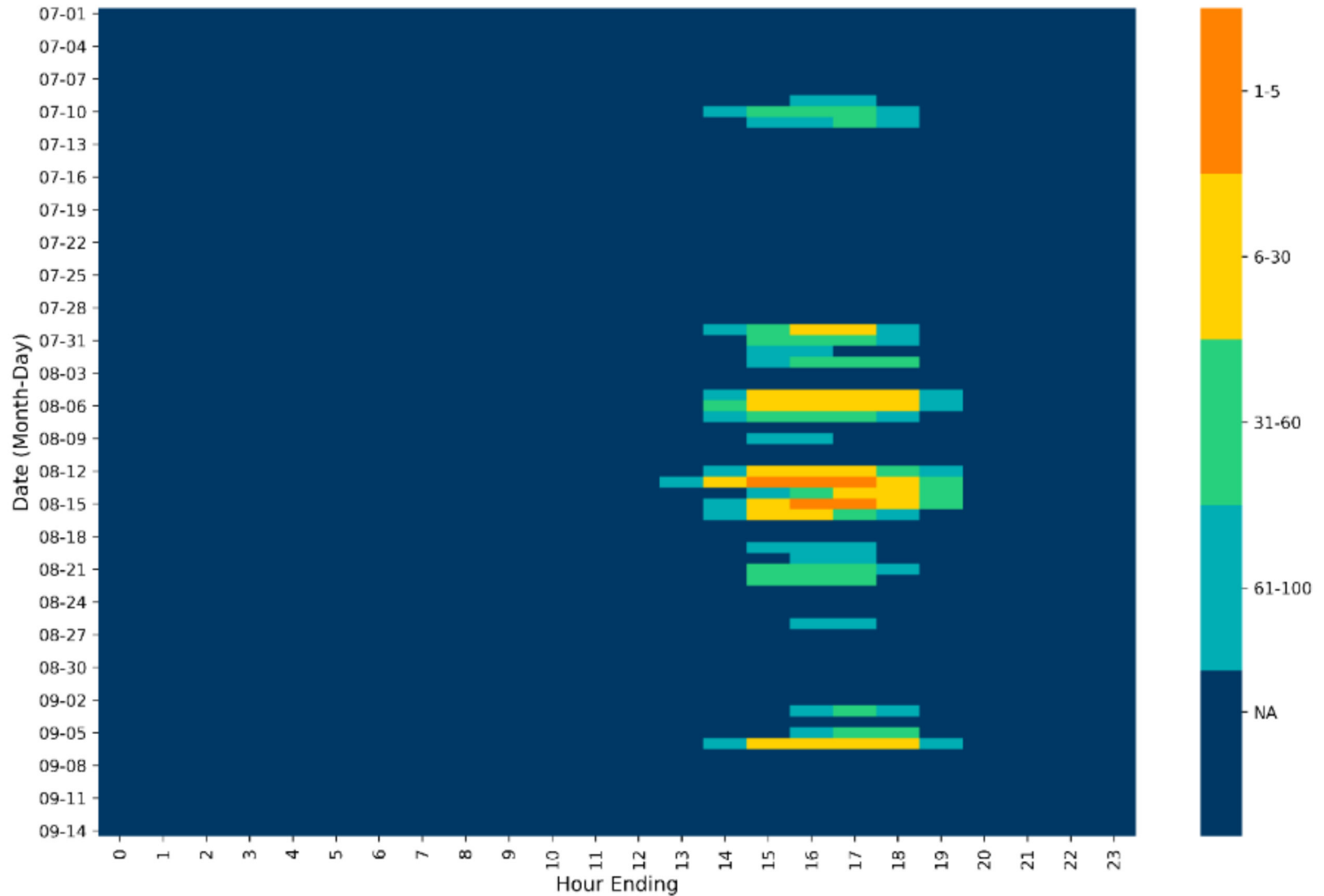


2019 Peak Net Load - Seasonal

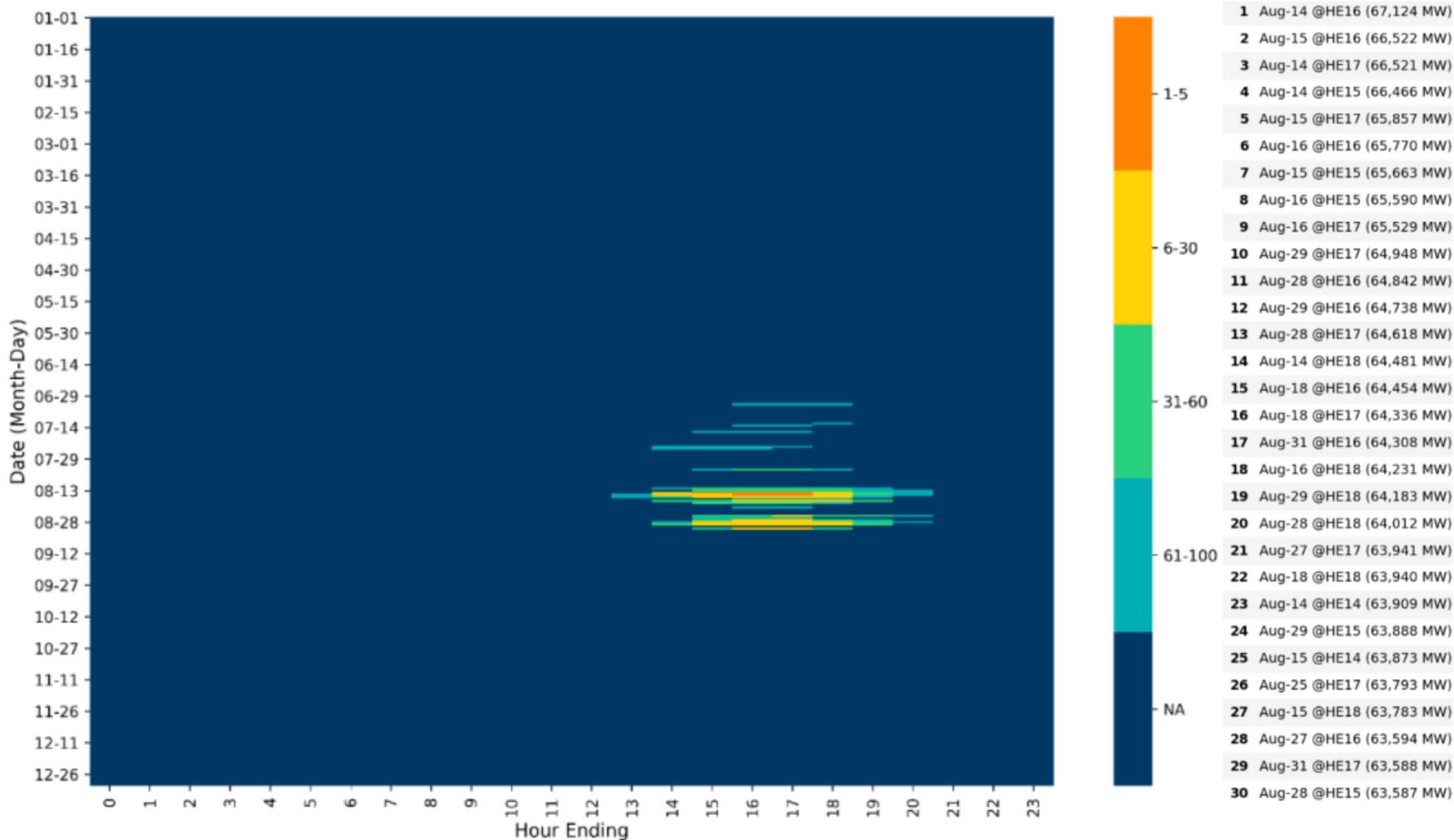


Season	Summary
Winter	Jan-02 @HE19 (52,096 MW)
Winter	Jan-02 @HE20 (51,606 MW)
Winter	Jan-02 @HE18 (51,153 MW)
Winter	Jan-02 @HE21 (50,450 MW)
Winter	Jan-02 @HE12 (50,042 MW)
Winter	Jan-02 @HE14 (50,016 MW)
Winter	Jan-02 @HE13 (49,913 MW)
Winter	Jan-02 @HE17 (49,554 MW)
Winter	Jan-02 @HE15 (49,393 MW)
Winter	Jan-02 @HE16 (49,021 MW)
Spring	Mar-05 @HE8 (58,042 MW)
Spring	Mar-05 @HE7 (57,968 MW)
Spring	Mar-04 @HE20 (56,188 MW)
Spring	Mar-04 @HE21 (55,537 MW)
Spring	Mar-05 @HE9 (55,088 MW)
Spring	Mar-04 @HE19 (54,360 MW)
Spring	Mar-04 @HE22 (54,324 MW)
Spring	Mar-05 @HE6 (54,191 MW)
Spring	May-31 @HE16 (52,637 MW)
Spring	May-31 @HE17 (52,364 MW)
Summer	Aug-13 @HE16 (68,254 MW)
Summer	Aug-13 @HE17 (67,676 MW)
Summer	Aug-13 @HE15 (67,630 MW)
Summer	Aug-15 @HE16 (67,380 MW)
Summer	Aug-15 @HE17 (66,962 MW)
Summer	Aug-05 @HE16 (66,477 MW)
Summer	Aug-05 @HE17 (66,390 MW)
Summer	Aug-13 @HE18 (66,315 MW)
Summer	Aug-14 @HE18 (66,221 MW)
Summer	Aug-06 @HE16 (66,122 MW)
Fall	Sep-06 @HE17 (65,824 MW)
Fall	Sep-06 @HE16 (65,814 MW)
Fall	Sep-06 @HE18 (65,618 MW)
Fall	Sep-06 @HE15 (65,382 MW)
Fall	Sep-05 @HE17 (64,523 MW)
Fall	Sep-03 @HE17 (64,496 MW)
Fall	Sep-05 @HE18 (64,200 MW)
Fall	Sep-03 @HE16 (64,120 MW)
Fall	Sep-06 @HE19 (64,002 MW)
Fall	Sep-05 @HE16 (63,594 MW)

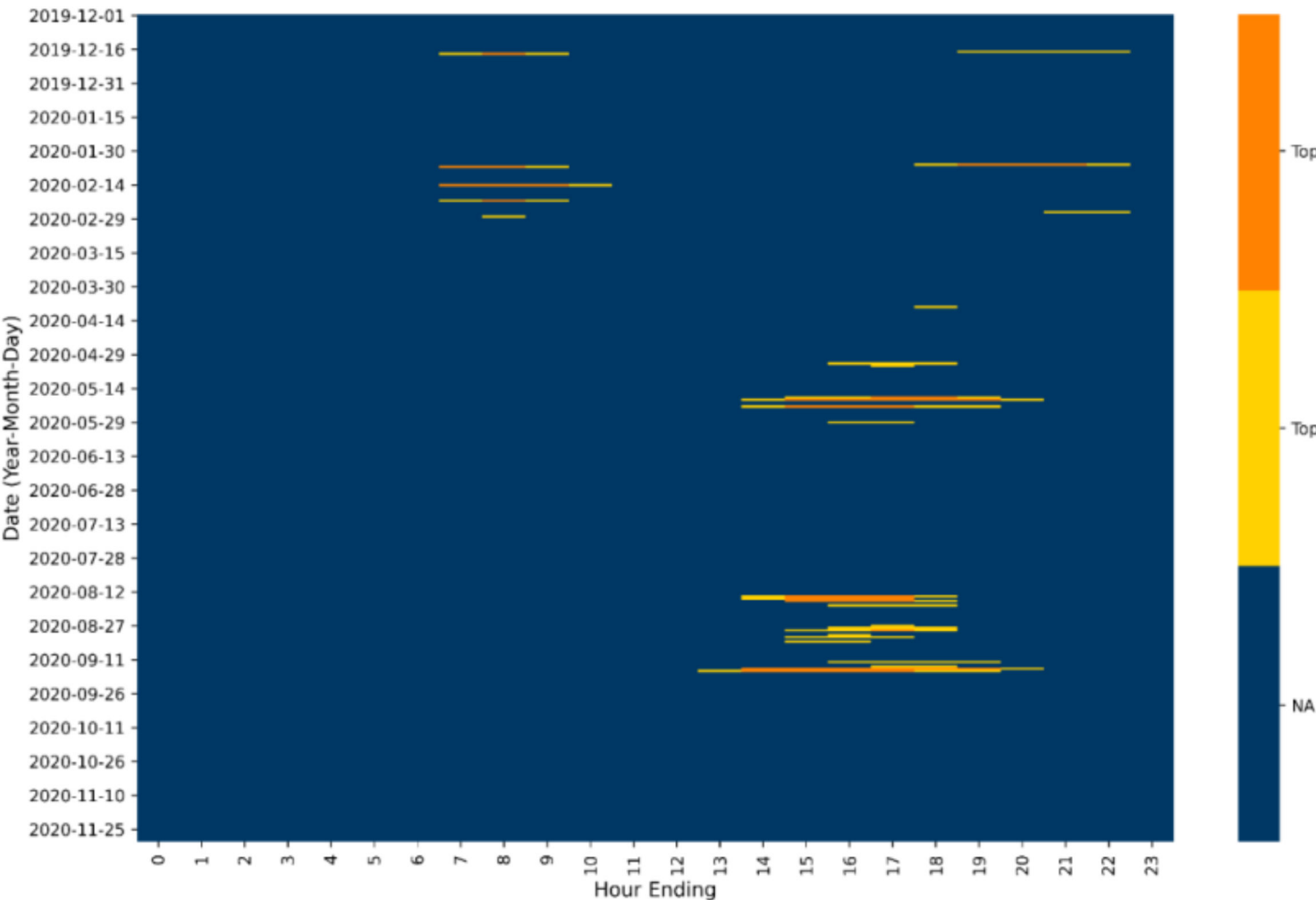
2019 Peak Net Load - Zoomed



2020 Peak Net Load

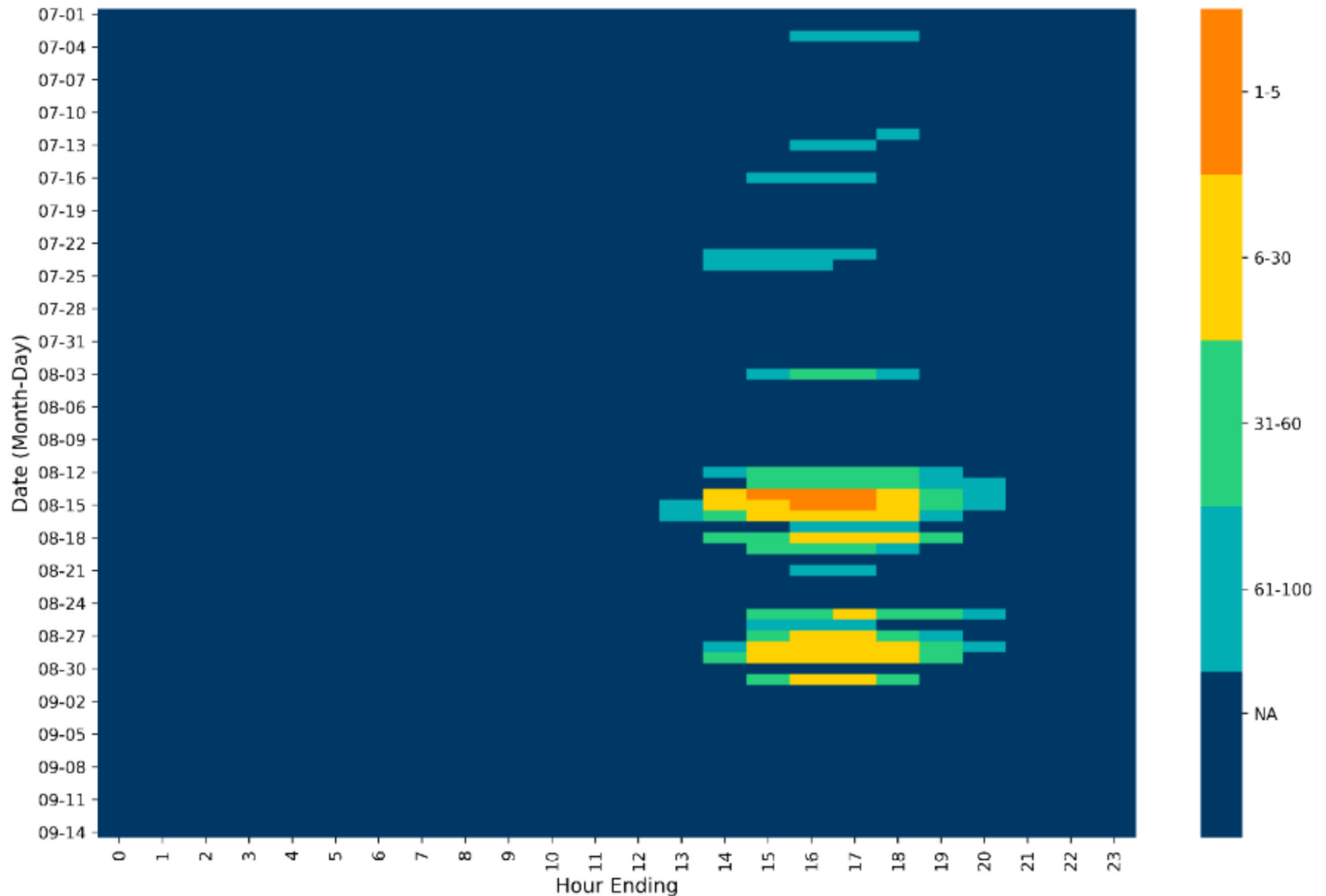


2020 Peak Net Load - Seasonal

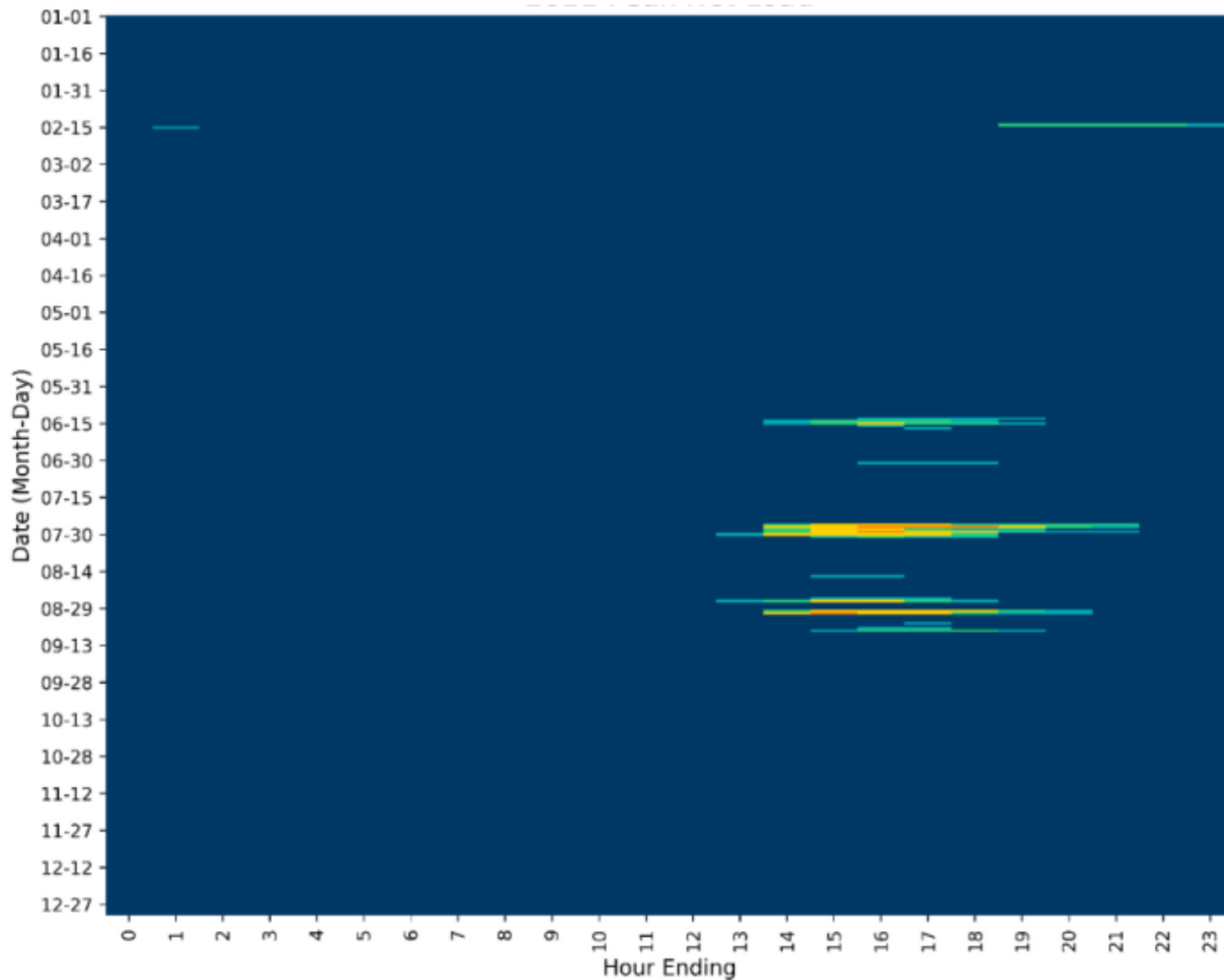


Season	Summary
Winter	Feb-14 @HE8 (49,703 MW)
Winter	Feb-05 @HE20 (49,122 MW)
Winter	Feb-06 @HE8 (49,018 MW)
Winter	Dec-18 @HE8 (48,867 MW)
Winter	Feb-05 @HE19 (48,725 MW)
Winter	Feb-06 @HE7 (48,301 MW)
Winter	Feb-14 @HE7 (48,109 MW)
Winter	Feb-14 @HE9 (47,902 MW)
Winter	Feb-21 @HE8 (47,668 MW)
Winter	Feb-05 @HE21 (47,459 MW)
Spring	May-19 @HE17 (54,315 MW)
Spring	May-19 @HE16 (53,971 MW)
Spring	May-19 @HE18 (53,687 MW)
Spring	May-22 @HE16 (52,729 MW)
Spring	May-22 @HE17 (52,595 MW)
Spring	May-19 @HE15 (52,240 MW)
Spring	May-22 @HE15 (51,553 MW)
Spring	May-18 @HE18 (51,467 MW)
Spring	May-18 @HE17 (51,459 MW)
Spring	May-19 @HE19 (51,457 MW)
Summer	Aug-14 @HE16 (67,124 MW)
Summer	Aug-15 @HE16 (66,522 MW)
Summer	Aug-14 @HE17 (66,521 MW)
Summer	Aug-14 @HE15 (66,466 MW)
Summer	Aug-15 @HE17 (65,857 MW)
Summer	Aug-16 @HE16 (65,770 MW)
Summer	Aug-15 @HE15 (65,663 MW)
Summer	Aug-16 @HE15 (65,590 MW)
Summer	Aug-16 @HE17 (65,529 MW)
Summer	Aug-29 @HE17 (64,948 MW)
Fall	Sep-16 @HE16 (58,051 MW)
Fall	Sep-15 @HE17 (57,976 MW)
Fall	Sep-15 @HE16 (57,696 MW)
Fall	Sep-15 @HE18 (57,558 MW)
Fall	Sep-16 @HE15 (57,450 MW)
Fall	Sep-16 @HE17 (57,365 MW)
Fall	Sep-15 @HE19 (56,847 MW)
Fall	Sep-15 @HE15 (56,812 MW)
Fall	Sep-16 @HE14 (56,441 MW)
Fall	Sep-15 @HE14 (55,777 MW)

