Program Year 2024 Southern California Edison Summer Discount Plan Impact Evaluation

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ABSTRACT

This study analyzes the impact of Southern California Edison's Summer Discount Plan program for a range of weather conditions and dispatch hours. Summer Discount Plan is a voluntary demand response program that provides incentives to residential and non-residential customers who allow SCE to manage the use of their air conditioner when grid conditions require additional resources. The impacts were evaluated using a quasi-experimental design where a matched control customer was identified for each participant. The load impacts were calculated via difference-in-differences by comparing the energy use of participants and the control customer during event and hot non-event days. The SDP program has over 152,000 residential customers enrolled and includes nearly 178,000 control devices and 641,000 tons of air conditioner load. Approximately 82% of residential customers elect the higher incentive option, allowing SCE to curtail air conditioner demand (100% cycling) during SDP demand response events. On the commercial side, there are approximately 6,500 customers enrolled with about 61,000 control devices and 306,000 tons of air conditioner load. Roughly 65% of customers elect the higher incentive, accounting for 60% of the total commercial air conditioner load. During the CAISO peak day event, September 5th, the SDP program reduced demand by 119.1 MW for the 100% cycling group and 12.6 MW for the 50% and [redacted] for the 30% (commercial only) cycling groups.

During normal (1-in-2) August worst day planning conditions, residential participants can reduce demand by 100 MW on average across the five-hour 4:00–9:00 PM resource adequacy window, while commercial participants can reduce demand by 16 MW on average across the five-hour window. In practice, program resources are dispatched by grid location, with varying event times and under different weather conditions.

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1 EXECUTIVE SUMMARY

This report presents the load impacts of the program year 2024 Summer Discount Plan (SDP). SDP is a voluntary demand response program that provides incentives to customers who allow Southern California Edison to curtail or reduce the use of their central air conditioner on summer days with high energy usage or high energy prices. The report has two primary objectives: estimate the demand reductions that were delivered via 2024 operations and quantify the magnitude of reductions available during peaking conditions used for planning over the next eleven years (2025 – 2035).

1.1 SDP RESIDENTIAL KEY FINDINGS

The SDP Residential (SDP-R) program has over 152,000 customers enrolled and includes nearly 178,000 control devices and 641,000 tons of air conditioner load. Approximately 82% of customers elect the higher incentive option, which allows SCE to fully curtail air conditioner demand (100% cycling) during SDP demand response (DR) events. During normal conditions (1-in-2), participant loads peak at 399.6 MW, and participants can curtail demand by 99.8 MW on average during the 4–9 PM resource adequacy window.

Figure 1 summarizes the per participant demand reductions for each event hour in a single LCG as a function of temperature. Demand reductions grow larger in magnitude when temperatures are hotter and resources are needed most.

Figure 1: Relationship between SDP-R Demand Reductions and Weather

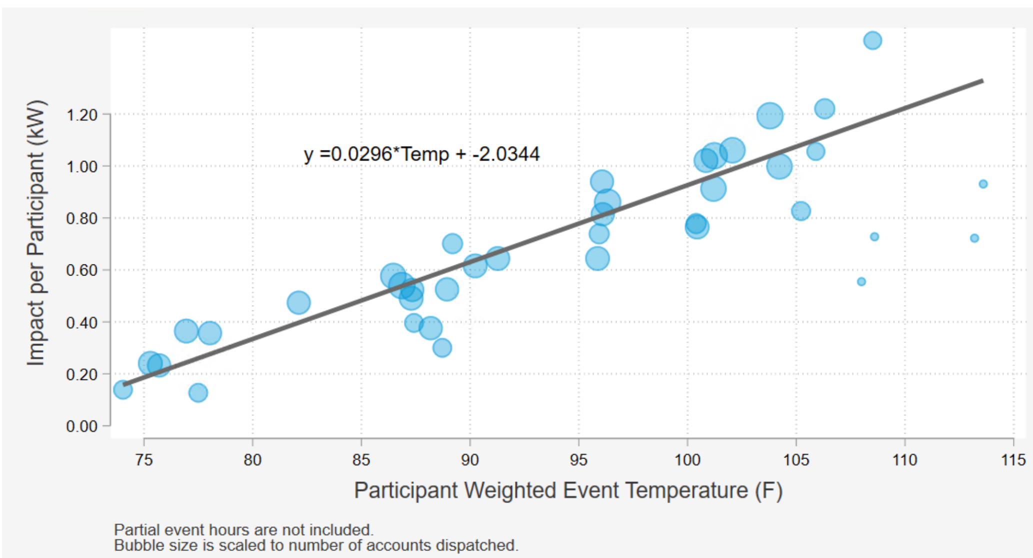


Table 1 summarizes the reductions attained during full event hours for each event in the evaluation period. Average impacts were approximately 0.59 kW per participant, and percent impacts were generally around 26.8%.

Table 1: SDP-Residential Event Summary, 2024

Date	Load Control Groups	Event start	Event end	Accts	MW Metrics					Impact per … (kW)				
					Reference Load	Observed Load	Impact	90% LB	90% UB	Account	Device	Ton	% Impact	Weighted Temp (F)
6/25/2024	Territory	6:00 PM	7:00 PM	151,270	305	232	72	67	78	0.48	0.41	0.11	23.8%	84.5
7/11/2024	Excludes C-3	5:00 PM	6:00 PM	144,031	343	241	102	96	107	0.71	0.61	0.17	29.7%	91.7
8/20/2024	Excludes C-3	4:00 PM	5:00 PM	143,414	330	223	107	102	112	0.75	0.65	0.18	32.5%	95.6
9/5/2024	Excludes C-3	7:00 PM	8:00 PM	143,319	452	330	121	113	129	0.85	0.73	0.20	26.8%	98.0
9/6/2024	Localized	5:13 PM	8:02 PM	5,681	22	18	5	4	6	0.84	0.64	0.18	21.3%	105.5
Avg. Event	**5:00 PM – 7:00 PM**			**150,762**	**330**	**242**	**88**	**85**	**91**	**0.59**	**0.50**	**0.14**	**26.8%**	**88.1**

Table 2: SDP-Residential Summary of Key Findings

Topic	Findings
How did SDP-R perform during full event hours?	The summer of 2024 had five event days with full event hours. There was one large event called on the CAISO peak (September 5th). This event day omitted the Central-3 load control group, known to be a section of the territory with hotter weather. For the load control groups that were called in the 100% cycling group reduced demand by 111.41 MW between 7:00 PM and 8:00 PM. The average demand reductions per customer, per device, and per ton for the 100% cycling dispatch were 0.94 kW, 0.81 kW, and 0.22 kW, respectively. The 50% cycling group reduced demand by 9.8 MW between 7:00 PM and 8:00 PM. The average demand reductions per customer, per device, and per ton for the 50% cycling dispatch were 0.39 kW, 0.35 kW, and 0.10 kW, respectively.
Did performance differ for the 100% cycling and 50% cycling options?	The per-participant demand reductions for customers signed up for the 100% cycling were about three times as large as demand reductions for those on 50% cycling.
How did 2024 weather influence the magnitude of demand reductions?	Residential air conditioner loads are highly weather-sensitive. As a result, demand reductions are lower in magnitude when temperatures are cooler, and resources are not necessarily needed.
What is the magnitude of demand reduction capability under planning conditions?	Given current enrollments, the resource can deliver an average reduction of 99.8 MW during the resource adequacy window (4:00 PM – 9:00 PM) under 1-in-2 weather planning conditions (August monthly worst day).

1.2 SDP COMMERCIAL KEY FINDINGS

The SDP Commercial (SDP-C) program has approximately 6,500 customers enrolled with about 60,000 control devices and 306,000 tons of air conditioner load. Roughly 65% of customers elect the higher incentive option, which allows SCE to entirely curtail air conditioner demand (100% cycling) during SDP-C DR events. During normal conditions (1-in-2), participant loads peak around 331.9 MW, and participants can curtail demand by 15.7 MW on average during the 4–9 PM resource adequacy window.

Figure 2 summarizes the per participant demand reductions for each event hour in a single LCG as a function of temperature. This figure includes all full event hours in the resource adequacy window (4–9 PM). As expected for a load control program, the magnitude of demand reductions is larger when temperatures are hotter.

Figure 2: Relationship between SDP-C Demand Reductions and Weather

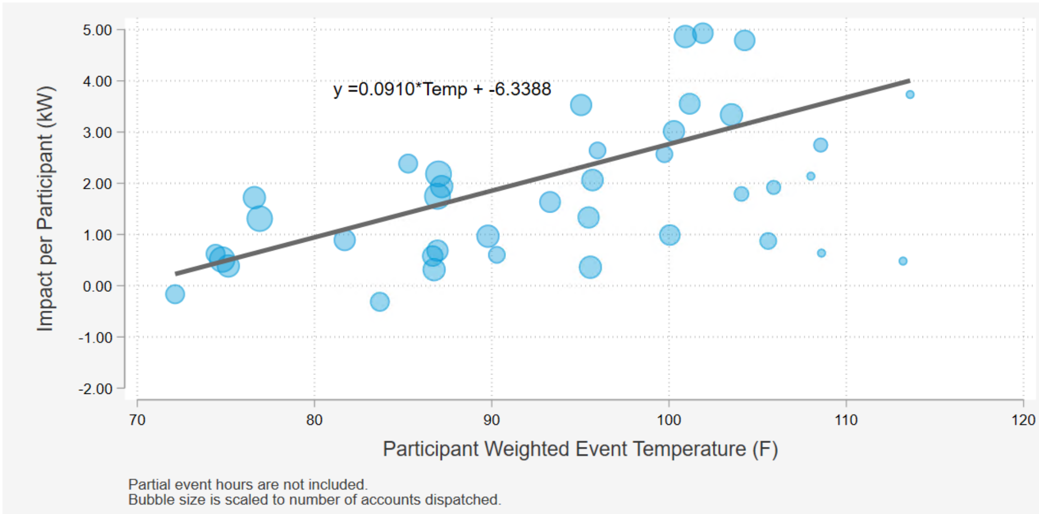


Table 3 summarizes the reductions attained during each event in 2024, where average impacts per device were 0.10 kW.

Table 3: SDP-Commercial Event Summary, 2024

Date	Load Control Groups	Event start	Event end	Accts	MW Metrics					Impact per ... (kW)				
					Reference Load	Observed Load	Impact	90% LB	90% UB	Account	Device	Ton	% Impact	Weighted Temp (F)
6/25/2024	Full Territory	6:00 PM	7:00 PM	6,549	94	90	4	1	8	0.65	0.07	0.01	4.6%	81.7
7/11/2024	Excludes C-3	5:00 PM	6:00 PM	6,350	105	97	9	4	14	1.37	0.15	0.03	8.3%	86.8
8/20/2024	Excludes C-3	4:00 PM	5:00 PM	6,320	162	143	18	10	26	2.90	0.31	0.06	11.3%	92.7
9/5/2024	Excludes C-3	7:00 PM	8:00 PM	6,298	137	125	12	-1	24	1.83	0.20	0.04	8.4%	94.3
9/6/2024	Localized	5:13 PM	8:02 PM	119	[redacted]									
Avg. Event	**5:00 PM – 7:00 PM**			**6,469**	**99**	**93**	**6**	**2**	**10**	**0.93**	**0.10**	**0.02**	**6.1%**	**84.2**

Table 4: SDP-Commercial Summary of Key Findings

Topic	Findings
How did SDP-C perform during full event hours?	The summer of 2024 had five event days with full event hours. There was one large event called on the CAISO peak (September 5th). This event day omitted the Central-3 load control group. For the load control groups that were called in the 100% cycling group, demand decreased by 7.7 MW between 7:00 PM and 8:00 PM. The average demand reductions per customer, per device, and per ton for the 100% cycling dispatch were 1.90 kW, 0.22 kW, and 0.04 kW, respectively. The 30% and 50% cycling groups reduced demand by [redacted] MW and [redacted] MW, respectively, between 7:00 PM and 8:00 PM. The average demand reductions per customer, per device, and per ton for the 50% cycling dispatch were [redacted] kW, [redacted] kW, and [redacted] kW, respectively.
How does the customer mix impact performance?	SDP-C is a very top-heavy program, as 10% of the program participants account for more than 60% of the total AC tonnage. In other words, a small handful of customers account for a majority of the AC tonnage. Schools also account for about 67% of the SDP-C AC tonnage, so demand reductions are tied to whether or not schools are in session and whether AC units are in operation on event days. School whole building and air conditioner loads drop off considerably after 3 PM, leaving limited controllable AC loads during the 4–9 PM hours.
Did performance differ for the 100% cycling and 50% cycling options?	On average, percent impacts in the 100% cycling strategy group are about three times as large as percent impacts in the 50% cycling group.
What is the magnitude of demand reduction capability under planning conditions?	Given current enrollments, the resource can deliver an average reduction of 15.7 MW during the resource adequacy window (4:00 PM – 9:00 PM) under 1-in-2 weather planning conditions.

2 INTRODUCTION

This report presents the results of the program year 2024 Summer Discount Plan (SDP) impact evaluation. SDP is a voluntary demand response program that provides incentives to residential and commercial customers who allow Southern California Edison to curtail or reduce the use of their central air conditioner on summer days with high energy usage or high energy prices. The report has two primary objectives: estimate the demand reductions that were delivered via 2024 operations and quantify the magnitude of reductions available during peaking conditions used for planning over the next eleven years (2025 – 2035).

Historically, utilities operated demand response programs to reduce peak demand and offset the need for additional peaking capacity. While peak demand reductions to offset capacity remain critical, existing programs have had to adjust as operating needs have evolved due to the higher penetration of renewable power. The most immediate changes have been the shift of system peaking conditions to the late afternoon and evening hours and the increased economic dispatch of resources.

2.1 KEY RESEARCH QUESTIONS

The impact evaluation study was designed to address the following research questions:

- What were the demand reductions due to program operations and interventions in 2024 for each event day?
- How do weather and event conditions influence the magnitude of demand response?
- How does the cycling strategy – the degree of control over the air conditioner units – relate to the magnitude of demand reductions?
- How do load impacts vary for different customer sizes, locations, and customer segments?
- What is the magnitude of resources available under planning conditions (1-in-2 and 1-in-10 ex ante weather)?
- What concrete steps can help improve program performance?

2.2 PROGRAM DESCRIPTION

SDP is a voluntary demand response program that provides incentives to customers who allow Southern California Edison to curtail or reduce the use of their central air conditioner on summer days with high energy usage or high energy prices. All SDP participants have a load cycling switch device installed on at least one air conditioner unit. The device enables SCE to cycle the customer's air conditioner off and on to reduce load during an SDP event. SCE initiates events by sending a signal to all participating devices through radio frequency transmission. The signals instruct the switch devices to either fully curtail the use of the air conditioning system or to cycle the air condition on and off, reducing the unit's run time during events, thus reducing demand.

SCE may dispatch SDP any month of the year, but total program dispatch is limited to 180 event hours annually. On a single day, dispatch of SDP is limited to a maximum of 6 hours. In total, events were called on five days in 2024. While the program is designed to deliver flexible resources under system peaking conditions, SCE may dispatch SDP resources in response to:

- Grid operator warnings or emergencies;
- Adverse reliability conditions on SCE's electric system such as high peak demand of loss of key transmission lines;
- High wholesale energy prices (based on CAISO bid awards); and
- Measurement and evaluation (M&E) testing.

2.3 SDP LOADS AND SYSTEM PEAKING CONDITIONS

SCE peak loads remain highly concentrated in a limited number of hours, as shown in Figure 3. System load rarely exceeded 20,000 MW during the 2024 summer. The 2024 system peak, which occurred on September 6th, was 23,809 MW. There was one localized SDP demand response event dispatched on this day. The previous day, which was the second-highest peak day in 2024, dispatched all load control groups except SDP-Central-3.

Figure 3: System Load Duration Curves

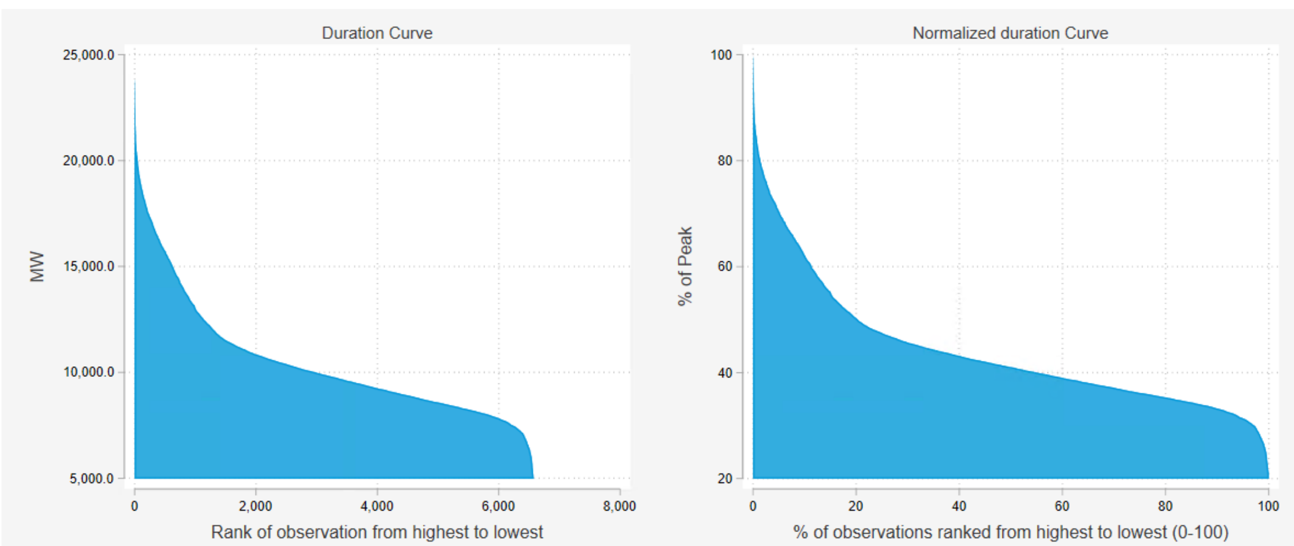


Figure 4: Top Ten System Load Days, 2024

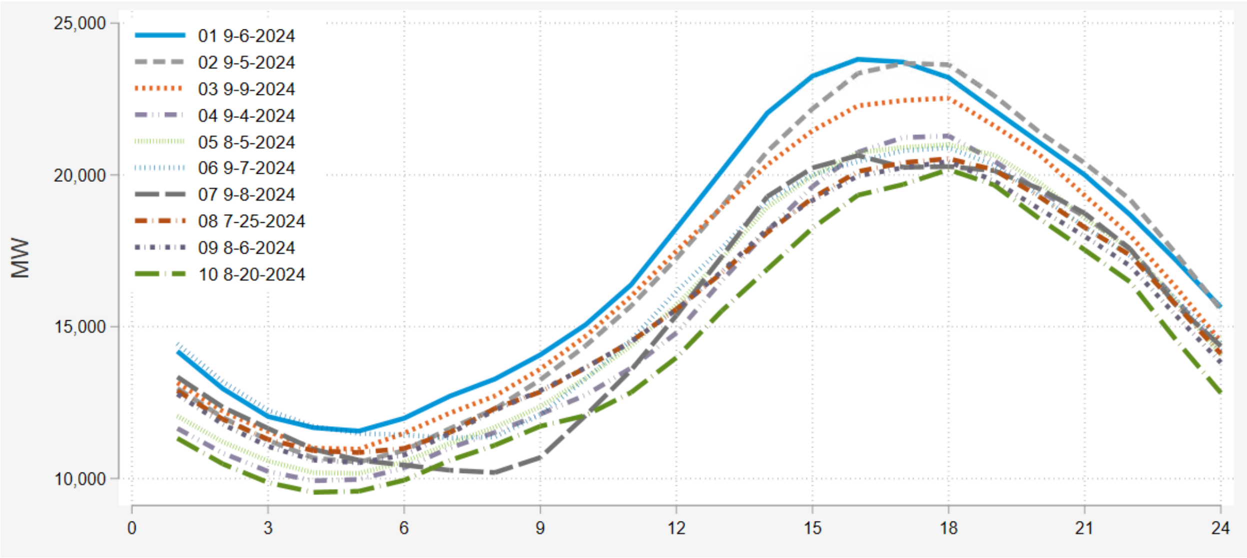
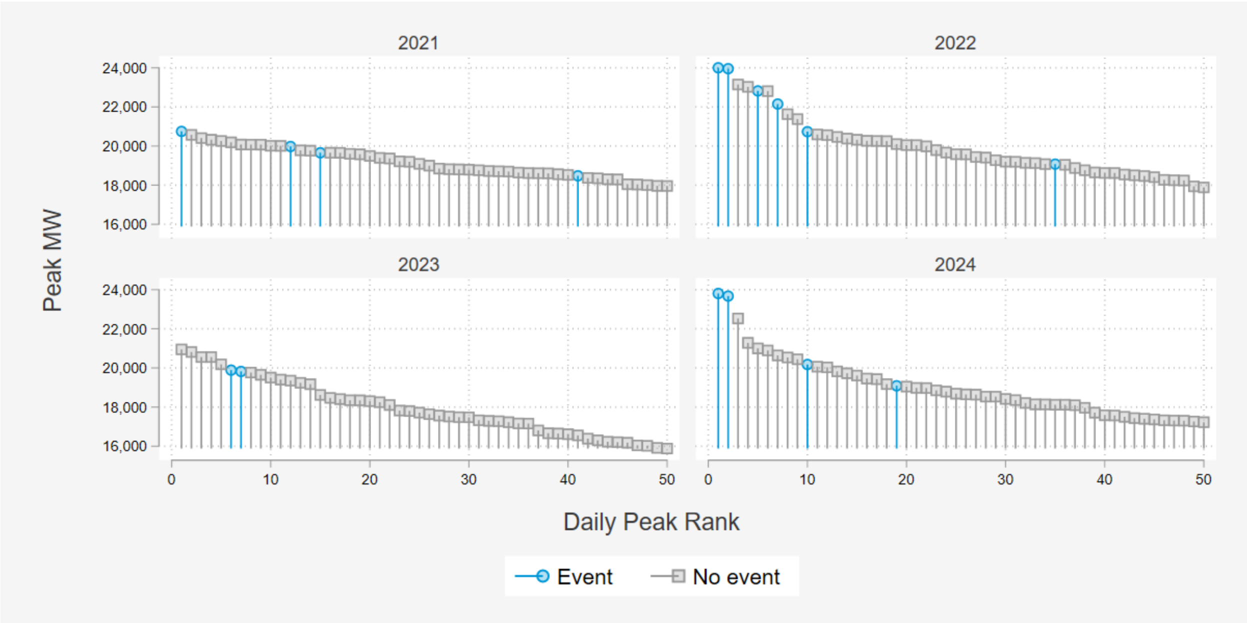


Figure 5 compares system-wide daily peaks over the past four years. System peaks in 2024 were higher than these historic years and comparable to those of 2022.

