SELF-GENERATION
INCENTIVE PROGRAM

SGIP 1st Quarterly Workshop of 2025

March 24, 2025

Los Angeles Department of Water & Power

Southern California Edison
An Edison International Company

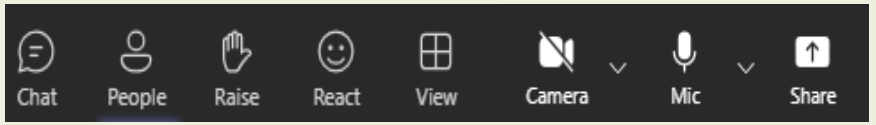
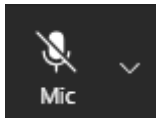
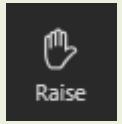
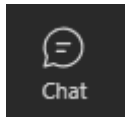
Pacific Gas and Electric Company

SoCalGas

Center for Sustainable Energy

Teams Meeting

SELF-GENERATION INCENTIVE PROGRAM

Function	Teams Icon
Controls	
Mute – *Remain muted unless called on*	
Raise Your Hand – *Wait until you are confirmed to speak on the chat or host*	
Type Your Question or Comment	

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Agenda

SELF-GENERATION INCENTIVE PROGRAM

- Safety (ED) 9:00 – 9:05
- Welcome and Introductions (PGE) 9:05 – 9:10
- Program Metrics (PGE) 9:10 – 9:20
- Demand Response Update (ED) 9:20 – 9:40
- Regulatory Updates (SCE) 9:40 – 9:50
- Storage Sizing Tool (CSE) 9:50 – 10:10
- RSSE Solar Sizing (AESC) 10:10 – 10:20
- COVID Extensions (SCG) 10:20 – 10:35
- M&E (Verdant) 10:35 – 11:00
- Open Q&A 11:00 – 12:00

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Introduction

SELF-GENERATION INCENTIVE PROGRAM

PROGRAM ADMINISTRATORS

SCE:

- Jim Stevenson
- Vicky Velazquez

SoCalGas:

- Julio Robles
- Laura Diaz
- Adrian Martinez
- Ashley Pezikian
- Jan Santos
- Sandi Linares-Plimpton

PG&E:

- Ron Moreno
- Mary Magdanz

CSE:

- Dema Tzamaras
- Shalene Watanabe-O'Toole
- Jess Hilton
- Lupe Knox

LADWP:

- Christian Kroupa
- Narek Abcarian
- Stephanie Macoritto
- Eric Escamilla
- Sarik Artooniansevarani
- Samer Fakhro

Introduction (continued)

SELF-GENERATION INCENTIVE PROGRAM

AESC (Technical)

- Dara Salour
- Stephanie Raya

Verdant

- Brian McAuley
- William Marin

Energy Division (CPUC)

- Justin Galle
- Gabriel Petlin
- Maya Noesen

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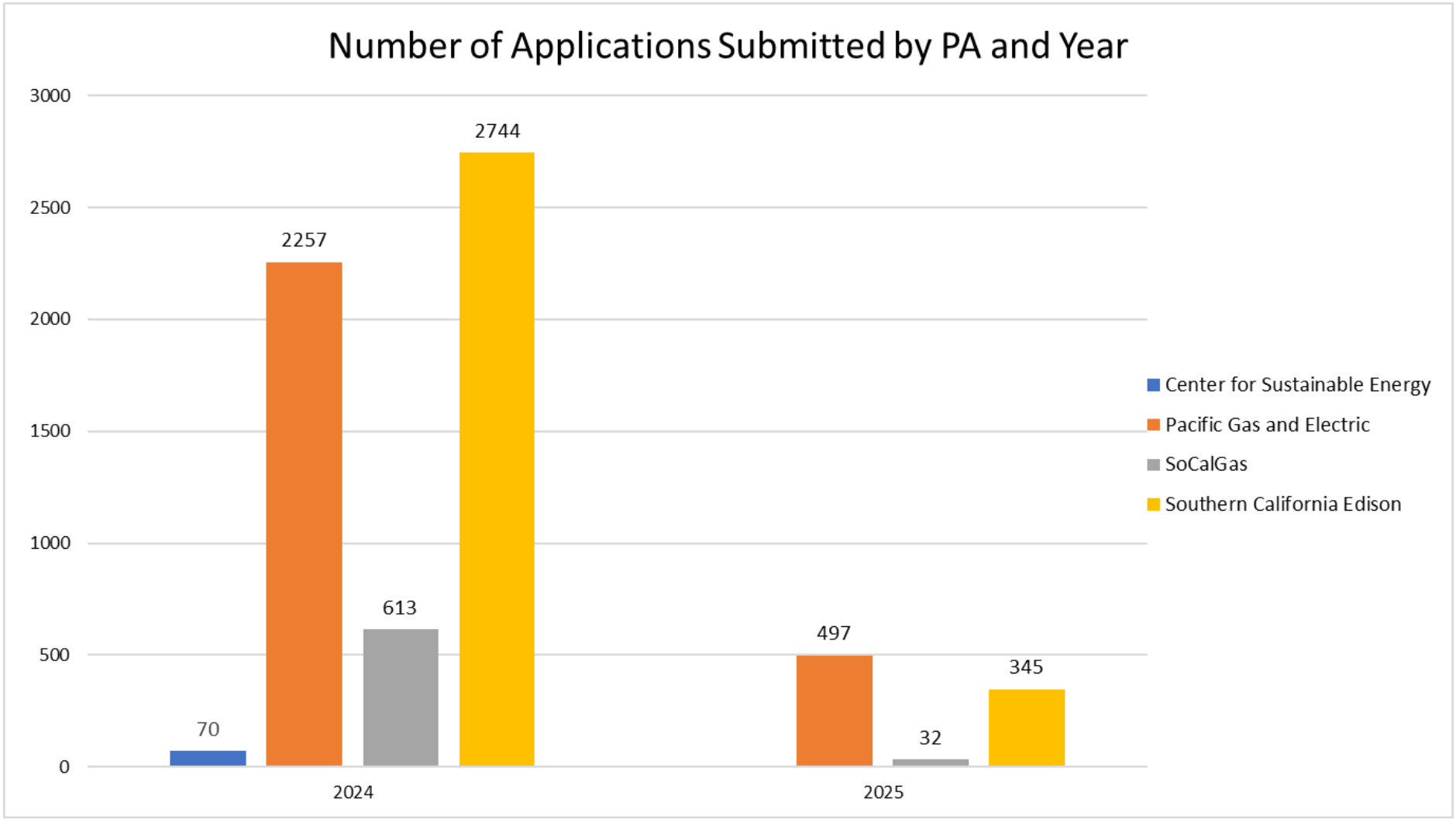
SELF-GENERATION INCENTIVE PROGRAM

Program Metrics

Program Metrics

Data 2024 – March 19, 2025

SELF-GENERATION INCENTIVE PROGRAM

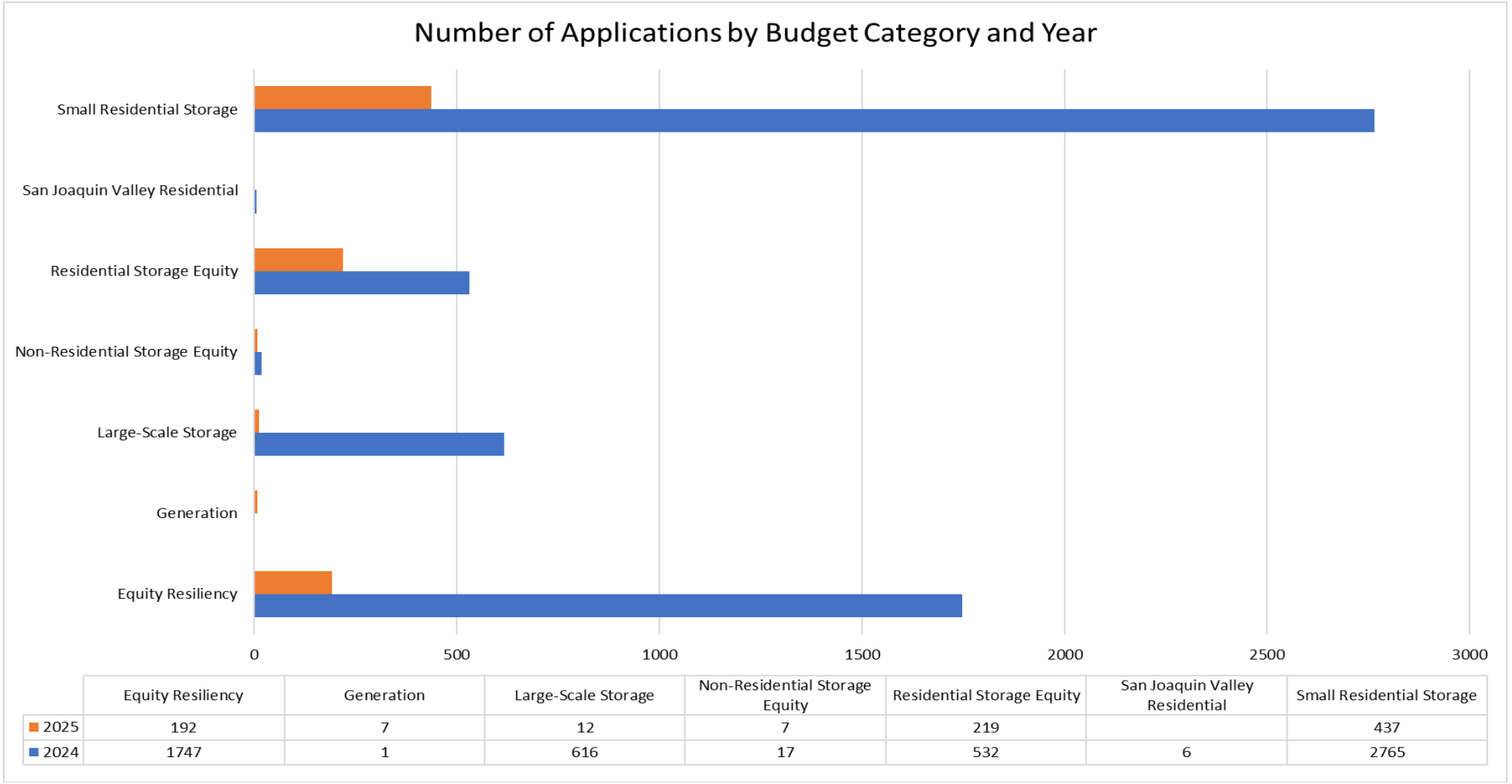


Does not included cancellations and waitlist projects

Program Metrics

Data 2024 – March 19, 2025

SELF-GENERATION INCENTIVE PROGRAM

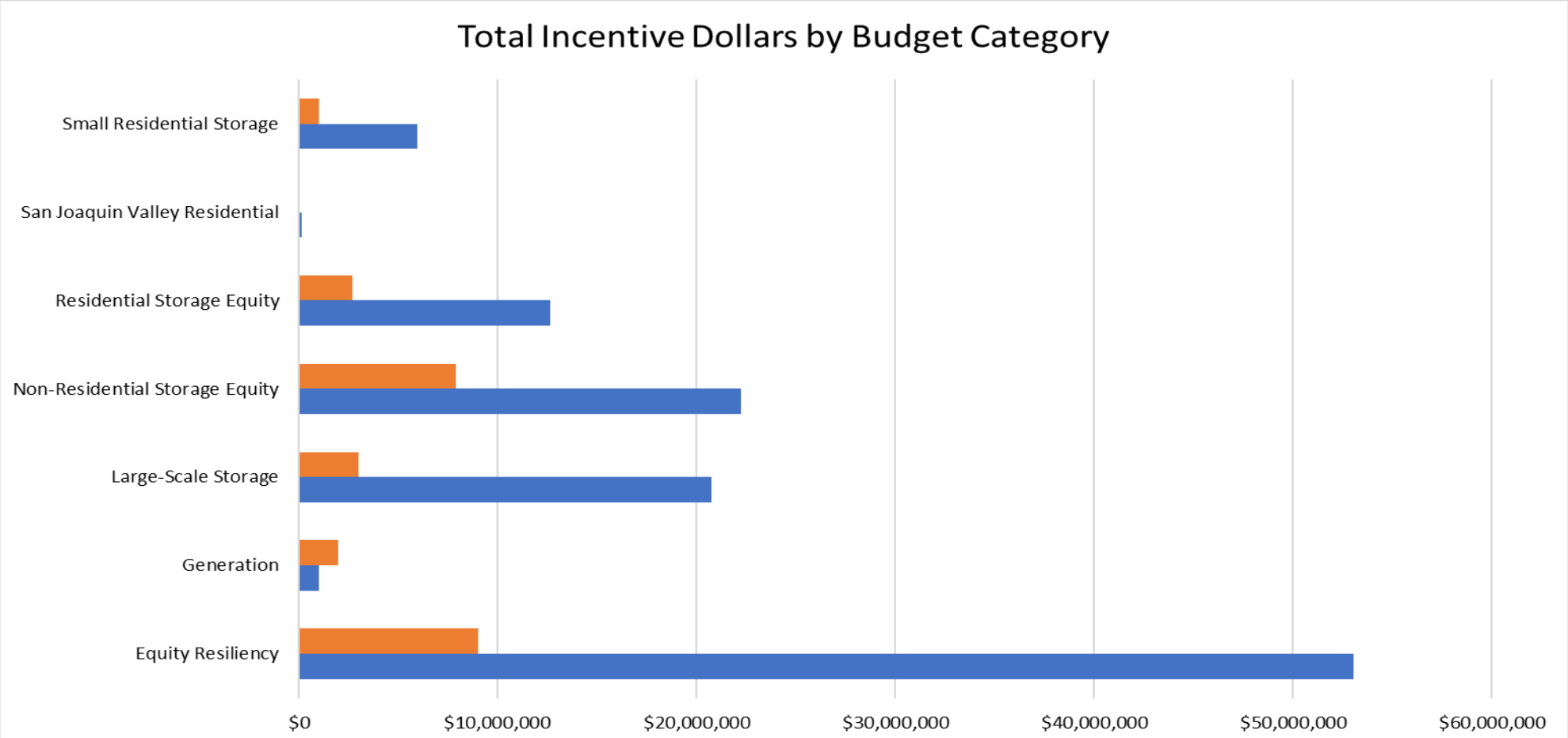


	Equity Resiliency	Generation	Large-Scale Storage	Non-Residential Storage Equity	Residential Storage Equity	San Joaquin Valley Residential	Small Residential Storage
2025	192	7	12	7	219		437
2024	1747	1	616	17	532	6	2765

Program Metrics

Data 2024 – March 19, 2025

SELF-GENERATION INCENTIVE PROGRAM

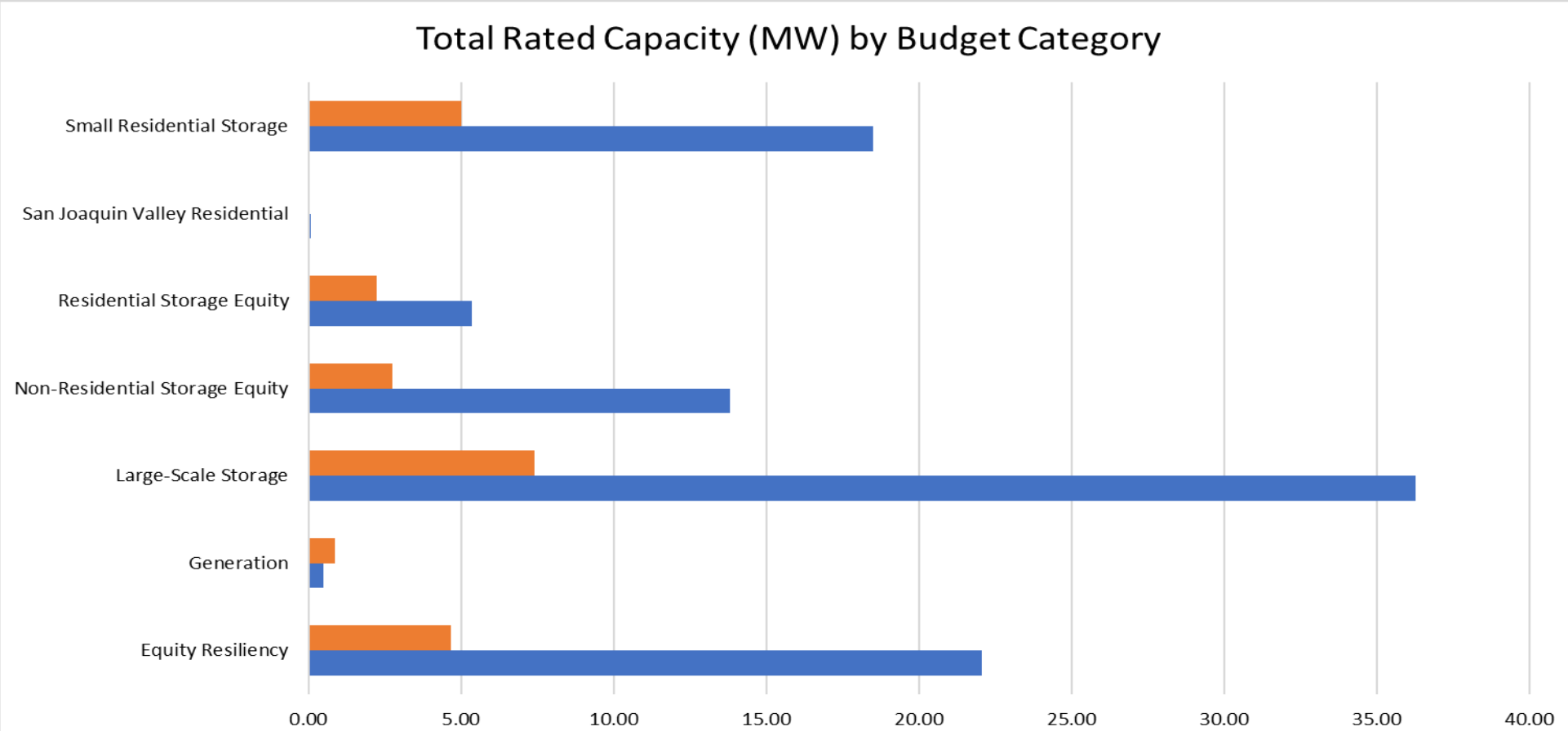


	Equity Resiliency	Generation	Large-Scale Storage	Non-Residential Storage Equity	Residential Storage Equity	San Joaquin Valley Residential	Small Residential Storage
2025	$9,023,725	$1,975,308	$3,016,209	$7,895,515	$2,694,927		$1,012,165
2024	$53,058,889	$1,000,000	$20,766,358	$22,229,220	$12,624,167	$158,400	$5,982,553

Program Metrics

Data 2024 – March 19, 2025

SELF-GENERATION INCENTIVE PROGRAM

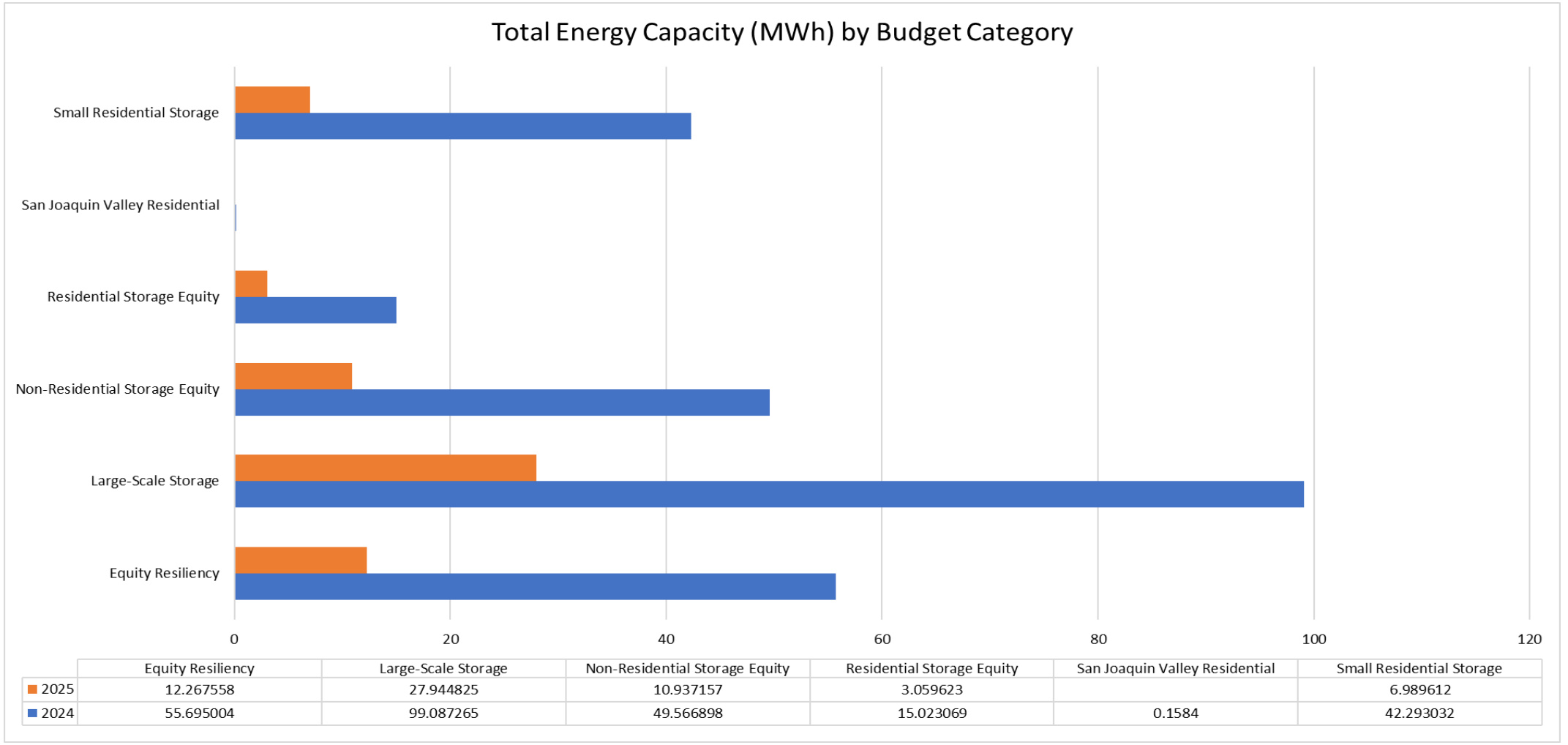


	Equity Resiliency	Generation	Large-Scale Storage	Non-Residential Storage Equity	Residential Storage Equity	San Joaquin Valley Residential	Small Residential Storage
2025	4.66	0.87	7.42	2.75	2.24		5.01
2024	22.06	0.50	36.29	13.80	5.34	0.06	18.52

