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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	Ratemaking 18-12-006

PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E) VEHICLE-GRID INTEGRATION STRATEGIES ANNUAL REPORT FOR 2021 AND MOTION TO ACCEPT LATE FILING

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PACIFIC GAS AND ELECTRIC COMPANY

Dated: March 17, 2022

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I. VEHICLE-GRID INTEGRATION STRATEGIES ANNUAL REPORT

Pursuant to Ordering Paragraph (OP) 1 of Decision (D.) 21-12-029, Pacific Gas and Electric Company (PG&E) hereby submits its 2021 annual report on Vehicle-Grid Integration (VGI) Strategies for 2021. The Report outlines PG&E's VGI activities through December 31, 2021.

II. MOTION TO ACCEPT LATE FILING

Decision 21-12-029, OP 1, required the electric corporations to file its 2021 annual report on VGI Strategies on March 15, 2022. Accordingly, this filing is two days late. However, since compliance itself was timely and complete, PG&E does not believe that any prejudice will result from accepting this late filing of the annual report. Therefore, PG&E respectfully requests acceptance of this filing.

Respectfully Submitted,
BENJAMIN ELLIS

By: */s/ Benjamin Ellis*
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Dated: March 17, 2022

Attachment A

Annual VGI Strategies Report

Pacific Gas & Electric

Annual

Vehicle-Grid Integration Strategies Report

Submitted on March 17, 2022

Table of Contents

Pacific Gas and Electric's Annual Report on Vehicle-Grid Integration Strategies, Programs and Pilots Metrics 1

Executive Summary 1

VGI Definitions 1

Based on this definition, VGI activities and programs can take many forms, broadly categorized as follows: 2

- V1G: Vehicle charging is managed to respond to grid requirements to improve reliability and reduce costs. SCE further breaks this down into direct and indirect forms: 2
  - Indirect V1G uses price signals and/or other mechanisms to optimize charging, including TOU rates and demand response 2
  - Direct V1G features the utility taking an active role in controlling timing and amount of vehicle charging, for example throttling charging load during peak periods 2
- V2B: Vehicle-to-building integration, under which an EV may provide power directly to a home or building 2
- V2G: Vehicle-to-grid bidirectional charging and discharging, under which EVs may discharge onto the grid in addition to characteristics offered by V1G. 2

VGI Reporting Template Structure 2

Narrative Questions 3

3. Customer program or pilot and incentives related to VGI - 3
4. Adoption of rates that encourage VGI and adoption of mechanism to provide credit for export 6
5. Efforts to collaborate with CAISO to design wholesale market rules and access that support VGI 6
6. Leveraging or supplementing EPIC and/or other sources of funding for VGI technology demonstration projects 6
7. Efforts to accelerate the use of VGI for resiliency 6
8. Progress to reform interconnection rules to advance VGI 7
9. Support and adoption of non-interconnection technical standards to advance VGI - 7
10. Summary on efforts to fund and launch VGI customer education 7
11. Summary on efforts to develop and support complementary policies needed to support Automated Load Management (ALM) technology 7
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 7
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 – 8

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. 8

15. Implementation of VGI pilots, lessons learned and potential future efforts Highlight what we filed / EMT / EPRI / EPIC 8

16. Integration of VGI across the utility relevant business activities 8

17. Pilots underway with a discussion on the results and next steps including cost, lessons learned .. 8

18. Metrics on interconnection reform (in conjunction with item 7) 11

19. Effectiveness of credit-for-export availability, lessons learned and potential next steps to increase availability 11

20. Participants in credit for export and discussion to increase participation – 11

21. Annual energy exported (kWh) and report out on potential efforts to increase participation 11

22. Overall barriers removed in V2B 11

23. Number of EVs enrolled in DR programs 11

24. Rate of change of EV DR enrollment and potential steps to increase enrollment 11

25. EV DR enrollment capacity (MW) 11

26. EV DR enrollment load shift (MWh) 11

27. Estimated aggregated GHG reduction attributable to VGI 12

28. Site Participation in rate-to-driver and discussion on how to increase participation – 12

29. Sites participating in DR, lesson learned and next steps to increase participation – 12

30. Barriers to data collection and potential solutions 12

31. Load shift for EV rate customers 12

32. Rate-to-driver enrollment by sites 12

33. Dynamic rate load shift (MWh) 12

34. Aggregate unmanaged load profiles within programs (kWh) 12

35. Aggregate unmanaged load profiles within programs (kW) 12

36. Aggregate unmanaged load profiles outside of programs (kWh, Misc.) 12

37. Aggregate unmanaged load profiles outside of programs (kW, Misc.) 13

38. Net Avoided Costs from Avoided Upgrades 13

39. Aggregate load profiles for EV TOU rates within programs (kWh) 13

40. Aggregate peak load of EV TOU rates within programs (kW) 13

41. Rate-to-host 14

42. Rate-to-driver 14

43. Aggregate load profiles for EV TOU rates outside of programs (kWh) 14
44. Aggregate peak load of EV TOU rates outside of programs (kW) 16
Appendix A - VGI Reporting Template 19
Program and Pilot Metrics 19

Pacific Gas and Electric's Annual Report on Vehicle-Grid Integration Strategies, Programs and Pilots Metrics

March 15, 2022

Executive Summary

On December 21, 2020, the California Public Utilities Commission (CPUC or Commission) issued Decision (D.) 20-12-029, *Decision Concerning Implementation of Senate Bill 676 and Vehicle-Grid Integration Strategies* (the Decision), which among other things, orders the utilities to file annual and mid-term reports on metrics pertaining to pilots and programs related to Vehicle-Grid Integration (VGI).

