Portland General Electric
121 SW Salmon Street · Portland, Ore. 97204

May 5, 2023

Via Electronic Filing

Public Utility Commission of Oregon
Attn: Filing Center
201 High Street, S.E., Suite 100
P.O. Box 1088
Salem, OR 97308-1088

Re: UM 1514 Evaluations of PGE's Energy Partner Schedule 26 Demand Response Program
for the Summer 2021 and Winter 2021/2022 Seasons

Dear Filing Center:

Enclosed is Guidehouse's (formerly Navigant) evaluations of the Portland General Electric
(PGE's) Energy Partner Schedule 26 nonresidential demand response program. The evaluation
provides impact estimates and process recommendations for Summer 2021 and Winter 2021/22.

The Summer 2021 and Winter 2021/22 evaluation reported the following:

The evaluation resulted in the following key impact and process observations during these seasons.

- The program delivered its largest summer season average savings in Summer 2021—
curtailing an average of 13.8 MW per event vs 12.7 MW for Summer 2020—and yielded
an average of 8.6 MW per event in Winter 2021/22 (see Table 1 below).

- The program delivered a realization rate of 73 to 95 percent over the course of six
curtailment events in Summer 2021; the evaluation's calculated total curtailment during
each event was within one percent of the initial post-event analysis for five of six events,
and did not exceed 1.3% for the remaining event.

- The program conducted two Winter 2021/22 events; the events achieved realization rates
of 84 and 62 percent, respectively. The evaluation's calculated total curtailment relative
to the initial post event analysis for each event was 0.1% and 2.6%, respectively.

- Impact results contained discrepancies greater than 5% of the customer's nomination for
30 of 78 customers for Summer 2021 season and 14 of 76 customers for Winter 2021/22.
Typical drivers of the discrepancies include:

  - Minor differences between pulse meter and AMI hourly data sources, which
propagates to differences in impact results;

- o Minor differences in AMI hourly data, which are due to historical corrections made to the AMI data after it is delivered to the program vendor for analysis;

- o Instances of incomplete data used for baseline calculation resulting in substantially different impact calculations.

- o Estimated or incomplete AMI data for some site days, resulting in vendor inability to verify the reliability of the participant's pulse meter data;

- o Missing data for one of several meters for a customer.

In the time since the end of the event seasons described in these reports, the program vendor has instituted quality control processes to address the latter three bullets noted above.

The Summer 2021 Process evaluation identified the following program findings based on staff and implementer interviews:

- PGE is in the midst of exploring incentive design updates to minimize payments for capabilities that customers rarely use, and optimize incentives to improve consistency of customer participation. PGE's program team is in close coordination with its Power Operations group on design updates to drive value of the program as a market resource.

- PGE Program and Power Operations staff is focused on developing a pathway for the resource to participate in the CAISO real-time market. As a pathway to CAISO participation continues to be developed and implemented, PGE should continue to monitor impacts to customer experience that may result from potential changes to event frequency, consecutive day events, or performance degradation during moderate weather events.

- Program growth is a continued priority for PGE, and a shift to recruitment of unmanaged customers is underway. Identification of eligible unmanaged customers has come with challenges; new strategies that have proven to be effective in customer recruitment include targeting business types that are sole proprietorships and working with national corporations to aggregate multiple smaller locations to participate in the program.

- Relationships with program vendors has been relatively smooth, with a successful transition to Generac's Concerto system and minor issues with the transition from 4G to 5G and transition of program notifications in Winter 2021/22.

- Opportunities for program growth include adjustments to the tariff for optimized customer performance relative to cost, increased participation from battery storage, continued emphasis on active recruiting from key program stakeholders (i.e., CLEAResult, PGE Business Customer Outreach, Key Customer Managers, internal marketing), and exploration of synergies with PGE's transportation electrification offerings.

Table 1 below summarizes Schedule 26 enrollment and performance by season over time and shows the success the program.

Table 1. Summary of Schedule 26 Enrollment and Performance by Season

Season	Max. MW Nominated	Max # Enrolled	Max. MW Reduction	Avg. MW Reduction per Event	Avg. Realization Rate
Winter 2017–2018	4.0	33	2.7	2.7	66%
Summer 2018	8.8	43	11.8	10.5	131%
Winter 2018–2019	9.8	45	6.6	6.6	68%
Summer 2019	15.2	50	13.8	12.4	82%
Winter 2019–2020	11.8	61	8.5	8.5	73%
Summer 2020	14.3	61	13.5	12.7	91%
Winter 2020–2021	11.7	67	10.4	10.2	91%
Summer 2021	18.0	77	18.0	13.8	83%
Winter 2021-2022	12.1	76	10.1	8.7	73%

If you have any questions or require further information, please contact Megan Stratman at megan.stratman@pgn.com. Please direct all formal correspondence and requests to the following e-mail address pge.opuc.filings@pgn.com.

Sincerely,

/s/ *Jaki Ferchland*
Jaki Ferchland
Manager, Revenue Requirement

JF: dm
Enclosures

cc: UM 1514 Service List

Memorandum

To:	**Adam Gardels, Danny Grady, Portland General Electric**
From:	**Robin Maslowski, Isabeau Hitzman, Presley Batchelor**
Date:	**January 31, 2023**
Re:	**PGE Energy Partner Impact Evaluation – Summer 2021 & Winter 2021-22 Summary**

Introduction and Summary

Guidehouse conducted an impact and process evaluation of Portland General Electric's (PGE) Energy Partner Schedule 26 demand response (DR) program for medium / large customers during the Summer 2021 and Winter 2021-22 seasons. The goal of Guidehouse's impact evaluation was to replicate and validate the impact calculations for settlement payment performed by CLEAResult, PGE's implementation contractor. The goal of the process evaluation was to understand recent and upcoming changes to the Energy Partner program with Schedule 26. This memo summarizes the findings and issues encountered while validating CLEAResult's impact results for the events of the Summer 2021 and Winter 2021-22 seasons.

In comparison to CLEAResult's calculated impacts, Guidehouse identified discrepancies[1] in results for 30 out of 78 customers across all events[2] in the Summer 2021 season. Four customers' incentive levels were affected—specifically, B26-AGR-1000011 reached or exceeded 70% of their nomination for the July 29th event, B26-AGR-1000022 did for the July 29th and September 9th events, B26-AGR-1000036 did for the June 28th event, B26-AGR-1000063 did for the two June events. Guidehouse recommends that PGE provide these customers their incentive payment. In the Winter 2021-22 season, Guidehouse identified discrepancies in results for 14 out of 76 customers across all events[3]. No customers' incentive levels were affected. Details on the causes of discrepancies are discussed further in the Impact Result Discrepancies section, below.

As noted in past evaluation cycles, Guidehouse recommends continuing to enhance quality assurance processes during the season to maximize the completeness of AMI and Pelican data used for both CLEAResult and Guidehouse analyses.

Approach and Data Sources

CLEAResult performs post-event analysis within the season to develop impact calculations. CLEAResult's impact calculations primarily used Pelican data[4], where it was available, since their AMI

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[1] A discrepancy is where Guidehouse calculates a different impact than CLEAResult's calculated impact for a given customer.
[2] 78 customers reflect CBL customers only and do not include Firm Service Load customers. There were four Firm Service Load customers and two CBL customers excluded from analysis due to missing AMI data, for a total of 84 participants in Summer 2021.
[3] 76 customers reflect CBL customers only and do not include Firm Service Load customers. There were five Firm Service Load customers, for a total of 81 participants in Winter 2021-22.
[4] Pelican data are real-time usage data from CLEAResult's Pelican devices.

feed is occasionally delayed for some sites. If Pelican data was not available or complete, CLEAResult then used the AMI data from their daily in-season feed.

In contrast, Guidehouse uses the historically corrected post-season AMI data for the impact evaluation since this data is the system of record. In the past, Guidehouse has supplemented the AMI data with Pelican data provided by CLEAResult to fill in gaps if the AMI data was not available or complete. Guidehouse did not supplement the AMI data for this evaluation due to timeline delays. There were two customers who were excluded from the Summer 2021 analysis due to missing AMI data: B26-AGR-1000020 and B26-AGR-1000066.

Guidehouse used PGE's Customer Baseline Load (CBL) methodology to calculate the impact for the Summer DR events. The CBL calculation starts with a participant's interval data for ten non-event days preceding the event day. A non-event day is a business day in which an event was not called and does not fall on a holiday.

Guidehouse calculated the average load for each non-event day during the same hours as the event hours. Guidehouse selected baseline days as the five non-event days with the highest average loads. The average load across the five baseline days for each hour of the event period represented the Unadjusted Baseline.

To calculate the Adjusted Baseline, an additive adjustment was first calculated based on an adjustment period. The adjustment period is the two-hour period beginning six hours before the event start time and ending four hours before the end start time. Guidehouse calculated the average load during the adjustment period on the event day and baseline days, which are the event day adjustment load and baseline adjustment load, respectively. The additive adjustment is the event day adjustment load minus the baseline adjustment load. Guidehouse calculated the Adjusted Baseline as the sum of the Unadjusted Baseline and additive adjustment.

An Unadjusted Baseline is used as the basis for a customer's payment settlement if the participant receives an 18-hour advance notification, the event occurred during a winter morning, or CLEAResult has determined that a non-adjusted baseline is a better measure for on-site operations—otherwise, the customer's payment settlement is based on an Adjusted Baseline. For the Summer 2021 analysis, 36 out of 78 participants had an Unadjusted Baseline as the basis for their payment settlement, with an Adjusted Baseline applying to the remainder. For the Winter 2021-22 analysis, all participants had an Unadjusted Baseline as the basis for their payment settlement.

