

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 6500E
As of May 31, 2022

Subject: Joint Advice Letter Proposing Interconnection Pathway for Vehicle-to-Grid Alternating Current Projects and Implementation Steps for Direct Current Electric Vehicle Supply Equipment Projects, Pursuant to Decision 20-09-035

Division Assigned: Energy

Date Filed: 02-11-2022

Date to Calendar: 02-16-2022

Authorizing Documents: D2009025

Authorizing Documents: E-5165

Disposition:	Accepted
Effective Date:	02-11-2022

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



Resolution Required: No

Resolution Number: None

Commission Meeting Date: None

CPUC Contact Information:

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AL Certificate Contact Information:

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PGETariff@pge.com

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



To: Energy Company Filing Advice Letter

From: Energy Division PAL Coordinator

Subject: Your Advice Letter Filing

The Energy Division of the California Public Utilities Commission has processed your recent Advice Letter (AL) filing and is returning an AL status certificate for your records.

The AL status certificate indicates:

- Advice Letter Number
- Name of Filer
- CPUC Corporate ID number of Filer
- Subject of Filing
- Date Filed
- Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)
- Effective Date of Filing
- Other Miscellaneous Information (e.g., Resolution, if applicable, etc.)

The Energy Division has made no changes to your copy of the Advice Letter Filing; please review your Advice Letter Filing with the information contained in the AL status certificate, and update your Advice Letter and tariff records accordingly.

All inquiries to the California Public Utilities Commission on the status of your Advice Letter Filing will be answered by Energy Division staff based on the information contained in the Energy Division's PAL database from which the AL status certificate is generated. If you have any questions on this matter please contact the:

Energy Division's Tariff Unit by e-mail to
edtariffunit@cpuc.ca.gov

February 11, 2022

Advice Letter 6500-E
(Pacific Gas and Electric Company ID U 39 E)

Advice Letter 3955-E
(San Diego Gas & Electric Company ID U 902 E)

Advice Letter 4718-E
(Southern California Edison Company ID U 338 E)

Public Utilities Commission of the State of California

SUBJECT: Joint Advice Letter Proposing Interconnection Pathway for Vehicle-to-Grid Alternating Current Projects and Implementation Steps for Direct Current Electric Vehicle Supply Equipment Projects, Pursuant to Decision 20-09-035, with Modifications Pursuant to Resolution E-5165

Purpose

On May 28, 2021, pursuant to Ordering Paragraphs (OP) 41-42 and 44 of Decision (D.) 20-09-035 (the Decision), San Diego Gas & Electric Company (SDG&E), Southern California Edison Company (SCE), and Pacific Gas and Electric Company (PG&E) – collectively, the Utilities – submitted a Joint Advice Letter (AL) 3774-E, 4510-E, and 6209-E requesting Commission approval for:

- 1) a temporary pathway for pilots seeking vehicle-to-grid alternating current (V2G AC) interconnection that will ensure the necessary safety precautions, and
- 2) implementation steps for interconnection applicants with Electric Vehicle Supply Equipment (EVSE) with stationary inverter for direct current charging of vehicles (V2G DC EVSE) system to request permission to switch to bidirectional mode after completing the Rule 21 interconnection process and receiving permission to operate from a Utility.

On November 4, 2021, the joint advice letter was approved *with modifications* in OP 1 of [Resolution E-5165](#).

Per the guidance of Energy Division, this Tier 1 advice letter incorporates the Resolution's modifications into the language of the joint advice letter. The modifications are summarized in the background section and included in the implementation section in red text.

Background

The Commission adopted Order Instituting Rulemaking (R.) 17-07-007 on July 13, 2017, to consider a variety of refinements to the interconnection of distributed energy resources under Electric Tariff Rule 21 of the Utilities and the equivalent tariff rules of the small and multi-jurisdictional electric utilities.

The October 2, 2017, *Scoping Memo of Assigned Commissioner and Administrative Law Judge* (Scoping Memo) set forth the scope and schedule of the proceeding. The proceeding will be conducted in three phases that will address technical issues, cost-related issues, and issues related to small multi-jurisdictional utilities. The Scoping Memo established the working group process, whereby resolution of the technical issues of the proceeding would be proposed by six working groups, Working Groups One through Six. Further, there were several iterations of the responsibilities and design of each Working Group, including the issues scoped into each.