2020 Peak Net Load - Zoomed

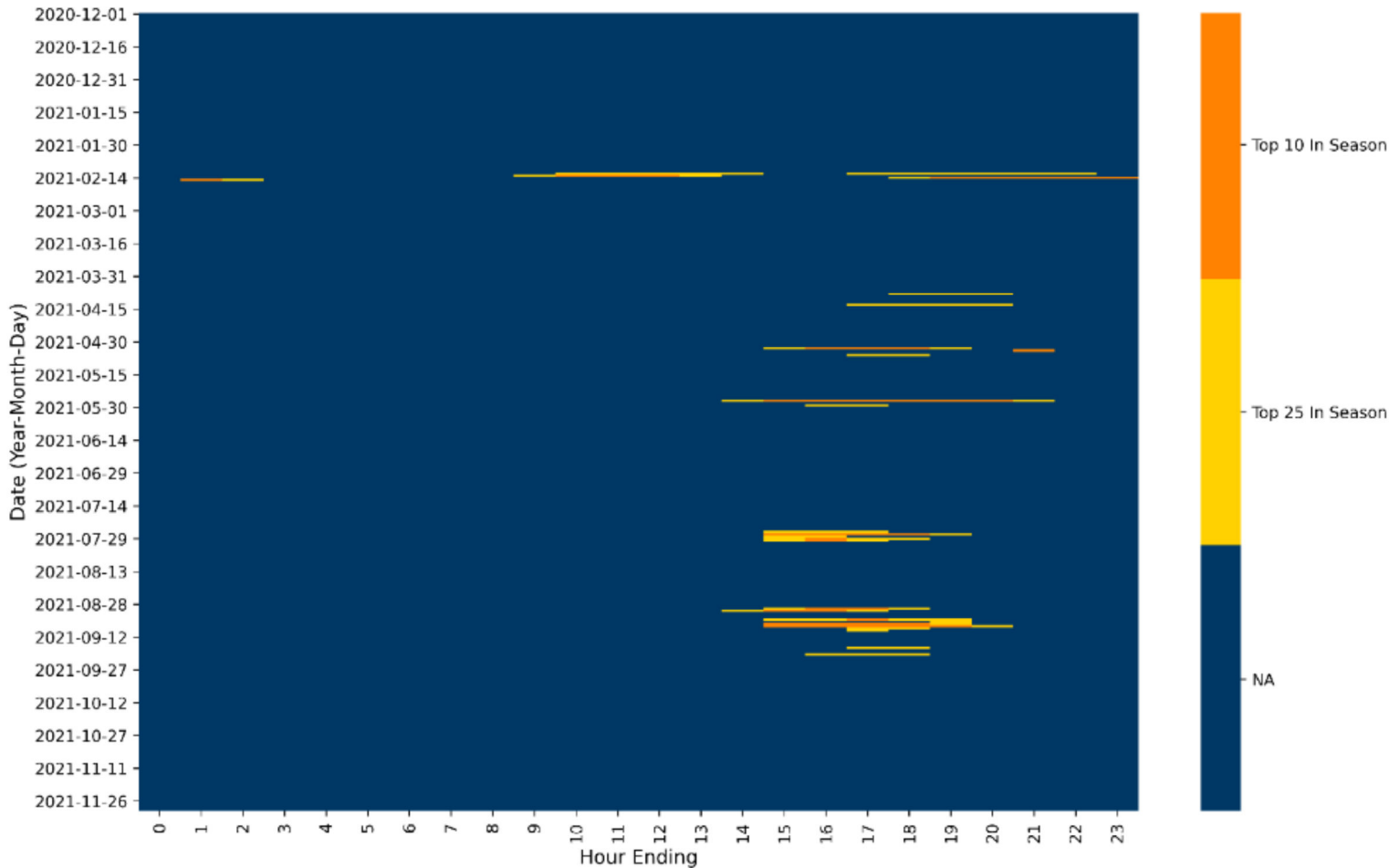


2021 Peak Net Load



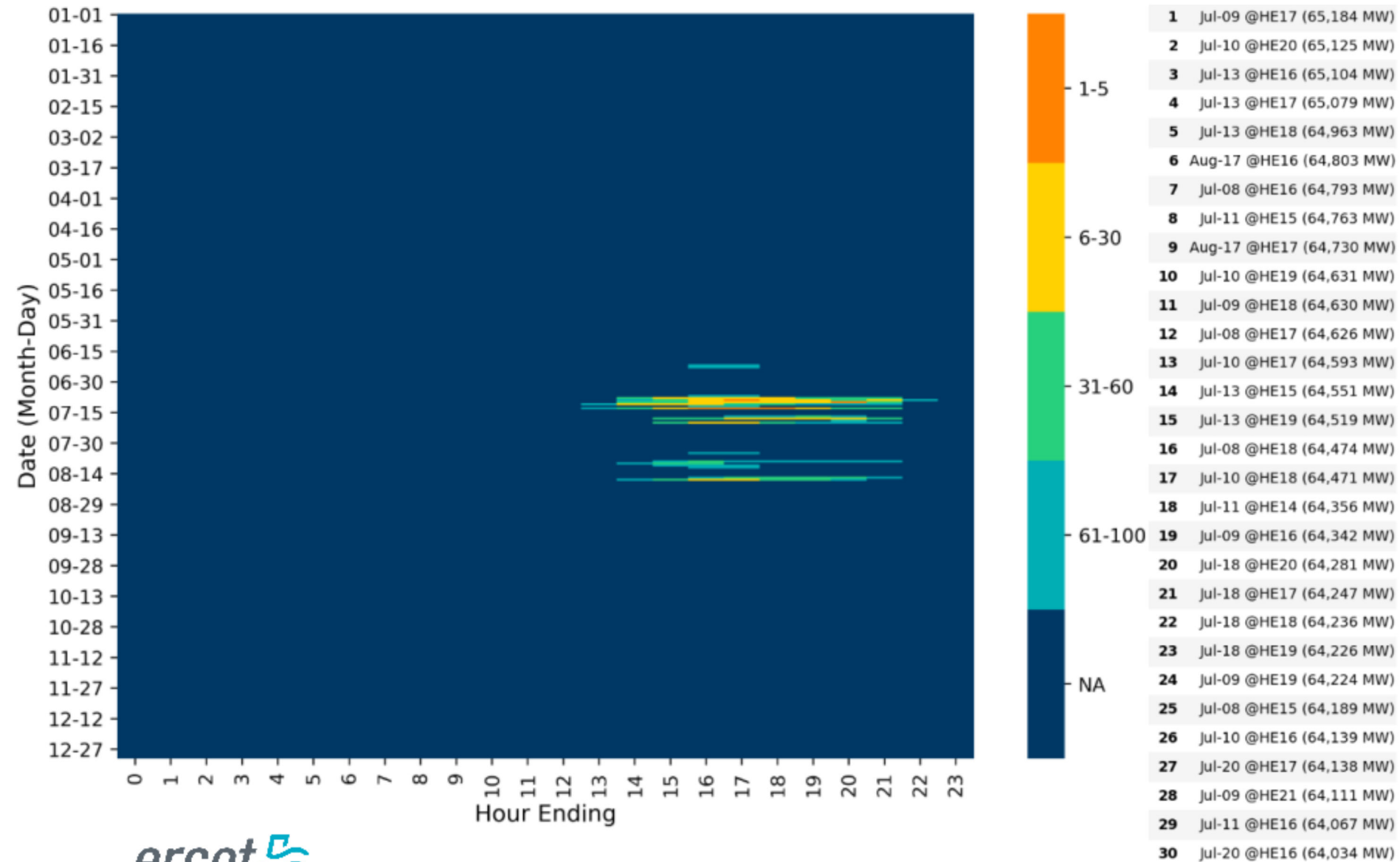
- 1 Jul-27 @HE17 (64,710 MW)
- 2 Jul-27 @HE16 (64,515 MW)
- 3 Jul-27 @HE18 (64,513 MW)
- 4 Aug-31 @HE15 (63,995 MW)
- 5 Jul-29 @HE16 (63,876 MW)
- 6 Aug-30 @HE17 (63,839 MW)
- 7 Jul-27 @HE15 (63,786 MW)
- 8 Aug-31 @HE16 (63,642 MW)
- 9 Jul-30 @HE16 (63,636 MW)
- 10 Aug-30 @HE16 (63,607 MW)
- 11 Jul-30 @HE15 (63,465 MW)
- 12 Aug-30 @HE18 (63,407 MW)
- 13 Jul-29 @HE15 (63,401 MW)
- 14 Aug-31 @HE17 (63,400 MW)
- 15 Jul-26 @HE16 (63,387 MW)
- 16 Aug-30 @HE15 (63,327 MW)
- 17 Jul-30 @HE17 (63,283 MW)
- 18 Jul-29 @HE17 (63,152 MW)
- 19 Jul-28 @HE16 (63,145 MW)
- 20 Jul-27 @HE19 (63,114 MW)
- 21 Jul-28 @HE15 (63,090 MW)
- 22 Jul-26 @HE17 (62,919 MW)
- 23 Jul-29 @HE18 (62,918 MW)
- 24 Jul-26 @HE15 (62,810 MW)
- 25 Aug-31 @HE14 (62,585 MW)
- 26 Aug-26 @HE16 (62,520 MW)
- 27 Aug-26 @HE15 (62,481 MW)
- 28 Jul-27 @HE14 (62,461 MW)
- 29 Jun-15 @HE16 (62,362 MW)
- 30 Jul-30 @HE14 (62,302 MW)

2021 Peak Net Load - Seasonal

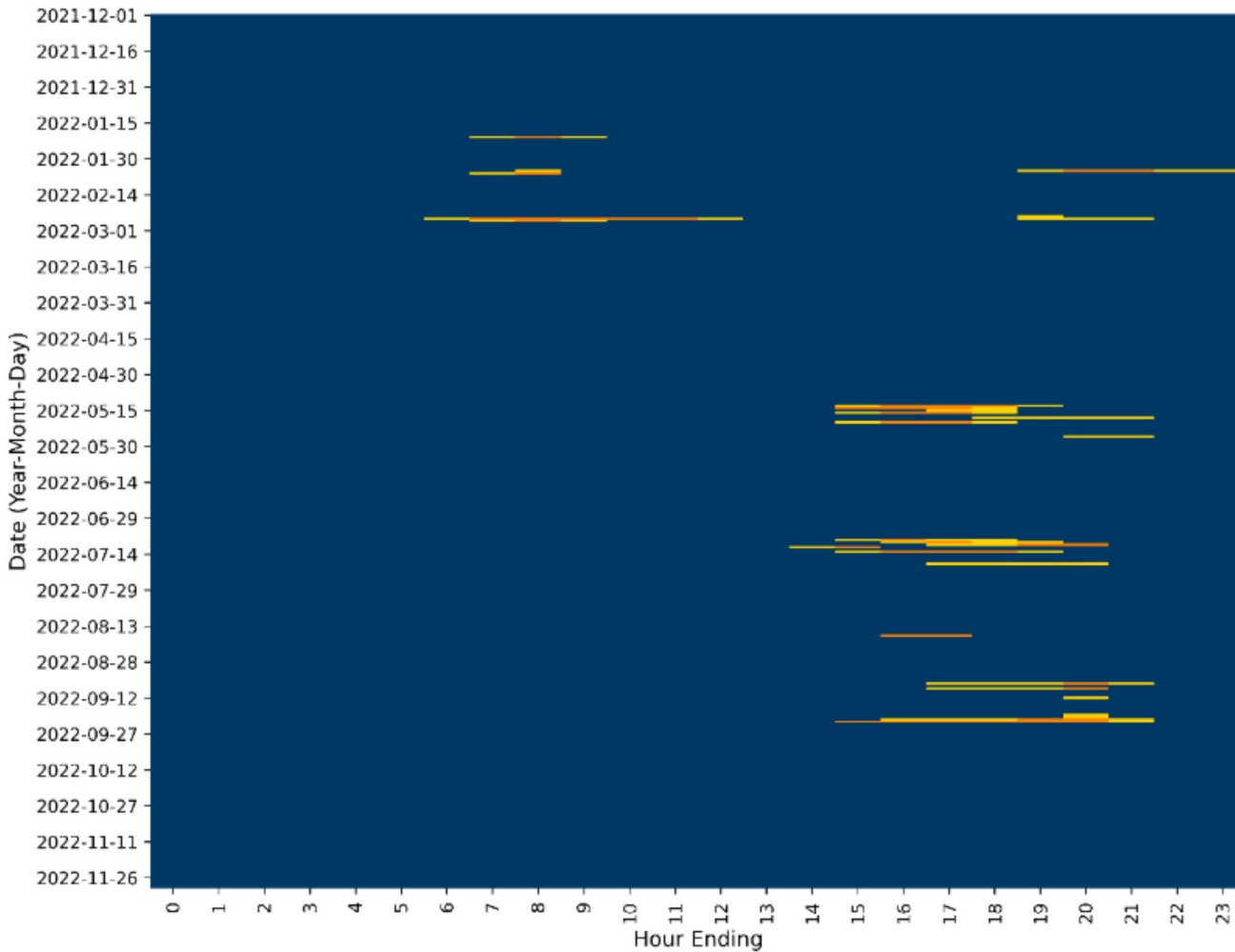


Season	Summary
Winter	Feb-14 @HE21 (61,213 MW)
Winter	Feb-14 @HE20 (61,112 MW)
Winter	Feb-14 @HE22 (60,908 MW)
Winter	Feb-14 @HE19 (60,868 MW)
Winter	Feb-14 @HE23 (60,335 MW)
Winter	Feb-14 @HE24 (60,296 MW)
Winter	Feb-15 @HE1 (59,883 MW)
Winter	Feb-13 @HE11 (59,279 MW)
Winter	Feb-13 @HE12 (58,760 MW)
Winter	Feb-13 @HE10 (58,719 MW)
Spring	May-27 @HE17 (49,448 MW)
Spring	May-27 @HE18 (48,894 MW)
Spring	May-27 @HE16 (47,839 MW)
Spring	May-27 @HE19 (47,607 MW)
Spring	May-27 @HE15 (45,620 MW)
Spring	May-03 @HE17 (45,314 MW)
Spring	May-27 @HE20 (44,646 MW)
Spring	May-03 @HE18 (44,631 MW)
Spring	May-03 @HE16 (44,160 MW)
Spring	May-04 @HE21 (42,795 MW)
Summer	Jul-27 @HE17 (64,710 MW)
Summer	Jul-27 @HE16 (64,515 MW)
Summer	Jul-27 @HE18 (64,513 MW)
Summer	Aug-31 @HE15 (63,995 MW)
Summer	Jul-29 @HE16 (63,876 MW)
Summer	Aug-30 @HE17 (63,839 MW)
Summer	Jul-27 @HE15 (63,786 MW)
Summer	Aug-31 @HE16 (63,642 MW)
Summer	Jul-30 @HE16 (63,636 MW)
Summer	Aug-30 @HE16 (63,607 MW)
Fall	Sep-07 @HE17 (61,813 MW)
Fall	Sep-07 @HE18 (61,620 MW)
Fall	Sep-07 @HE16 (61,111 MW)
Fall	Sep-06 @HE16 (60,092 MW)
Fall	Sep-06 @HE17 (59,923 MW)
Fall	Sep-07 @HE19 (59,634 MW)
Fall	Sep-04 @HE17 (59,504 MW)
Fall	Sep-07 @HE15 (59,493 MW)
Fall	Sep-06 @HE18 (59,218 MW)
Fall	Sep-06 @HE15 (59,025 MW)