Each participant's system impact was calculated as the difference between their Adjusted or Unadjusted Baseline and average load during the event day. A positive system impact denotes that a participant's demand is higher than their baseline; thus, no DR was delivered. A negative system impact indicates that a participant delivered DR.

Impact Summary

The impact of the eight events that occurred during the Summer 2021 and Winter 2021-22 seasons is summarized in Table 1. Guidehouse estimates a total reduction of up to 14,070 kW, with a realization rate of up to 95% during Summer 2021. For Winter 2021-22, Guidehouse estimates a total reduction of up to 10,142 kW, with a realization rate of up to 84%. Note that the Summer 2020 and Winter 2020-21 events had realization rates of up to 96%.

Guidehouse's estimated total demand reduction is up to 2.6% higher and as much as 1.3% lower than CLEAResult's. Guidehouse identified 30 customers where the discrepancy between Guidehouse and

CLEAResult's calculated impacts per event differed by 5% or greater of the nomination. These customers are further discussed in Impact Result Discrepancies section, below.

Table 1 Summary of Summer 2021 and Winter 2021-22 Events[5]

Event Date	6/21/2021	6/28/2021[6]	7/29/2021	8/4/2021	8/12/2021	9/9/2021	2/2/2022	2/23/2022
Event Time	5pm to 8pm	5pm to 8pm	5pm to 8pm	5pm to 8pm	5pm to 8pm	5pm to 8pm	8am to 11am	7am to 10am
Customers Called in Event	72	67	71	74	72	77	73	76
Total Nomination (kW)	16,320	13,915	16,245	16,443	16,053	18,018	12,079	11,613
Guidehouse Calculated Total Reduction - CBL Customers (kW)	12,721	13,274	13,155	14,070	13,806	13,157	10,142	7,215
CLEAResult Calculated Total Reduction - CBL Customers (kW)	12,675	13,343	13,083	14,144	13,987	13,207	10,154	7,032
Difference (kW)	47	-69	71	-74	-180	-49	-13	182
Difference (%)	0.4%	-0.5%	0.5%	-0.5%	-1.3%	-0.4%	-0.1%	2.6%
Customers That Delivered DR (Guidehouse Analysis)	60	60	58	63	61	63	70	60
Guidehouse Realization Rate[7]	78%	95%	81%	86%	86%	73%	84%	62%

Customers Not Delivering Demand Response

Thirty-five customer sites did not deliver any DR for at least one event called during the Summer 2021 season, and eighteen customer sites did not deliver DR for at least one event called during Winter 2021-22. Figures 1 to 14 list these customers and compare their nomination to their system impact for these

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[5] Reflects only CBL customers. Evaluation of Firm Service Load customers is out of scope.
[6] The event on June 28th, 2021, occurred during Portland's extreme weather event.
[7] Total curtailment divided by total nomination.

events. In the figures below, the sign on system Impact is inverted compared to other tables. Reductions to usage are shown as positive values, while increases to usage are shown as negative values.

Figure 1 Customers Not Delivering DR on June 21st (1 of 2)

	B26-AGR-1000006	B26-AGR-1000018	B26-AGR-1000039	B26-AGR-1000043	B26-AGR-1000058	B26-AGR-1000059
■ System Impact (kW)	-62.66	-325.92	-48.95	-1.96	-161.12	-21.83
■ Nomination (kW)	250	650	125	45	425	100
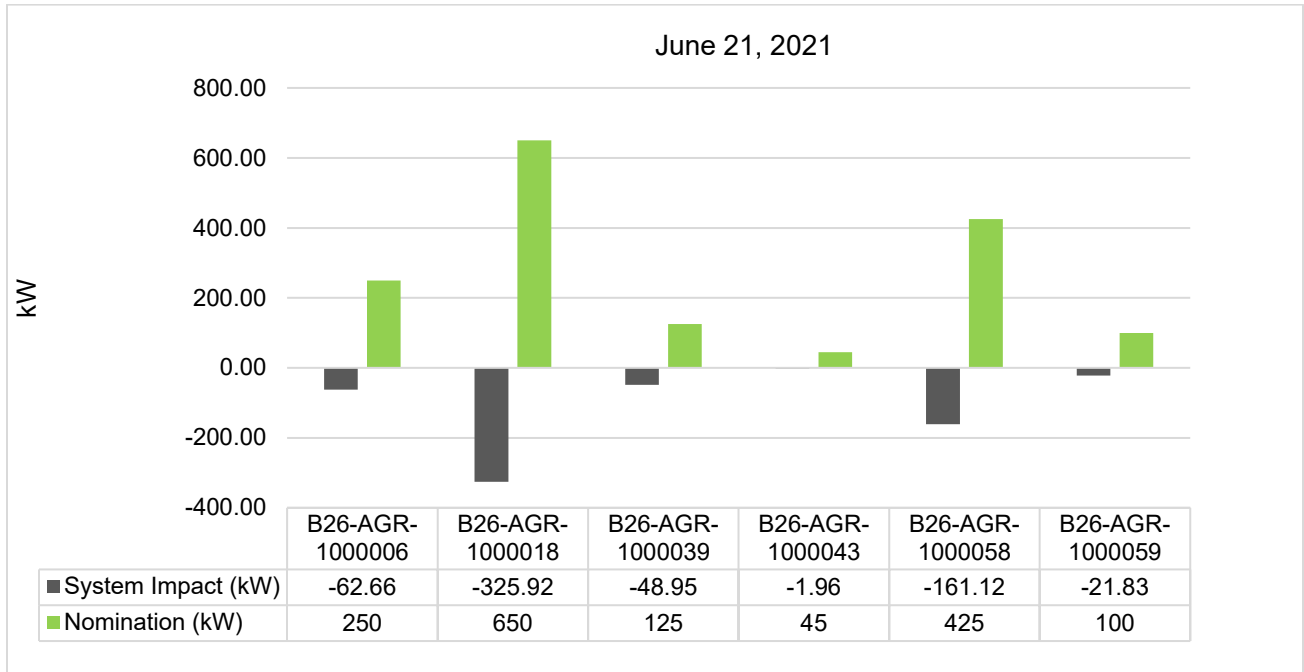
Figure 2 Customers Not Delivering DR on June 21st (2 of 2)

	B26-AGR-1000062	B26-AGR-1000064	B26-AGR-1000075	B26-AGR-1000511	B26-AGR-1000635	B26-AGR-1000740
■ System Impact (kW)	-35.92	-145.60	-21.87	-10.06	-118.63	-35.89
■ Nomination (kW)	50	20	80	50	100	75
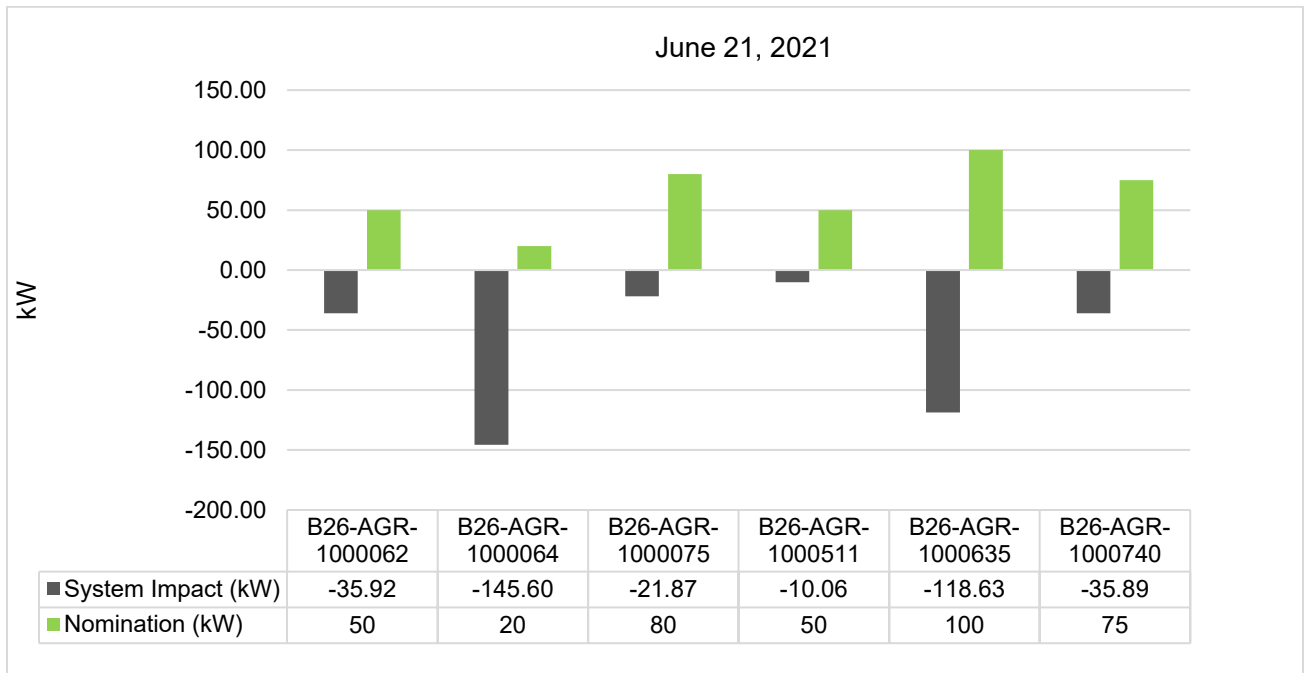
Figure 3 Customers Not Delivering DR on June 28th

