



Community Advisory Committee

Regular Meeting

April 11, 2024

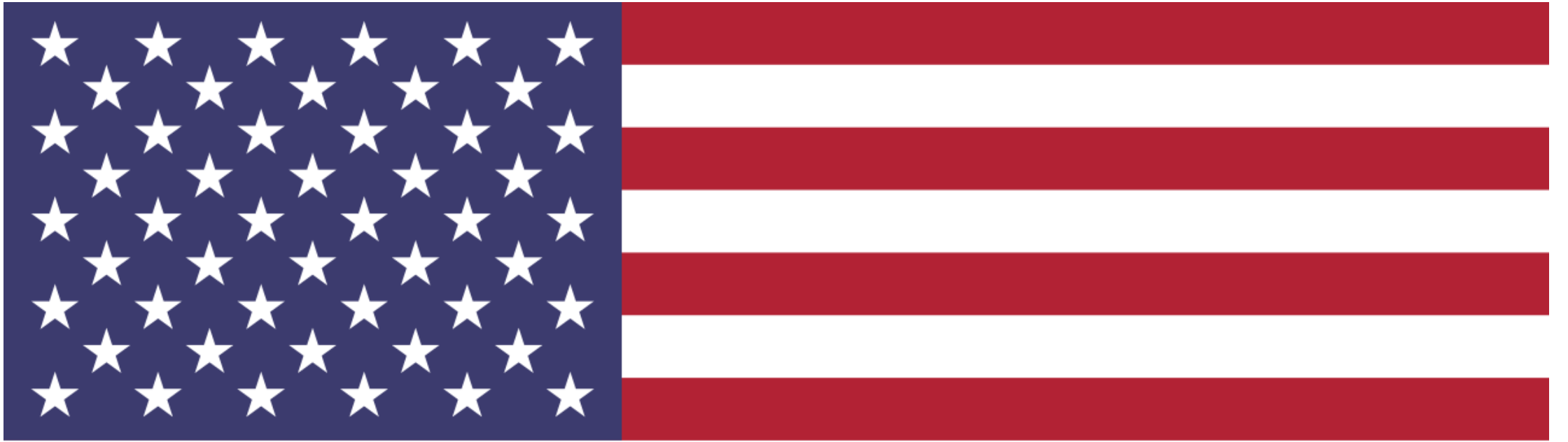




**Welcome
&
Call to Order**

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Roll Call



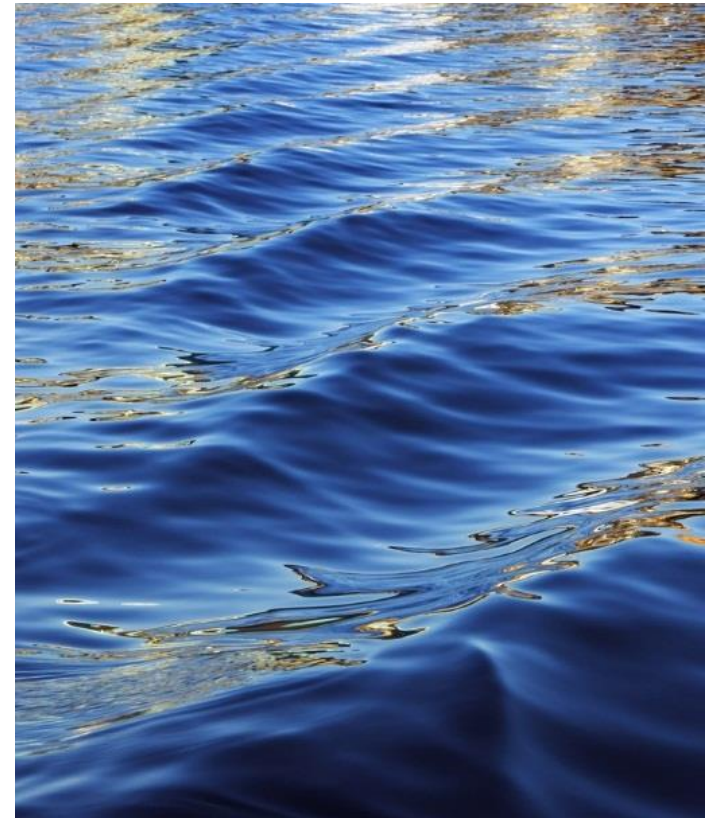
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Land Acknowledgement




Warm welcome to
our new hire!