2022 Peak Net Load (Till date)

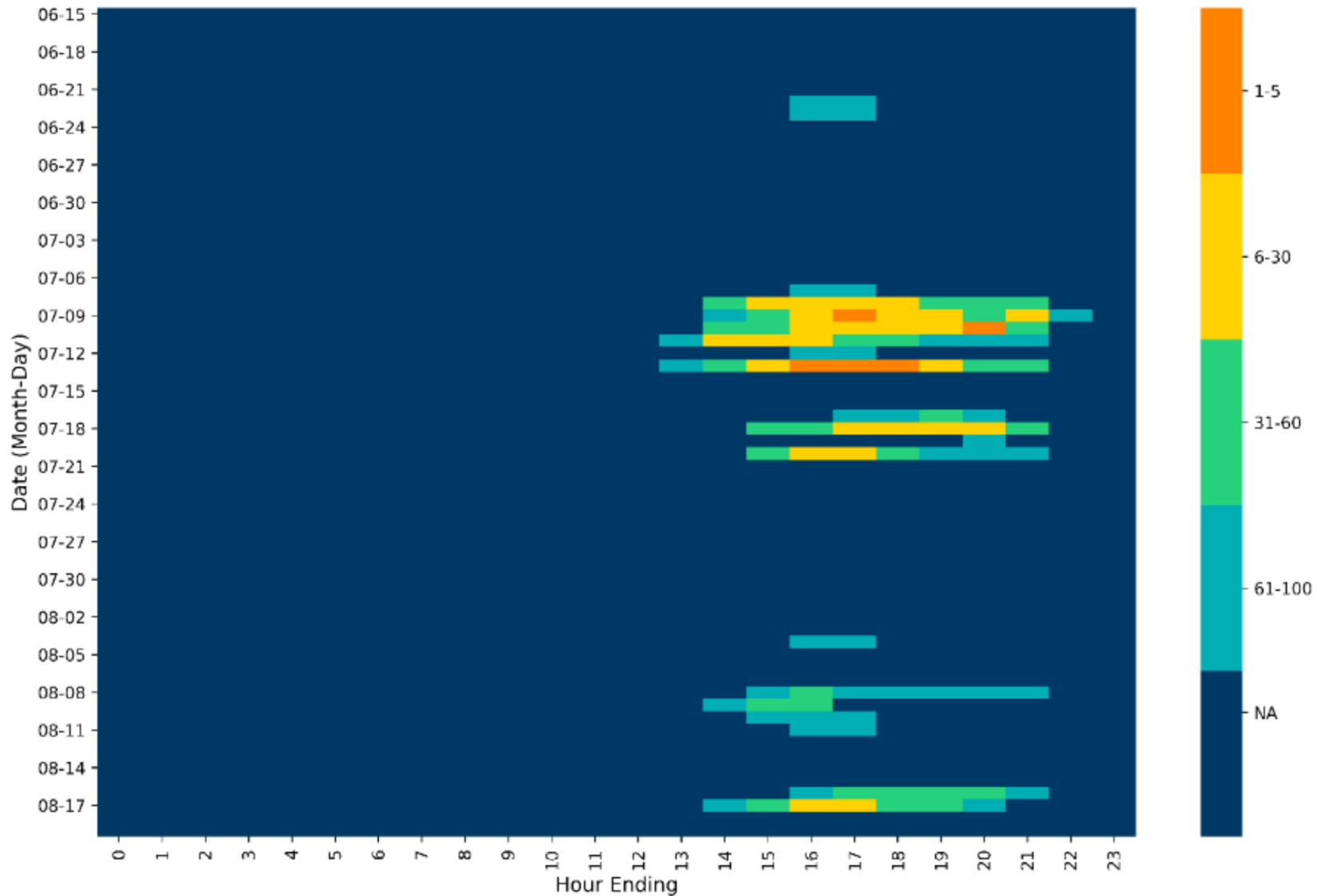


2022 Peak Net Load - Seasonal



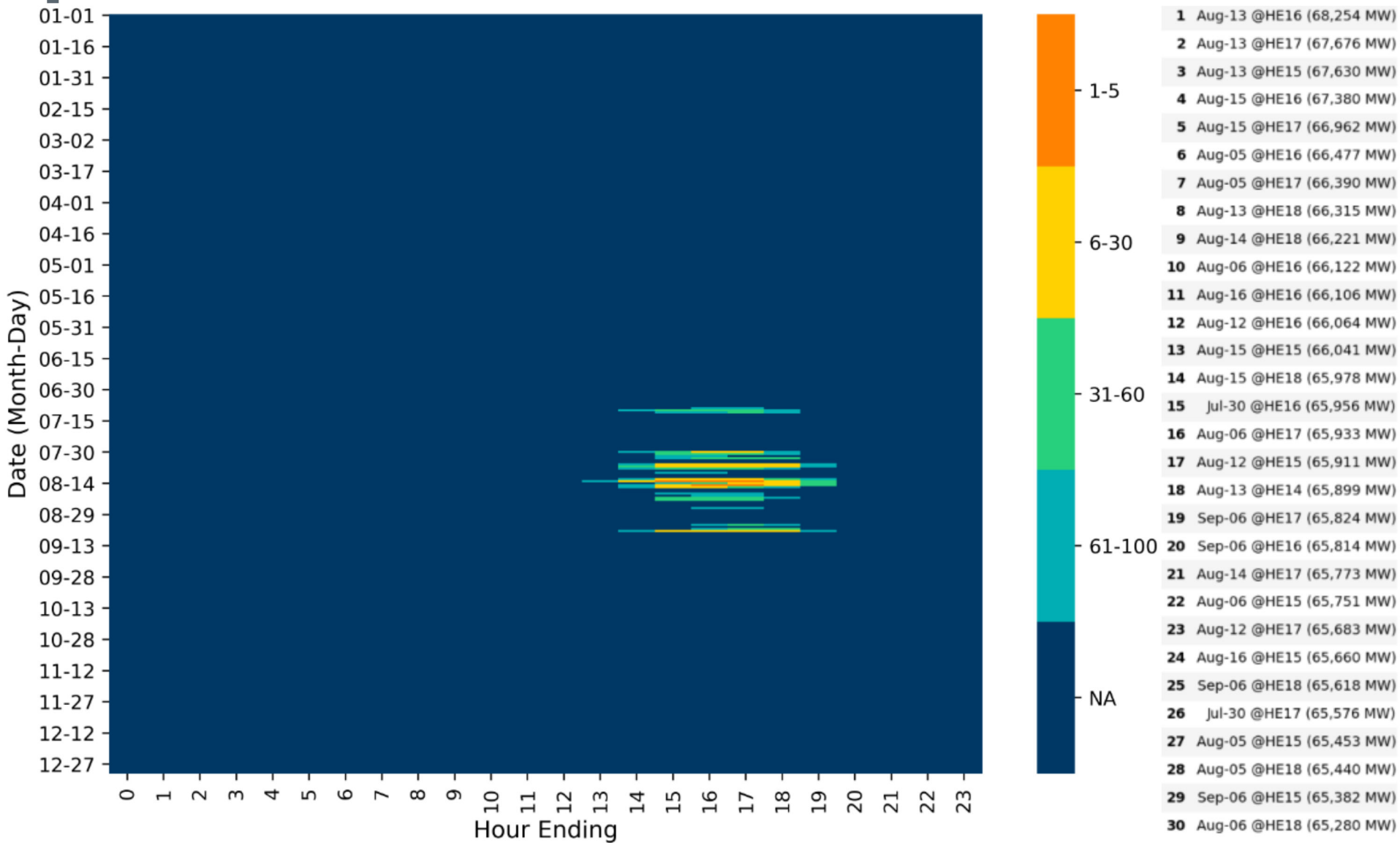
Season	Summary
Winter	Feb-24 @HE9 (59,599 MW)
Winter	Feb-24 @HE8 (59,315 MW)
Winter	Feb-24 @HE10 (59,117 MW)
Winter	Feb-24 @HE7 (58,097 MW)
Winter	Feb-24 @HE11 (57,979 MW)
Winter	Jan-21 @HE8 (57,533 MW)
Winter	Feb-04 @HE20 (56,996 MW)
Winter	Feb-04 @HE21 (56,619 MW)
Winter	Feb-05 @HE8 (56,575 MW)
Winter	Feb-25 @HE8 (56,130 MW)
Spring	May-14 @HE16 (51,227 MW)
Spring	May-13 @HE18 (51,215 MW)
Spring	May-13 @HE17 (51,128 MW)
Spring	May-13 @HE16 (50,925 MW)
Spring	May-14 @HE17 (50,868 MW)
Spring	May-20 @HE17 (50,784 MW)
Spring	May-20 @HE16 (50,399 MW)
Spring	May-16 @HE17 (50,380 MW)
Spring	May-16 @HE16 (50,044 MW)
Spring	May-14 @HE15 (50,038 MW)
Summer	Jul-09 @HE17 (65,184 MW)
Summer	Jul-10 @HE20 (65,125 MW)
Summer	Jul-13 @HE16 (65,104 MW)
Summer	Jul-13 @HE17 (65,079 MW)
Summer	Jul-13 @HE18 (64,963 MW)
Summer	Aug-17 @HE16 (64,803 MW)
Summer	Jul-08 @HE16 (64,793 MW)
Summer	Jul-11 @HE15 (64,763 MW)
Summer	Aug-17 @HE17 (64,730 MW)
Summer	Jul-10 @HE19 (64,631 MW)
Fall	Sep-22 @HE20 (60,630 MW)
Fall	Sep-22 @HE19 (60,363 MW)
Fall	Sep-21 @HE20 (60,120 MW)
Fall	Sep-22 @HE18 (59,208 MW)
Fall	Sep-22 @HE17 (59,039 MW)
Fall	Sep-22 @HE16 (58,944 MW)
Fall	Sep-21 @HE19 (58,610 MW)
Fall	Sep-22 @HE15 (58,199 MW)
Fall	Sep-08 @HE20 (57,737 MW)
Fall	Sep-06 @HE20 (57,493 MW)

2022 Peak Net Load (Till date) - Zoomed

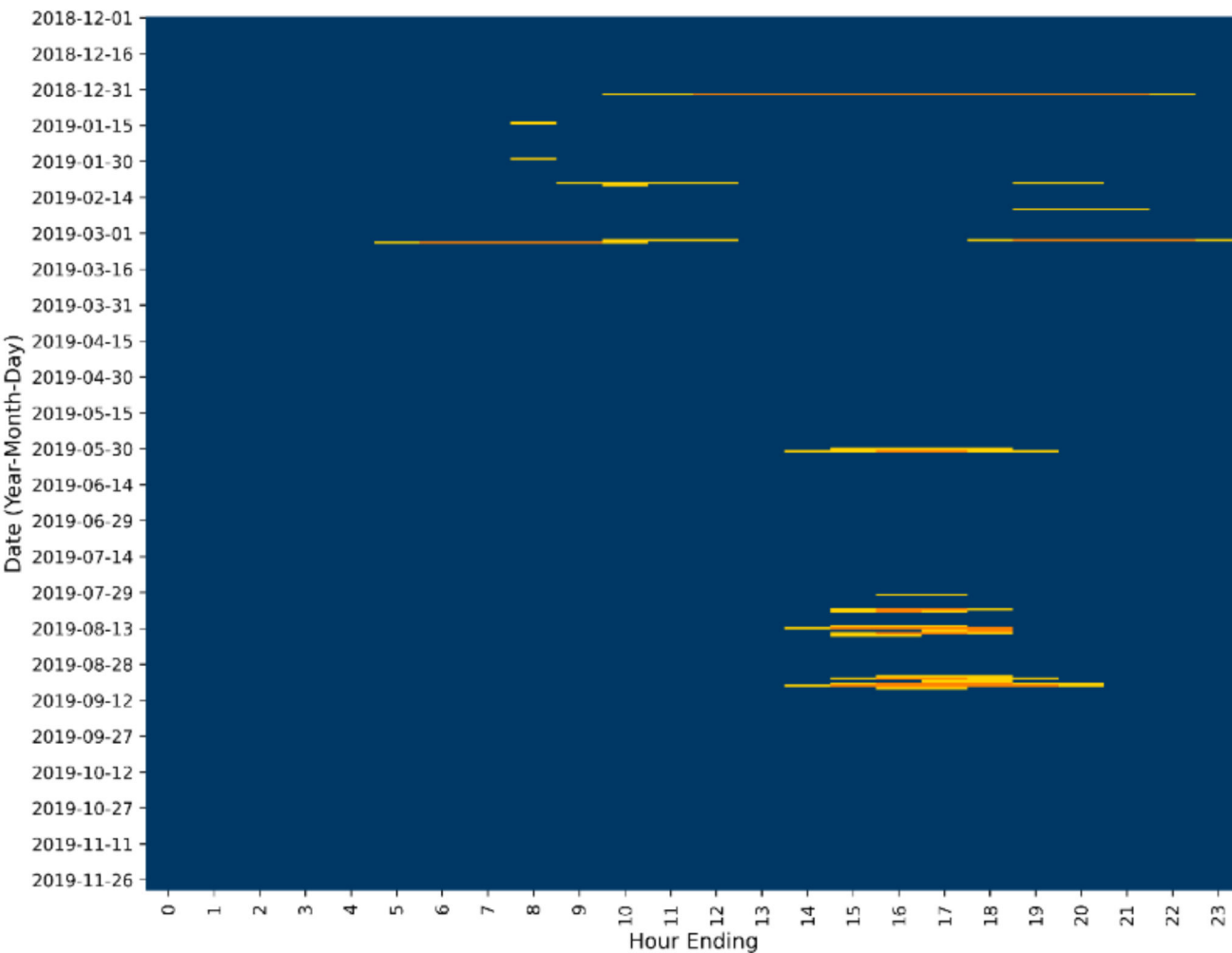


“NET LOAD” METHOD

2019 Net Load

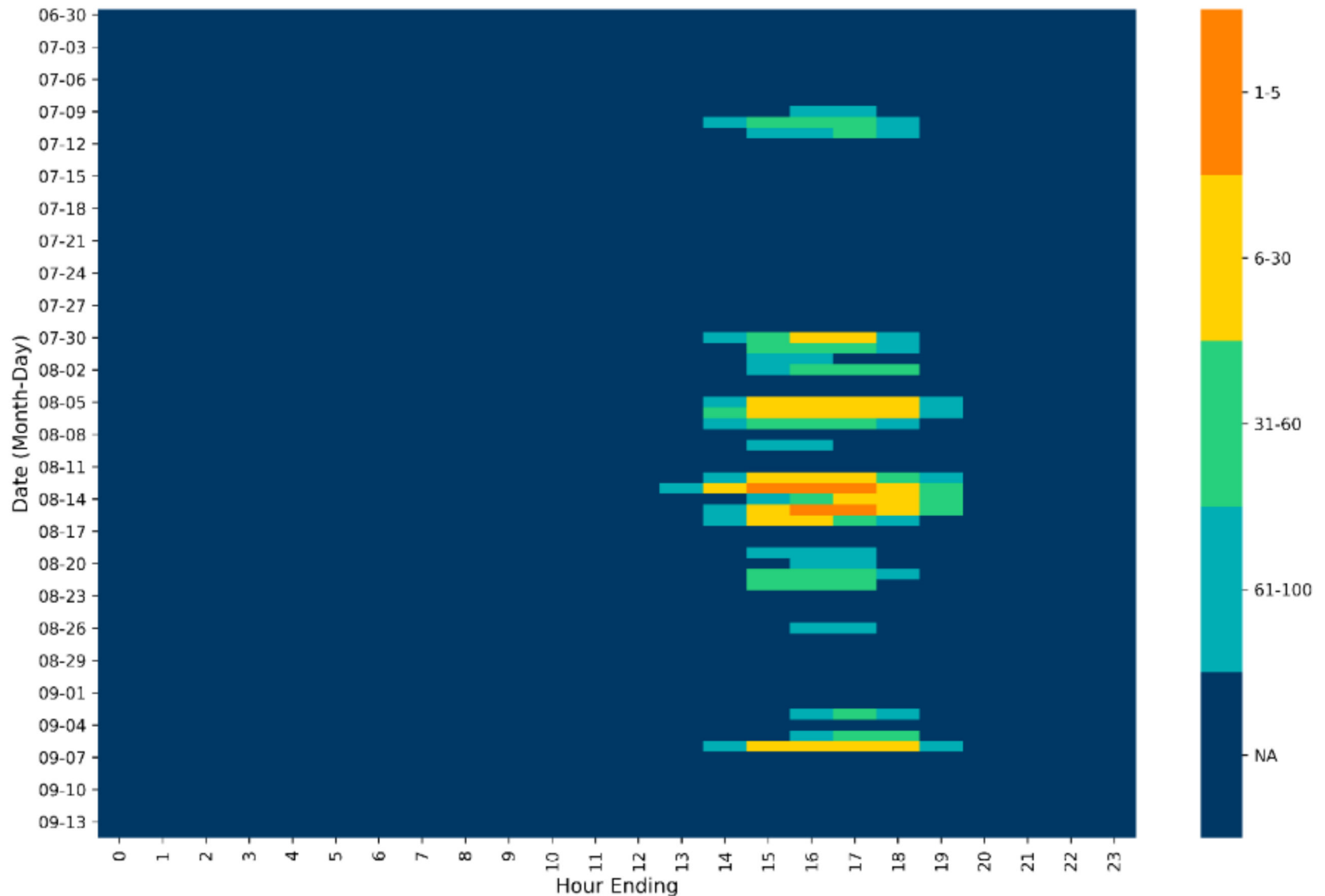


2019 Net Load - Seasonal

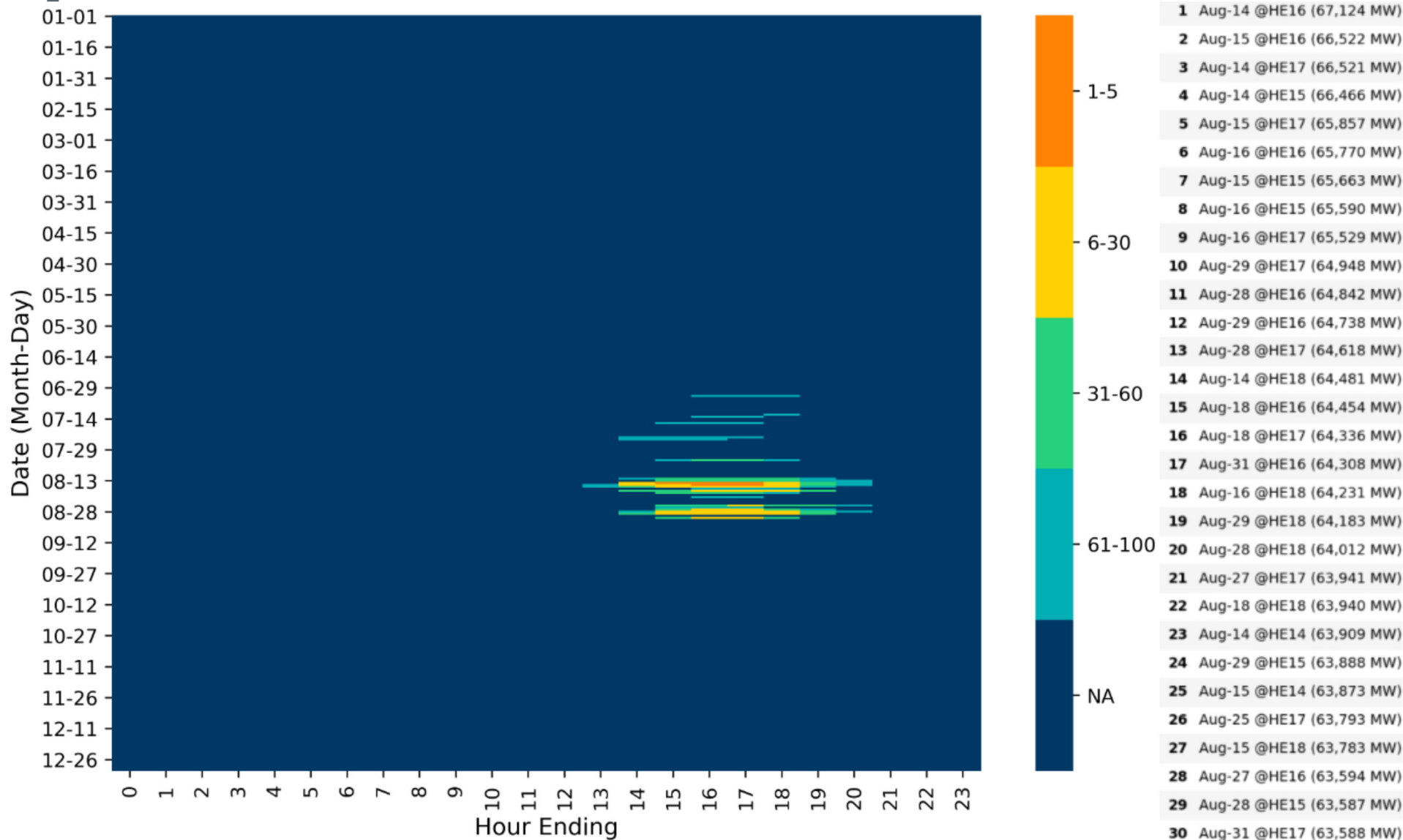


Season	Summary
Winter	Jan-02 @HE19 (52,099 MW)
Winter	Jan-02 @HE20 (51,606 MW)
Winter	Jan-02 @HE18 (51,155 MW)
Winter	Jan-02 @HE21 (50,450 MW)
Winter	Jan-02 @HE12 (50,046 MW)
Winter	Jan-02 @HE14 (50,016 MW)
Winter	Jan-02 @HE13 (49,915 MW)
Winter	Jan-02 @HE17 (49,555 MW)
Winter	Jan-02 @HE15 (49,394 MW)
Winter	Jan-02 @HE16 (49,021 MW)
Spring	Mar-05 @HE8 (58,044 MW)
Spring	Mar-05 @HE7 (57,973 MW)
Spring	Mar-04 @HE20 (56,189 MW)
Spring	Mar-04 @HE21 (55,543 MW)
Spring	Mar-05 @HE9 (55,089 MW)
Spring	Mar-04 @HE19 (54,364 MW)
Spring	Mar-04 @HE22 (54,324 MW)
Spring	Mar-05 @HE6 (54,193 MW)
Spring	May-31 @HE16 (52,642 MW)
Spring	May-31 @HE17 (52,368 MW)
Summer	Aug-13 @HE16 (68,268 MW)
Summer	Aug-13 @HE17 (67,685 MW)
Summer	Aug-13 @HE15 (67,643 MW)
Summer	Aug-15 @HE16 (67,390 MW)
Summer	Aug-15 @HE17 (66,973 MW)
Summer	Aug-05 @HE16 (66,483 MW)
Summer	Aug-05 @HE17 (66,392 MW)
Summer	Aug-13 @HE18 (66,316 MW)
Summer	Aug-14 @HE18 (66,234 MW)
Summer	Aug-06 @HE16 (66,135 MW)
Fall	Sep-06 @HE17 (65,835 MW)
Fall	Sep-06 @HE16 (65,825 MW)
Fall	Sep-06 @HE18 (65,628 MW)
Fall	Sep-06 @HE15 (65,384 MW)
Fall	Sep-05 @HE17 (64,533 MW)
Fall	Sep-03 @HE17 (64,506 MW)
Fall	Sep-05 @HE18 (64,209 MW)
Fall	Sep-03 @HE16 (64,125 MW)
Fall	Sep-06 @HE19 (64,003 MW)
Fall	Sep-05 @HE16 (63,606 MW)