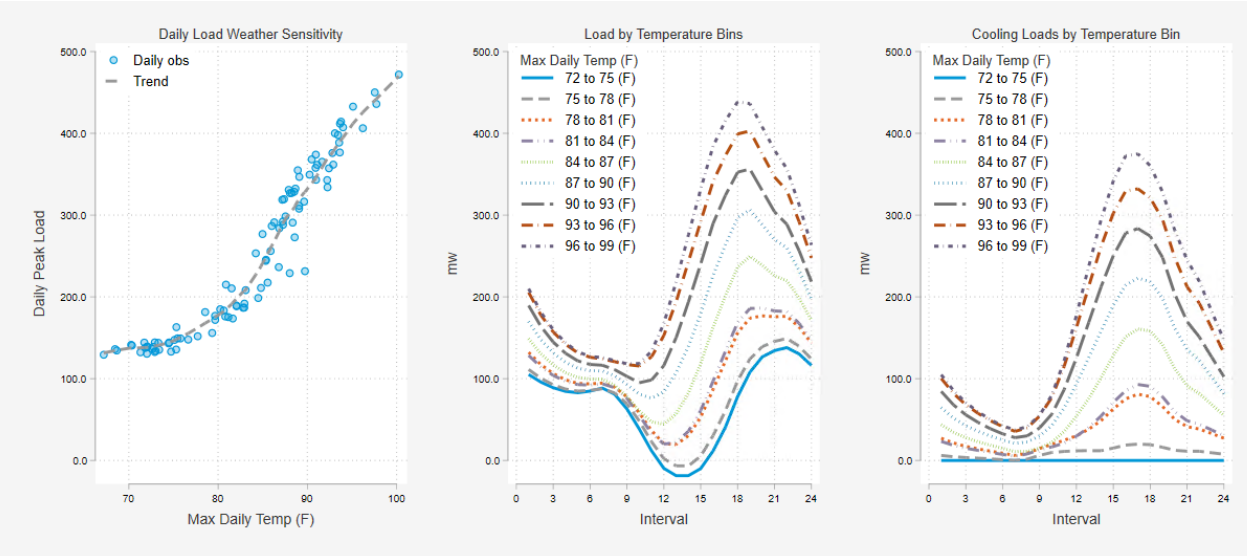
Figure 5: System Peaks by Year



2.4 RESIDENTIAL PARTICIPANT CHARACTERISTICS

A total of 153,025 SCE residential customers participated in at least one SDP demand response event during the 2024 summer. On aggregate, these 153,025 customers have over 300 MW of cooling load when temperatures were hot – 93°F or higher (right pane in Figure 6). At milder temperatures in the mid-to-high 80s, these customers had closer to 200 MW of cooling load.

Figure 6: SDP-R Participant Load Summary



SDP-R customers can enroll in one of two cycling strategies: 50% or 100%. For 100% cycling, participant AC units are shut off entirely during the DR event. For 50% cycling, participant AC units are shut off for fifteen minutes out of every half hour during the DR event. The large majority of homes – about 82% – are in the 100% cycling group. Participants can also sign up with an "Override" option that allows them to opt out of up to five events per year.

Table 5 shows the distribution of SDP-R participants, devices, and air conditioner tonnage by cycling strategy and several other key customer segments. Some key highlights of the SDP-R resources include:

- The majority of SDP-R participants are on 100% cycling (82%);
- SCE dispatches SDP resources by geographically defined regional subgroups known as load control groups (LCGs). The Low Desert load control group has the smallest share of participants (0.10%), and the other nine load control groups have somewhere between 4% and 20% of participants each;
- The majority of participants and controllable air conditioner tonnage (~77%) is in the LA Basin area, which encompasses the four SDP-Central load control groups as well as the two SDP-West load control groups; and
- Approximately 30% of participants, representing 28% of the total tonnage, are enrolled in the California Alternate Rates for Energy (CARE) program or the Family Electric Rate Assistance (FERA). Low-income residential customers enrolled in these programs receive discounts on their electric bills.

Table 5: SDP-R Participation by Category

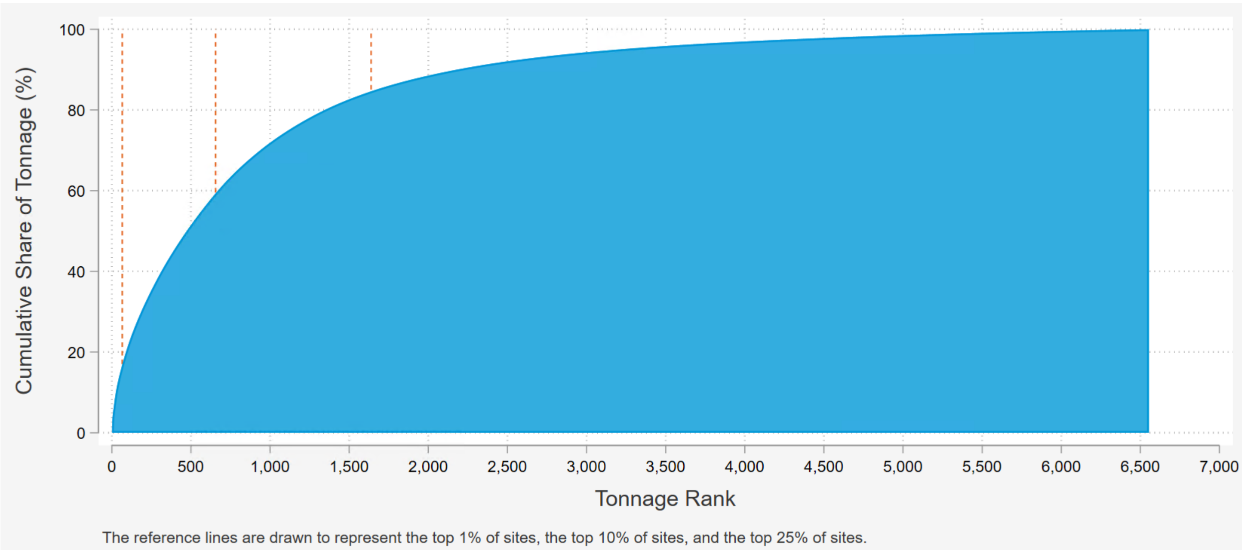
Category	Subcategory	Number of Accounts	Share of Accounts	Number of Devices	Share of Devices	Total Tonnage	Share of Tonnage
Cycling	50%	27,021	17.7%	30,108	16.9%	107,467	16.8%
	100%	125,992	82.3%	147,565	83.0%	532,997	83.2%
Load Control Group	SDP-Central-1	25,931	16.9%	31,229	17.6%	110,979	17.3%
	SDP-Central-2	17,147	11.2%	19,057	10.7%	70,442	11.0%
	SDP-Central-3	7,209	4.7%	9,630	5.4%	34,888	5.4%
	SDP-Central-4	29,761	19.4%	34,754	19.6%	125,262	19.6%
	SDP-High Desert	9,228	6.0%	10,348	5.8%	36,449	5.7%
	SDP-Low Desert	149	0.1%	159	0.1%	583	0.1%
	SDP-North	19,353	12.6%	22,636	12.7%	78,781	12.3%
	SDP-Northwest	6,954	4.5%	8,618	4.9%	31,950	5.0%
	SDP-West-1	19,405	12.7%	21,972	12.4%	80,585	12.6%
	SDP-West-2	17,696	11.6%	19,112	10.8%	70,019	10.9%
Local Capacity Area	Big Creek/Ventura	26,411	17.3%	31,357	17.6%	111,114	17.3%
	LA Basin	117,284	76.6%	135,884	76.5%	492,612	76.9%
	Outside LA Basin	9,325	6.1%	10,441	5.9%	36,771	5.7%
CARE/FERA Status	Non-CARE/FERA	106,180	69.4%	126,317	71.1%	462,816	72.3%
	CARE/FERA	46,845	30.6%	51,370	28.9%	177,695	27.7%
Zone	South Orange County	12,143	7.9%	13,558	7.6%	48,856	7.6%
	South of Lugo	56,003	36.6%	64,172	36.1%	234,355	36.6%
	Remainder of System	84,874	55.5%	99,952	56.3%	357,285	55.8%
NEM	Yes	32,752	21.4%	40,753	22.9%	148,814	23.2%
	No	120,273	78.6%	136,934	77.1%	491,697	76.8%
Overall Total		**153,025**	**100%**	**177,687**	**100%**	**640,511**	**100%**

* Based on all participants that were enrolled in the program between the first event and last event of the 2024 season.

2.5 NON-RESIDENTIAL PARTICIPANT CHARACTERISTICS

A total of 6,569 SCE non-residential customers participated in at least one SDP demand response event during the 2024 summer. A defining characteristic of the SDP-C customer pool is its top-heaviness in terms of AC tonnage. Overall, 1% of the sites account for approximately 20% of the SDP-C tonnage, 10% of the sites account for nearly 60% of the tonnage, and 25% of the sites account for just over 83% of the tonnage (Figure 7). This means that a handful of customers drive the load reduction results.

Figure 7: Tonnage Ranks against Cumulative Tonnage Shares



On aggregate, the 6,569 SDP-C customers have approximately 180 MW of cooling load when temperatures are hot – 93°F or higher (right pane in Figure 8). At milder temperatures in the mid-to-high 80s, these customers have closer to 160 MW of cooling load. However, the non-residential air conditioner load peak earlier in the day than SCE's 4-9 pm peak hours. Cooling load drops substantially in evening hours. The overall load shape for the SDP-C customer pool is driven by schools and religious institutions (often private schools), which account for around 81% of the total SDP-C AC tonnage. Though there certainly is some correlation between the maximum daily temperature and the daily peak load (left pane in Figure 8), the relationship isn't nearly as strong as it is for the residential component of SDP (left pane in Figure 6). Because loads from schools dominate, the magnitude of loads is highly dependent on whether schools are in session or not.

Figure 8: SDP-C Participant Load Summary

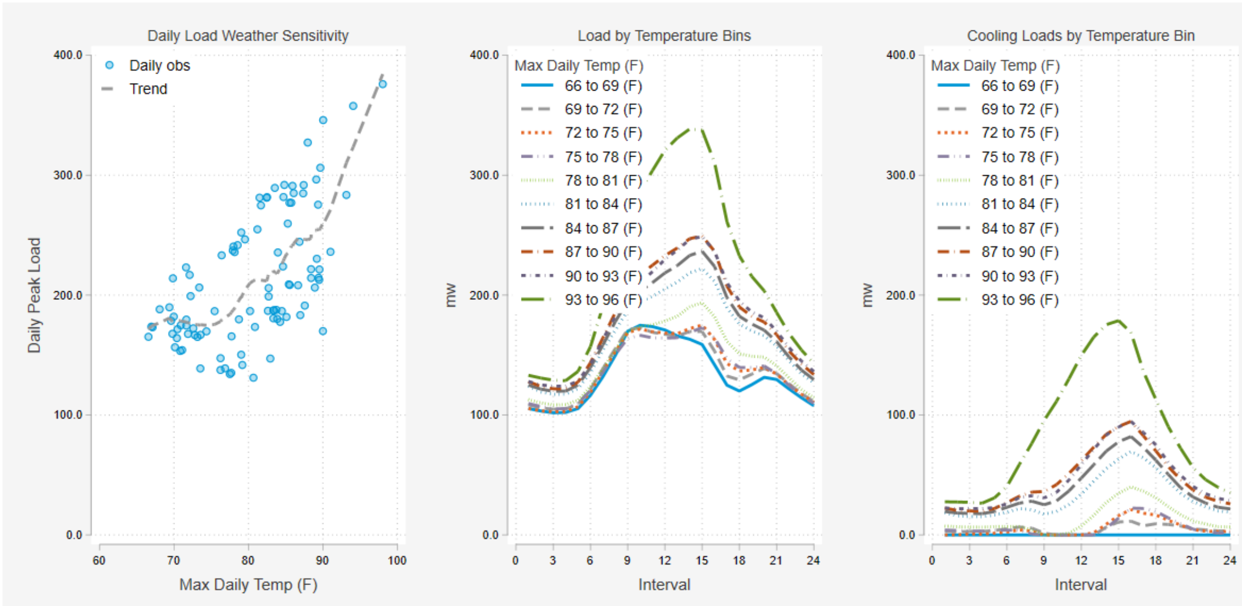


Table 6 shows the distribution of SDP-C participation, devices, and AC tonnage by several key categories and subcategories. Some key highlights of the SDP-C resources include:

- The majority of SDP-C tonnage is on 100% cycling (65%);
- The Low Desert region has the smallest share of tonnage (0.05%), while SDP-West-2 has the most (23%);
- Most SDP-C resources are in the LA Basin local capacity area; and
- Three key industry segments – Institutional/Government, Schools, and Religious Organizations – account for approximately 88% of the SDP-C tonnage. Schools alone account for 67% of the participant tonnage.

Our ex post methodology relied on matching participants to similar non-participants in a control pool. As noted earlier, some SDP-C participants are large and unique. We withheld some sites from the analysis due to the lack of viable control matches in the control pool. To account for this, ex post impacts were scaled based on tonnage. More details are presented in Appendix A. Specifically, Table 25 illustrates how the scaling was accomplished, and Table 6 shows the percentage of accounts, devices, and total tonnage that remained in the analysis file.

Table 6: SDP-C Participation by Category

Category	Subcategory	Number of Accounts	Share of Accounts	Number of Devices	Share of Devices	Total Tonnage	Share of Tonnage
Cycling	30%	512	7.8%	3,344	5.6%	19,138	6.3%
	50%	1,812	27.6%	20,793	34.7%	103,012	33.9%
	100%	4,245	64.6%	35,864	59.8%	181,332	59.8%
Load Control Group	SDP-Central-1	644	9.8%	10,783	18.0%	57,284	18.9%
	SDP-Central-2	770	11.7%	4,286	7.1%	20,734	6.8%
	SDP-Central-3	148	2.3%	570	0.9%	3,339	1.1%
	SDP-Central-4	933	14.2%	7,730	12.9%	39,463	13.0%
	SDP-High Desert	274	4.2%	3,660	6.1%	21,612	7.1%
	SDP-Low Desert	11	0.17%	27	0.0%	158	0.05%
	SDP-North	717	10.9%	6,971	11.6%	34,949	11.5%
	SDP-Northwest	457	7.0%	4,046	6.7%	20,229	6.7%
	SDP-West-1	923	14.1%	7,065	11.8%	36,100	11.9%
	SDP-West-2	1,692	25.8%	14,863	24.8%	69,614	22.9%
Local Capacity Area	Big Creek/Ventura	1,175	17.9%	11,026	18.4%	55,200	18.2%
	LA Basin	5,109	77.8%	45,288	75.5%	226,512	74.6%
	Outside LA Basin	285	4.3%	3,687	6.1%	21,770	7.2%
Zone	South Orange County	589	9.0%	4,397	7.3%	23,172	7.6%
	South of Lugo	2,031	30.9%	17,709	29.5%	91,161	30.0%
	Remainder of System	3,949	60.1%	37,895	63.2%	189,149	62.3%
Industry	Agriculture, Mining, Construction	169	2.6%	421	0.7%	1,842	0.6%
	Institutional/Government	588	9.0%	3,332	5.6%	18,971	6.3%
	Manufacturing	402	6.1%	1,157	1.9%	6,541	2.2%
	Offices, Hotels, Finance, Services	1,414	21.5%	2,747	4.6%	11,597	3.8%
	Religious organizations	1,045	15.9%	7,301	12.2%	42,897	14.1%

Category	Subcategory	Number of Accounts	Share of Accounts	Number of Devices	Share of Devices	Total Tonnage	Share of Tonnage
	Retail Stores	716	10.9%	1,592	2.7%	8,296	2.7%
	Schools	1,382	21.0%	41,560	69.3%	204,657	67.4%
	Unknown/Other	60	0.9%	248	0.4%	1,058	0.3%
	Wholesale, Transport, Other Utilities	528	8.0%	1,643	2.7%	7,622	2.5%
Tonnage Bin	3 or less	883	13.4%	886	1.5%	2,197	0.7%
	3 to 4	702	10.7%	724	1.2%	2,444	0.8%
	4 to 5	500	7.6%	567	0.9%	2,261	0.7%
	5 to 10	1,096	16.7%	1,976	3.3%	7,717	2.5%
	10-100	2,222	33.8%	16,401	27.3%	78,104	25.7%
	100-500	855	13.0%	32,831	54.7%	168,116	55.4%
	500+	46	0.7%	6,616	11.0%	42,644	14.1%
All Customers		**6,569**	**100%**	**60,001**	**100%**	**303,482**	**100%**

* Based on all participants that were enrolled in the program between the first event and last event of the 2024 season.

2.6 2024 EVENT CONDITIONS

Figure 9 visualizes the timing of the SDP events during the 2024 summer. Events varied in timing and length, and some events started or ended mid-hour. There was a territory wide event on June 25th, three events that excluded SDP-Central-3 (July 11th, August 20th, and September 5th), and a localized event on September 6th, which dispatched only one abank. The large events lasted for one hour, without overlapping hours.

Figure 9: Timing of SDP Summer Events, 2024

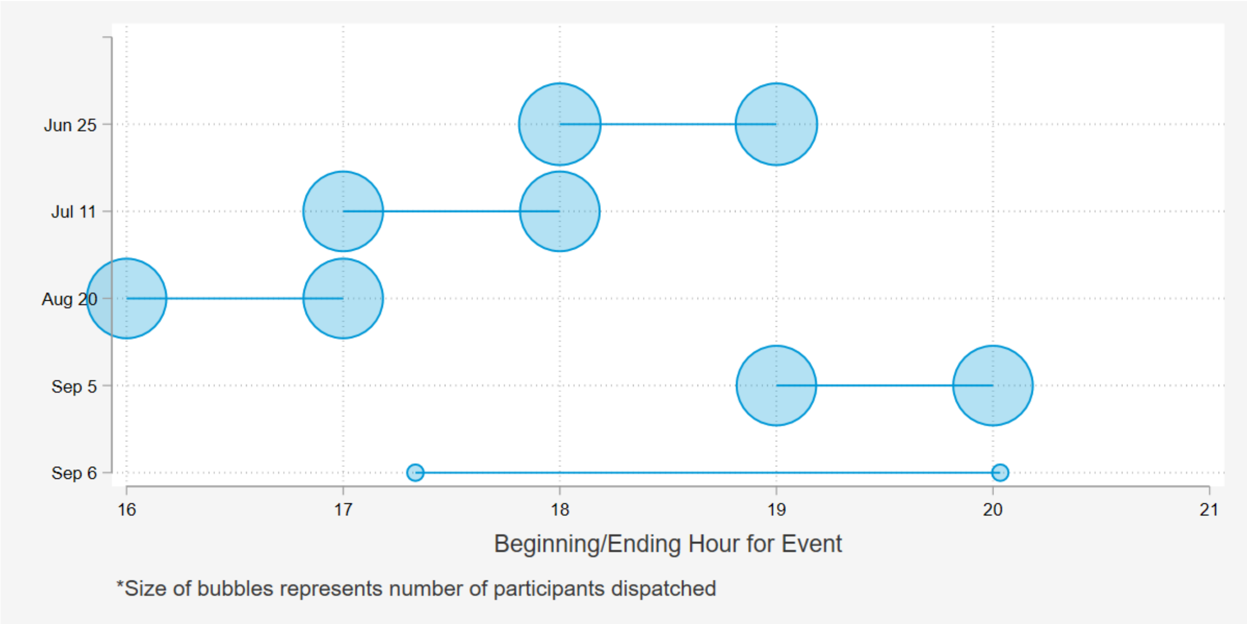


Table 7 shows the dates, start times, and end times for the two SDP DR event days in 2024. It also shows the number of dispatched accounts, devices, and tonnage for the SDP-R and SDP-C segments. The last row in the table shows characteristics for the "average" 2024 events, which were constructed to show what a territory wide event would have delivered this year. The 5:00 PM – 7:00 PM window was selected for the average event because the only territory-wide event was dispatched from 6:00 PM – 7:00 PM on June 25th, and the subsequent event only July 11th dispatched almost the full-territory and covered the hour prior. For the load control groups that were dispatched during the July event, the direct impacts on this day were used to construct the average event impact. Since the Central-3 load control group was not dispatched on the July event, the event dispatch in June was used to extrapolate the average 5:00 PM – 6:00 PM impact. Some highlights from the table:

- There were just over 150,000 participants and approximately 632,000 total tons of AC load for the average SDP-R event.
- There were over 6,400 participants and approximately 302,000 total tons of AC load for the average SDP-C event.
- The average temperature for the average event day was 86.2 F.

Table 7: Summary of SDP-R and SDP-C Events

Date	Load Control Groups	Event Start	Event End	SDP-Residential				SDP-Commercial			
				Accounts	Devices	Tonnage	Weighted Temp (F)	Accounts	Devices	Tonnage	Weighted Temp (F)
6/25/2024	Full territory	6:00 PM	7:00 PM	151,270	176,037	634,586	87.4	6,549	60,514	306,184	84.5
7/11/2024	Excl. C-3	5:00 PM	6:00 PM	144,031	166,370	599,564	92.3	6,350	59,453	300,359	87.9
8/20/2024	Excl. C-3	4:00 PM	5:00 PM	143,414	165,657	596,996	95.6	6,320	59,172	298,940	92.7
9/5/2024	Excl. C-3	7:00 PM	8:00 PM	143,319	165,547	596,601	102.1	6,298	58,966	297,899	98.7
9/6/2024	Localized	5:13 PM	8:02 PM	5,681	7,410	26,578	108.9	119	880	4,491	108.9
Avg. Event		**5:00 PM – 7:00 PM**		**150,762**	**175,446**	**632,454**	**89.8**	**6,469**	**59,775**	**302,444**	**86.2**

3 RESIDENTIAL EX POST RESULTS

This section focuses on the magnitude of demand reductions delivered by SDP-R during 2024 event days. The magnitude of demand reductions is a function of several factors – temperature, time of day, and geo-targeted dispatch of resources.

