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Vehicle-Grid Integration Market Status and Funding Solicitation Concepts Workshop

California Energy Commission

9:00 a.m. – 12:00 p.m.

July 28, 2022

Welcome

VGI Market Status and
Funding Solicitation Concepts

We will begin at 9:02 a.m.

9:02 a.m. | Jeffrey Lu (CEC)
Introduction and background + Q&A

~9:25 a.m. | CPUC, Enel, Ford, PG&E
VGI market status: Presentations + Q&A

~10:50 a.m. | Anita Carraher and Jeffrey Lu (CEC)
VGI funding solicitation concepts

Participants are encouraged to provide live feedback!

~11:50 a.m.
Other Q&A and public comment

What is VGI?

Vehicle-grid integration, or **VGI**, refers to technologies, policies, and strategies which alter the time, power level, or location of charging (or discharging) of electric vehicles (EVs) in a manner that benefits the grid while ensuring driver needs are met. VGI includes but is not limited to:

- Managed one-way charging (V1G) or smart charging
  - Could be in response to rates, demand response events, automatic load management systems, and so on
- Bidirectional charging (V2X)
  - Includes vehicle-to-home (V2H) and vehicle-to-grid (V2G)

→ "VGI" does not *necessarily* imply bidirectional charging!

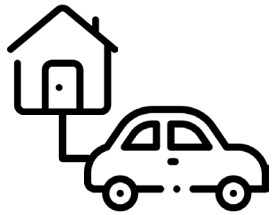
VGI is crucial to California's future

Grid decarbonization

- Variable generation
- Mitigating curtailment
- Load flexibility

Customer savings and confidence

- Meet driver needs
- Bill savings
- Carbon savings



Sense of autonomy and resilience

- Backup power / V2H
- Microgrids
- Quiet, zero emissions

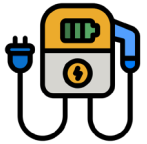
Grid reliability

- Grid support / V2G
- Emergency response
- Ramp mitigation

This slide includes visuals from Flaticon.com

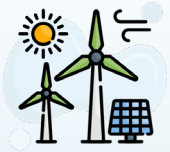
Staff vision: Widespread, easy, diverse VGI options for all

Diverse options for customer compensation and value



Diverse, easy-to-use, interoperable products and services

VGI options with any charger, any vehicle, even if the customer chooses not to participate



Widespread, grid-aware charging load flexibility

This slide includes visuals from Flaticon.com

Clarifying questions?

Please raise your hand to speak

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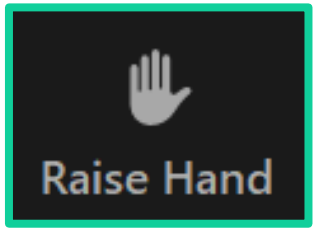
- Zoom: Click **Raise Hand** and we will enable your audio



Presentations on current VGI-related activities

- **Achintya Madduri,** California Public Utilities Commission
- **Marc Monbouqutte,** Enel North America
- **Dave McCreadie,** Ford
- **Rudi Halbright,** PG&E

Questions? Please add them to the Q&A box.

There will be **one combined Q&A session** following all presentations.

Questions for panelists?

We'll address questions in the Q&A box and any spoken questions.

If you'd like to ask a spoken question, please raise your hand

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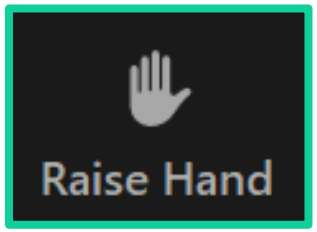
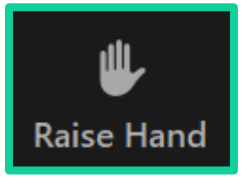
- Zoom: Click **Raise Hand** and we will enable your audio



Proposed funding solicitation concepts

- Proposals presented today are **concepts** – some or all may not be released as full fledged solicitations
- Staff will present concepts followed by guiding questions
  - **Raise Hand (*9)** to share your thoughts