Program Metrics

Data 2024 – March 19, 2025

SELF-GENERATION INCENTIVE PROGRAM

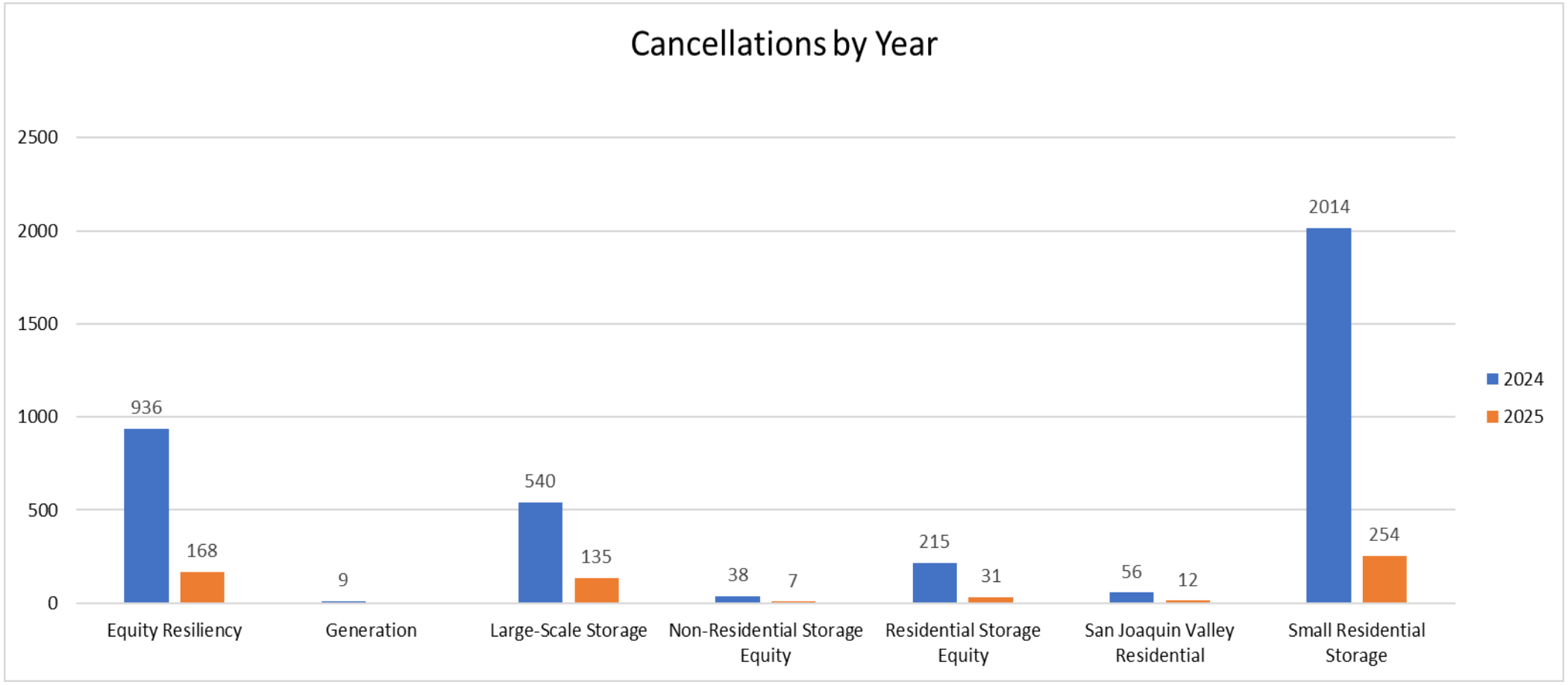


	Equity Resiliency	Large-Scale Storage	Non-Residential Storage Equity	Residential Storage Equity	San Joaquin Valley Residential	Small Residential Storage
2025	12.267558	27.944825	10.937157	3.059623		6.989612
2024	55.695004	99.087265	49.566898	15.023069	0.1584	42.293032

Program Metrics

Data 2024 – March 19, 2025

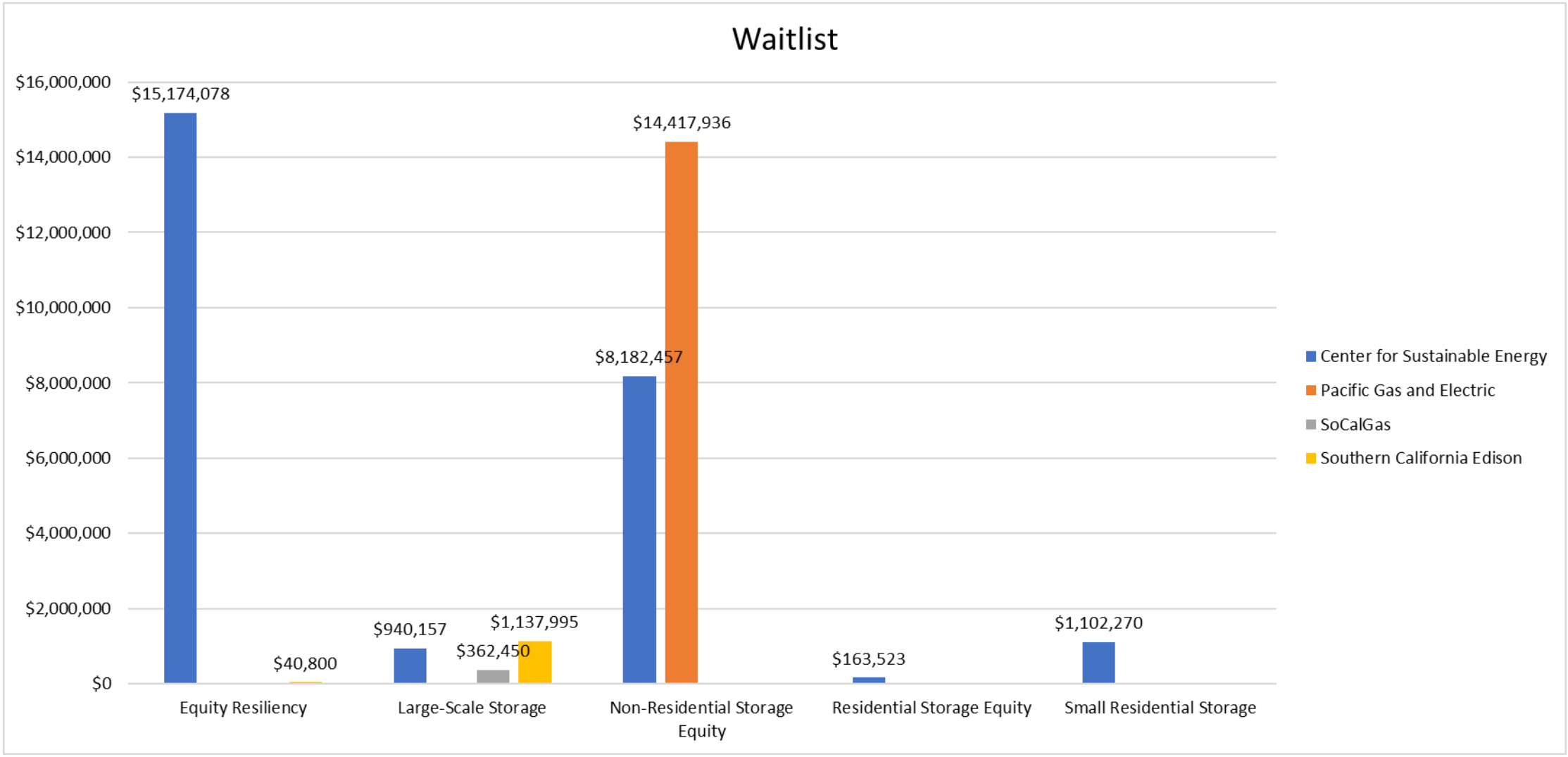
SELF-GENERATION INCENTIVE PROGRAM



Program Metrics

Data 2024 – March 19, 2025

SELF-GENERATION INCENTIVE PROGRAM



Program Metrics

As of March 19, 2025

SELF-GENERATION INCENTIVE PROGRAM

Budget Category	CSE	SCE	SCG	PG&E
Large-Scale Storage	**Waitlist**	**Waitlist**	**Waitlist**	**Step 5**
				$9,560,418
Small Residential Storage	**Waitlist**	**Step 7**	**Step 7**	**Step 7**
		$1,756,208	$1,193,444	$3,023,903
Residential Storage Equity	**Waitlist**	**Open**	**Open**	**Open**
		$3,799,343	$2,418,363	$10,988,163
Non-Residential Storage Equity	**Waitlist**	**Open**	**Open**	**Waitlist**
		$3,011,410	$859,588	
Equity Resiliency	**Waitlist**	**Open**	**Open**	**Open**
		$11,659,191	$3,888,661	$12,265,642
San Joaquin Valley Residential		**Open**		**Open**
		$4,589,600		$1,131,200
San Joaquin Valley Non-Residential		**Open**		**Open**
		$120,000		$120,000
Generation	**Open**	**Open**	**Open**	**Open**
	$1,600,883	$36,468,483	$12,284,567	$16,733,629

SCE and CSE have reached the 50% Residential Storage Soft Target Cap for Small Residential Step 7

When additional funding is provided in a given budget category, applications on a waitlist will be awarded funding in the order they were received

https://www.selfgenca.com/home/program_metrics/

Program Metrics

SELF-GENERATION INCENTIVE PROGRAM

Questions?

SGIP Demand Response Requirement

Gabe Petlin, Supervisor Energy Storage and Grid Planning
Justin Galle, Senior Analyst SGIP
Maya Noesen, Analyst SGIP

California Public
Utilities Commission

Background

- Commission Decision 24-03-071 added a Demand Response Requirement to SGIP. Rule in effect as of June 4, 2024 compliance filing.
- Relevant SGIP Handbook Sections:
  - Section 6.2.2 New Non-Residential Projects: “All new non-residential systems, regardless of system size, must be enrolled in an SGIP-approved Demand Response program by incentive claim submission… A list of Demand Response Programs can be found on www.selfgenca.com.”
  - Section 6.2.4 New Residential Projects "All new residential systems... require the host customer to be on an SGIP-approved rate and enrolled in an SGIP-approved Demand Response program by incentive claim submission."
    - "PAs, in consultation with the SGIP working group, may exempt an applicant from the Demand Response participation requirement if Non-IOU customers do not have access to qualified Demand Response programs or if the customer would have to forfeit a low-income rate to join a Demand Response program."
    - Section 3.1 Host Customer: "For multifamily buildings that are installing a system on behalf of tenants and are enrolled in a Virtual Net Energy Metering (VNEM) tariff, the Property Owner may be the Host Customer."

SGIP-Approved Demand Response Programs

Electric Utility	Demand Response Program	Eligible Host Customer Sector
Pacific Gas and Electric	Capacity Bidding Program (CBP)	Commercial, Small Business, Educational Institution, Residential, Single Family, Multifamily, Multifamily Non-Residential
Pacific Gas and Electric	Peak Day Pricing	Commercial, Small Business, Educational Institution, Multifamily Non-Residential
Pacific Gas and Electric	SmartRate	Residential, Single Family, Multifamily
San Diego Gas and Electric	Capacity Bidding Program (CBP)	Commercial, Small Business, Educational Institution, Multifamily, Multifamily Non-Residential
San Diego Gas and Electric	Critical Peak Pricing (CPP)	Commercial, Small Business, Educational Institution, Multifamily Non-Residential
San Diego Gas and Electric	Time-of-Use Plus Pricing Plan	Commercial, Small Business, Educational Institution, Residential, Single Family, Multifamily, Multifamily Non-Residential
Southern California Edison	Capacity Bidding Program (CBP)	Commercial, Small Business, Educational Institution, Residential, Single Family, Multifamily, Multifamily Non-Residential
Southern California Edison	Critical Peak Pricing (CPP)	Commercial, Small Business, Educational Institution, Residential, Single Family, Multifamily, Multifamily Non-Residential

For SGIP participants in POUs, an SGIP approved qualified DR program is one that would use the storage device to (1) shifts onsite energy use to off-peak time periods or reduces demand from the grid by offsetting or lowering some or all of the customer's onsite energy demand, (2) is not an emergency DR program; and (3) the load impact from the storage device can be accurately measured and evaluated.

- CCA customers can access IOU Capacity Bidding Program (CBP), but no residential aggregators exist for the PG&E and SCE Capacity Bidding Program at this time and SDG&E CBP does not allow any residential customers.
- PG&E NEM customers are not eligible for SmartRate, unless they switch to NBT.

Selfgen has the most up to date list of SGIP-Approved DR programs https://www.selfgenca.com/home/resources/demand_response/

Process to Add Additional DR Programs to the SGIP-Approved List

DR Program Criteria

I. Program must be easy to enroll and participate in.

II. Program must provide verifiable load drop using the storage device supported by the SGIP incentive.

III. Program must meet criteria established in D.23-12-005:

1. Economic supply-side market integrated DR programs counted for RA irrespective of whether the administrator is an IOU, CCA or third-party DRP.
2. Load modifying DR programs that satisfy the following two requirements:
    a. The program is indirectly integrated with the CAISO energy market such that the program's dispatch signal is linked to the energy prices in the Day-Ahead or realtime market – operational domain.
    b. The program's load impact is counted towards RA obligations directly or indirectly through an approved process (such as, via a process for reducing RA obligations by integrating the program's load impact with CEC's peak forecasts) – planning domain.
3. Any DR pilot authorized and designated by the Commission in a DR proceeding including R.22-07-005 as a "qualified" DR program eligible to meet the DR enrollment requirement.
4. Critical Peak Pricing or Peak Day Pricing. These options, which at this time do not meet requirement 2a above, shall be discontinued as a "qualified" DR program if they still do not meet requirements listed here when the dynamic rate(s) under consideration in R.22-07-005 (to comply with CEC adopted Load Management Standards (California Code of Regulations – Title 20, Article 5, Section 1623) are made available to customers.

IV. For SGIP participants in POUs, an SGIP-approved qualified DR program is one in which (1) the storage device would shift onsite energy use to off-peak time periods or reduce demand from the grid by offsetting or lowering some or all of the customer's onsite energy demand, (2) the DR program is not a Reliability Demand Response Resource (RDRR) that is use-limited; and (3) the load impact from the storage device can be accurately measured and evaluated.

Process to Add Additional DR Programs to the SGIP-Approved List

Regulatory Process

1. Any LSE party may file a Tier 2 Advice Letter in response to D.23-12-005
    a) Indicate the program meets criteria III to be added to the Commission's Qualified DR list for all programs.
2. SGIP PA may file a Tier 2 Advice Letter in response to D.24-03-071
    a) Indicate the program meets criteria I and II if already on the Commission's Qualified DR list or if in process of getting approval. Approved programs will be added to just the SGIP-Approved DR list.
    b) Indicate the program meets criteria I, II, and III if not on the Commission's Qualified DR list. Approved programs will be added to just the SGIP-Approved DR list.

A single Advice Letter may be filed in response to both Decisions to get on both the Commission's Qualified DR list and the SGIP-Approved DR List.

Option 1: New Applications Must Have Access to a DR Program to Apply to SGIP

- For IOU customers (which includes unbundled IOU/CCA customers), only host customers with access to an SGIP-approved Demand Response (DR) program can receive a confirmed RRF status.
  - The host customer is not required to enroll in a qualified DR program at the time of RRF request; rather there must be an available and approved option at the RRF stage.
- If no SGIP-approved DR program is available, then the application will be denied at RRF. This includes applications where there is a pending AL to approve a DR program.
- This is a consumer protection measure to prevent a host customer from installing a system expecting an SGIP incentive while being unable to receive the incentive due to lack of an SGIP-approved DR program.

Option 2: New Applications Without Access to a DR Program Can Reserve SGIP Funds

- For IOU customers (which includes unbundled IOU/CCA customers), all host customers can receive a confirmed RRF status.
- A developer may receive a 50% advanced payment for the system. Have 180 days to complete the project.
- If the applicant gets access to an SGIP-approved DR program and completes the ICF, they receive the full SGIP incentive.
- If the applicant does not get access to an SGIP approved DR program, the applicant can not receive the SGIP incentive.
    - The applicant may not be granted an extension.
    - The developer must return any advanced payment to the SGIP PA.
    - The host customer may have an installed system that will not receive any SGIP incentive. With RSSE these will all be low-income customers.

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Regulatory Updates

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Resolution E-5360

SELF-GENERATION INCENTIVE PROGRAM

- On December 19, 2024, the Commission issued Resolution E-5360 to Change Storage System Sizing in the Self-Generation Incentive Program
  - Changes SGIP system sizing approach from kW to kWh
  - Replaces the 10kW load justification threshold with a 15 kWh
  - Load used for sizing justification for projects above the threshold is no longer peak demand over the past 12 months
    - Paired: Average daily excess solar generation in a summer calendar month
    - Standalone: Average daily energy consumption during the 4-9PM peak demand window during a summer calendar month
  - Institutes a 30-kWh incentive cap for all residential equity budgets

- A joint PA Tier 1 AL (Advice 5034-G/7510-E) was filed on February 18, 2025, implementing these programmatic changes.
- SGIP Energy Storage Sizing Tool (ESST) was developed and published.
- Webinar was held February 11, 2025, introducing and demonstrating the new SGIP storage sizing tool.

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IRA Tax Credit Resolution E-5373

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- On November 18, 2024, the SGIP PAs file a joint AL (Advice 6405-G) proposal to maximize the cost share of the Inflation Reduction Act (IRA) tax credits on SGIP projects.

- February 26, 2025, Resolution E-5373 issued approving, with modification, the joint Advice Letter 6405-G.
  - SGIP will cap its share of incentive payments at 70 percent of eligible project costs when the SGIP payment is from state funds, the system is third-party owned (TPO), or the system is nonresidential. Each of these types of projects is eligible to claim an IRA tax credit of 30 percent of eligible project costs.
  - When the SGIP payment is from ratepayer funds for host customer owned residential projects, the applicant is required to disclose the percentage of total eligible project costs being claimed through the IRA tax credit between 0 to 30 percent. For ratepayer funded equity budget projects, the SGIP payment will cover the difference between the reported IRA tax credit and up to 100 percent of eligible project costs.
  - SGIP PAs shall file a Tier 2 Advice Letter six months after the RSSE budget is opened to modify the IRA tax credit exemption criteria as needed. The current exemption criteria requires documentation be provided for projects claiming to be ineligible to claim the IRA tax credit and why the credit could not otherwise be utilized or transferred by a third-party entity.
  - SGIP PAs shall implement these SGIP handbook, application, and database changes before the Residential Solar and Storage Equity (RSSE) budget opens to apply to all future SGIP applications.

- SGIP PAs to make the IRA tax credit relevant changes to the SGIP handbook and application before the RSSE opens.

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Extension to open RSSE

SELF-GENERATION INCENTIVE PROGRAM

- March 7, 2025, the PAs submitted a request for Extension of Time to Comply with Ordering Paragraph 6 of Resolution E-5362 to open the SGIP Residential Solar and Storage Equity (RSSE) Budget.
  - OP 6 directs the SGIP PAs to launch the RSSE budget for customer applications within 45 days of the adoption of the resolution, *i.e.*, by March 16, 2025.
  - Resolution E-5373, issued on February 20, 2025, adopts, with modification, the SGIP PAs' proposal related to maximization of federal Inflation Reduction Act (IRA) tax credits directs the SGIP PAs to implement the changes described in that resolution before the RSSE budget opens.
  - Significant SGIP database development activities including implementation of the requirements established in Resolution E-5373, is May 20, 2025.
- Request opening the RSSE budget be extended from March 16, 2025, to May 20, 2025, to fully implement SGIP handbook, application, and database changes required by Resolution E-5373.
- March 17, 2025, the CPUC granted the Joint PAs request for extension to open RSSE to **May 20, 2025**.

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Extension to open RSSE (LADWP)

SELF-GENERATION INCENTIVE PROGRAM

- February 21, 2025, LADWP submitted a request for Extension of Time to comply with the requirement to begin accepting applications by March 21, 2025, for the Self-Generation Program's (SGIP) AB 209 incentives in Decision (D.) 24-03-071.
  - The Decision authorized LADWP to establish itself as an independent Program Administrator (PA) and required LADWP to open its SGIP AB 209 application intake no later than 12 months from the Decision's adoption date, or March 21, 2025.
  - LADWP is also required in the Decision to use the existing SGIP database, contribute administrative funds for joint PA purposes, participate in the Marketing and Education (M&E) plan and fulfill all other requirements that apply to SGIP PAs as appropriate.
  - Encountered delays due to challenges associated with the technical configuration of the SGIP database. The scope and complexity of the AB 209 modifications have resulted in delays beyond LADWP's control.
- March 18, 2025, CPUC granted LADWP's request for an extension from March 21, 2025, to **December 21, 2025**, to comply with the Decision's directive to begin accepting applications for AB 209 SGIP incentives.