3.1 INDIVIDUAL EVENT DAY REDUCTIONS

The 2024 SCE system peak was 23,809 MW and occurred on Friday, September 6th. There was one localized SDP demand response event dispatched on this day. The previous day, which was the second-highest peak day in 2024, dispatched all load control groups except SDP-Central-3. Table 8 reference loads, observed loads, impacts, and percent impacts for each of the SDP-R summer 2024 DR events. The table also shows performance metrics for the average event, which was constructed to show what a territory wide event would have delivered this year. The 5:00 PM – 7:00 PM window was selected for the average event because the only territory-wide event was dispatched from 6:00 PM – 7:00 PM on June 25th, and the subsequent event only July 11th dispatched almost the full-territory and covered the hour prior.

Table 8: SDP-R Event Results, 2024

Date	Load Control Groups	Event start	Event end	Accts	MW Metrics					Impact per … (kW)				
					Reference Load	Observed Load	Impact	90% LB	90% UB	Account	Device	Ton	% Impact	Weighted Temp (F)
6/25/2024	Territory wide	6:00 PM	7:00 PM	151,270	305	232	72	67	78	0.48	0.41	0.11	23.8%	84.5
7/11/2024	Excludes C-3	5:00 PM	6:00 PM	144,031	343	241	102	96	107	0.71	0.61	0.17	29.7%	91.7
8/20/2024	Excludes C-3	4:00 PM	5:00 PM	143,414	330	223	107	102	112	0.75	0.65	0.18	32.5%	95.6
9/5/2024	Excludes C-3	7:00 PM	8:00 PM	143,319	452	330	121	113	129	0.85	0.73	0.20	26.8%	98.0
9/6/2024	Localized	5:13 PM	8:02 PM	5,681	22	18	5	4	6	0.84	0.64	0.18	21.3%	105.5
Avg. Event	**5:00 PM – 7:00 PM**			**150,762**	**330**	**242**	**88**	**85**	**91**	**0.59**	**0.50**	**0.14**	**26.8%**	**88.1**

Figure 10 shows the one event that took place on September 5th of 2024, which was the second-highest SCE peak day. This event ran from 7:00 PM to 8:00 PM. During the event hour, load was reduced by 26.8% or 121 MW. For this event, it is important to recognize that the SDP-C-3 load control group was not dispatched. This load control groups contains approximately 7,200 customers.

Figure 10: SDP-R Reductions on September 5th, 2024 Event Day

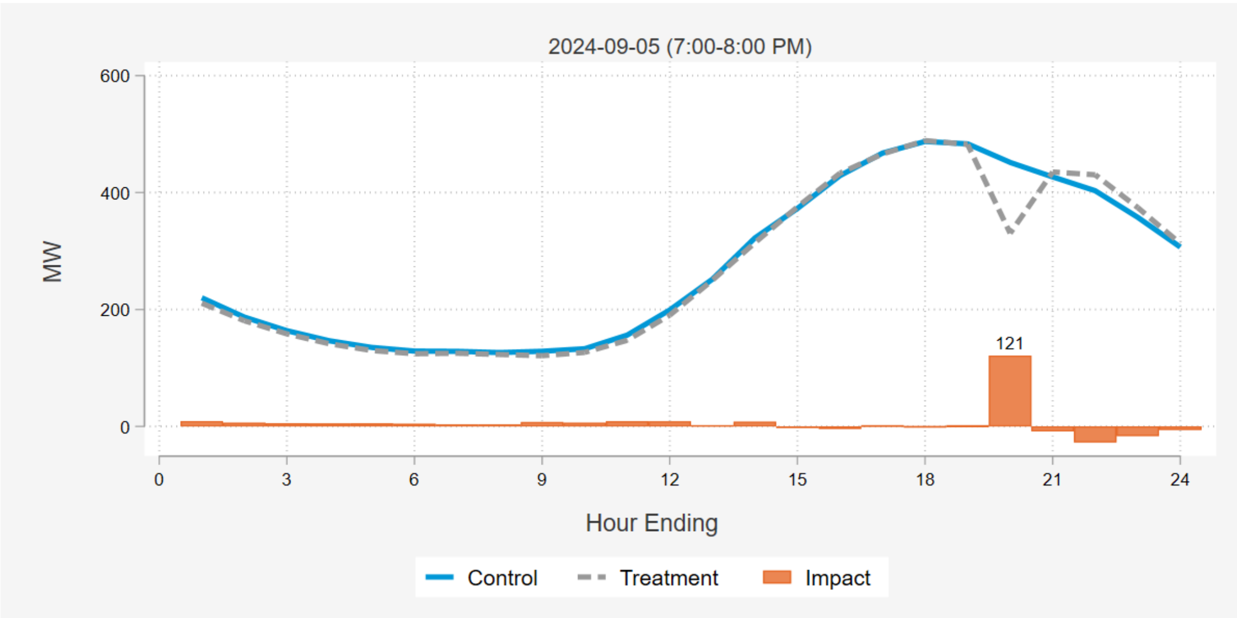
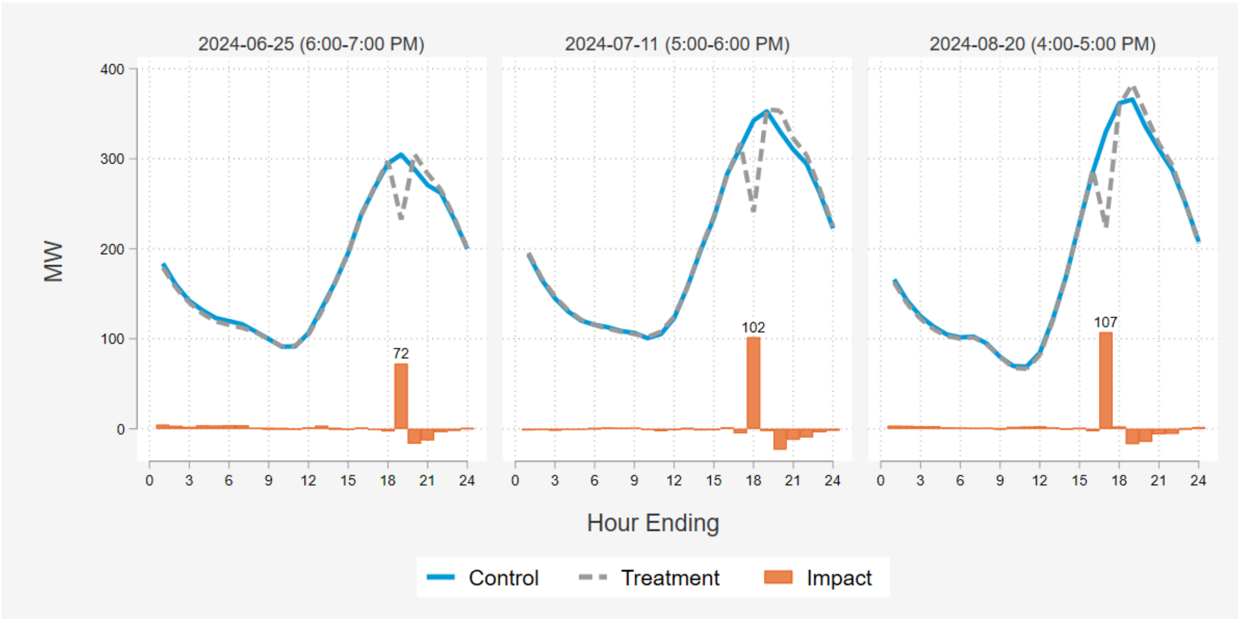


Figure 11 shows the non-September events. The event dispatched on June 25th, was a territory wide event that lasted from 6:00 PM to 7:00 PM. This event had an impact of 72 MW (representing a 23.8% decrease). The events dispatched on July 11th and August 20th, excluded SDP-C-3 load control group (approximately 7,200 customers). The July 11th event lasted from 5:00 PM to 6:00 PM and achieved a reduction of 102 MW (29.7%). The August 20th event lasted from 4:00 to 5:00 PM and had an impact of 107 MW (32.5%).

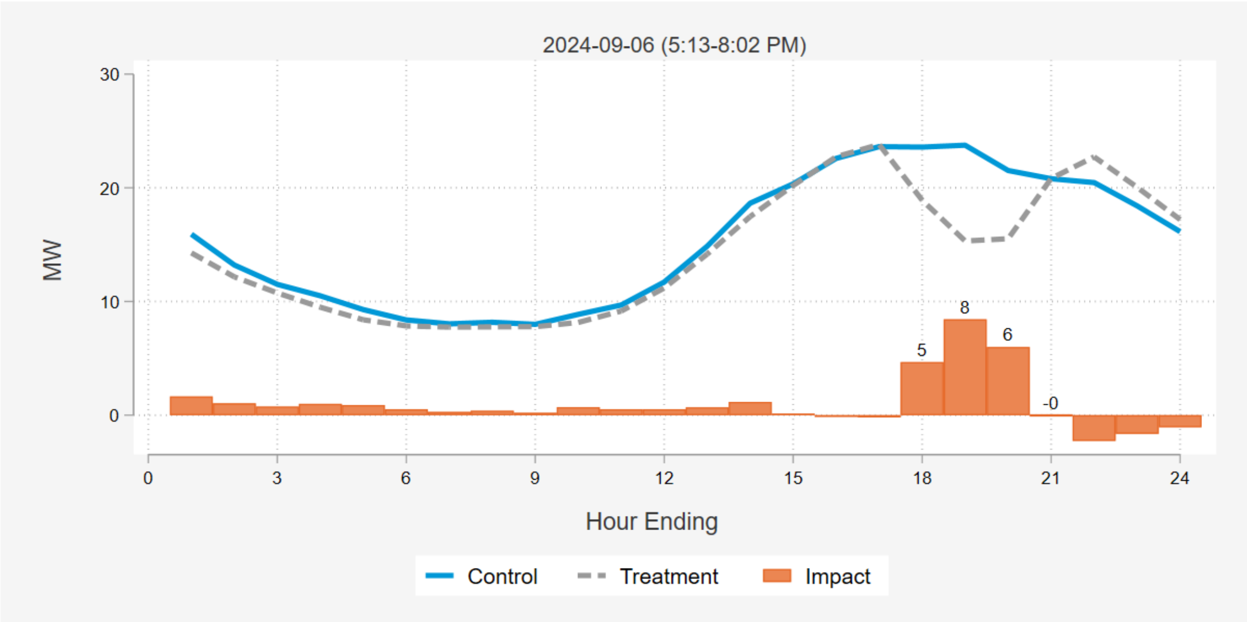
Figure 11: SDP-R Reductions on Non-September 2024 Event Days



It is worth noting that all large-scale events lasted for one hour each, with no overlapping time periods. Additionally, the events covered nearly all peak hours, except for hour ending 9 PM.

Figure 12 shows the impacts of September 6th event, which was a localized event. This event lasted from 5:13 to 8:02 and had an overall impact of 4.8 MW, or 21.3%. If considering only full event hours, the event had an average impact of 7.21 MW, or 31.9%. While the event on September 6th had small aggregate impacts due to the smaller number of customers dispatched, the localized load relief provided to the distribution system on that day was valuable. Load relief value can often vary considerably from location to location within the SCE system based on distribution circuit loading and local conditions. Program flexibility in dispatching small-scale events may be a source of future value for SDP.

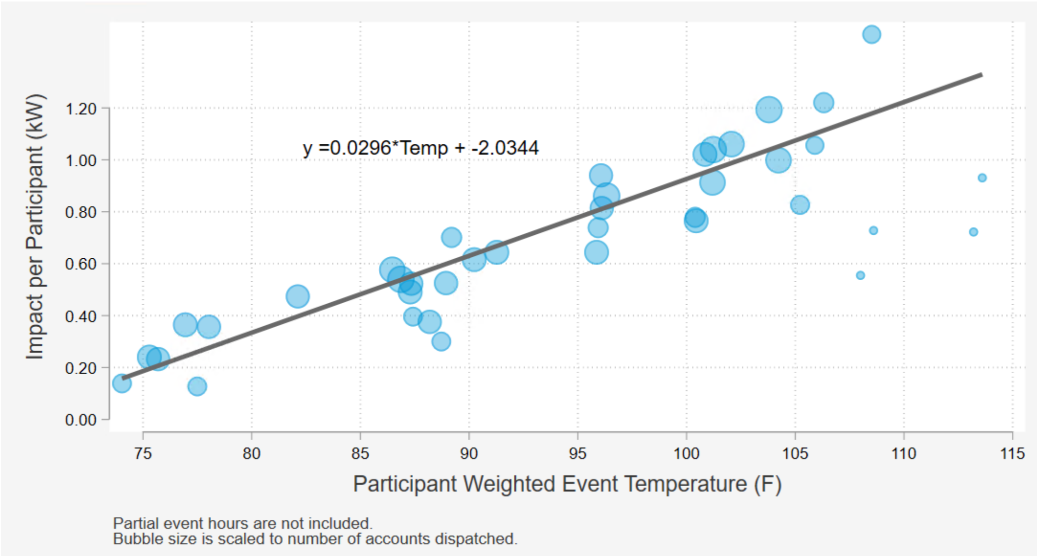
Figure 12: SDP-R Reductions on Localized September 2024 Event Day



3.2 WEATHER SENSITIVITY OF LOAD IMPACTS

Residential SDP impacts tend to be larger when outdoor temperatures are higher since more controllable air conditioner load is available for reductions. Figure 13 shows this relationship by LCG for each event hour The slope of the line in the figure is 0.03 which implies the average impact per participant increased by 0.03 kW for every one-degree increase in outdoor temperature.

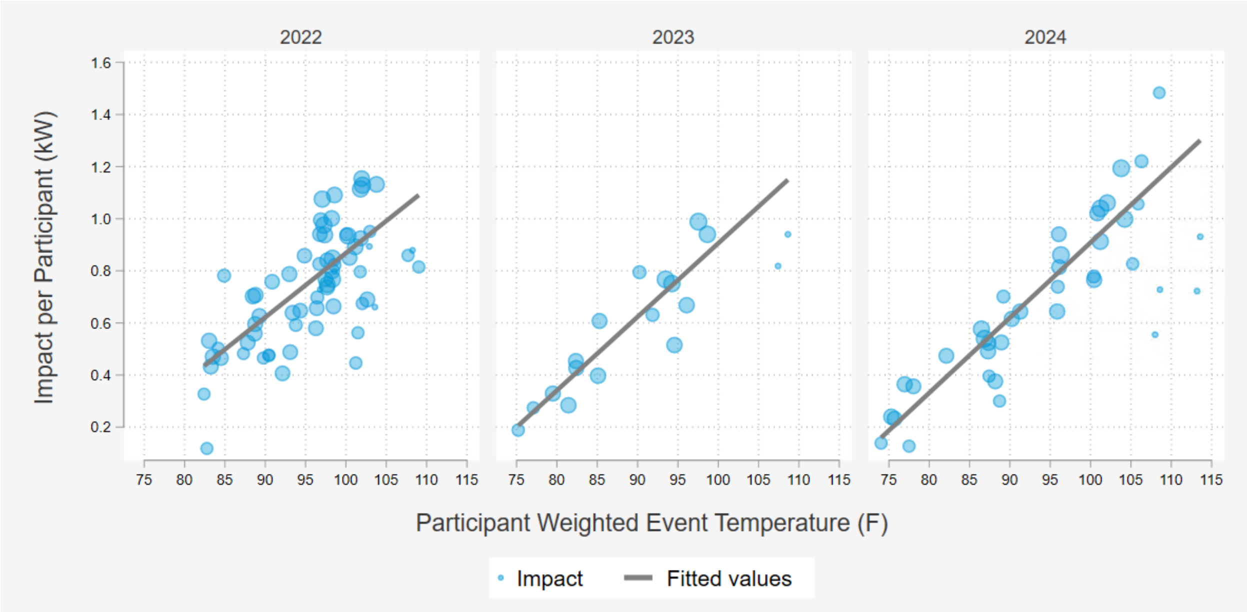
Figure 13: Relationship between SDP-R Demand Reductions and Weather by LCG



3.3 COMPARISON TO PRIOR YEARS

Figure 14 shows the relationship between SDP-R reductions and outdoor temperature for the past three years. The years on the graphs range in the frequency of events called as well as the temperatures during events (2023 was relatively cool). The individual trend lines by year are very similar. This implies a fairly stable relationship between temperature and SDP-R impacts for the past three years.

Figure 14: SDP-R Reductions and Temperature by Year, 2022-2024

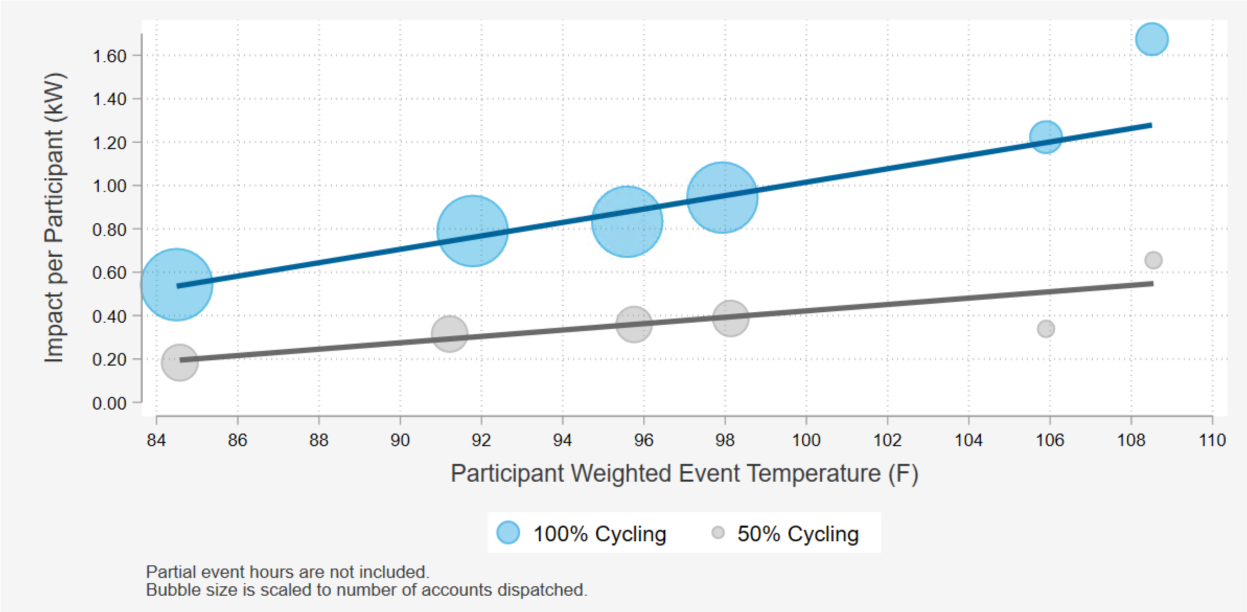


3.4 IMPACTS BY CYCLING STRATEGY

Figure 15 plots the load impacts against outdoor temperature for the two cycling strategy groups. As in past years, SDP-R impacts for participants in the 100% cycling group are more than double that of the 50% cycling group across the range of temperatures.

The relationship between load impacts and temperature is similar for the two groups, however, with impacts increasing as temperature increases. The steeper slope of the line for 100% cycling group implies slightly larger kW impacts per participant for each additional degree of outdoor temperature.

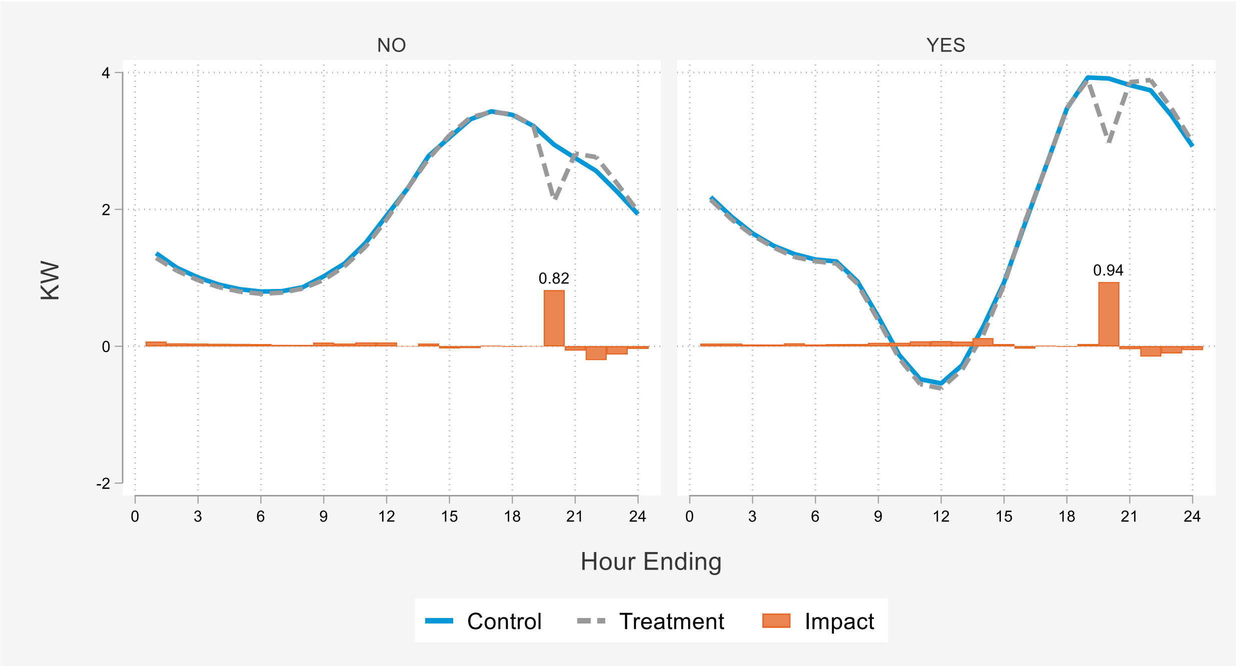
Figure 15: SDP-R Impacts by Cycling Strategy



3.5 IMPACTS BY NET ENERGY METERED CUSTOMERS

Figure 16 show the load shapes and reductions by net energy metered (NEM) status for the September 5th event. During this event, NEM participants produced a load reduction of 0.94 kW per-customer, while those without solar reduced load by 0.82 kW. This pattern of higher, per-customer reductions for NEM participants holds across all events dispatched during this program year. This is likely a result of NEM customers having larger loads in the afternoon and evening hours, which creates an increased opportunity to reduce energy usage. As a results, percent impacts are not always greater for NEM customers but are larger in absolute terms.