The Decision resolves the set of issues assigned to Working Groups Two and Three and the recommendations from Vehicle-to-Grid Alternating Current Subgroup. Among other recommendations, the Decision adopts Proposals 23e and 23i:

- **OP 41:** Proposal 23e is adopted. Interconnection applicants with a V2G DC EVSE system may request permission to switch to bidirectional mode after completing the Rule 21 interconnection process and receiving permission to operate from a utility. Only the manufacturer or approved third-party installer may program or enable bidirectional operation after the permission to operate is given by a utility.
- **OP 42:** The Utilities shall meet and confer to develop a consistent, to the extent possible, set of implementation steps for Proposal 23e, as required by OP 42. No later than six months from the issuance of this decision, Utilities shall present and discuss the proposed implementation at a Vehicle-to-Grid workshop, facilitated by Utilities. If Commission approval is needed for the implementation steps, Utilities shall request approval in a Tier 3 Advice Letter submitted no later than 60 days following the workshop.
- **OP 44:** Proposal 23i is adopted. V2G AC system pilots are exempt, temporarily, from Rule 21 smart inverter requirements. The Utilities shall host a series of meetings with stakeholders to develop a temporary interconnection pathway for

pilots seeking V2G AC interconnection that will ensure the necessary safety precautions. The first of these meetings shall begin no later than 30 days from the issuance of this decision. Following these meetings, Utilities shall propose a temporary pathway in the same Vehicle-to-Grid Workshop directed in OP 42. Utilities shall request approval of the pathway in the Tier 3 Advice Letter submitted no later than 60 days following the workshop.

Resolution E-5165 issued November 4, 2021 provided a disposition of the joint Utilities ALs. Page 2 of the resolution summarizes the modifications made (with citations included in brackets [] correlating the changes to the Resolution E-5165 ordering paragraph):

This Resolution approves with modifications the proposed implementation plans for proposals 23e and 23i put forth in the Joint Advice Letter SDG&E AL 3774-E, SCE AL 4510-E, and PG&E 6209-E. As it relates to the grace period as part of proposal 23e, the CPUC hereby affirms the term "model year" refers to the year the EVSE was manufactured [not in an ordering paragraph]. This Resolution requires the Utilities to reevaluate relay requirements for V2G AC projects should a certification for relaying within a power control system become available [OP 3]. Regarding requests for an exceedance of the limitations placed on the V2G AC pilot, the CPUC clarifies that the Utility must either accept or decline the request within 30 calendar days and provide a rationale if declining [OP 4]. Finally, this Resolution requests an Advice Letter no later than the end of the pilot period articulating lessons learned and recommendations for a permanent interconnection pathway [OP 5].

Additionally, per OP 2 - "The Utilities shall continue to work toward offering a single, streamlined process to customers submitting interconnection requests that include both load and generation. The Utilities shall also report on these efforts at a meeting of the Interconnection Discussion Forum within 120 days of the issuance of this Resolution."

Implementation Steps for V2G DC EVSE Interconnections

As required in OP 42, the Utilities met and conferred to develop a consistent, to the extent possible, set of implementation steps for Proposal 23e, as required in OP 41.¹ The Utilities presented the implementation process during a V2G workshop held on March 26, 2021 as directed in OP 42. During the workshop, Utilities discussed OP 42 as well as the related OP 40 and OP 41. These three Ordering Paragraphs were used as the basis for the presentation and discussion of the Utility implementation plan, which included discussion on:

¹ OP 42 of the Decision incorrectly refers to OP 42 rather than OP 41.

- Implementation steps to operationalize Proposal 23e as outlined in OP 41
- Certification requirements and limitations for V2G DC ready EVSE devices

While workshop stakeholders provided valuable input, stakeholders did not provide opposition or alternative proposals to the Utilities' proposal on the implementation steps and certification requirements and limitations.

A. Implementation Steps to Operationalize Proposal 23e

1. Interconnection Application

The first step in the process begins with the applicant's interconnection application, which has two parts.

a. Preparation of the Interconnection Request Package

First, the applicant must prepare an accurate and complete single-line diagram (SLD) and plot plan showing the service panel, EVSE, controls connection, and other relevant information. Second, the applicant must use an inverter/EVSE that meets certification requirements pursuant to Rule 21 Section Hh, including:

- Certification under the applicable Underwriters Laboratories (UL) 1741 standard
- Communications compatibility testing
- Evidence of compliance with the smart inverter Function 1 (Monitor Key Data) requirement

Depending on the type of interconnection request (*i.e.*, non-export or export), the applicant may want to reference the Utility's Integration Capacity Analysis information.

b. Submittal of the Interconnection Request in the Interconnection Portal

The applicant will then submit the Interconnection Request Package using the Utility's interconnection portal. The applicant must also include the inverter rating information and verify that the information is consistent with the SLD. Note: Each Utility's interconnection portal may need to be updated to allow precise identification of EVSE information.