1. Responsive, Easy Charging Products with Dynamic Signals
2. Municipal EV Fleets and Community Resilience Blueprints
3. Bidirectional Charging Equipment Rebates
4. VGI and Charging Ready Homes

Concept 1

Responsive, Easy Charging ProDucts With Dynamic Signals (**REDWDS**)

A single solicitation funding **two project stages**:

1. **Development** of customer-friendly products that coordinate charging (and optionally, discharging) with dynamic signals (such as rates, DR)
2. **Deployment** of above products with customers on dynamic rates

Goal: Commercial availability and customer deployment of easy-to-use, interoperable products that manage charging in response to dynamic signals and customer needs. Products would improve customer value (bill savings or other compensation) and grid integration (load flexibility, renewable integration, shed load during emergencies, and so on).

Proposed eligible applicants

Open to **charging providers**, including:

- Charging networks / electric vehicle service providers
- Aggregators / automation service providers (including telematics)
- Charger and vehicle manufacturers

The same applicant is responsible for delivering both stages of the project (development and deployment). Additional team members or subcontractors may be included to support outreach, customer installation, and so on.

Concept 1 – REDWDS

Possible stage 1 (development) minimum requirements

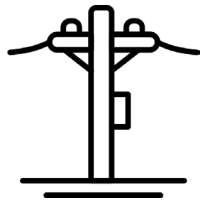
1. Backend must integrate with MIDAS[1] and ELRP,[2] and optionally TeMix's CalFUSE API
2. Product must be capable of optimizing charging in response to the dynamic signals (and, optionally, by executing transactive energy tenders through TeMix's API) and customer preferences (vehicle energy needs, departure times, and so on)
3. Product must include customer-facing interfaces that collect inputs (such as the customer's Rate Identification Number and charging preferences), explain how charging will be managed, and explain any customer compensation or rewards
4. Product must be interoperable with different vehicles and chargers
   - Charging station management system products must be OCPP compliant + certified
   - EVSE products must be OCPP compliant + certified
   - Vehicle telematics products must be interoperable with multiple vehicle makes
   - Products that do not fall into the above categories are eligible and must describe how they support interoperability

1 CEC's Market Informed Demand Automation Server
2 Emergency Load Reduction Program; branded as "Power Saver Rewards" for residential customers

Concept 1 – REDWDS

Example applicant and possible stage 1 development work

Backend integration with chargers (OCPP) and/or EVs; must be interoperable

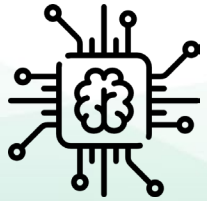


Backend integration with dynamic signals using MIDAS or utility APIs

A CHARGING NETWORK

Front end development to improve interfaces, reward systems, and customer engagement

Algorithm development to optimize charging around customer needs and grid signals



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Concept 1 – REDWDS

Possible stage 2 (deployment) minimum requirements

1. Deploy the product(s) developed in Stage 1 to at least 50 customers
2. At least 50% of EVSE or vehicles must be **located in a DAC/LIC**
3. At least 50% of EVSE and vehicles must be deployed with **customers enrolled in a dynamic or transactive energy rate** (such as SCE CalFUSE, PG&E DAHRTP, and so on; rates must update at least hourly); all other customers must be enrolled in a time-varying rate (such as time of use)
4. Data collection, including cost comparison with a non-dynamic rate

Given SCE's ongoing CalFUSE pilot, CEC may award priority (that is, bonus points) to projects deploying products to customers enrolled in the SCE pilot.