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Regulatory Updates

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Questions?

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Storage Sizing Tool

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SELF-GENERATION INCENTIVE PROGRAM

What will be presented today

- Introduction to new Storage sizing Tool
  - Tool can be downloaded from link found here; https://selfgenca.com/documents/application_forms/storage_sizing
  - Link to tool can also be found on the SGIP Statewide Announcements page
- Overview on how to;
  - Input project information
  - Obtain justified storage size (for Residential Projects subject to the updated system size parameters)
    - For more information see 2025 SGIP Handbook, section **6.3 System Size Parameters**

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Input Project Information

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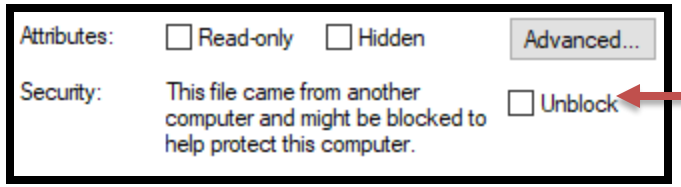
Step 1: Download Workbook from link

Step 2: Open Workbook and enable macros

- You may need to enter the file properties and check “unblock” in order to enable the macros



Step 3: Navigate to Project Information tab and input project specific Information

- Note, you must answer all questions on this tab in order for the sizing tool to work as intended
- Be sure to select the correct Electrical Utility

For more information on how to fill out this section;

- Navigate to Instructions tab within this workbook
- Or ctrl+click on link to download Storage Sizing Slides
- Or ctrl+click on link to view Youtube Slide Presentation

Links can also be accessed from Statewide Announcements page

1	***Application Information***	
2	Application Number	Utility-SGIP-202X-XXXX
3	Site Street	Street Address
4	Site City, State, Zip Code	City, CA, ZIPXXXXX
5	***System Information***	
6	Is the battery system currently or planned to be paired with Solar or be a Standalone System?	Select---
7	Please choose if the system is standalone or is paired with solar.	N/A
8	Please choose if the system is standalone or is paired with solar.	N/A
9	***Please choose if the system is standalone or is paired with solar.***	
10	Please choose if the system is standalone or is paired with solar.	N/A
11	Is the project incentivizing only battery or both battery and solar?	Select---
12	Electrical Utility	Select---
13	Is Green Button Data (GBD) available?	Select---
14	Is the system being sized to the Current Home Load or Future Load Growth?	Select---
15	What is the make and model of the battery that is expected to be installed?	
16	What is the SGIP-approved capacity (kWh) of a single battery unit?	
17	How many battery units are being proposed?	
18	For batteries that have been previously installed and received an SGIP incentive, what is the make and model of the battery that has been previously installed? (Enter "N/A" if none have been installed and received an SGIP incentive)	
19	What is the total capacity of the system (in kWh) that has been previously installed and received an SGIP incentive? (Enter "0" if a battery has not been previously installed and received an SGIP incentive).	
20	Is system being sized for resiliency?	No
21		

Instructions | Project Information | Results

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If Paired with New/Existing Solar

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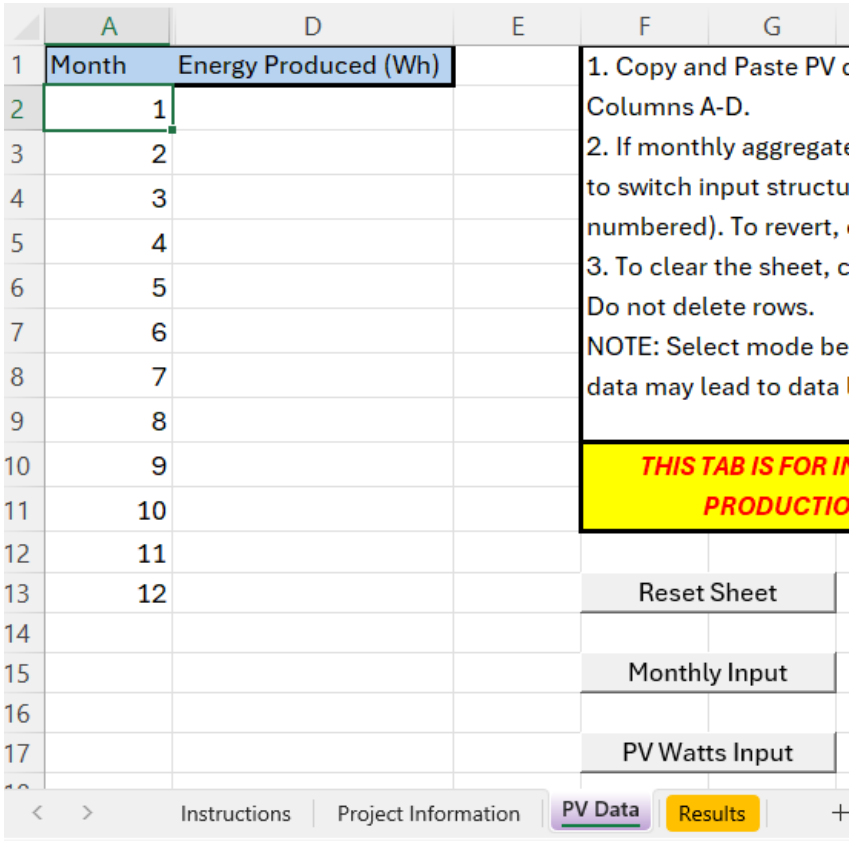
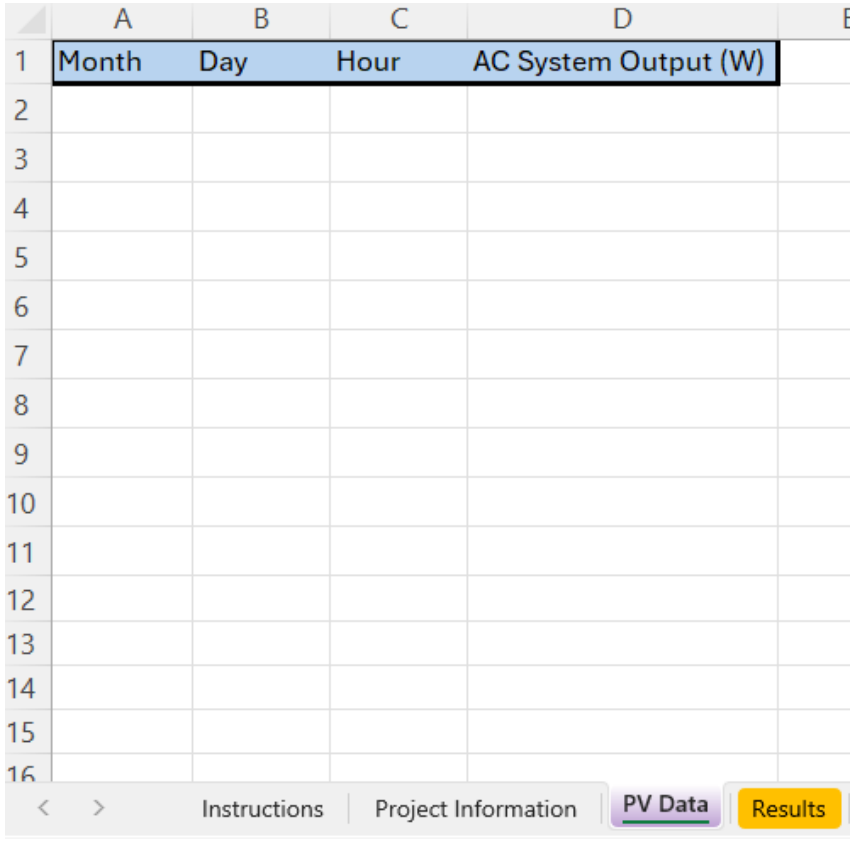


Enter PV Data of New or Existing solar into the **PV Data** tab

- If monthly PV aggregated data is available click on Monthly Input and enter Energy Produced (Wh) by month *(see example on left)*
- If PV monthly aggregated data is not available, enter PV Watts data *(see example on right)*



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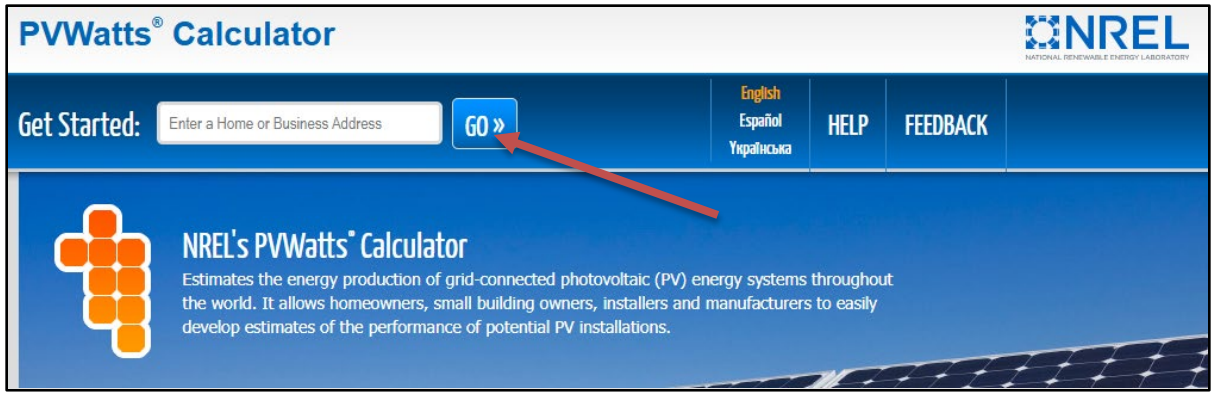
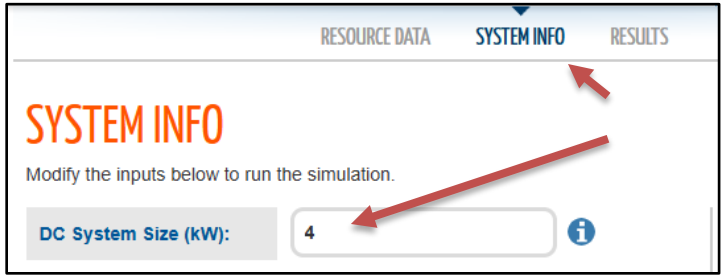
How to Obtain PV Watt Data

SELF-GENERATION INCENTIVE PROGRAM

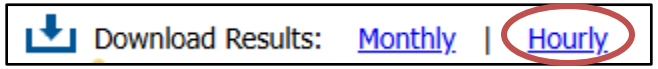
Step 1: Go to PV Watts Calculator (pvwatts.nrel.gov)
Step 2: Enter Project Site Address and click GO



Step 3: Navigate to System Info and enter PV DC System Size in kW



Step 4: Navigate to Results and scroll down to Download Results by Hourly



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If Paired with Expanded Solar

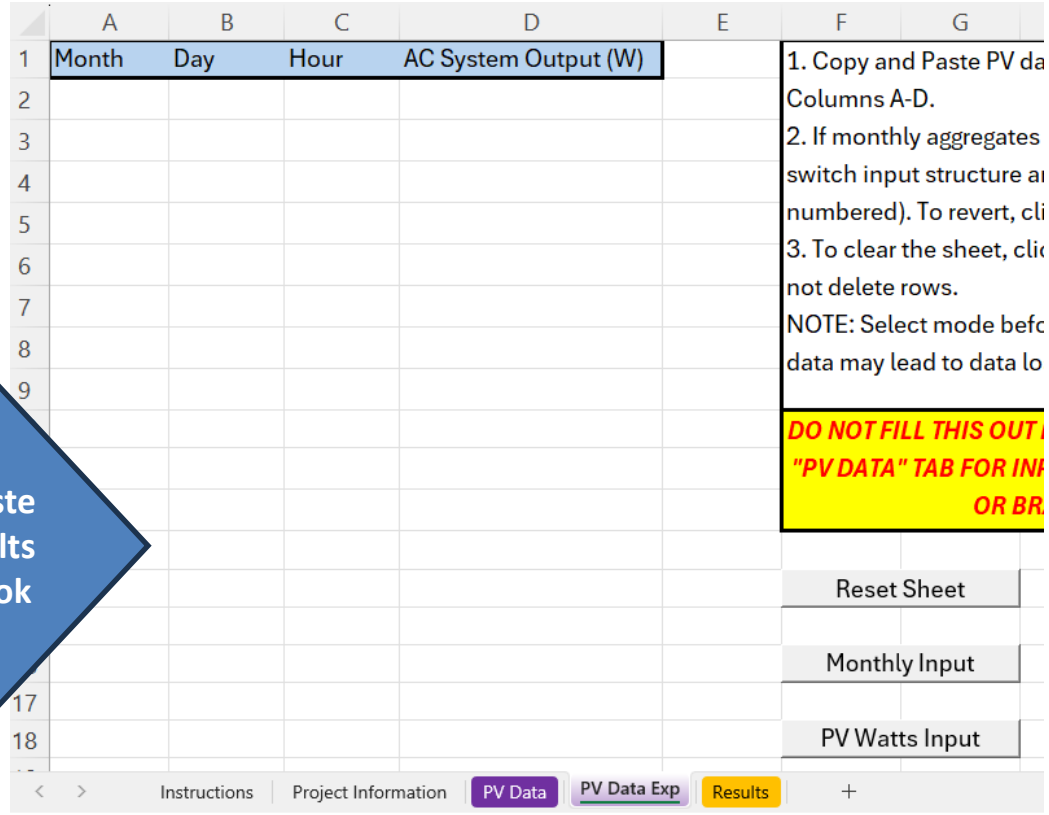
SELF-GENERATION INCENTIVE PROGRAM

Enter Expanded PV Data obtained from PV Watts Calculator into the **PV Data Exp** tab

Definition for Expanded Solar: Situation where a preexisting solar system already exists onsite and additional PV will be added therefore expanding the preexisting system. For situations where a new solar system will be installed, the preexisting solar tab should be used, as the tool does not consider a new solar system to be an expansion

	Month	Day	Hour	Beam Irra	Diffuse Irr	Ambient T	Wind Spe	Albedo	Plane of A	Cell Temp	DC Array C	AC System Output (W)
33	1	1	0	0	0	13	4.1	0.12	0	13	0	0
34	1	1	1	0	0	13	4	0.12	0	13	0	0
35	1	1	2	0	0	13	3.8	0.12	0	13	0	0
36	1	1	3	0	0	13	3.7	0.12	0	13	0	0
37	1	1	4	0	0	13	3.5	0.12	0	13	0	0
38	1	1	5	0	0	12	3.4	0.12	0	12	0	0
39	1	1	6	0	0	13	3.6	0.12	0	13	0	0
40	1	1	7	454	32	15	4.1	0.12	178.06	17.932	2166.899	2025.867
41	1	1	8	729	58	18	4.2	0.12	432.568	25.329	6086.077	5806.174
42	1	1	9	844	72	20	3.7	0.12	640.59	31.678	8850.637	8472.775
43	1	1	10	936	67	22	3	0.12	792.131	38.118	10607.86	10167.736
44	1	1	11	956	69	23	2.5	0.12	859.051	42.069	11280.16	10816.211
45	1	1	12	952	69	24	2	0.12	847.209	44.713	11013.39	10558.897
46	1	1	13	917	68	24	1.6	0.12	754.626	44.096	9882.378	9467.957
47	1	1	14	851	61	23	1	0.12	596.139	41.325	7943.297	7597.585
48	1	1	15	709	48	20	0.6	0.12	372.055	32.645	4969.809	4729.459
49	1	1	16	338	19	17	0.9	0.12	103.756	19.602	791.306	699.017
50	1	1	17	0	0	15	1.4	0.12	0	15	0	0

Copy and Paste PV Data results into workbook



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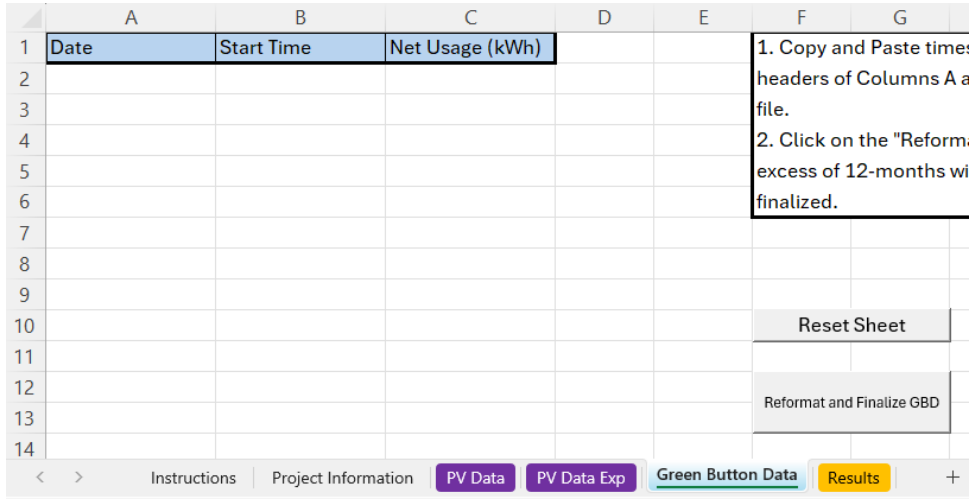
Monthly Usage Data

SELF-GENERATION INCENTIVE PROGRAM

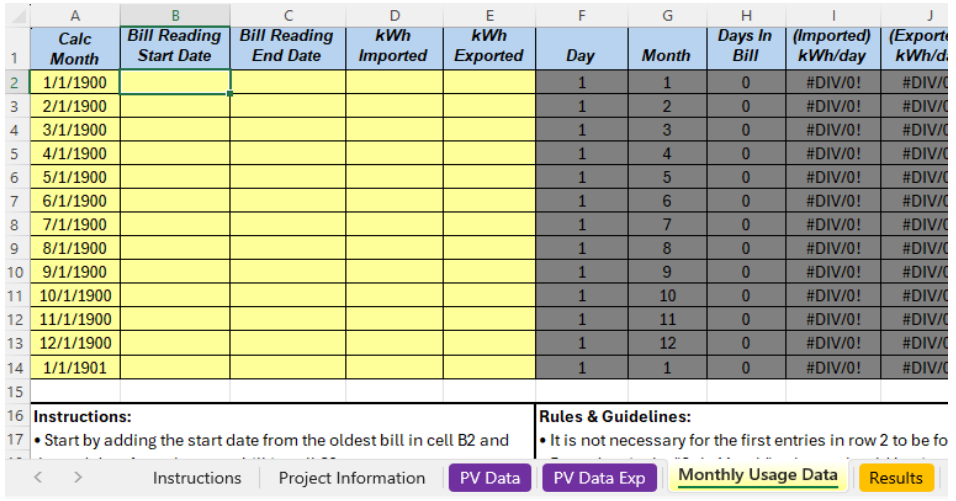
If Green Button Data is available;

- Enter Green Button Data (GBD) in **Green Button Data** tab and click Reformat and Finalize GBD



If Green Button Data does not exist;

- Enter Monthly Usage Data from previous 12 months of utility bills in the **Monthly Usage Data** tab



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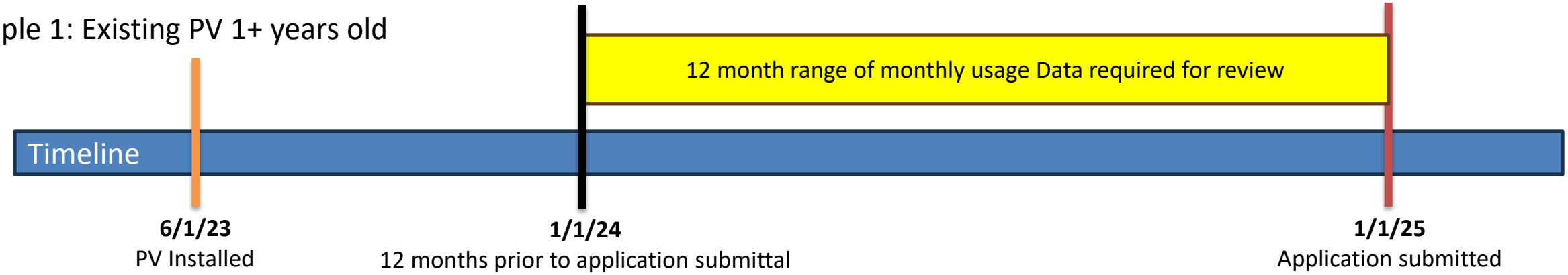
Range of GBD/Monthly Usage Data required based on when PV was installed

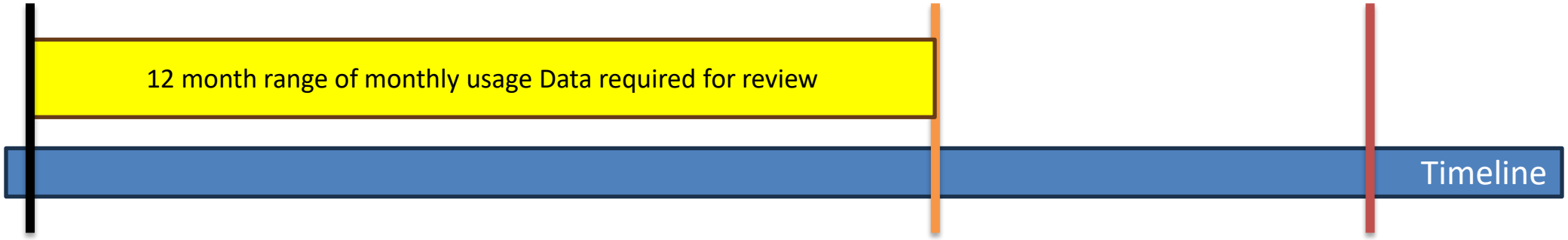
SELF-GENERATION INCENTIVE PROGRAM

Example 1: Existing PV 1+ years old



Example 2: Existing PV < 1 year old

If the pre-existing solar is less than a year old, you will need to enter 12 months of GBD/Monthly Usage Data starting from day of solar installation



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If System is Based on Future Growth

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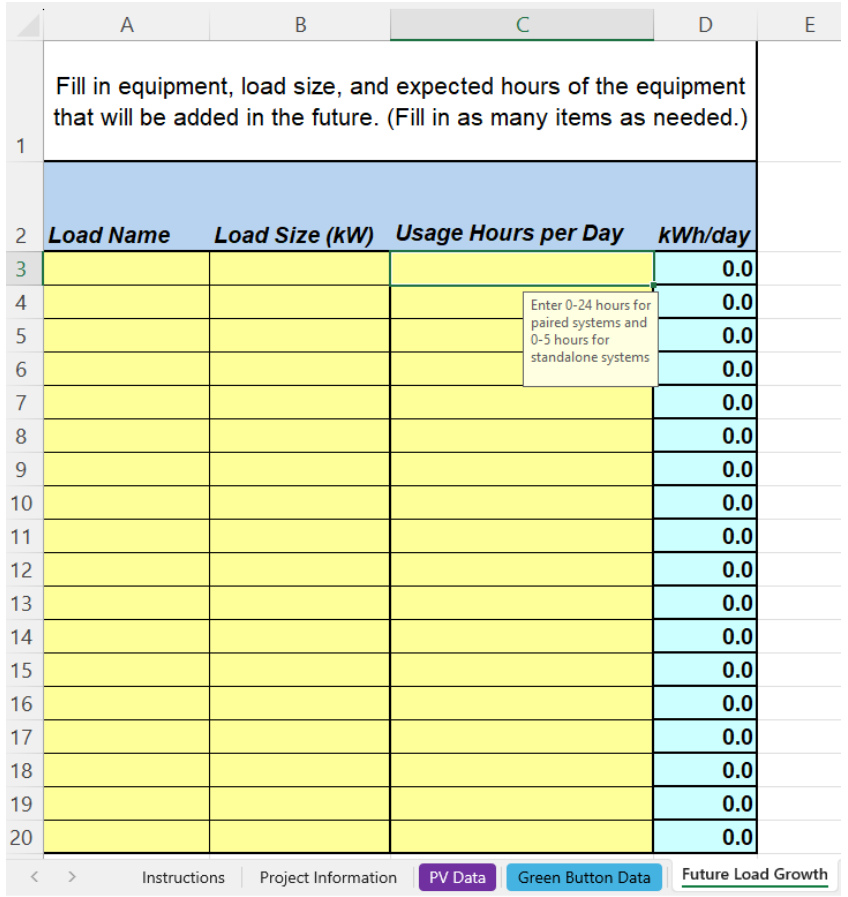
Enter only future equipment load information in the **Future Load Growth** tab

- Note, if Stand Alone system, you will only be able to enter the hours used per day between the hours of 4pm-9pm
- Please note that the estimated future load growth will need to materialize at the time of incentive claim.
  - Substantiation will need to be provided with load data
  - If the estimated load does not materialize the system size and the incentive will be reduced and determined based on the load provided at reservation request.