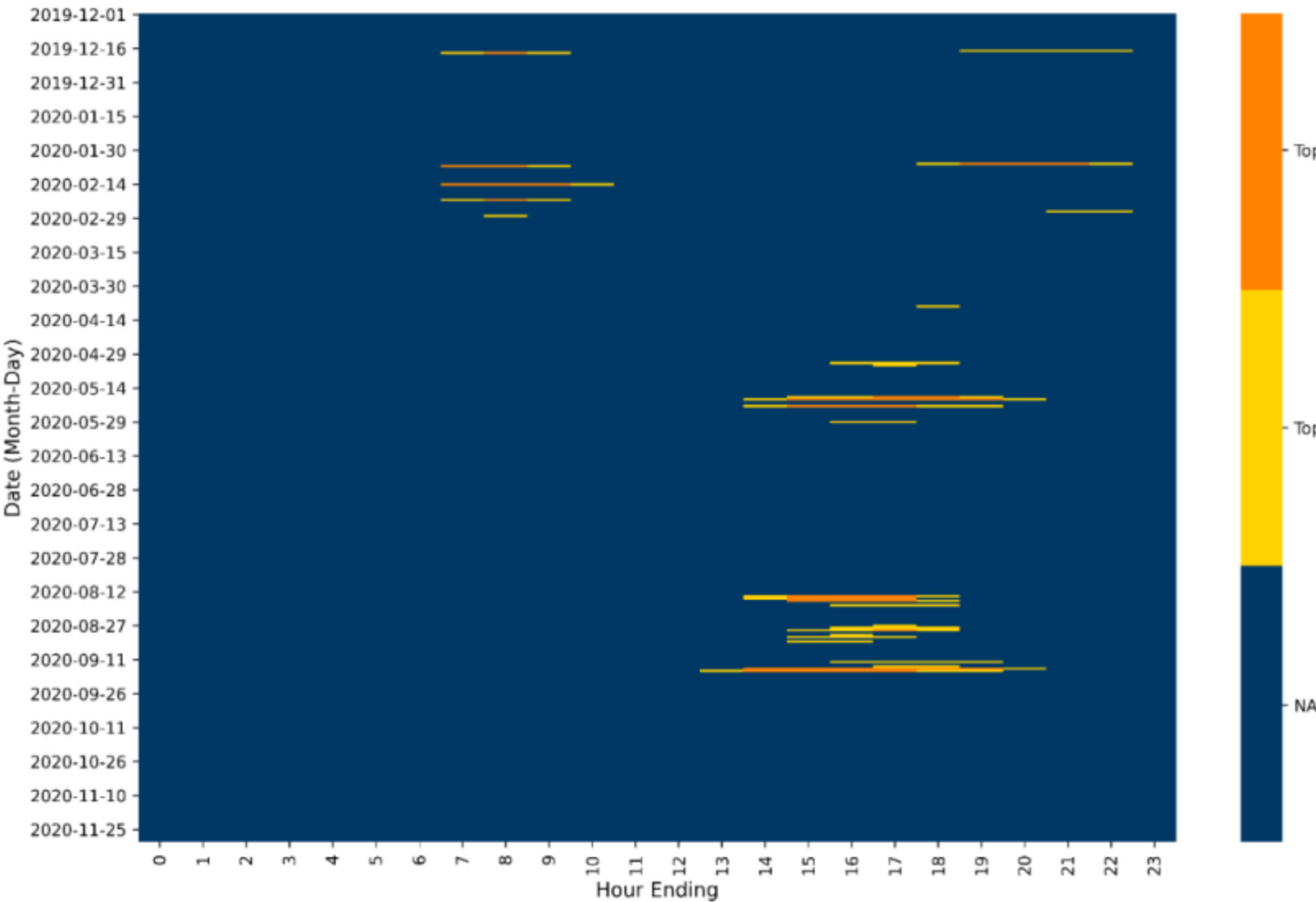
2019 Net Load - Zoomed



2020 Net Load

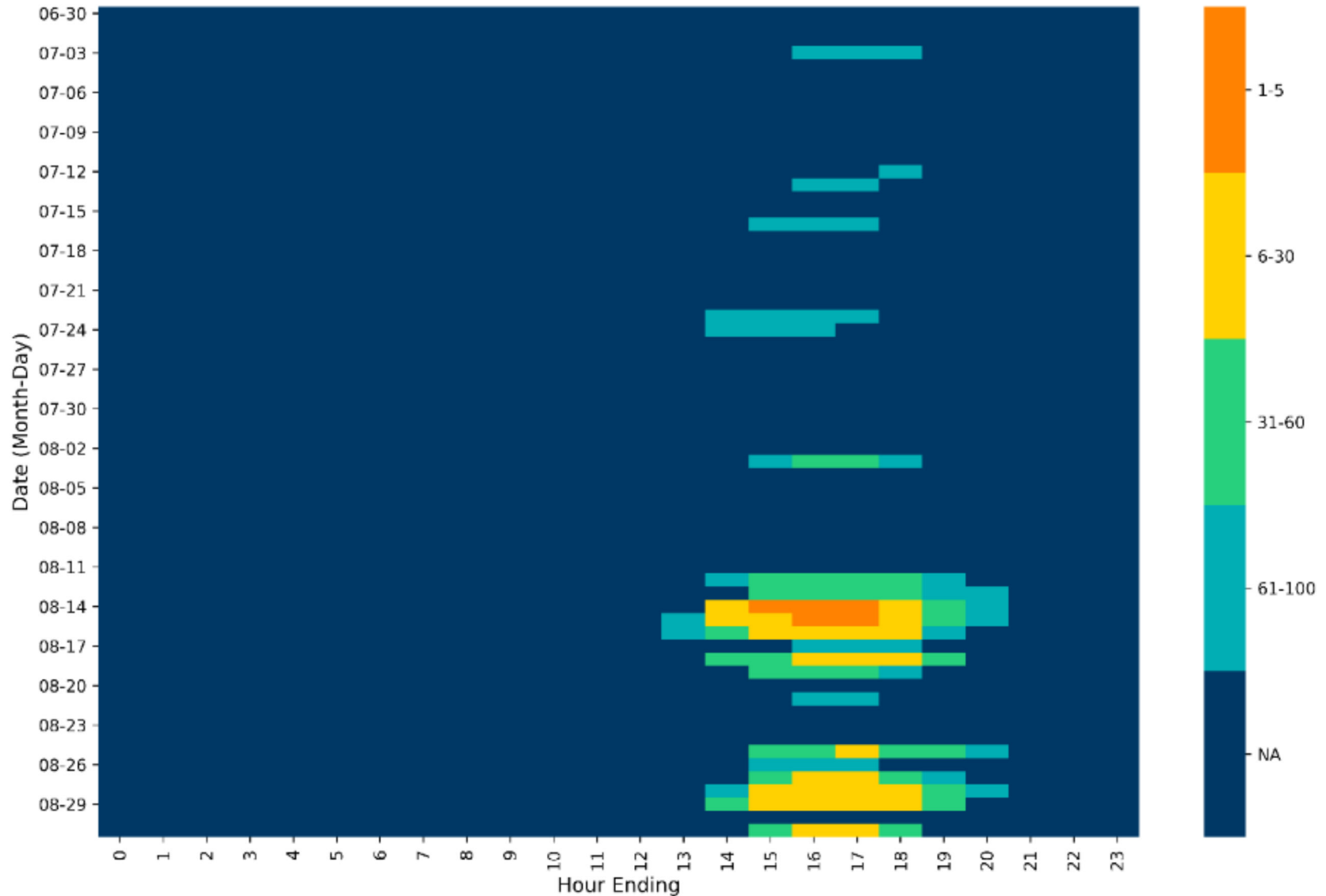


2020 Net Load - Seasonal

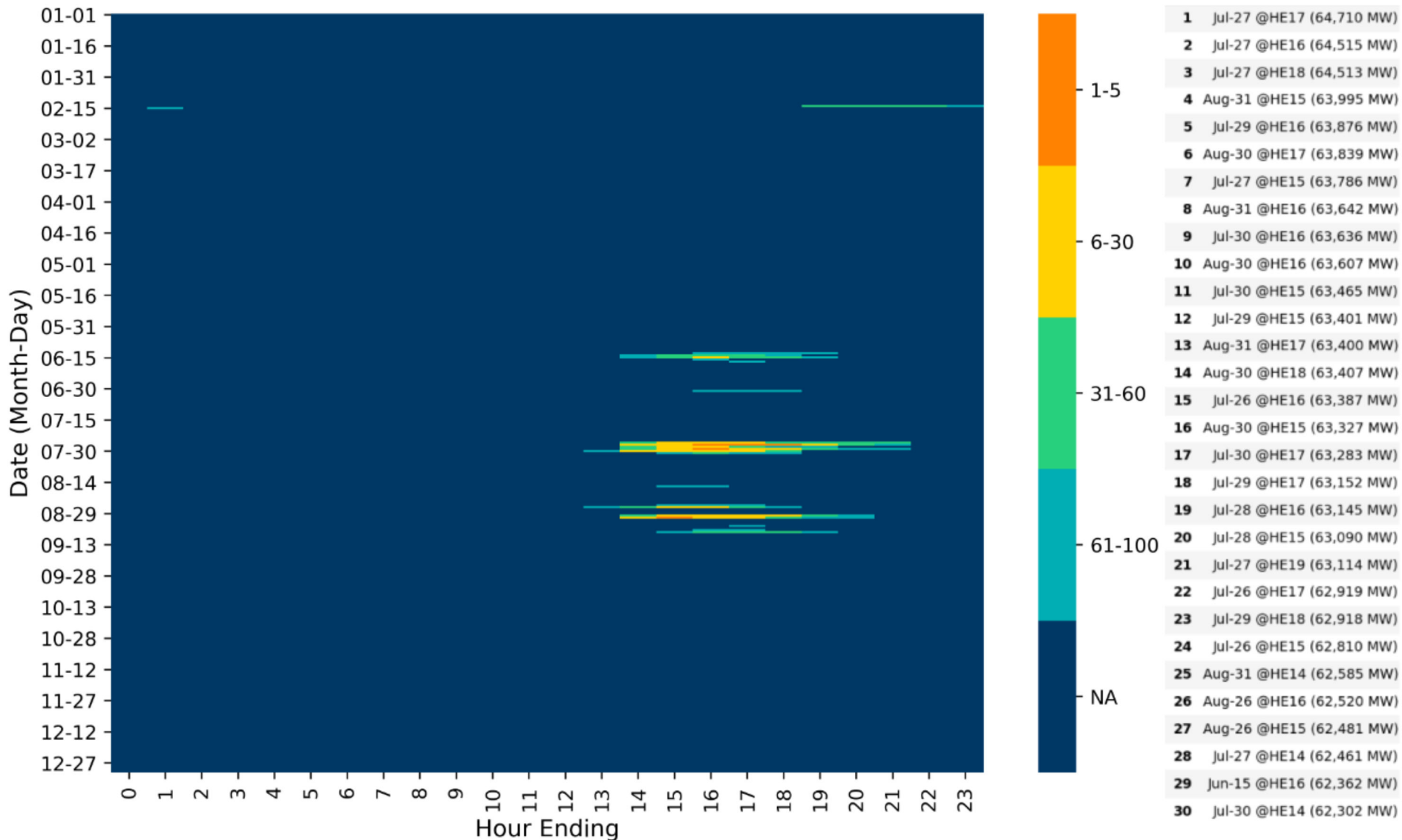


Season	Summary
Winter	Feb-14 @HE8 (49,713 MW)
Winter	Feb-05 @HE20 (49,135 MW)
Winter	Feb-06 @HE8 (49,020 MW)
Winter	Dec-18 @HE8 (48,871 MW)
Winter	Feb-05 @HE19 (48,750 MW)
Winter	Feb-06 @HE7 (48,306 MW)
Winter	Feb-14 @HE7 (48,128 MW)
Winter	Feb-14 @HE9 (47,909 MW)
Winter	Feb-21 @HE8 (47,674 MW)
Winter	Feb-05 @HE21 (47,463 MW)
Spring	May-19 @HE17 (54,333 MW)
Spring	May-19 @HE16 (53,985 MW)
Spring	May-19 @HE18 (53,696 MW)
Spring	May-22 @HE16 (52,751 MW)
Spring	May-22 @HE17 (52,610 MW)
Spring	May-19 @HE15 (52,252 MW)
Spring	May-22 @HE15 (51,565 MW)
Spring	May-18 @HE18 (51,477 MW)
Spring	May-18 @HE17 (51,473 MW)
Spring	May-19 @HE19 (51,463 MW)
Summer	Aug-14 @HE16 (67,143 MW)
Summer	Aug-15 @HE16 (66,542 MW)
Summer	Aug-14 @HE17 (66,536 MW)
Summer	Aug-14 @HE15 (66,481 MW)
Summer	Aug-15 @HE17 (65,866 MW)
Summer	Aug-16 @HE16 (65,791 MW)
Summer	Aug-15 @HE15 (65,681 MW)
Summer	Aug-16 @HE15 (65,608 MW)
Summer	Aug-16 @HE17 (65,549 MW)
Summer	Aug-29 @HE17 (64,968 MW)
Fall	Sep-16 @HE16 (58,060 MW)
Fall	Sep-15 @HE17 (57,990 MW)
Fall	Sep-15 @HE16 (57,711 MW)
Fall	Sep-15 @HE18 (57,570 MW)
Fall	Sep-16 @HE15 (57,461 MW)
Fall	Sep-16 @HE17 (57,376 MW)
Fall	Sep-15 @HE19 (56,855 MW)
Fall	Sep-15 @HE15 (56,822 MW)
Fall	Sep-16 @HE14 (56,445 MW)
Fall	Sep-15 @HE14 (55,783 MW)

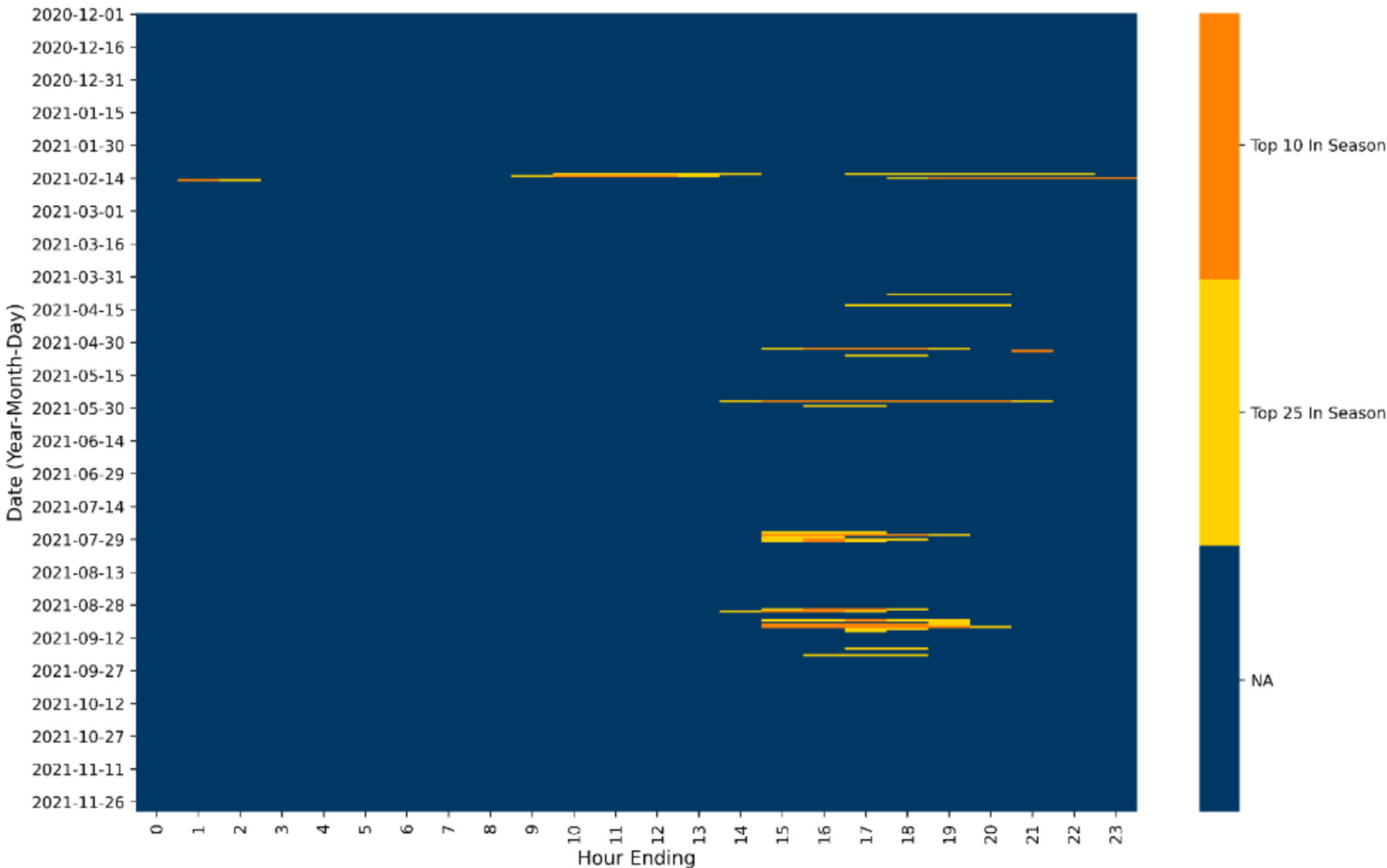
2020 Net Load - Zoomed



2021 Net Load

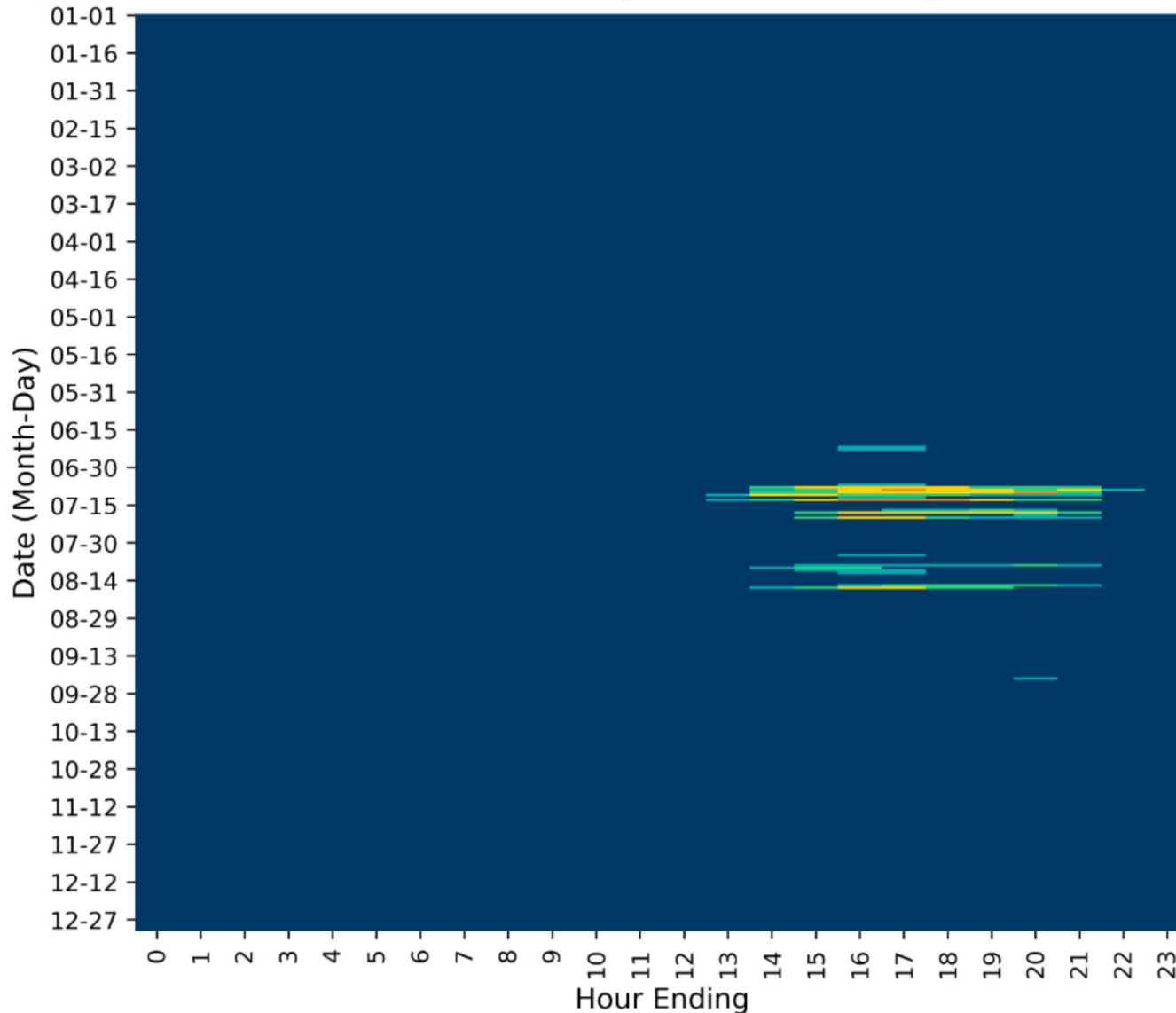


2021 Peak Net Load - Seasonal



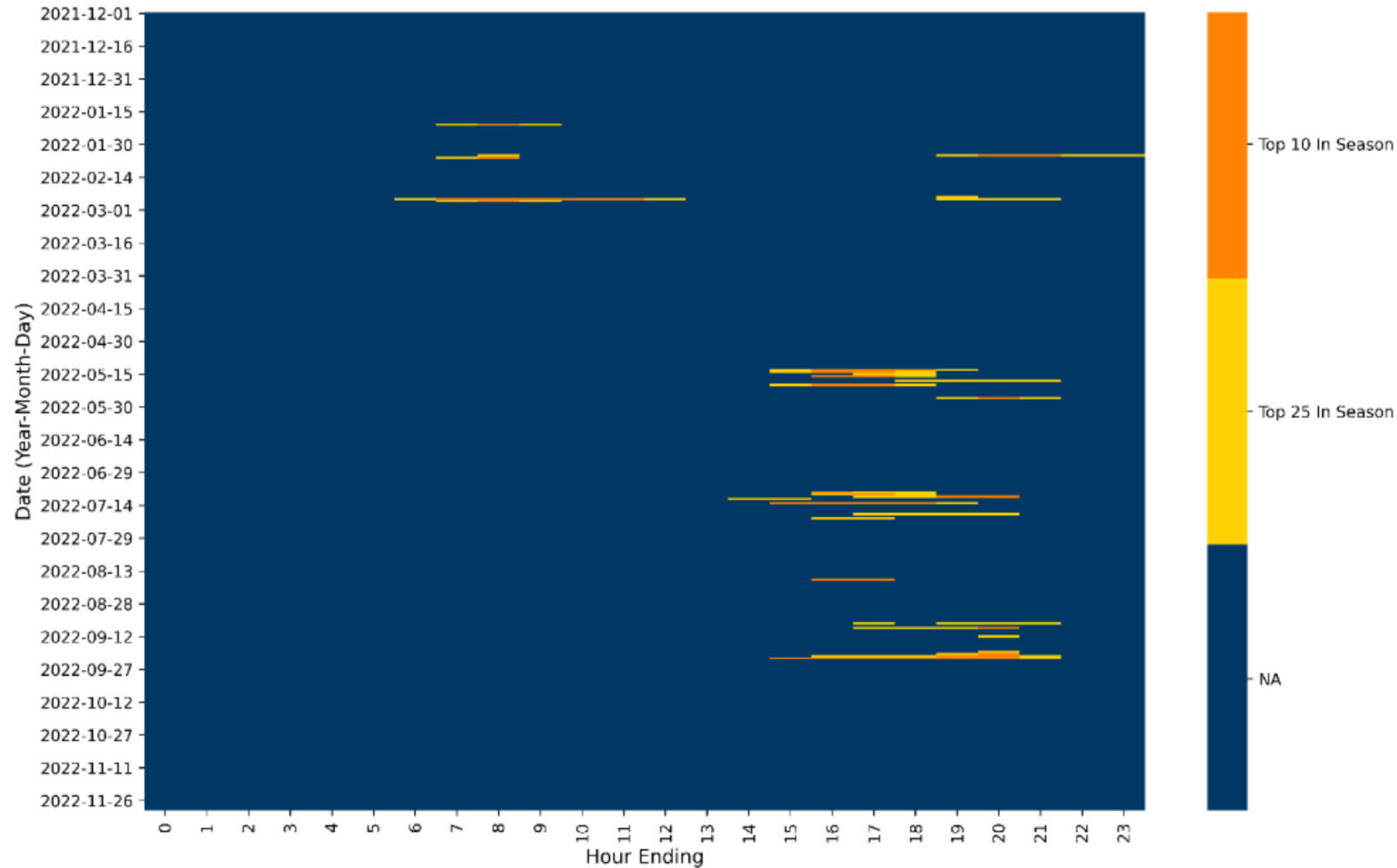
Season	Summary
Winter	Feb-14 @HE21 (61,219 MW)
Winter	Feb-14 @HE20 (61,129 MW)
Winter	Feb-14 @HE22 (60,916 MW)
Winter	Feb-14 @HE19 (60,887 MW)
Winter	Feb-14 @HE23 (60,347 MW)
Winter	Feb-14 @HE24 (60,317 MW)
Winter	Feb-15 @HE1 (59,906 MW)
Winter	Feb-13 @HE11 (59,290 MW)
Winter	Feb-13 @HE12 (58,765 MW)
Winter	Feb-13 @HE10 (58,740 MW)
Spring	May-27 @HE17 (49,475 MW)
Spring	May-27 @HE18 (48,908 MW)
Spring	May-27 @HE16 (47,851 MW)
Spring	May-27 @HE19 (47,626 MW)
Spring	May-27 @HE15 (45,634 MW)
Spring	May-03 @HE17 (45,334 MW)
Spring	May-27 @HE20 (44,648 MW)
Spring	May-03 @HE18 (44,642 MW)
Spring	May-03 @HE16 (44,178 MW)
Spring	May-04 @HE21 (42,811 MW)
Summer	Jul-27 @HE17 (64,745 MW)
Summer	Jul-27 @HE16 (64,540 MW)
Summer	Jul-27 @HE18 (64,521 MW)
Summer	Aug-31 @HE15 (64,020 MW)
Summer	Jul-29 @HE16 (63,916 MW)
Summer	Aug-30 @HE17 (63,879 MW)
Summer	Jul-27 @HE15 (63,815 MW)
Summer	Aug-31 @HE16 (63,672 MW)
Summer	Jul-30 @HE16 (63,670 MW)
Summer	Aug-30 @HE16 (63,656 MW)
Fail	Sep-07 @HE17 (61,882 MW)
Fail	Sep-07 @HE18 (61,644 MW)
Fail	Sep-07 @HE16 (61,209 MW)
Fail	Sep-06 @HE16 (60,116 MW)
Fail	Sep-06 @HE17 (59,932 MW)
Fail	Sep-07 @HE19 (59,645 MW)
Fail	Sep-07 @HE15 (59,534 MW)
Fail	Sep-04 @HE17 (59,519 MW)
Fail	Sep-06 @HE18 (59,226 MW)
Fail	Sep-06 @HE15 (59,064 MW)