	B26-AGR-1000011	B26-AGR-1000023	B26-AGR-1000027	B26-AGR-1000043	B26-AGR-1000062	B26-AGR-1000064	B26-AGR-1000511
■ System Impact (kW)	-0.28	-767.35	-186.96	-1.70	-27.33	-62.94	-11.24
■ Nomination (kW)	50	230	100	45	50	20	50
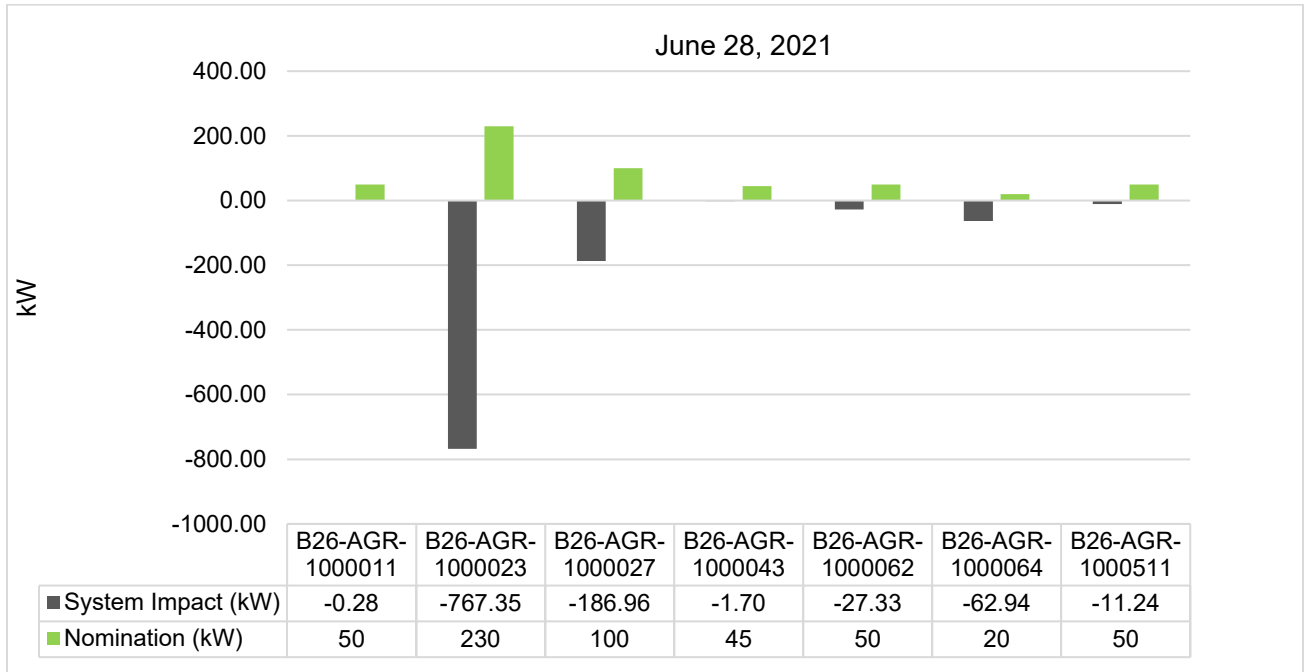
Figure 4 Customers Not Delivering DR on July 29th (1 of 2)

	B26-AGR-1000005	B26-AGR-1000007	B26-AGR-1000010	B26-AGR-1000016	B26-AGR-1000023	B26-AGR-1000026	B26-AGR-1000052
■ System Impact (kW)	-31.34	-5.80	-39.62	-25.15	-102.38	-32.90	-30.22
■ Nomination (kW)	125	65	60	40	230	50	250
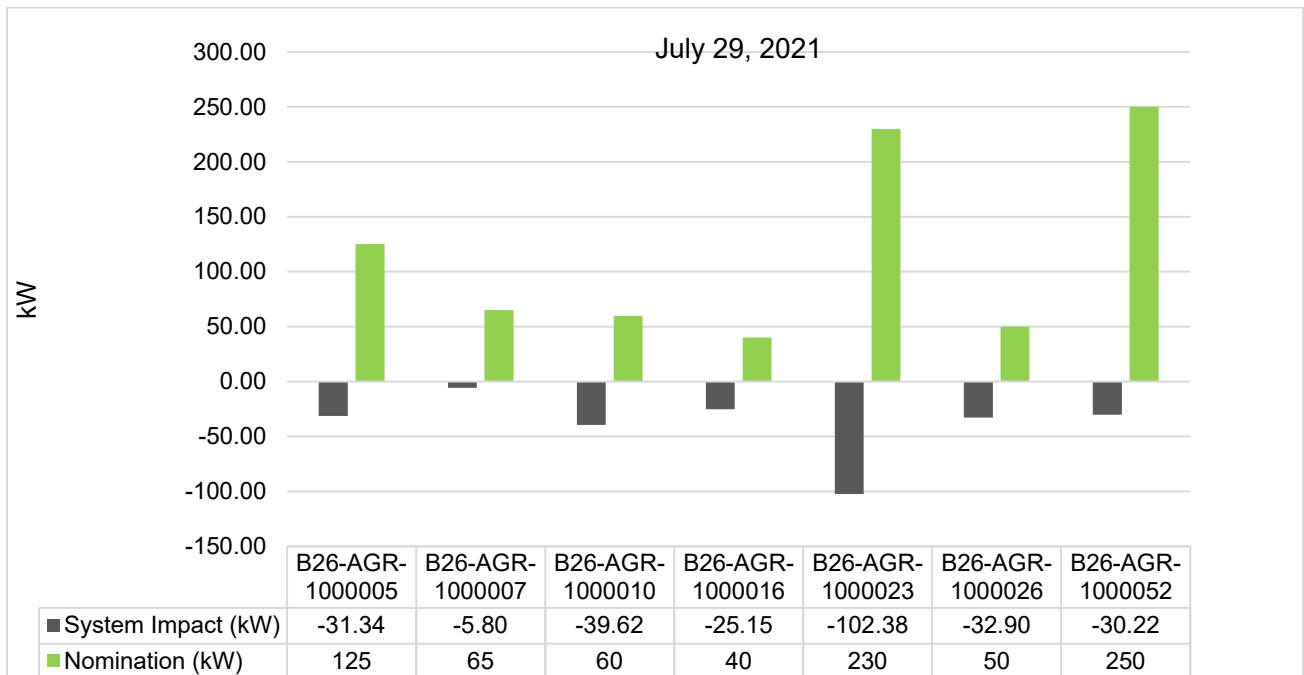
Figure 5 Customers Not Delivering DR on July 29ᵗʰ (2 of 2)

July 29, 2021

	B26-AGR-1000062	B26-AGR-1000063	B26-AGR-1000075	B26-AGR-1000149	B26-AGR-1000544	B26-AGR-1000635
■ System Impact (kW)	-17.61	-4.82	-10.13	-19.54	-71.02	-157.23
■ Nomination (kW)	50	60	80	200	150	100
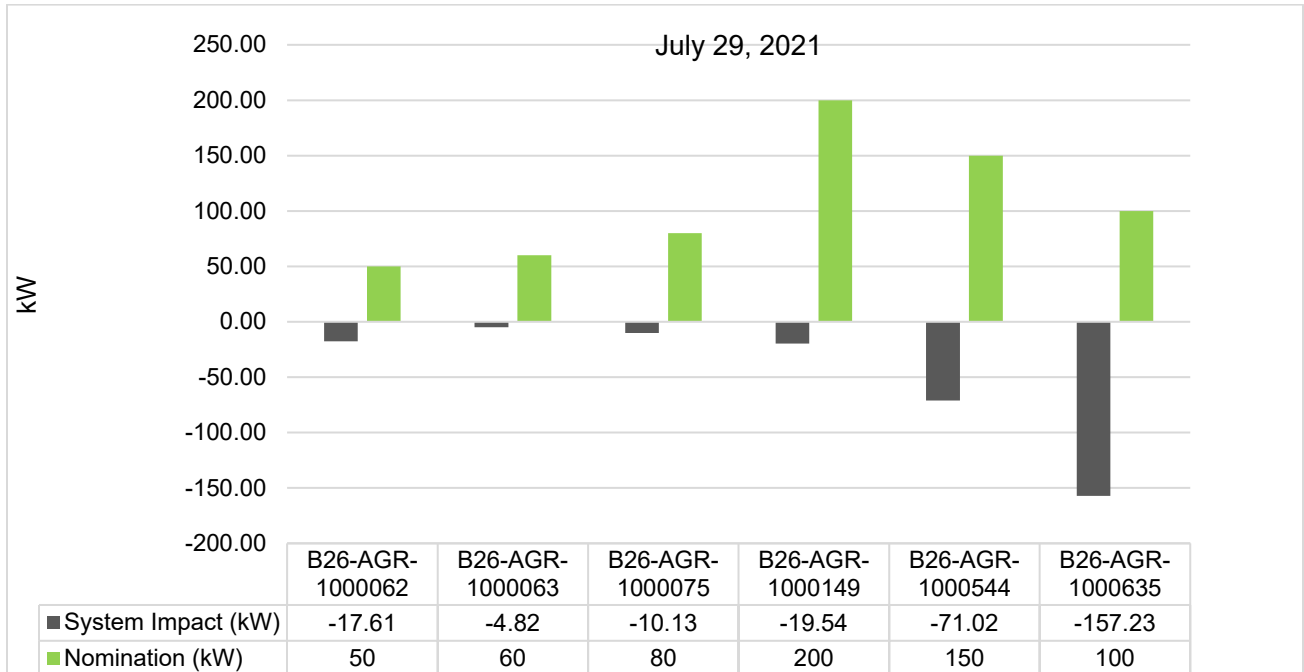
Figure 6 Customers Not Delivering DR on August 4ᵗʰ (1 of 2)