	A	B	C	D	E
1	Fill in equipment, load size, and expected hours of the equipment that will be added in the future. (Fill in as many items as needed.)				
2	*Load Name*	*Load Size (kW)*	*Usage Hours per Day*	*kWh/day*	
3				0.0	
4				0.0	
5				0.0	
6				0.0	
7				0.0	
8				0.0	
9				0.0	
10				0.0	
11				0.0	
12				0.0	
13				0.0	
14				0.0	
15				0.0	
16				0.0	
17				0.0	
18				0.0	
19				0.0	
20				0.0	

Enter 0-24 hours for paired systems and 0-5 hours for standalone systems

Instructions | Project Information | PV Data | Green Button Data | Future Load Growth

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Obtain Results

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Navigate to **Results** tab and click on **Update Table**

	A	B	C	D	E	F	G	H	I	J	K	L	M
1						*Energy Breakdown Table of a Paired With Solar*							
2		January	February	March	April	May	June	July	August	September	October	November	December
3	*PV Generation (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	*Planned PV Expansion Generation (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	*Imported Energy (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	*Exported Energy (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	*Monthly Load (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8													
9													
10	*Average Daily PV Generation (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	*Average Daily Load (kWh)*	0.00	0.00	0.00	0.00	39.90	0.00	50.55	0.00	0.00	0.00	0.00	0.00
12	*Average Future Load Growth (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	*Excess PV Generation (kWh)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	*SGIP Eligible Battery Storage Size (kWh) **	0.00				Update Table							
15	**Total Incentivized System Size (kWh)**	0											
16	**Battery Determination:**	System Size 15 kWh or Less Does Not Need Justification											
17	**PV Check:**	Please Select Whether Battery or Battery + Solar Is Being Incentivized In The Project Information Tab											
18	**Additional Note:**	*None*											
19	*	***This value should be entered into the "Justified Load (kWh)" field in the SGIP Application.***											

Page 1 Page 2 Page 3

Instructions | Project Information | PV Data | PV Data Exp | Monthly Usage Data | Results | +

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Energy Storage Sizing Tool FAQ

SELF-GENERATION INCENTIVE PROGRAM

Questions Answered:

1. For projects that do not have Green Button Data how do we input monthly data into the tool?
2. The tool is okay but not clear enough because there are so many questions to answer on the spreadsheet. We need to determine system type: paired vs stand alone; different types of PV data: GBD vs Monthly. Why are there so many questions? It can get confusing.
3. How should the PV data be entered?
4. How should the GBD data be entered?
5. How should monthly data be entered?
6. Does battery information need to be entered? What about battery discharge/charge data?
7. What if the customer is adding a new battery with a different make/model/capacity than a preexisting battery?
8. Can I use PV Watts data if I have a preexisting solar system?
9. If I have 12 months of data (GBD or monthly) for pre-existing solar system that has been installed for more than a year will it show both import and export data?
10. The tool is showing 0 as the eligible storage size. Is this a bug?

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Storage Sizing Tool

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Questions?

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PV System Sizing

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PV System Sizing

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NET BILLING TARIFF

Allows sizing solar systems to 150% of the annual load to allow for future electrification

SGIP

All RSSE Budget solar systems will be on the Net Billing Tariff

Under the RSSE Budget solar systems larger than 5 kW will require load justification

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Single Family Residential

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Single Family Residential System Sizing:

To be eligible for SGIP incentives, the system must be sized so that the amount of electricity produced by the system primarily offsets the home electrical needs at the Project Site.

Unless additional load substantiation documentation is submitted, the estimated annual kWh production of the proposed system as shown on the EPBB Calculator may not be higher than the annual site consumption for the residence's electrical meter.

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Multifamily Residential

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Multifamily Residential System Sizing:

To be eligible for SGIP incentives, the system must be sized so that the amount of electricity produced by the system primarily offsets the tenant area electrical needs at the Project Site.

At least 51% of the system's electric output must directly offset tenant load and be provided to tenants in the form of VNEM bill credits. Unless additional load substantiation documentation is submitted, the estimated annual kWh production of the proposed system as shown on the EPBB Calculator may not be higher than the annual site consumption for all eligible meters.

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Future Load Growth

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Oversizing Attestation for Single Family or Multifamily Residential System Sizing Based on Future Load Growth:

In the case of Host Customers with new or expanded loads with no electric bill history or where the existing electric bill does not reflect the Host Customer's expected expanded consumption, the Applicant must include an estimate of the expected expanded consumption.

The engineering estimate must include the appropriate substantiation of the forecast of the Host Customer Site's annual energy use (in kWh) if the PV system size is based on future load growth, including load growth due to site expansion or other load growth circumstances. Justification for increasing the PV system size may include the planned completion of the following measures:

- *Conversion of gas water heating (individual or central) to high efficiency electric*
- *Conversion of gas space heating (individual or central) to high efficiency electric*
- *Conversion of gas cooking, gas laundry drying, or gas pool heating to high efficiency electric*
- *Installation of electric vehicle charging stations on the property premises.*

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Future Load Growth

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- *Suggested methods of demonstrating load growth include:*

  - *An application for electric service or interconnection with corresponding equipment schedules and a single line diagram*
  - *Building simulation program reports such as eQUEST, EnergyPro, DOE-2, and VisualDOE;*
  - *Detailed engineering calculations including lists of equipment with corresponding equipment schedules.*

The PA will verify the load growth predicted and may request further information prior to confirming a reservation and/or approving the increased system size based on future load growth at subsequent application milestones.

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PV System Sizing

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COVID Extensions

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COVID Extensions

SELF-GENERATION INCENTIVE PROGRAM

Why are we talking about COVID Extensions at today's workshop?

- The SGIP Program Administrators continue to receive requests for COVID (4th) Extensions.
- The COVID-19 pandemic ended in 2023.
- The SGIP Working Group has made a determination on how these extension requests will be treated moving forward.

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COVID Extensions – D.21-03-009

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In March 2021, the CPUC issued Decision 21-03-009, which modified Decision 15-06-022. D.21-03-009 allowed interim relief to customers a stay on cancellation of projects past their 3rd extension who have been affected by the COVID-19 pandemic. The stay of cancellation was for a period of 1 year from a SGIP project's Reservation Expiration Date from the 3rd six-month extension.

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COVID Extensions – D.21-03-009

SELF-GENERATION INCENTIVE PROGRAM

The intent of D.21-03-009 was to grant relief to SGIP projects that were progressing in a timely manner prior to the COVID-19 pandemic.

The language specifically approved was:
"Projects that require additional time to complete the installation and have been unable to do so due to issues related to the COVID-19 pandemic may be granted a stay on the cancellation of a project that is past their third six-month extension, if verifiable information is provided that clearly demonstrates the project was progressing in a timely manner prior to the COVID-19 pandemic."

The stay on cancellation for a period of 1 year was not intended to be an indefinite rule/guideline.
"It is also inappropriate to indefinitely grant this relief.."

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COVID Extension Delay Reasons

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The SGIP Program Administrators regularly approved the stay on cancellations from 2021-2023 for various reasons:

- Supply Constraints due to manufacturing facility closures
- Delay in Permitting and Interconnection process due to staff shortages or offices being closed
- Installation contractors not being able to install or delaying installs due to being diagnosed with COVID.

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COVID Extensions Moving Forward

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After several SGIP Working Group (WG) discussions, the SGIP WG has decided that requests for a stay on cancellations on SGIP projects will likely not be approved moving forward.

The SGIP WG will be looking to remove the stay on cancellations language from the SGIP Handbook in the future.

The SGIP PAs will work with Regulatory teams to determine the appropriate regulatory pathway for removing the language from the SGIP Handbook.

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COVID Extensions

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Questions?

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2023 SGIP IMPACTS EVALUATION

2025 Q1 SGIP Workshop

3/24/2025

VERDANT

INTRODUCTION

- Results from recently completed SGIP Impacts Evaluation for 2023
  - BTM energy storage and generation technologies receiving SGIP incentives
- Explore different ways energy storage technologies are utilized
  - How does that behavior/utilization impact GHG emissions, grid needs, customer resiliency, customer bills, utility avoided costs
- Observed impacts compared to optimal dispatch of storage
  - With perfect foresight, how could storage be dispatched to maximize GHG reductions, utility avoided costs, customer bill impacts

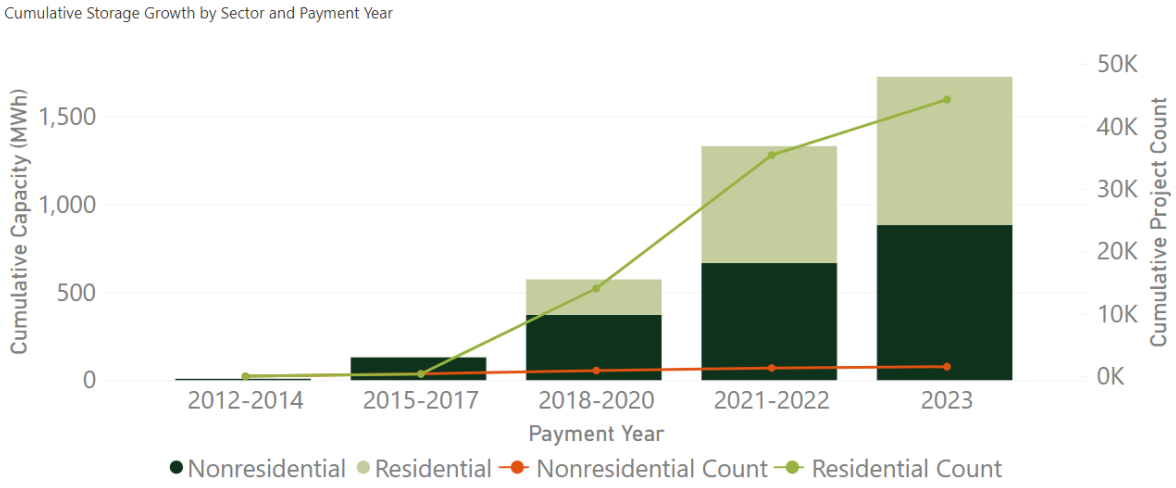
MEASUREMENT AND EVALUATION

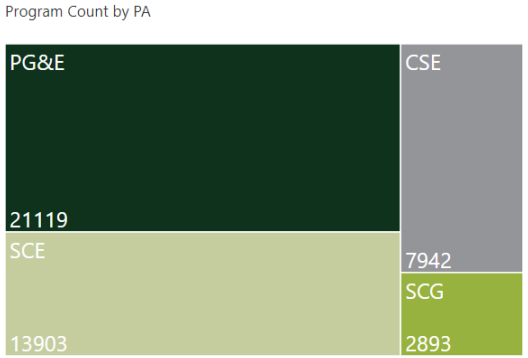
Research Objectives

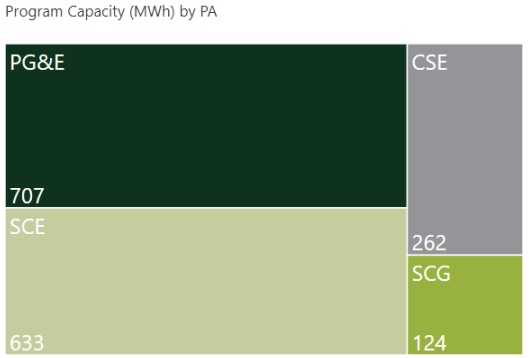
- Evaluation is guided by 2021-2025 M&E plan for CY 2023
- Ongoing evaluation reports assess SGIP's effectiveness and ability to meet its goals:
  - System performance – utilization and efficiency
  - Grid impacts and Utility Avoided Costs
  - Environmental impacts – GHG emissions reductions
  - Customer resiliency and bill impacts
  - Track storage costs and market characteristics over time
  - Quantification of SGIP population impacts

EVALUATION POPULATION

- SGIP population represents all energy storage projects that:
  - Received their upfront SGIP incentive prior to 12/31/2023
- Residential: 44,297 | 845 MWh
- Nonresidential: 1,560 | 882 MWh
- **Total: 45,857 | 1,727 MWh**







Detailed Evaluation Findings

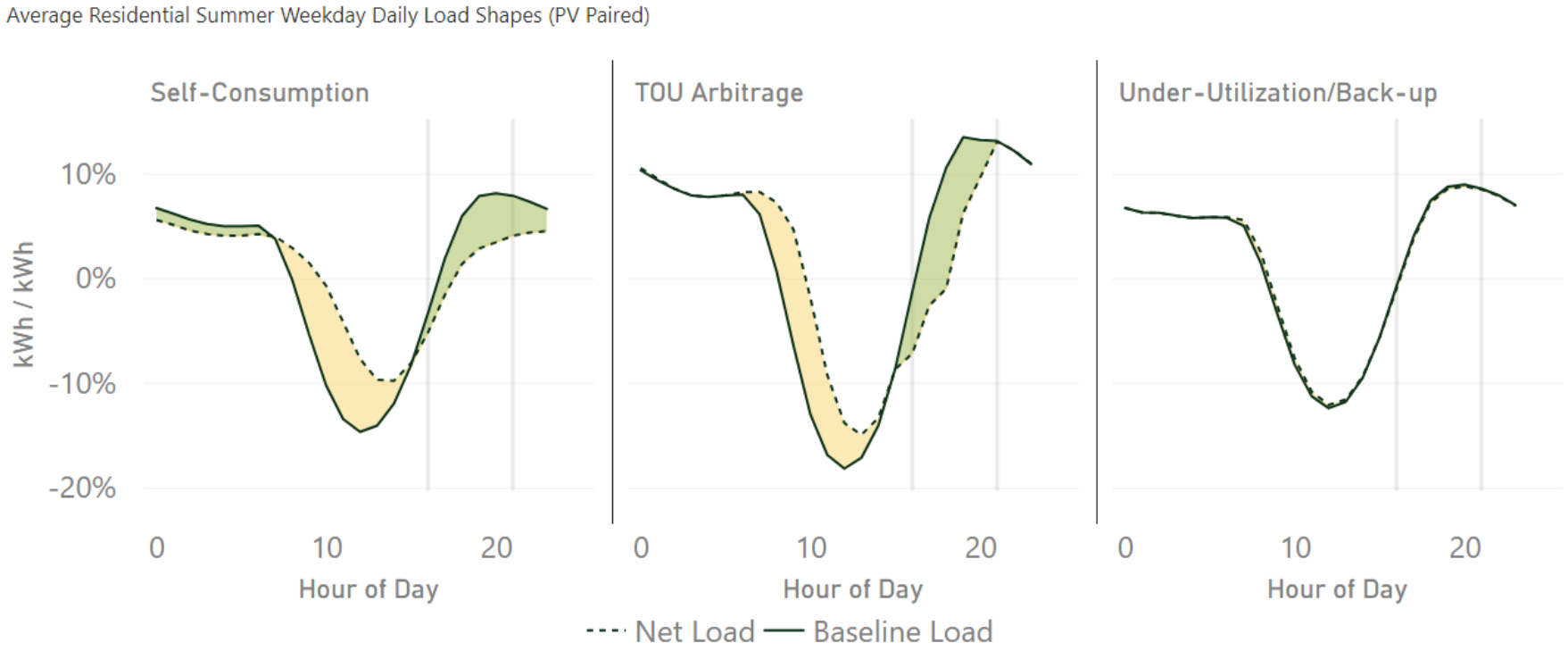
RESIDENTIAL STORAGE DISPATCH BEHAVIOR

- **99% of residential storage paired with Solar PV**
  - Charging from early morning on-site PV (97%)
  - Charging overnight (3%)
  - Discharging for:
    - Self-consumption – zero out imported load
    - TOU arbitrage w/out export
    - TOU arbitrage with export – regularly or during specific events (DR)
    - Under-utilization or backup (not allowed in SGIP)
- **1% are standalone systems**
  - Discharging on-peak (arbitrage) and charging overnight

TYPICAL RESIDENTIAL LOAD SHAPES

PV Paired by Operating Mode

Shaded yellow = an increase in customer load
Shaded green = a decrease in customer load
Vertical Lines = 4pm to 9pm on-peak



- **64%** of sampled projects
- Zero out imported load
- Discharge outside on-peak

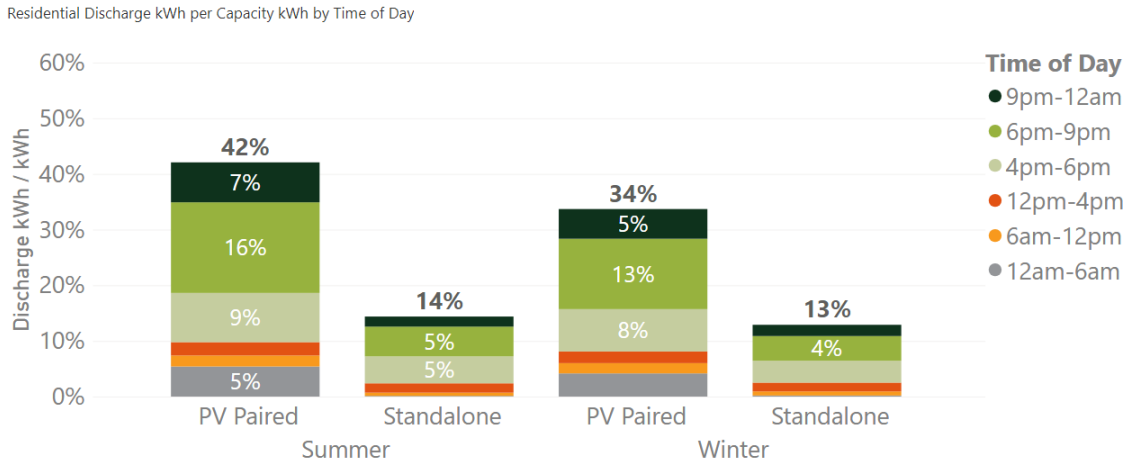
- **30%** of sampled projects
- With and without export
- Discharge on-peak only