Figure 16: SDP-R Reductions by NEM Status on CAISO Peak Day



3.6 IMPACTS FOR KEY CUSTOMER SEGMENTS

Table 9 shows the impacts of key customer segments for the average 2024 SDP-R event day, which was constructed to show what a territory wide event would have delivered this year. The 5:00 PM – 7:00 PM window was selected for the average event because the only territory-wide event was dispatched from 6:00 PM – 7:00 PM on June 25th, and the subsequent event only July 11th dispatched almost the full-territory and covered the hour prior. For the load control groups that were dispatched during the July event, the direct impacts on this day were used to construct the average event impact. Since the Central-3 load control group was not dispatched on the July event, the event dispatch in June was used to extrapolate the average 5:00 PM – 6:00 PM impact.

- On average, percent impacts in the 100% cycling strategy group are approximately 3 times larger than impacts in the 50% cycling strategy group, due to the temperate weather leading to less AC usage.
- Percent impacts varied across LCG groups. High Desert and Central-4 had impacts over 30% on average. The Central-1, Central-4, North, and Low Dessert had impacts over 20% on average. West-1 and West-2 had impacts of 20% and 19% respectively, while Northwest, which is coastal and very temperate, had impacts of only 8%.
- The largest average load impacts occurred in those participants outside of LA Basin (0.96 kW).
- Net energy metered customers tend to have a larger per-customer load reduction on average (NEM – 0.55 kW vs. Non-NEM – 0.49 kW).

Table 9: SDP-R Impacts by Key Customer Segments, Average 2024 Event Day

Category	Subcategory	Number of Accounts	Devices	Tonnage	Ref. Load (MW)	Obs. Load (MW)	Impact (MW)	Percent Impact	Impact per Device (kW)
Cycling	50%	26,631	29,730	106,119	60.8	54.4	6.4	10.5%	0.21
	100%	124,121	145,704	526,292	269.1	187.1	82.0	30.5%	0.56
Load Control Group	SDP-Central-1	25,579	30,841	109,595	65.6	46.8	18.8	28.6%	0.61
	SDP-Central-2	16,921	18,832	69,599	32.3	23.9	8.4	26.1%	0.45
	SDP-Central-4	29,356	34,317	123,685	66.8	46.1	20.6	30.9%	0.60
	SDP-High Desert	9,104	10,231	36,033	24.2	15.5	8.7	36.0%	0.85
	SDP-Low Desert	147	157	575	0.5	0.4	0.1	20.7%	0.72
	SDP-North	19,102	22,400	77,946	56.1	40.2	15.9	28.3%	0.71
	SDP-Northwest	6,858	8,516	31,568	11.3	10.4	0.9	8.1%	0.11
	SDP-West-1	19,128	21,748	79,782	27.7	22.0	5.6	20.3%	0.26
	SDP-West-2	17,455	18,887	69,193	27.2	22.0	5.2	19.2%	0.28
Local Capacity Area	Big Creek/Ventura	26,023	30,990	109,803	67.4	50.8	16.7	24.8%	0.54
	LA Basin	115,548	134,140	486,324	237.4	174.6	62.8	26.4%	0.47
	Outside LA Basin	9,186	10,312	36,315	24.6	15.8	8.8	35.9%	0.86
NEM	No	118,586	135,380	486,019	266.0	199.6	66.4	25.0%	0.49
	Yes	32,176	40,065	146,435	64.0	42.0	22.0	34.4%	0.55
Zone	South Orange County	11,951	13,429	48,418	15.6	12.3	3.3	21.2%	0.25
	South of Lugo	55,188	63,317	231,238	115.5	83.1	32.4	28.1%	0.25
	Remainder of System	83,621	98,697	352,792	199.7	146.7	53.0	26.5%	0.54
Overall Total		**150,762**	**175,446**	**632,454**	**329.9**	**241.5**	**88.3**	**26.8%**	**0.50**

Figure 17 shows average aggregate impacts across 2024 events, broken down by LCG. Central-1 and Central-4 tend to deliver the largest impacts, followed by North and Central-2.

Figure 17: Average Aggregate Impacts by Event and LCG, SDP-R

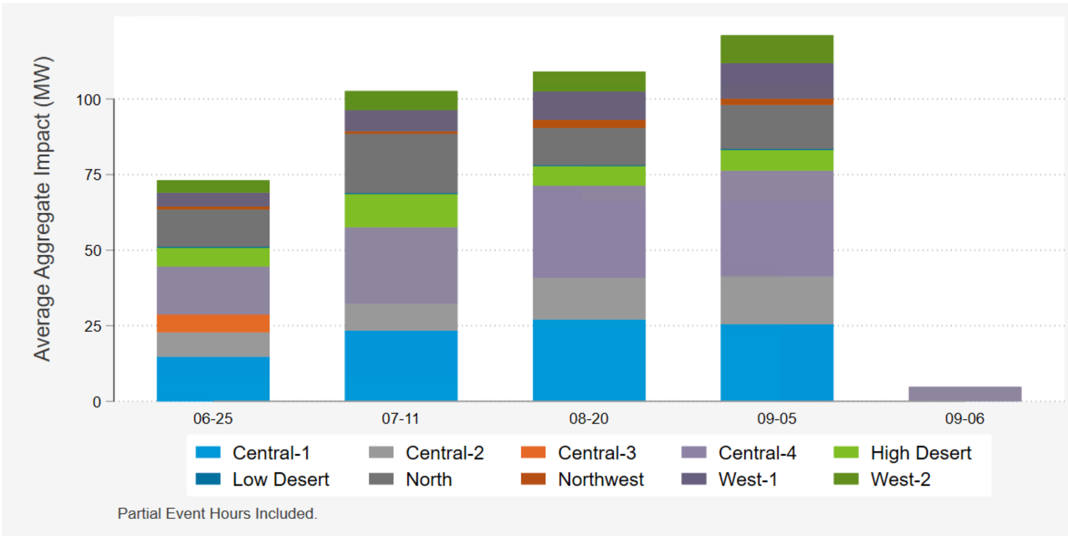
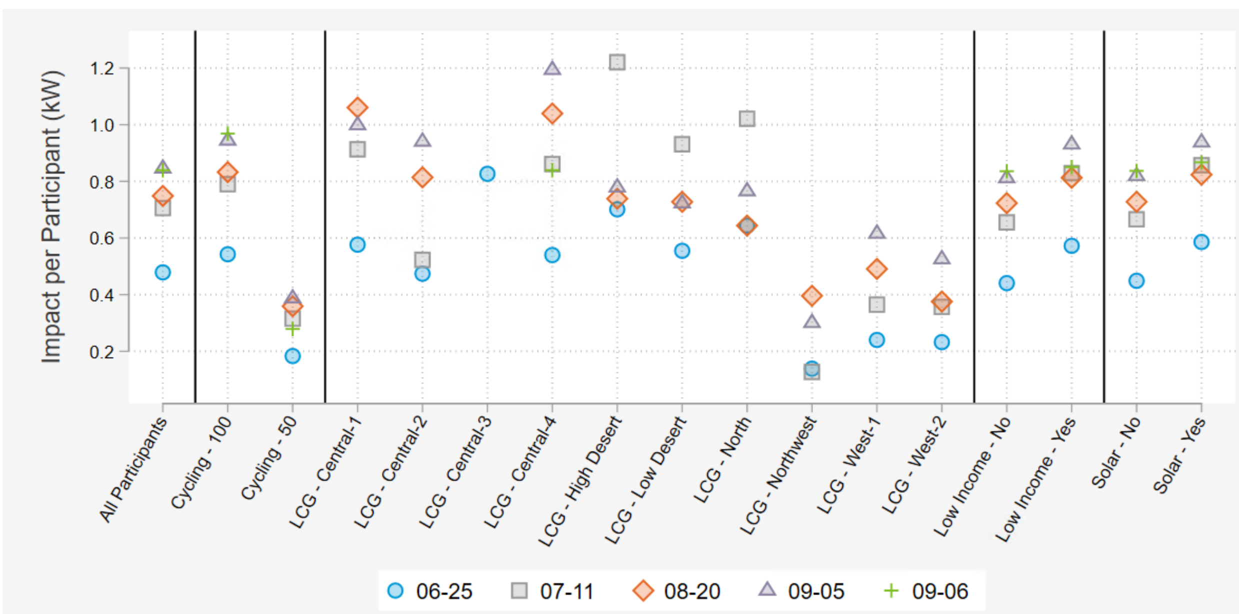


Figure 18 shows how participant-level impacts vary across subcategories for several key research categories (cycling strategy, load control group, and CARE status).

Figure 18: Average Participant Impact by Event and Key Subcategory, SDP-R



3.7 KEY FINDINGS

The SDP Residential (SDP-R) program has approximately 153,000 customers enrolled and includes nearly 178,000 control devices and 641,000 tons of air conditioner load. Approximately 82% of customers elect the higher incentive option, which allows SCE to fully curtail air conditioner demand (100% cycling) during DR events. Demand reductions grow larger in magnitude when temperatures are hotter, and resources are needed most. On a per customer basis, demand reductions increased by an average of 0.03 kW for each one-degree increase in outdoor temperature in 2024. Across 153,000 customers, this translates to 4.6 MW in incremental demand reductions for each one-degree increase in outdoor temperature.

For the 2024 average event, demand was reduced by 0.50 kW per participant, a 27% decrease.

A few other key findings are worth highlighting:

- The per-participant demand reductions for customers signed up for the 100% cycling are around three times larger than demand reductions for those on 50% cycling.
- Residential air conditioner loads are highly weather-sensitive. As a result, demand reductions are larger in magnitude when temperatures are hotter, and resources are needed most.

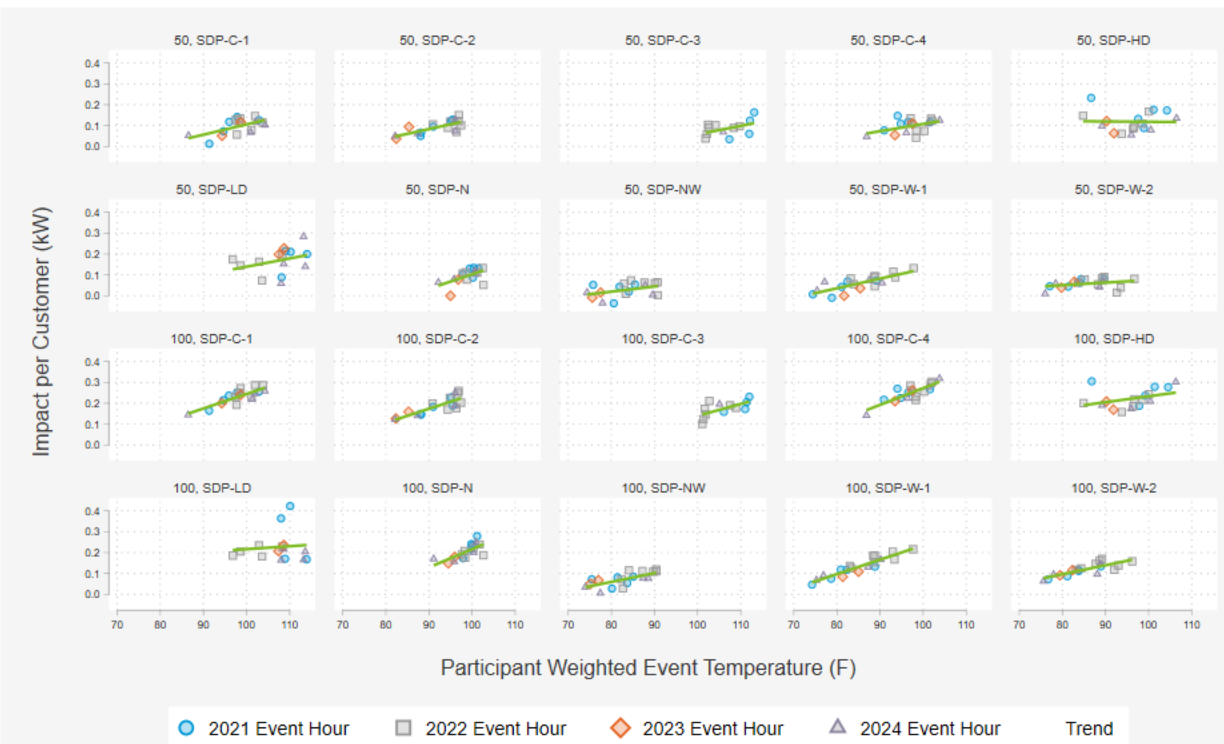
4 RESIDENTIAL EX ANTE RESULTS

Ex ante impacts describe the magnitude of program resources available under planning conditions defined by weather. The ex ante estimates are developed for both SCE and California ISO conditions under normal weather (1-in-2). We estimate the ex ante impacts based on the relationship between demand reductions and weather using four years of historical performance data (2021-2024) and factor in projected changes in enrollment.

4.1 DEVELOPMENT OF EX ANTE IMPACTS

The ex ante impacts were developed by estimating the relationship between weather and demand reductions during 2021-2024 for customers currently enrolled in the program. Partial event hours were not used in the analysis. In total, we estimated the demand reductions for 20 distinct segments defined by load control group and cycling strategy, which ensures that impacts are only included when load control groups are dispatched. The granularity of the analysis was dictated by how SCE dispatches resources (at the load control group level), the geographic diversity of the SCE territory, and the fact that 100% and 50% cycling produce different magnitudes of demand reduction. Figure 19 shows the relationship between weather and demand reductions for each of the building blocks.

Figure 19: 2021-2024 Impacts as a Function of Weather by Load Control Group and Cycling



The pattern of reductions across events and segments was analyzed using a multi-variate regression model. The model accounts for the effects of the hour of day, day of week, period of summer, cycling strategy, and load control group. Appendix E includes the output from the model. The model also estimates "snapback" usage after events based on trends in data from 2021-2024. Estimates are based on the number of hours after the event and daily heat buildup.

4.2 OVERALL RESULTS

For the monthly worst day, Table 10 shows average participant-level ex ante impacts for May through September. Impacts are shown under two different scenarios – CAISO 1-in-2 weather conditions and SCE 1-in-2 weather conditions. For reference, on the August event day in 2024, the average impact per participant was 0.75 kW.

Table 10: Per Participant Worst Day Ex Ante Impacts (kW)

Month	SCE Weather 1-in-2	CAISO Weather 1-in-2
May	0.46	0.36
June	0.66	0.64
July	0.70	0.65
August	0.70	0.68
September	0.73	0.70

Table 11 shows aggregate ex ante demand reduction forecasts for an August worst event day. Forecasts are shown under the two scenarios identified above. Reductions in aggregate impacts over time are driven by the declining enrollment forecast. This is driven by rates of customer attrition from the program (customers moving and/or requesting to be removed from the program). Ex ante weather conditions are static through the forecast window. There is a small amount of variation in participant-level impacts through the forecast window (typically in the second or third decimal place).

Table 11: Aggregate August Worst Day Demand Reduction Forecast (MW)

Forecast Year	Enrollment Forecast	SCE Weather 1-in-2	CAISO Weather 1-in-2
2025	142,192	99.8	96.0
2026	133,216	93.5	90.0
2027	125,189	87.9	84.5
2028	118,009	82.8	79.7
2029	111,589	78.3	75.4
2030	105,847	74.3	71.5
2031	100,712	70.7	68.0
2032	96,120	67.5	64.9
2033	92,013	64.6	62.1
2034	88,340	62.0	59.7
2035	85,056	59.7	57.4

Figure 20 show the estimated ex ante load profiles for the SDP-R customer pool. The figure shows the profile for the August worst day under 1-in-2 weather conditions and uses SCE weather conditions rather than CAISO conditions.

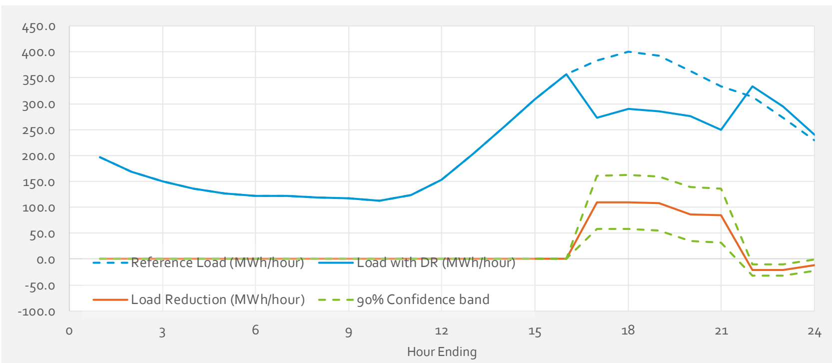
Figure 20: SDP-R Aggregate Ex Ante Impact for 1-in-2 Weather Conditions, August Worst Day 2025

Table 1: Menu options

Type of result	Aggregate
Category	All
Segment	All Customers
Weather Data	SCE
Weather Year	1-in-2
Day Type	August Worst Day
Forecast Year	2025
Portfolio Level	Program
Hour Ending View	HE (Prevailing Time)

Table 2: Event day information

Event start	4:00 PM
Event end	9:00 PM
Total sites	142,192
Total devices	165,905
Total cooling tons	599,212
Event window temperature (F)	91.2
Event window load reduction (MWh/hour	99.79
% Load reduction (Event window)	26.7%
Redaction Information	Public



Hour Ending	Reference Load (MWh/hour	Load with DR (MWh/hour	Load Reduction (MWh/hour)	% Load Reduction	Avg Temp (°F, Site-Weighted)	Uncertainty-Adjusted Impact - Percentiles 5th	50th	95th	Standard Error	T-Statistic
1	196.78	196.78	0.00	0.00%	79.96	0.00	0.00	0.00	0.00	0.00
2	169.30	169.30	0.00	0.00%	78.58	0.00	0.00	0.00	0.00	0.00
3	149.91	149.91	0.00	0.00%	77.54	0.00	0.00	0.00	0.00	0.00
4	135.78	135.78	0.00	0.00%	76.50	0.00	0.00	0.00	0.00	0.00
5	126.02	126.02	0.00	0.00%	75.60	0.00	0.00	0.00	0.00	0.00
6	122.16	122.16	0.00	0.00%	74.96	0.00	0.00	0.00	0.00	0.00
7	121.98	121.98	0.00	0.00%	74.29	0.00	0.00	0.00	0.00	0.00
8	119.52	119.52	0.00	0.00%	74.19	0.00	0.00	0.00	0.00	0.00
9	116.76	116.76	0.00	0.00%	76.54	0.00	0.00	0.00	0.00	0.00
10	113.40	113.40	0.00	0.00%	80.99	0.00	0.00	0.00	0.00	0.00
11	123.03	123.03	0.00	0.00%	85.47	0.00	0.00	0.00	0.00	0.00
12	153.67	153.67	0.00	0.00%	89.13	0.00	0.00	0.00	0.00	0.00
13	202.85	202.85	0.00	0.00%	91.64	0.00	0.00	0.00	0.00	0.00
14	256.34	256.34	0.00	0.00%	93.82	0.00	0.00	0.00	0.00	0.00
15	307.81	307.81	0.00	0.00%	95.29	0.00	0.00	0.00	0.00	0.00
16	356.39	356.39	0.00	0.00%	95.39	0.00	0.00	0.00	0.00	0.00
17	383.10	273.49	109.61	28.61%	94.89	57.71	109.61	161.51	31.55	3.47
18	399.61	289.30	110.31	27.60%	93.29	58.52	110.31	162.09	31.48	3.50
19	392.63	285.00	107.63	27.41%	91.55	55.74	107.63	159.52	31.55	3.41
20	362.67	275.90	86.77	23.93%	89.90	35.02	86.77	138.53	31.46	2.76
21	334.13	249.52	84.62	25.32%	86.60	32.55	84.62	136.69	31.65	2.67
22	312.94	333.36	-20.41	-6.52%	83.36	-31.32	-20.41	-9.51	6.63	-3.08
23	273.38	294.36	-20.98	-7.67%	81.15	-31.61	-20.98	-10.35	6.46	-3.25
24	229.18	240.85	-11.67	-5.09%	79.46	-22.09	-11.67	-1.25	6.34	-1.84
Period	Reference Load (MWh/hour	Load with DR (MWh/hour	Energy Savings (MWh/hour)	% Change	Average Temperature (°F)	Uncertainty adjusted impact - Percentiles 5th	50th	95th	Standard Error	T-statistic
Average Event Hour	374.43	274.64	99.79	26.7%	91.24	47.91	99.79	151.67	31.54	3.16
Daily	227.47	208.89	18.58	8.2%	84.17	6.44	18.58	30.72	7.38	2.52

4.3 RESULTS BY CUSTOMER SEGMENT

The ex ante table generator, submitted in tandem with the report, allows users to review ex ante impact estimates across years, weather conditions, and several relevant customer segments. Table 12 shows ex ante impacts under SCE August weather conditions for two key groupings: cycling strategy and load control groups. Impacts are shown for 1-in-2 weather scenarios. Similar to the 2024 ex post results, ex ante estimates in the 50% cycling group are slightly less than half of those of the 100% cycling group. Trends by Load Control Groups similarly follow the ex post estimates. Impacts tend to be largest in the SDP-Central regions, both per-participant and aggregate. The lowest impacts are in the SDP-Northwest region, which is along the coast.