2022 Net Load (Till Date)



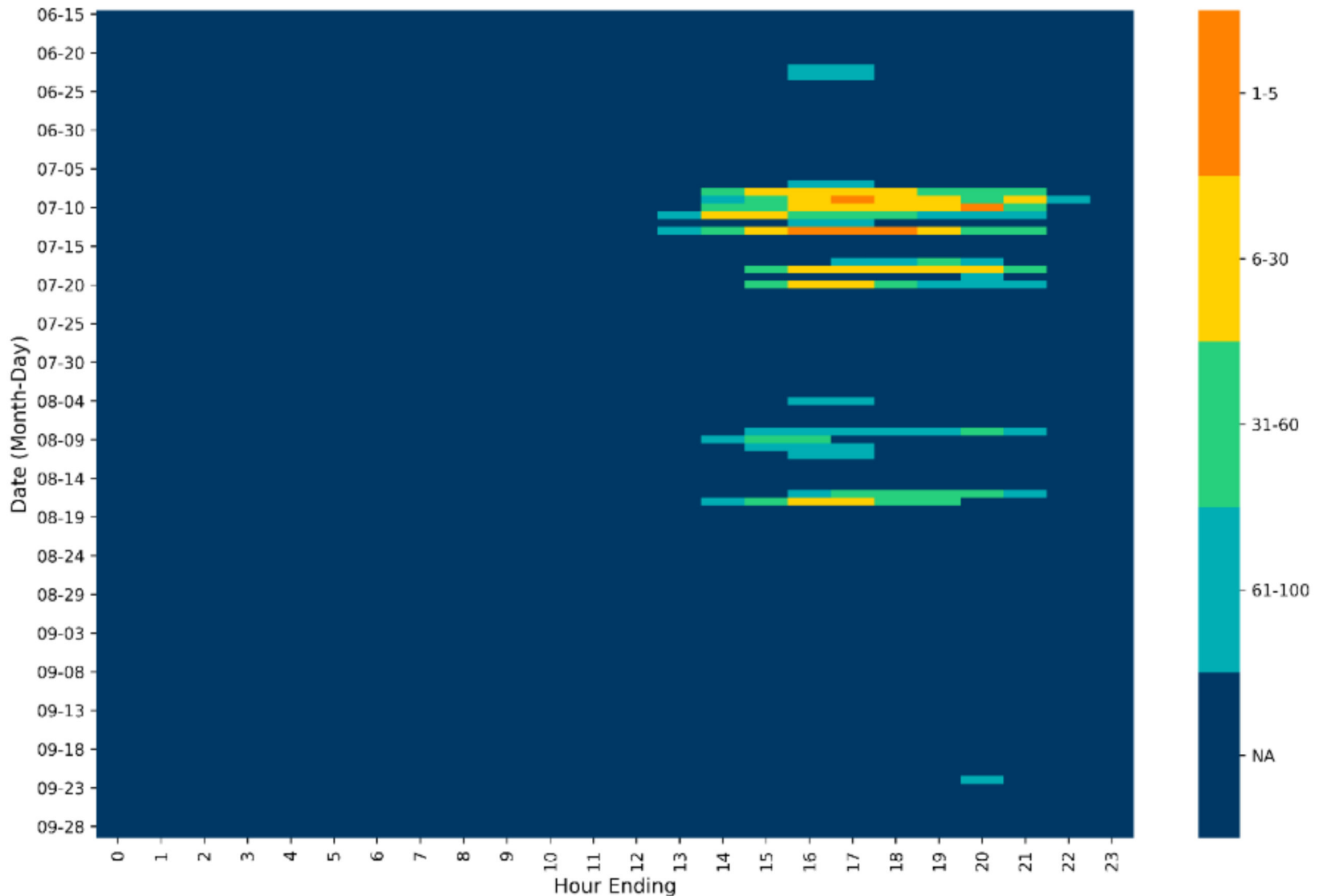
1	Jul-13 @HE16 (65,104 MW)
2	Jul-09 @HE17 (65,184 MW)
3	Jul-13 @HE17 (65,079 MW)
4	Jul-10 @HE20 (65,125 MW)
5	Jul-13 @HE18 (64,963 MW)
6	Jul-08 @HE16 (64,793 MW)
7	Aug-17 @HE16 (64,803 MW)
8	Jul-13 @HE15 (64,551 MW)
9	Aug-17 @HE17 (64,730 MW)
10	Jul-10 @HE19 (64,631 MW)
11	Jul-08 @HE17 (64,626 MW)
12	Jul-10 @HE17 (64,593 MW)
13	Jul-11 @HE15 (64,763 MW)
14	Jul-09 @HE18 (64,630 MW)
15	Jul-08 @HE18 (64,474 MW)
16	Jul-09 @HE16 (64,342 MW)
17	Jul-10 @HE18 (64,471 MW)
18	Jul-18 @HE18 (64,236 MW)
19	Jul-18 @HE17 (64,247 MW)
20	Jul-13 @HE19 (64,519 MW)
21	Jul-20 @HE16 (64,034 MW)
22	Jul-18 @HE19 (64,226 MW)
23	Jul-18 @HE20 (64,281 MW)
24	Jul-11 @HE14 (64,356 MW)
25	Jul-20 @HE17 (64,138 MW)
26	Jul-09 @HE19 (64,224 MW)
27	Jul-08 @HE15 (64,189 MW)
28	Jul-10 @HE16 (64,139 MW)
29	Jul-09 @HE21 (64,111 MW)
30	Jul-18 @HE16 (63,993 MW)

2022 Net Load - Seasonal



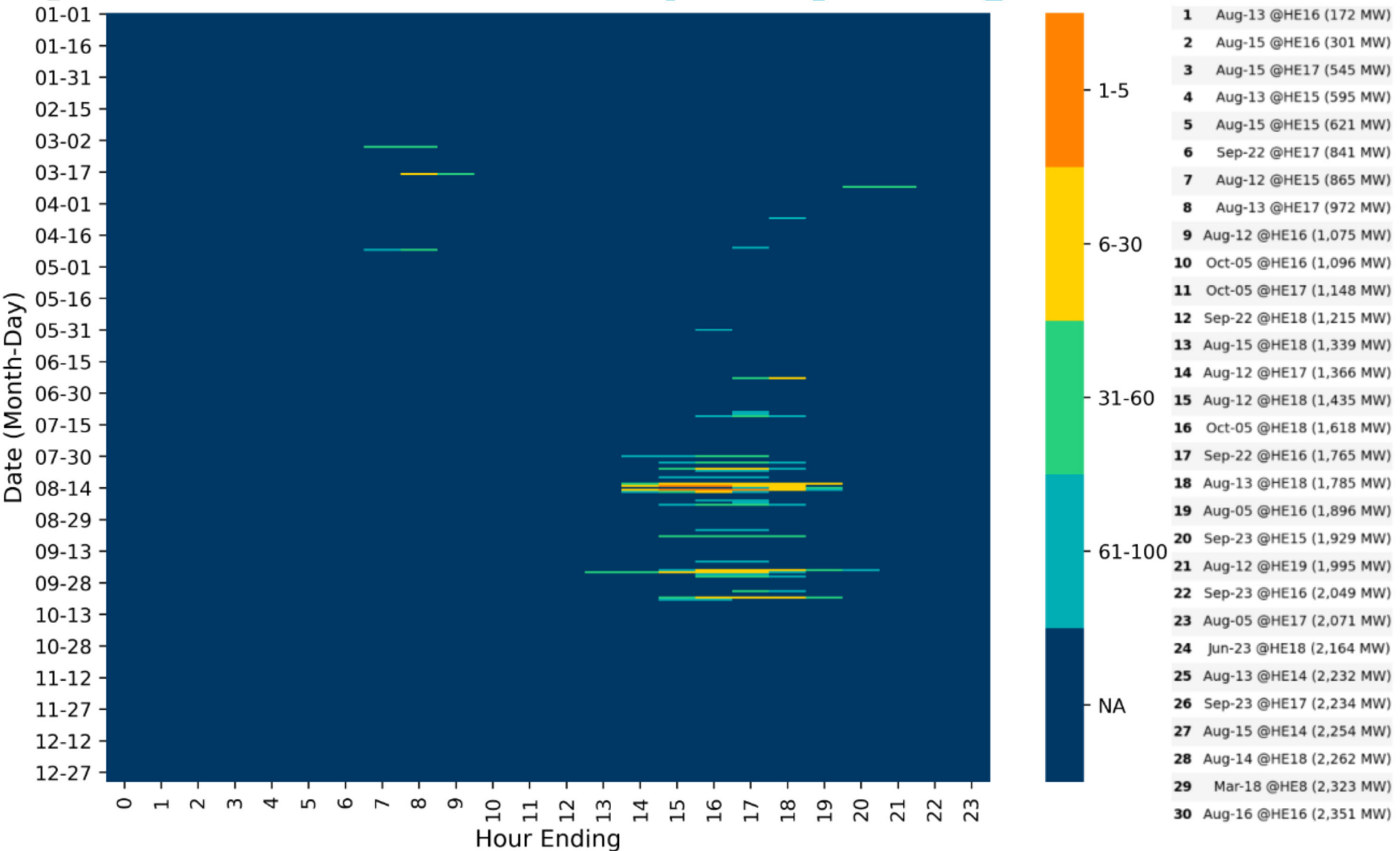
Season	Summary
Winter	Feb-24 @HE9 (59,701 MW)
Winter	Feb-24 @HE8 (59,388 MW)
Winter	Feb-24 @HE10 (59,149 MW)
Winter	Feb-24 @HE7 (58,162 MW)
Winter	Feb-24 @HE11 (58,003 MW)
Winter	Jan-21 @HE8 (57,683 MW)
Winter	Feb-04 @HE20 (57,018 MW)
Winter	Feb-05 @HE8 (56,637 MW)
Winter	Feb-04 @HE21 (56,623 MW)
Winter	Feb-25 @HE8 (56,227 MW)
Spring	May-13 @HE17 (51,376 MW)
Spring	May-13 @HE18 (51,366 MW)
Spring	May-14 @HE16 (51,311 MW)
Spring	May-13 @HE16 (51,124 MW)
Spring	May-20 @HE17 (50,996 MW)
Spring	May-14 @HE17 (50,895 MW)
Spring	May-20 @HE16 (50,836 MW)
Spring	May-16 @HE17 (50,413 MW)
Spring	May-26 @HE20 (50,109 MW)
Spring	May-16 @HE16 (50,100 MW)
Summer	Jul-13 @HE16 (65,684 MW)
Summer	Jul-09 @HE17 (65,458 MW)
Summer	Jul-13 @HE17 (65,265 MW)
Summer	Jul-10 @HE20 (65,259 MW)
Summer	Jul-13 @HE18 (65,053 MW)
Summer	Jul-08 @HE16 (65,033 MW)
Summer	Aug-17 @HE16 (65,021 MW)
Summer	Jul-13 @HE15 (64,980 MW)
Summer	Aug-17 @HE17 (64,974 MW)
Summer	Jul-10 @HE19 (64,933 MW)
Fall	Sep-22 @HE20 (60,938 MW)
Fall	Sep-22 @HE19 (60,720 MW)
Fall	Sep-21 @HE20 (60,396 MW)
Fall	Sep-22 @HE18 (59,278 MW)
Fall	Sep-22 @HE17 (59,165 MW)
Fall	Sep-22 @HE16 (59,062 MW)
Fall	Sep-21 @HE19 (58,985 MW)
Fall	Sep-22 @HE15 (58,241 MW)
Fall	Sep-08 @HE20 (57,796 MW)
Fall	Sep-20 @HE20 (57,702 MW)

2022 Net Load (Till date) - Zoomed



“COMMITTED CAPACITY MARGIN” METHOD

2019 Committed Capacity Margin



2019 Committed Capacity Margin - Season

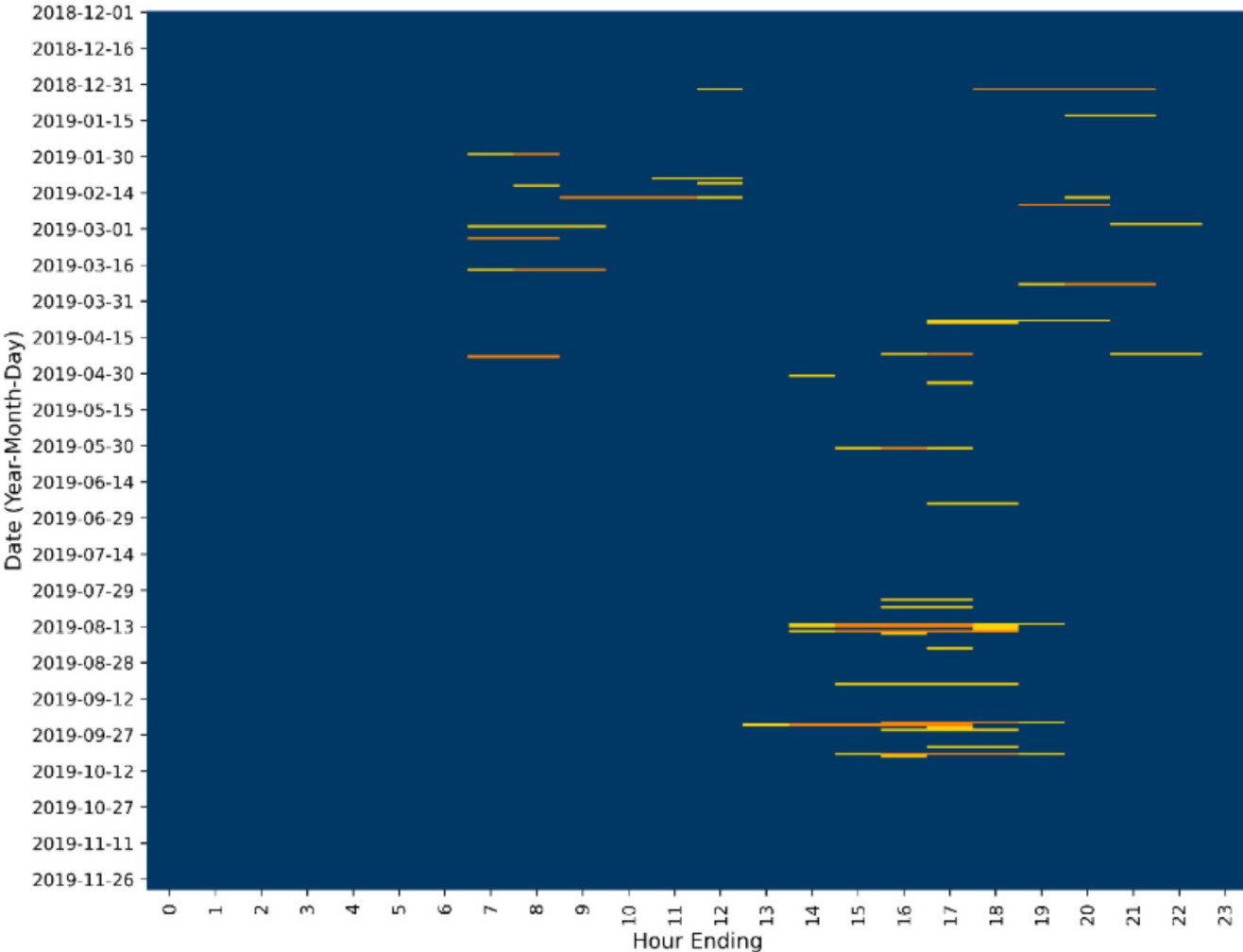
Season Summary

Winter	Jan-02 @HE19 (3,603 MW)
Winter	Jan-02 @HE20 (3,898 MW)
Winter	Jan-02 @HE18 (4,543 MW)
Winter	Feb-16 @HE10 (4,720 MW)
Winter	Feb-16 @HE11 (4,725 MW)
Winter	Jan-02 @HE21 (4,890 MW)
Winter	Feb-19 @HE19 (4,959 MW)
Winter	Feb-19 @HE20 (5,092 MW)
Winter	Feb-16 @HE9 (5,277 MW)
Winter	Feb-28 @HE9 (6,134 MW)
Spring	Mar-18 @HE8 (2,323 MW)
Spring	Mar-24 @HE20 (2,426 MW)
Spring	Mar-24 @HE21 (2,456 MW)
Spring	Mar-05 @HE8 (2,620 MW)
Spring	Mar-05 @HE7 (2,642 MW)
Spring	Mar-18 @HE9 (2,645 MW)
Spring	Apr-23 @HE8 (2,758 MW)
Spring	May-31 @HE16 (3,085 MW)
Spring	Apr-22 @HE17 (3,190 MW)
Spring	May-31 @HE17 (3,755 MW)
Summer	Aug-13 @HE16 (172 MW)
Summer	Aug-15 @HE16 (301 MW)
Summer	Aug-15 @HE17 (545 MW)
Summer	Aug-13 @HE15 (595 MW)
Summer	Aug-15 @HE15 (621 MW)
Summer	Aug-12 @HE15 (865 MW)
Summer	Aug-13 @HE17 (972 MW)
Summer	Aug-12 @HE16 (1,075 MW)
Summer	Aug-15 @HE18 (1,339 MW)
Summer	Aug-02 @HE17 (2,561 MW)
Fall	Sep-22 @HE17 (841 MW)
Fall	Oct-05 @HE16 (1,096 MW)
Fall	Oct-05 @HE17 (1,148 MW)
Fall	Sep-22 @HE18 (1,215 MW)
Fall	Oct-05 @HE18 (1,618 MW)
Fall	Sep-22 @HE16 (1,765 MW)
Fall	Sep-23 @HE15 (1,929 MW)
Fall	Sep-23 @HE16 (2,049 MW)
Fall	Sep-23 @HE17 (2,234 MW)
Fall	Sep-23 @HE14 (2,376 MW)