- **6%** of sampled projects
- Not allowed in SGIP
- Observed infrequently

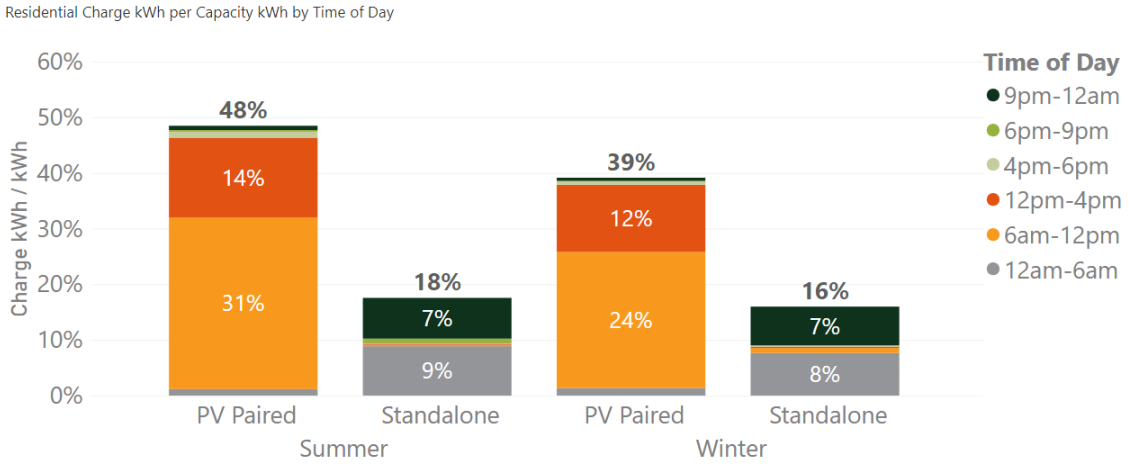
RESIDENTIAL STORAGE DAILY KWH UTILIZATION

PV Paired vs. Standalone by Season

Discharge kWh per Capacity kWh



Charge kWh per Capacity kWh



- PV Paired utilized ~42% of battery capacity daily in Summer
- Most discharge comes between 4pm-9pm
- Standalone utilized ~14%

- PV paired early morning solar charging
- Standalone system overnight charging

RESIDENTIAL STORAGE HOURLY KWH UTILIZATION

PV Paired Charging from Solar (Weekdays Only)

Average Hourly Residential PV Paired Net Discharge kWh / kWh Capacity (Charging from Solar)

BY MONTH, HOUR

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
January	0%	0%	0%	0%	0%	0%	0%	-0%	-2%	-4%	-6%	-6%	-5%	-3%	-1%	0%	3%	4%	5%	3%	2%	1%	1%	1%
February	1%	1%	1%	0%	0%	0%	0%	-0%	-3%	-6%	-8%	-7%	-5%	-3%	-2%	-0%	3%	5%	6%	4%	3%	2%	2%	1%
March	1%	1%	1%	0%	0%	0%	0%	-0%	-3%	-5%	-7%	-6%	-5%	-3%	-2%	-1%	2%	3%	5%	4%	3%	2%	2%	1%
April	1%	1%	1%	1%	1%	1%	1%	-0%	-4%	-7%	-9%	-8%	-5%	-3%	-1%	-0%	2%	3%	4%	4%	4%	3%	2%	2%
May	1%	1%	1%	1%	1%	1%	1%	-1%	-3%	-6%	-8%	-7%	-5%	-4%	-2%	-1%	1%	3%	4%	4%	4%	3%	2%	2%
June	2%	1%	1%	1%	1%	1%	1%	-1%	-4%	-7%	-8%	-8%	-6%	-4%	-2%	-0%	2%	3%	5%	4%	4%	3%	3%	2%
July	1%	1%	1%	1%	1%	1%	0%	-1%	-5%	-8%	-10%	-9%	-6%	-3%	-1%	0%	4%	5%	6%	6%	5%	3%	2%	2%
August	1%	1%	1%	1%	1%	1%	0%	-1%	-4%	-8%	-10%	-9%	-7%	-4%	-2%	-0%	3%	5%	6%	6%	5%	3%	2%	2%
September	1%	1%	1%	1%	1%	1%	1%	-0%	-3%	-6%	-9%	-9%	-7%	-4%	-2%	-0%	3%	5%	6%	6%	5%	3%	2%	2%
October	1%	1%	1%	1%	1%	1%	1%	0%	-2%	-6%	-9%	-9%	-7%	-4%	-2%	-0%	3%	5%	6%	6%	4%	3%	2%	1%
November	1%	0%	0%	0%	0%	0%	0%	-1%	-3%	-6%	-8%	-7%	-5%	-3%	-1%	1%	4%	5%	5%	4%	3%	2%	1%	1%
December	0%	0%	0%	0%	0%	0%	0%	-0%	-2%	-5%	-6%	-6%	-5%	-3%	-1%	1%	4%	5%	5%	3%	2%	1%	1%	1%

RESIDENTIAL STORAGE HOURLY KWH UTILIZATION

Standalone and PV Paired Charging from Grid (Weekdays Only)

- Similar dispatch patterns between standalone and PV Paired systems *charging* from grid
- Greater utilization from the latter
- Charging begins 9pm local time
- Greatest magnitude after midnight
  - More than half of PV paired systems are on an EV rate

Average Hourly Residential Standalone Net Discharge kWh / kWh Capacity

BY MONTH, HOUR

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
January	-5%	-3%	-0%	0%	-0%	-0%	-0%	0%	-1%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	1%	1%	-2%	0%	-3%
February	-5%	-3%	-0%	0%	-0%	-0%	0%	0%	-0%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	1%	1%	-2%	0%	-3%
March	-5%	-1%	-0%	0%	-0%	-0%	0%	0%	-1%	0%	0%	0%	0%	0%	1%	1%	1%	2%	1%	1%	1%	-2%	0%	-3%
April	-5%	-1%	-0%	0%	-0%	-0%	-0%	0%	-0%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	1%	1%	-2%	0%	-3%
May	-5%	-2%	0%	0%	-0%	-0%	-0%	0%	-0%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	1%	1%	-2%	0%	-3%
June	-6%	-3%	-0%	-0%	-0%	-0%	-0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	2%	1%	-2%	0%	-3%
July	-6%	-3%	-0%	-0%	-0%	-0%	-0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	3%	3%	2%	0%	-3%	-0%	-3%
August	-6%	-3%	-0%	0%	-0%	-0%	-0%	-0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	2%	2%	2%	1%	-3%	-0%	-3%
September	-5%	-2%	0%	-0%	-0%	-0%	-0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	1%	1%	-2%	0%	-3%
October	-5%	-2%	-0%	0%	-0%	-0%	-0%	0%	-1%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	2%	1%	-2%	0%	-3%
November	-5%	-2%	-0%	-0%	-0%	-0%	-0%	0%	-1%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	2%	1%	-2%	0%	-3%
December	-6%	-2%	-0%	-0%	-0%	-0%	-0%	0%	-1%	0%	0%	0%	0%	0%	0%	1%	2%	2%	2%	2%	1%	-2%	0%	-3%

Average Hourly Residential PV Paired Net Discharge kWh / kWh Capacity (Charging from Grid)

BY MONTH, HOUR

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
January	-6%	-5%	-3%	-1%	-0%	-0%	0%	-0%	-2%	-2%	-2%	-2%	-1%	-1%	0%	2%	6%	7%	6%	4%	4%	-2%	-1%	-2%
February	-7%	-5%	-2%	-1%	-0%	-0%	0%	-0%	-2%	-3%	-3%	-2%	-2%	-1%	0%	1%	5%	7%	6%	4%	4%	-1%	-1%	-2%
March	-9%	-5%	-2%	-1%	-0%	-0%	1%	1%	-2%	-2%	-3%	-2%	-2%	-1%	-0%	1%	5%	6%	5%	4%	4%	-1%	0%	-1%
April	-13%	-6%	-1%	-0%	-0%	-0%	1%	0%	-2%	-2%	-2%	-2%	-2%	-1%	0%	1%	5%	6%	6%	5%	4%	-1%	1%	-2%
May	-13%	-5%	-1%	-0%	-0%	-0%	0%	-0%	-2%	-2%	-1%	-2%	-1%	-1%	0%	2%	5%	6%	6%	5%	5%	-3%	-0%	-3%
June	-13%	-6%	-1%	-0%	-0%	-0%	-0%	-0%	-0%	-1%	-1%	-1%	-1%	-0%	0%	2%	5%	6%	6%	5%	5%	-5%	-1%	-4%
July	-14%	-8%	-2%	-1%	-0%	-0%	-0%	-0%	-0%	-0%	-1%	-1%	-1%	-0%	1%	2%	8%	10%	9%	6%	4%	-8%	-5%	-4%
August	-13%	-7%	-1%	-1%	-0%	-0%	-0%	-0%	-0%	-0%	-1%	-0%	-0%	-0%	1%	2%	7%	9%	8%	5%	3%	-7%	-4%	-4%
September	-14%	-7%	-1%	-1%	-0%	-0%	-0%	-0%	-0%	-0%	-0%	-0%	-0%	-0%	1%	2%	7%	8%	7%	5%	3%	-7%	-3%	-4%
October	-14%	-6%	-1%	-1%	-0%	-0%	-0%	-0%	-2%	-1%	-0%	-0%	0%	0%	1%	2%	7%	8%	6%	5%	3%	-4%	-2%	-4%
November	-13%	-6%	-1%	-1%	-0%	-0%	-0%	-0%	-2%	-1%	-0%	-0%	-0%	0%	1%	2%	6%	7%	6%	4%	3%	-3%	-1%	-3%
December	-13%	-7%	-1%	-0%	-0%	-0%	-0%	-0%	-2%	-2%	-1%	-0%	-0%	0%	1%	2%	6%	7%	6%	4%	3%	-3%	-1%	-3%

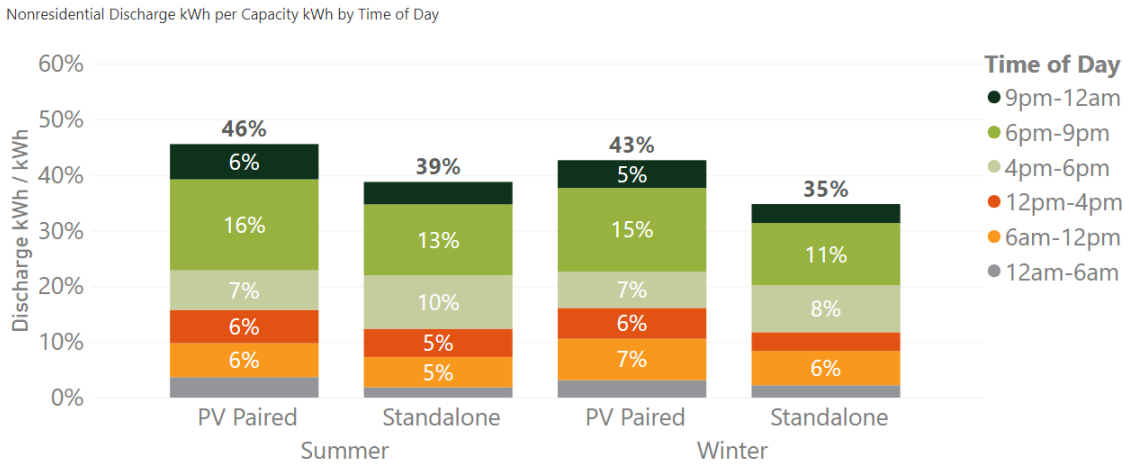
NONRESIDENTIAL STORAGE DISPATCH BEHAVIOR

- **35% of nonresidential storage paired with Solar PV**
  - Charging from early morning on-site PV
  - Discharging for:
    - Self-consumption & TOU arbitrage
    - Demand charge reduction (non-coincident and on-peak)
    - Monthly demand charges
- **65% are standalone systems**
  - TOU arbitrage and demand charge reduction
  - Cycling

NONRESIDENTIAL STORAGE DAILY KWH UTILIZATION

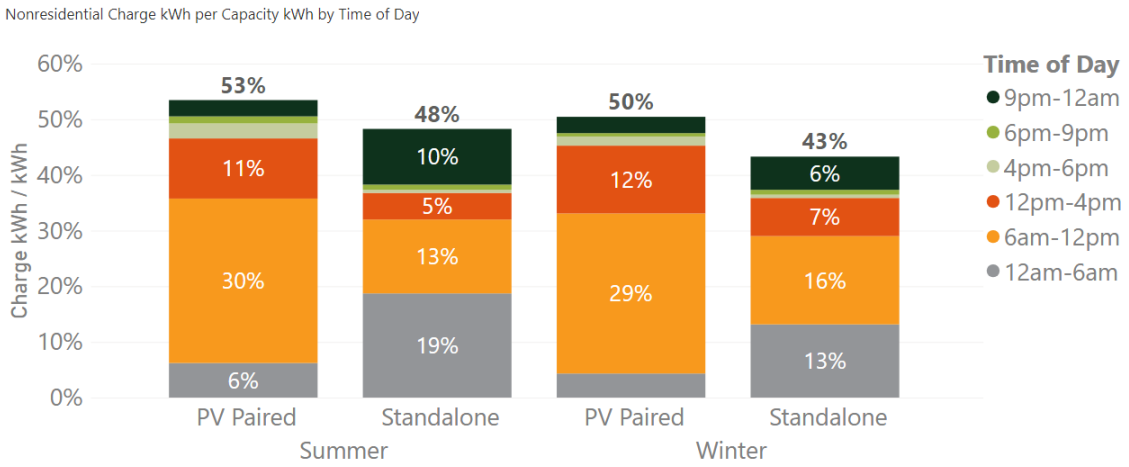
PV Paired vs. Standalone by Season

Discharge kWh per Capacity kWh



- PV Paired utilized ~46% of battery capacity daily in Summer
- Discharging occurs across hours

Charge kWh per Capacity kWh



- More heterogeneity in charge timing
- Most PV paired charging from on-site solar

NONRESIDENTIAL STORAGE HRLY KWH UTILIZATION

Standalone and PV Paired

- PV paired systems charging almost exclusively from solar
- Max avg hourly discharge ~6-7% of kWh capacity
- Standalone systems exhibit similar discharge pattern (lower magnitude)

Discharge mostly on-peak

Average Nonresidential with On-site PV Net Discharge kWh / kWh Capacity

BY MONTH, HOUR

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
January	-1%	-1%	-0%	0%	-0%	0%	2%	1%	-3%	-6%	-7%	-6%	-3%	-1%	-2%	-0%	2%	4%	4%	5%	4%	1%	-0%	0%
February	-1%	-1%	-0%	0%	-0%	1%	3%	1%	-4%	-7%	-8%	-6%	-3%	-1%	-2%	-0%	2%	4%	5%	5%	5%	1%	-0%	0%
March	-1%	-1%	-0%	0%	0%	1%	2%	1%	-3%	-6%	-7%	-6%	-3%	-2%	-3%	-1%	0%	2%	4%	5%	5%	2%	0%	1%
April	-1%	-0%	-0%	0%	0%	1%	3%	0%	-4%	-7%	-8%	-6%	-3%	-2%	-3%	-1%	-0%	2%	3%	6%	6%	3%	1%	1%
May	-1%	-1%	-0%	-0%	-0%	1%	2%	-1%	-4%	-6%	-6%	-5%	-3%	-2%	-3%	-1%	-0%	2%	3%	6%	6%	2%	1%	1%
June	-1%	-1%	-0%	-0%	0%	1%	1%	-2%	-5%	-6%	-6%	-5%	-2%	-1%	-3%	-0%	1%	3%	3%	5%	7%	3%	1%	1%
July	-1%	-1%	-1%	-0%	-0%	1%	1%	-2%	-6%	-8%	-6%	-4%	-2%	-1%	-2%	-0%	1%	3%	3%	6%	7%	3%	1%	0%
August	-1%	-1%	-1%	-0%	-0%	0%	1%	-2%	-5%	-7%	-6%	-5%	-2%	-1%	-1%	-0%	1%	3%	3%	6%	6%	2%	1%	-0%
September	-2%	-1%	-1%	-0%	-0%	0%	1%	-0%	-4%	-6%	-6%	-5%	-3%	-1%	-1%	0%	1%	4%	4%	6%	6%	2%	0%	-0%
October	-1%	-1%	-0%	-0%	-0%	0%	2%	1%	-4%	-7%	-7%	-6%	-3%	-1%	-2%	-0%	2%	4%	5%	5%	5%	1%	-0%	0%
November	-1%	-1%	-0%	-0%	-0%	1%	2%	-1%	-6%	-8%	-7%	-5%	-2%	-1%	-1%	1%	3%	4%	4%	5%	5%	1%	-0%	0%
December	-1%	-1%	-0%	-0%	-0%	0%	1%	0%	-4%	-7%	-7%	-6%	-3%	-1%	-2%	0%	3%	4%	4%	4%	5%	2%	-0%	0%

Average Nonresidential Standalone Net Discharge kWh / kWh Capacity

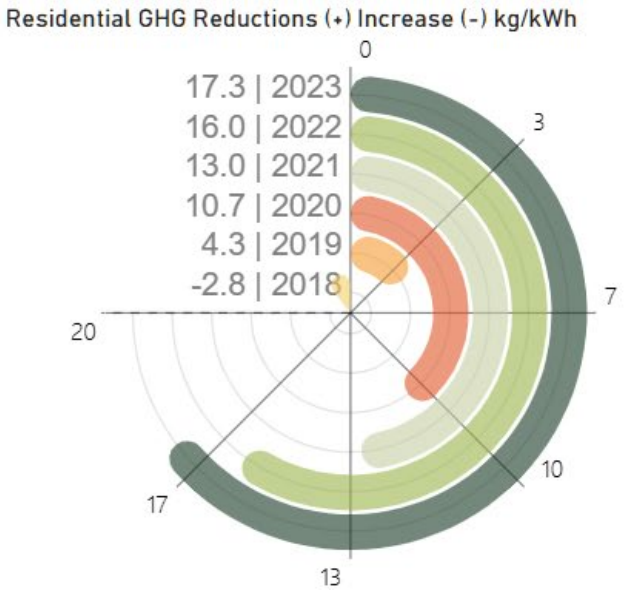
BY MONTH, HOUR

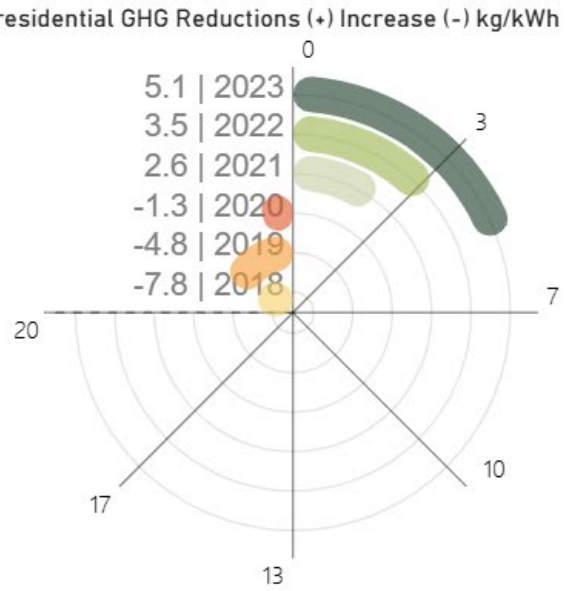
Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
January	-3%	-2%	-2%	-1%	-1%	-0%	1%	1%	-2%	-3%	-3%	-3%	-2%	-1%	-1%	-1%	3%	5%	4%	3%	3%	-1%	-1%	-1%
February	-3%	-2%	-2%	-1%	-1%	-0%	1%	1%	-3%	-4%	-3%	-2%	-1%	-1%	-1%	-1%	3%	4%	4%	3%	3%	-1%	-1%	-1%
March	-3%	-2%	-2%	-1%	-1%	-0%	1%	1%	-2%	-4%	-4%	-3%	-2%	-1%	-1%	-1%	3%	4%	4%	4%	4%	-0%	-1%	-0%
April	-3%	-2%	-2%	-1%	-1%	0%	1%	0%	-3%	-5%	-4%	-2%	-2%	-1%	-1%	-1%	3%	3%	3%	4%	4%	-0%	-1%	-1%
May	-3%	-2%	-2%	-2%	-1%	-0%	0%	-0%	-3%	-5%	-3%	-2%	-1%	-1%	-1%	-0%	3%	3%	3%	4%	4%	-1%	-1%	-1%
June	-4%	-3%	-3%	-2%	-1%	-1%	-0%	-1%	-1%	-3%	-3%	-1%	-1%	-0%	-0%	-0%	4%	4%	4%	4%	5%	-2%	-2%	-1%
July	-4%	-3%	-3%	-2%	-2%	-1%	-0%	-2%	-2%	-4%	-3%	-1%	-0%	0%	0%	0%	4%	4%	4%	5%	5%	-2%	-2%	-2%
August	-4%	-3%	-3%	-3%	-2%	-1%	-0%	-1%	-2%	-3%	-3%	-1%	-1%	-0%	0%	0%	4%	4%	4%	4%	4%	-2%	-2%	-1%
September	-4%	-3%	-3%	-2%	-2%	-1%	0%	-0%	-2%	-4%	-3%	-2%	-1%	-1%	0%	0%	4%	4%	4%	4%	4%	-2%	-1%	-0%
October	-3%	-2%	-2%	-2%	-1%	-0%	1%	1%	-3%	-5%	-4%	-2%	-1%	-1%	-1%	-1%	4%	4%	4%	4%	4%	-1%	-1%	-0%
November	-3%	-2%	-2%	-1%	-1%	-0%	1%	0%	-3%	-5%	-4%	-2%	-1%	-1%	-1%	-0%	4%	4%	4%	4%	4%	-1%	-1%	0%
December	-3%	-2%	-2%	-1%	-1%	-0%	1%	1%	-3%	-5%	-4%	-2%	-1%	-1%	-1%	-0%	4%	4%	4%	4%	4%	-1%	-0%	0%

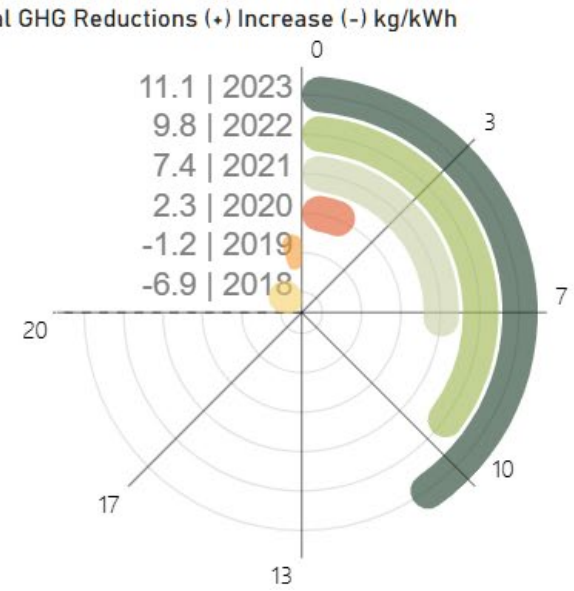
Greenhouse Gas Emissions

ENERGY STORAGE GHG IMPACTS (2018-2023)