Ordering Paragraph (OP) 1 directs utilities to "file …. ."[1] Additionally, in accordance with the Decision,[2] the report uses the VGI reporting template that was developed in consultation with Energy Division staff and upon which stakeholders commented during the Joint Utilities' VGI Pilots and Reporting Template Workshop on March 16, 2021.[3] The data collection template is provided as a separate excel document.

The report covers the period from January 1 through December 31, 2021.

VGI Definitions

SB 676 originally defined VGI and gave authority to the Commission to revise the definition. In the Decision, VGI's definition is revised to the following:

> "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:
> A. Increasing electrical grid asset utilization and operational flexibility.
> B. Avoiding otherwise necessary distribution infrastructure upgrades and supporting resiliency.
> C. Integrating renewable energy resources.

---

[1] D.20-12-029, OP 1.
[2] D.20-12-029, p. 61.
[3] SCE, San Diego Gas & Electric Company (SDG&E), and Pacific Gas and Electric Company (PG&E) are collectively referred to as the Joint Utilities.

D. Reducing the cost of electricity supply.
E. Offering reliability services consistent with the resource adequacy requirements established by Section 380 or the Independent System Operator tariff.[4]

Based on this definition, VGI activities and programs can take many forms, broadly categorized as follows:

- V1G: Vehicle charging is managed to respond to grid requirements to improve reliability and reduce costs. SCE further breaks this down into direct and indirect forms:
  - Indirect V1G uses price signals and/or other mechanisms to optimize charging, including TOU rates and demand response
  - Direct V1G features the utility taking an active role in controlling timing and amount of vehicle charging, for example throttling charging load during peak periods
- V2B: Vehicle-to-building integration, under which an EV may provide power directly to a home or building
- V2G: Vehicle-to-grid bidirectional charging and discharging, under which EVs may discharge onto the grid in addition to characteristics offered by V1G.

VGI Reporting Template Structure

The Decision determines that "[r]obust VGI metrics and reporting are essential" for statutory compliance as well as determining progress toward goals and providing information to various parties and to help evaluate the VGI programs.[5] Additionally, the Decision adopts the VGI staff paper proposal to establish 3 categories, with numerous corresponding metrics:

(1) activity – track adoption of VGI policy actions
(2) program – track the success of program implementation against program goals
(3) outcome – track aggregate progress toward end goals across all programs and activities.[6]

For reporting purposes, the Decision directed the large electrical corporations to consult with the Commission's Energy Division staff to create a VGI reporting template that

[4] D.20-12-029, p. 12-13.
[5] Decision, p. 52.
[6] Id.

incorporated the required metrics.[7] The utilities collaborated with Energy Division staff and also served a draft copy of the VGI reporting template to the service list and other stakeholders on February 28, 2021 in order to allow time for review prior to the Joint Utilities' workshop on March 16, 2021, in which stakeholders had an opportunity to provide feedback.

The VGI reporting template consists of two components: (1) a narrative section, which includes general utility and PG&E specific questions, to provide an overview of the utility's VGI efforts and qualitative information and (2) a spreadsheet for reporting quantifiable data, such as pilot/program participation, costs, and other data. PG&E's spreadsheet is provided as Attachment A.

Narrative Questions

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 DER (such as EV and battery) for DR and its barriers to collect information for existing DR program enhancements

DRP DIDF and Partnership Pilot Aggregated Distribution Service (ongoing)

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.

Electric School Bus Renewables Integration – Infrastructure (active)

PG&E is deploying 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.

[7] Decision, p. 60.

EPIC 3.27 Multi-Purpose Meter (completed)

Project focused 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.

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.

EV Charge Network Program – Infrastructure (active)

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. The program offers Automated Load Management services to interested hosts. It is currently fully subscribed. www.pge.com/evcharge

EV Charge 2 Program – Infrastructure (proposed)

An extension of the EV Charge Network program intended to support the installation of approximately 16,000 charging ports for multifamily housing residents.

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.

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.

Residential V2X pilot – Infrastructure (Proposed in AL 6259-E)

Give residential customers access to V2G technology, determine pathways to scale and enable the following services:

- EV backup power (2022)
- EV load shift (2023)
- EV export (2023)

Commercial V2X pilot – Infrastructure (Proposed in AL 6259-E)

Give commercial customers access to V2G technology, determine pathways to scale and enable the following services:

- EV backup power (2022)
- EV load shift (2023)
- EV export (2023)

V2G Market Simulation pilot – Infrastructure (Proposed in AL 6259-E)

Determine pathways for heavy duty EV market participation providing ancillary services. It gives School Districts access to V2G technology for E-Buses, creates new revenue streams for customers and grid support services. (launch 2022)

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

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

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

BMW ChargeForward Pilot (active)

The BMW ChargeForward Pilot is a smart charging program in partnership with PG&E. It has been running for more than 5 years and is currently in its third phase. Phase three has a goal of enrolling approximately 3,000 customers who will use their vehicles to support grid reliability. This program offers both upfront and performance-based incentives to customers.