August 4, 2021

	B26-AGR-1000006	B26-AGR-1000016	B26-AGR-1000018	B26-AGR-1000026	B26-AGR-1000059	B26-AGR-1000062
■ System Impact (kW)	-59.56	-10.49	-76.01	-62.10	-7.48	-3.58
■ Nomination (kW)	250	40	650	50	100	50
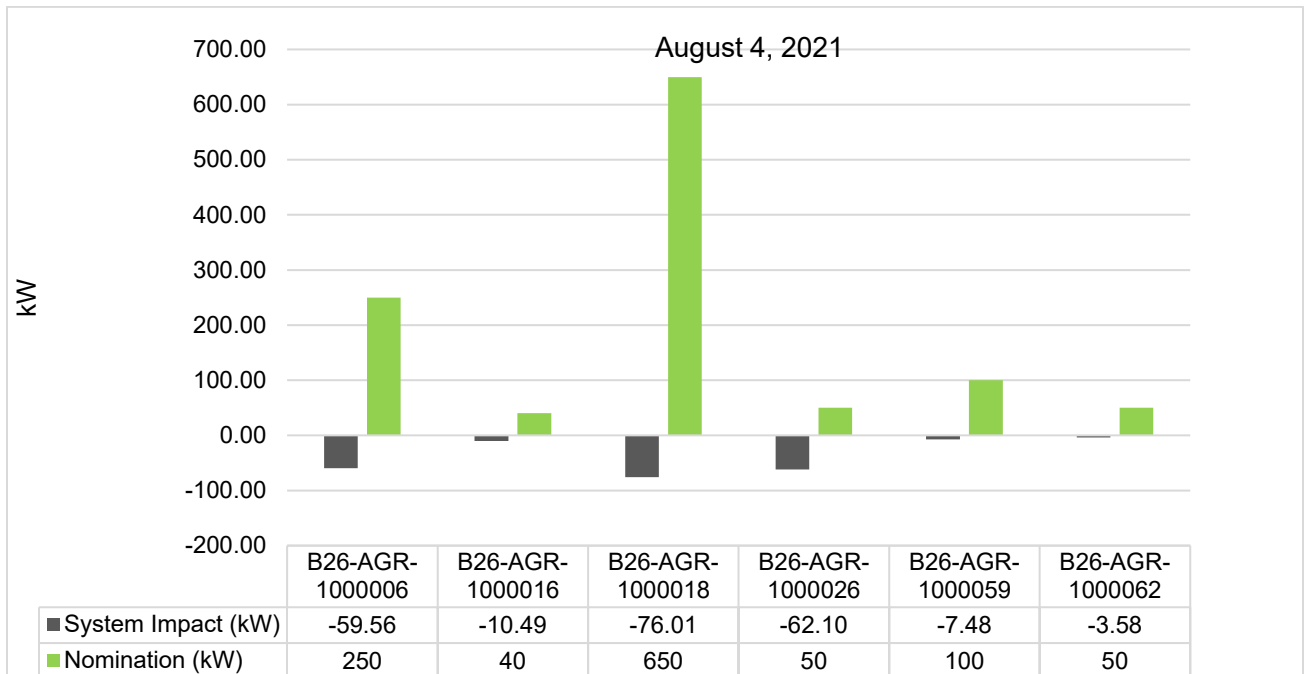
Figure 7 Customers Not Delivering DR on August 4th (2 of 2)

	B26-AGR-1000063	B26-AGR-1000151	B26-AGR-1000152	B26-AGR-1000178	B26-AGR-1000644
■System Impact (kW)	-8.34	-69.92	-57.77	-26.17	-38.77
■Nomination (kW)	60	300	115	250	95
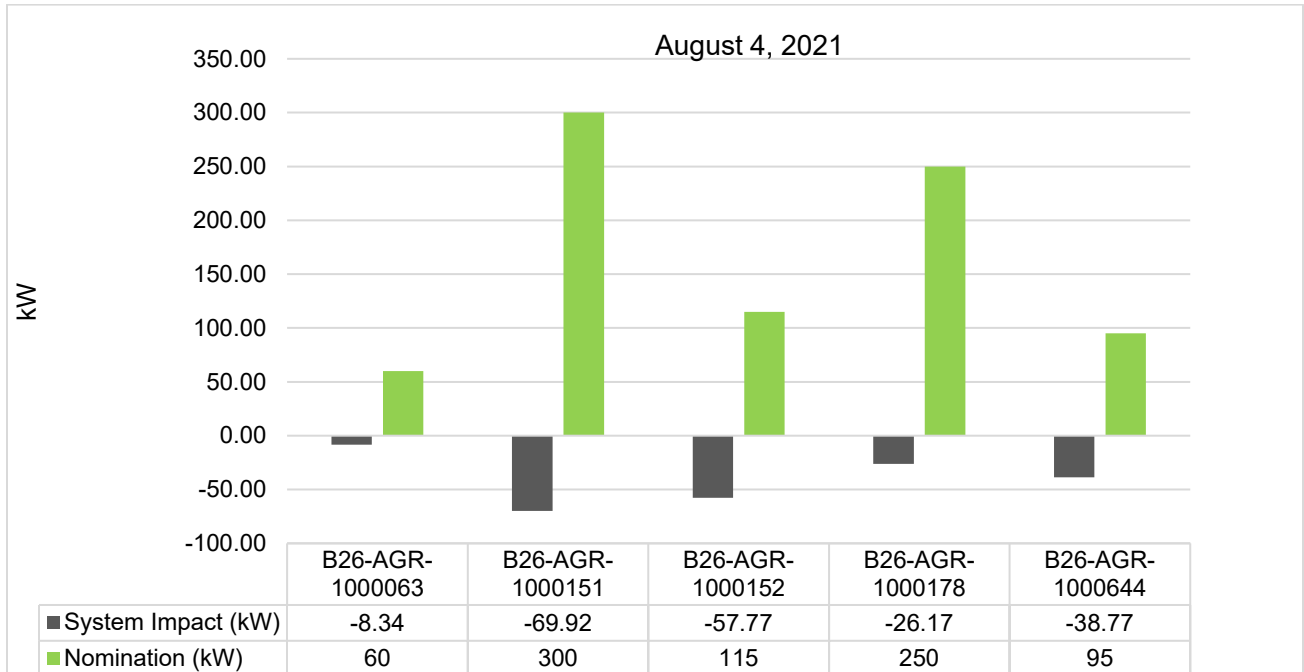
Figure 8 Customers Not Delivering DR on August 12th (1 of 2)

	B26-AGR-1000005	B26-AGR-1000012	B26-AGR-1000027	B26-AGR-1000043	B26-AGR-1000062	B26-AGR-1000063
■System Impact (kW)	-10.80	-5.51	-155.67	-5.07	-14.97	-68.89
■Nomination (kW)	125	85	100	45	50	60
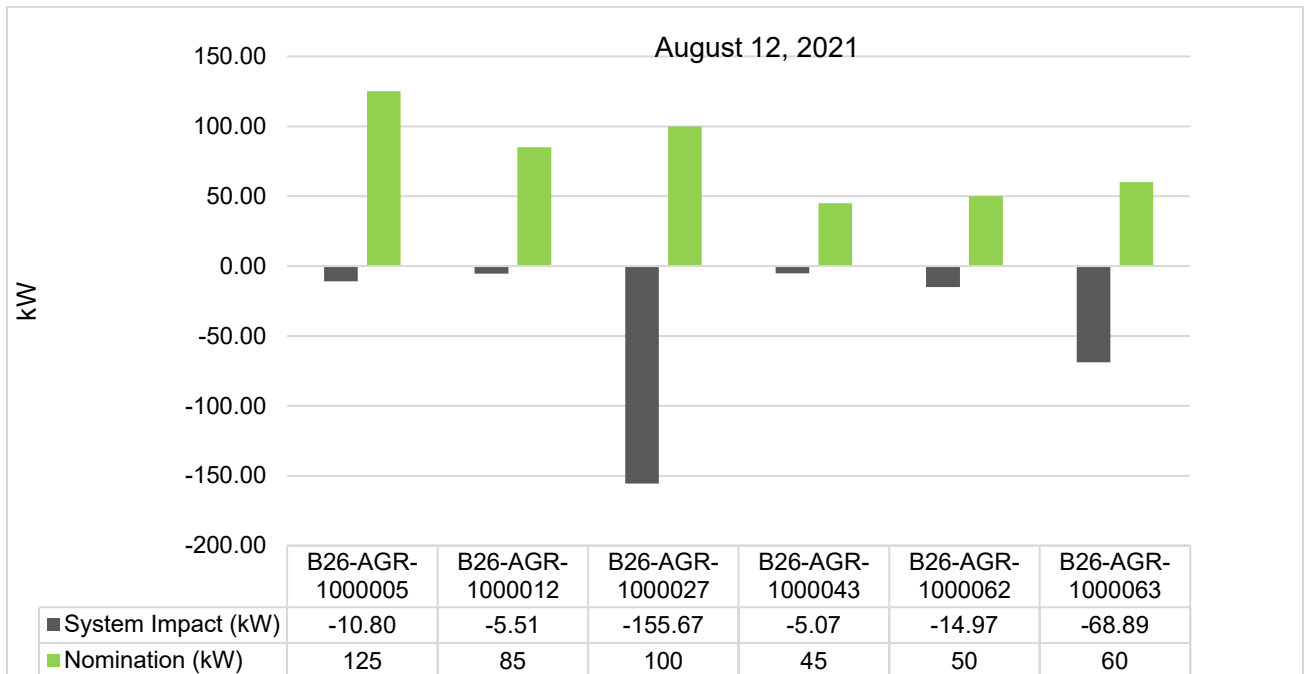
Figure 9 Customers Not Delivering DR on August 12th (2 of 2)

