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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue the Development of Rates and Infrastructure for Vehicle Electrification.	R.18-12-006 (Filed December 13, 2018)

MID-TERM VEHICLE GRID INTEGRATION REPORT OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E)

PUBLIC VERSION

(ATTACHMENT A CONTAINS CONFIDENTIAL INFORMATION)

KRISTIN D. CHARIPAR

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 535-4138
Facsimile: (415) 973-5520
E-Mail: Kristin.Charipar@pge.com

Attorney for
PACIFIC GAS AND ELECTRIC COMPANY

Dated: September 15, 2021

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Pursuant to Ordering Paragraph 1 of Decision 20-12-029, Pacific Gas and Electric Company (PG&E) provides its annual *Mid-Term Vehicle Grid Integration (VGI) Report* (Report) in Attachment A. Pursuant to Section 3.4 of General Order 66-D, certain data in the report has been determined to be confidential. PG&E is concurrently filing a motion for leave to file under seal the confidential, unredacted version of the Report.

Respectfully Submitted,

KRISTIN D. CHARIPAR

By: */s/ Kristin D. Charipar*
KRISTIN D. CHARIPAR

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 535-4138
Facsimile: (415) 973-5520
E-Mail: Kristin.Charipar@pge.com

Attorney for
PACIFIC GAS AND ELECTRIC COMPANY

Dated: September 15, 2021

ATTACHMENT A

(CONFIDENTIAL MATERIAL CONTAINED IN THIS ATTACHMENT WILL BE PROVIDED TO THE DOCKET OFFICE TO BE FILED UNDER SEAL.)

Title: **(D.20-12-029) VGI Reporting Template**

Authors: **Pacific Gas and Electric**
San Diego Gas & Electric
Southern California Edison

Last Updated: 4/20/2021

Introduction:

CPUC VGI Decision (D.20-12-029) directs the large electrical corporations to develop a reporting template that will provide quantifiable metrics that can be used to determine whether the implementation of the Decision's actions are effective and help track progress of strategies aiming to maximize the integration of electric vehicles into the grid.

The final VGI reporting template will be developed in 3 stages:
1) Draft template due on 2/28/2021;
2) Workshop to solicit feedback on the draft template planned for 3/16/2021;
3) Final report due on 4/20/2021

Summary of the current version:

The Joint Utilities have been working together to develop a draft template that incorporates the elements from the Decision. The SB350 template was initially reviewed and duplicative VGI scope items were flagged. The Joint Utilities treated the incremental VGI scope as separate from the SB 350 data template scope.

The Joint Utilities also reviewed other reporting templates, like the Cost and Load Research Report, and flagged VGI scope items that were duplicative in these templates as well. The incremental VGI scope reviewed in other reporting templates, such as the Cost and Load Research Report, was treated as separate from existing reports.

The current template includes the following sections:
- READ ME tab: Provides an introduction to the template including: authors, date revised, objectives, context and review

- Descriptions tab: Provides details and definitions of the different metrics listed in the Program and Pilot Metrics, and Narrative tabs. Where relevant, it will include references to other reports and provide sources of information.
- Program and Pilot Metrics tab: Includes metrics in the VGI Decision by program or pilot. This tab plans to list the utilities VGI programs and pilots and their associated aggregated metrics. Definitions of each metric are provided in the Descriptions tab. For draft purposes, illustrative program examples are provided.
- Narrative tab: Lists the metrics that are not easily quantifiable and as a result, will be reported on a qualitative basis separately via a narrative. The narrative will be a Word document that will accompany the final reporting template spreadsheet and will summarize all VGI activities for each of the utilities. In the future and as more programs become available to the public, some of these metrics may move to the Program and Pilot Metrics tab. Narrative items with quantitative elements will be reported on in the narrative document only and will include graphs or data visualization elements where appropriate. The underlying data for any graphs or visualizations will be provided via a separate spreadsheet in the Appendix.
- **Stocktake tab:** Includes the list of existing and planned VGI activities as mandated in section 6.8. of the Decision.
- V2X EVSE tab: This tab will include a list of V2X equipment available in the market.

All reporting items are subject to availability of data; determination of causal relationship between VGI programs and the data; ability to track and report VGI-program specific costs and net benefits; confidential nature of PG&E, SDG&E, SCE and third-party customer, vendor and other data, which may not be provided to third parties or the public; and ability to reference program and metric reports for VGI-related programs and services that are subject to pre-VGI decision existing reporting requirements. Any additional costs to acquire data associated with this report will require approval. Additionally, CPUC Decisions regarding future VGI pilot proposals may result in modifications to the VGI Reporting Template.