LCFS Resilient Charging Pilot (active)

Resilient Charging is a Low Carbon Fuel Standard (LCFS) funded pilot designed to provide EV resiliency in the face of increasing wildfires. It is a two-phased pilot, with the following goals:

Phase One

1. Identify EV drivers in High Fire Threat Districts (HFTDs) and areas that have been affected by Public Safety Power Shutoff (PSPS) events

Phase Two

2. Develop a baseline for EV driver charging behavior before a PSPS event
3. Test customer experience and valuation of a third-party platform that provides proactive communication and managed charging of EVs as a resiliency service

Emergency Load Reduction Program (ELRP)

The ELRP is a 5-year pilot to ensure adequate electric power in the event of extreme weather during times of greatest need. The adoption of this pilot was driven by the July 30, 2021, Governor Newsom Emergency Proclamation "urging all state energy agencies to ensure there is adequate electricity to meet the needs of Californians in 2022."[8] The 2022 ELRP, among other requirements adopted, "...expanded on electric vehicle potential by allowing aggregation of vehicle to grid managed charging and discharge to support the grid at net peak."[9]

PG&E-GM Vehicle-to-Home Pilot

In the pilot, PG&E and GM will test a retrofit GM electric vehicle (EV) at PG&E's Applied Technology Services (ATS) facility in San Ramon, Calif. in summer 2022 and test in a field demonstration at small subset of customers' homes following the lab testing.

PG&E-Ford Vehicle-to-Home Pilot

In the pilot, PG&E and Ford will test Ford's F-150 Lightning EVs and bidirectional charging systems in a field demonstration at a small subset of customers' homes beginning in spring 2022.

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 submitted in AL 6259-E. The pilot was rejected by CPUC in the PD and may be refiled). It is also being considered in a BEV Export pilot that is currently being proposed.

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. The pilot is currently pending approval and is expected to commence in 2022. It is also being considered in the BEV Export pilot as mentioned above.

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. PG&E is also looking to participate in additional EPIC projects which EPRI in which is taking the lead as applicant.

7. Efforts to accelerate the use of VGI for resiliency

[8] IBID

[9] D. 21-12-015, page 3

The PG&E microgrid pilot specified in AL 6259-E and pending approval include such efforts. Efforts have also been submitted in an advice letter to add the use of VGI resources to the ELRP pilot beginning in 2022.

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 has been approved with some modifications.

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 has submitted proposal for an extension program 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

EVC2 has not yet been approved so 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 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. This is expected to change in May of 2022 when such support begins in the updated Emergency Load Response Program (ELRP).

15. Implementation of VGI pilots, lessons learned and potential future efforts Highlight what we filed / EMT / EPRI / EPIC

PG&E's VGI Pilots are currently pending approval.

16. Integration of VGI across the utility relevant business activities

PG&E is preparing to integrate VGI in the Emergency Load Response Program beginning in May of 2022.

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

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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 incentive mechanisms for compensating fleet operators to adapt charging schedules to align with renewable generation.	$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 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	$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.

	(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 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.		• 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.
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	$113.6M	• Offering turnkey support drives participation and strong demand from Disadvantaged Community (DAC) customers in EVCN 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 criteria- • 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 when EVSPs play a larger role in application submission on behalf of sites • Utilizing automated load management (ALM) whenever possible 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 of EV programs- • There are low cost opportunities for futureproofing that PG&E can support when they fit within program cost thresholds

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 was anticipated as being part of the EV Export pilot proposed in AL 6259-E which has been rejected by the CPUC. PG&E may refile in a new advice letter or may substitute the separate BEV Export pilot currently being proposed.

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

This will be determined when one of the above pilot projects is approved and completed.

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

22. Overall barriers removed in V2B

PG&E has not as of yet, removed any of the barriers for V2B.

23. Number of EVs enrolled in DR programs

This number is expected to grow beginning in May of 2022 when enrollments for ELRP are planned to begin.

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

N/A.

25. EV DR enrollment capacity (MW)

0 MW.

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 –

PG&E does not have rate-to-driver programs.

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

PG&E does not have VGI sites that participate in DR.

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 the record of what these customers did before they changed rates was not recorded.

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.)

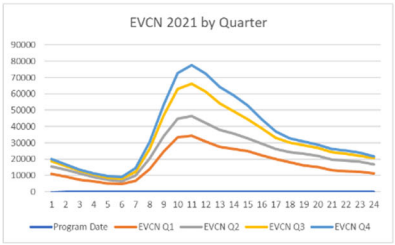
PG&E does not have the requisite information to compare residential EV customers not on TOU rates with those on TOU rates.

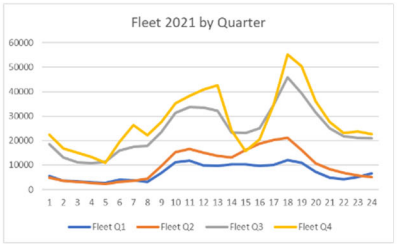
38. Net Avoided Costs from Avoided Upgrades

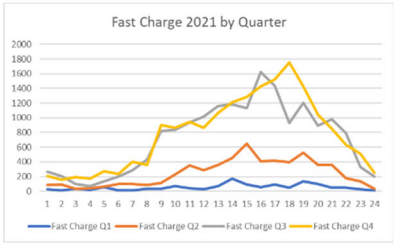
PG&E does not track avoided costs from avoided upgrades.