	B26-AGR-1000064	B26-AGR-1000075	B26-AGR-1000151	B26-AGR-1000178	B26-AGR-1000544
System Impact (kW)	-23.28	-7.61	-224.34	-3.40	-37.81
Nomination (kW)	20	80	300	250	150
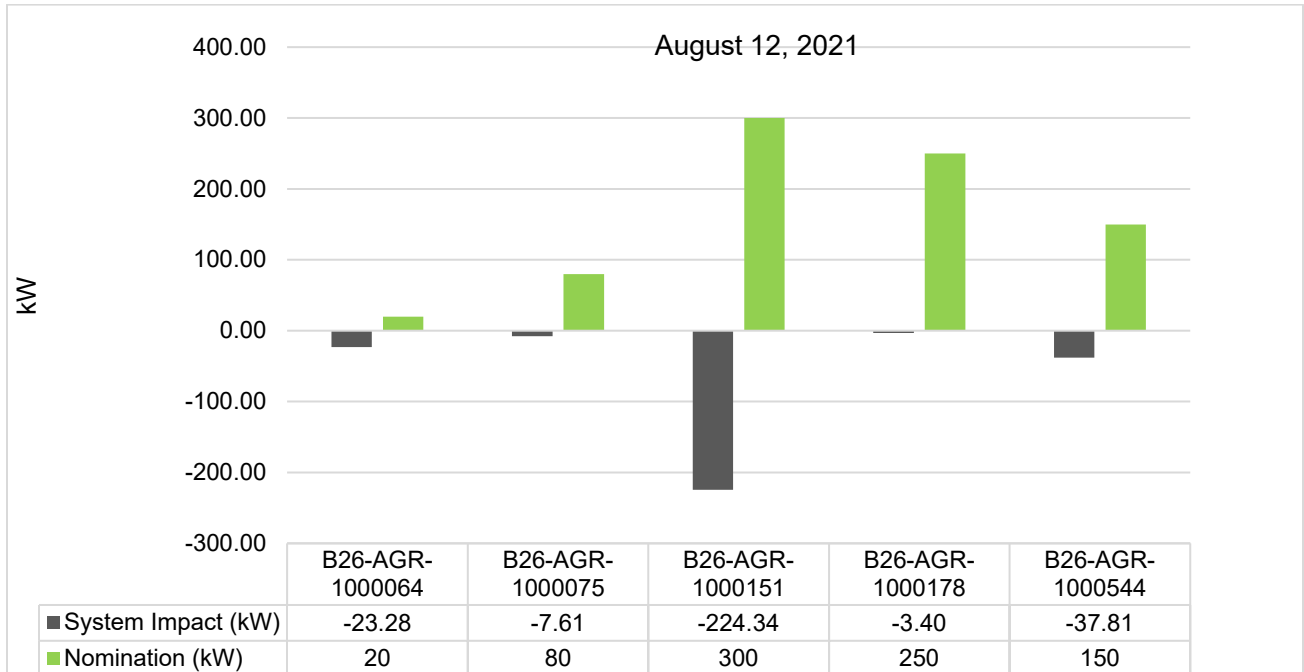
Figure 10 Customers Not Delivering DR on September 9th (1 of 2)

	B26-AGR-1000002	B26-AGR-1000016	B26-AGR-1000039	B26-AGR-1000040	B26-AGR-1000049	B26-AGR-1000052	B26-AGR-1000058
System Impact (kW)	-46.85	-18.50	-8.82	-92.30	-5.50	-0.32	-42.50
Nomination (kW)	200	40	125	70	350	250	425
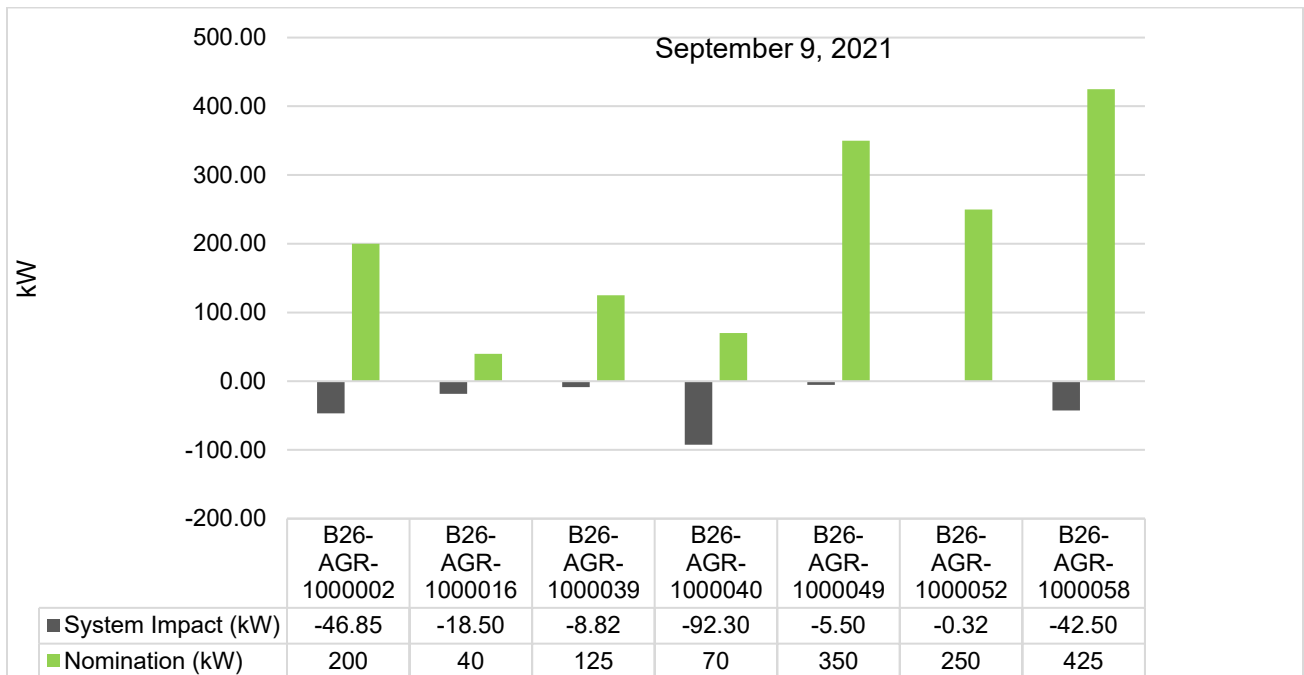
Figure 11 Customers Not Delivering DR on September 9th (2 of 2)

	B26-AGR-1000062	B26-AGR-1000064	B26-AGR-1000069	B26-AGR-1000511	B26-AGR-1000544	B26-AGR-1000631	B26-AGR-1000644
System Impact (kW)	-27.87	-5.19	-0.02	-3.55	-275.35	-26.35	-5.17
Nomination (kW)	50	20	20	50	150	800	95
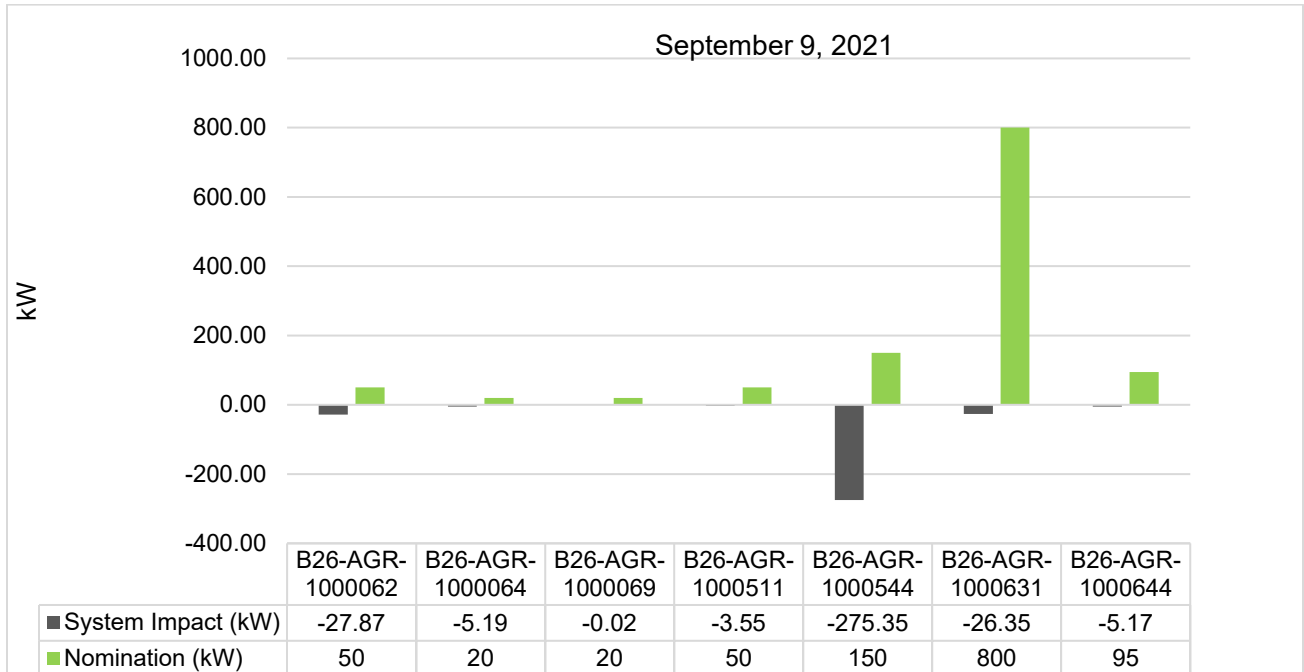
Figure 12 Customers Not Delivering DR on February 2nd