Data Tab	Decision Category	Column Name or Row Name	Description
Program and Pilot tab	Program Metrics	Market Segment - Residential or Commercial	Commercial (includes Multi-Unit Dwelling), Residential
Program and Pilot tab	Program Metrics, Outcome Metrics	Market Segment - Subcategory	Single Family Home, Multi Unit Dwelling, Workplace, Fleet, Light Duty, Medium Duty, Heavy Duty, Off Road (separate line per entry per program/pilot), as applicable. Example Medium and Heavy Duty Subcategories may include but are not limited to School Bus, Transit Bus, Medium-Duty Vehicles, Heavy-Duty Vehicles, Yard Tractors, Airport GSE, Forklift, TRU, Truck Stop. Note, these are the same MD/HD subcategories defined in the SB 350 Data Template.
Program and Pilot tab	Program Metrics, Outcome Metrics	ESJ subcategory	Underserved Community, DAC, Low Income (separate line per entry per program/pilot), as applicable
Program and Pilot tab	Program Metrics	Implementation Status	Development, Pending, Active
Program and Pilot tab	Program Metrics	Number of ports participating in ALM	One vehicle served per port
Program and Pilot tab	Program Metrics	Number of sites participating in ALM	Per program/pilot
Program and Pilot tab	Program Metrics	Number of sites participating in dynamic rates	Per program/pilot
Program and Pilot tab	Program Metrics	Number of EV drivers participating in dynamic rates	Per program/pilot
Program and Pilot tab	Program Metrics	Total number of V2G EVSE customers	Per program/pilot and rate class
Program and Pilot tab	Program Metrics	Distribution-side cost savings	Per program/pilot
Program and Pilot tab	Program Metrics	Customer-side cost savings (related to panel and similar equipment)	Per program/pilot
Program and Pilot tab	Program Metrics	Upgrade avoided by ALM	Per program/pilot
Program and Pilot tab	Program Metrics	Savings of upgrades avoided by ALM	Per program/pilot. The IOUs will describe the methodology used to calculate savings in the VGI report. The methodology may vary over time and based on the program or pilot.
Program and Pilot tab	Program Metrics	Authorized Budget	Per program/pilot
Program and Pilot tab	Program Metrics	Budget expended	Per program/pilot
Program and Pilot tab	Program Metrics	Total Number of ports participating in ALM	Aggregate - all programs/pilots
Program and Pilot tab	Program Metrics	Total Number of sites participating in ALM	Aggregate - all programs/pilots
Program and Pilot tab	Program Metrics	Total Number of sites participating in dynamic rates	Aggregate - all programs/pilots
Program and Pilot tab	Program Metrics	Total Number of EV drivers participating in dynamic rates	Aggregate - all programs/pilots
Program and Pilot tab	Outcome Metrics	Total number of V2G EVSE customers	Aggregate. The IOUs will describe the methodology used to calculate number of V2G EVSE customers in the VGI report. The methodology may vary over time and based on the program or pilot.
Program and Pilot tab	Outcome Metrics	Total Distribution-side cost savings	Aggregate - all programs/pilots. The IOUs will describe the methodology used to calculate savings in the VGI report. The methodology may vary over time and based on the program or pilot.
Program and Pilot tab	Program Metrics	Total Customer-side cost savings (related to panel and similar equipment	Aggregate - all programs/pilots. The IOUs will describe the methodology used to calculate savings in the VGI report. The methodology may vary over time and based on the program or pilot.
Program and Pilot tab	Program Metrics	Total Count of upgrades avoided by ALM	Aggregate - all programs/pilots. The IOUs will describe the methodology used to calculate count of upgrades in the VGI report. The methodology may vary over time and based on the program or pilot.
Program and Pilot tab	Program Metrics	Total Cost savings of upgrades avoided by ALM	Aggregate - all programs/pilots. The IOUs will describe the methodology used to calculate savings in the VGI report. The methodology may vary over time and based on the program or pilot.
Program and Pilot tab	Program Metrics	Total Authorized Budget	Aggregate - all programs/pilots
Program and Pilot tab	Program Metrics	Total Budget expended	Aggregate - all programs/pilots
Narrative Tab	Activity Metrics	Customer program or pilot and incentives related to VGI	Description of each customer program or pilot and incentives related to VGI
Narrative Tab	Activity Metrics	Adoption of rates that encourage VGI and adoption of mechanism to provide credit for export	Discussion on the adoption of rates that encourage VGI and adoption of mechanism to provide credit for export
Narrative Tab	Activity Metrics	Efforts to collaborate with CAISO to design wholesale market rules and access that support VGI	Discussion on the efforts to collaborate with CAISO to design wholesale market rules and access that support VGI
Narrative Tab	Activity Metrics	Leveraging or supplementing EPIC and/or other sources of funding for VGI technology demonstration projects	Discussion on leveraging or supplementing EPIC and/or other sources of funding for VGI technology demonstration projects
Narrative Tab	Activity Metrics	Efforts to accelerate the use of VGI for resiliency	Discussion on Efforts to accelerate the use of VGI for resiliency
Narrative Tab	Activity Metrics	Progress to reform interconnection rules to advance VGI	Discussion on progress to reform interconnection rules to advance VGI
Narrative Tab	Activity Metrics	Support and adoption of non-interconnection technical standards to advance VGI	Discussion on support and adoption of non-interconnection technical standards to advance VGI
Narrative Tab	Activity Metrics	Summary on efforts to fund and launch VGI customer education	Discussion and summary on efforts to fund and launch VGI customer education
Narrative Tab	Activity Metrics	Summary on efforts to develop and support complementary policies needed to support Automated Load Management (ALM) technology	Discussion and summary on efforts to develop and support complementary policies needed to support Automated Load Management (ALM) technology
Narrative Tab	Activity Metrics	ALM deployment in the utility territory in the context of both existing and future transportation electrification programs, rules, and tariffs to the extent practical; including estimates on the number of ALM	Discussion on ALM deployment in the utility territory in the context of both existing and future transportation electrification programs, rules, and tariffs to the extent practical; including estimates on the number of ALM
Narrative Tab	Activity Metrics	ALM systems Installed for passenger vehicles and any medium and heavy-duty vehicle segment(s) under currently approved transportation electrification programs as well as estimates on the potentially expected avoided distribution and customer-side cost savings attributable to such ALM installations	Discussion on ALM systems Installed for passenger vehicles and any medium and heavy-duty vehicle segment(s) under currently approved transportation electrification programs as well as estimates on the potentially expected avoided distribution and customer-side cost savings attributable to such ALM installations
Narrative Tab	Activity Metrics	Customer VGI participation in utility demand response programs, including customer retention and efforts to reduce churn and data requested from 3rd party providers as needed;	Synopsis on customer VGI participation in utility demand response programs, including customer retention and efforts to reduce churn and data requested from 3rd party providers as needed;
Narrative Tab	Activity Metrics	Implementation of VGI pilots, lessons learned and potential future efforts	Description and discussion of Implementation of VGI pilots, lessons learned and potential future efforts
Narrative Tab	Activity Metrics	Integration of VGI across the utility relevant business activities;	Discussion on the integration of VGI across the utility relevant business activities;
Narrative Tab	Program Metrics	Pilots underway with a discussion on the results and next steps including	Report on each pilot underway with a discussion on the results and next steps including cost, lessons learned, etc.
Narrative Tab	Program Metrics	Metrics on interconnection reform (in conjunction with item 7)	Report out on metrics on interconnection reform (in conjunction with item 7)
Narrative Tab	Program Metrics	Effectiveness of credit-for-export availability, lessons learned and potenti	Discussion on the effectiveness of credit-for-export availability, lessons learned and potential next steps to increase availability
Narrative Tab	Program Metrics	Participants in credit for export and discussion to increase participation	Report on the number of participants in credit for export and discussion to increase participation
Narrative Tab	Program Metrics	Annual energy exported (kWh) and report out on potential efforts to incr	Discussion on the annual energy exported (kWh) and report out on potential efforts to increase participation
Narrative Tab	Program Metrics	Overall barriers removed in V2B	Report out on overall barriers removed in V2B
Narrative Tab	Program Metrics	Number of EVs enrolled in DR programs	Discussion on the number of EVs enrolled in DR programs
Narrative Tab	Program Metrics	Rate of change of EV DR enrollment and potential steps to increase enroll	Discussion on the rate of change of EV DR enrollment and potential steps to increase enrollment
Narrative Tab	Program Metrics	EV DR enrollment capacity (MW)	Synopsis on EV DR enrollment capacity (MW)
Narrative Tab	Program Metrics	EV DR enrollment load shift (MWh)	Synopsis on EV DR enrollment load shift (MWh)
Narrative Tab	Outcome Metrics	Estimated aggregated GHG reduction attributable to VGI	Leverage CARB's Incremental Credit Methodology which is part of LCFS Regulation to report GHG benefits due to VGI. The current regulation can be viewed here https //ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf.
Narrative Tab	Program Metrics	Site Participation in rate-to-driver and discussion on how to increase part	Report out on from sites on participating in rate-to-driver and discussion on how to increase participation
Narrative Tab	Program Metrics	Site participating in DR, lesson learned and next steps to increase particip	Report out from sites on participating in DR, lesson learned and next steps to increase participation
Narrative Tab	Miscellaneous	Barriers to data collection and potential solutions	Discussion of various barriers to data collection efforts and potential solutions identified by the IOUs. For example, EV load may not be separately metered. IOUs will describe why these data gaps would occur and will discuss their efforts to address these gaps in their respective reports.
Narrative Tab	Program Metrics	Load shift for EV rate customers	This would be updated on an annual basis for the annual VGI Report submitted in March. Metric will compare EV rate customers with known, where possible, EV driver customers on non-EV rates.
Narrative Tab	Program Metrics	Rate-to-driver enrollment by sites	Rate-to-driver enrollment for commercial sites subscribing to EV dynamic rates. The IOUs will report on this metric for programs that track and offer this service.
Narrative Tab	Program Metrics	Dynamic rate load shift (MWh)	This will be estimated using meter load data from broadly similar program customers on TOU rates as a baseline.
Narrative Tab	Program Metrics	Aggregate unmanaged load profiles within programs (kWh)	Per the Decision, "unmanaged load" refers to customers not on TOU rates. There are no customers within IOU TE programs with entirely unmanaged charging, if "managed charging" includes service on TOU rates.
Narrative Tab	Program Metrics	Aggregate unmanaged load profiles within programs (kW)	Per the Decision, "unmanaged load" refers to customers not on TOU rates. There are no customers within IOU TE programs with entirely unmanaged charging, if "managed charging" includes service on TOU rates.
Narrative Tab	Outcome Metrics	Aggregate unmanaged load profiles outside of programs (kWh)	This metric will be estimated by distinguishing, where possible, residential EV customers not on TOU rates from those on TOU rates.
Narrative Tab	Outcome Metrics	Aggregate unmanaged load profiles outside of programs (kW)	This metric will be estimated by distinguishing, where possible, residential EV customers not on TOU rates from those on TOU rates.
Narrative Tab	Outcome Metrics	Net avoided costs from avoided upgrades from behind-the-meter VGI services such as ALM	IOU deferral calculations are currently confidential; pursuant to ALJ Ruling issued January 27, 2021 within R.14-08-013, deferral value calculations are required to be public for 2021. The IOUs will provide additional detail regarding the net avoided costs from avoided upgrades in the report. The methodology may vary over time and based on the program or pilot.
Narrative Tab	Program Metrics	Aggregate load profiles for EV TOU rates within programs (kWh)	Data will be based on separately metered EV load.
Narrative Tab	Program Metrics	Aggregate peak load of EV TOU rates within programs (kW)	Data will be based on separately metered EV load.
Narrative Tab	Program Metrics	Rate-to-host	Utilities will report on this metric for programs that track and offer this service.