2. Utility Application Review

The second step in the process involves the Utility's review of the Interconnection Request and all information provided in the package. The Utility will determine if additional information or clarification is needed through deficiency notifications. If there are no deficiencies, the Utility will review the generating information and documents

(SLD, certification, etc.) and complete any applicable Rule 21 review screens. Finally, the Utility will inform the applicant of approval of the interconnection project.

Per OP 2 of Resolution E-5165 – The Utilities shall continue to work toward offering a single, streamlined process to customers submitting interconnection requests that include both load and generation. The Utilities shall also report on these efforts at a meeting of the Interconnection Discussion Forum within 120 days of the issuance of the Resolution.

3. Interconnection Agreement Execution

The third step in the process requires the applicant to complete the following activities:

- Pay all applicable fees
- Execute the Interconnection Agreement and provide associated documentation (such as certificate of insurance)
- Provide final sign-off from the Authority Having Jurisdiction (AHJ)

The Utility must also complete any upgrades or interconnection facilities identified in the Utility Application Review process. Upon completion of these activities and all other remaining Utility requirements (e.g., bus tap drawing, Rule 2 contract, etc.), the applicant will proceed to Step 4.

4. Permission to Operate

Upon completion of Step 3, the Utility will issue either full Permission to Operate (PTO), allowing the applicant to proceed, or conditional PTO, if additional field verification is required prior to switching to bidirectional mode.

a. If the Utility Issues Full PTO

In most cases, full PTO may be provided without field verification. If the Utility issues full PTO, the applicant may proceed to Step 5.

b. If the Utility Issues Conditional PTO

If the Utility issues a conditional PTO, the applicant and Utility coordinate field verification testing. Field verification may only be needed on certain new types of systems. Once field verification is complete and equipment performance is confirmed, the Utility will issue full PTO. The applicant may then proceed to Step 5.

5. Switching to Bidirectional Mode

Once the Utility issues full PTO, upon request from the applicant, only the manufacturer or approved third-party installer may program or enable bidirectional operation. The applicant must inform the Utility on the same day that bidirectional mode is enabled.

B. Certification requirements and limitations for V2G DC ready EVSE devices

V2G DC EVSE Generating Facilities must meet all the applicable certification requirements at the time of interconnection request. However, the Utilities also recognize that certification requirements evolve over time and V2G DC systems that had all the applicable certification requirements at the time of purchase could find that they cannot be interconnected because the certification standards change from the time of purchase to the time of interconnection request. To address this issue, the Utilities propose the following exception for V2G DC systems:

- Utilities will accept the certification for the model year of the EVSE for five years after model year. In this case, if a customer purchases a V2G DC system that meets all Rule 21 certification requirements for such year, then utilities will accept the application even if the certification requirements have evolved, provided that the interconnection request is submitted no later than five years after the EVSE model year.
- The proposed V2G DC system must not impose any safety risks due to not complying with applicable requirements at the time of interconnection.

Resolution E-5165 affirms that the term "model year" refers to the year the EVSE was manufactured.

Pathway for V2G AC Pilots to Interconnection

As required by OP 44, the Utilities held a series of meetings with stakeholders from the Transportation Electrification proceeding² and the Rule 21 proceeding to discuss the development of a temporary interconnection pathway for pilots seeking V2G AC interconnection that would ensure the necessary safety precautions. The first meeting was held on October 29, 2020, which is within 30 days after issuance of the Decision. The Utilities continued to hold these meetings to clarify and reach consensus on the pathway. These additional meetings were held on November 19, 2020, December 10, 2020, and February 18, 2021.

² R.18-12-006, *Order Instituting Rulemaking to Continue the Development and Infrastructure for Vehicle Electrification*.

Following these meetings, the Utilities hosted a V2G Workshop on March 26, 2021, in which they proposed the temporary pathway developed during the meetings with the stakeholders. Below, the Utilities outline the pathway that was discussed and agreed on by all stakeholders during the V2G Workshop and stakeholder meetings. The agreed-upon pathway consists of three elements, as outlined below.