39. Aggregate load profiles for EV TOU rates within programs (kWh)

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	10924	9412	7518	6263	5139	4660	6707	13838	24528	33428	34530	30884	27529	26219	24866	22497	20200	18129	16164	15120	13204	12730	12128	11418
EVCN	Q2	15612	13543	11379	9053	7373	6542	10029	20556	34185	44813	46397	42058	37970	35584	32644	29612	26144	24186	23292	21925	19886	19124	18317	16840
EVCN	Q3	18619	15963	13014	10511	8680	7914	12270	26263	46826	62995	66254	61472	54117	49334	44397	38974	33075	30127	28594	26868	24372	23311	22180	20587
EVCN	Q4	19978	16913	13690	11292	9627	9104	14605	30599	53154	72800	77540	72421	64243	58947	53013	44601	37114	32729	30769	28868	26192	25308	23879	21790
Fleet	Q1	5553	3641	3451	2994	2693	3967	3729	3206	6852	11226	11870	9793	9728	10336	10274	9752	10193	12017	11025	7278	4972	4176	5030	6597
Fleet	Q2	4854	3498	3120	2809	2319	3180	3518	4406	9742	15254	16704	15140	13707	13050	16127	18665	20316	21106	16081	10755	8278	6927	5651	5211
Fleet	Q3	18626	13136	11141	10819	11359	15955	17518	17804	23476	31399	33711	33428	32112	23265	23062	25075	34679	45916	39303	31526	25031	21858	21135	20841
Fleet	Q4	22468	16897	15185	13390	11067	19381	26364	22175	27631	35320	38183	40910	42717	24151	15669	20542	34535	55158	50366	36087	27620	23195	23786	22770
Fast Charge	Q1	24	11	37	19	56	12	12	34	34	73	37	27	68	168	92	55	93	49	137	98	49	48	24	12
Fast Charge	Q2	86	92	35	40	63	98	97	83	115	226	350	287	356	450	645	407	416	395	523	360	356	177	135	34
Fast Charge	Q3	262	204	102	70	136	199	285	428	821	835	934	1013	1159	1181	1132	1624	1435	928	1202	895	982	792	333	202
Fast Charge	Q4	207	157	192	173	272	237	401	356	900	866	945	864	1066	1211	1285	1432	1523	1754	1427	1044	849	633	512	253

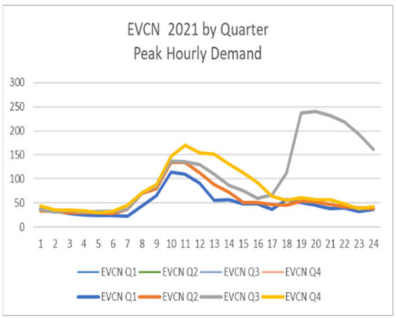


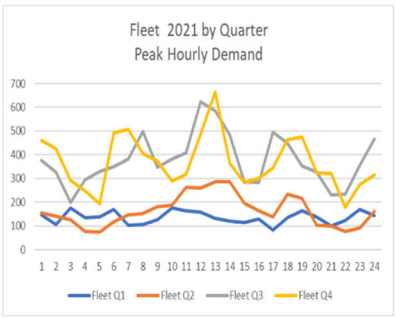


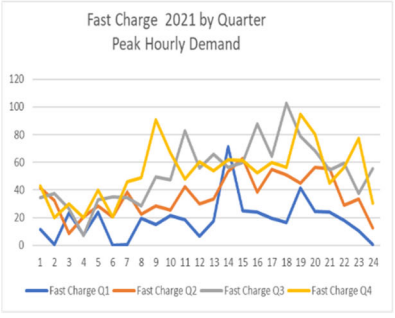


40. Aggregate peak load of EV TOU rates within programs (kW)

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	38	34	27	26	24	24	23	44	65	114	110	92	55	57	48	49	37	56	51	46	37	40	32	36
EVCN	Q2	33	32	30	30	30	28	37	70	79	134	135	112	89	73	51	52	47	45	54	53	46	42	39	38
EVCN	Q3	37	31	36	31	32	32	36	72	85	137	135	131	110	87	76	60	67	113	238	241	232	218	193	162
EVCN	Q4	44	35	35	33	30	32	46	71	88	147	170	155	152	132	113	93	64	56	62	56	56	48	38	43
Fleet	Q1	148	106	175	135	137	171	104	105	128	176	165	159	131	121	115	128	84	135	164	139	101	123	171	144
Fleet	Q2	156	140	127	76	73	117	148	154	183	187	264	260	286	286	197	163	139	234	217	102	100	77	91	162
Fleet	Q3	376	326	200	296	329	350	383	498	346	381	410	624	584	482	287	283	496	449	353	328	231	233	355	465
Fleet	Q4	461	425	291	247	192	493	506	405	374	290	317	486	665	364	283	299	345	463	474	324	322	180	275	316
Fast Charge	Q1	12	0	24	8	24	0	0	20	15	21	19	7	18	71	25	24	20	17	41	24	24	18	11	0
Fast Charge	Q2	41	32	8	20	28	21	38	23	28	26	42	30	34	53	63	39	55	51	45	57	55	29	33	13
Fast Charge	Q3	35	37	27	7	33	35	35	29	50	48	83	56	66	56	60	88	64	103	79	68	55	59	38	55
Fast Charge	Q4	43	20	30	20	40	21	46	49	91	67	48	60	54	62	61	52	60	56	95	80	45	56	77	31







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 for EV TOU rates outside of programs (kWh)