	B26-AGR-1000075	B26-AGR-1000178	B26-AGR-1000631
System Impact (kW)	-7.97	-34.79	-318.49
Nomination (kW)	20	200	250
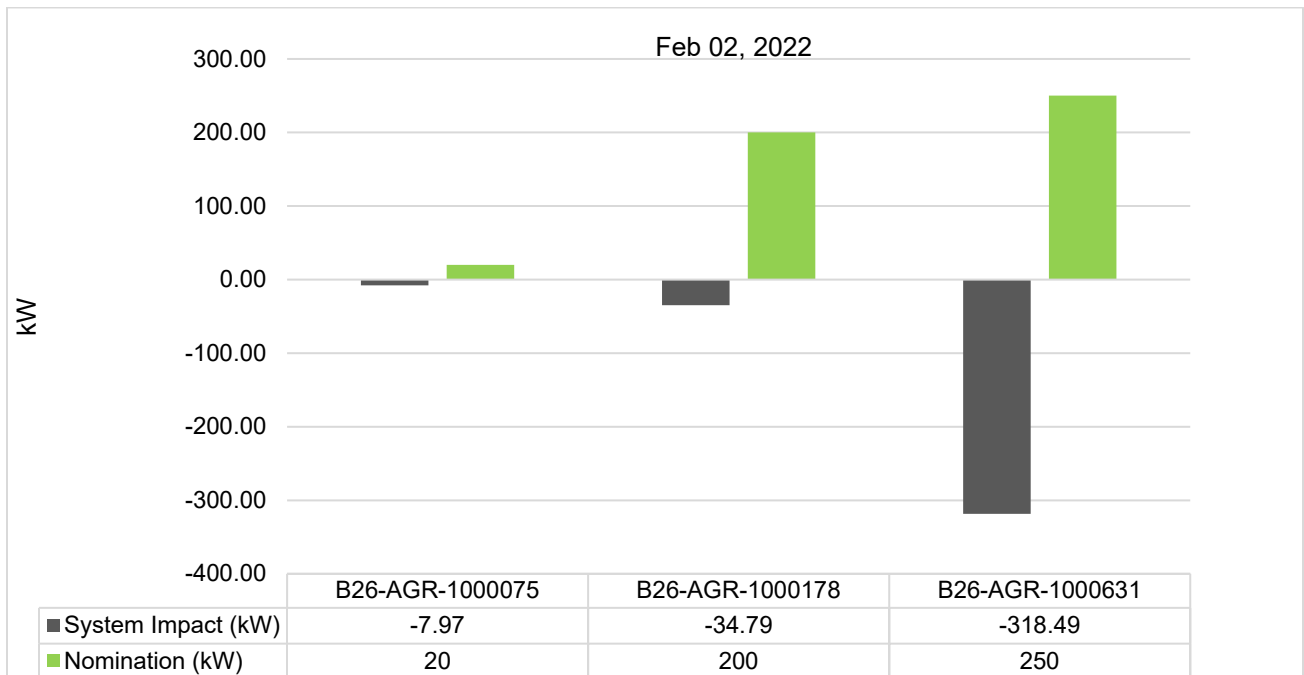
Figure 13 Customers Not Delivering DR on February 23rd (1 of 2)

	B26-AGR-1000012	B26-AGR-1000016	B26-AGR-1000023	B26-AGR-1000034	B26-AGR-1000051	B26-AGR-1000064	B26-AGR-1000074	B26-AGR-1000149
System Impact (kW)	-0.32	-10.37	-395.05	-0.18	-1.92	-12.18	-11.47	-48.07
Nomination (kW)	85	40	400	25	40	20	100	200
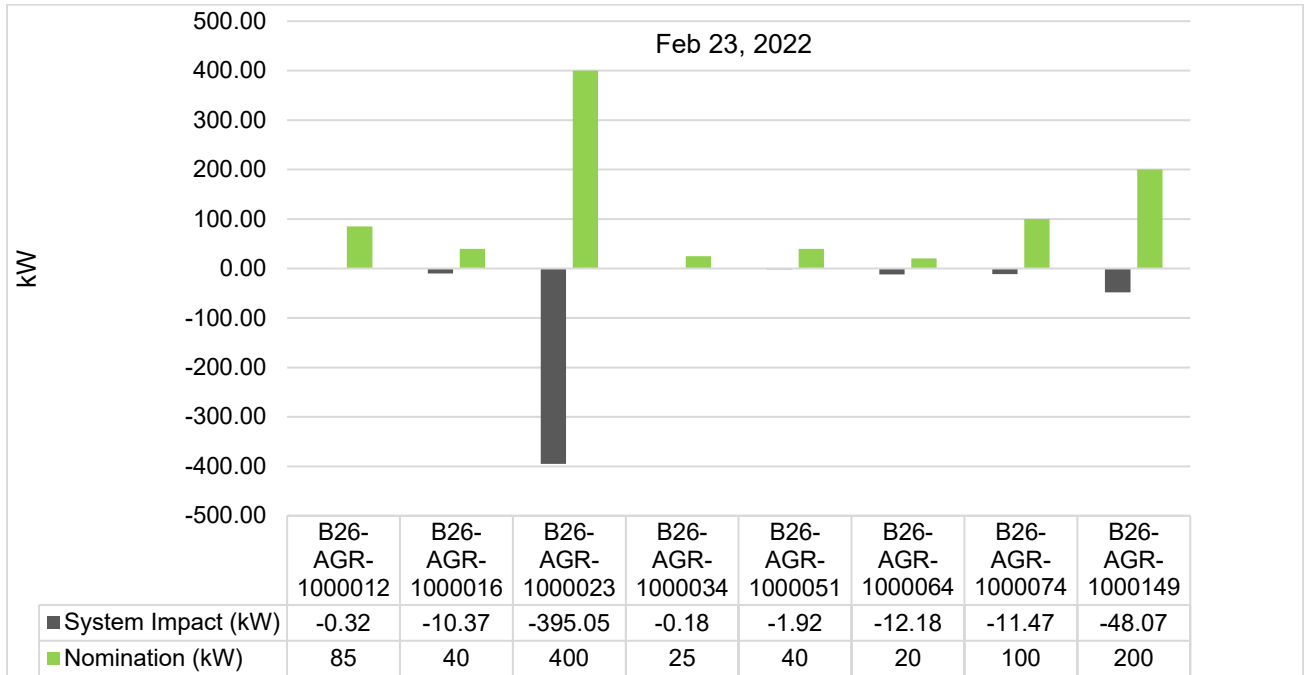
Figure 14 Customers Not Delivering DR on February 23rd (2 of 2)

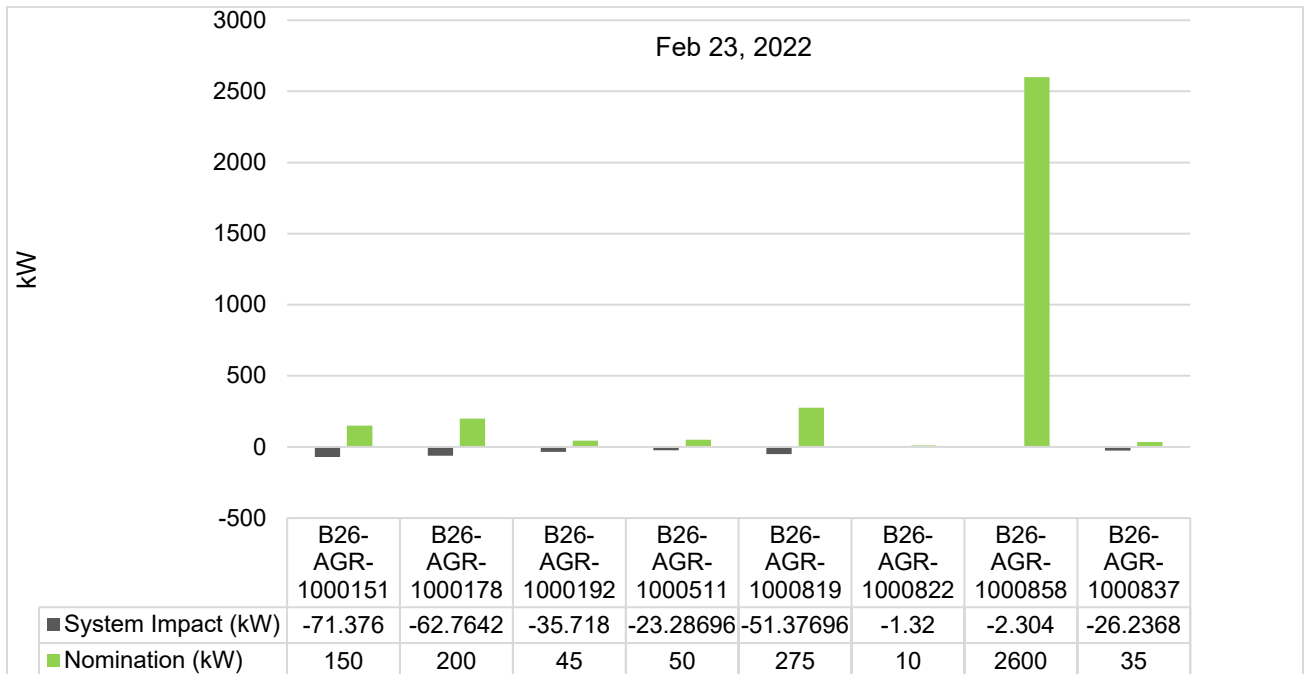|	B26-AGR-1000151	B26-AGR-1000178	B26-AGR-1000192	B26-AGR-1000511	B26-AGR-1000819	B26-AGR-1000822	B26-AGR-1000858	B26-AGR-1000837
System Impact (kW)	-71.376	-62.7642	-35.718	-23.28696	-51.37696	-1.32	-2.304	-26.2368
Nomination (kW)	150	200	45	50	275	10	2600	35

Table 2 summarizes the event dates in which customers did not deliver DR. Most of these customers show an increase in their load during the event compared to their CBL. As with other customers, each participant's system impact was calculated as the difference between their CBL and average load during the event day. A positive system impact indicates that a participant's demand was higher than their baseline; thus, no DR was delivered. A negative system impact indicates that a participant delivered DR.