Proposed funding amounts

- **Stage 1** eligible costs: Labor for product development, materials and miscellaneous for development, interoperability testing, certification costs
- **Stage 2** eligible costs: EVSE, labor to install new or update existing EVSE, labor for education/outreach/customer enrollment

	Stage 1 Max	Stage 2 Max	Max Total Award
New EVSE deployed*	$200k	$500k	$700k
No new EVSE deployed (updates existing EVSE or uses telematics)	$200k	$50k	$250k

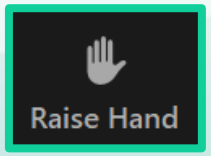
** **Note:** New chargers funded through REDWDS would not be eligible for other CEC EVSE deployment funding, such as CALeVIP*

Concept 1 – REDWDS

Share your feedback! Some possible guiding questions:

1. Is $200k a reasonable amount to meaningfully support **development**?
2. Is $500k ($50k) a reasonable amount to meaningfully support customer outreach and **deployment** with (without) installation of new EVSE?
3. Is it appropriate to require 50% of deployments with customers enrolled in current or upcoming dynamic rates?
4. Should this solicitation target larger deployments (meaning: higher minimum customer deployment requirement and higher stage 2 funding amounts)?
5. Are there other costs associated with development and deployment of charging products that should be included as eligible costs?

*Please use **Raise Hand** (*9)*



Concept 2

Municipal EVs and Community Resilience Blueprints

Funding for municipal electrification blueprints that leverage bidirectional charging for community resilience. Municipalities would partner with community-based organizations and technology providers to identify:

- Community needs and priorities for resilience (for example, clean air/cooling centers)
- Municipal vehicle electrification opportunities
- How to meet community needs with V2G-capable municipal vehicles

Goal: Blueprints for electrifying municipal fleet vehicles and using those vehicles to support community resilience with bidirectional charging. If appropriate, a subsequent solicitation could fund implementation of the most promising blueprints.

Proposed eligible applicants

Open to project **teams** composed of, at minimum:

- A public fleet vehicle operator, such as a municipality or transit agency
- A community based organization
- A community center operator (could be one of the above)

Project teams are expected to collaborate with vehicle manufacturers, charging providers, and/or other technology providers. They may optionally be included on project teams.

Additional requirements

- Blueprints must describe how V2G EVs could provide power to community resilience centers during grid outages (islanded operation)
- Blueprints must describe how V2G EVs and chargers could respond to grid emergencies, including events called through the Emergency Load Reduction Program (grid parallel operation)
- This solicitation may include priority for rural communities, communities with a high likelihood of experiencing outages, disadvantaged communities, low-income communities, and/or Tribes
- Funding amounts are not yet determined; $200k used in GFO-20-601 (Blueprints for Medium- and Heavy-Duty ZEV Infrastructure)

Upcoming and related solicitation

Solicitation concept for V2G school bus charging also pending

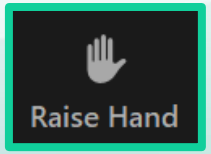
- The CEC's School Bus Unit is developing a related solicitation with a focus on school buses
- School Bus Unit will host a workshop discussing the concept in the upcoming months
- As proposed, the Muni EV and Community Resilience Blueprints concept does not exclude school bus fleets

Concept 2 – Muni EV and Community Resilience

Share your feedback! Some possible guiding questions:

1. Is $200k a reasonable amount to meaningfully support development of a municipal fleet electrification and community resilience blueprint?
2. Should eligible vehicle fleet operators be limited to public fleets?
3. What provisions should be included to ensure that community needs are appropriately gathered and considered during blueprint development?
4. Should this solicitation be limited to (or award priority to) projects sited within rural communities, communities with a high likelihood of experiencing outages, disadvantaged communities, low-income communities, and/or Tribes?

*Please use **Raise Hand** (*9)*



Concept 3

Bidirectional Charging Equipment Rebates

Funding for bidirectional charging equipment and installation in targeted groups and communities by offering “adders” to existing CEC rebate projects or in partnership with a sister agency project. These “adders” could be for:

- V2X charging equipment
- Electrical upgrade work
- Automatic transfer switches or critical load panels

Proposed funding amounts per unit are not yet identified.

Goal: To incentivize both the usage of V2X-capable equipment in current, non-residential charging projects, as well as the infrastructure needed to support V2X equipment.