Commercial

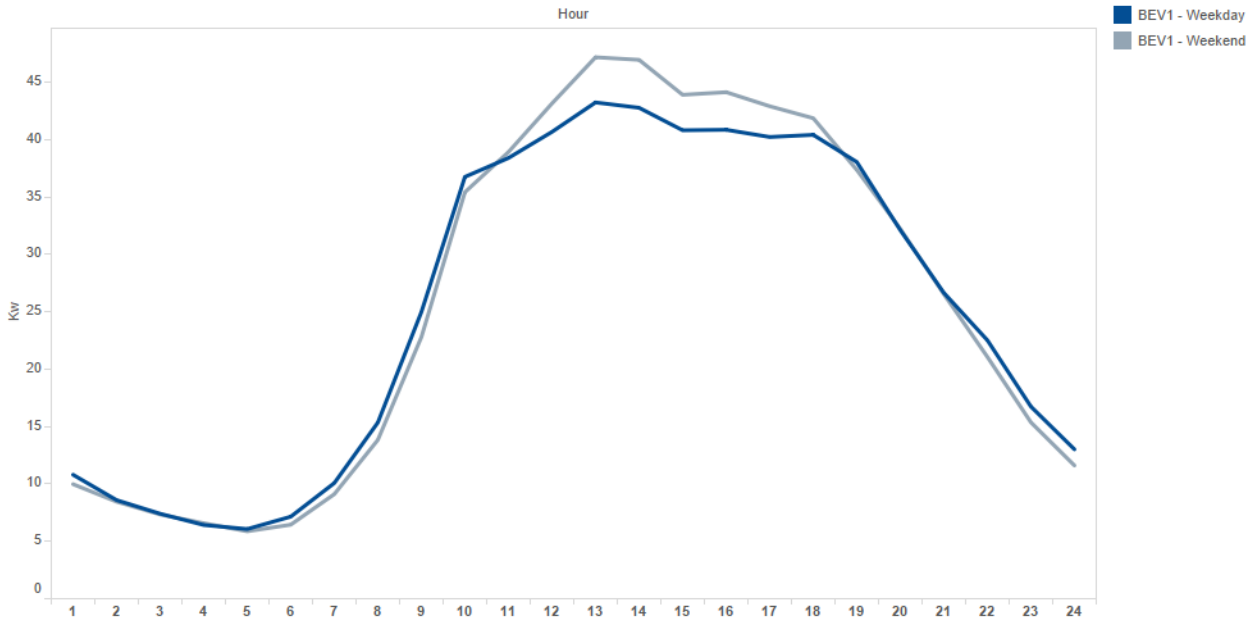


Figure 1. Average Load Profile for BEV-1 Customer by Weekday and Weekend (2021)

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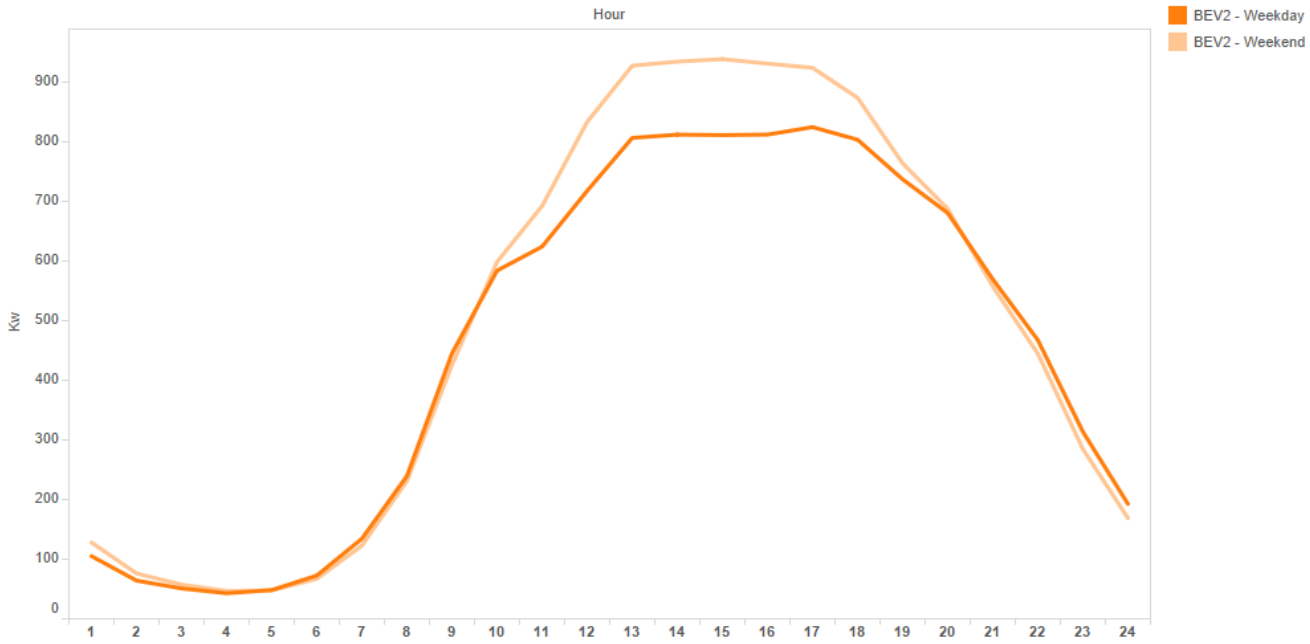

Figure 2. Average Load Profile for BEV-2 Customer by Weekday and Weekend (2021)