Narrative Tab	Program Metrics	Rate-to-driver	Utilities will report on this metric for programs that track and offer this service.
Narrative Tab	Outcome Metrics	Aggregate load profiles for EV TOU rates outside of programs (kWh)	This would be updated on an annual basis for the annual VGI Report submitted in March. Metric will compare EV rate customers with customers enrolled in IOU infrastructure programs.
Narrative Tab	Outcome Metrics	Aggregate peak load of EV TOU rates outside of programs (kW)	This would be updated on an annual basis for the annual VGI Report submitted in March. Metric will compare EV rate customers with customers enrolled in IOU infrastructure programs.

The Program and Pilot Metrics tab includes metrics in the VGI Decision by program or pilot. This tab plans to list the utilities VGI programs and pilots and their associated aggregated metrics. Definitions of each metric are provided in the Descriptions tab. For draft purposes, illustrative program examples are provided.

Aggregated totals:				Totals:	1364	20	20	N/A	N/A	N/A	N/A	N/A	N/A	388.7	137.45
					Counts By Program or Pilot					Cost By Program or Pilot					
Program/Pilot(1)	Market Segment - Residential or Commercial	Market Segment - Subcategory	ESJ subcategory	Implementation Status	Number of ports participating in ALM	Number of sites participating in ALM	Number of sites participating in dynamic rates	Number of EV drivers participating in dynamic rates	Total number of V2G EVSE customers	Distribution-side cost savings	Customer-side cost savings (related to panel and similar equipment)	Upgrade avoided by ALM	Savings of upgrades avoided by ALM	Authorized Budget ($Millions)	Budget expended ($Millions)
EVCN (Program)	Commercial	Workplace	DAC	[redacted]				N/A	N/A	N/A	N/A	N/A	N/A	130.00	113.60
EVCN (Program)	Commercial	Workplace	Non DAC					N/A	N/A	N/A	N/A	N/A	N/A	130.00	113.60
EVCN (Program)	Commercial	Multi Unit Dwelling	DAC					N/A	N/A	N/A	N/A	N/A	N/A	130.00	113.60
EVCN (Program)	Commercial	Multi Unit Dwelling	Non DAC					N/A	N/A	N/A	N/A	N/A	N/A	130.00	113.60
Fleet Ready Program	Commercial	All	All	Active	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	236.30	20.60
Fast Charge Program	Commercial	All	All	Active	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22.40	3.25

Notes

(1) Programs/Pilots are examples only and are not intended to reflect all programs that would be listed.

(2) Program or pilots added or removed based on changes from previous report out

The Narrative tab lists the metrics that are not easily quantifiable and as a result, will be reported on a qualitative basis separately via a narrative. The narrative will be a Word document that will accompany the final reporting template spreadsheet and will summarize all VGI activities for each of the utilities. In the future and as more programs become available to the public, some of these metrics may move to the Program and Pilot Metrics tab. Narrative items with quantitative elements will be reported on in the narrative document only and will include graphs or data visualization elements where appropriate. The underlying data for any graphs or visualizations will be provided via a separate spreadsheet in the Appendix.