Table 12: Per Participant SDP-R Ex Ante Results by Customer Segment, SCE August Weather (kW)

Load Control Group	1-in-2 Weather Conditions		
	50% Cycling	100% Cycling	Total
SDP-Central-1	0.45	0.91	0.83
SDP-Central-2	0.47	0.82	0.74
SDP-Central-3	0.35	0.45	0.43
SDP-Central-4	0.49	1.00	0.90
SDP-High Desert	0.42	0.71	0.67
SDP-Low Desert	0.55	0.53	0.54
SDP-North	0.40	0.71	0.65
SDP-Northwest	0.22	0.49	0.45
SDP-West-1	0.34	0.69	0.62
SDP-West-2	0.29	0.58	0.53
Average	**0.41**	**0.77**	**0.70**

4.4 COMPARISON TO PRIOR YEARS

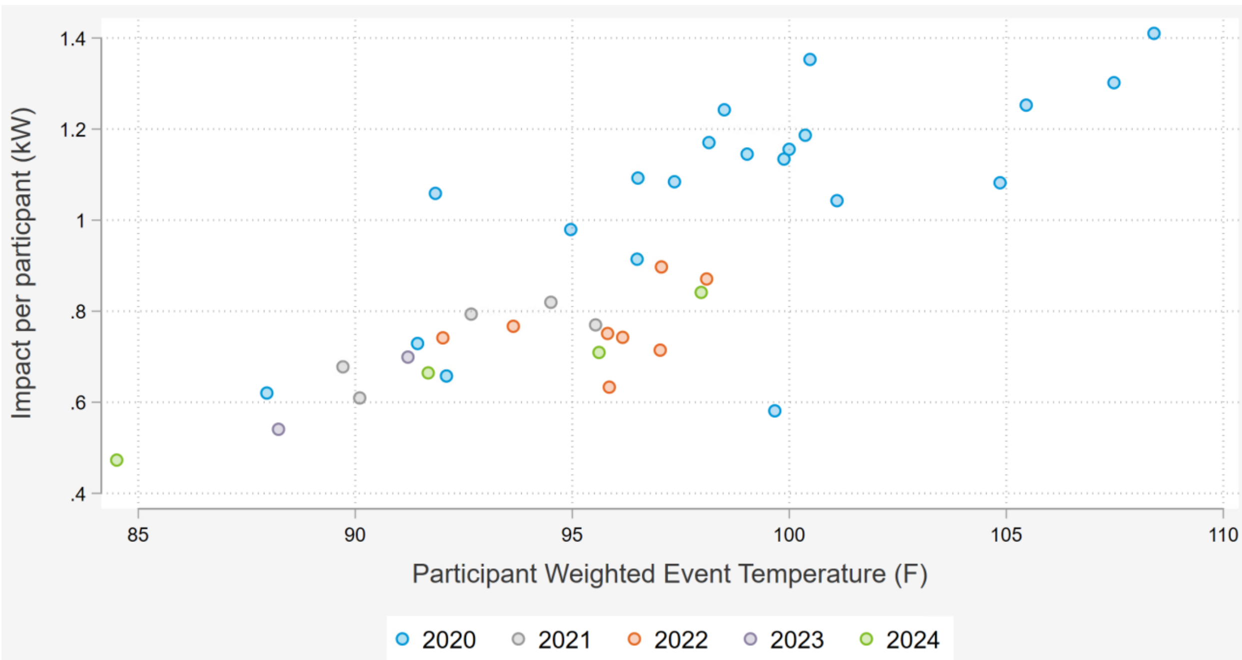
Table 13 shows a comparison of year 2022, 2023, and 2024 ex ante impacts. All impacts represent monthly worst day impact estimates, and SCE weather conditions are used. Each vintage of predictions in the table reports forecasts for the next year: 2022 ex ante predictions are for 2023, 2023 predictions are for 2024, and 2024 predictions are for 2025.

Table 13: Comparison of SDP-R Per Participant Ex Ante SCE Weather Impacts (kW), 2022-2024

Month	Vintage Year 2022	Vintage Year 2023	Vintage Year 2024
	1-in-2	1-in-2	1-in-2
June	0.88	0.82	0.66
July	0.96	0.89	0.70
August	0.99	0.92	0.70
September	1.00	0.93	0.73

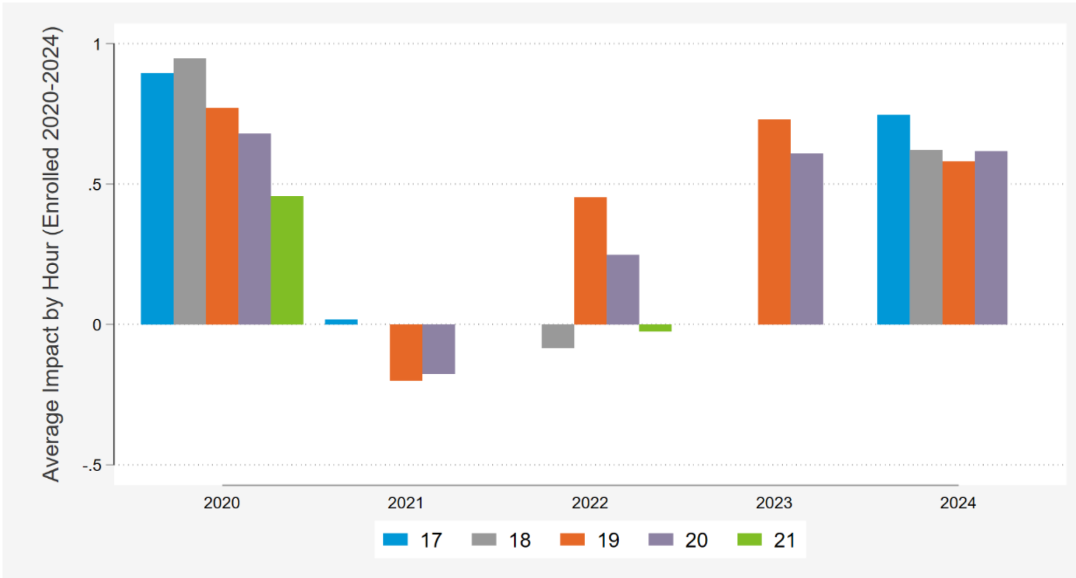
The impacts in 2022-2023 are similar both in magnitude and direction, while the 2024 impacts are lower. The changes in ex ante impacts this year are directly linked to the exclusion of 2020 ex post impacts from the modeling the ex ante predictions (the analysis uses four years of historical performance). As Figure 20 shows, the 2020 impacts were significantly larger than those in other years, even at comparable temperatures. This discrepancy is likely due to the greater number of events, a wider temperature range, and the exceptionally high temperatures in 2020, which exceeded 100°F—something not observed in the subsequent years. Moreover, the higher impacts in 2020 are also likely driven by greater load reduction potential due to the extreme temperatures and the influence of COVID-19, which led to increased residential energy usage

Figure 21: SDP-R Ex Post Impact per Participant by Year



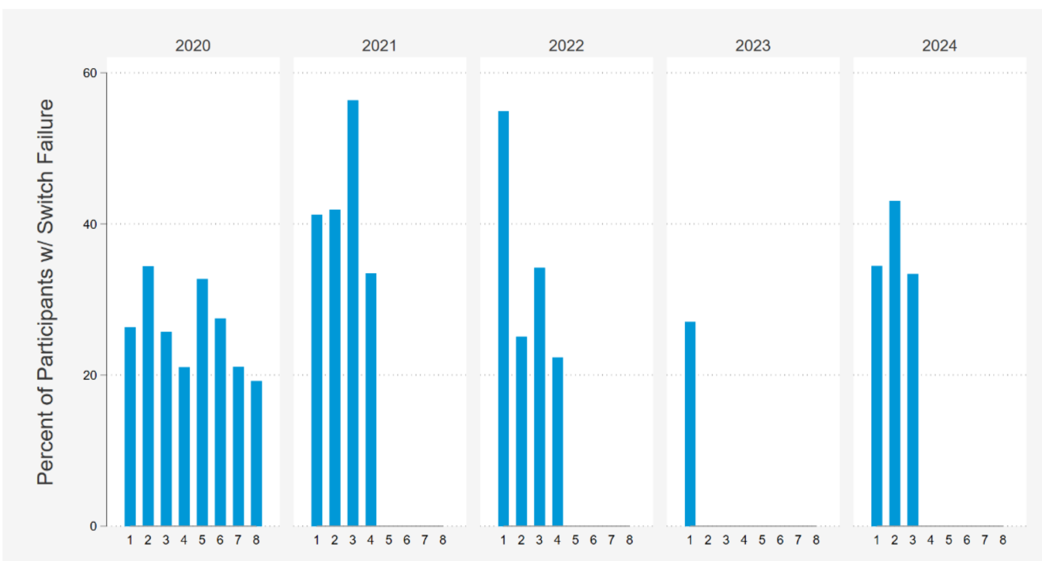
To examine the reasons behind this decrease, we reviewed the average hourly impacts from 2020 to 2024, focusing on customers who were enrolled throughout this entire period. Consistent enrollments account for roughly 112,000 participants. Figure 22 reveals that these participants experienced significantly lower impacts in 2021 and 2022. This is at least partially attributable to the removal of the 20-hour dispatch minimum, which occurred as a result of the extensive dispatch required during the 2020 season. We see that the impacts in 2023 and 2024 appear to be stabilizing, however, they remain below the levels observed in 2020.

Figure 22: Average Hourly Impact for Participants Enrolled Continuously from 2020 to 2024



The lower impacts observed in 2021 and 2022 may correlate with what could be classified as a "switch failure". In this case, a "switch failure" is flagged when the observed usage in the first event hour is 5% larger than the observed usage in the hour prior to the start of the event. Figure 23 shows that these "switch failures" peak on the same years where the impacts are the lowest, where each bar represents an event that started at the top of an hour.

Figure 23: Percent of Participants Enrolled Continuously with Switch Failures



4.5 EX POST TO EX ANTE COMPARISON

Comparing ex ante to ex post estimates is a useful check on predicted demand reductions. When comparing these, however, it is important to keep the distinction between the two estimates in mind.

Ex ante impacts are estimates of the future resources available under standardized planning conditions (defined by weather). Ex post impacts are estimates of what past impacts were given the weather, hours of dispatch, and resources dispatched. Because most events have historically been triggered by wholesale market price conditions in specific load pockets, the reductions do not always reflect the magnitude of resources available.

Table 14 compares the hour-by-hour ex post load impacts for the 2024 full-hour event day to the ex ante 1-in-2 SCE monthly worst days for August under 1-in-2 and 1-in-10 weather conditions. In direction, the ex post load impacts are similar to the ex ante impact estimates shown in the table. The 9/5 event had higher impacts for a 7:00 PM to 8:00 PM dispatch, which was likely the result of conditions being more similar to forecasted dispatches earlier in the day. The 9/5 impacts more closely mirror the 4:00 PM to 5:00 PM and 5:00 PM to 6:00 PM dispatch windows.

Table 14: SDP-R Ex Post to Ex Ante Comparison

Units	Date	Accounts	Devices	Max Daily Temp (F)	Average Daily Temp (F)	4:00-5:00 PM	5:00-6:00 PM	6:00-7:00 PM	7:00-8:00 PM	8:00-9:00 PM
Aggregate Impacts (MW)	2024-09-05	143,319	165,547	102.7	88.3	---	---	---	121.2	---
	SCE Ex-ante 1-in-10 August Worst Day	142,192	165,905	100.7	87.4	120.4	118.9	114.7	91.7	89.4
	SCE Ex-ante 1-in-2 August Worst Day	142,192	165,905	95.4	84.2	109.6	110.3	107.6	86.8	84.6
Impacts per Account (kW)	2024-09-05	143,319	165,547	102.7	88.3	---	---	---	0.85	---
	SCE Ex-ante 1-in-10 August Worst Day	142,192	165,905	100.7	87.4	0.85	0.84	0.81	0.65	0.63
	SCE Ex-ante 1-in-2 August Worst Day	142,192	165,905	95.4	84.2	0.77	0.78	0.76	0.61	0.60
Impacts per Device (kW)	2024-09-05	143,319	165,547	102.7	88.3	---	---	---	0.73	---
	SCE Ex-ante 1-in-10 August Worst Day	142,192	165,905	100.7	87.4	0.73	0.72	0.69	0.55	0.54
	SCE Ex-ante 1-in-2 August Worst Day	142,192	165,905	95.4	84.2	0.66	0.66	0.65	0.52	0.51

5 NON-RESIDENTIAL EX POST RESULTS

This section focuses on the magnitude of demand reductions delivered by SDP-C during 2024 event days and reflects the impacts delivered given the weather conditions, hours of dispatch, industry and participants mix, and amount of resources dispatched.

5.1 INDIVIDUAL EVENT DAY REDUCTIONS

Table 15 reference loads, observed loads, impacts, and percent impacts for each of the SDP-C summer 2024 DR events. The table also shows performance metrics for the average event, which was constructed to show what a territory wide event would have delivered this year. The 5:00 PM – 7:00 PM window was selected for the average event because the only territory-wide event was dispatched from 6:00 PM – 7:00 PM on June 25th, and the subsequent event only July 11th dispatched almost the full-territory and covered the hour prior.

Table 15: SDP-C Event Results, 2024

Date	Load Control Groups	Event start	Event end	Accts	MW Metrics					Impact per … (kW)				
					Reference Load	Observed Load	Impact	90% LB	90% UB	Account	Device	Ton	% Impact	Weighted Temp (F)
6/25/2024	Full Territory	6:00 PM	7:00 PM	6,549	94	90	4	1	8	0.65	0.07	0.01	4.6%	81.7
7/11/2024	Excludes C-3	5:00 PM	6:00 PM	6,350	105	97	9	4	14	1.37	0.15	0.03	8.3%	86.8
8/20/2024	Excludes C-3	4:00 PM	5:00 PM	6,320	162	143	18	10	26	2.90	0.31	0.06	11.3%	92.7
9/5/2024	Excludes C-3	7:00 PM	8:00 PM	6,298	137	125	12	-1	24	1.83	0.20	0.04	8.4%	94.3
9/6/2024	Localized	5:13 PM	8:02 PM	119	[redacted]									
Avg. Event	**5:00 PM - 7:00 PM**			**6,469**	**99**	**93**	**6**	**2**	**10**	**0.93**	**0.10**	**0.02**	**6.1%**	**84.2**

Figure 24 visualizes impacts on September 5th which excluded the SDP-C-3 load control group, or about 6% of the available tonnage, from participation. The impacts were around 12 MW, which accounts for an 8% reduction in the reference load.

Figure 24: SDP-C Reductions on September 5th, 2024 Event Day

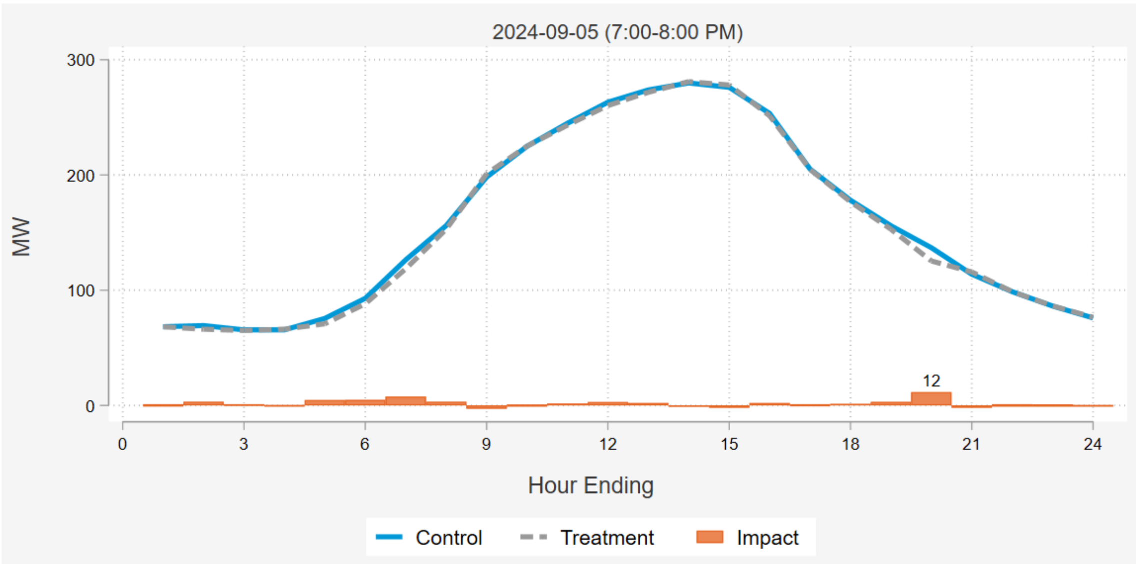


Figure 25 shows the hourly load profile for the control and participant groups on the non-September events. The event dispatched on June 25th, was a territory wide event and had an impact of 4.3 MW (representing a 5% decrease). The events dispatched on July 11th and August 20th, omitted SDP-C-3 load control group, excluding 147 customers. The July 11th event achieved a reduction of 8.7 MW (8%), while the August 20th event had an impact of 18.3 MW (11%).

These results reflect the participant composition in SDP-C. With schools comprising a significant portion of participants (68%), the program tends to achieve higher impacts when schools are in session and during their operating hours. This explains the higher impacts observed on Tuesday, August 20, from 4:00 PM to 5:00 PM compared to the other event hours and days. Moreover, for commercial customers, AC usage represents a smaller share of load than for residential customers. Commercial AC loads and building occupancy tend to occur mid-day, with less load in the evening hours.

Figure 25: SDP-C Reductions on non-September Event Days

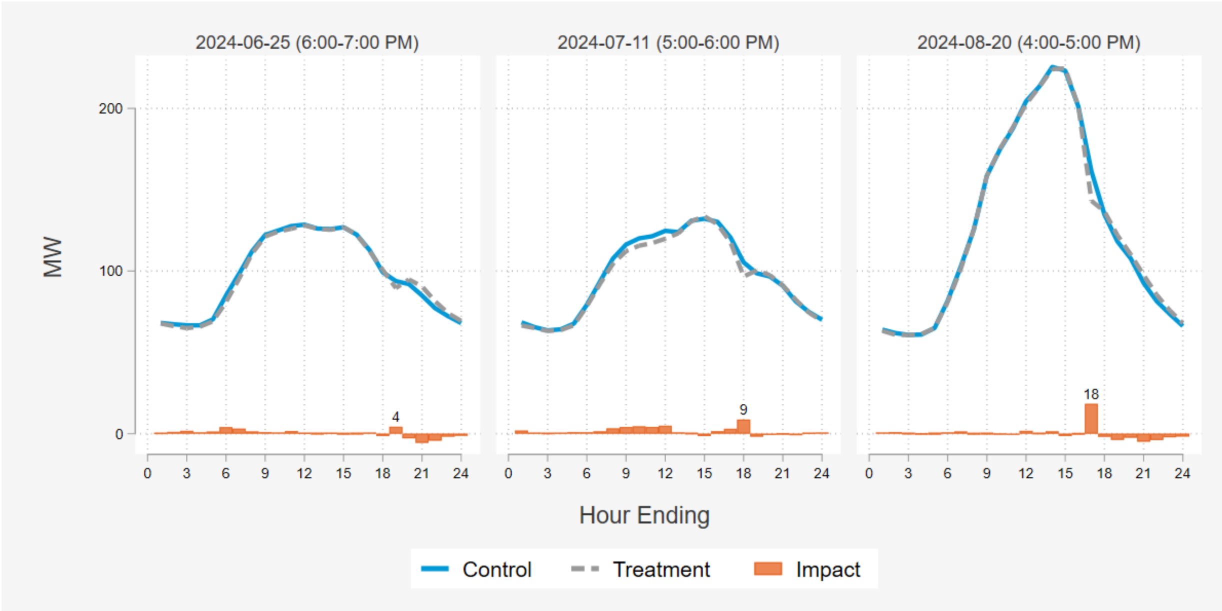


Figure 22 shows the impacts of September 6th event, which dispatched a single A-bank. This event lasted from 5:13 to 8:02 and had an overall impact of [redacted] While the event on September 6th had small aggregate impacts due to the smaller number of customers dispatched, the localized load relief provided to the distribution system on that day was valuable. Load relief value can often vary considerably from location to location within the SCE system based on distribution circuit loading and local conditions. Program flexibility in dispatching small-scale events may be a source of future value for SDP.

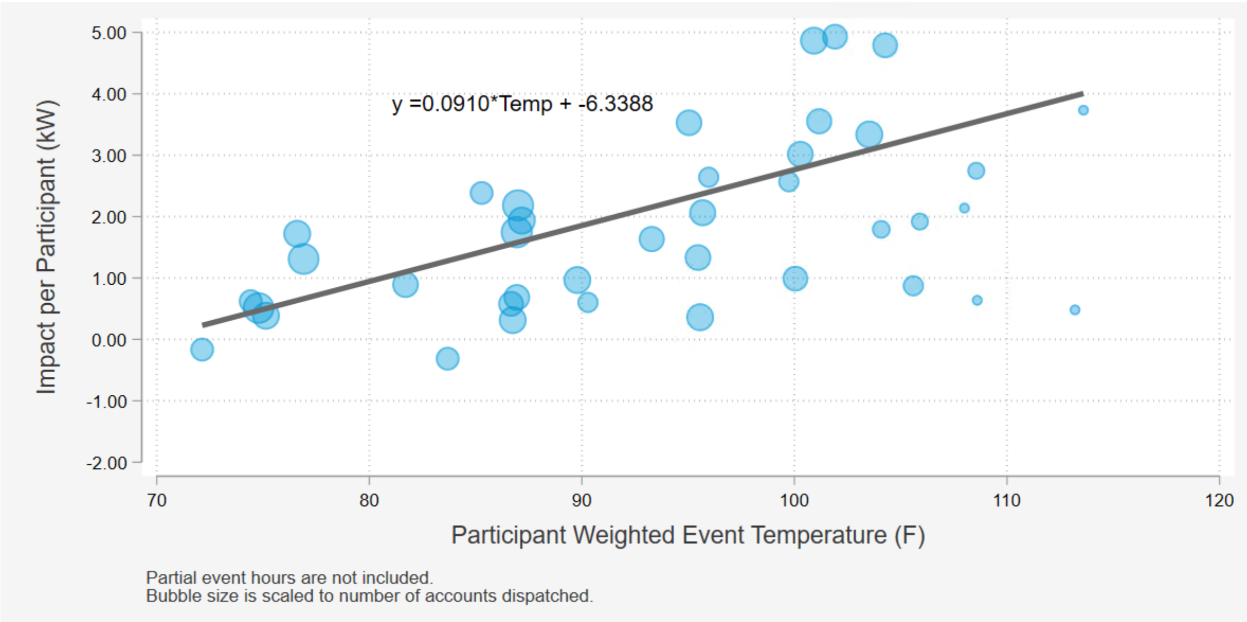
Figure 26: SDP-C Reductions on September 6th, 2024

[Image Redacted]

5.2 WEATHER SENSITIVITY OF LOAD IMPACTS

The relationship between SDP-C per-participant demand reductions and outdoor air temperature is visualized in Figure 27 and includes all full event hours. As would be expected for a load control program, the magnitude of demand reductions is larger when temperatures are hotter. The slope of the trend line is 0.091 per degree. This implies that each one-degree increase in temperature is associated with a 0.091 kW increase in the per participant demand reduction.