Residential

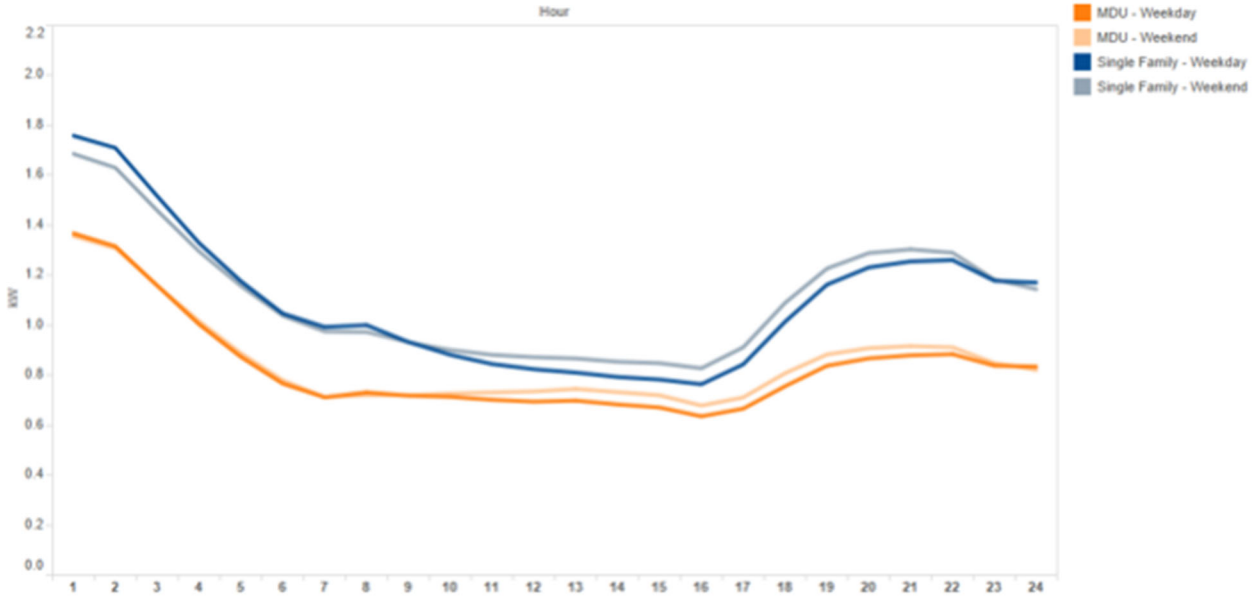

Figure 3. Average Load Profile for SF and MDU Single-Metered by Weekday and Weekend

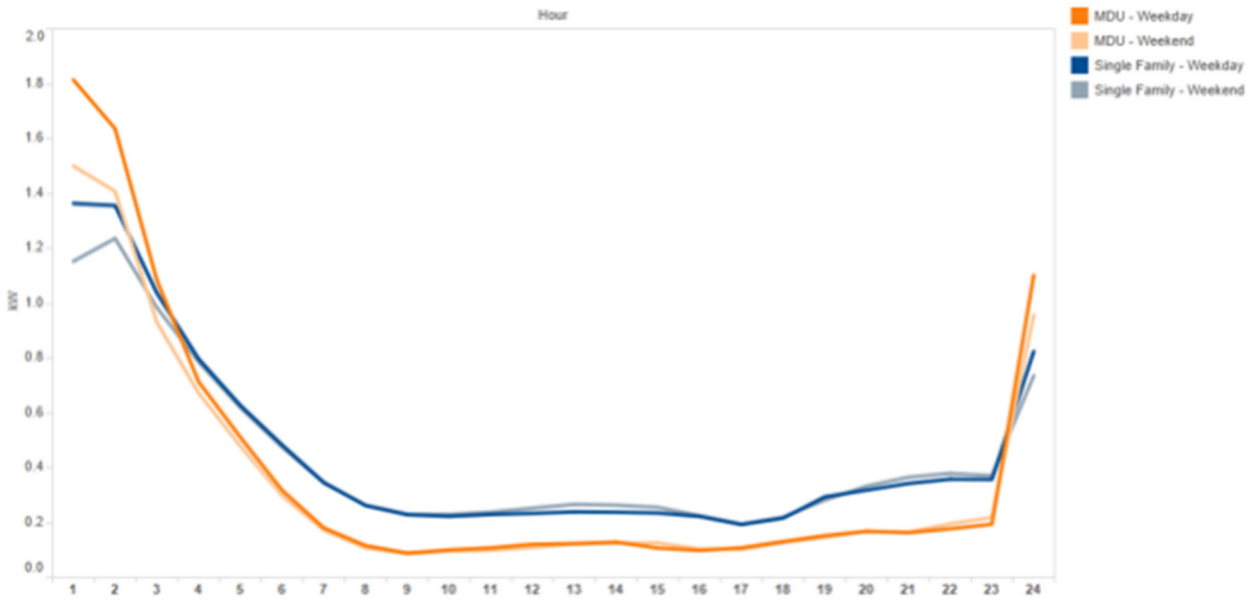

Figure 4. Average Load Profile for SF and MDU Separately-Metered by Weekday and Weekend