Table 2 CBL Customers Not Delivering DR by Event Date in Summer 2021

Unique Remote ID	CBL Type	6/21/2021	6/28/2021	7/29/2021	8/4/2021	8/12/2021	9/9/2021
1. B26-AGR-1000002	Adjusted						x
2. B26-AGR-1000005	Adjusted			x		x	
3. B26-AGR-1000006	Unadjusted	x			x		
4. B26-AGR-1000007	Adjusted			x			
5. B26-AGR-1000010	Adjusted			x			
6. B26-AGR-1000011	Adjusted		x				
7. B26-AGR-1000012	Adjusted					x	
8. B26-AGR-1000016	Adjusted			x	x		x
9. B26-AGR-1000018	Adjusted	x			x		
10. B26-AGR-1000023	Unadjusted		x	x			
11. B26-AGR-1000026	Adjusted			x	x		
12. B26-AGR-1000027	Adjusted		x			x	
13. B26-AGR-1000039	Adjusted	x					x
14. B26-AGR-1000040	Adjusted						x
15. B26-AGR-1000043	Adjusted	x	x			x	
16. B26-AGR-1000049	Unadjusted						x
17. B26-AGR-1000052	Adjusted			x			x
18. B26-AGR-1000058	Unadjusted	x					x
19. B26-AGR-1000059	Adjusted	x			x		
20. B26-AGR-1000062	Unadjusted	x	x	x	x	x	x
21. B26-AGR-1000063	Unadjusted			x	x	x	
22. B26-AGR-1000064	Unadjusted	x	x			x	x
23. B26-AGR-1000069	Unadjusted						x
24. B26-AGR-1000075	Unadjusted	x		x		x	
25. B26-AGR-1000149	Adjusted			x			
26. B26-AGR-1000151	Adjusted				x	x	
27. B26-AGR-1000152	Adjusted				x		

#	Unique Remote ID	CBL Type						
28.	B26-AGR-1000178	Unadjusted				x	x	
29.	B26-AGR-1000511	Unadjusted	x	x				x
30.	B26-AGR-1000544	Adjusted			x		x	x
31.	B26-AGR-1000631	Unadjusted						x
32.	B26-AGR-1000635	Adjusted	x		x			
33.	B26-AGR-1000644	Adjusted				x		x
34.	B26-AGR-1000740	Adjusted	x					

Table 3 CBL Customers Not Delivering DR by Event Date in Winter 2021-22

	Unique Remote ID	CBL Type	2/2/2022	2/23/2022
1.	B26-AGR-1000075	Unadjusted	x	
2.	B26-AGR-1000178	Unadjusted	x	x
3.	B26-AGR-1000631	Unadjusted	x	
4.	B26-AGR-1000012	Unadjusted		x
5.	B26-AGR-1000016	Unadjusted		x
6.	B26-AGR-1000023	Unadjusted		x
7.	B26-AGR-1000034	Unadjusted		x
8.	B26-AGR-1000051	Unadjusted		x
9.	B26-AGR-1000064	Unadjusted		x
10.	B26-AGR-1000074	Unadjusted		x
11.	B26-AGR-1000149	Unadjusted		x
12.	B26-AGR-1000151	Unadjusted		x
13.	B26-AGR-1000192	Unadjusted		x
14.	B26-AGR-1000511	Unadjusted		x
15.	B26-AGR-1000819	Unadjusted		x
16.	B26-AGR-1000822	Unadjusted		x
17.	B26-AGR-1000858	Unadjusted		x
18.	B26-AGR-1000837	Unadjusted		x

Impact Result Discrepancies

Guidehouse compared impact results with CLEAResult and identified discrepancies greater than or equal to 5% of the customer's nomination for 30 out of the 78 customers for the Summer 2021 season and 14

out of 76 customers for the Winter 2021-22 season. The discrepancies across customers are typically driven by the following main reasons:

- Minor differences between Pelican and AMI hourly data, which propagates to differences in impact results. However, these absolute differences are low and an investigation by CLEAResult did not show evidence of systemic difference between AMI and Pelican.
- Minor differences in AMI hourly data, which are due to historical corrections made to the AMI data after CLEAResult receives it. Thus, AMI data delivered to CLEAResult during the season can have differences when compared to the data pulled for Guidehouse after the season after corrections have been made.

In addition to the above reasons, which are expected, CLEAResult identified the following additional sources of discrepancies:

- CLEAResult reviewed event day usage for quality, did not review selected baseline day usage. As such, there were instances where unreliable/incomplete data was used for baseline calculation, resulting in substantially different impact calculations. CLEAResult has added baseline day usage review to quality control methods moving forward.
- CLEAResult AMI data was either estimated or incomplete for some site-days. Therefore, CLEAResult could not verify the reliability of the Pelican data. CLEAResult noted that a possible improvement for the future would be to request AMI data from PGE to compare against and wait to finalize results until this verification is complete.
- CLEAResult was missing data for one of several meters for a customer. A possible improvement to avoid this in the future is to continue to improve quality control methods.

Of the 30 customers with a discrepancy in Summer 2021, 5 customers' incentive payments are affected. In contrast to CLEAResult, Guidehouse's calculated impact for the following customer-date combinations reached 70% of their nomination and, thus, should have received an incentive payment: Customers B26-AGR-1000011 for July 29th, B26-AGR-1000022 for July 29th and September 9th, B26-AGR-1000036 for June 28th, B26-AGR-1000063 for June 21st and 28th. Of the 14 customers with a discrepancy in Winter 2021-22, no customers' incentive payments are affected.

Tables 4 through 11 provide details of each discrepancy by date and customer. The table contains Guidehouse calculated impact, CLEAResult reported impact, percent difference between the estimates, absolute difference, and difference as a percent of nomination. Cells highlighted in red indicate the customer incentive payment was affected by the discrepancy.

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Table 4 Summary of Impact Result Discrepancies on June 21st, 2021

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000001	6/21/2021	11	12	-6%	-1	-1%
B26-AGR-1000005	6/21/2021	1	1	-23%	0	0%
B26-AGR-1000012	6/21/2021	3	2	18%	0	0%
B26-AGR-1000016	6/21/2021	6	6	-11%	-1	-2%
B26-AGR-1000039	6/21/2021	-49	-16	205%	-33	-26%
B26-AGR-1000063	6/21/2021	52	-187	-128%	239	399%
B26-AGR-1000544	6/21/2021	458	434	6%	24	16%

Table 5 Summary of Impact Result Discrepancies on June 28th, 2021

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000011	6/28/2021	0	0	157%	0	0%
B26-AGR-1000016	6/28/2021	5	6	-17%	-1	-3%
B26-AGR-1000022	6/28/2021	170	241	-30%	-71	-32%
B26-AGR-1000039	6/28/2021	101	149	-32%	-48	-38%
B26-AGR-1000063	6/28/2021	113	-205	-155%	319	531%
B26-AGR-1000504	6/28/2021	160	182	-12%	-22	-18%

Table 6 Summary of Impact Result Discrepancies on July 29th, 2021

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000006	7/29/2021	13	14	-7%	-1	0%
B26-AGR-1000011	7/29/2021	48	27	81%	22	43%
B26-AGR-1000012	7/29/2021	10	10	-5%	-1	-1%
B26-AGR-1000022	7/29/2021	162	104	57%	59	27%
B26-AGR-1000039	7/29/2021	44	50	-12%	-6	-5%
B26-AGR-1000043	7/29/2021	11	10	6%	1	1%
B26-AGR-1000059	7/29/2021	5	5	-8%	0	0%
B26-AGR-1000063	7/29/2021	-5	-108	-96%	103	172%
B26-AGR-1000151	7/29/2021	174	185	-6%	-10	-3%

| B26-AGR-1000152 | 7/29/2021 | 4 | 4 | -10% | 0 | 0% |
| B26-AGR-1000739 | 7/29/2021 | 548 | 517 | 6% | 31 | 6% |

Table 7 Summary of Impact Result Discrepancies on August 4th, 2021

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000016	8/4/2021	-10	-12	-14%	2	4%
B26-AGR-1000018	8/4/2021	-76	-81	-7%	5	1%
B26-AGR-1000027	8/4/2021	10	-2	-659%	12	12%
B26-AGR-1000039	8/4/2021	47	42	13%	5	4%
B26-AGR-1000043	8/4/2021	0	0	33%	0	0%
B26-AGR-1000059	8/4/2021	-7	-8	-7%	1	1%
B26-AGR-1000069	8/4/2021	0	0	18%	0	0%
B26-AGR-1000151	8/4/2021	-70	-75	-6%	5	2%
B26-AGR-1000461	8/4/2021	43	55	-21%	-12	-46%
B26-AGR-1000644	8/4/2021	-39	-52	-25%	13	14%
B26-AGR-1000739	8/4/2021	416	491	-15%	-75	-15%

Table 8 Summary of Impact Result Discrepancies on August 12th, 2021

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000005	8/12/2021	-11	-9	26%	-2	-2%
B26-AGR-1000012	8/12/2021	-6	-5	10%	-1	-1%
B26-AGR-1000016	8/12/2021	4	3	53%	2	4%
B26-AGR-1000029	8/12/2021	256	335	-23%	-78	-22%
B26-AGR-1000151	8/12/2021	-224	-241	-7%	16	5%
B26-AGR-1000544	8/12/2021	-38	-30	26%	-8	-5%
B26-AGR-1000739	8/12/2021	455	539	-16%	-85	-17%
B26-AGR-1000740	8/12/2021	1	-8	-117%	10	13%

Table 9 Summary of Impact Result Discrepancies on September 9th, 2021

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000005	9/9/2021	77	73	6%	4	3%
B26-AGR-1000012	9/9/2021	8	7	13%	1	1%
B26-AGR-1000022	9/9/2021	228	54	325%	175	79%