Linda Robertson
IT Manager





**Public
Comment
for Items
Not
on the
Agenda**

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**Items to be
Withdrawn
or
Reordered
on the
Agenda**

Consent Meeting Agenda

1. Approval of February 8, 2024 CAC Meeting Minutes
2. Update on Marketing, Public Relations, and Local Government Affairs
3. Update on Customer Operations
4. Update on Regulatory and Legislative Affairs
5. Update on Programs



Public Comment for Consent Agenda

Regular Meeting Agenda

6. Update on Vehicle-Grid Integration Strategy Overview
- ~~7. Recommend Board Approval of Power100 Green-e Certified Service~~
8. Update on Power100 Ad-Hoc Committee

Item 6

Update on Vehicle-Grid Integration Strategy Overview

Recommendation:

Receive and File the Update on Vehicle-Grid
Integration Strategy Overview

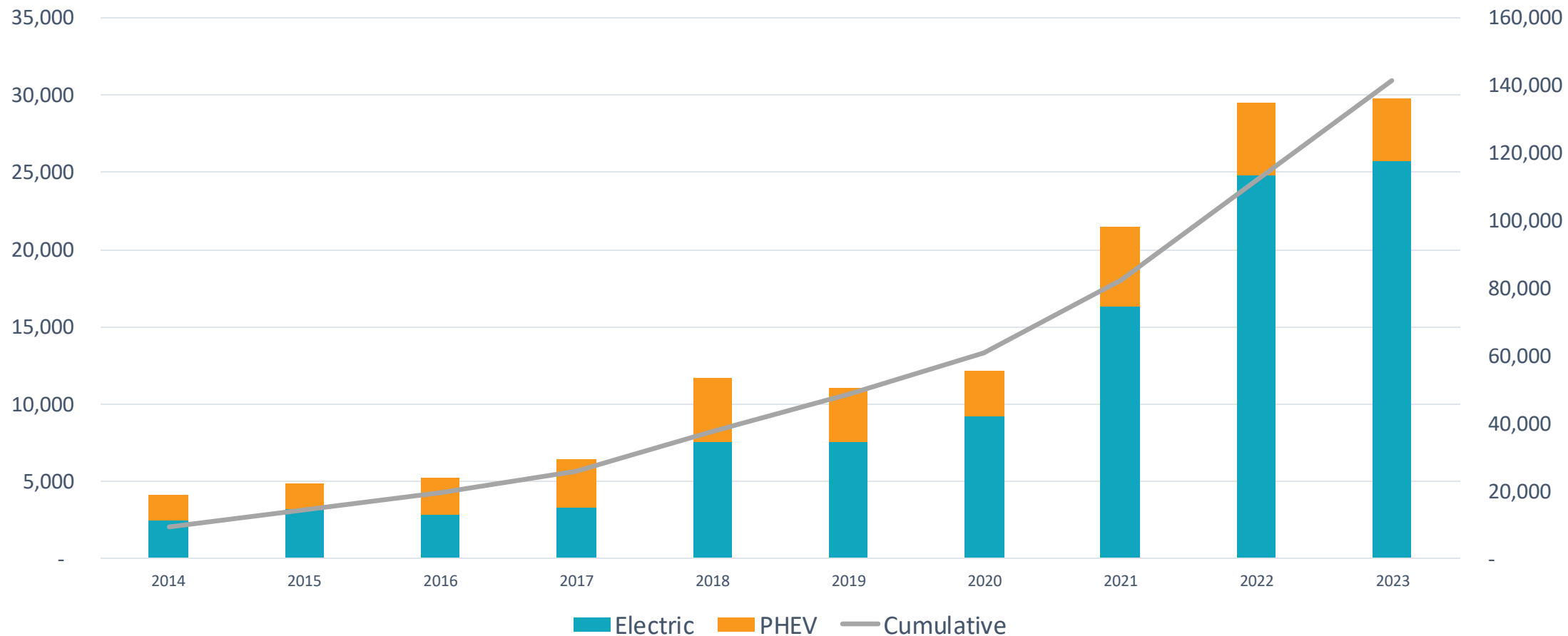
Presenter:

Timothy Treadwell, Senior Program Manager

Executive Summary

- California is undergoing a rapid transition to electric vehicles (EVs), presenting both market opportunities and grid management challenges.
- San Diego County is at the forefront of EV adoption, offering a compelling case study for exploring managed charging options and grid integration strategies.
- This presentation:
 - Outlines the current landscape of EV market dynamics, managed charging programs, and potential use cases for grid optimization through V1G and V2X (V2H, V2B & V2G)
 - Is an extension of the Flexible Load Strategy and outlines the opportunity to drive operational efficiency and reduce cost for SDCP customers
- Recommended strategy and roadmap for SDCP

EV Market Characterization in San Diego County



Source: California Energy Commission. (2023, April). Light-Duty Vehicle Population in California.
Retrieved from <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/light-duty-vehicle>

Regulatory Framework

In October 2019, [Senate Bill \(SB\) 676](#) originally defined Vehicle-Grid Integration (VGI) and gave authority to the Commission to revise the definition.