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

Commercial

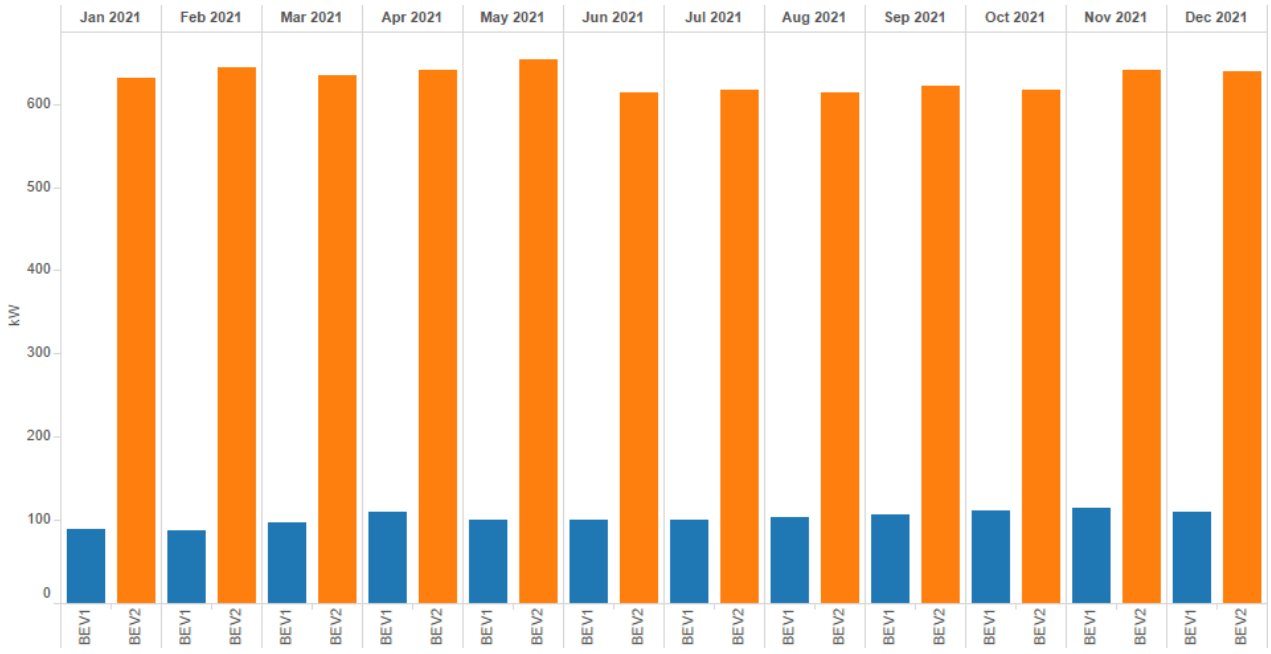

Figure 5. Average Non-Coincident Peak Load (kW) by Customer Type by Month (2021)