B26-AGR-1000027	9/9/2021	48	20	143%	29	29%
B26-AGR-1000035	9/9/2021	0	0	-100%	0	0%
B26-AGR-1000039	9/9/2021	-9	-2	372%	-7	-6%
B26-AGR-1000047	9/9/2021	96	159	-40%	-63	-11%
B26-AGR-1000049	9/9/2021	-5	-8	-32%	3	1%
B26-AGR-1000052	9/9/2021	0	0	-723%	0	0%
B26-AGR-1000063	9/9/2021	27	11	145%	16	27%
B26-AGR-1000068	9/9/2021	0	0	-15%	0	0%
B26-AGR-1000069	9/9/2021	0	0	65%	0	0%
B26-AGR-1000152	9/9/2021	17	15	10%	2	1%
B26-AGR-1000644	9/9/2021	-5	-6	-16%	1	1%
B26-AGR-1000739	9/9/2021	599	815	-27%	-216	-43%

Table 10 Summary of Impact Result Discrepancies on February 2nd, 2022

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000016	2/2/2022	4	0	1008%	4	9%

Table 11 Summary of Impact Result Discrepancies on February 23rd, 2022

Customer Site	Event Date	GH Calculated Reduction	CR Reported Reduction	Impact Percentage Difference	Absolute Difference	Difference as a Percent of Nomination
B26-AGR-1000006	2/23/2022	5	4	30%	1	1%
B26-AGR-1000012	2/23/2022	0	-1	-36%	0	0%
B26-AGR-1000016	2/23/2022	-10	-7	47%	-3	-8%
B26-AGR-1000025	2/23/2022	113	-13	-993%	125	29%
B26-AGR-1000032	2/23/2022	18	17	5%	1	0%
B26-AGR-1000034	2/23/2022	0	0	6%	0	0%
B26-AGR-1000035	2/23/2022	2	2	5%	0	0%
B26-AGR-1000039	2/23/2022	17	19	-11%	-2	-2%
B26-AGR-1000043	2/23/2022	1	1	-5%	0	0%
B26-AGR-1000047	2/23/2022	377	453	-17%	-76	-18%
B26-AGR-1000149	2/23/2022	-48	-51	-6%	3	1%
B26-AGR-1000544	2/23/2022	43	59	-27%	-16	-11%
B26-AGR-1000837	2/23/2022	-26	-75	-65%	49	139%
B26-AGR-1000838	2/23/2022	11	-20	-156%	31	90%

Process Summary

Guidehouse conducted 5 interviews with 6 staff members across the program, PGE Power Operations, customer outreach, and implementer teams to support the process evaluation. The interviews focused on both the Summer 2021 season and Winter 2021-22. The review focused on recent and ongoing changes in the program in addition to areas of success and opportunity.

Over the past year, PGE successfully transitioned the Schedule 26 pilot into a full program. Looking ahead, the biggest challenge for the program is growth—with goals to grow the program by as much as 5.5 MW.

At the time of the interview (June 2022), PGE had just received approval from the OPUC to update the tariff to be technology agnostic and facilitate multiple grid services (e.g., ancillary services) to further incentivize customers to participate in the program. PGE expects this update to open the door for more battery storage participation, since PGE could incentivize customers to participate in both peak events and ancillary services and frontload incentives for battery storage. PGE has also been exploring redesign of the program incentive to minimize payments for capabilities that customers rarely use (e.g., 10-minute notification, 80 hour maximum, etc.) and optimize the split between the energy and reservation payments. While PGE has primarily dispatched historically with 18-hour notification, Power Operations noted potential value for a 4-hour dispatch option to serve as a day-of market resource.

The program staff have also focused on how to participate in the CAISO real-time market. Historically, the program has consistently reported to CAISO for the day-ahead market, but staff indicated that they were looking to expand to the real-time market. At the time of the interview, the program staff reported that the program is working to improve the forecast accuracy of the resource to meet CAISO standards and have been working with Power Operations and Generac to develop hourly forecasting for CAISO participation. The Power Operations team provides the program with CAISO guidelines and feedback essential to efforts to ready the resource to participate in the day-ahead market. Program staff do not expect participation in CAISO to impact the customer experience; however, Guidehouse recommends continuing to monitor whether CAISO participation drives greater event frequency, more consecutive events, or performance degradation during moderate weather events. The Power Operations staff and program team also see the creation of virtual power plants (VPPs) as an ongoing opportunity for Schedule 26. At the time of the interview, the PGE team was exploring ways to create 10 MW groups among existing participants (e.g., by region, maximum hours, notification) for discrete dispatch as a VPP.

As PGE ramped up the Schedule 26 over the past year, the program has seen a need to grow the customer base quickly and intentionally. This process was catalyzed by bringing in the Business Customer Outreach (BCO) team. The BCO team took over the program recruitment for unmanaged customers during the past year. The BCO team has been working with CLEAResult to streamline and make more affordable enablement for these smaller customers (e.g., minimizing initial engineering design costs). The BCO team has found a few new strategies that have proved effective in customer recruitment, including targeting business types that are more commonly sole proprietorships (e.g., cannabis wholesalers, craft distilleries) and working with national corporations, (e.g., retail, pharmacies) to aggregate multiple smaller franchises/locations for participation in the program. The BCO team also expressed interest in exploring synergies between Schedule 26 and PGE's transportation electrification offerings. Challenges include having access to reliable customer data, such as industry type, that is useful in implementing industry-specific outreach approaches to all applicable customers.

The Key Customer Managers (KCMs) continue to hold the primary relationships with PGE's largest, managed customers. The BCO team noted that the KCMs have occasionally sent customers with interest in Schedule 26 to BCO. The program team has been working with internal marketing to help CLEAResult

work with the managed customers instead of through the KCMs for the managed customers (e.g., sending communications from CLEAResult to customers on the KCMs' behalf).

In general, the relationships with program vendors have been relatively smooth, with a successful transition to Generac's Concerto system and only a couple of minor issues transmitting customer usage information via cellular connections during the transition from 4G to 5G and transition of program notifications to the Concerto Notification System that have not been resolved.

Looking forward, the program team will be focused on expanding the program to maximize enrollment while continuing to work with Power Operations to access the CAISO real-time market and deploy Schedule 26 as a VPP. Opportunities for program growth include adjustments to the tariff for optimized customer performance relative to cost, increased participation from battery storage, continued emphasis on active recruiting from key program stakeholders (i.e., CLEAResult, BCO, KCMs, internal marketing), and exploration of synergies with PGE's transportation electrification offerings. The program team will also keep close tabs on the impact of battery storage, and any opportunities for further refinement or clarification as the program includes the tariff in its operations.

Key Takeaways and Recommendations

Guidehouse estimates a total reduction of up to 14,070 kW, with a realization rate of up to 95% for the Summer 2021 season and a total reduction of up to 10,142 kW, with a realization rate of up to 84% for the Winter 2021-22 season. Guidehouse's estimated demand reduction was up to 2.6% higher and up to 1.3% lower than CLEAResult's due to discrepancies in calculated impact results for 30 out of 78 Summer 2021 customers and 14 out of 76 Winter 2021-22 customers.

Guidehouse's evaluation determined that four customers should receive incentive payments in cases where they had not been paid. Guidehouse recommends these customers be paid their incentive retroactively. Furthermore, the evaluation found there were more differences between Guidehouse and CLEAResult's' calculations than in previous seasons. While overall calculations of program impacts were consistent, Guidehouse noted more variation for specific customers than previously seen.

To better understand and mitigate these differences in the future, Guidehouse recommends further investigation into the cause of differences between CLEAResult and Guidehouse's analyses (e.g., baseline days selected, data quality, etc.). Some specific recommendations include:

- Work with CLEAResult to continue to investigate the source of discrepancies.
    - In most cases of considerable differences, Guidehouse and CLEAResult used different data sources, AMI data and Pelican data respectively.
    - In several cases, CLEAResult included a note in their results that AMI data was estimated and used Pelican data, but the end of season AMI data matched the "estimated" AMI data and differed considerably from the Pelican data.
    - The above two points should be explored to determine whether there is a systematic issue with either data source, or if the differences are random.
- Continue to enhance data transfer and quality assurance processes with both PGE and CLEAResult.
    - CLEAResult has already proposed the following modifications to their quality assurance processes:
        - Inclusion of baseline days in data quality reviews
        - Postpone result finalization until additional data can be provided for sites with incomplete AMI data to verify Pelican data accuracy

Additionally, Guidehouse notes the following process-related findings for PGE's and CLEAResult's consideration:

- Develop a plant parameter sheet for Schedule 26 with PGE Power Operations to understand constraints on dispatchable assets during different scenarios.
- Collaborate closely with CAISO staff to ensure that the program continues to meet necessary resource requirements.
- Continue to test opportunities and drivers for tariff design refinements, including minimizing capabilities that customers rarely use (e.g., 10-minute notification, 80 hour maximum, etc.); optimizing the split between the energy and reservation payments; and monitoring event frequency, consecutive events, and performance degradation during moderate weather events with increased CAISO participation.
- Work with the PGE internal teams and CLEAResult to create up-to-date and accurate customer lists for the BCO team's recruitment efforts.
- Continue to explore collaboration opportunities with the KCMs to catalyze and optimize the engagement of managed customers.
- Continue to facilitate open communication with the PGE program, implementer, and recruitment teams to ensure all parties are aligned on the "ideal" customer type and new possibilities for outreach.
- Continue driving strategic opportunities for program growth, including adjustments to the tariff for optimized customer performance relative to cost, increased participation from battery storage, continued emphasis on active recruiting from key program stakeholders (i.e., CLEAResult, BCO, KCMs, internal marketing), and exploration of synergies with PGE's transportation electrification offerings.