Tracking Per Unit Impacts over time (kg/kWh or MT/MWh)







- Continued improvement in GHG emissions reductions in 2023
- Fourth consecutive evaluation with program-level reductions
- ~19,100 MT reduction in 2023 (almost a 50% overall improvement from a year prior)

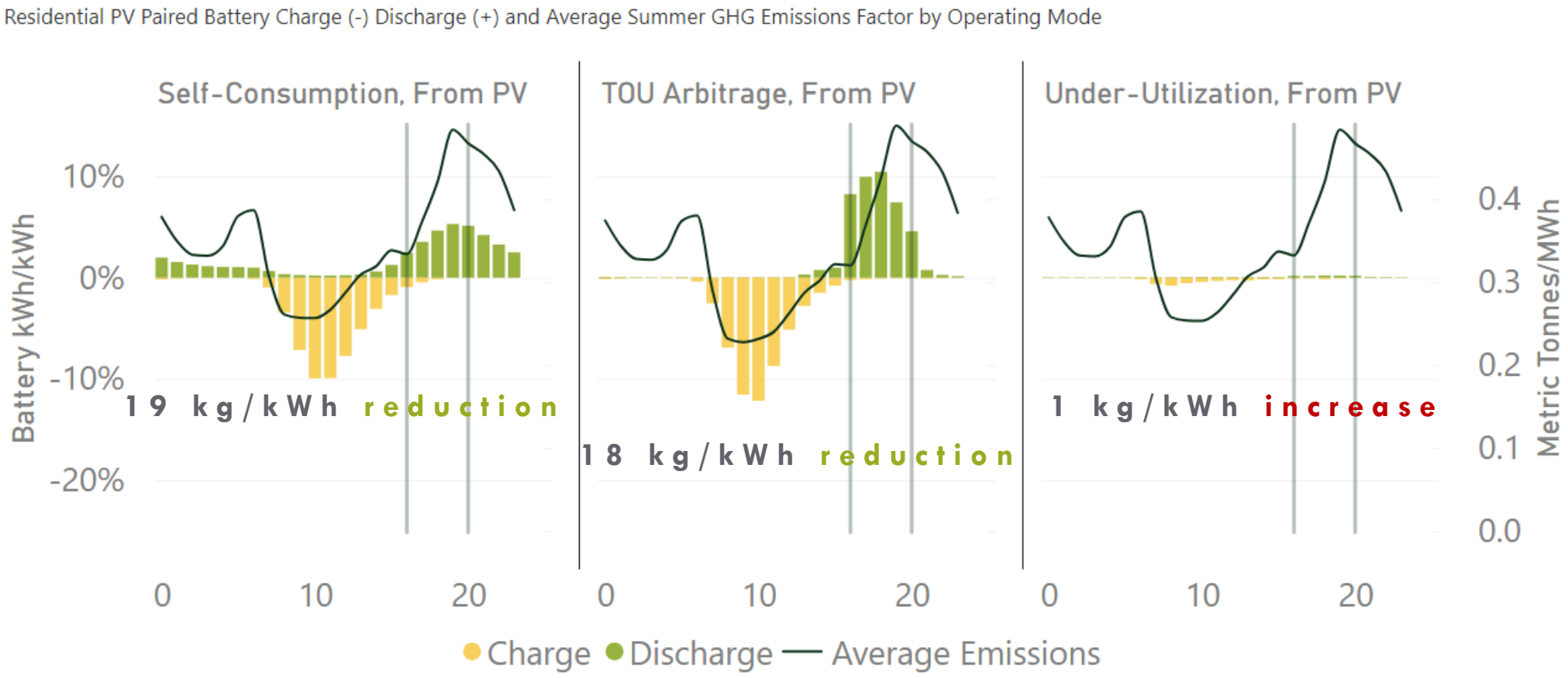
ENERGY STORAGE GHG IMPACTS

Charging from on-site solar critical to GHG reductions in the energy storage sector

- **Residential energy storage sector**
  - PV paired charging from solar – average GHG reductions of 19 kg per kWh capacity
  - PV paired charging from grid – average GHG increases of 2 kg per kWh capacity
  - Standalone systems increase emissions by almost 5 kg per kWh capacity
  - Idle/under-utilized systems increase emissions slightly
- **Nonresidential energy storage sector**
  - PV paired average GHG reductions of 14 kg per kWh capacity
  - Standalone systems reduced emissions by 3 kg per kWh capacity
    - Medium duration batteries – public utilities (ERB)
    - More targeted dispatch – EV stations

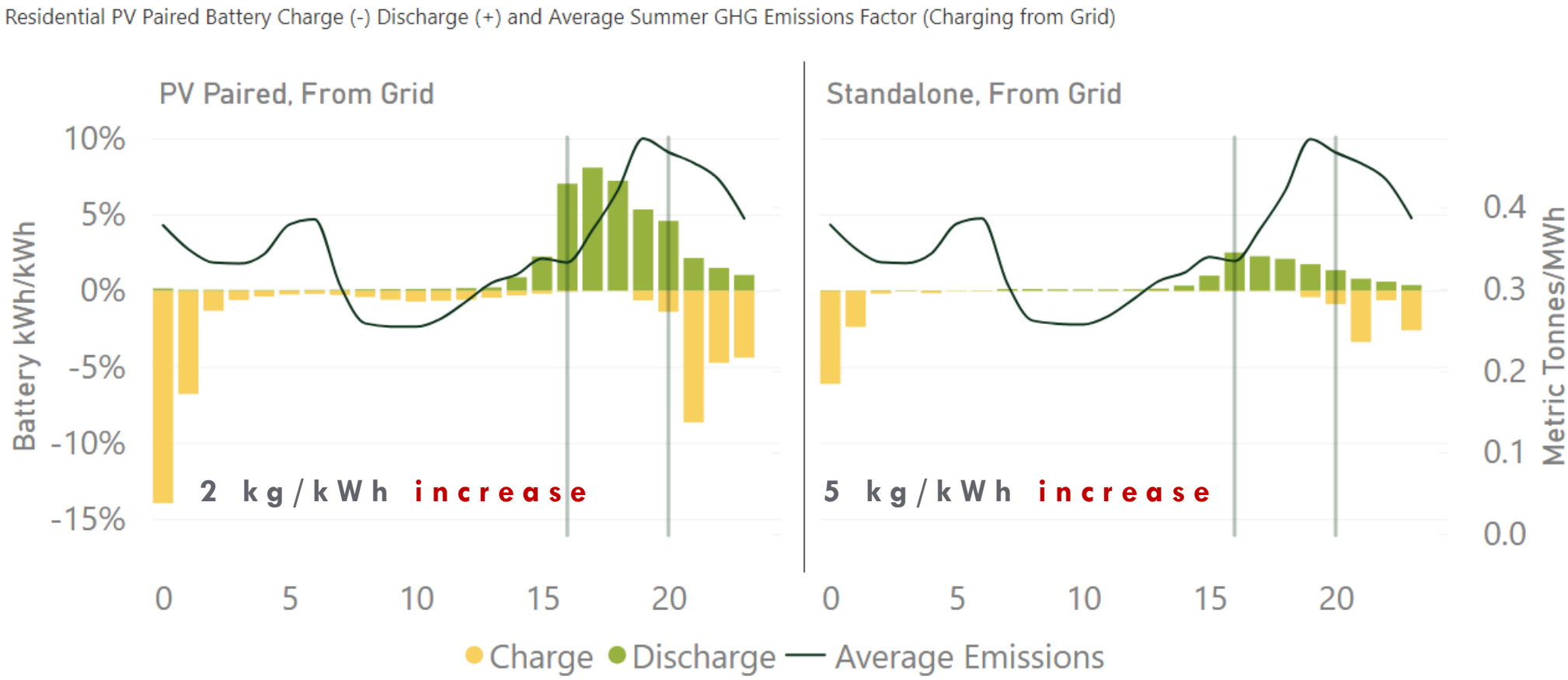
RESIDENTIAL ENERGY STORAGE GHG IMPACTS

PV Paired by Operating Mode



RESIDENTIAL ENERGY STORAGE GHG IMPACTS

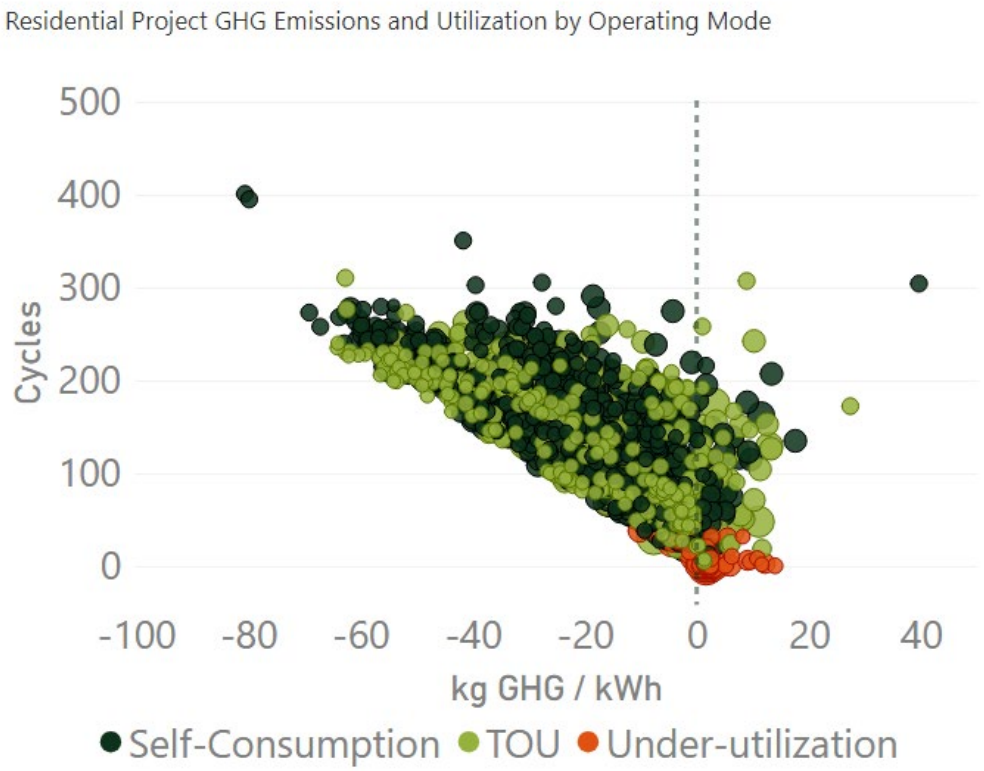
PV Paired vs. Standalone Charging from Grid Resources



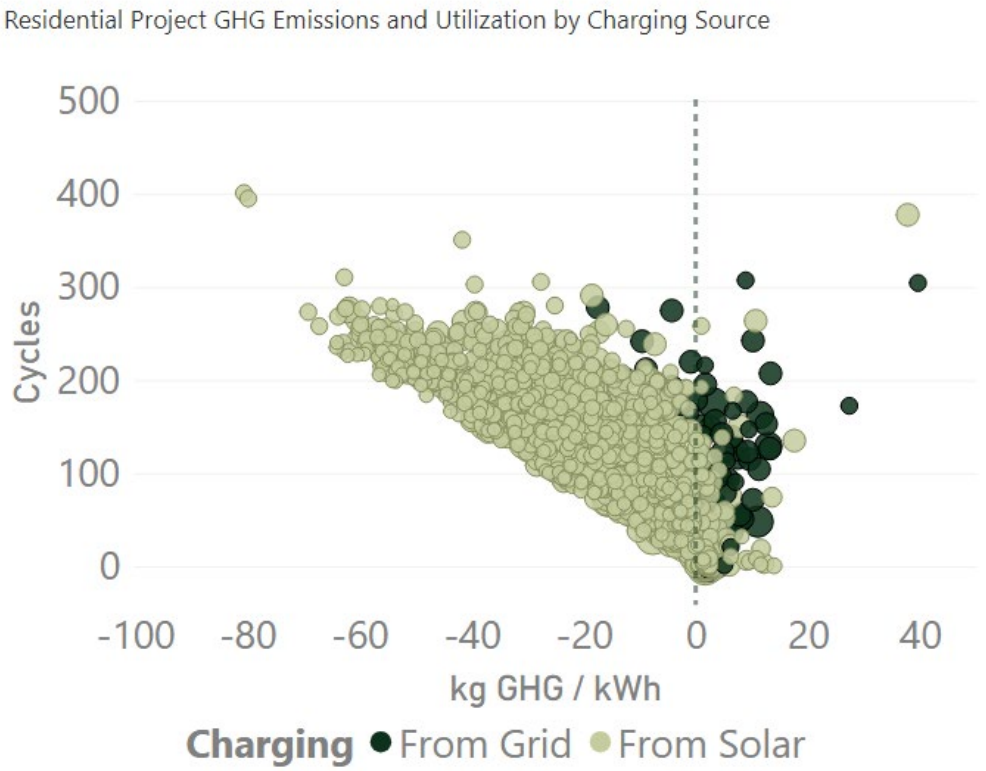
RESIDENTIAL ENERGY STORAGE GHG IMPACTS

Per Project Annual Emissions Reductions (-) Increases (+) and Utilization

» By Operating Mode

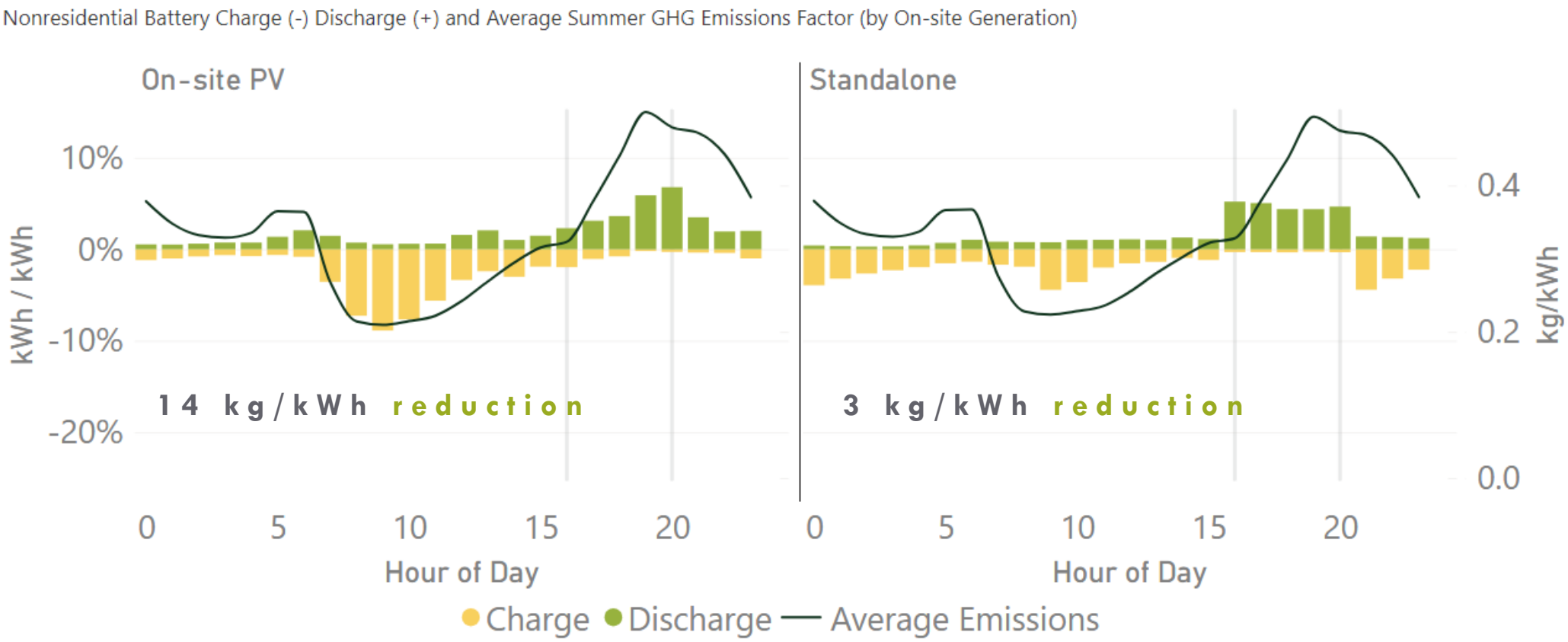


» By Charging Source



NONRESIDENTIAL ENERGY STORAGE GHG IMPACTS

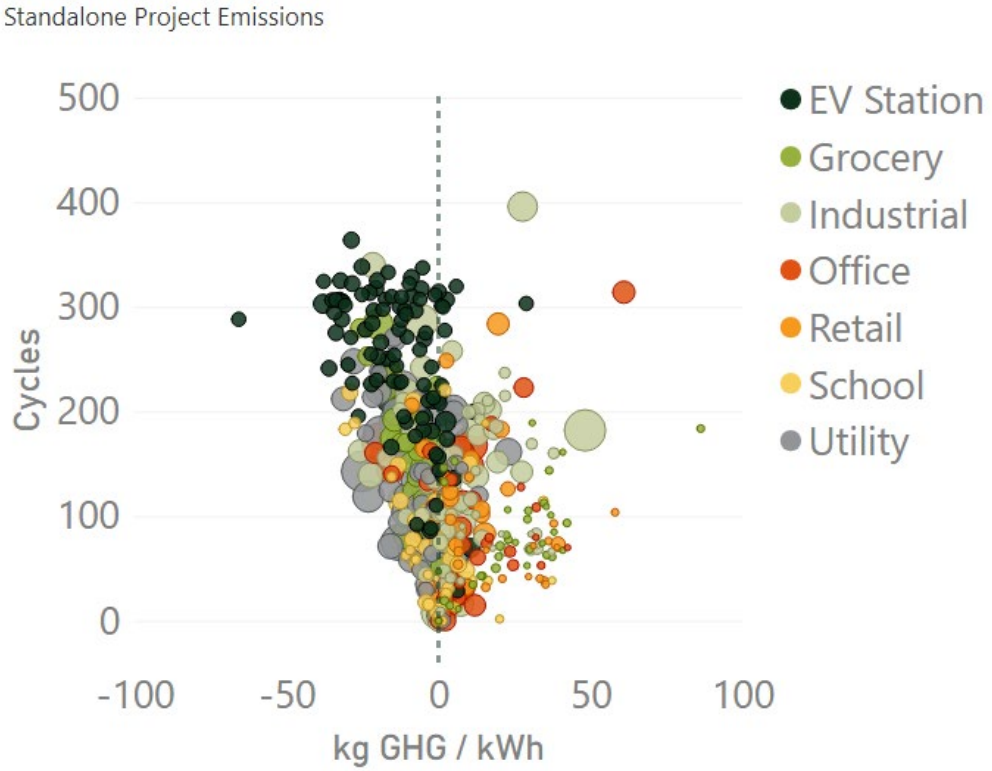
PV Paired vs. Standalone



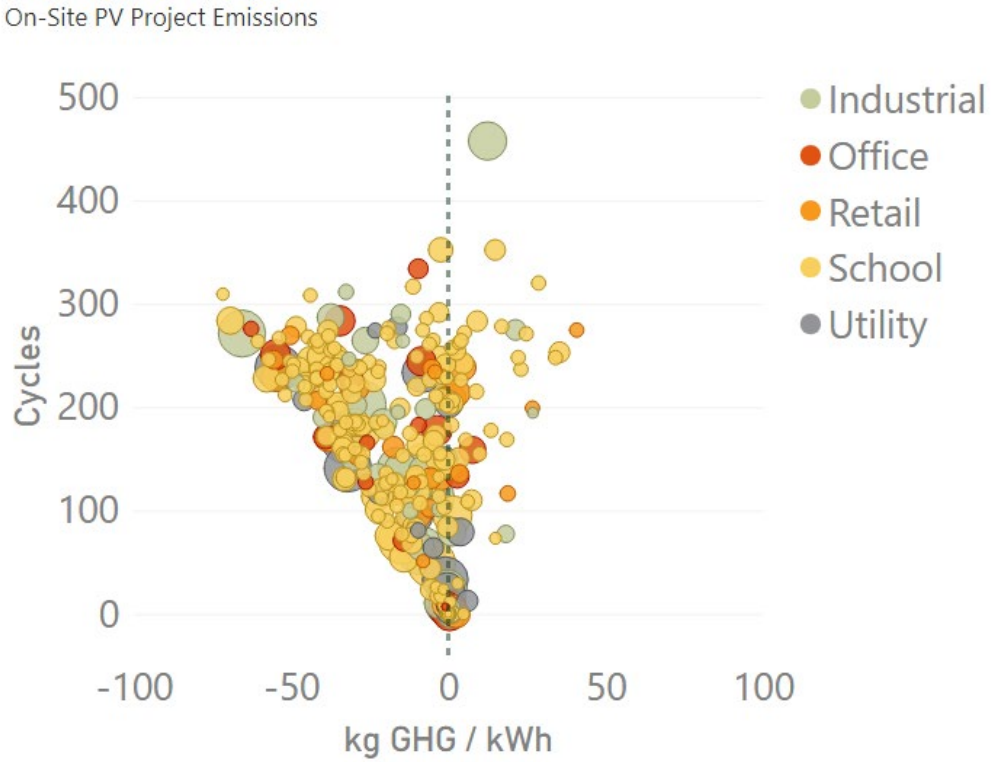
NONRESIDENTIAL ENERGY STORAGE GHG IMPACTS