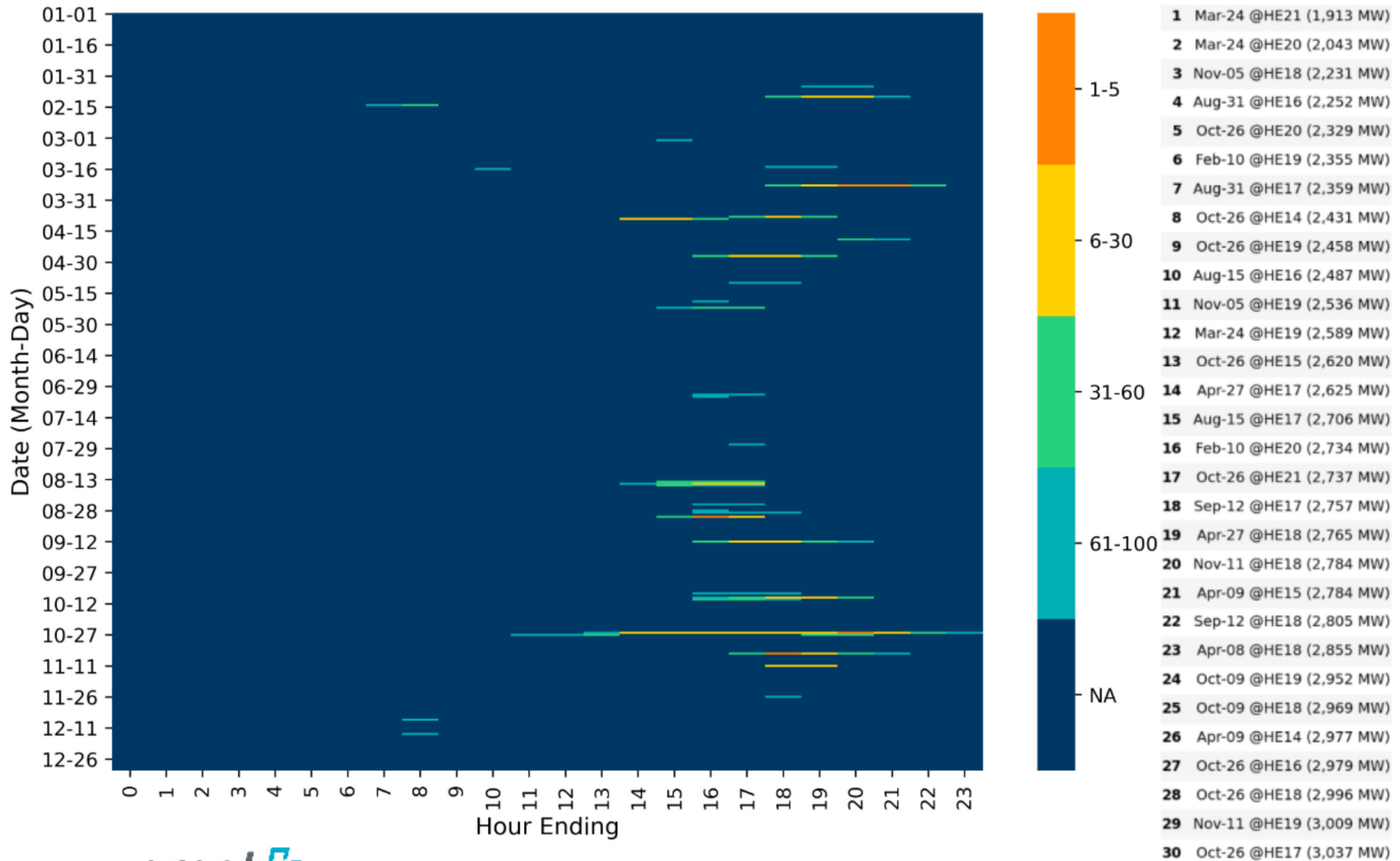
Top 10 In Season

Top 25 In Season

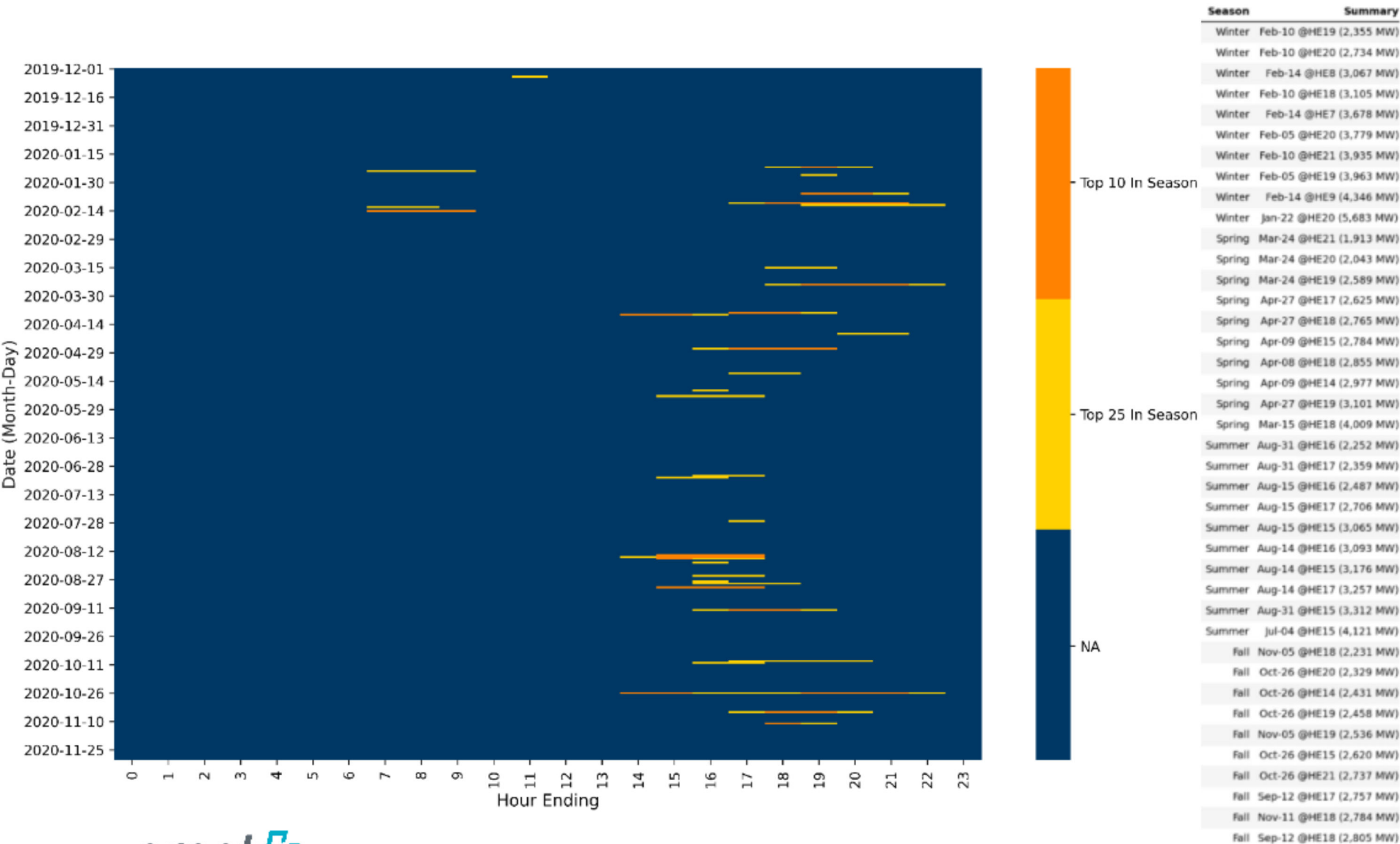
NA



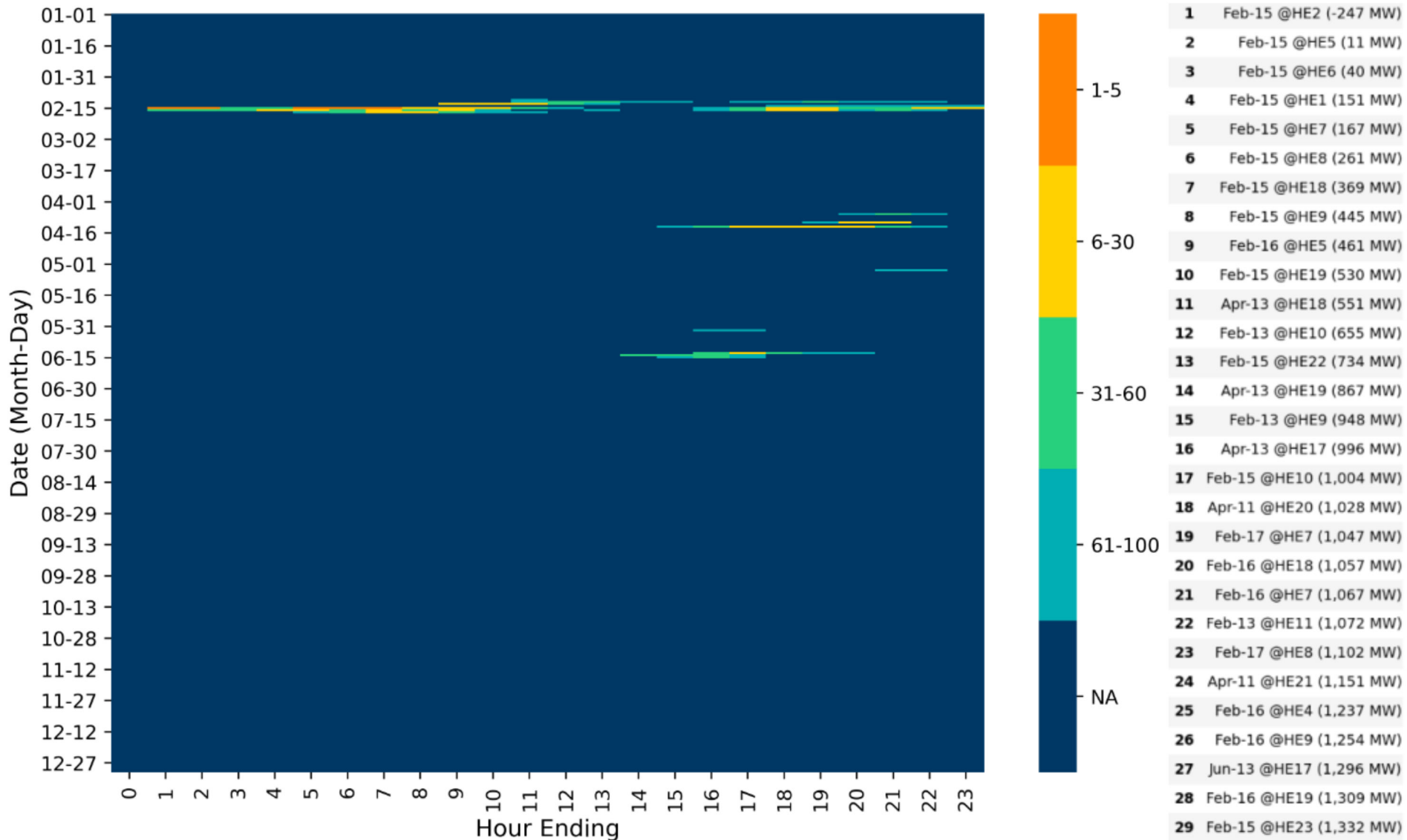
2020 Committed Capacity Margin



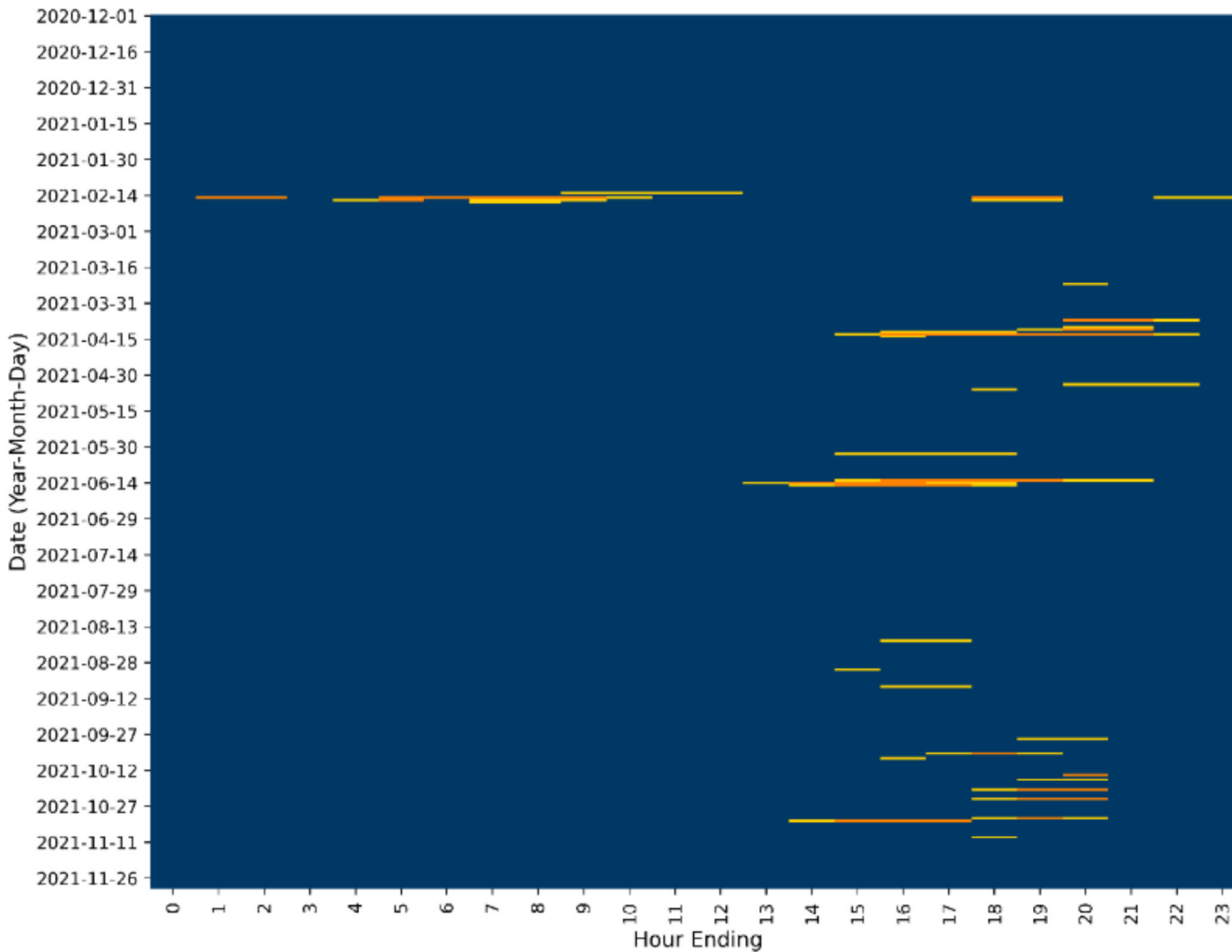
2020 Committed Capacity Margin - Season



2021 Committed Capacity Margin

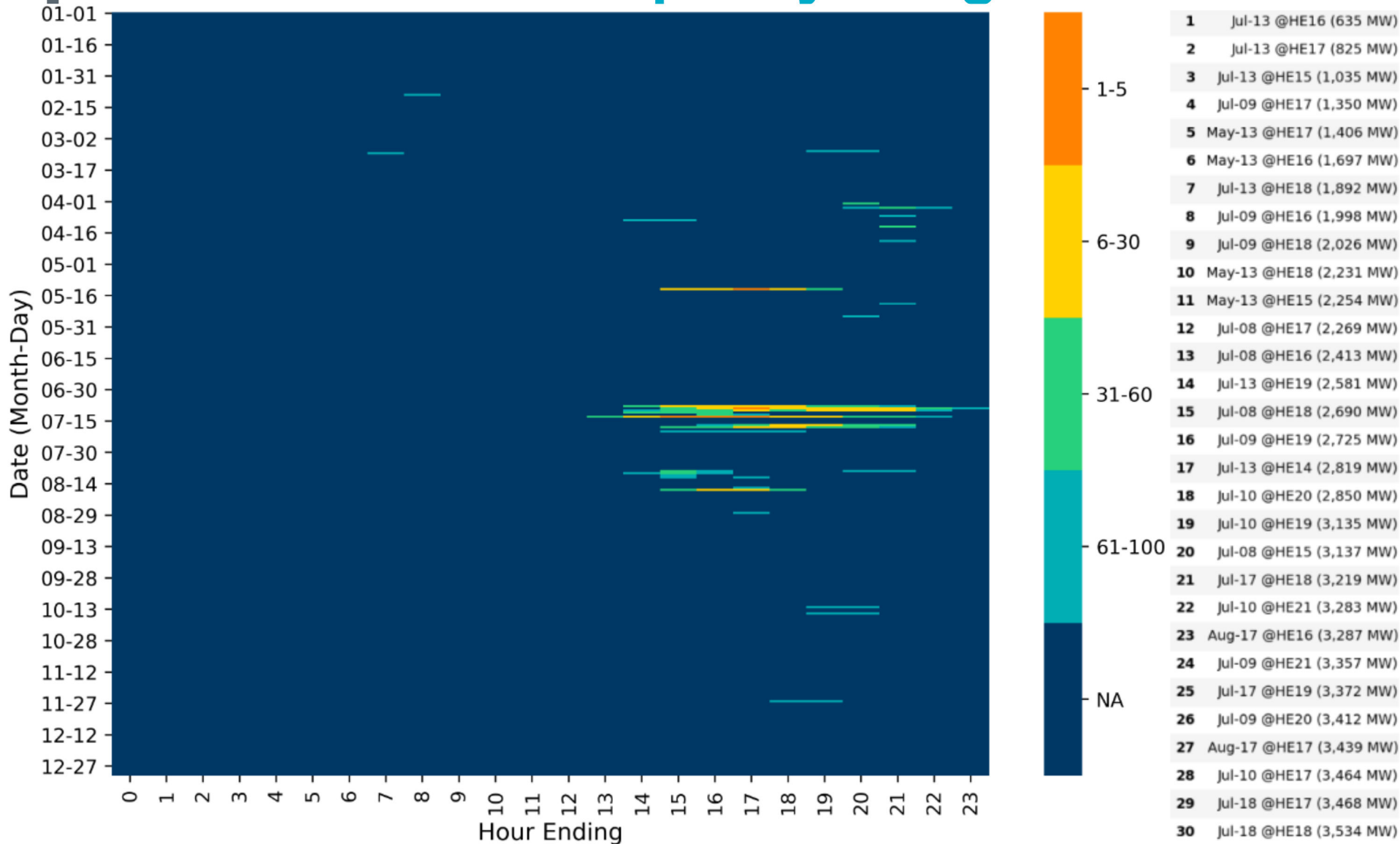


2021 Committed Capacity Margin - Season

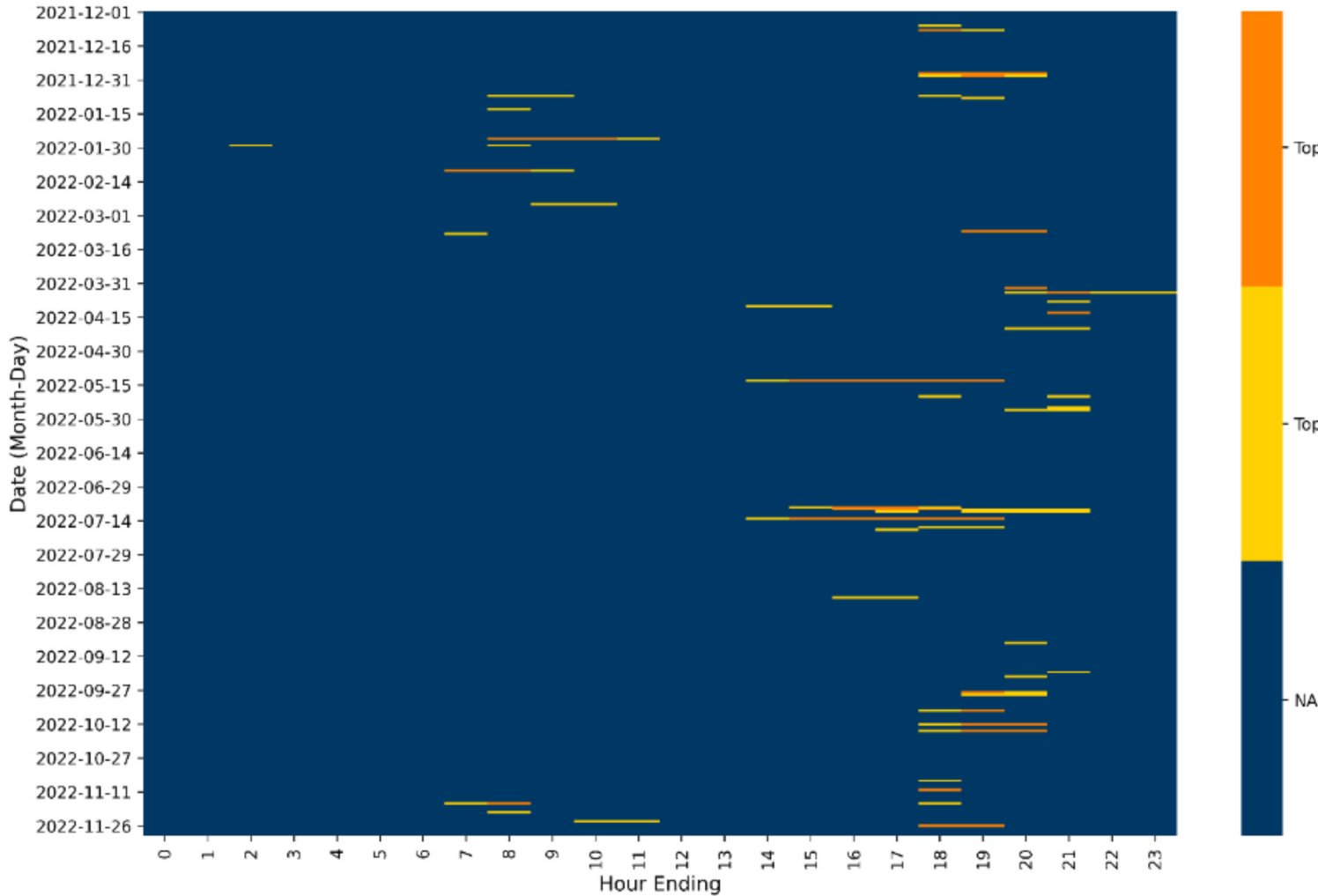


Season	Summary
Winter	Feb-15 @HE2 (-247 MW)
Winter	Feb-15 @HE5 (11 MW)
Winter	Feb-15 @HE6 (40 MW)
Winter	Feb-15 @HE1 (151 MW)
Winter	Feb-15 @HE7 (167 MW)
Winter	Feb-15 @HE8 (261 MW)
Winter	Feb-15 @HE18 (369 MW)
Winter	Feb-15 @HE9 (445 MW)
Winter	Feb-16 @HE5 (461 MW)
Winter	Feb-15 @HE19 (530 MW)
Spring	Apr-13 @HE18 (551 MW)
Spring	Apr-13 @HE19 (867 MW)
Spring	Apr-13 @HE17 (996 MW)
Spring	Apr-11 @HE20 (1,028 MW)
Spring	Apr-11 @HE21 (1,151 MW)
Spring	Apr-13 @HE20 (1,350 MW)
Spring	Apr-13 @HE21 (1,793 MW)
Spring	Apr-13 @HE16 (1,808 MW)
Spring	Apr-07 @HE21 (1,962 MW)
Spring	Apr-07 @HE20 (2,363 MW)
Summer	Jun-13 @HE17 (1,296 MW)
Summer	Jun-14 @HE15 (1,653 MW)
Summer	Jun-13 @HE18 (1,725 MW)
Summer	Jun-13 @HE16 (1,896 MW)
Summer	Jun-14 @HE14 (2,012 MW)
Summer	Jun-14 @HE16 (2,086 MW)
Summer	Jun-15 @HE16 (2,266 MW)
Summer	Jun-15 @HE15 (2,350 MW)
Summer	Jun-13 @HE19 (2,435 MW)
Summer	Jun-15 @HE17 (2,517 MW)
Fall	Oct-24 @HE19 (4,146 MW)
Fall	Oct-24 @HE20 (4,802 MW)
Fall	Oct-20 @HE19 (4,815 MW)
Fall	Nov-02 @HE15 (4,980 MW)
Fall	Oct-20 @HE20 (5,144 MW)
Fall	Nov-02 @HE16 (5,151 MW)
Fall	Nov-01 @HE19 (5,218 MW)
Fall	Oct-05 @HE18 (5,466 MW)
Fall	Oct-14 @HE20 (5,702 MW)
Fall	Nov-02 @HE17 (5,803 MW)