Name	Sub Category
Customer program or pilot and incentives related to VGI	Misc.
Adoption of rates that encourage VGI and adoption of mechanism to provide credit for export	Misc.
Efforts to collaborate with CAISO to design wholesale market rules and access that support VGI	Misc.
Leveraging or supplementing EPIC and/or other sources of funding for VGI technology demonstration projects	Misc.
Efforts to accelerate the use of VGI for resiliency	Misc.
Progress to reform interconnection rules to advance VGI	Misc.
Support and adoption of non-interconnection technical standards to advance VGI	Misc.
Summary on efforts to fund and launch VGI customer education	Misc.
Summary on efforts to develop and support complementary policies needed to support Automated Load Management (ALM) technology	Automated Load Management
ALM deployment in the utility territory in the context of both existing and future transportation electrification programs, rules, and tariffs to the extent practical; including estimates on the number of ALM	Automated Load Management
ALM systems Installed for passenger vehicles and any medium and heavy-duty vehicle segment(s) under currently approved transportation electrification programs as well as estimates on the potentially expected avoided distribution and customer-side cost savings attributable to such ALM installations	Automated Load Management
Customer VGI participation in utility demand response programs, including customer retention and efforts to reduce churn and data requested from 3rd party providers as needed;	Demand Response
Implementation of VGI pilots, lessons learned and potential future efforts	Misc.
Integration of VGI across the utility relevant business activities;	Misc.
Pilots underway with a discussion on the results and next steps including cost, lessons learned, et	Automated Load Management
Metrics on interconnection reform (in conjunction with item 7)	Misc.
Effectiveness of credit-for-export availability, lessons learned and potential next steps to increase	Misc.
Participants in credit for export and discussion to increase participation	Misc.
Annual energy exported (kWh) and report out on potential efforts to increase participation	Misc.
Overall barriers removed in V2B	Misc.
Number of EVs enrolled in DR programs	Demand Response
Rate of change of EV DR enrollment and potential steps to increase enrollment	Demand Response
EV DR enrollment capacity (MW)	Demand Response
EV DR enrollment load shift (MWh)	Demand Response
Estimated aggregated GHG reduction attributable to VGI	Misc.
Site Participation in rate-to-driver and discussion on how to increase participation	Rates
Site participating in DR, lesson learned and next steps to increase participation	Rates
Barriers to data collection and potential solutions	Misc.
Load shift for EV rate customers	Rates
Rate-to-driver enrollment by sites	Rates
Dynamic rate load shift (MWh)	Rates
Aggregate unmanaged load profiles within programs (kWh)	Rates
Aggregate unmanaged load profiles within programs (kW)	Rates
Aggregate unmanaged load profiles outside of programs (kWh)	Misc.
Aggregate unmanaged load profiles outside of programs (kW)	Misc.
Net avoided costs from avoided upgrades	Misc.
Aggregate load profiles for EV TOU rates within programs (kWh)	Rates
Aggregate peak load of EV TOU rates within programs (kW)	Rates
Rate-to-host	Rates
Rate-to-driver	Rates
Aggregate load profiles for EV TOU rates outside of programs (kWh)	Misc.
Aggregate peak load of EV TOU rates outside of programs (kW)	Misc.

3/12/21 Joint Utilities Amended Stocktake
Pilots and Programs Related to VGI

Column F, "VGI Project", represents the preliminary judgment of the Joint Utilities based on the information available and is subject to change based on further evaluation and analysis.

Agency/Org	Status	Pilots and Programs	Description	Infrastructure / Vehicle Procurement	VGI Project
Pacific Gas & Electric	Active	Clean Fuel Rebate: For Residential EV Customers	PG&E customers with EVs are eligible to receive an $800 Clean Fuel Rebate for their use of electricity as a clean transportation fuel. The Clean Fuel Rebate comes from a State of California program called the Low Carbon Fuel Standard. The goal of the Standard is to reduce greenhouse gas emissions from transportation by encouraging the adoption of cleaner transportation fuels, including electricity. This rebate will be transitioned to the statewide Clean Fuel Reward program by 2020.	Program	No
Pacific Gas & Electric	Ongoing	Demand Response Emerging Technology Pilot that relates to EV	1) EV study for ADR incentive - Develop an ADR incentive for residential EV Charging Station, 2) DER Technology for DR - Understand using DER (such as EV and battery) for DR and its barriers in order to collect information for existing DR program enhancements	Technology demonstration	No
Pacific Gas & Electric	Proposed	DRP DIDF and Partnership Pilot	The existing Distribution Investment Deferral Framework (DIDF) currently provides opportunities for Distributed Energy Resources (DERs), including EVs, to defer distribution investments . The Proposed Partnership pilot would explore alternative sourcing methods to procure aggregated Behind-The-Meter (BTM) DERs to defer distribution investments.	Aggregated Distribution Service (from EVs)	Yes
Pacific Gas & Electric	Active	Electric School Bus Renewables Integration.	PG&E will deploy make-ready infrastructure to serve a fleet of electric school buses in a disadvantaged community. In addition to providing make-ready infrastructure for charging stations, PG&E will test how charge management software can be used to integrate onsite renewable generation. Charge management software will be utilized to align the charging of the buses with excess renewable energy mid-day and thereby reduce energy costs and GHG emissions.	Infrastructure	Yes
Pacific Gas & Electric	Pending	Empower EV	To support EV adoption in low-moderate income communities, PG&E will provide EV chargers at no cost and additional installation funding for PG&E residential customers who have low-moderate incomes. PG&E will target low-moderate income communities with the program's EV Marketing, Education and Outreach (ME&O).	Infrastructure	No
Pacific Gas & Electric	Ongoing	EPIC 3.27 Multi-Purpose Meter	Project focuses on accurate, affordable utility grade EV charging submeter in support of Plug-In Electric Vehicle Submetering Protocol. Not directly VGI related but a foundational work for EV charging.	Infrastructure	No
Pacific Gas & Electric	Completed	EPIC 2.03B - Smart Meter - Vehicle to Home	The goal of this project was to complement EPIC 2.03 solar photovoltaics (PV) smart inverter assessment project by including electric vehicle related technology. EPIC2.03.b – Vehicle to Home demonstration focused on charging and discharging of theEVs in response to a demand respond event (providing load drop by islanding the house) or hard islanding events in different configurations. It was completed Feb. 2018.	Technology demonstration	Yes

*Incentive programs listed may overlap because SCE is listing the state agency's proceeding that allocates the fund and the agency that disperses the fund.

3/12/21 Joint Utilities Amended Stocktake
Pilots and Programs Related to VGI

Column F, "VGI Project", represents the preliminary judgment of the Joint Utilities based on the information available and is subject to change based on further evaluation and analysis.