Per Project Annual Emissions Reductions (-) Increases (+) and Utilization

» **Standalone Systems by Building Type**



» **PV Paired Systems by Building Type**

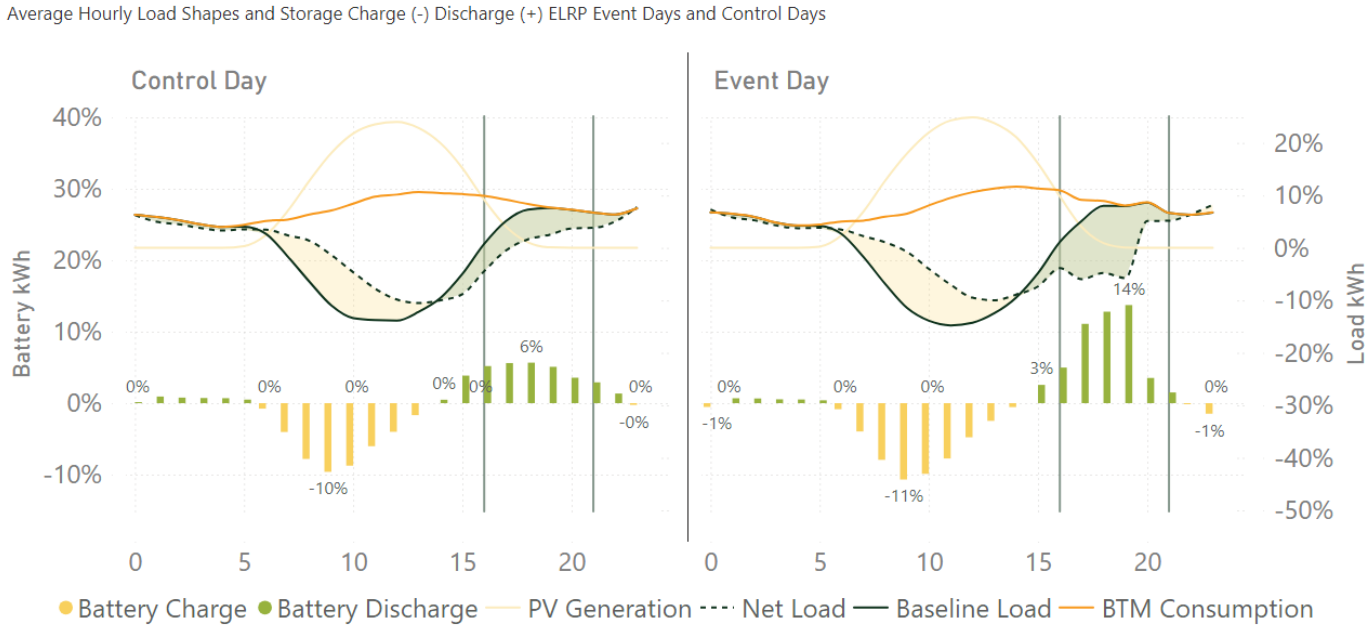


Demand Response

RESIDENTIAL UTILIZATION AND GRID NEEDS

Demand Response Participation (ELRP)

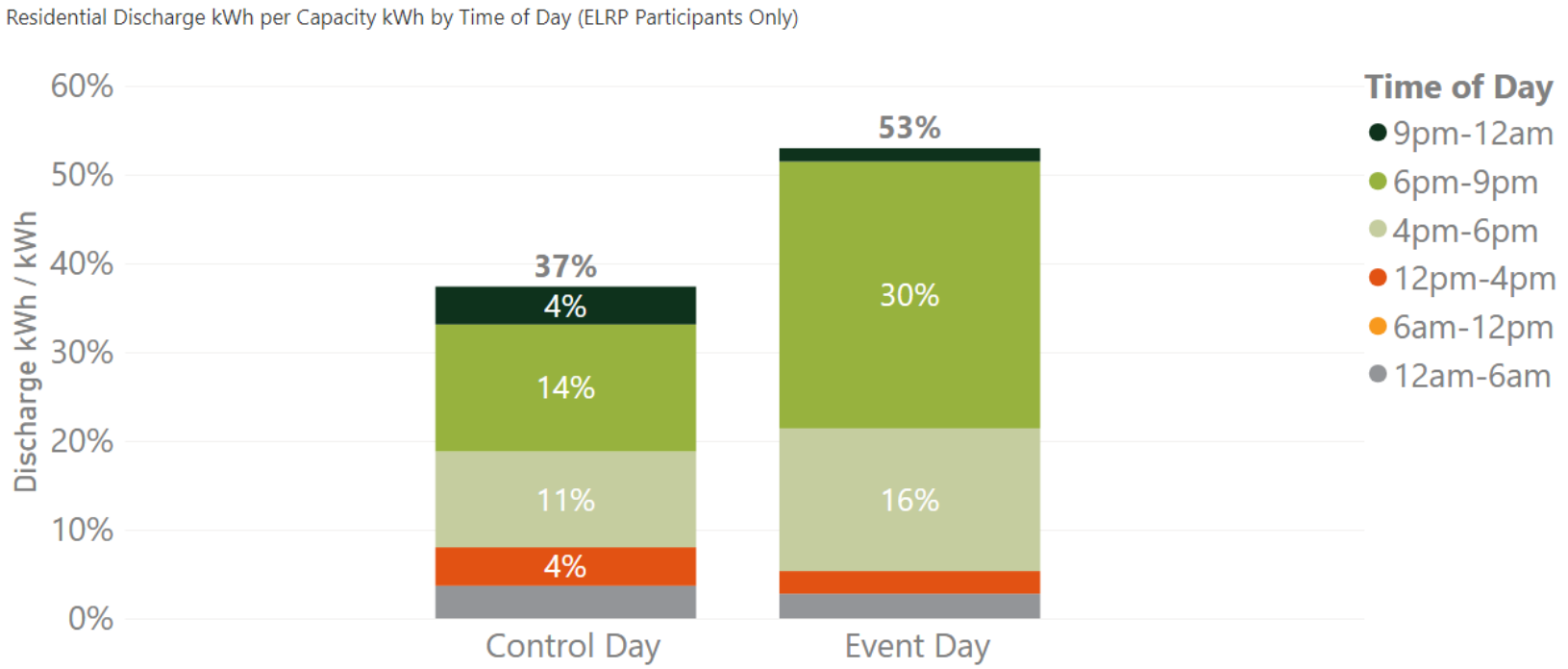
- Control days
  - Similar non-event days
  - Typical dispatch patterns and magnitudes (6% peak hourly discharge)
- Event days
  - ELRP events called
  - Similar PV generation, consumption
  - Greater discharge magnitudes (14% peak hourly discharge)
  - Excess capacity discharged to grid



Shaded yellow = an increase in customer load
Shaded green = a decrease in customer load
Vertical Lines = 4pm to 9pm on-peak

RESIDENTIAL STORAGE DAILY KWH UTILIZATION

Control Days vs. Event Days

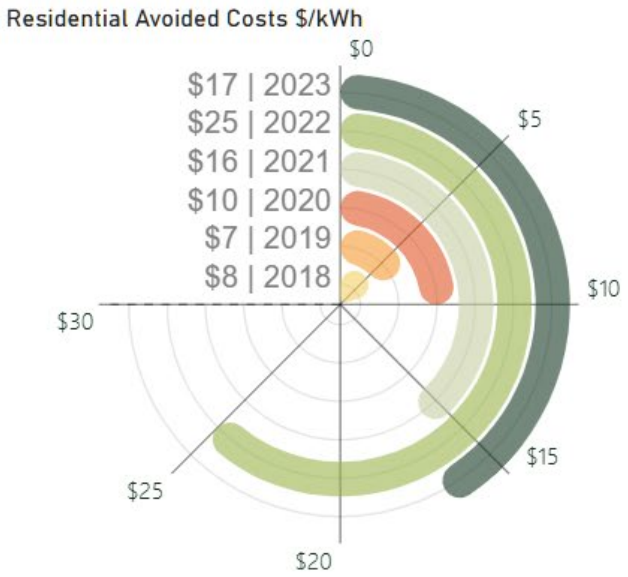


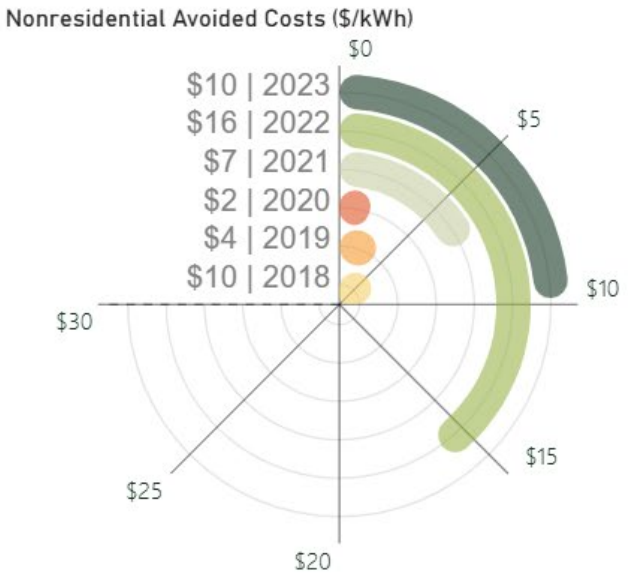
- 37% of system kWh capacity discharged regularly
- Utilization increases to 53% of kWh capacity on event days

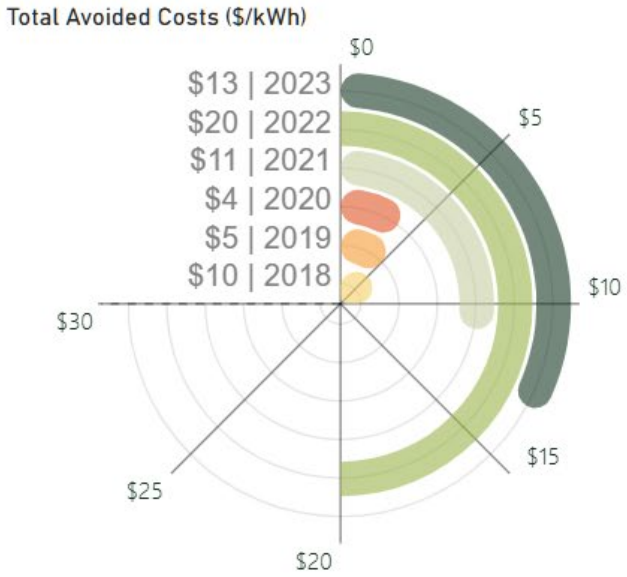
Utility Avoided Costs

UTILITY AVOIDED COSTS (2018–2023)

Tracking Per Unit Impacts over time ($/kWh)







- Utility avoided cost benefits realized for all three electric IOUs in 2023
- $22.7 million in avoided cost benefits
- Most benefits derived from several capacity-constrained hours in summer

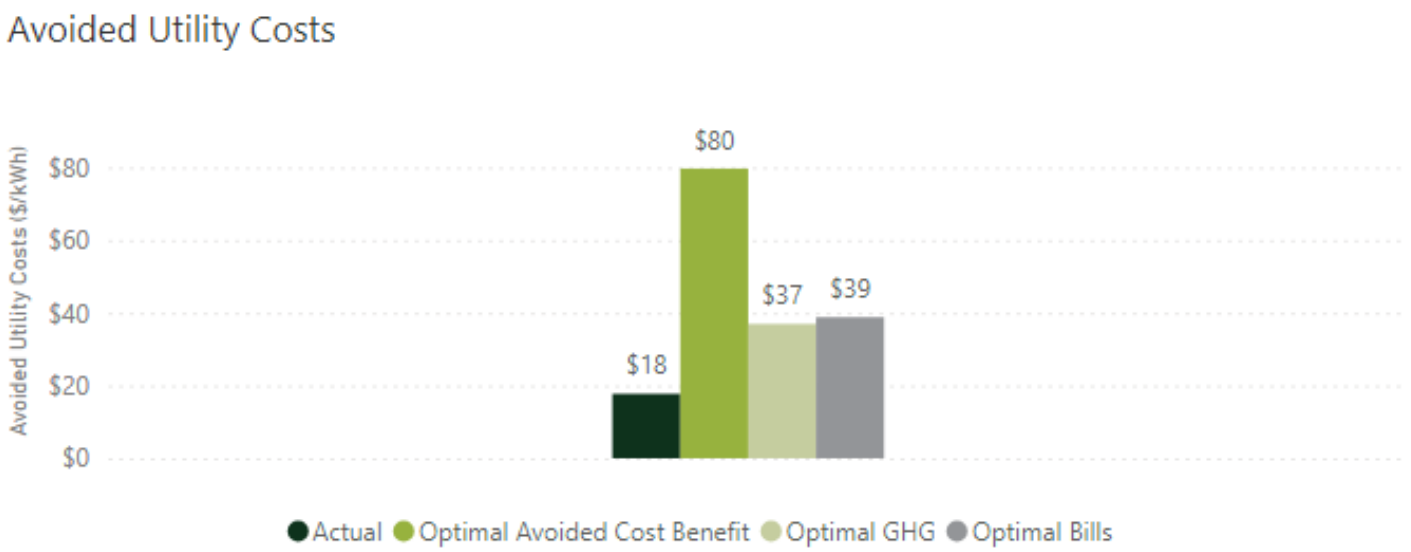
*2022 heat dome created unprecedented conditions, costs, and grid constraints

Energy Storage Optimization

RESIDENTIAL OPTIMIZATION

Utility Avoided Cost Scenario

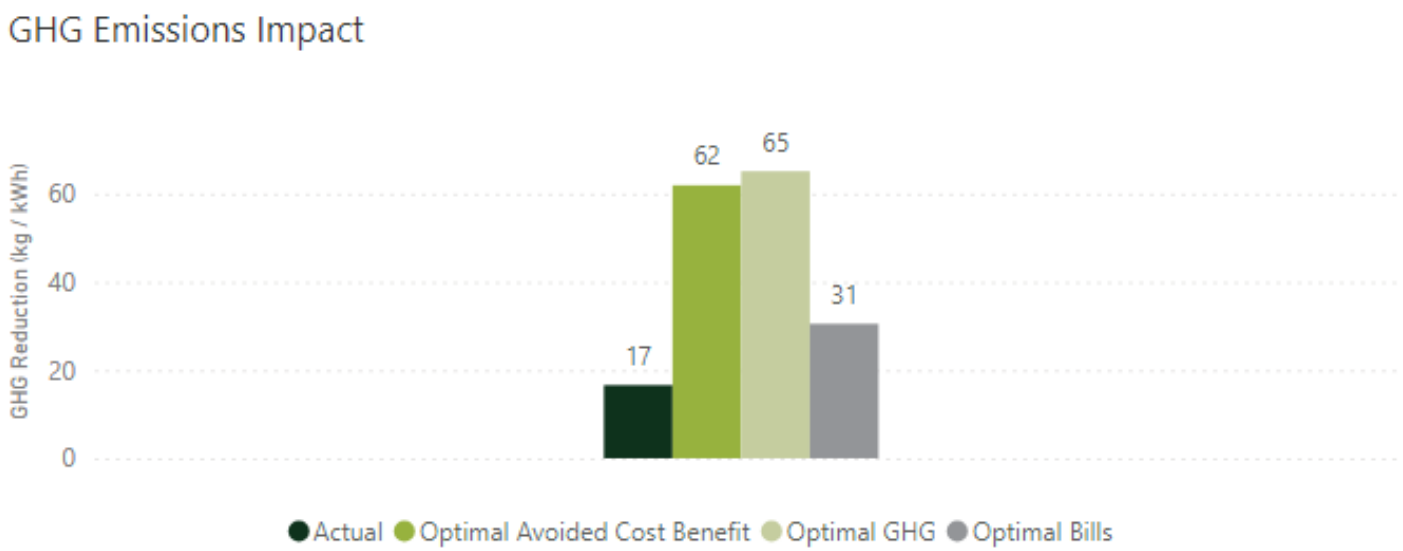
- $18/kWh observed avoided cost benefit
- 4x improvement in avoided cost when optimized for it
- ~2x improvement when optimizing for GHG
- ~2x increase when optimized for bill savings



RESIDENTIAL OPTIMIZATION

GHG Scenario

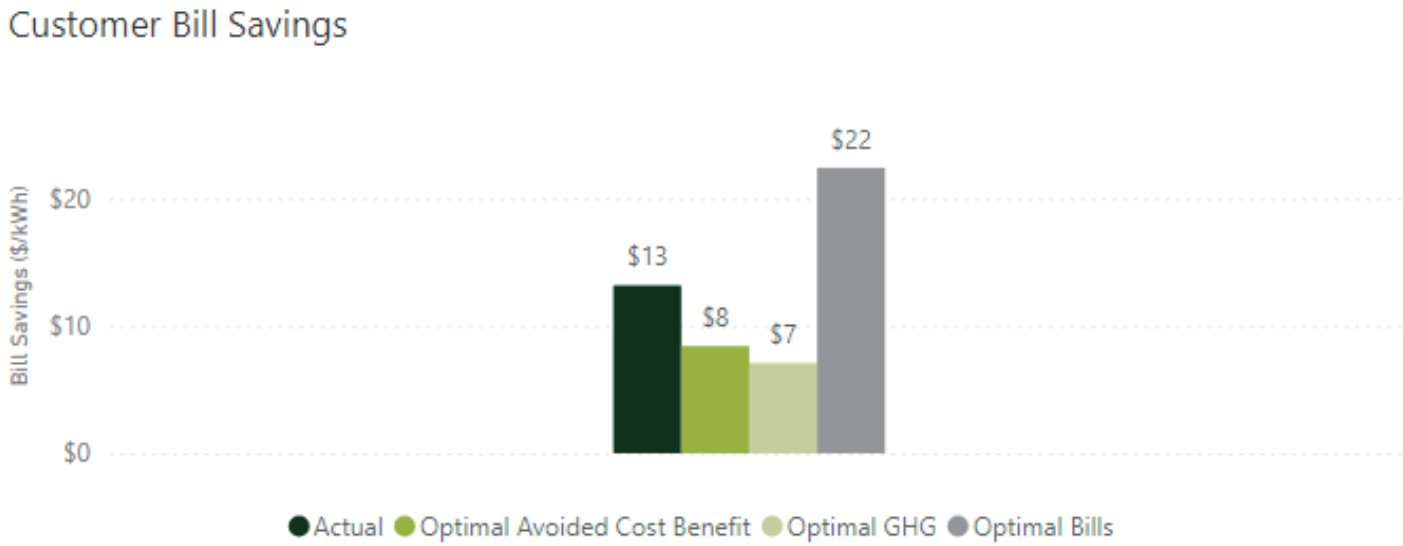
- 17 kg/kWh observed GHG reduction
- Over 3x improvement in GHG when optimized for it
- Similar improvement when optimized for avoided costs
- ~2x improvement when optimized for bill savings



RESIDENTIAL OPTIMIZATION

Customer Bills Scenario

- Bill savings would be reduced from observed when optimizing for avoided cost benefits or GHG reductions
- ~70% increase in bill savings when optimizing for it

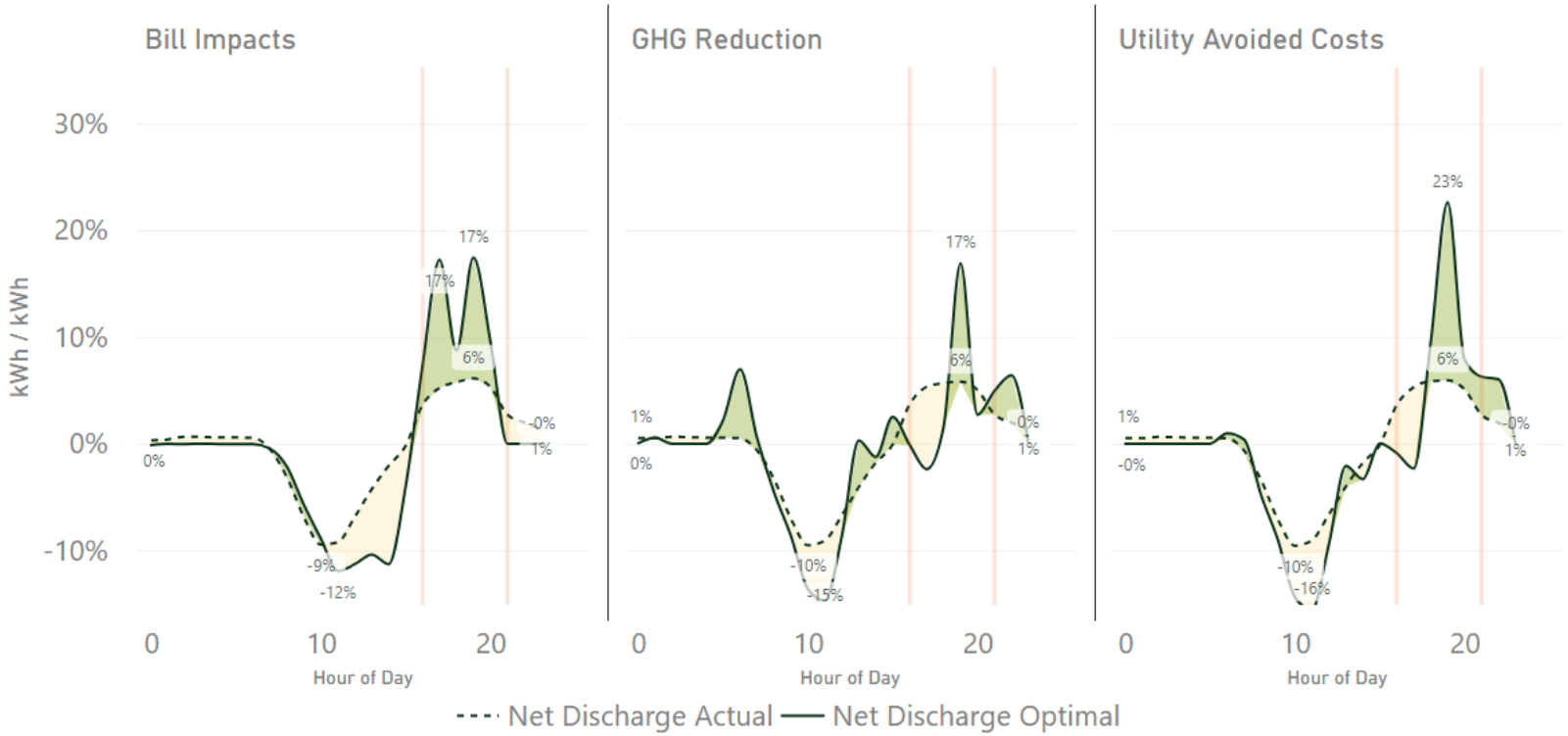


Shaded yellow = more charging than actual
Shaded green = more discharge than actual
Vertical Lines = 4pm to 9pm on-peak