Per the Decision, **VGI is defined** as:

“Electric vehicle grid integration means any method of altering the time, charging level, or location at which grid-connected light-duty electric vehicles, medium-duty electric vehicles, heavy-duty electric vehicles, off- road electric vehicles, or off-road electric equipment charge or discharge, in a manner that **optimizes plug-in electric vehicle or equipment interaction with the electrical grid** and provides net benefits to ratepayers by doing any of the following:

- Increasing electrical grid asset utilization and operational flexibility
- Avoiding otherwise necessary distribution infrastructure upgrades and supporting resiliency
- Integrating renewable energy resources
- Reducing the cost of electricity supply
- Offering reliability services consistent with the resource adequacy requirements established by Section 380 or the Independent System Operator tariff.”

VGI Categories

V2B & V2H

Vehicle-to-building integration, under which an EV may provide power directly to a home or building.

Unmanaged Charging

Vehicle charging is performed solely by the customer.

V2G

Vehicle-to-grid bidirectional charging and discharging, under which EVs may discharge onto the grid in addition to characteristics offered by V1G.

V1G

Vehicle charging is managed to respond to grid requirements to improve reliability and reduce costs. This includes pricing signals (TOU and DR) and active control of vehicle charging.

TECHNOLOGY

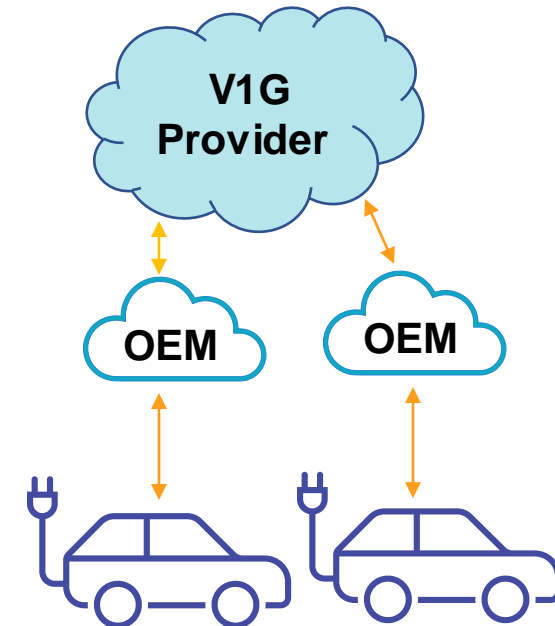
Unmanaged Charging

V1G – Managed EV Charging

V1G Explained

V1G focuses on of when kWh are delivered to the EV battery by leveraging intelligent management of EV charging based on grid needs and/or electricity pricing, focusing on reducing costs and optimizing grid load.

- May involve charging primarily during off-peak hours or dynamically adjusting charging rates in response to real-time grid conditions.
- Does **not** involve sending power back from the EV to the grid.



V1G Opportunities

Participant Bill Savings

- Optimize EV charging schedule around time-of-use rates
- Provide summary of charging history and alignment with low-cost periods

Energy Procurement

- Reduce on-peak usage through targeted daily load shifting
- Increase consumption during low/negative pricing events using chemical/thermal storage
- Manage usage in real time to align load with forecasted/hedged position

Resource Adequacy (RA)

- Reduce demand and RA obligation through daily load shifting
- Monetize customer capacity through California Independent System Operator (CAISO) market integrated programs

Pilot Programs – Customer API Access

Peninsula Clean Energy



Objectives

- Reduce overall daily peak loads and maximize for daytime solar
- Reduce customer bills
- Test customer reactions to different incentive types

Strategy

- Leverages OEM cloud-based telematics for charge scheduling
- Assesses load shift through rate modification and TOU design

Quick Stats

- ~700 customers recruited

Customer Journey

- High retention
- Program participants used less energy overall
- \$100 one-time incentive most effective, \$12.50 customer bill savings per month