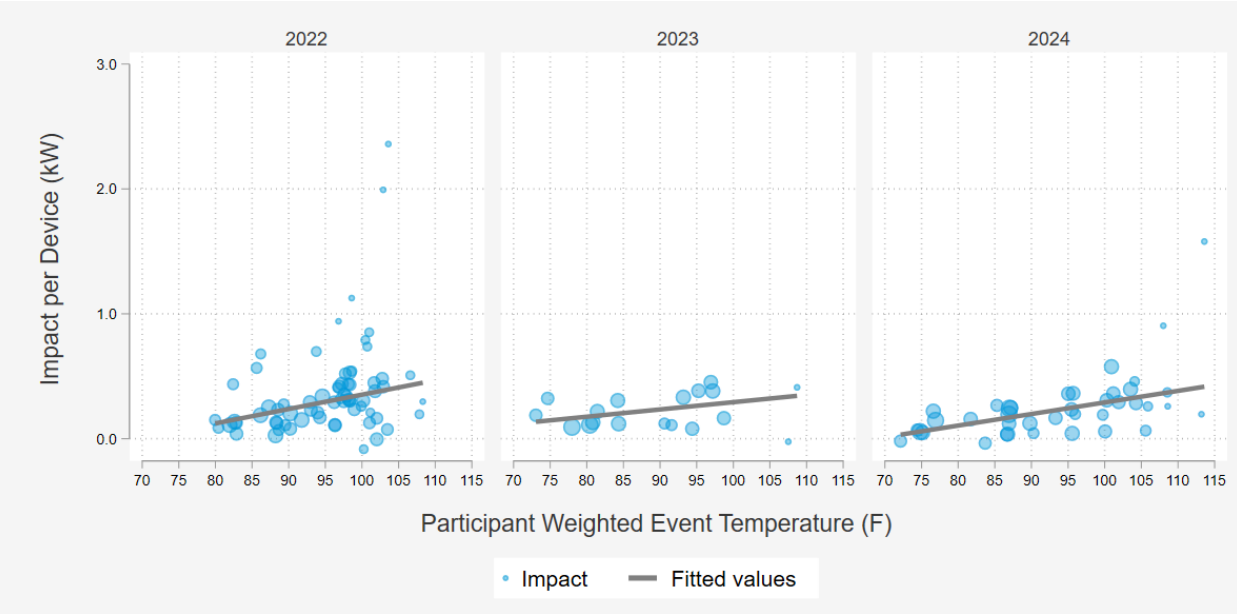
Figure 27: Relationship between SDP-C Demand Reductions and Weather



5.3 COMPARISON TO PRIOR YEAR

Figure 28 shows the relationship between 2024 SDP-C per-device reductions and outdoor temperature compared to 2022 and 2023. The individual trend lines by year are similar, which implies a stable relationship between temperature and SDP-C per-device impacts over the past three years.

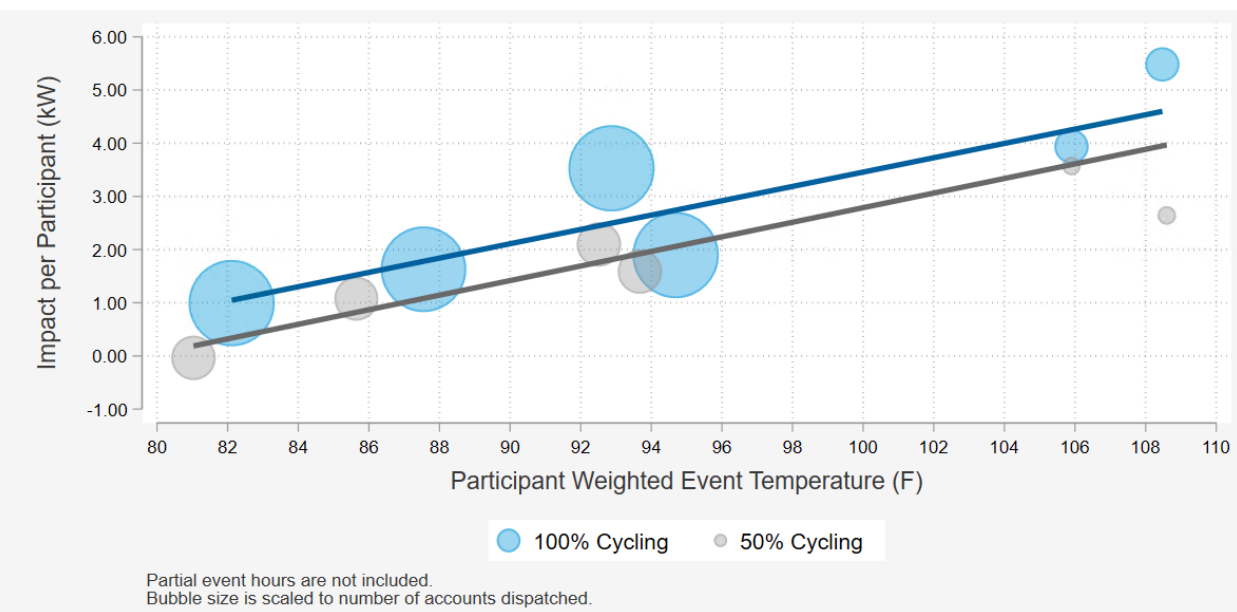
Figure 28: SDP-C Reductions and Temperature by Year, 2022-2024



5.4 IMPACTS BY CYCLING STRATEGY

Figure 29 plots the load impacts against outdoor temperature for the two of the three cycling strategy groups. Impacts for 30% cycling are excluded, as that groups only includes 6.3% of devices. As expected, the magnitude of impacts for the 100% cycling group is larger than the impacts in the 50% cycling group. The slopes of the lines in the figure are 0.016 in the 100% cycling group and 0.012 in the 50% cycling group. Recall that these slopes represent the expected increase in the impact for every one degree increase in temperature.

Figure 29: SDP-C Impacts by Cycling Strategy



5.5 IMPACTS FOR KEY CUSTOMER SEGMENTS

Table 16 shows per-device impacts of key customer segments for the average 2024 SDP-C event day, which was constructed to show what a territory wide event would have delivered this year. The 5:00 PM – 7:00 PM window was selected for the average event because the only territory-wide event was dispatched from 6:00 PM – 7:00 PM on June 25th, and the subsequent event only July 11th dispatched almost the full-territory and covered the hour prior. For the load control groups that were dispatched during the July event, the direct impacts on this day were used to construct the average event impact. Since the Central-3 load control group was not dispatched on the July event, the event dispatch in June was used to extrapolate the average 5:00 PM – 6:00 PM impact.

- On average, percent impacts in the 100% cycling strategy group are over three times larger than impacts in the 50% cycling strategy group, due to the temperate weather leading to less AC usage.
- Schools account for more than half of the aggregate demand reductions on the average event day and drive the results for SDP-C.

Table 16: SDP-C Impacts by Key Customer Segments, Average 2024 Event Day

Category	Subcategory	Number of Accounts	Devices	Tonnage	Ref. Load (MW)	Obs. Load (MW)	Impact (MW)	Percent Impact	Impact per Device (kW)
Cycling	30%	505	3,311	18,946	[redacted]				
	50%	1,789	20,634	102,193	[redacted]				
	100%	4,174	35,829	181,305	56.9	51.8	51.2	9.0%	1.43
Load Control Group	SDP-Central-1	635	10,662	56,745	11.2	10.9	3.4	3.1%	0.32
	SDP-Central-2	759	4,302	20,841	10.4	9.8	5.7	5.5%	1.31
	SDP-Central-4	919	7,740	39,488	13.0	12.6	3.7	2.9%	0.48
	SDP-High Desert	270	3,616	21,353	[redacted]				
	SDP-Low Desert	11	27	156	[redacted]				
	SDP-North	706	6,905	34,622	[redacted]				
	SDP-Northwest	450	4,019	20,087	6.6	6.4	1.5	2.3%	0.37
	SDP-West-1	907	7,062	36,080	12.4	11.4	9.7	7.8%	1.37
	SDP-West-2	1,667	14,875	69,753	27.5	25.8	17.2	6.2%	1.15
Load Capacity Area	Big Creek/Ventura	1,157	10,933	54,730	[redacted]				
	LA Basin	5,031	45,198	226,204	76.6	72.2	44.3	5.8%	0.98
	Outside LA Basin	281	3,643	21,509	[redacted]				
Zone	South Orange County	579	4,414	23,237	8.4	8.0	3.2	3.9%	0.73
	South of Lugo	2,001	17,775	91,488	29.5	27.7	18.5	6.3%	1.04
	Remainder of System	3,889	37,585	187,720	[redacted]				
Industry	Agriculture, Mining, Construction	168	419	1,829	[redacted]				
	Institutional/Government	580	3,289	18,725	[redacted]				
	Manufacturing	402	1,184	6,656	[redacted]				
	Offices, Hotels, Finance, Services	1,403	2,721	11,490	12.4	11.6	8.4	6.8%	3.09
	Religious Organizations	1,038	7,272	42,764	10.7	8.2	25.4	23.7%	3.50

Category	Subcategory	Number of Accounts	Devices	Tonnage	Ref. Load (MW)	Obs. Load (MW)	Impact (MW)	Percent Impact	Impact per Device (kW)
	Retail Stores	923	1,813	9,537	15.3	15.2	1.7	1.1%	0.92
	Schools	1,372	41,198	202,819	40.5	37.2	32.8	8.1%	0.80
	Unknown/Other	59	245	1,044	[redacted]				
	Wholesale, Transport, Other Utilities	524	1,634	7,579	7.1	7.3	-2.2	-3.2%	-1.37
Tonnage Bin	03 or less	879	882	2,190	3.9	3.7	2.0	5.2%	2.29
	03 to 04	736	758	2,566	4.5	4.3	1.3	3.0%	1.75
	04 to 05	511	577	2,317	3.2	3.3	-0.2	-0.5%	-0.28
	05 to 10	1,217	2,094	8,483	13.6	13.4	1.8	1.3%	0.85
	10-100	2,231	16,400	78,232	[redacted]				
	100-500	849	32,533	166,565	31.9	28.7	32.0	10.1%	0.98
	500+	45	6,530	42,091	[redacted]				
Overall		**6,469**	**59,775**	**302,444**	**99.4**	**93.4**	**60.4**	**6.1%**	**1.01**

By LCG, Figure 30 shows the average aggregate impact for each event. Note that all event hours were included. During the August 20th event Central-1, Central-4, and West-2 provided the strongest performance.

Figure 30: Average Aggregate Impacts by Event and LCG, SDP-C

[redacted]

Figure 31 shows how participant-level impacts vary across subcategories for several key research categories (cycling strategy, select industries, and load control group).

Figure 31: Average Participant Impact by Event and Key Subcategory, SDP-C

[redacted]

5.6 KEY FINDINGS

The SDP Commercial (SDP-C) program has approximately 6,500 customers enrolled and includes about 61,000 control devices and 306,000 tons of air conditioner load. Roughly 65% of customers elect the higher incentive option, which allows SCE to entirely curtail air conditioner demand (100% cycling) during SDP-C DR events. Average per-device impacts on the average event day were about 0.10 kW.

A few other key findings are worth highlighting:

- SDP-C is a very top-heavy program, as 10% of the program participants account for more than 60% of the total AC tonnage. In other words, a small handful of customers account for a majority of the AC tonnage. Schools also account for a considerable share of the SDP-C AC tonnage, so demand reductions are tied to whether or not schools are in session. School whole building and air conditioner loads drop off considerably during peak hours.
- The relationship between per-device DR impacts and outdoor temperature is positive, meaning impacts tend to increase when temperatures are higher.
- On average, percent impacts in the 100% cycling strategy group are about three times larger than percent impacts in the 50% cycling group.

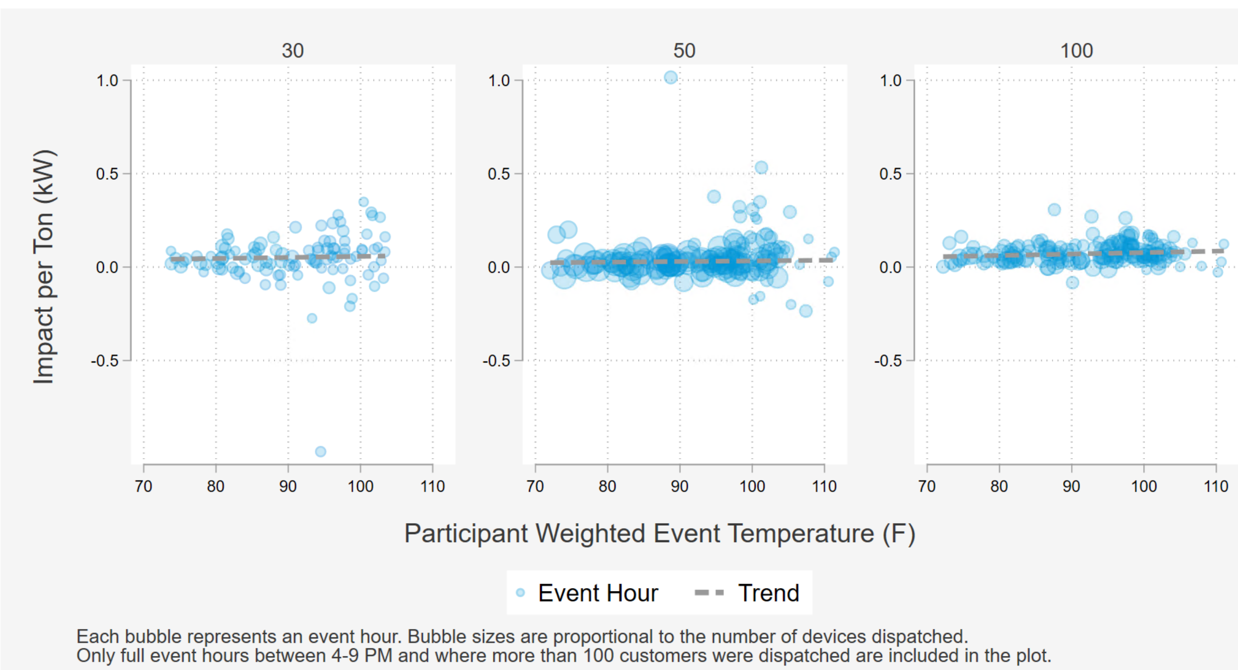
6 NON-RESIDENTIAL EX ANTE RESULTS

Ex ante impacts describe the magnitude of program resources available under standard planning conditions defined by weather. The ex ante estimates are developed for both SCE and California ISO conditions under normal weather (1-in-2). We estimate the ex ante impacts based on the relationship between demand reductions and weather using four years of historical performance data (2021-2024) and factor in projected changes in enrollment.

6.1 DEVELOPMENT OF EX ANTE IMPACTS

The ex ante impacts were developed by estimating the relationship between weather and demand reductions during 2021-2024 for customers currently enrolled in the program. Partial event hours were not used in the analysis, and neither were a handful events from previous years due to discrepancies in the dispatch. In total, we estimated the relationship between demand reductions and impact by two key categories: the three cycling strategies and the ten load control groups. Figure 32 shows the relationship between outdoor temperature and demand reductions (per device) for the three cycling strategies across the three-year period. Note that only weekdays are included in the figure. Weekend impacts tend to be smaller due to the makeup of the program (predominantly schools).

Figure 32: Impacts against Temperature by Cycling Strategy



The pattern of reductions across events and segments was analyzed using a multivariate regression model. The model accounts for the effects of the hour of day, day of week, period of summer, cycling strategy, and load control group. Appendix E includes the output from the model. In addition, the historical snapback was analyzed to produce estimates of the post-event increase in loads based on the number of hours since the event finished and the daily heat buildup.

The impact models were combined with reference load models that were developed using historical load data and historical weather for 2024. The relationship between historical loads and weather was cast across ex ante weather conditions to develop ex ante reference loads.

6.2 OVERALL RESULTS

For the monthly worst day, Table 17 shows average device-level ex ante impacts for each of the summer months (and also May). Impacts are shown under two different scenarios – CAISO 1-in-2 weather conditions and SCE 1-in-2 weather conditions. For reference, on the August event day in 2024, the average impact per device was 0.31 kW.

Table 17: Per Device Worst Day Ex Ante Impacts (kW)

Month	SCE Weather 1-in-2	CAISO Weather 1-in-2
May	0.19	0.20
June	0.16	0.17
July	0.18	0.17
August	0.28	0.27
September	0.30	0.28

Table 18 shows aggregate ex ante demand reduction forecasts for an August worst event day. Forecasts are shown under the four scenarios identified above. The fact that the demand reductions decrease throughout the forecast window can be explained by the decline in the enrollment forecast, which itself can be explained general customer attrition (customers moving and/or requesting to be removed from the program). Ex ante weather conditions are static through the forecast window.

Table 18: Aggregate August Worst Day Demand Reduction Forecast – SDP-C (MW)

Forecast Year	Enrollment Forecast	Total Devices	SCE Weather 1-in-2	CAISO Weather 1-in-2
2025	6,086	56,258	15.7	15.2
2026	5,719	52,865	14.7	14.3
2027	5,376	49,695	13.9	13.4
2028	5,055	46,727	13.0	12.6
2029	4,754	43,945	12.3	11.9
2030	4,473	41,347	11.5	11.2
2031	4,210	38,916	10.9	10.5
2032	3,964	36,642	10.2	9.9
2033	3,733	34,507	9.6	9.3
2034	3,518	32,520	9.1	8.8
2035	3,316	30,652	8.6	8.3

Figure 33 shows the estimated ex ante load profiles for the SDP-C customer pool under 1-in-2 weather conditions. The figure show profiles for the August worst day and use SCE weather conditions rather than CAISO conditions. Note that the forecast year shown is 2025.

While these results are not statistically significant at the 95% confidence interval, many segments are statistically significant. There are a handful of large customers in [redacted] that contribute to this overall result. The SDP-Central and SDP-West estimates, which account for 78% of participants in August 2025, are both statistically significant.

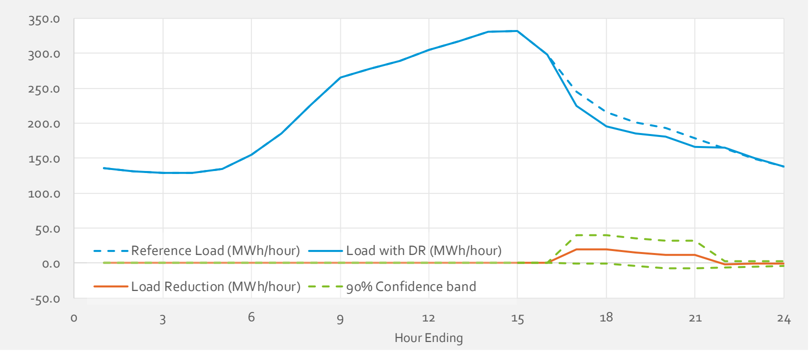
Figure 33: SDP-C Aggregate Ex Ante Impact for 1-in-2 Weather Conditions, August Worst Day 2025

Table 1: Menu options

Type of result	Aggregate
Category	All
Segment	All Customers
Weather Data	SCE
Weather Year	1-in-2
Day Type	August Worst Day
Forecast Year	2025
Portfolio Level	Program
Hour Ending View	HE (Prevailing Time)

Table 2: Event day information

Event start	4:00 PM
Event end	9:00 PM
Total sites	6,086
Total devices	56,258
Total cooling tons	284,817
Event window temperature (F)	88.8
Event window load reduction (MWh/hour	15.69
% Load reduction (Event window)	7.6%
Redaction Information	Public



Hour Ending	Reference Load (MWh/hour)	Load with DR (MWh/hour)	Load Reduction (MWh/hour)	% Load Reduction	Avg Temp (°F, Site-Weighted)	Uncertainty-Adjusted Impact - Percentiles 5th	50th	95th	Standard Error	T-Statistic
1	135.93	135.93	0.00	0.0%	77.49	0.00	0.00	0.00	0.00	0.00
2	131.11	131.11	0.00	0.0%	76.37	0.00	0.00	0.00	0.00	0.00
3	128.78	128.78	0.00	0.0%	75.47	0.00	0.00	0.00	0.00	0.00
4	128.83	128.83	0.00	0.0%	74.53	0.00	0.00	0.00	0.00	0.00
5	134.63	134.63	0.00	0.0%	73.82	0.00	0.00	0.00	0.00	0.00
6	154.55	154.55	0.00	0.0%	73.28	0.00	0.00	0.00	0.00	0.00
7	185.65	185.65	0.00	0.0%	72.69	0.00	0.00	0.00	0.00	0.00
8	226.04	226.04	0.00	0.0%	72.72	0.00	0.00	0.00	0.00	0.00
9	265.67	265.67	0.00	0.0%	74.92	0.00	0.00	0.00	0.00	0.00
10	277.65	277.65	0.00	0.0%	79.01	0.00	0.00	0.00	0.00	0.00
11	289.16	289.16	0.00	0.0%	83.22	0.00	0.00	0.00	0.00	0.00
12	304.99	304.99	0.00	0.0%	86.72	0.00	0.00	0.00	0.00	0.00
13	317.08	317.08	0.00	0.0%	89.16	0.00	0.00	0.00	0.00	0.00
14	330.60	330.60	0.00	0.0%	91.24	0.00	0.00	0.00	0.00	0.00
15	331.90	331.90	0.00	0.0%	92.59	0.00	0.00	0.00	0.00	0.00
16	298.57	298.57	0.00	0.0%	92.60	0.00	0.00	0.00	0.00	0.00
17	244.67	225.22	19.46	8.0%	92.04	-0.44	19.46	39.35	12.10	1.61
18	215.57	196.06	19.51	9.1%	90.78	-0.39	19.51	39.41	12.10	1.61
19	200.88	185.53	15.35	7.6%	89.40	-4.32	15.35	35.02	11.96	1.28
20	192.93	180.75	12.17	6.3%	87.58	-7.57	12.17	31.92	12.00	1.01
21	178.69	166.71	11.97	6.7%	84.23	-7.84	11.97	31.79	12.05	0.99
22	163.50	165.46	-1.96	-1.2%	80.93	-6.12	-1.96	2.19	2.53	-0.78
23	149.13	150.28	-1.16	-0.8%	78.84	-5.09	-1.16	2.78	2.39	-0.48
24	137.81	138.57	-0.76	-0.6%	77.25	-4.55	-0.76	3.03	2.31	-0.33

Period	Reference Load (MWh/hour)	Load with DR (MWh/hour)	Energy Savings (MWh/hour)	% Change	Average Temperature (°F)	Uncertainty-Adjusted Impact - Percentiles 5th	50th	95th	Standard Error	T-statistic
Average Event Hour	206.55	190.85	15.69	7.6%	88.80	-4.11	15.69	35.50	12.04	1.30
Daily	213.51	210.41	3.11	1.5%	81.95	-1.51	3.11	7.73	2.81	1.11

6.3 RESULTS BY CUSTOMER SEGMENT

The ex ante table generator, submitted in tandem with the report, allows users to review ex ante impact estimates across years, weather conditions, and several relevant customer segments. The number of possible combinations is quite large – too large for all combinations to be presented in this report. We believe two of the key grouping variables for SDP-C are cycling strategy and load control group (which bins participants into regional areas). Table 19 shows ex ante impact estimates (per device) for these key segments using SCE weather conditions for forecast year 2025. Impacts are shown for the 1-in-2 weather scenario. On the surface, one curious trend is the average impacts by cycling strategy – [redacted]. This is simply because the participants in the [redacted]. On a percent impact basis, the trend follows intuition. (For 1-in-2 weather, percent impacts for 100% and 30% cycling are 9.4% and [redacted] respectively.)