RESIDENTIAL OPTIMIZATION

Actual Storage Discharge and Optimized Discharge (August 2023)

- Actual Discharge
  - 40% kWh
- Optimal Bill Discharge
  - 59% kWh
- Optimal GHG Discharge
  - 64% kWh
- Optimal AC Discharge
  - 65% kWh




THANK
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VERDANT

Conclusions and Study Recommendations

CONCLUSIONS AND RECOMMENDATIONS

- GHG emissions differentials between charging overnight and discharging on-peak are not sufficient to realize emissions reductions like observed with PV paired systems charging from on-site PV
  - **We recommend that the CPUC explore ways to ensure that standalone systems achieve GHG reductions, such as requiring that they follow the SGIP GHG signal or real-time pricing signals.**
  - **Furthermore, policies and rate structures developed to promote EV home charging overnight should be considered alongside SGIP program goals of reducing GHG emissions to ensure the motivations of one policy don't adversely affect those of the other.**
- Residential and nonresidential systems are not discharging the total capacity of the system regularly and many residential customers are limiting discharge to maintain net zero load rather than exporting
  - **We recommend that the CPUC explore ways to encourage additional battery utilization through enrollment in virtual power plants (VPP), utility control of storage, participation in real-time rates, or other mechanisms.**

CONCLUSIONS AND RECOMMENDATIONS

- Solar PV paired residential storage discharges roughly 42% of system kWh capacity daily throughout summer weekdays, and standalone systems discharge about 14% of available capacity
- Residential and nonresidential storage discharged 14% of kW capacity during CAISO net peak hour
  - **We recommend that the CPUC explore ways to encourage more targeted dispatch that emphasizes the importance of discharging batteries (and reducing load) during on-peak hours rather than daily self-consumption.**
- SGIP energy storage systems were not performing too differently during capacity constrained hours than they were ordinarily in 2023. But, ELRP participation is where we observe differences in storage dispatch between event and control days
  - **We recommend that the CPUC and SGIP PAs continue to encourage participation in DR programs. Programs like the ELRP that compensate customers for export (rather than just reductions in consumption) should be prioritized as they represent an incremental load reduction relative to typical battery dispatch.**

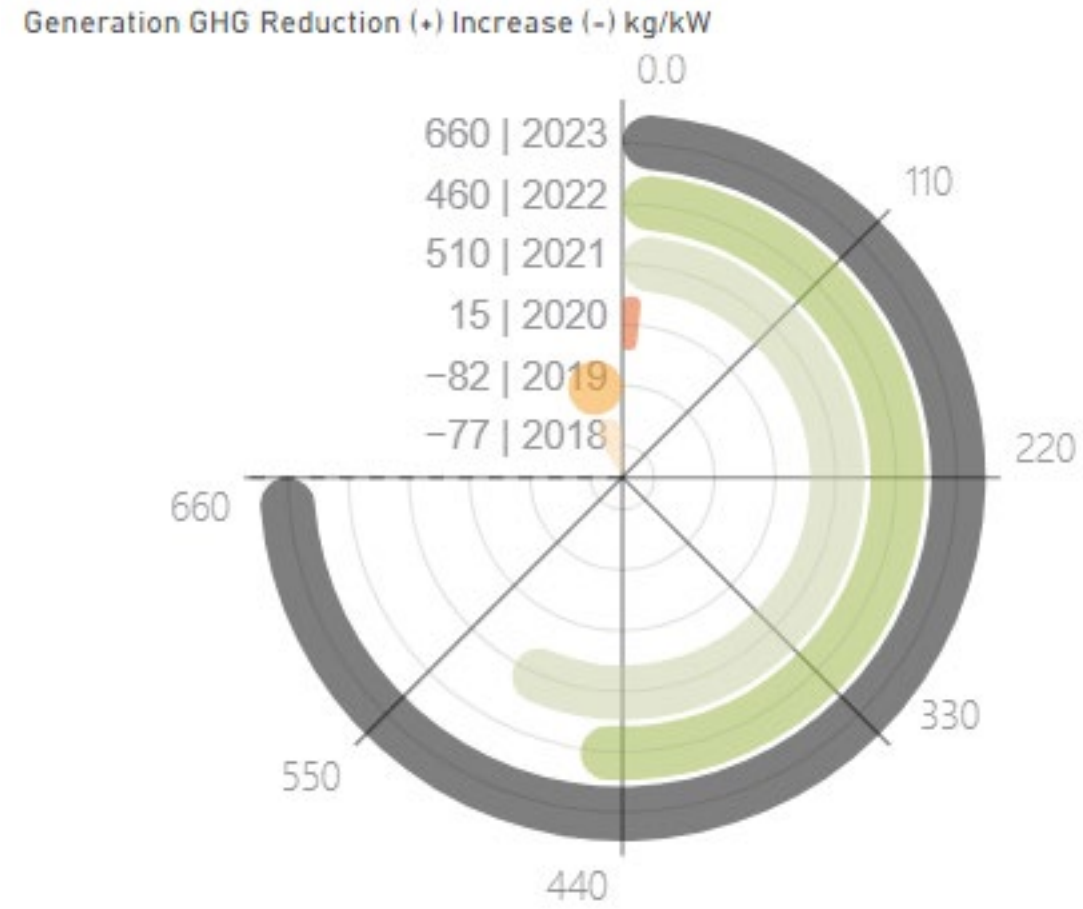
CONCLUSIONS AND RECOMMENDATIONS

- Optimization modeling revealed that the average actual avoided emissions of 17 kg of GHG per kWh of capacity would more than triple if optimized for GHG reductions or utility avoided costs. They would almost double if customer bill savings were optimized.
  - **We recommend that the CPUC revisit the 5 kg/kWh GHG reduction target and consider replacing it with a more ambitious target that reflects improvements in technology to maximize its potential.**
- Optimizing residential charge and discharge for utility avoided cost benefits would result in a 4x improvement over actual avoided cost benefits in 2023. Avoided cost benefits would also increase if GHG emissions or bill savings were optimized, but at lower magnitudes.
  - **We recommend the CPUC continue to explore strategies to encourage SGIP participants to enroll in DR or real-time retail rates to encourage increased dispatch during high GHG/demand hours.**

GREENHOUSE GAS IMPACTS

YoY Results

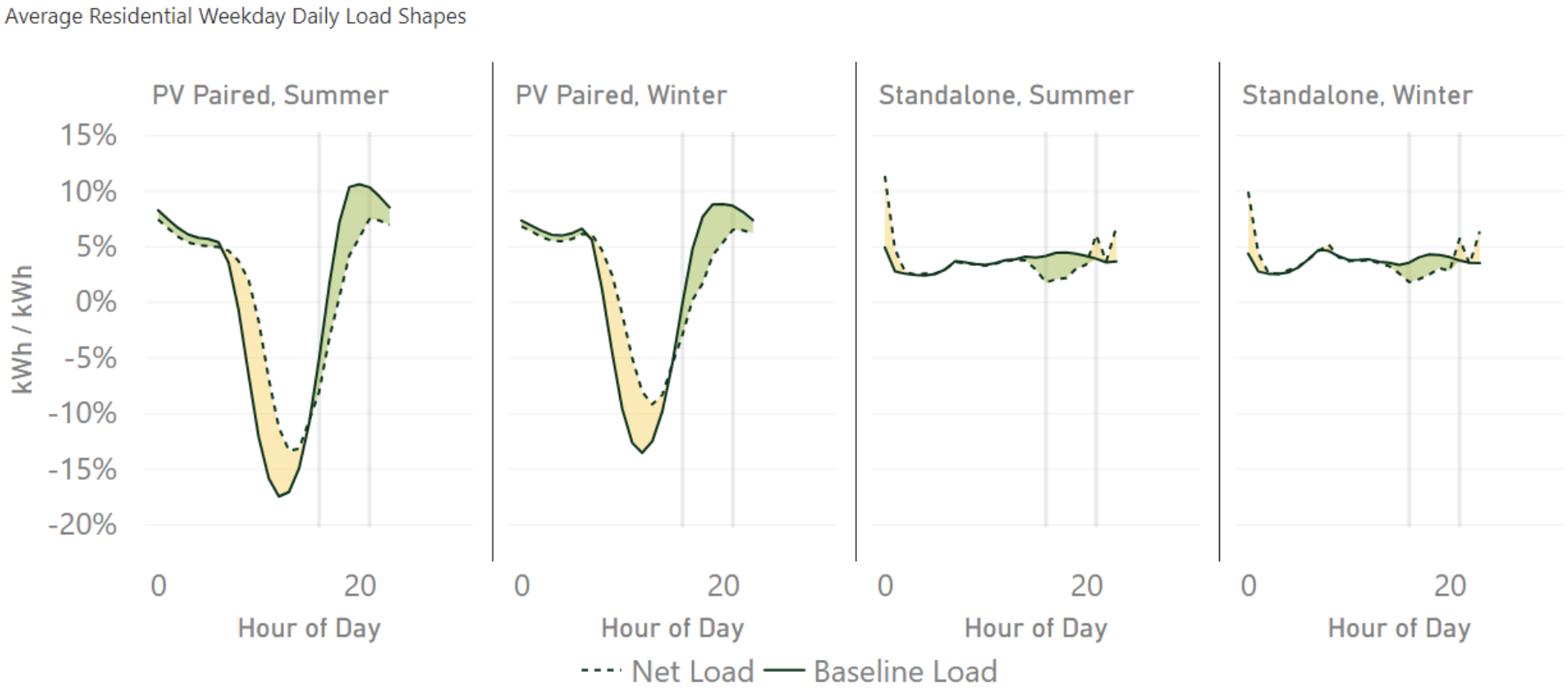
- Version changes to the ACC contributed to significant differences to earlier years.
- Many older, poorly performing generation systems wrapped up their permanency period. Therefore, relative impacts of remaining systems are higher than last evaluation.



TYPICAL RESIDENTIAL LOAD SHAPES

PV Paired vs. Standalone by Season

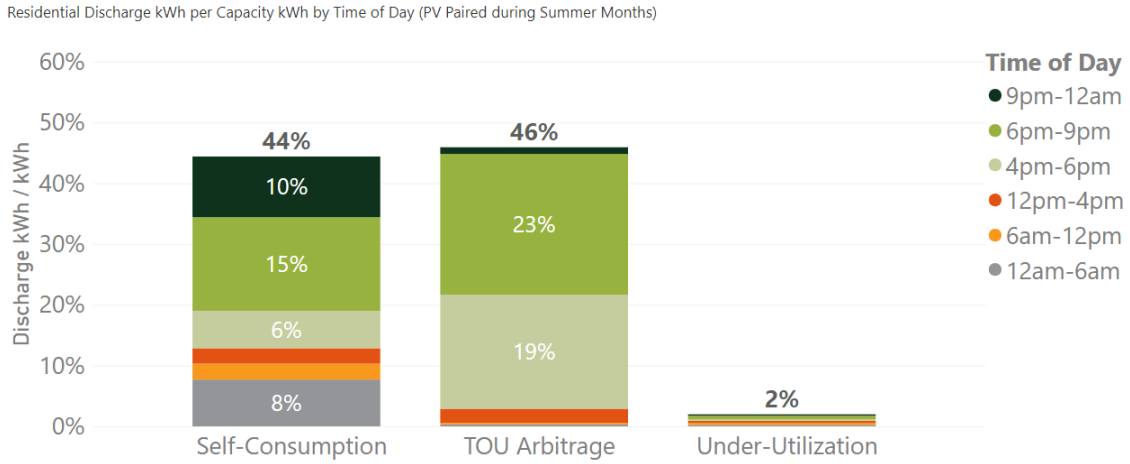
Shaded yellow = an increase in customer load
Shaded green = a decrease in customer load
Vertical Lines = 4pm to 9pm on-peak



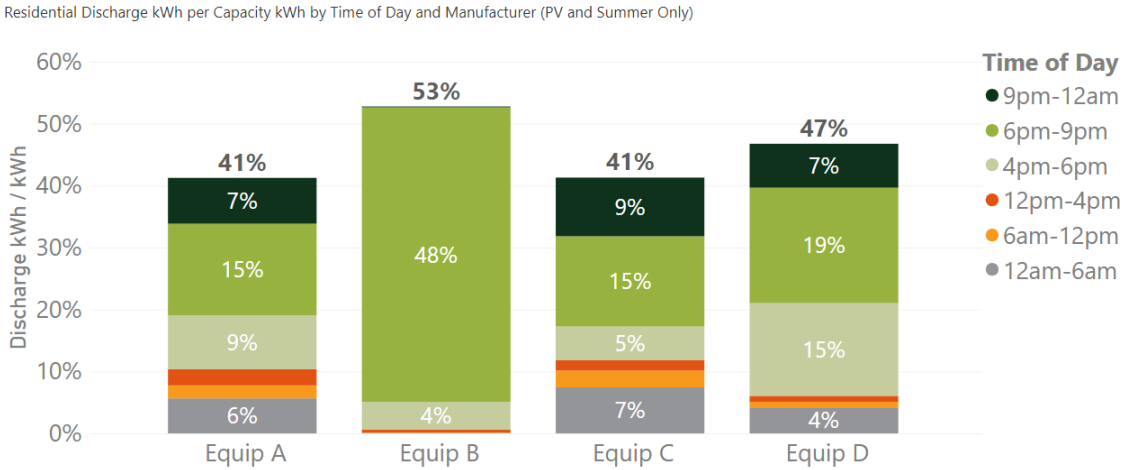
RESIDENTIAL STORAGE DAILY KWH UTILIZATION

By Operating Mode and Manufacturer (Summer Months Only)

Discharge kWh per Capacity kWh by Operating Mode



Discharge kWh per Capacity kWh by Manufacturer



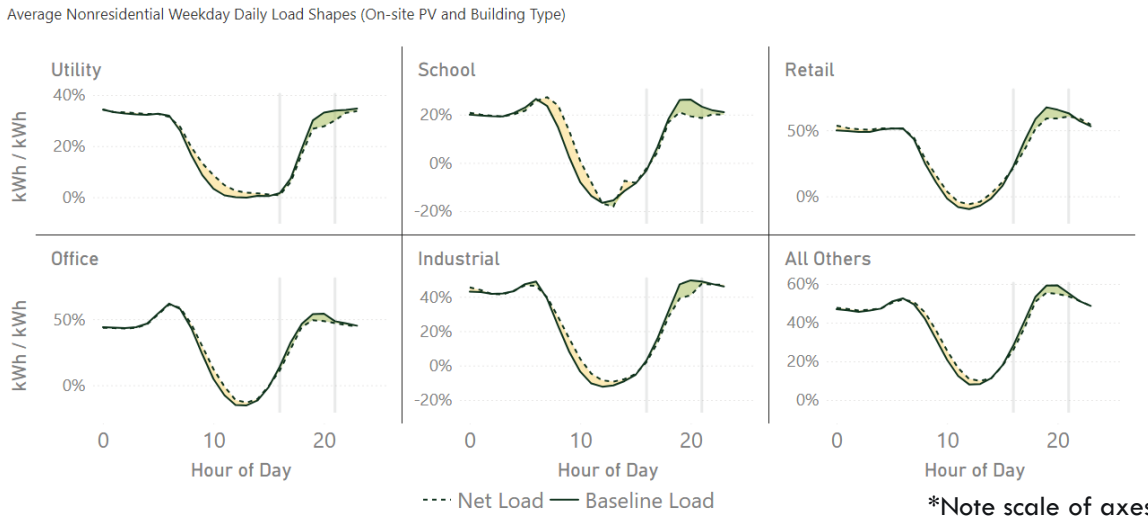
- Similar Summer utilization by operating modes
- Timing of discharge differentiator

- Equip B exhibits greatest utilization and focused on-peak discharge

TYPICAL NONRESIDENTIAL LOAD SHAPES

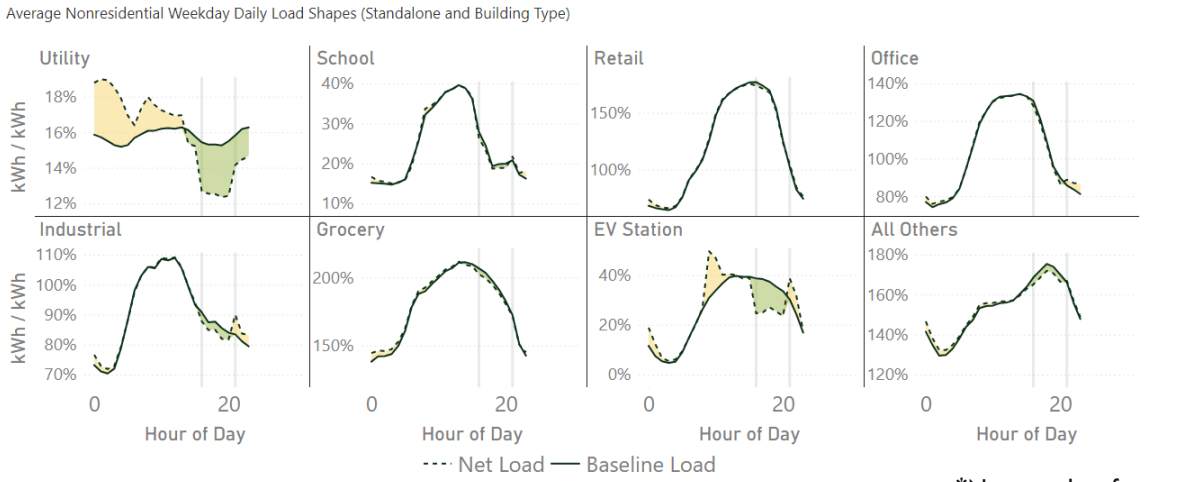
PV Paired vs. Standalone by Prevalent Building Types

On-site PV by Building Type*



*Note scale of axes

Standalone Systems by Building Type*



*Note scale of axes

- Charging from on-site solar generation
- Most discharge comes between 4pm-9pm
- While load shapes are similar, different magnitudes of on-site load relative to average battery size

- Variations in timing and magnitudes of facility peak demand more prevalent
- Utility and EV station exhibit most pronounced change in load from battery dispatch

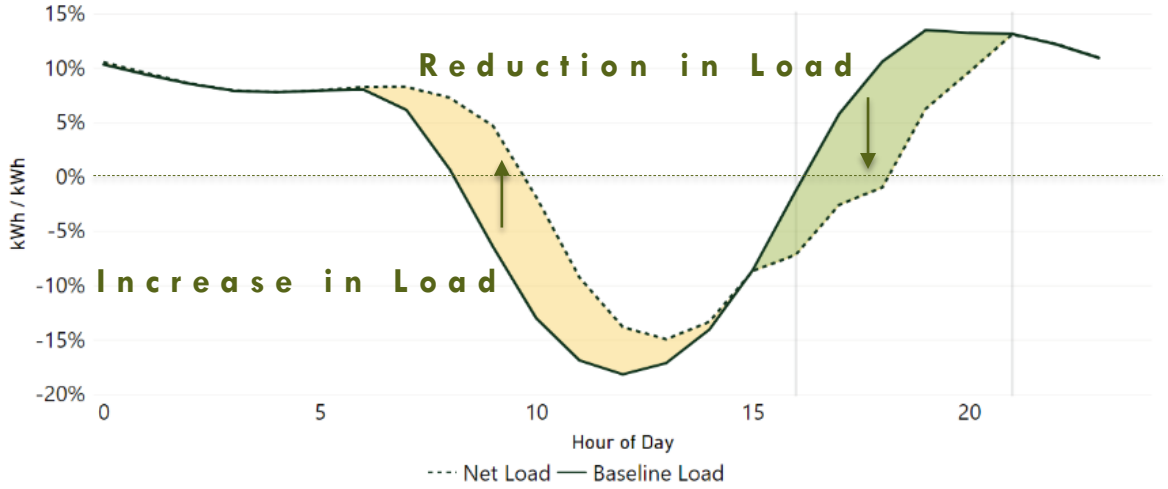
Shaded yellow = an increase in customer load
Shaded green = a decrease in customer load
Vertical Lines = 4pm to 9pm on-peak

EVALUATION APPROACH

Observed Impacts and Unobservable Baselines

- **Metered storage charge/discharge**
  - Actual system characteristics calculated from metered data – RTE, CF, Annual cycles

- **Consumption at the meter in the absence of the SGIP technology –** an unobservable baseline requires pre-storage installation assumptions:
  - GHG emissions reductions if → emissions avoided during discharge are greater than emissions increases during charging
  - Customer bill savings if → discharging occurs during high-priced hours and charging occurs during lower-priced hours



SELF-GENERATION INCENTIVE PROGRAM

Q&A

Los Angeles Department of Water & Power
Southern California Edison — An Edison International Company
Pacific Gas and Electric Company
SoCalGas
Center for Sustainable Energy

SELF-GENERATION INCENTIVE PROGRAM

Thank You

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