Agency/Org	Status	Pilots and Programs	Description	Infrastructure / Vehicle Procurement	VGI Project
Pacific Gas & Electric	Active	EV Charge Network Program	Make-ready and utility-owned charging infrastructure for workplaces and multi-family dwellings. Includes incentives for charger purchase in some customer segments. Up to 7500 level 2 chargers deployed over 3 years. www.pge.com/evcharge	Infrastructure	Yes
Pacific Gas & Electric	Active	EV Fast Charge Program	Make-ready infrastructure for public DC Fast Charging plazas. Includes incentives for charger purchase in disadvantaged communities sites. Budget estimates to deploy approximately 50 sites and 230 DCFC chargers over 5 years.	Infrastructure	No
Pacific Gas & Electric	Active	EV Fleet Program	Make-ready infrastructure for medium-, heavy-duty, and non-road fleets that have commitments to purchase corresponding electric vehicles. Includes charger purchase incentives for transit, school bus, and disadvantaged community sites. Targets approximately 700 sites and 6500 vehicles over 5 years. www.pge.com/fleetready	Infrastructure	No
Pacific Gas & Electric	Pending	EV Schools and Parks	PG&E will deploy EV charging infrastructure that enables EV drivers to charge EVs on campuses where they learn or work and that enables state park visitors and employees to charge at the park	Infrastructure	No
Pacific Gas & Electric	Proposed	GRC Phase 1 Grid Mod 2020, 2023	D.18-03-023 in the CPUC's DRP proceeding requires each IOU to submit a Grid Modernization Plan in the distribution chapter of its GRCs to identify grid modernization investments that integrated DERs, including EVs, into the IOU's grid consistent with the DRP goals of avoiding or deferring the costs of distribution investments and enhancing the ability of DERs including EVs to support grid reliability and safety. PG&E's first Grid Modernization Plan was approved in PG&E's 2020 GRC and its next Grid Modernization Plan will be submitted with PG&E's 2023 GRC in June, 2021.	Grid Modernization	No
Pacific Gas & Electric	Active	Home EV Charger Information Resource.	PG&E will enhance the EV information it provides on its website, including checklists to help customers who are considering purchasing charging stations or looking for contractors to install them. Information should be translated into other languages PG&E customers speak.	ME&O	No
Pacific Gas & Electric	Active	Idle Reduction Technology.	PG&E will deploy make-ready infrastructure to serve up to 30 transport refrigeration units at one site in a disadvantaged community. In addition to providing make-ready infrastructure for charging stations, PG&E will provide a rebate for the EVSE and will provide technical assistance. PG&E will test how to minimize total cost of ownership for a fleet of transport refrigeration units and will test the maturity of charging stations for this vehicle technology.	Infrastructure	No

*Incentive programs listed may overlap because SCE is listing the state agency's proceeding that allocates the fund and the agency that disperses the fund.

3/12/21 Joint Utilities Amended Stocktake
Pilots and Programs Related to VGI

Column F, "VGI Project", represents the preliminary judgment of the Joint Utilities based on the information available and is subject to change based on further evaluation and analysis.

Agency/Org	Status	Pilots and Programs	Description	Infrastructure / Vehicle Procurement	VGI Project
Pacific Gas & Electric	Active	Medium or Heavy-duty Fleet Customer Demonstration	PG&E will deploy make ready infrastructure to serve a fleet of electronic transit buses in a disadvantaged community. In addition to providing make-ready infrastructure for charging stations, PG&E will provide a rebated for EVSE and will also provide a rebated and make ready infrastructure to deploy battery storage on site. PG&E will test how to minimize total cost of ownership for an electric fleet through a combination of tools, including different types of charging, load management software and battery storage. PG&E will produce a handbook of lessons learned.	Infrastructure	Yes
Pacific Gas & Electric	Proposed	Microgrid pilot	Proposed pilot and development of production-ready technology which leverages BTM DERs for resiliency in a PSPS. Project would develop coordination between an FTM generator (or battery) and BTM resources during grid islanding. This project would focus on BTM solar and storage, but would support, and may also test, V2G or other BTM technologies. Potential to grow project to a "Feeder of the Future" in support of cleaner PSPS.	Infrastructure, Microgrid Controls	Yes
Pacific Gas & Electric	Proposed at CPUC	PG&E Commercial electric vehicle day-ahead hourly real time pricing pilot (DAHRTP-CEV pilot)	PG&E's DAHRTP-CEV Pilot aims to gather information regarding the technical and operational feasibility, cost and benefits associated with a proposed day ahead hourly real time rate	Technology demonstration	Yes
Pacific Gas & Electric	Completed	Submetering Pilot	Study the potential for using submetering to provide rates and bills specific to the owners of PEVs. The pilot was conducted in two phases evaluating the strengths and weaknesses of subtractive billing for Single- and Multiple-Customers-of_record (SCOR/MCOR). Focus was on mapping service offerings across stakeholders, assessing accuracy, and evaluating customer satisfaction with the procut. Verified with SME's (Albert Phan/Albert Yan) that this pilot had no VGI elements.	Technology demonstration	No
Pacific Gas & Electric	Completed	V2G EVSE AC Pathway	The objective of this project was to develop a temporary interconnection pathway for pilots seeking V2G AC interconnection that will ensure the necessary safety precautions	Bi-directional charging	Yes
Pacific Gas & Electric, BMW	Active	ChargeForward Stage III	Objective of this project is to optimize smart charging to reducing customer charging bills and maximizing renewable energy integration, while reducing the impact to the grid. The project also analyzes the response of customers to incentives. The testing phase aims to explore the technical feasibility and cost-effectiveness of bi-directional charging.	One-directional, Bi-directional charging	Yes

*Incentive programs listed may overlap because SCE is listing the state agency's proceeding that allocates the fund and the agency that disperses the fund.

List of V2X Electric Vehicle Supply Equipment*		
Manufacturer	Model	Description
OEM 1	M1	150kW, 1 port, CCS
OEM 1	M2	150kW, 2 port, CCS, Chademo
OEM 2	Mod 1	300kW 2 ind port, CSS, Chademo
OEM 3	EVSE 1	500kW, Off Road
OEM4	Chr 1	

**Examples provided above do not represent a full or complete list. They are provided for illustrative purposes.*

VGI Mid-Term Report Narrative

Reporting Period: 1/2021 - 6/2021

PG&E is actively working on developing pathways that would allow customers interested in utilizing Vehicle Grid Interactive (VGI) technologies to participate in PG&E's programs. PG&E has proposed a set of four VGI pilot projects through its recent VGI Pilots AL[1] submission pursuant to D. 20-12-029[2], which is currently awaiting CPUC approval as of publication of report. PG&E is optimistic that the submitted AL will be approved in time to commence efforts by Q1 of 2022. PG&E is committed to integrating VGI throughout a wide range of its business activities. This document represents the narrative section of the first mid-term VGI report that PG&E is submitting in compliance with the decision. As PG&E is early in the process of integrating VGI, this report is brief in scope and it is expected to increase in scope and detail in future iterations.

The metrics reported below correspond to the row number in the VGI Reporting Template excel file, Narrative tab (starts with Row 3).

3. Customer program or pilot and incentives related to VGI

Demand Response Emerging Tech Pilot – Technology Demonstration (ongoing)

1) EV study for ADR incentive - Develop an ADR incentive for residential EV Charging Station,
2) DER Technology for DR - Understand using DERs (such as EV and battery) for DR and its barriers to collect information for existing DR program enhancements

[1] Request for Approval of PG&E's VGI Pilots in Compliance with Decision 20-12-029 ELEC_6259-E.pdf (pge.com)
[2] DECISION CONCERNING IMPLEMENTATION OF SENATE BILL 676 AND VEHICLE- GRID INTEGRATION STRATEGIES 355794454.PDF (ca.gov)

DRP DIDF and Partnership Pilot Aggregated Distribution Service (proposed)

The existing Distribution Investment Deferral Framework (DIDF[3]) currently provides opportunities for Distributed Energy Resources (DERs), potentially including Electric Vehicles (EVs), to defer distribution investments. The Proposed Partnership pilot would explore alternative sourcing methods to procure aggregated Behind-The-Meter (BTM) DERs to defer distribution investments.