Concept 3 – Bidirectional Charging Equipment Rebates

Proposed example project integration - EnergIIZE[3]

Eligible applicants:

- Fleet owners
- Charging station developers
- Private, municipal, tribal, or non-profit entities
- Charging providers or vendors on behalf of site owners

EnergIIZE COMMERCIAL VEHICLES

EV Fast-Track
Applicants in this funding lane are ready to go and may already have prior experience applying for commercial MHD EV funding

EV Jump Start
Applicants in this funding lane will need to meet specific eligibility criteria and will be allotted more time to submit required documents

EV Public Charging Station
Applicants in this funding lane intend to develop publicly available charging stations for commercial MHD EVs

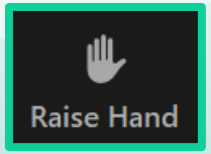
3 *Energy Infrastructure Incentives for Zero-Emission Commercial Vehicles*

Concept 3 – Bidirectional Charging Equipment Rebates

Share your feedback! Some possible guiding questions:

1. Are applicants facing a cost barrier to using V2X-capable equipment that an "adder" would address?
2. Are there other equipment areas that we can address with "adders" in order to incentivize the installation of V2X-capable equipment?
3. How can these "adders" be used to address equity issues? For example, should these adders be limited to (or award priority to) projects sited within rural communities, communities with a high likelihood of experiencing outages, disadvantaged communities, low-income communities, and/or Tribes?
4. Is there a project that hasn't been mentioned today that you think would benefit from this incentive?

*Please use **Raise Hand** (*9)*



Concept 4

VGI and Charging Ready Homes

Funding for a block grant to provide rebates for home electrical upgrades to enable more equitable at-home charging opportunities, as existing buildings may not meet VGI-capable charging equipment minimums. Potential eligible costs would include:

- Panel upgrades (for homes with a main breaker under 200 A)
- Installation of “electric-ready” circuits
- Automatic transfer switches

Proposed funding amounts per unit are not yet identified.

Goal: Promote equitable, VGI-capable at-home charging. While these upgrades benefit overall household electrification goals, they also enable at-home charging of electrical vehicles.

Current Decarbonization Projects

The CEC has an existing suite of electrification and decarbonization projects, targeting different audiences.

- CEC Projects
  - Existing buildings – TECH initiative
  - New buildings – BUILD Program
  - Upcoming guidance and best practices per SB 68 (2021)
    - RFI Comments due August 8, 2022
- Non-CEC Projects
  - SCE – Home Electrification Readiness (proposed)
  - PG&E – Empower EV program

Proposed audience and criteria

This proposed solicitation concept would be open to third-party rebate implementers.

The proposed rebates would be for single family housing and multi-family housing buildings.

Current proposed criteria for third-party implementers:

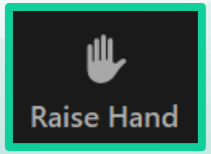
- Work plan with regional Community Based Organizations to engage priority communities
- Integration plan for working with other rebate implementers, including but not limited to audience sharing, integrated application, and so on

Concept 4 – VGI and Charging Ready Homes

Share your feedback! Some possible guiding questions:

1. What residential barriers to EV ownership are not being addressed by the previously mentioned decarbonization incentives?
2. How can this incentive be better aligned with EV ownership?
3. How can renters who want to own an EV be included within this proposed project?
4. How can we best address differences in community and regional housing electrification needs with a state-wide incentive project?

*Please use **Raise Hand** (*9)*



Thank you! Other questions or feedback?

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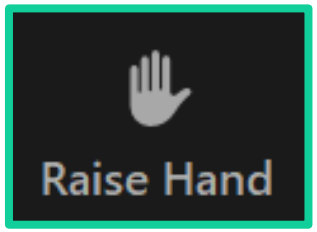

Written comments: Please file to 19-AB-2127 by **Friday, August 12.**

To connect after the workshop, email Anita Carraher or Jeffrey Lu.