Residential

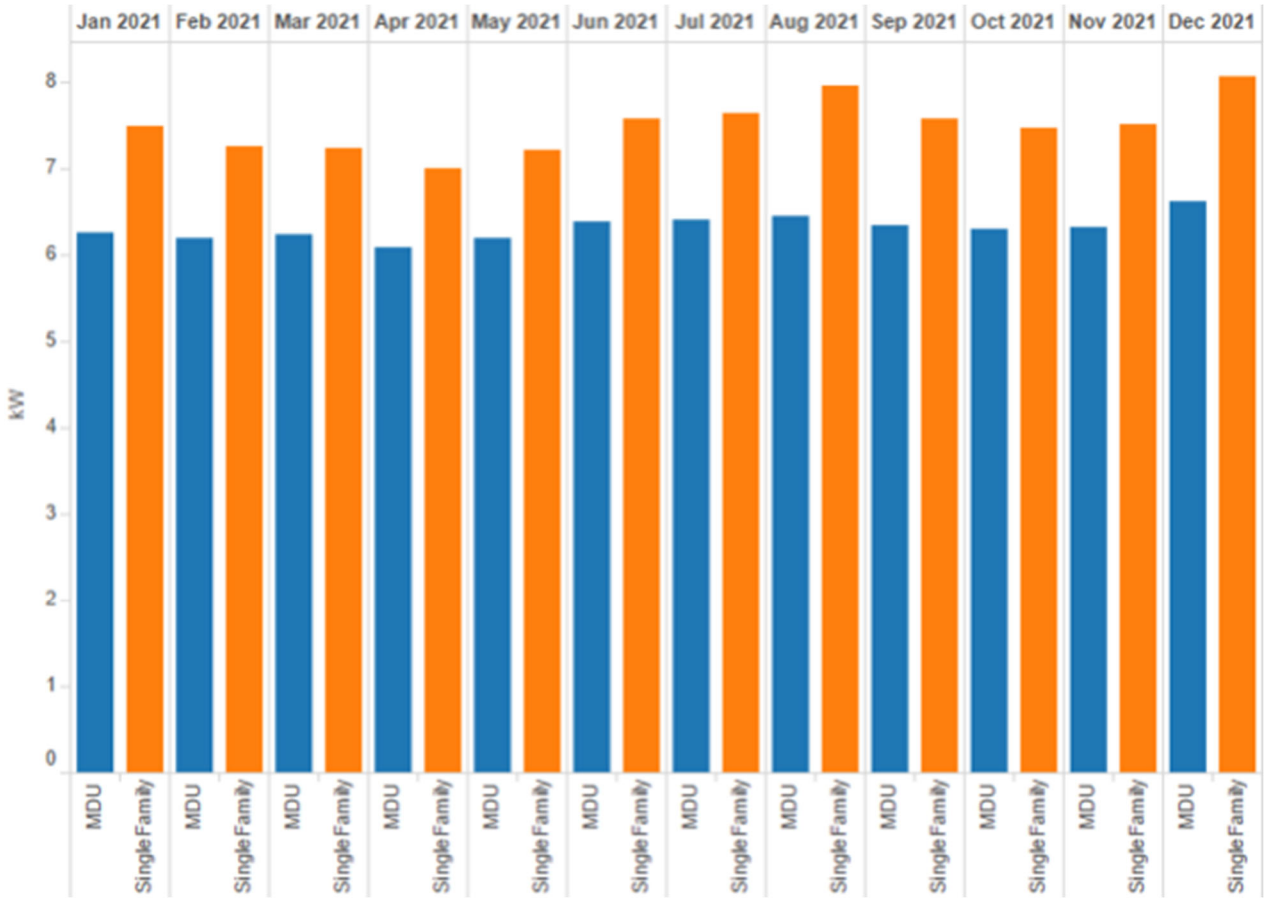

Figure 6. Average Non-Coincident Peak Load (kW) for Single-Metered by Customer Type by Month

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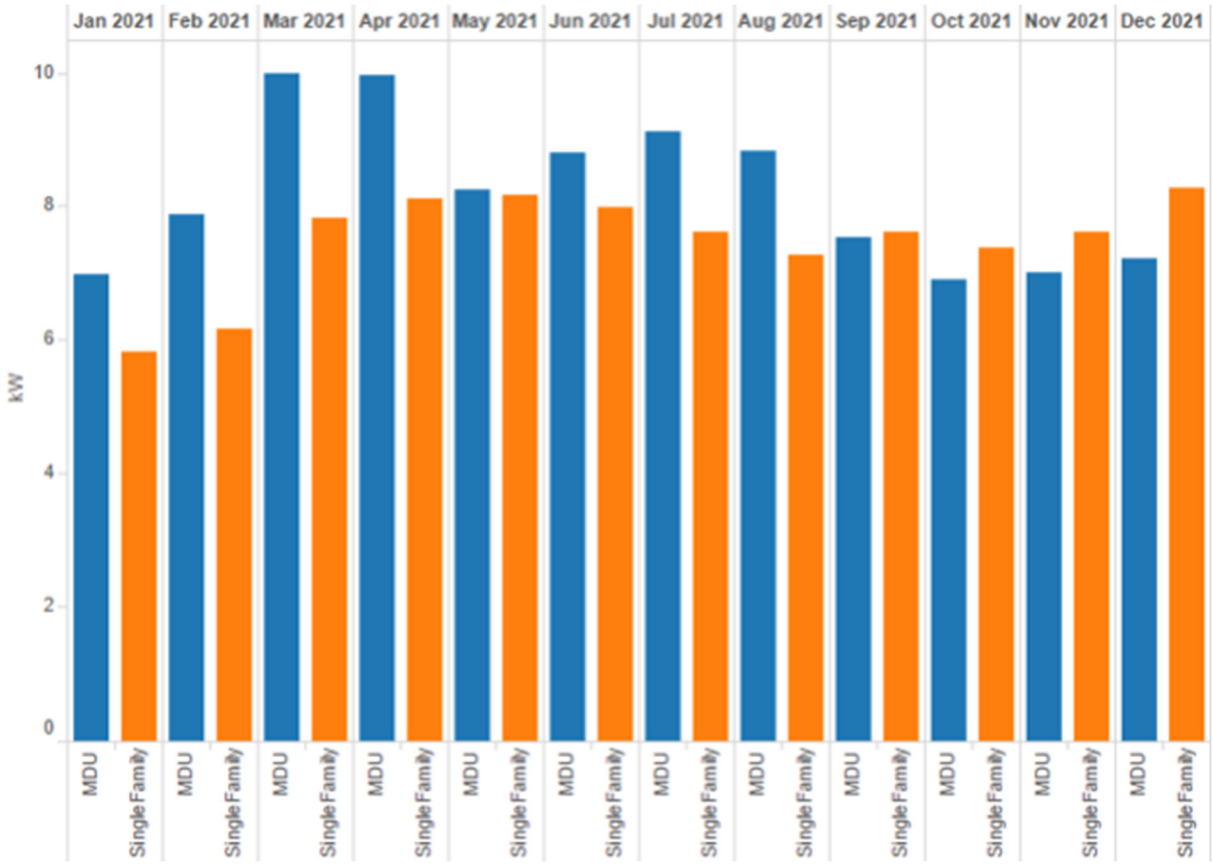

Figure 7. Average Non-Coincident Peak Load (kW) for Separately-Metered by Customer Type by Month

Appendix A - VGI Reporting Template

Program and Pilot Metrics

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**	**$ 388.70**	**$ 147.00**

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	Active	50	1	1	N/A	N/A	N/A	N/A	N/A	N/A	130	117
EVCN (Program)	Commercial	Workplace	Non DAC	Active	468	10	10	N/A	N/A	N/A	N/A	N/A	N/A	130	
EVCN (Program)	Commercial	Multi Unit Dwelling	DAC	Active	713	5	5	N/A	N/A	N/A	N/A	N/A	N/A	130	
EVCN (Program)	Commercial	Multi Unit Dwelling	Non DAC	Active	133	4	4	N/A	N/A	N/A	N/A	N/A	N/A	130	
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	236.3	25.4
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	22.4	4.6