Electric School Bus Renewables Integration – Infrastructure (complete)

PG&E has deployed make-ready infrastructure to serve a fleet of electric school buses in a disadvantaged community. In addition to providing make-ready infrastructure for charging stations, PG&E tested how charge management software can be used to integrate onsite renewable generation. Charge management software was utilized to align the charging of the buses with excess renewable energy mid-day and thereby reduce energy costs and GHG emissions.[4]

EPIC 3.27 Multi-Purpose Meter (ongoing)

Project focuses on accurate, affordable utility grade EV charging submeter in support of Plug-In Electric Vehicle Submetering Protocol. Not directly VGI related but a foundational work for EV charging. More about the program and an overview of this and other smart meter programs can be seen here.

EPIC 2.03B - Smart Meter - Vehicle to Home – Technology demonstration (completed)

The goal of this project was to complement EPIC 2.03 solar photovoltaics (PV) smart inverter assessment project by including electric vehicle related technology. EPIC 2.03.b – Vehicle to Home demonstration focused on charging and discharging of the EVs in response to a demand respond event (providing load drop by islanding the house) or hard islanding events in different configurations. It was completed Feb 2018. More about the program.

EV Charge Network Program – Infrastructure (active)

[3] Distribution Investment Deferral Framework ("DIDF") Partnership Pilot: 2021 Distribution Investment Deferral Framework ("DIDF") Partnership Pilot (pge.com)

[4] Final Evaluation Report, see page 280 for Electric School Bus Renewables Integration Pilot CA-TE-Priority-Review-Project-Evaluation-Report-Public-Version.pdf (cadmusgroup.com)

Make-ready and utility-owned charging infrastructure for workplaces and multi-family dwellings. Includes incentives for charger purchase in some customer segments. Up to 4,500 level 2 chargers deployed over 3 years. The program offers Automated Load Management services to interested hosts. It is currently fully subscribed. http://www.pge.com/evcharge.

Medium or Heavy-duty Fleet - Customer Demonstration (active)

PG&E is deploying make-ready infrastructure to serve a fleet of electronic transit buses in a disadvantaged community. In addition to providing make-ready infrastructure for charging stations, PG&E is providing a rebate for EVSE and will also provide a rebate and make-ready infrastructure to deploy battery storage on site. PG&E will test how to minimize total cost of ownership for an electric fleet through a combination of tools, including different types of charging, load management software and battery storage. PG&E will produce a handbook of lessons learned at the conclusion of the project. Read more about the PG&E Fleet Program.

Microgrid pilot – Infrastructure (Proposed in AL 6259-E)

Proposed pilot and development of production-ready technology which leverages BTM DERs for resiliency in a PSPS. Project would develop coordination between a Front of the Meter (FTM) generator (or battery) and behind the meter (BTM) resources during grid islanding. This project would focus on BTM solar and storage, but would support, and may also test, V2G or other BTM technologies. There is the potential to grow project to a "Feeder of the Future" in support of cleaner PSPS.

PG&E Commercial electric vehicle day-ahead hourly real time pricing pilot – Technology demonstration (DAHRTP-CEV pilot, Application No. A2010011)

PG&E's Commercial Electric Vehicle Day Ahead Realtime Rate (DAHRTP-CEV) Pilot aims to gather information regarding the technical and operational feasibility, cost and benefits associated with a proposed day ahead hourly real time rate. Read more about it at the application submitted to the CPUC.

V2G EVSE AC Pathway (completed)

The objective of this project was to develop a temporary interconnection pathway for pilots seeking V2G AC interconnection that will ensure the necessary safety precautions.

PG&E's Additional Efforts outside of utility programs:

PG&E is always seeking for opportunities to collaborate with different VGI players[5] inside and outside of our programs which can help us explore and understand better VGI technologies. Outside of the utility Demand Response Programs, PG&E collaborates with BMW in their smart charging pilot program, ChargeForward. In March 2021 in a joint press release[6], PG&E and BMW launched the third iteration of this program (ChargeForward Stage III) that will focus on enhancing their smart charging optimization mechanisms, integration of renewable energy and charging bill reduction for participants, as well as exploring future use cases of bidirectional charging.

4. Adoption of rates that encourage VGI and adoption of mechanism to provide credit for export

This will be part of the PG&E V2G Export pilot in submitted AL 6259-E. The pilot is currently pending approval and is expected to commence in 2022.

5. Efforts to collaborate with CAISO to design wholesale market rules and access that support VGI

This will be part of the PG&E V2G Export pilot in submitted AL 6259-E in response to FERC order 2222. The pilot is currently pending approval and is expected to commence in 2022.

6. Leveraging or supplementing EPIC and/or other sources of funding for VGI technology demonstration projects

PG&E plans to leverage the investment made in the EPIC Smart meter project and Pilot 3.11.B.

[5]The VGI ecosystem has several players which include OEMs, EVSE manufacturers, software companies, research institutions, aggregators, load serving entities and Agencies.

[6] PG&E & BMW ChargeForward Stage III – Joint Press Release: https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20210322_pge_and_bmw_group_taking_next_step_in_powering_electric_vehicles_with_renewable_energy_and_supporting_grid_reliability

7. Efforts to accelerate the use of VGI for resiliency

The PG&E microgrid pilot specified in AL 6259-E and pending approval included such efforts. Efforts have also been submitted in the OIR Reliability Proposal.

8. Progress to reform interconnection rules to advance VGI

PG&E has submitted AL ELEC_6209-E with the intent to further reform interconnection rules to advance VGI in junction with ALs from the other IOUs. The AL is currently pending CPUC approval.

9. Support and adoption of non-interconnection technical standards to advance VGI

ISO 15118-20	Is being considered for approval but is not yet finalized by the International Standards Organization (ISO).
IEEE 2030.5	
OpenADR 2.0.b	Currently being used for the ChargeForward pilot program and will be embraced for upcoming VGI Pilots.
Vehicle telematics (4G network rules)	Currently being used by ChargeForward pilot

10. Summary on efforts to fund and launch VGI customer education

PG&E plans to begin these efforts post funding of the VGI Pilot projects in submitted AL 6259-E and will provide educational resources to prospective program participants. This education will be further developed when and if we are able to scale these pilots into full programs.

11. Summary on efforts to develop and support complementary policies needed to support Automated Load Management (ALM) technology

PG&E is actively developing a proposal for an extension program, EV Charge 2 (EVC 2) to follow-up on its successful EV Charge Network (EVCN) program, which has installed Level 2 EV charging infrastructure in multi-unit dwellings and workplaces. As part of the extension program

proposal, and in line with the recent CPUC VGI/SB 676 Decision, PG&E will "describe its standard evaluation criteria to determine host sites where ALM would benefit ratepayers by reducing costs while meeting host site needs for electric vehicle charging." PG&E has used ALM in EVCN and looks forward to again using this technology in an extension program if/when such a program is approved by the CPUC.