2022 Committed Capacity Margin



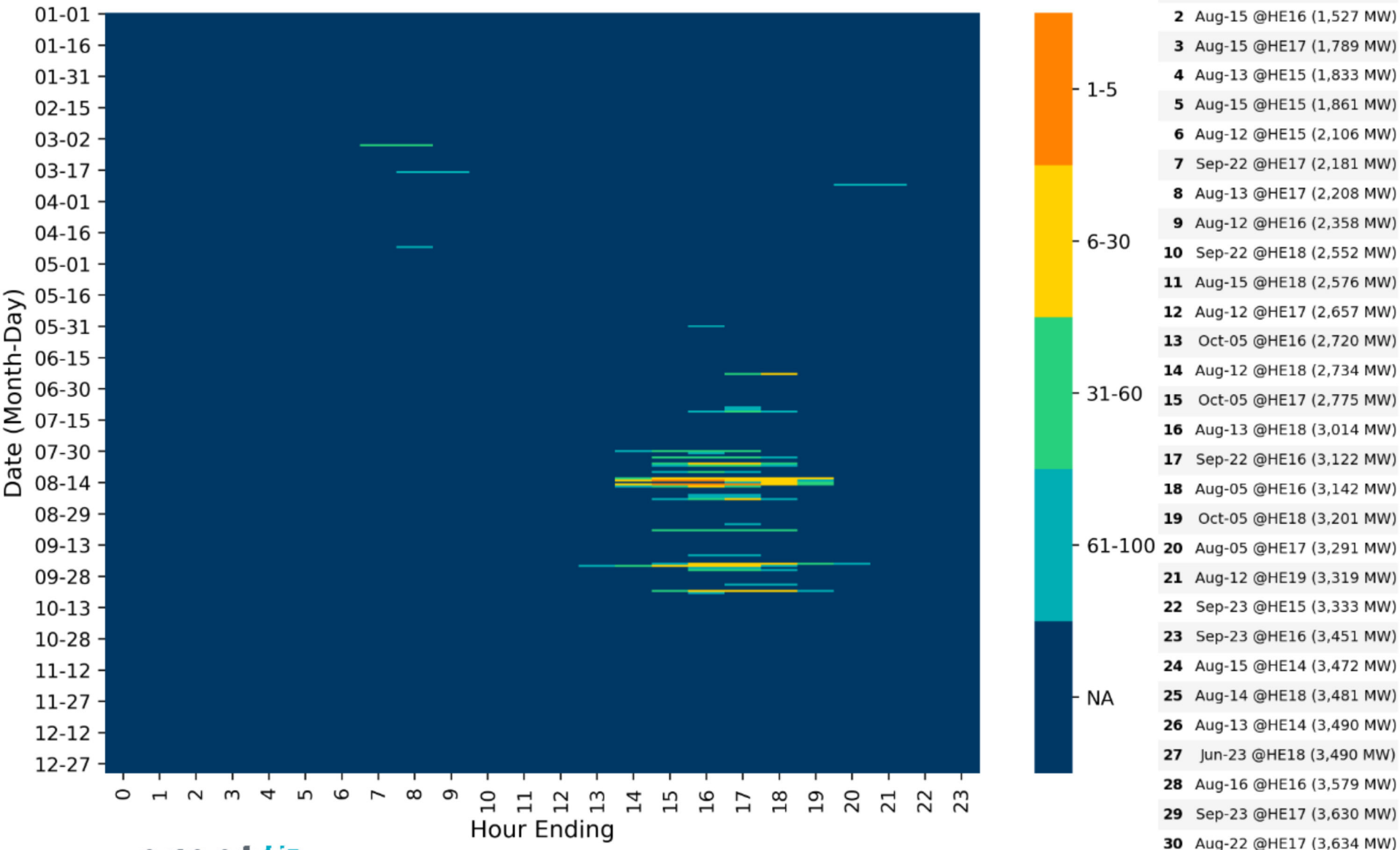
2022 Committed Capacity Margin - Season



Season	Summary
Winter	Feb-09 @HE8 (5,096 MW)
Winter	Dec-28 @HE19 (5,804 MW)
Winter	Feb-09 @HE7 (5,977 MW)
Winter	Jan-26 @HE9 (6,155 MW)
Winter	Dec-28 @HE18 (6,209 MW)
Winter	Dec-29 @HE19 (6,245 MW)
Winter	Dec-09 @HE18 (6,388 MW)
Winter	Dec-28 @HE20 (6,431 MW)
Winter	Jan-26 @HE8 (6,451 MW)
Winter	Jan-07 @HE18 (7,114 MW)
Spring	May-13 @HE17 (1,406 MW)
Spring	May-13 @HE16 (1,697 MW)
Spring	May-13 @HE18 (2,231 MW)
Spring	May-13 @HE15 (2,254 MW)
Spring	May-13 @HE19 (4,437 MW)
Spring	Apr-13 @HE21 (4,458 MW)
Spring	Apr-04 @HE21 (4,622 MW)
Spring	Apr-02 @HE20 (4,708 MW)
Spring	Mar-08 @HE20 (4,747 MW)
Spring	Apr-20 @HE20 (5,486 MW)
Summer	Jul-13 @HE16 (635 MW)
Summer	Jul-13 @HE17 (825 MW)
Summer	Jul-13 @HE15 (1,035 MW)
Summer	Jul-09 @HE17 (1,350 MW)
Summer	Jul-13 @HE18 (1,892 MW)
Summer	Jul-09 @HE16 (1,998 MW)
Summer	Jul-09 @HE18 (2,026 MW)
Summer	Jul-08 @HE17 (2,269 MW)
Summer	Jul-08 @HE16 (2,413 MW)
Summer	Jul-18 @HE17 (3,468 MW)
Fall	Nov-26 @HE19 (4,811 MW)
Fall	Oct-12 @HE19 (4,822 MW)
Fall	Nov-26 @HE18 (4,847 MW)
Fall	Oct-15 @HE19 (4,895 MW)
Fall	Oct-12 @HE20 (5,195 MW)
Fall	Oct-15 @HE20 (5,359 MW)
Fall	Nov-10 @HE18 (6,018 MW)
Fall	Oct-06 @HE19 (6,038 MW)
Fall	Sep-28 @HE19 (6,042 MW)
Fall	Nov-16 @HE8 (6,314 MW)

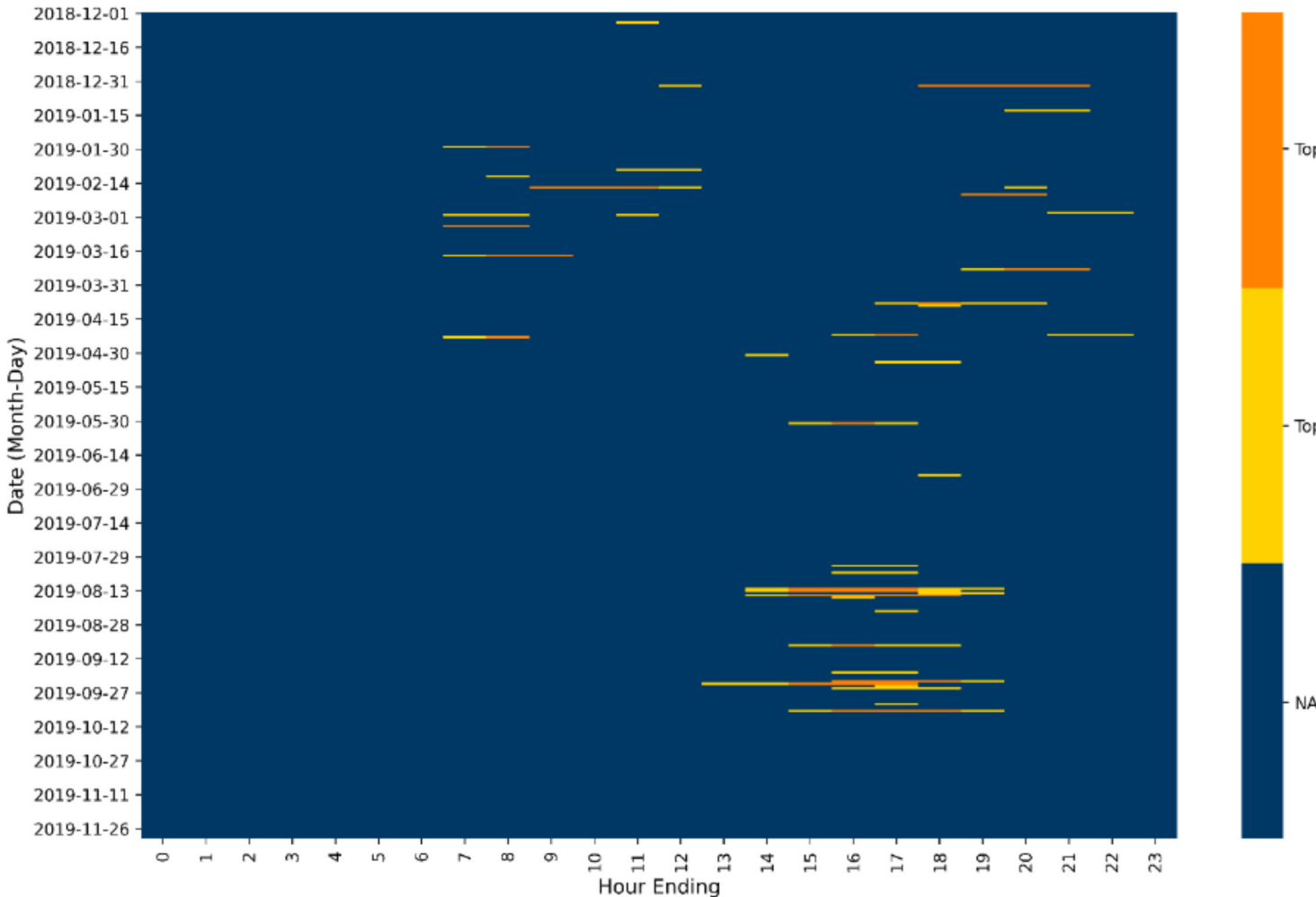
“REAL TIME MARGIN” METHOD (ERCOT ALTERNATIVE PROPOSAL)

2019 Real Time Margin

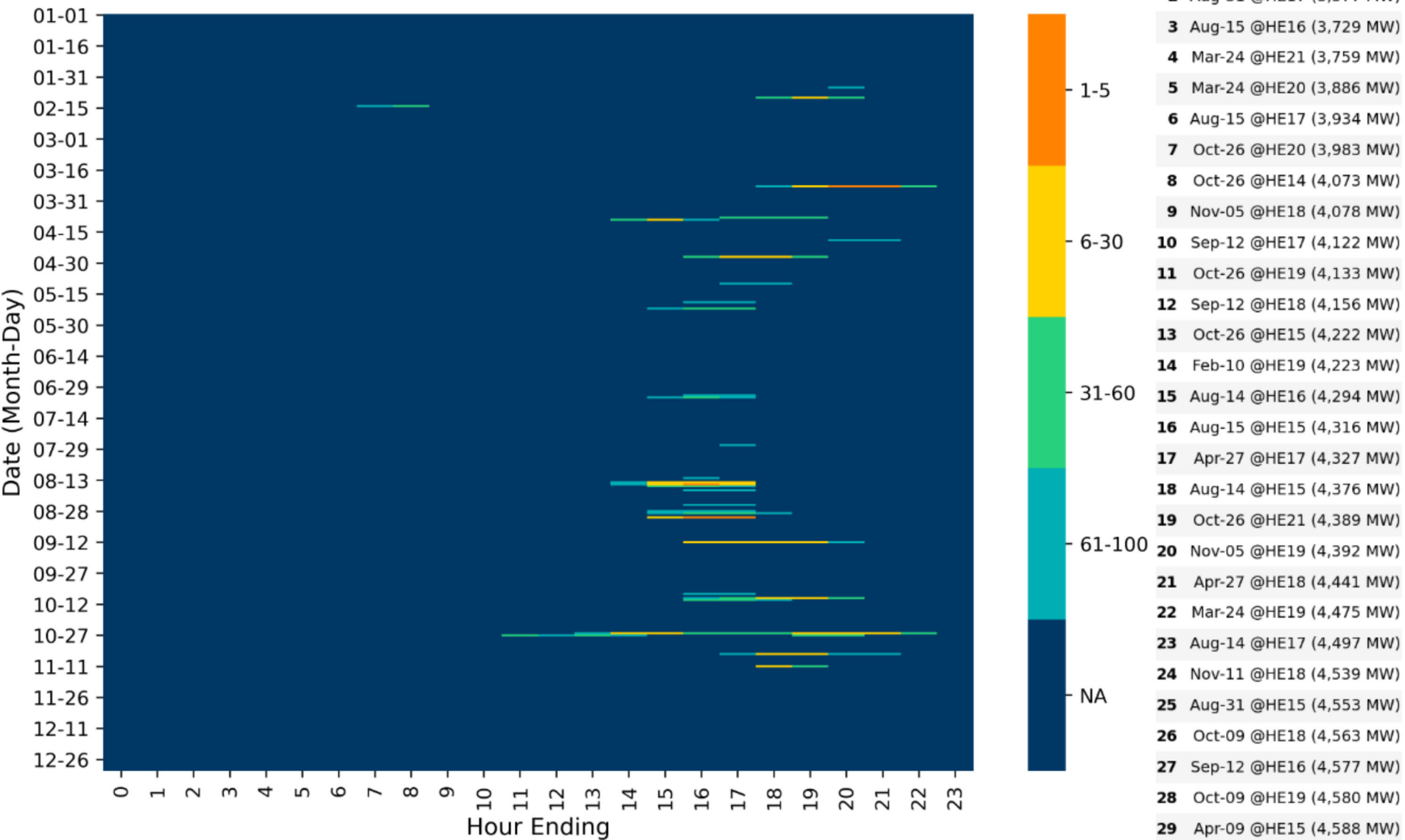


2019 Real Time Margin - Seasonal

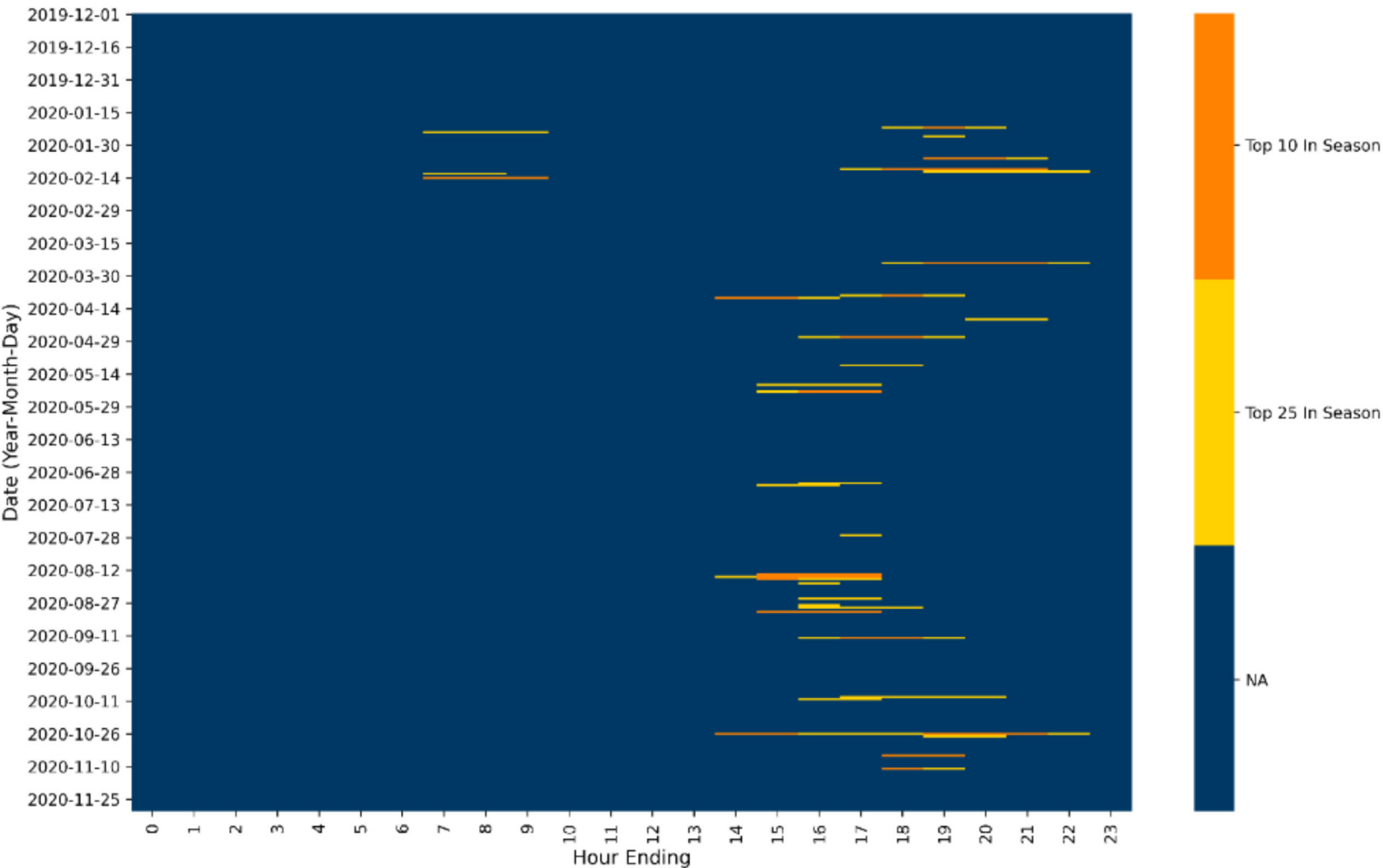
Season	Summary
Winter	Jan-02 @HE19 (5,456 MW)
Winter	Jan-02 @HE20 (5,724 MW)
Winter	Jan-02 @HE18 (6,390 MW)
Winter	Feb-16 @HE11 (6,536 MW)
Winter	Feb-16 @HE10 (6,557 MW)
Winter	Jan-02 @HE21 (6,719 MW)
Winter	Feb-19 @HE19 (6,808 MW)
Winter	Feb-19 @HE20 (6,932 MW)
Winter	Feb-16 @HE9 (7,101 MW)
Winter	Feb-28 @HE11 (7,860 MW)
Spring	Mar-05 @HE8 (4,047 MW)
Spring	Mar-05 @HE7 (4,078 MW)
Spring	Mar-18 @HE8 (4,150 MW)
Spring	Mar-24 @HE20 (4,194 MW)
Spring	Mar-24 @HE21 (4,222 MW)
Spring	Mar-18 @HE9 (4,457 MW)
Spring	Apr-23 @HE8 (4,569 MW)
Spring	May-31 @HE16 (4,606 MW)
Spring	Apr-22 @HE17 (4,980 MW)
Spring	Apr-22 @HE22 (5,444 MW)
Summer	Aug-13 @HE16 (1,392 MW)
Summer	Aug-15 @HE16 (1,527 MW)
Summer	Aug-15 @HE17 (1,789 MW)
Summer	Aug-13 @HE15 (1,833 MW)
Summer	Aug-15 @HE15 (1,861 MW)
Summer	Aug-12 @HE15 (2,106 MW)
Summer	Aug-13 @HE17 (2,208 MW)
Summer	Aug-12 @HE16 (2,358 MW)
Summer	Aug-15 @HE18 (2,576 MW)
Summer	Aug-14 @HE19 (3,826 MW)
Fall	Sep-22 @HE17 (2,181 MW)
Fall	Sep-22 @HE18 (2,552 MW)
Fall	Oct-05 @HE16 (2,720 MW)
Fall	Oct-05 @HE17 (2,775 MW)
Fall	Sep-22 @HE16 (3,122 MW)
Fall	Oct-05 @HE18 (3,201 MW)
Fall	Sep-23 @HE15 (3,333 MW)
Fall	Sep-23 @HE16 (3,451 MW)
Fall	Sep-23 @HE17 (3,630 MW)
Fall	Sep-06 @HE16 (3,738 MW)