Pilot Programs – Direct OEM API

Pacific Gas & Electric



Objectives

- Improve grid resiliency
- Optimize charging around low cost and low carbon periods
- Increase EV driver preparedness in PSPS impacted communities

Strategy

- Leverages OEM cloud-based telematics for charge scheduling
- Assesses customer preferences, utility rates, and electricity grid needs

Quick Stats

- ~3,500 customers recruited

Customer Journey

- Invited customers in eligible zip codes
- Received a recommended charging schedule with access to a personalized dashboard that will show optimal charging times
- Text alerts to prepare for PSPS events
- \$50 incentive for joining and up to \$100 more for continued participation

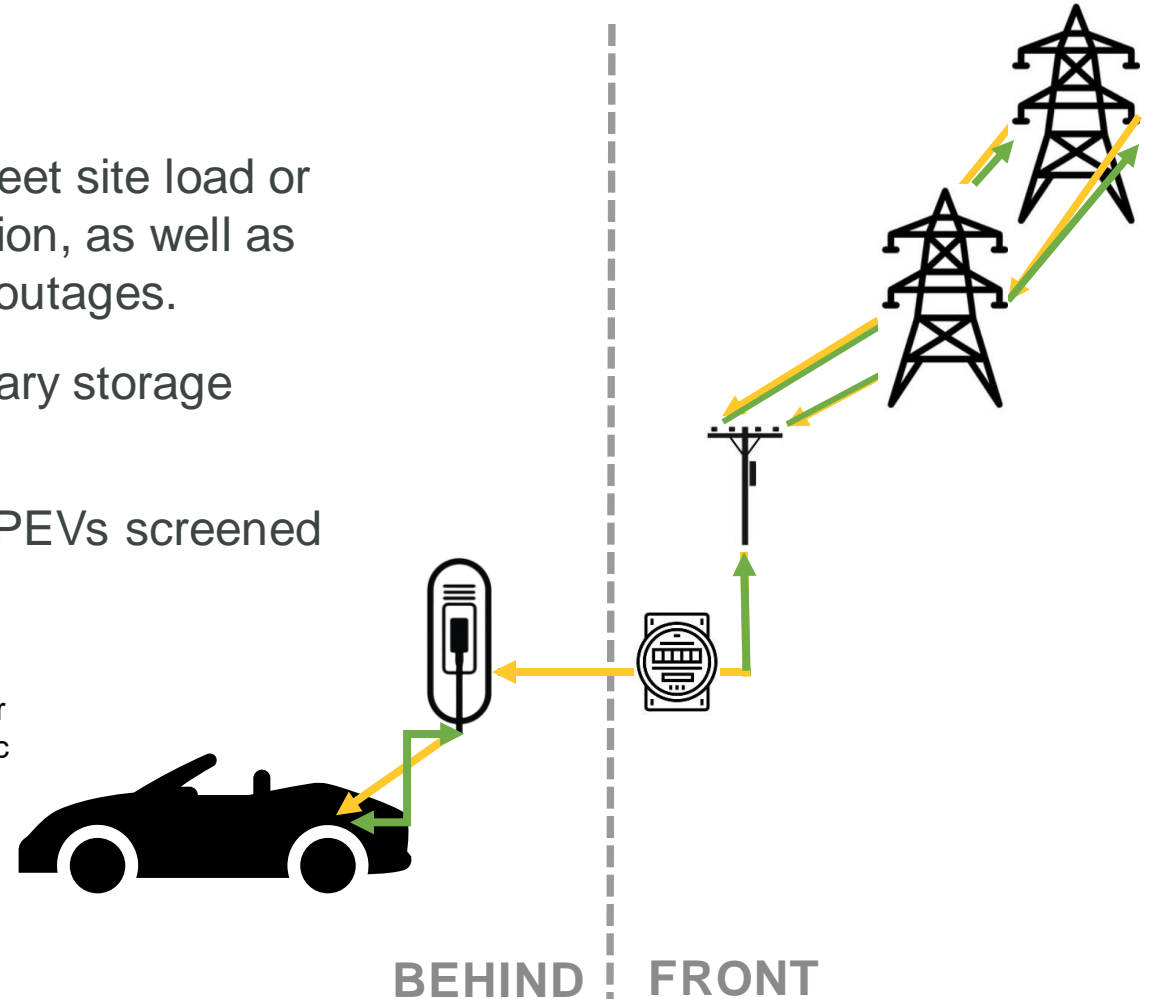
V2X – Bidirectional EV Charging

V2X Explained

V2X allows for power to flow from the battery to meet site load or grid needs. This allows EVs to support grid operation, as well as act as resilience assets for customers during grid outages.