12. ALM deployment in the utility territory in the context of both existing and future transportation electrification programs, rules, and tariffs to the extent practical; including estimates on the number of ALM

EVC 2 has not yet been proposed and as such, the number of ALM ports that will be involved is not yet known.

13. ALM systems Installed for passenger vehicles and any medium and heavy-duty vehicle segment(s) under currently approved transportation electrification programs as well as estimates on the potentially expected avoided distribution and customer-side cost savings attributable to such ALM installations

Within the EVCN program, 1,364 ports are participating in ALM. PG&E does not track the information required to calculate distribution and customer side cost savings.

14. Customer VGI participation in utility demand response programs, including customer retention and efforts to reduce churn and data requested from 3rd party providers as needed.

PG&E does not currently have VGI participation in demand response programs.

15. Implementation of VGI pilots, lessons learned and potential future efforts

PG&E's VGI Pilots are currently pending approval and have been submitted in AL 6259-E filed with the CPUC.

16. Integration of VGI across the utility relevant business activities

Compliant with CPUC VGI Decision (D. 20-12-029) and following PG&E's approach to incorporate a holistic portfolio of VGI customer offerings, PG&E is actively including VGI in relevant business areas. In addition to the projects and programs mentioned in previous sections of this report, PG&E has integrated VGI in the following activities:

- Clean Energy Transportation: Development of future transportation electrification programs will include identifying areas where VGI could provide benefits to customers and the grid. Currently, and as part of the near-term TEF Decision, PG&E is considering offering

Automated Load Management (ALM) applications[7] in cases that the customer would benefit from it and opts to voluntarily install VGI technology.

- Reliability OIR, R. 20-11-033[8] - Summer 2022 and 2023: PG&E has provided supportive comments to ED Staff's suggestion that ELRP modification should include VGI.
- Draft DER Action Plan 2.0[9]: PG&E is identifying high value VGI use cases that could potentially be incorporated into the plan.
- Interconnection V2G AC: PG&E Interconnection team continues to collaborate with other utilities to explore V2G AC use cases that will help inform future regulation.

17. Pilots underway with a discussion on the results and next steps including cost, lessons learned

Pilot name	Description	Costs	Lessons Learned
Electric School Bus Renewables Integration	PG&E partnered with Olivine Inc. and Liberty Access Technologies this pilot project to provide Pittsburg Unified School District (PUSD) with a low-cost, configurable electric fleet management system. The main goals of this pilot were: 1. Reduce the Total Cost of Ownership (TCO) of electric buses for school districts by: a. Minimizing infrastructure costs; b. Minimizing fuel costs - Managing charging to reduce electric usage during expensive, peak times. 2. Inform how medium and heavy-duty fleet vehicles can act as distributed energy resources during periods of high renewable penetration by testing	$1.4M	• Contracting, construction, and implementing test protocols with schools may require planning for extra time to reflect their unique contracting processes and seasonal operational patterns. • Fleet electrification projects do not occur in a vacuum and are subject to broader risks that site hosts face. For example, projects that implement networked systems or virtual charge management controls are exposed to cybersecurity threats. These internet-enabled capabilities are only as durable as the site host system is secure. • School districts and other early fleet adopters may not be able to adjust operations to optimize the use of new electric buses. The suitability of selected electric buses to serve as 1:1 replacements for existing fleet vehicles should be carefully considered during procurement (including passenger capacity and range), or expectations for usage (number of days in use and overall mileage) should be appropriately tempered. • The electric school bus industry is experiencing growing pains, which affects equipment O&M. PRP activities brought to light new barriers and accelerated conversations between key industry actors to identify issues and search for solutions. • When upfront cost support is available, electric school buses have strong potential to reduce fleet TCO relative to the fleet baseline due to the large fuel and O&M savings anticipated under normal operating patterns; lacking support in the form of grants and infrastructure, the cost of electric school buses relative to conventional vehicles does

[7] https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M386/K637/386637996.PDF

[8] **Staff Concepts Paper**: see here; **PG&E Opening Testimony**: see here

[9] Draft DER Action Plan 2.0 see here

Pilot name	Description	Costs	Lessons Learned
	incentive mechanisms for compensating fleet operators to adapt charging schedules to align with renewable generation.		not pencil out. • Managed charging with low-cost, non-networked chargers is feasible and can yield operational cost savings for the fleet compared to uncontrolled charging. • PG&E was insightful in scheduling a significant block of time after commissioning during which project operators could iron out issues with project hardware and software integration. The challenge of identifying the cause of issues can be compounded when there are several distinct systems integrated in a single project. • The use of dynamic signaling to optimize for grid services, renewables, and GHG reductions is feasible. These opportunities can be better realized with high, consistent utilization of the buses. • PG&E's Commercial BEV rate design is effective in motivating desired charging behavior and consumption patterns but does not align well with XSP participation.
Medium/Heavy-duty Fleet Customer Demonstration	PG&E partnered with San Joaquin Regional Transit District (SJRTD) to install five depot chargers for overnight charging, demand management software to reduce demand charges associated with overhead fast chargers, and a battery energy storage system (BESS) to further reduce demand charges. The goals of this pilot were: 1. Reduce the Total Cost of Ownership (TCO) using three unique charging models a. Overnight charging at the Regional Transportation Center (RTC) depot location using direct current (DC) fast chargers b. Extreme fast charging at SJRTD's Union Transfer Station (UTS) paired with energy storage c. Extreme fast charging at SJRTD's Downtown Transit Center (DTC) paired with demand management software	$1.7M	• The process of deploying energy storage in relatively new applications like transit transfer stations may be more complex and time consuming than expected because local contractors and customers like transit agencies may still have uncertainty about what is required for the install, cost of components, and cost of labor. This issue may or may not be resolved if a turnkey solution is procured from product manufacturers. • Early partnership and regular coordinated discussions between the utility, transit agencies, and relevant vendors will provide opportunities for transfer of knowledge and best practices. The utility brings unique insights and can support agencies with expertise developed through implementing programs and projects throughout the territory. • Direct access to vehicle manufacturer's online portal with electric bus and charger operational data expedited the data collection process and analysis. It provided transparency into RTD's operations and enabled the evaluation team to react quickly to operational changes. • The complexity of managing the charging protocol of multiple generations of buses with a mix of overhead fast charging and depot charging warrants extensive guidance from the bus manufacturer and requires sophisticated management from the transit agency.