2020 Real Time Margin

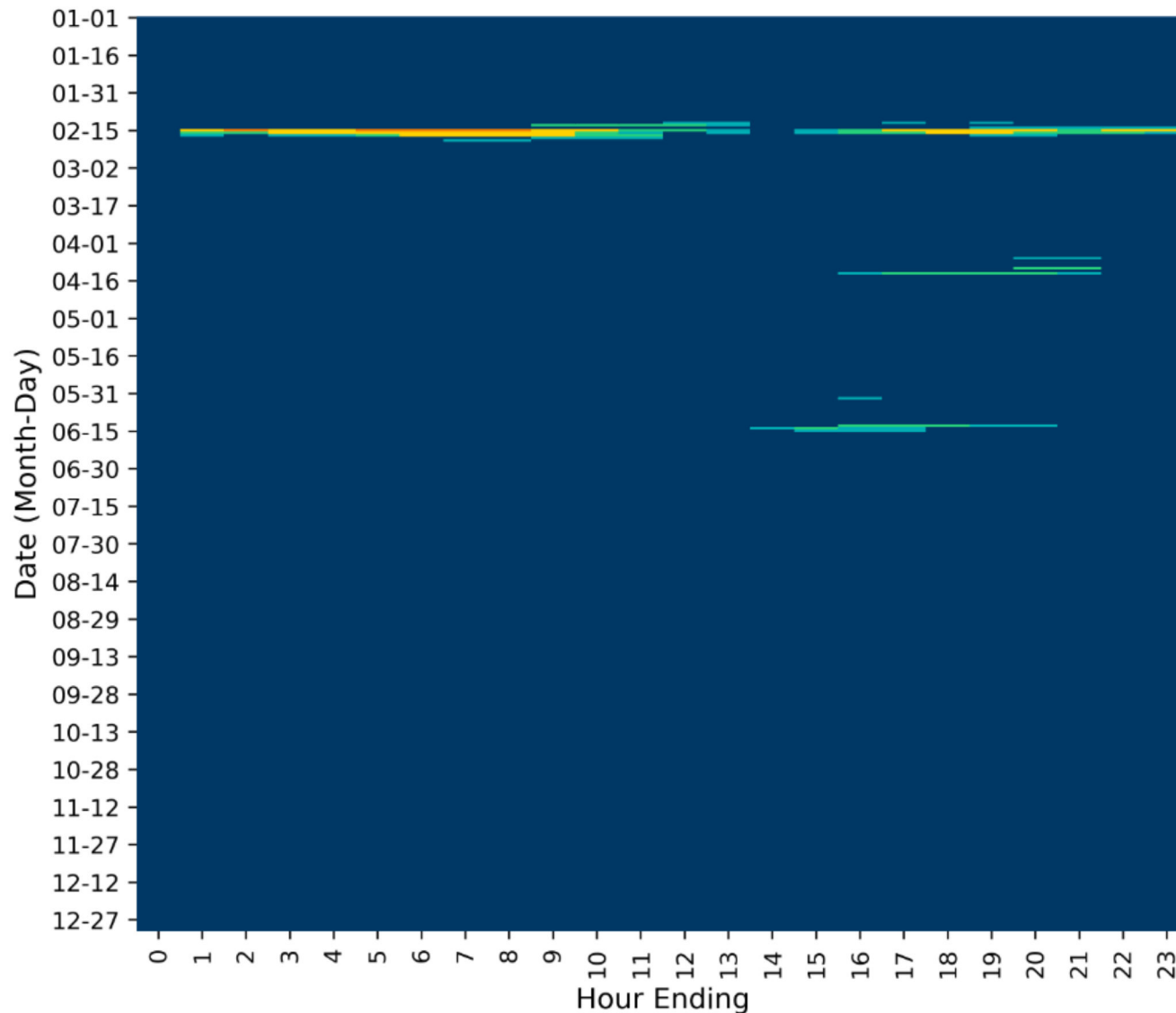


2020 Real Time Margin - Seasonal



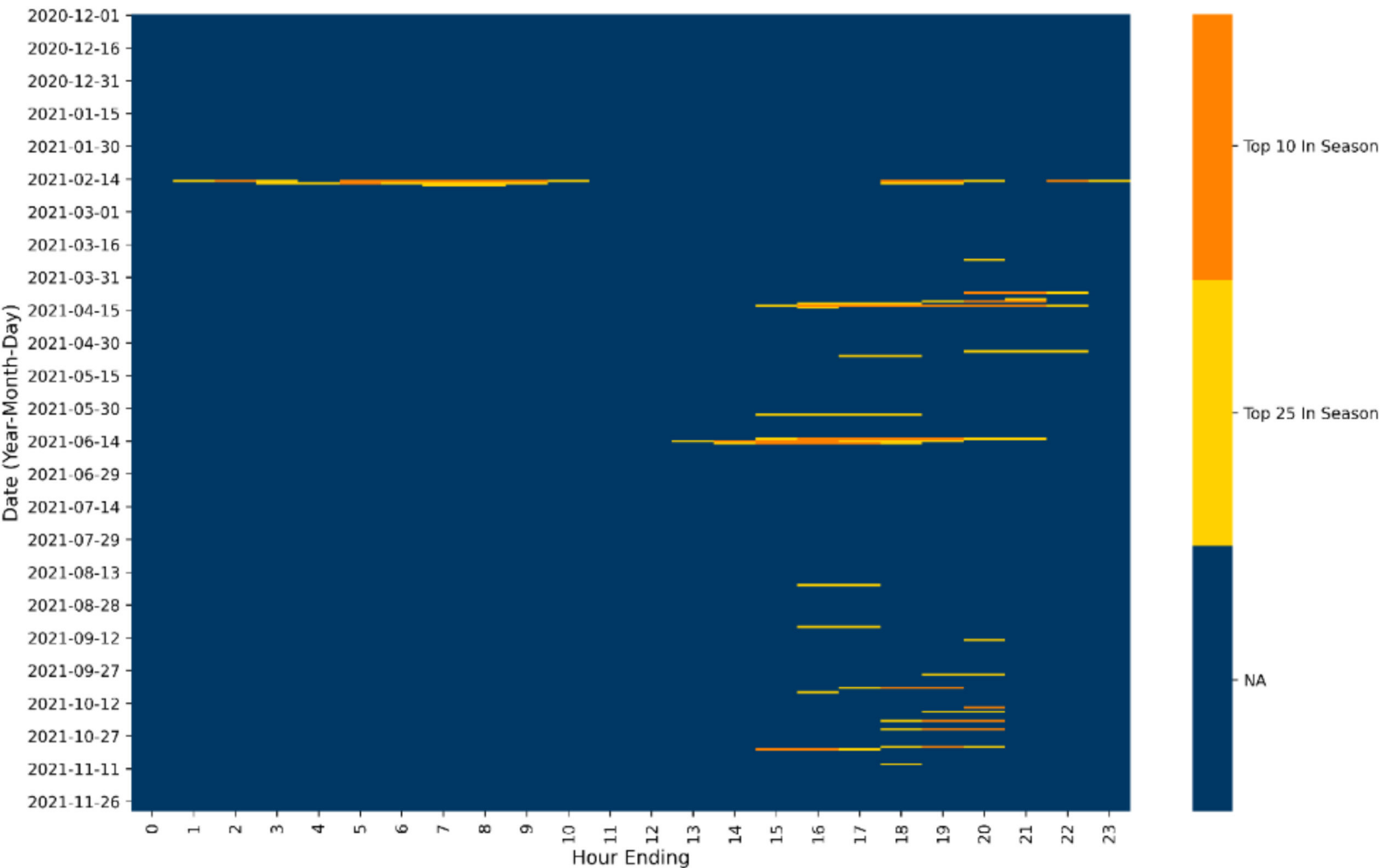
Season	Summary
Winter	Feb-10 @HE19 (4,223 MW)
Winter	Feb-10 @HE20 (4,598 MW)
Winter	Feb-14 @HE8 (4,947 MW)
Winter	Feb-10 @HE18 (4,967 MW)
Winter	Feb-14 @HE7 (5,564 MW)
Winter	Feb-05 @HE20 (5,602 MW)
Winter	Feb-05 @HE19 (5,790 MW)
Winter	Feb-10 @HE21 (5,793 MW)
Winter	Feb-14 @HE9 (6,218 MW)
Winter	Jan-22 @HE19 (6,438 MW)
Spring	Mar-24 @HE20 (3,886 MW)
Spring	Apr-27 @HE17 (4,327 MW)
Spring	Apr-27 @HE18 (4,441 MW)
Spring	Mar-24 @HE19 (4,475 MW)
Spring	Apr-09 @HE15 (4,588 MW)
Spring	Apr-08 @HE18 (4,660 MW)
Spring	May-22 @HE16 (4,695 MW)
Spring	Apr-09 @HE14 (4,795 MW)
Spring	May-22 @HE17 (4,798 MW)
Spring	Apr-27 @HE19 (4,809 MW)
Summer	Aug-31 @HE17 (3,577 MW)
Summer	Aug-15 @HE16 (3,729 MW)
Summer	Aug-15 @HE17 (3,934 MW)
Summer	Aug-14 @HE16 (4,294 MW)
Summer	Aug-15 @HE15 (4,316 MW)
Summer	Aug-14 @HE15 (4,376 MW)
Summer	Aug-14 @HE17 (4,497 MW)
Summer	Aug-31 @HE15 (4,553 MW)
Summer	Aug-16 @HE15 (4,706 MW)
Summer	Aug-16 @HE16 (4,786 MW)
Fall	Oct-26 @HE14 (4,073 MW)
Fall	Nov-05 @HE18 (4,078 MW)
Fall	Sep-12 @HE17 (4,122 MW)
Fall	Oct-26 @HE19 (4,133 MW)
Fall	Sep-12 @HE18 (4,156 MW)
Fall	Oct-26 @HE15 (4,222 MW)
Fall	Oct-26 @HE21 (4,389 MW)
Fall	Nov-05 @HE19 (4,392 MW)
Fall	Nov-11 @HE18 (4,539 MW)
Fall	Oct-09 @HE18 (4,563 MW)

2021 Real Time Margin



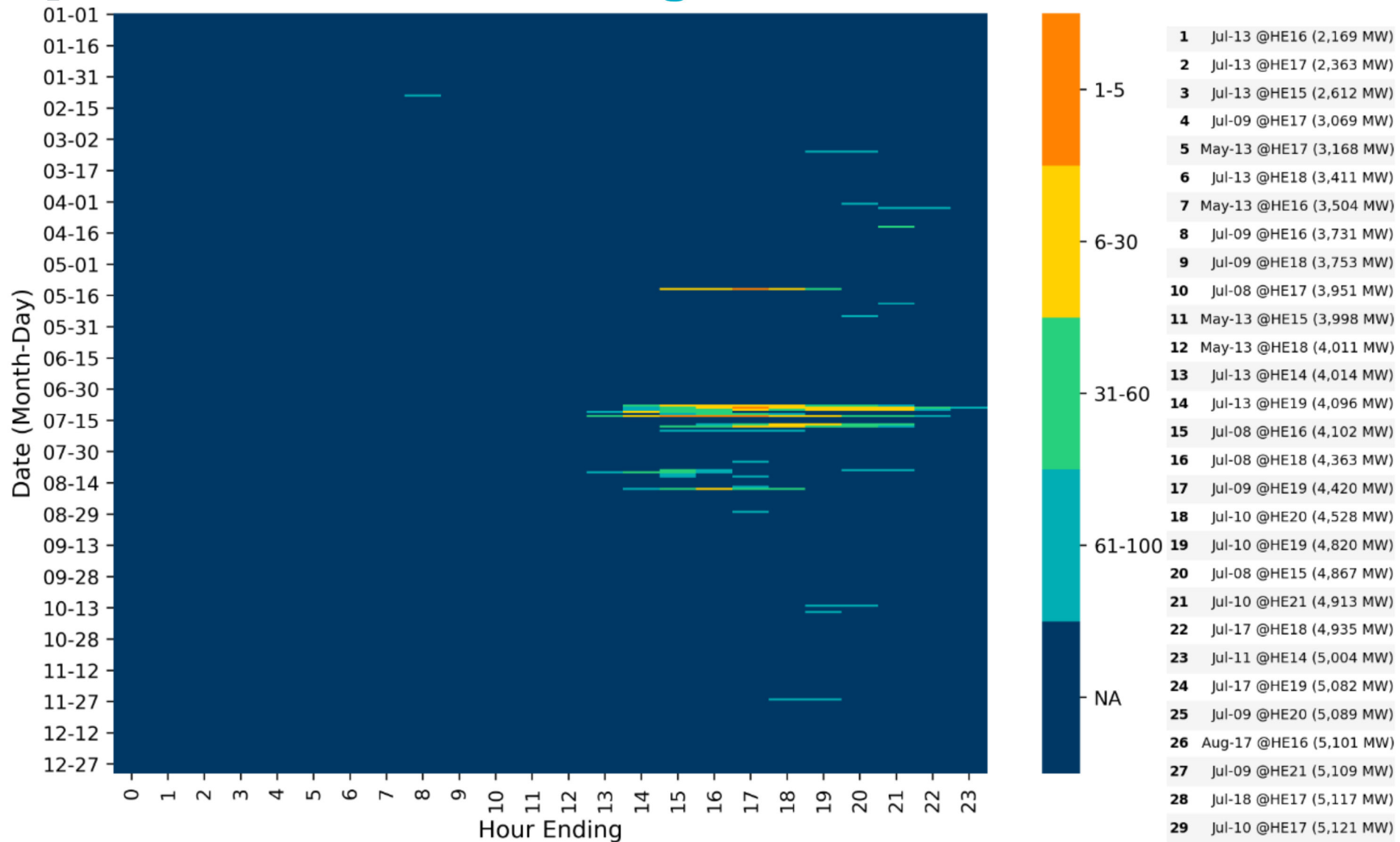
1	Feb-15 @HE2 (27 MW)
2	Feb-15 @HE5 (56 MW)
3	Feb-15 @HE6 (93 MW)
4	Feb-15 @HE7 (231 MW)
5	Feb-15 @HE8 (321 MW)
6	Feb-15 @HE18 (393 MW)
7	Feb-16 @HE5 (466 MW)
8	Feb-15 @HE9 (506 MW)
9	Feb-15 @HE19 (551 MW)
10	Feb-15 @HE22 (754 MW)
11	Feb-17 @HE7 (1,051 MW)
12	Feb-16 @HE18 (1,062 MW)
13	Feb-15 @HE10 (1,064 MW)
14	Feb-16 @HE7 (1,072 MW)
15	Feb-15 @HE1 (1,105 MW)
16	Feb-17 @HE8 (1,109 MW)
17	Feb-16 @HE4 (1,240 MW)
18	Feb-16 @HE9 (1,259 MW)
19	Feb-16 @HE19 (1,313 MW)
20	Feb-15 @HE23 (1,354 MW)
21	Feb-16 @HE8 (1,354 MW)
22	Feb-16 @HE6 (1,507 MW)
23	Feb-15 @HE3 (1,551 MW)
24	Feb-15 @HE20 (1,553 MW)
25	Feb-16 @HE3 (1,559 MW)
26	Feb-15 @HE4 (1,582 MW)
27	Feb-17 @HE6 (1,681 MW)
28	Feb-15 @HE17 (1,726 MW)
29	Feb-15 @HE24 (2,055 MW)
30	Feb-17 @HE9 (2,056 MW)

2021 Real Time Margin - Seasonal

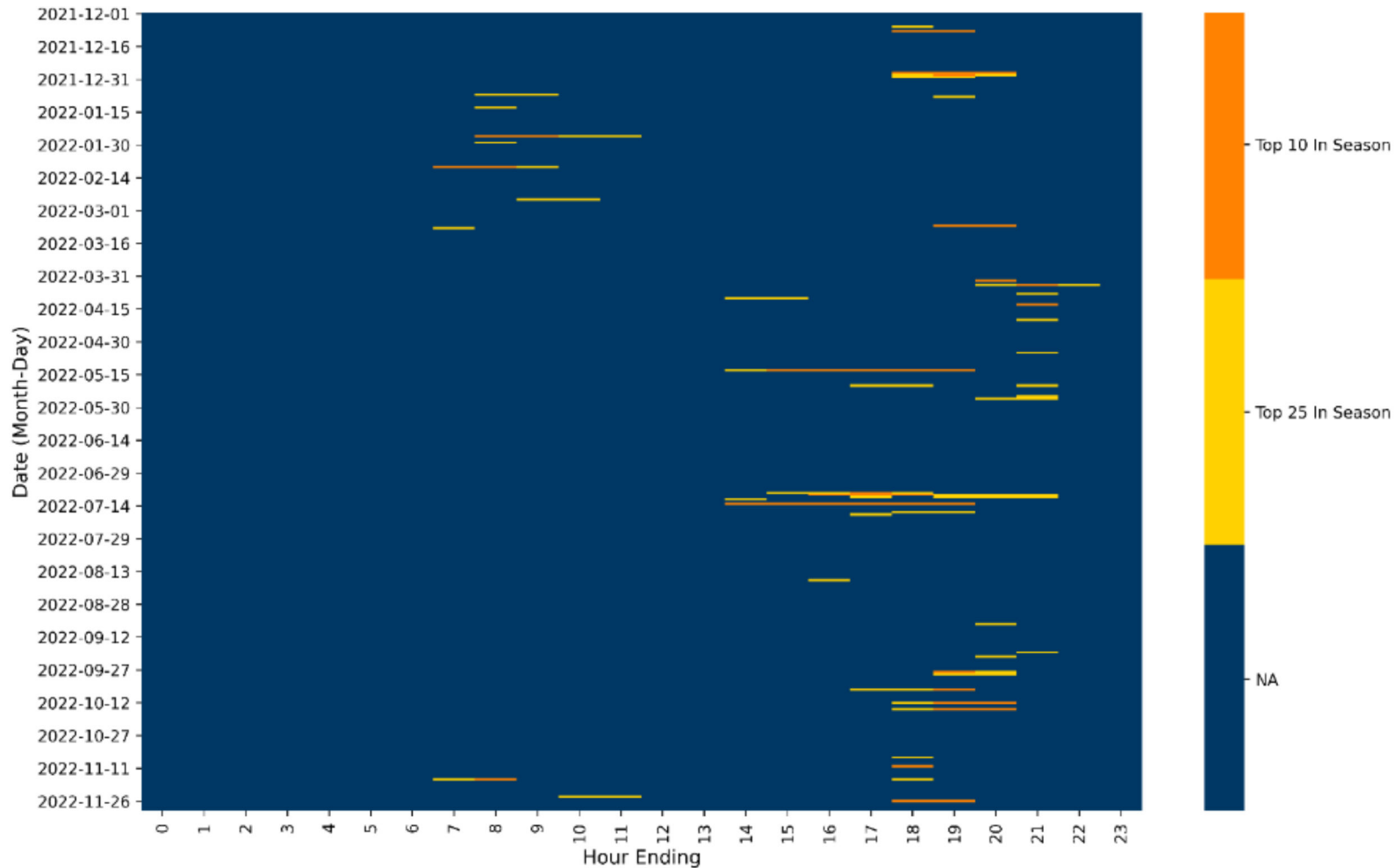


Season	Summary
Winter	Feb-15 @HE2 (27 MW)
Winter	Feb-15 @HE5 (56 MW)
Winter	Feb-15 @HE6 (93 MW)
Winter	Feb-15 @HE7 (231 MW)
Winter	Feb-15 @HE8 (321 MW)
Winter	Feb-15 @HE18 (393 MW)
Winter	Feb-16 @HE5 (466 MW)
Winter	Feb-15 @HE9 (506 MW)
Winter	Feb-15 @HE19 (551 MW)
Winter	Feb-15 @HE22 (754 MW)
Spring	Apr-13 @HE18 (2,172 MW)
Spring	Apr-13 @HE19 (2,520 MW)
Spring	Apr-13 @HE17 (2,624 MW)
Spring	Apr-11 @HE20 (2,707 MW)
Spring	Apr-11 @HE21 (2,808 MW)
Spring	Apr-13 @HE20 (2,997 MW)
Spring	Apr-13 @HE16 (3,434 MW)
Spring	Apr-13 @HE21 (3,445 MW)
Spring	Apr-07 @HE21 (3,642 MW)
Spring	Apr-07 @HE20 (4,051 MW)
Summer	Jun-13 @HE17 (2,355 MW)
Summer	Jun-14 @HE15 (2,713 MW)
Summer	Jun-13 @HE18 (2,777 MW)
Summer	Jun-13 @HE16 (2,964 MW)
Summer	Jun-14 @HE16 (3,127 MW)
Summer	Jun-14 @HE14 (3,138 MW)
Summer	Jun-15 @HE16 (3,332 MW)
Summer	Jun-15 @HE15 (3,398 MW)
Summer	Jun-13 @HE19 (3,574 MW)
Summer	Jun-15 @HE17 (3,586 MW)
Fall	Oct-24 @HE19 (5,738 MW)
Fall	Oct-20 @HE19 (6,360 MW)
Fall	Oct-24 @HE20 (6,378 MW)
Fall	Oct-20 @HE20 (6,672 MW)
Fall	Nov-02 @HE15 (6,691 MW)
Fall	Nov-02 @HE16 (6,852 MW)
Fall	Nov-01 @HE19 (6,943 MW)
Fall	Oct-05 @HE18 (6,977 MW)
Fall	Oct-14 @HE20 (7,260 MW)
Fall	Oct-05 @HE19 (7,402 MW)

2022 Real Time Margin



2022 Real Time Margin - Seasonal



Season	Summary
Winter	Feb-09 @HE8 (6,926 MW)
Winter	Dec-28 @HE19 (7,526 MW)
Winter	Feb-09 @HE7 (7,811 MW)
Winter	Dec-28 @HE18 (7,860 MW)
Winter	Dec-29 @HE19 (7,968 MW)
Winter	Jan-26 @HE9 (8,010 MW)
Winter	Dec-09 @HE18 (8,038 MW)
Winter	Dec-28 @HE20 (8,125 MW)
Winter	Dec-09 @HE19 (8,307 MW)
Winter	Jan-26 @HE8 (8,309 MW)
Winter	Dec-30 @HE18 (8,902 MW)
Spring	May-13 @HE17 (3,168 MW)
Spring	May-13 @HE16 (3,504 MW)
Spring	May-13 @HE15 (3,998 MW)
Spring	May-13 @HE18 (4,011 MW)
Spring	May-13 @HE19 (6,221 MW)
Spring	Apr-13 @HE21 (6,326 MW)
Spring	Apr-04 @HE21 (6,493 MW)
Spring	Mar-08 @HE20 (6,591 MW)
Spring	Mar-08 @HE19 (6,606 MW)
Spring	May-20 @HE17 (7,390 MW)
Summer	Jul-13 @HE16 (2,169 MW)
Summer	Jul-13 @HE17 (2,363 MW)
Summer	Jul-13 @HE15 (2,612 MW)
Summer	Jul-09 @HE17 (3,069 MW)
Summer	Jul-13 @HE18 (3,411 MW)
Summer	Jul-09 @HE16 (3,731 MW)
Summer	Jul-09 @HE18 (3,753 MW)
Summer	Jul-08 @HE17 (3,951 MW)
Summer	Jul-13 @HE14 (4,014 MW)
Summer	Jul-10 @HE17 (5,121 MW)
Fall	Oct-12 @HE19 (6,537 MW)
Fall	Oct-15 @HE19 (6,702 MW)
Fall	Nov-26 @HE19 (6,766 MW)
Fall	Nov-26 @HE18 (6,774 MW)
Fall	Oct-12 @HE20 (6,883 MW)
Fall	Oct-15 @HE20 (7,141 MW)
Fall	Oct-06 @HE19 (7,725 MW)
Fall	Sep-28 @HE19 (7,845 MW)
Fall	Nov-10 @HE18 (7,951 MW)