- Existing EV storage is **5x** the amount of stationary storage currently on the grid (25 GWh in 2023)¹
- Interconnection requirements for V2G capable PEVs screened as “generating resources” under [Rule 21](#).

¹With a sales-weighted average battery size of 60 kilowatt-hours (kWh) for light-duty EVs, ([source](#)) the United States’ (U.S.) 2.1 million battery electric vehicles (BEVs) represent approximately **126 Gigawatt-hours** (GWh) in storage capacity ([source](#)).



V2X Configurations

V2H/V2B

Description: EV provides supplementary power to a building while connected to or disconnected from the grid.

Benefits: Saves customers money by reducing the customer's peak demand from the utility and/or is used to provide backup power to a building during blackouts.

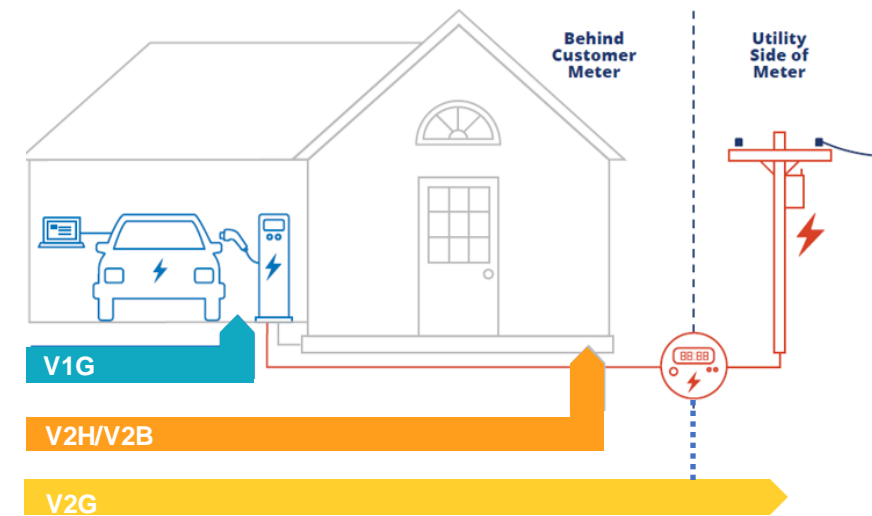
Limitations: Can operate as grid isolated or parallel, non-exporting. Interconnection agreements are required if set up for parallel operation.

V2G

Description: EV operates as grid resource, allowing charge and discharge, supporting various grid services.

Benefits: Reduces net load during system and distribution peak hours to lower customer bills and operational costs.

Limitations: Interconnection required and many of the use cases/value streams are not compensated for under current markets/rules.



V1G: Interconnection *not* required.

V2H/V2B: Requires interconnection agreement.

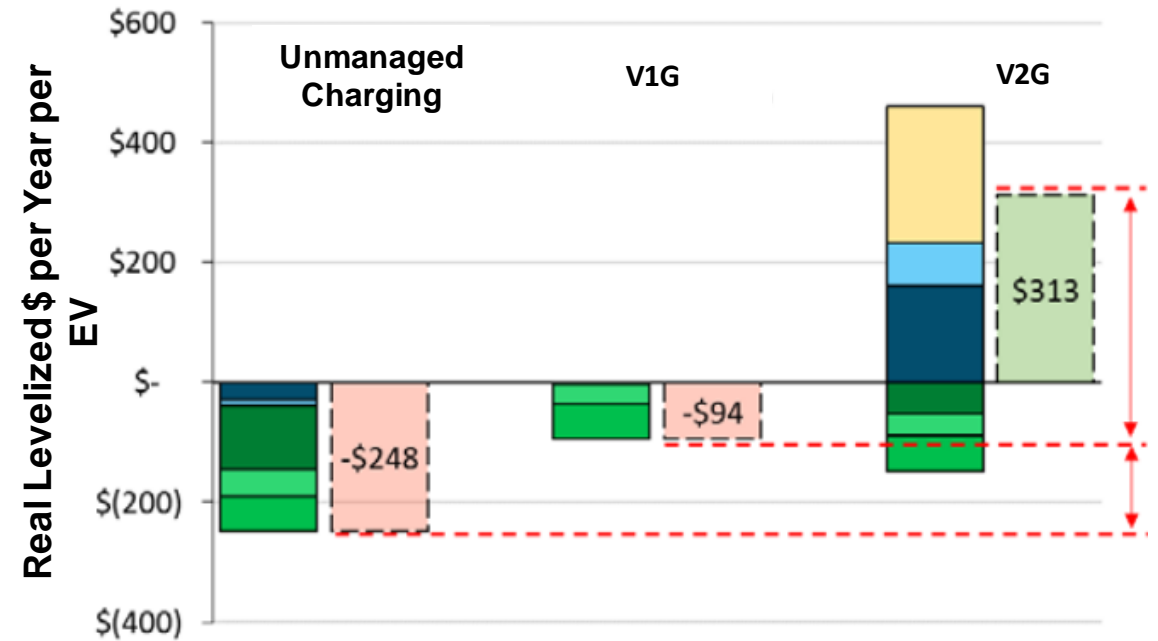
V2G: Requires interconnection agreement.