Pilot name	Description	Costs	Lessons Learned
	2. Inform how transit agencies can best implement transportation electrification and electrify their fleet 3. Identify how non-electrification resources could be used to evaluate other opportunities for cost savings and energy management.		
EV Charge Network Program	Make-ready and utility-owned charging infrastructure for workplaces and multi-family dwellings. Includes incentives for charger purchase in some customer segments. Up to 4,500 level 2 chargers deployed over 3 years. www.pge.com/evcharge	$113.6M	• Offering turnkey support drives participation and strong demand from Priority Community customers and is generally preferred by most customers • Customers seek further support beyond what was offered in EVCN • Costs can be effectively managed through a variety of tactics and targets- • It is efficient and effective to create sophisticated applications to prioritize sites quantitatively before conducting site walks, preliminary designs, and offering contracts • Application sophistication can increase in certain cases when EVSPs play a larger role in application submission on behalf of sites • Utilizing automated load management (ALM) is an effective way to keep costs low • Customer willingness to pay can be maximized through custom-tailored incentives and capping PG&E's cost exposure • Utilization of ports can be increased by prioritizing key indicative criteria • Alignment with other funding entities increases likelihood of project success- • Coordination with community-based organizations can increase site acquisition and customer awareness and ultimate success of EV programs, particularly in priority communities- • There are low cost opportunities for futureproofing that PG&E can support when they fit within program cost targets

18. Metrics on interconnection reform (in conjunction with item 7)

N/A

19. Effectiveness of credit-for-export availability, lessons learned and potential next steps to increase availability

This will be part of the PG&E V2G Export pilot in submitted AL 6259-E. The pilot is currently pending approval and is expected to commence in 2022.

20. Participants in credit for export and discussion to increase participation

This will be part of the PG&E V2G Export pilot in submitted AL 6259-E. The pilot is currently pending approval and is expected to commence in 2022.

21. Annual energy exported (kWh) and report out on potential efforts to increase participation

N/A

22. Overall barriers removed in V2B

PG&E was closely involved in identifying barriers to VGI implementation (including V2B technology) during the VGI Working Group[10] effort. VGI is still a nascent market and more research is required to identify most beneficial pathways to overcome barriers. As a result, PG&E is proposing several vehicle-to-anything (V2X) pilot programs[11] that will explore cost-effective strategies to enable vehicle-to-building solutions.

23. Number of EVs enrolled in DR programs

No vehicles are currently enrolled in PG&E DR programs. PG&E in conjunction with the BMW ChargeForward pilot has 400 vehicles enrolled as described above in #3.

24. Rate of change of EV DR enrollment and potential steps to increase enrollment

N/A

25. EV DR enrollment capacity (MW)

0 MW

[10] VGI Working Group: https://gridworks.org/wp-content/uploads/2020/07/VGI-Working-Group-Final-Report-6.30.20.pdf
[11] Advice Letter 6259-2

26. EV DR enrollment load shift (MWh)

0 MWh

27. Estimated aggregated GHG reduction attributable to VGI

This is not currently tracked within PG&E

28. Site Participation in rate-to-driver and discussion on how to increase participation

N/A

29. Sites participating in DR, lesson learned and next steps to increase participation

N/A

30. Barriers to data collection and potential solutions

The barriers include not having previously tracked the data and in certain cases, PG&E doesn't have direct access to that data and would only be able to collect it through a customer survey process which would require additional funding to conduct.

31. Load shift for EV rate customers

PG&E is not able to provide this as there is no record of what these customers did before they changed rates.

32. Rate-to-driver enrollment by sites

N/A

33. Dynamic rate load shift (MWh)

N/A

34. Aggregate unmanaged load profiles within programs (kWh)

PG&E does not have a way to identify EV users that are on unmanaged load profiles.

35. Aggregate unmanaged load profiles within programs (kW)

PG&E does not have a way to identify EV users that are on unmanaged load profiles.

36. Aggregate unmanaged load profiles outside of programs (kWh, Misc.)

PG&E does not have the requisite information to compare residential EV customers not on TOU rates with those on TOU rates.

37. Aggregate unmanaged load profiles outside of programs (kW, Misc.)

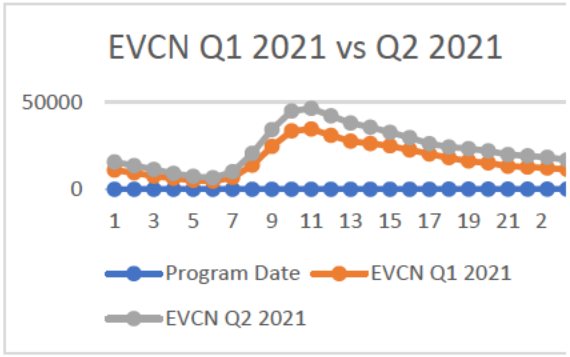
PG&E does not have the requisite information to compare residential EV customers not on TOU rates with those on TOU rates.

38. Net Avoided Costs from Avoided Upgrades

N/A for midterm report. It is uncertain if this data will be determinable for the annual report.

39. Aggregate Load Profile for EV TOU Rates within programs (kWh, Rates)

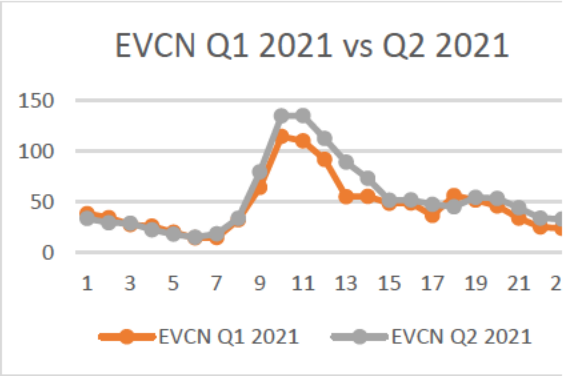
Program	Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
EVCN	Q1 2021	10934	9418	7523	6269	5144	4665	6712	13843	24533	33435	34538	30894	27544	26235	24876	22504	20204	18134	16169	15129	13219	12741	12137	11423
EVCN	Q2 2021	15616	13548	11384	9057	7377	6546	10033	20560	34190	44820	46409	42071	37981	35595	32651	29619	26153	24197	23301	21939	19892	19128	18322	16845
Fleet	Q1 2021	[redacted]																							
Fleet	Q2 2021																								
Fast Charge	Q1 2021																								
Fast Charge	Q2 2021																								



[redacted]

40. Aggregate peak load of EV TOU rates within programs (kW, Rates)

Program	Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
EVCN	Q1 2021	38	34	27	26	20	14	15	32	64	114	110	92	55	55	48	49	36	56	51	46	34	25	24	21
EVCN	Q2 2021	33	29	29	22	18	15	18	34	79	134	135	112	89	73	51	52	47	45	54	53	44	34	33	31
Fleet	Q1 2021	[redacted]																							
Fleet	Q2 2021																								
Fast Charge	Q1 2021																								
Fast Charge	Q2 2021																								



[redacted]

41. Rate-to-host

PG&E does not have a rate-to-host program.

42. Rate-to-driver

PG&E does not have a rate-to-driver program nor is PG&E aware of what drivers are charged by third parties. Collecting this data would require a separately funded survey process.

43. Aggregate load profiles of EV TOU rates outside of programs (kWh)

N/A (outcome metric)

44. Aggregate peak load of EV TOU rates outside of programs (kW)

N/A (outcome metric)