Regarding load control groups, trends in the ex ante estimates follow trends in the ex post estimates. Impacts tend to be larger in the SDP-Central region. [redacted]

Table 19: Per Device SDP-C Ex Ante Results by Customer Segment, SCE August Weather (kW)

Load Control Group	1-in-2 Weather Conditions			
	30% Cycling	50% Cycling	100% Cycling	Total
SDP -Central-1	[redacted]	[redacted]	0.36	0.30
SDP-Central-2	[redacted]	[redacted]	0.44	0.33
SDP-Central-3	[redacted]	[redacted]	0.48	0.34
SDP-Central-4	[redacted]	[redacted]	0.48	0.44
SDP-High Desert	[redacted]	[redacted]	[redacted]	[redacted]
SDP-Low Desert	[redacted]	[redacted]	[redacted]	[redacted]
SDP-North	[redacted]	[redacted]	[redacted]	[redacted]
SDP-Northwest	[redacted]	[redacted]	0.19	0.18
SDP-West-1	[redacted]	[redacted]	0.42	0.16
SDP-West-2	[redacted]	[redacted]	0.21	0.16
Average	[redacted]	[redacted]	**0.34**	**0.28**

6.4 COMPARISON TO PRIOR YEAR

Table 20 shows a comparison of year 2022, 2023, and 2024 ex ante impacts for the 1-in-2 two weather scenario at the participant level. All impacts represent monthly worst day impact estimates, and SCE weather conditions are used. Each vintage of predictions in the table reports forecasts for the next year: 2022 ex ante predictions are for 2023, 2023 predictions are for 2024, and 2024 predictions are for 2025.

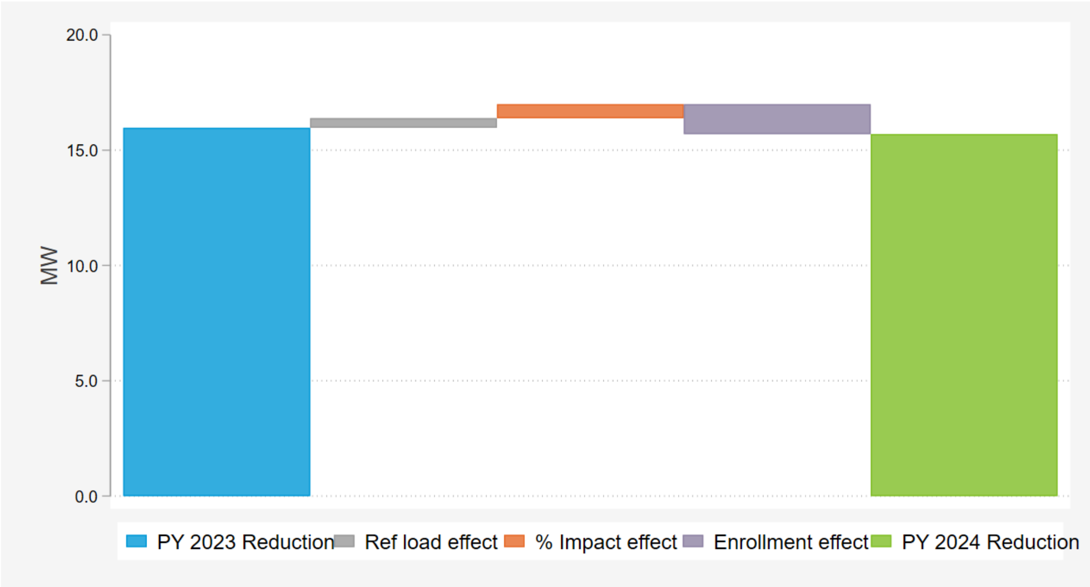
In magnitude and direction, the 2022-2024 impacts are similar. Still, differences do exist. The differences can be attributed to a few factors. One of the main factors is the ex ante weather conditions, which were updated in 2022. Changing the weather conditions should (and does) result in different ex ante impacts. Other key differences include: differences in the customer mix, differences in which historical ex post impacts are used in developing the ex-ante impacts, and differences in ex ante regression model specifications.

Table 20: Comparison of SDP-C Per Participant Ex Ante SCE Weather Impacts (kW), 2022-2024

Month	Vintage Year 2022 1-in-2	Vintage Year 2023 1-in-2	Vintage Year 2024 1-in-2
June	2.18	1.97	1.52
July	2.30	2.15	1.63
August	2.38	2.42	2.58
September	2.48	2.82	2.78

Figure 34 look at how the SCE August aggregate load reductions have changed since the 2023 evaluation. While results are similar between the years, the contributing factors vary. Both the reference load and impact increased the aggregate reduction, while the effect of the enrollment mix brought the estimate down and closer to the 2023 value.

Figure 34: Comparison of Ex Ante August Load Reductions and Contributing Factors



Unlike the August estimate, the June and July forecast has decreased since the prior evaluation. SDP-C impacts have become more sensitive to the seasonality of schools, which accounts for 67% of total commercial tonnage. The last few years have had more June and July dispatches, when schools are not in session, which has directly influenced the magnitude of the estimates in those months.

6.5 EX POST TO EX ANTE COMPARISON

When comparing ex post and ex ante, it is essential to keep the distinction between the two estimates in mind. Ex ante impacts are estimates of the future resources available under standardized planning conditions (defined by weather). Ex post impacts are estimates of what past impacts were given the weather, hours of dispatch, the magnitude of resources dispatched, and other dispatch conditions. Because most events have historically been triggered by wholesale market price conditions in specific load pockets, the reductions do not always reflect the magnitude of resources available.

Table 21 compares the hour-by-hour ex post load impacts for the 2024 full-hour event day to the ex ante 1-in-2 SCE monthly worst days for August under 1-in-2 and 1-in-10 weather conditions. In magnitude, the ex post load impacts are very similar to the ex ante impact estimates shown in the table. The 9/5 event had similar, but slightly lower impacts that what would be expected for a future August worst day.

Table 21: SDP-C Ex Post to Ex Ante Comparison

Units	Date	Accounts	Devices	Max Daily Temp (F)	Average Daily Temp (F)	4:00-5:00 PM	5:00-6:00 PM	6:00-7:00 PM	7:00-8:00 PM	8:00-9:00 PM
Aggregate Impacts (MW)	2024/09/05	6,298	58,966	99.6	85.8	---	---	---	11.51	---
	SCE Ex-ante 1-in-10 August Worst Day	6,086	56,258	97.5	84.7	21.11	20.96	16.22	12.66	12.32
	SCE Ex-ante 1-in-2 August Worst Day	6,086	56,258	92.6	82.0	19.46	19.51	15.35	12.17	11.97
Impacts per Account (kW)	2024/09/05	6,298	58,966	99.6	85.8	---	---	---	1.83	---
	SCE Ex-ante 1-in-10 August Worst Day	6,086	56,258	97.5	84.7	3.47	3.44	2.67	2.08	2.02
	SCE Ex-ante 1-in-2 August Worst Day	6,086	56,258	92.6	82.0	3.20	3.21	2.52	2.00	1.97
Impacts per Device (kW)	2024/09/05	6,298	58,966	99.6	85.8	---	---	---	0.20	---
	SCE Ex-ante 1-in-10 August Worst Day	6,086	56,258	97.5	84.7	0.38	0.37	0.29	0.23	0.22
	SCE Ex-ante 1-in-2 August Worst Day	6,086	56,258	92.6	82.0	0.35	0.35	0.27	0.22	0.21

7 RECOMMENDATIONS

The Summer Discount Program remains a significant component of the SCE Demand Response portfolio. It currently includes roughly 153,000 residential customers, 6,500 non-residential customers, approximately 238,000 air conditioner units, and 948,000 tons of air conditioning. It has the capability to deliver large magnitudes of flexible loads at very fast ramp rates, is available for a wide range of hours, and can target resources to specific geographic locations. Most importantly, the program delivers larger reductions when the weather is more extreme and resources are needed most. Table 22 summarizes our recommendations for the program. We recognize that our recommendations do not incorporate costs and may not be funded under current budgets.

Table 22: Evaluator Recommendations

Recommendation	Explanation
Develop a detailed test event plan for the Summer 2025 season to provide a framework for more granular event dispatch	In PY2024, the event that took place on September 6th was a localized emergency event that was intended for all participants in the Mira Loma A-Bank area. While this event had small aggregate impacts due to the smaller number of customers dispatched, the localized load relief provided to the distribution system on that day was valuable. In future program years, DSA recommends testing these granular geographic dispatch levels to ensure that in future emergency conditions the correct groups of participants can be reliably dispatched. The ability to dispatch program participants at granular geographic levels means that SEP has the potential to play an important part in system reliability in the future. With recent shifts towards scheduling events based on CAISO market economics, summer demand response seasons for SDP are seeing fewer events, pushing a heavier reliance on extrapolation for pre-event planning. To address this, Southern California Edison (SCE) is encouraged to roll out a test plan for Summer 2025, focusing on dispatching customer groups at the a-bank/b-bank level. This approach is designed to gather data from a wide range of event types, tailored to various temperature brackets, to better predict and understand the load impacts of future events, much like the September 6th dispatch this program year. An important component of this test plan is introducing a 2-hour limit for each participant in a test event, intended to mitigate customer fatigue. These events are not planned during peak market economic conditions. Instead, their purpose is to provide more data for the ex-ante analysis of the 2025 season by enabling more data collection across a range of conditions. The test plan would support gathering detailed insights without impacting customer fatigue by dispatching customers at the a-bank/b-bank level and increasing the number of these shorter, more granular events.
Add weekend days to the load impact protocol ex-ante tables and include	Historically, SCE and California as a whole has peaked on weekdays and planned resources to meet weekday demand. The emergency events in 2020 and the heatwave in 2022 highlighted the need to quantify the magnitude of resources available for weekend conditions. While those do not differ much for Desidential

Recommendation	Explanation
weekend test events, if needed	programs, the weekend DR resources available for non-residential customers differ substantially from weekday resources. To the extent that weekend events are part of future program plans, consider calling more weekend events and developing a "weekend" set of ex ante impacts, particularly for SDP-C where reference loads are smaller on weekends. To allow for better ex ante impact estimation, the weekend events would ideally cover the entire RA window – though not necessarily all in one event.
Include "test" event operations to fully assess the load reduction capability	To facilitate comparisons between ex post and ex ante results, we recommend at least one territory-wide event, ideally on the SCE system peak day or another day with high system loads. We also recommend ensuring that the combination of territory-wide actual and test events include each of the peak hour from 4–9 PM, which was nearly achieved in this program year's dispatch. To be clear, we are not recommending five-hour events (unless needed for reliability) but ensuring that at least one of each of the territory-wide events cover the 4–9 PM peak hours. To achieve this, it may be necessary to supplement events called by CAISO with Measurement and Evaluation events.
Make sure to dispatch "test" events that include enough variation to understand program performance	To understand how this program performs, it is imperative to acknowledge the various population groupings (LCG, LCA, etc). For evaluation, we recommend calling different types of events for different sub-populations to better understand performance. This includes variability on the event duration, event start time, and weather conditions. But it does not require calling many events for each customer, instead it encourages calling a couple events across smaller groupings of participants.

APPENDIX A: EX POST METHODOLOGY

The below table summarizes the ex post evaluation approach. The ex post evaluation is direct and relies on simple, transparent methods.

Table 23: Summer Discount Plan Ex Post Evaluation Approach

Methodology Component	Approach
1. Population or sample analyzed	For both residential and commercial customers, analyze the full population of participants and a matched control group.
2. Data included in the analysis	The analysis included nearly all PY2024 data.
3. Use of control groups	A matched control group was employed for residential and commercial customers. Control customers were pulled from a stratified random sample. From the control sample, the control group is selected using non-event day load patterns, geographic location, and other customer characteristics (e.g., industry) to develop propensity scores within each stratum. For each participant, the nearest neighbor based on propensity scores is identified. Several different propensity score models were tested. For each model, we produce standard metrics for bias and goodness of fit – these metrics measure the error between "nearest neighbor" loads and treatment home loads. Of the three models that produce the lowest percent bias, the model that minimizes mean absolute prediction error is selected as the best model. The control group picked by the best model is used as the control group in the ex post analysis.
4. Load impact Regression	The load impacts were estimated by using a difference-in-differences model with fixed effect and time effect. For each event day, the corresponding proxy event day was used to net out differences between the treatment and control group that were not due to the intervention.
5. Segmentation of impact results	The results are segmented by: ▪ Customer class (residential/non-residential) and NAICS code for non-residential customers, ▪ Zone, LCA, and dispatch group ▪ Cycling strategy, and ▪ AC tonnage size. The main segment categories are building blocks. They are designed to ensure segment-level results add up to the total, to enable production of ex ante impacts, and to allow for busbar level analysis.

Because customers enrolled in SDP do not have a natural control group against which to compare loads on event days, one must be constructed. There are many ways to construct a control group, but the evaluation team suggests a blocked propensity score matching process. Propensity score matching is a data pre-processing technique that identifies statistically similar non-participants for each participating customer. It relies on a probit model that relates observed characteristics such as geography, load shapes, industry, and size to whether a given customer has enrolled in a given demand response program – in this case, SDP. The outcome of this model is a propensity score for each participant and non-participant that is the likelihood, given the customer's characteristics, that the customer enrolled in DR. Participants are then "matched" to non-participants with similar propensity scores. Effectively, propensity score matching produces a cohort of non-participants that have the same overall likelihood to have been treated as the participant group – the only customers that did in fact enroll in the program. A blocked propensity score matching process performs this regression and matching procedure for customers in each key strata separately, effectively ensuring that only participants in a given climate zone, for example, will be matched with non-participants in that same climate zone.

For SDP-R and SDP-C, the evaluation team, in conjunction with SCE, decided to proceed with a matched control group relying on a stratified random sample of subsets of non-participants to act as the control pool. This eliminates the need to develop a two-stage matched control group, streamlining analysis. Essentially, instead of relying on information from all possible non-participants, we instead construct a control group from a targeted subset of control candidates that have been pre-screened to belong to sampling cells of influential variables. By oversampling large and/or NEM customers, and by allowing non-participants to be matched multiple times to different participants, we can improve the quality of matching compared to a random sample, while also removing the need to do two-stage matching on all non-participants in SCE's territory. For reference, the sample cells are summarized in Table 24.

Table 24: Summer Discount Plan Non-Participant Sampling Plan

Climate Zone	Customer Class	NEM Status	Annual kWh	Solar Capacity (kW)	Sample
For each CEC Climate Zone	Residential	Non-NEM	0-5000	N/A	1,000
			5k-10k	N/A	1,000
			10k	N/A	1,000
		NEM	N/A	0-6 kW	600
			N/A	6-10 kW	600
			N/A	>10 kW	600
Climate Zone	**Customer Class**	**NEM Status**	**Peak Demand**	**Solar Capacity (kW)**	**Sample**
For each CEC Climate Zone	Commercial	Non-NEM	<20kW	N/A	300
			20-200kW	N/A	300
			200kW-1MW	N/A	300
			>1MW	N/A	300
		NEM	<20kW	0-100kW	100
				100-500kW	100
				>500kW	100
			20-200kW	0-100kW	100
				100-500kW	100
				>500kW	100
			200kW-1MW	0-100kW	100
				100-500kW	100
				>500kW	100
			>1MW	0-100kW	100
				100-500kW	100
				>500kW	100

The matched control group for the residential component was successful, as our team found matches for each SDP participant. On the commercial side, however, some SDP participants have very large and unique loads and we were unable to find strong matches for these participants. Rather than leaving the candidates with poor matches in the ex post analysis data set, our team elected to remove them and simply scale the impacts based on the tonnage of the sites that were removed from the analysis. Table 25 lays out an example using a hypothetical event. In the example, the average tonnage per account for sites in the ex post sample is 35.12 tons, and the average tonnage per account for all sites that were curtailed is 45.07. The ratio between these numbers is 1.28. This ratio would be used to scale the estimated counterfactual and the demand reduction estimate (amongst other quantities) for this event. The implicit assumption is that percent impacts for the 400 curtailed sites that are not in the analysis will be similar to the percent impacts for the 7,900 sites that are in the analysis.

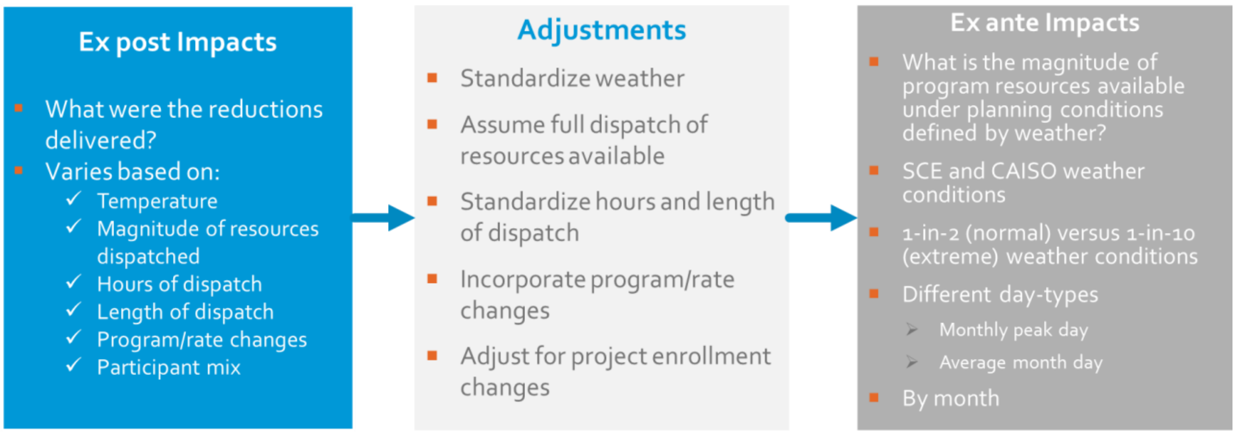
Table 25: Scaling Example

Level	Accounts	Tonnage	Tonnage per Account	Scaling Ratio
In Ex Post Analysis Data	7,900	277,448	35.12	1.28
Curtailed	8,300	374,081	45.07	

APPENDIX B: EX ANTE METHODOLOGY

Figure 35 summarizes some of the key differences between ex post impact estimates and ex ante impact estimates. Perhaps the most important difference is related to weather – ex ante impacts are weather-normalized while ex post impacts reflect historical weather conditions.

Figure 35: Difference between Ex Post and Ex Ante



There are two key steps in developing ex ante impacts. First, historical participant loads are modeled as a function of key weather variables. Using ex ante weather forecasts provided by SCE for both 1-in-2 and 1-in-10 weather years, ex ante reference loads are predicted using the same regression function. Second, a similar process is followed for historical demand response impacts – the impacts are modeled as a function of key weather variables, then the estimated model is used to predict impacts under ex ante weather conditions. Other components of the ex ante methods are discussed in Table 26.

As with ex post impacts, ex ante estimates are produced for key sub-segments of the participant population so that they can be aggregated in different ways to account for changes in future enrollment or program design.

Table 26: Summer Discount Plan Ex Ante Evaluation Approach

Methodology Component	Approach
1. Years of historical performance	We used four years (2021-2024) of historical data to estimate how demand reductions vary based on dispatch hours and weather conditions and to estimate the reductions available under planning conditions.
2. Process for producing ex ante impacts	The key steps are: ▪ Use four years of historical performance data for relevant customers. ▪ Decide on an adequate segmentation to reflect changes in the customer. Segments used were load control group and cycling strategy. These segments reflect that events are dispatched geographically and that impacts in the 100% cycling strategy group are

Methodology Component	Approach
	known to be larger in magnitude than impacts in the 30% and 50% cycling strategy group. ▪ Estimate the relationship between reference loads and weather using non-event days. This is done separately for each segment in both SDP-R and SDP-C. ▪ Use the models to predict reference loads for 1-in-2 and 1-in-10 weather year conditions. ▪ Estimate the relationship between weather and demand response impacts. Like the reference load estimation, this is done separately by segment. ▪ Estimate the relationship between weather and post-event snapback. ▪ Predict the reductions and snapback for 1-in-2 and 1-in-10 weather year conditions. ▪ Incorporate the enrollment forecast.
3. Accounting for changes in the participant mix	Enrollment forecasts were provided by SCE.

APPENDIX C: PROXY EVENT DAYS

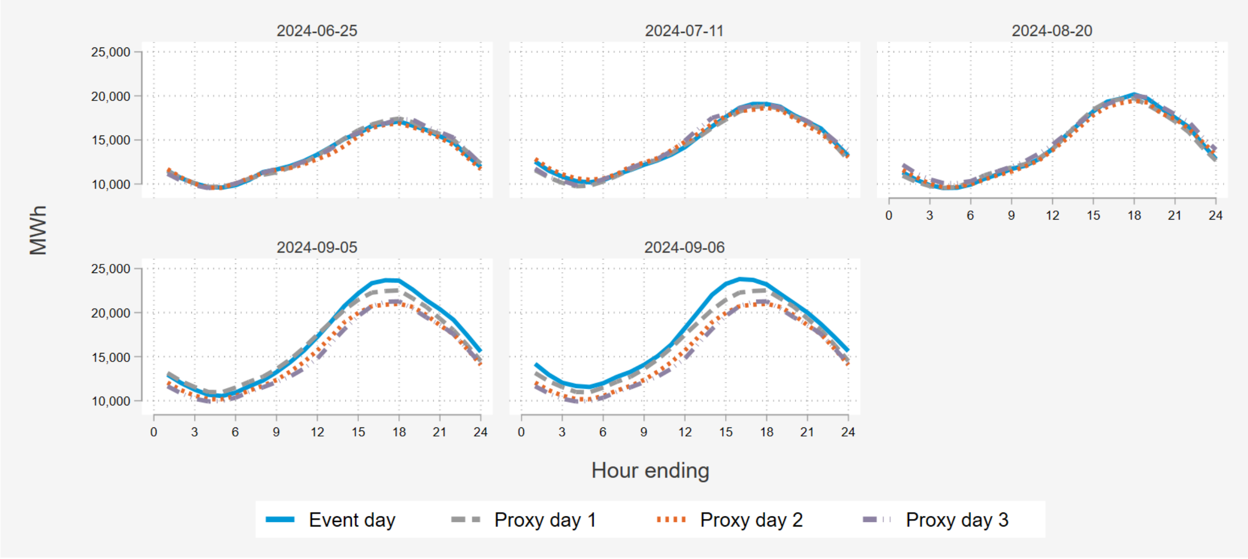
Proxy event days are event-like non-event days. In calculating event day demand reductions, proxy event days are used to net out differences between the treatment and control group that were not due to the intervention. Thus, selecting proxy event days that are similar to actual event days – in terms of total energy used and the hourly load profile – is crucial.