Bidirectional Charging Applications

| Application | Description | V2H/B | V2G |
|------------------------------|--|-------|-----|
| Peak Shaving | Discharge vehicle batteries to support real-time usage without dispatching to grid. | X | X |
| Grid Export | Discharge vehicle batteries across the meter to provide grid services. | | X |
| Grid-tied Non-export | Discharge vehicle batteries behind the meter (V2H & V2B) to meet site load. | X | |
| Islanded Operations | Discharge vehicle batteries to meet site load when grid is down. | X | |
| Renewable Integration | Charge and discharge vehicle batteries in coordination with intermittent renewable generation. | X | X |
| Energy Arbitrage | Charge and discharge vehicle batteries based on market signals/price differentials. | X | X |

VGI Value Streams

| SDCP | SDG&E | ISO |
|---|--|--|
| Generation Energy & Capacity: Estimate of hourly wholesale value of energy and the costs of building new generation capacity to meet system peak loads | Distribution Capacity: The costs of expanding distribution capacity to meet peak loads | Ancillary Services: The marginal costs of providing transmissions, system operations and reserves for grid reliability |
| <ul style="list-style-type: none"> ■ System Energy Cost ■ CO2 Cost ■ RPS Cost ■ Resource Adequacy | <ul style="list-style-type: none"> ■ Distribution Capacity | <ul style="list-style-type: none"> ■ Ancillary Services Revenue |



VGI Roadmap Overview

V1G Charge Management Strategies

- **Scale:** Pilot scale enrollment of hundreds of customers.
- **Customer Centric:** Optimize based on rate schedule and customer preference (e.g. set points, vehicle departure times, nomination capacity)
- **Operationally Efficient:** Dispatch to maximize retail-wholesale spread and minimize RA

V2X Bidirectional Charging

- **Scale:** Demonstration scale enrollment of tens of customers.
- **Grid and Customer Value:** Discharge when RA/Energy value exceeds round trip efficiency losses and T&D costs
- **Resiliency:** Operate to minimize impacts during customer outages
- **Leveraged Funding:** Coordinate with CEC awardees



VGI Roadmap Timeline

| | 2024 | | | | 2025 | | | |
|---------------------|------|----|----|----|------|----|----|----|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Market Assessment | █ | | | | | | | |
| Pilot Planning | | █ | | | | | | |
| Procurement Process | | | █ | | | | | |
| Implementation | | | | ◆ | █ | | | |



Public Comment for Item 6

Item 6

Recommendation:

Receive and File the Update on Vehicle-Grid
Integration Strategy Overview

Item 8

Update on Power100 Ad-Hoc Committee

Recommendation:

Receive and File the Update on Power100 Ad-Hoc

Presenter:

Lauren Cazares, Ad-Hoc Committee Member

Power100 Ad-Hoc Committee Discussion

Members

Key Objectives

- Learn about current Power100 premium and energy sources.
- Learn about Power100 Champions program benefits, existing businesses, and solicit support in addressing barriers to program participation.
- Recommend outreach scope and opportunities to promote the program, as appropriate

Peter Andersen (County of San Diego)

Aida Castañeda (National City)

Tara Hammond (Encinitas)

Ilian Sandoval (Imperial Beach)

Lauren Cazares (La Mesa)



Public Comment for Item 8

Item 8

Recommendation:

Receive and File the Update on Power100 Ad-Hoc Committee



**Discussion of
Potential
Agenda Items
for Board of
Directors
Meetings**



**Committee
Member
Announcements**

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Adjournment



Next Regular Community Advisory Committee Meeting

May 9, 2024