In this analysis, proxy days were selected separately for the residential and commercial customers. Residential proxy days were selected based on SCE loads, while commercial proxy days were selected based on aggregate participant loads.

More generally, proxy days were selected based on a matching algorithm that considers total energy used and how the energy consumption is distributed throughout the day. For the latter component, hourly differences between potential proxy event day loads and event day loads are calculated, then these differences are used to calculate bias and error metrics. For each event day, three proxy event days were selected. Out of all of the candidate days, the proxy event days were selected as follows: keep the nine days with the lowest absolute percent bias; out of those nine, keep the three days with the lowest sum of squared error.

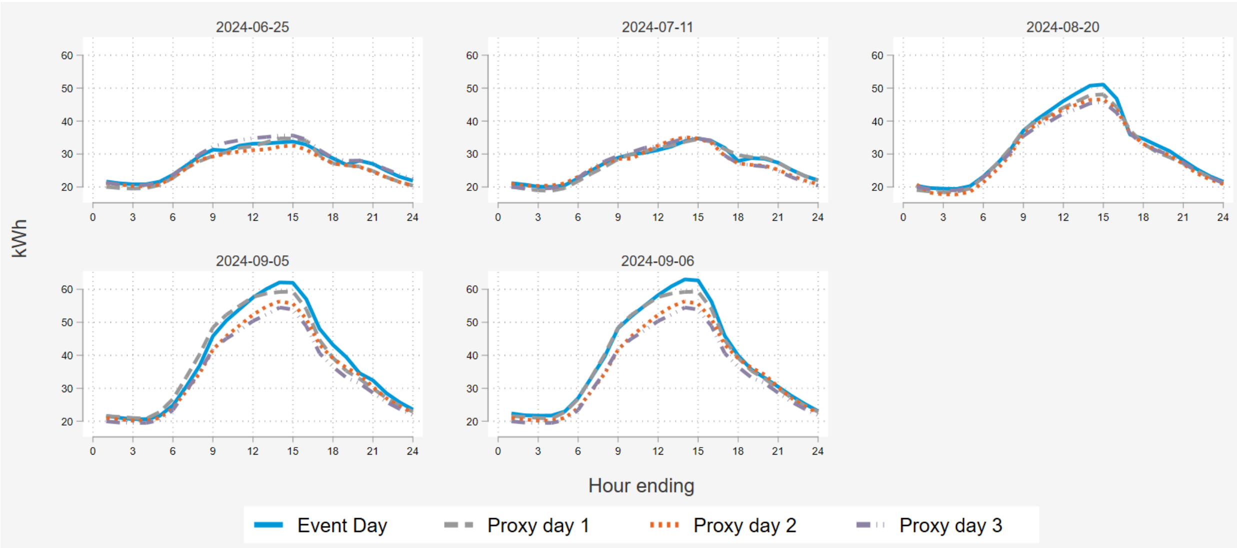
For each 2024 event day, Figure 36 shows system loads on event days and the residential proxy days.

Figure 36: System Load on Event Days and Residential Proxy Days



For each 2024 event day, Figure 37 shows aggregate participant loads on event days and the commercial proxy days.

Figure 37: Aggregate Participant Load on Event Days and Commercial Proxy Days



APPENDIX D: VALIDATION – COMPARISON OF MATCHED CONTROL AND PARTICIPANTS

Ideally, the load profile for a matched control group will mirror the load profile of a treatment group in all hours up until the demand response intervention. This was certainly the case for the 2024 SDP-R ex post evaluation. Figure 38 shows the average control group load and the average treatment group load for each 2024 summer event day.

Figure 38: Control Group and Treatment Group Event Day Loads, SDP-R

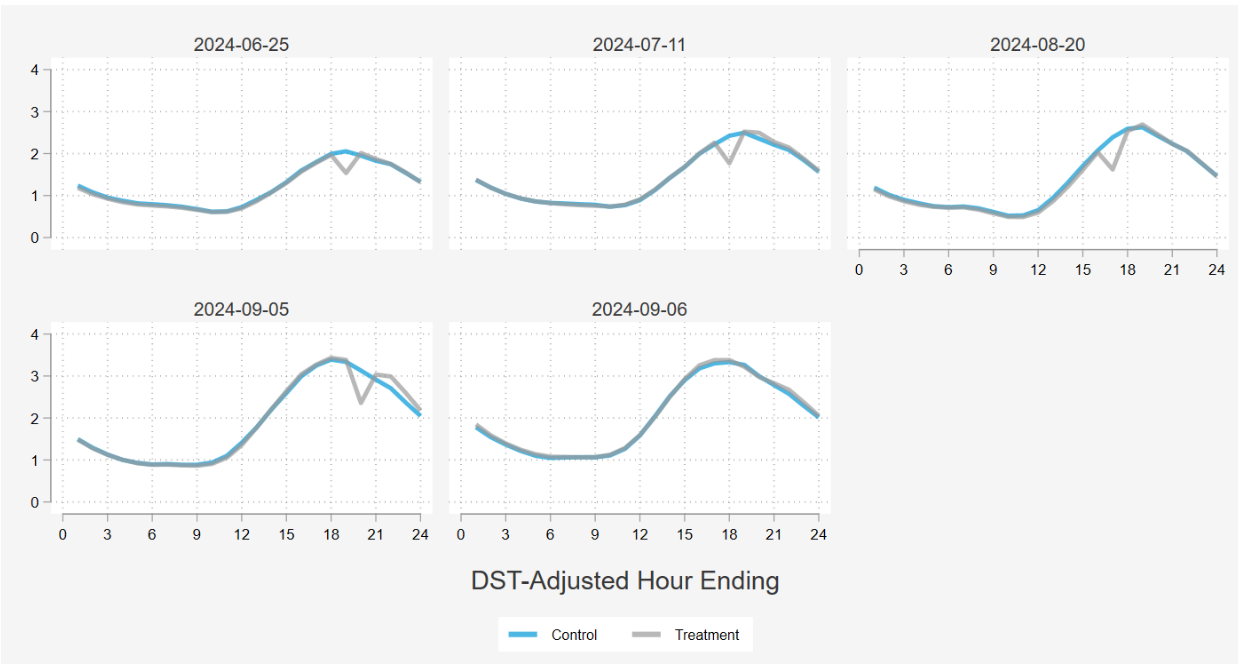
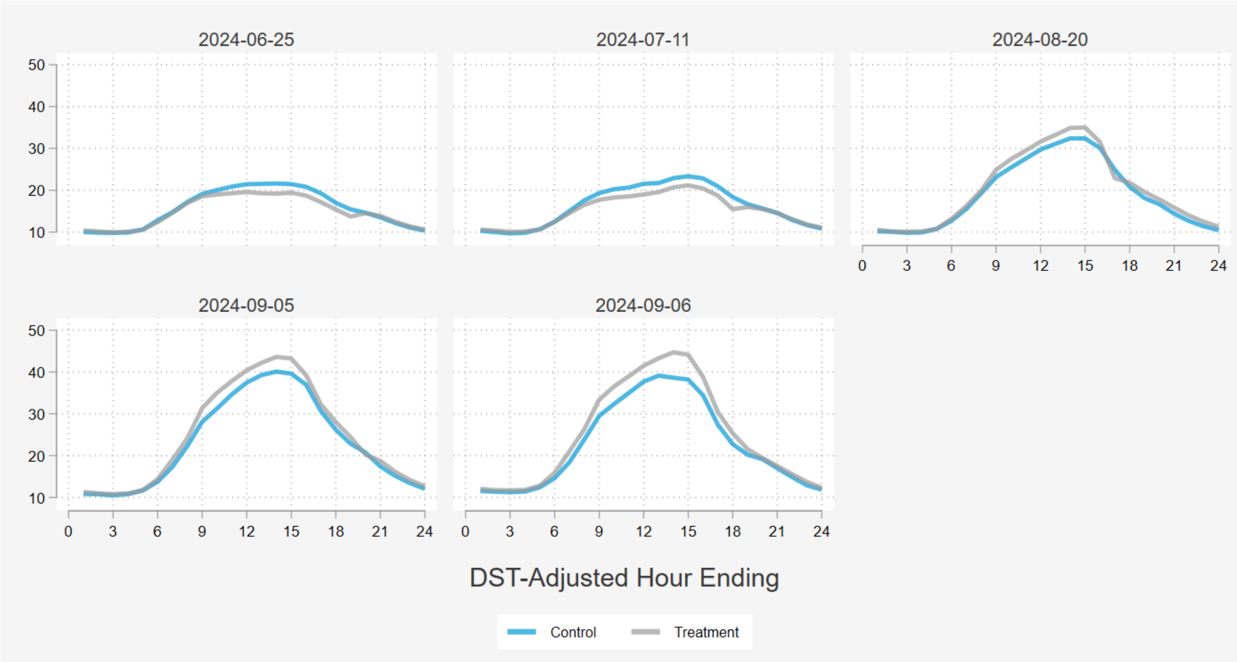


Figure 39 compares average control group load and average treatment group load for the summer 2024 SDP-C events. The control group load does not track the treatment group load as well as SDP-R, but the ex post analysis method (difference-in-differences) nets out any differences between the two groups.

Figure 39: Control Group and Treatment Group Event Day Loads, SDP-C



APPENDIX E: EX ANTE MODEL OUTPUT

SDP-R Impacts –100% Cycling Group

Source	SS	df	MS
Model	.686507241	20	.034325362
Residual	.062801297	150	.000418675
Total	.749308538	170	.004407697

Number of obs	=	171
F(20, 150)	=	81.99
Prob > F	=	0.0000
R-squared	=	0.9162
Adj R-squared	=	0.9050
Root MSE	=	.02046

impact_perton	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
avgtemp_1	-.0049665	.0017291	-2.87	0.005	-.0083831	-.0015499
avgtemp_2	-.0026494	.0025045	-1.06	0.292	-.007598	.0022992
avgtemp_3	.0085053	.0191718	0.44	0.658	-.0293764	.0463869
lag3cdh	-.0038323	.0008187	-4.68	0.000	-.0054499	-.0022147
hour_seg#c.lag3cdh						
2	.000363	.0001345	2.70	0.008	.0000973	.0006288
3	.0012471	.0001428	8.73	0.000	.000965	.0015292
dow#c.lag3cdh						
2	.0004008	.0002384	1.68	0.095	-.0000702	.0008719
3	.0005722	.0002089	2.74	0.007	.0001595	.000985
4	.0006163	.0001991	3.09	0.002	.0002228	.0010097
5	.0003209	.0002401	1.34	0.183	-.0001535	.0007952
outersummer#c.lag3cdh						
1	-.0000525	.0001276	-0.41	0.682	-.0003046	.0001997
lcgnum#c.lag3cdh						
SDP-C-2	-.0002391	.0001894	-1.26	0.209	-.0006133	.0001351
SDP-C-3	.0033664	.0003631	9.27	0.000	.0026489	.0040838
SDP-C-4	-.0006547	.0001345	-4.87	0.000	-.0009204	-.0003891
SDP-HD	.0004609	.0002147	2.15	0.033	.0000366	.0008851
SDP-LD	.0023985	.0012108	1.98	0.049	6.10e-06	.004791
SDP-N	.0008699	.0001567	5.55	0.000	.0005603	.0011795
SDP-NW	.0014693	.0003569	4.12	0.000	.0007641	.0021746
SDP-W-1	.000048	.0002375	0.20	0.840	-.0004213	.0005174
SDP-W-2	.0007113	.0002468	2.88	0.005	.0002237	.0011989
_cons	.327443	.1135639	2.88	0.005	.1030515	.5518345

SDP-R Impacts – 50% Cycling Group

Source	SS	df	MS
Model	.184914363	20	.009245718
Residual	.08429317	150	.000561954
Total	.269207533	170	.001583574

Number of obs	=	171
F(20, 150)	=	16.45
Prob > F	=	0.0000
R-squared	=	0.6869
Adj R-squared	=	0.6451
Root MSE	=	.02371

impact_perton	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
avgtemp_1	.0003572	.0020738	0.17	0.863	-.0037404	.0044548
avgtemp_2	-.0025626	.0028902	-0.89	0.377	-.0082735	.0031482
avgtemp_3	.0068944	.021984	0.31	0.754	-.036544	.0503328
lag3cdh	-.0038552	.0009806	-3.93	0.000	-.0057927	-.0019177
hour_seg#c.lag3cdh						
2	.000253	.0001552	1.63	0.105	-.0000536	.0005596
3	.0014776	.0001664	8.88	0.000	.0011489	.0018064
dow#c.lag3cdh						
2	.0005041	.000274	1.84	0.068	-.0000373	.0010456
3	.0004556	.0002396	1.90	0.059	-.0000179	.0009291
4	.0005838	.0002281	2.56	0.011	.0001331	.0010345
5	.0001976	.0002792	0.71	0.480	-.000354	.0007493
outersummer#c.lag3cdh						
1	-.0003864	.0001485	-2.60	0.010	-.0006798	-.0000931
lcgnum#c.lag3cdh						
SDP-C-2	-.0007373	.0002119	-3.48	0.001	-.0011561	-.0003185
SDP-C-3	.0013334	.0004504	2.96	0.004	.0004434	.0022235
SDP-C-4	-.0001784	.0001534	-1.16	0.247	-.0004815	.0001247
SDP-HD	-.0005822	.0003033	-1.92	0.057	-.0011815	.0000171
SDP-LD	-.0003989	.0014544	-0.27	0.784	-.0032726	.0024749
SDP-N	.0000524	.0001812	0.29	0.773	-.0003057	.0004105
SDP-NW	.0003403	.00043	0.79	0.430	-.0005093	.0011899
SDP-W-1	-.0006319	.0002603	-2.43	0.016	-.0011463	-.0001176
SDP-W-2	-.0003082	.0002778	-1.11	0.269	-.0008572	.0002408
_cons	.0124765	.1365363	0.09	0.927	-.2573064	.2822593

SDP-C Impacts – 100% Cycling Group

Source	SS	df	MS
Model	.134873266	19	.007098593
Residual	.207467472	136	.001525496
Total	.342340738	155	.00220865

Number of obs	=	156
F(19, 136)	=	4.65
Prob > F	=	0.0000
R-squared	=	0.3940
Adj R-squared	=	0.3093
Root MSE	=	.03906

impact_perton	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
avgtemp_1	-.0056256	.002992	-1.88	0.062	-.0115424	.0002911
avgtemp_2	-.0067324	.005874	-1.15	0.254	-.0183486	.0048838
avgtemp_3	.0397616	.0332875	1.19	0.234	-.0260665	.1055897
lag3cdh	.0059004	.0018307	3.22	0.002	.00228	.0095207
hour_seg#c.lag3cdh						
2	.0008001	.0002781	2.88	0.005	.0002501	.0013501
3	.0011159	.0002956	3.77	0.000	.0005313	.0017006
dow#c.lag3cdh						
2	-.0007513	.0004942	-1.52	0.131	-.0017285	.000226
3	-.0003612	.0004214	-0.86	0.393	-.0011945	.0004721
4	-.0008756	.000417	-2.10	0.038	-.0017002	-.0000509
5	-.0010236	.0004701	-2.18	0.031	-.0019532	-.0000941
school#c.lag3cdh						
1	-.001526	.000249	-6.13	0.000	-.0020184	-.0010336
lcgnum#c.lag3cdh						
SDP-C-2	-.0000506	.0004413	-0.11	0.909	-.0009234	.0008222
SDP-C-3	.0008369	.000868	0.96	0.337	-.0008796	.0025534
SDP-C-4	.0001346	.0002943	0.46	0.648	-.0004474	.0007165
SDP-HD	.0001416	.0004676	0.30	0.762	-.0007831	.0010663
SDP-N	.0001789	.0002808	0.64	0.525	-.0003765	.0007343
SDP-NW	-.0000467	.0007043	-0.07	0.947	-.0014394	.001346
SDP-W-1	-.0009995	.0005832	-1.71	0.089	-.0021527	.0001537
SDP-W-2	.000837	.0005154	1.62	0.107	-.0001822	.0018562
_cons	.2440169	.1884871	1.29	0.198	-.1287279	.6167617

SDP-C Impacts – 50% Cycling Group

Source	SS	df	MS
Model	.172668982	19	.009087841
Residual	.419867845	136	.003087264
Total	.592536827	155	.003822818

Number of obs	=	156
F(19, 136)	=	2.94
Prob > F	=	0.0001
R-squared	=	0.2914
Adj R-squared	=	0.1924
Root MSE	=	.05556

impact_perton	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
avgtemp_1	.0007764	.0044289	0.18	0.861	-.0079821	.0095349
avgtemp_2	-.0032119	.0079271	-0.41	0.686	-.0188883	.0124645
avgtemp_3	.0239418	.0446995	0.54	0.593	-.0644541	.1123377
lag3cdh	.0011648	.0027805	0.42	0.676	-.0043338	.0066635
hour_seg#c.lag3cdh						
2	.0003857	.0004177	0.92	0.358	-.0004405	.0012118
3	.000424	.000453	0.94	0.351	-.0004719	.0013199
dow#c.lag3cdh						
2	-.0007723	.0007485	-1.03	0.304	-.0022525	.0007079
3	-.0010727	.0006461	-1.66	0.099	-.0023504	.000205
4	-.0008044	.0006206	-1.30	0.197	-.0020317	.0004228
5	-.001198	.0007337	-1.63	0.105	-.0026488	.0002529
school#c.lag3cdh						
1	-.0011106	.0004281	-2.59	0.011	-.0019572	-.0002641
lcgnum#c.lag3cdh						
SDP-C-2	.0005183	.0006084	0.85	0.396	-.0006849	.0017215
SDP-C-3	-.00023	.0019981	-0.12	0.909	-.0041815	.0037214
SDP-C-4	-.0002412	.0004164	-0.58	0.563	-.0010646	.0005822
SDP-HD	-.0048317	.0010001	-4.83	0.000	-.0068095	-.0028539
SDP-N	-.0007948	.000922	-0.86	0.390	-.0026181	.0010284
SDP-NW	.0002919	.0010443	0.28	0.780	-.0017732	.002357
SDP-W-1	.0012776	.0006955	1.84	0.068	-.0000978	.002653
SDP-W-2	-.0001943	.0006873	-0.28	0.778	-.0015536	.001165
_cons	-.0819722	.2777464	-0.30	0.768	-.6312325	.4672882

SDP-C Impacts – 30% Cycling Group

Source	SS	df	MS
Model	.231656555	17	.013626856
Residual	1.25315961	83	.015098309
Total	1.48481617	100	.014848162

Number of obs	=	101
F(17, 83)	=	0.90
Prob > F	=	0.5731
R-squared	=	0.1560
Adj R-squared	=	-0.0168
Root MSE	=	.12288

impact_perton	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
avgtemp_1	.03145	.0143047	2.20	0.031	.0029986	.0599014
avgtemp_2	-.0395929	.0228118	-1.74	0.086	-.0849648	.0057789
avgtemp_3	.1810477	.1329837	1.36	0.177	-.0834516	.445547
lag3cdh	-.0116998	.0088693	-1.32	0.191	-.0293404	.0059409
hour_seg#c.lag3cdh						
2	-.000559	.0012086	-0.46	0.645	-.0029629	.0018449
3	-.0009659	.0012844	-0.75	0.454	-.0035205	.0015888
dow#c.lag3cdh						
2	-.0020098	.0021446	-0.94	0.351	-.0062753	.0022557
3	-.0012681	.0018486	-0.69	0.495	-.0049448	.0024086
4	-.0008894	.0018119	-0.49	0.625	-.0044933	.0027145
5	-.0026819	.0021125	-1.27	0.208	-.0068835	.0015198
school#c.lag3cdh						
1	-.0000695	.0011939	-0.06	0.954	-.002444	.0023051
lcgnum#c.lag3cdh						
SDP-C-2	-.0043109	.0022808	-1.89	0.062	-.0088473	.0002256
SDP-C-4	-.0020054	.0022643	-0.89	0.378	-.0065091	.0024983
SDP-N	-.001932	.0024178	-0.80	0.427	-.0067408	.0028768
SDP-NW	-.0010366	.0049468	-0.21	0.835	-.0108755	.0088023
SDP-W-1	-.0032523	.00269	-1.21	0.230	-.0086026	.002098
SDP-W-2	-.0050744	.0027965	-1.81	0.073	-.0106366	.0004877
_cons	-1.95318	.8917766	-2.19	0.031	-3.726887	-.179472

APPENDIX G: AGGREGATE HOURLY IMPACTS

Table 27: 2024 SDP-R Aggregate Hourly Impacts

Date	Load Control Groups	Event Start	Event End	Accts	MW Reductions				
					HE 17	HE 18	HE 19	HE 20	HE 21
6/25/2024	Territory wide	6:00 PM	7:00 PM	151,270			72.5		
7/11/2024	Excludes Central-3	5:00 PM	6:00 PM	144,031		101.7			
8/20/2024	Excludes Central-3	4:00 PM	5:00 PM	143,414	107.4				
9/5/2024	Excludes Central-3	7:00 PM	8:00 PM	143,319				121.2	
9/6/2024	Localized event	5:13 PM	8:02 PM	5,681			8.4	6.0	
2025 SCE August 1-in-2		**4:00 PM**	**9:00 PM**	**142,192**	**109.6**	**110.3**	**107.6**	**86.8**	**84.6**

Table 28: 2024 SDP-C Aggregate Hourly Impacts

Date	Load Control Groups	Event Start	Event End	Accts	MW Reductions				
					HE 17	HE 18	HE 19	HE 20	HE 21
6/25/2024	Territory wide	6:00 PM	7:00 PM	6,549			4.3		
7/11/2024	Excludes Central-3	5:00 PM	6:00 PM	6,350		8.7			
8/20/2024	Excludes Central-3	4:00 PM	5:00 PM	6,320	18.3				
9/5/2024	Excludes Central-3	7:00 PM	8:00 PM	6,298				11.5	
9/6/2024	Localized event	5:13 PM	8:02 PM	119			[redacted]	[redacted]	
2025 SCE August 1-in-2		**4:00 PM**	**9:00 PM**	**6,086**	**19.5**	**19.5**	**15.3**	**12.2**	**12.0**