Per OP 5 of Resolution E-5156 – The Utilities shall submit an Advice Letter no later than the completion of the V2G AC Pilot Period that includes lessons learned and recommendations for a permanent interconnection pathway for V2G AC EVSE.

A. Technical Requirements

To meet safety interconnection requirements, and accounting for the fact that plugin electric vehicles with onboard inverters are not currently certified to the UL 1741 national standard, the Utilities proposed that a relay should be installed at the Point of Common Coupling. The relay will be programmed with the applicable voltage and frequency settings, as required in Rule 21 Section H and other applicable settings, such as underpower and overcurrent, as may be specified in each Utility's Interconnection Handbook.³

Given the complexity of utilizing relaying systems, the Utilities strongly recommended that V2G AC applicants retain engineering firms that are knowledgeable on the installation of relays for meeting the Rule 21 interconnection requirements. Utilities also recommended that V2G AC applicants become familiar with each Utility's Interconnection Handbook and that V2G AC applicants consult with their Utility prior to submitting the V2G AC interconnection request.

Per OP 3 of Resolution E-5165 – If and when a nationally-recognized testing laboratory certifies capabilities equivalent to an external relay within a power control system, the Utilities shall reevaluate relay requirements for V2G AC projects to consider intrinsic solutions. The results of this assessment shall be reported to the CPUC's Energy Division within 60 days of the adoption of the new certification.

³ SCE Handbook - https://library.sce.com/content/dam/sce-doelib/documents/business/generating-your-own-power/grid-interconnections/SCE_InterconnectionHandbook.pdf

PG&E Handbook - https://www.pge.com/en_US/large-business/services/alternatives-to-pge/distribution-handbook.page

SDG&E Handbook - <https://www.sdge.com/more-information/customer-generation/electric-rule-21/distribution-interconnection-handbook>

B. V2G AC Pilot Limitations

The Utilities and stakeholders engaged in fruitful discussion to determine what constitutes a V2G AC pilot to limit the exemption from Rule 21 smart inverter requirements to only the intended V2G AC pilots, as allowed by OP 44. While the Decision referred to certain pilot projects⁴ to be used as a baseline, further clarifications were needed to ensure that this temporary pathway and exception to Rule 21 smart inverter requirements would only be used as intended.

Topics such as the limit on the number of V2G AC pilot projects, interconnection request submittal restrictions, and V2G AC funding mechanisms were discussed. At the December 10, 2020, stakeholder meeting, the following terms were agreed on. These same terms were presented in the V2G Workshop:

- The number of interconnection requests (locations) will be limited to six requests per year for each Utility. If the Utility's limit is reached, an applicant may request to the Utility an exceedance for its project. The Utility must respond to the request within 30 calendar days. If the Utility declines the request, the applicant may contact the Commission's Energy Division. **Per OP 4 of Resolution E-5165 – In response to an applicant's request for an exceedance of the cap on the number of V2G AC pilot projects per year per utility, the Utility shall either grant or decline the request within 30 calendar days. Any response declining an exceedance request must state the rationale for declining. This shall be made clear in any documentation of the temporary pathway for V2G AC interconnection.**
- Interconnection request must be submitted to the utility no later than December 31, 2022. If standards and a process have not been approved and updated in the Utilities' Rule 21 tariffs by that time, then the timeline will be extended to December 31, 2023. If standards and a process are approved and updated in the Utilities' Rule 21 tariffs, these pilot projects shall follow the requirements as approved in Rule 21.

C. Implementation Plan

As a final step in the discussion, the Utilities developed, presented for discussion, and adjusted based on stakeholder comments an implementation plan for V2G AC developers to follow.

The implementation plans for the Utilities are highly similar, with the only exception being which interconnection tool would be used for requesting interconnection of V2G AC projects.

⁴ D.20.09-035, at 128.

The implementation plans include four phases:

- Customer application
- Application submittal
- Application review
- Interconnection agreement and PTO

In the customer application phase, the Utilities require certain information that the V2G AC applicant must prepare for successful interconnection application submission. This information includes single line diagrams, plot plans, three-line diagrams, elementary diagrams, relay functional diagrams, and relay settings. The relay settings should be prepared based on the intended operation of the V2G AC Generating Facility (export vs. non-export).

In the application submittal phase, the Utilities each require applicants to use certain interconnection tools.⁵ Stakeholders must label the V2G AC interconnection requests as a “pilot” (Example: Ontario School District V2G AC Pilot Project) to allow the Utilities to monitor and track the status of these pilot projects.

For the application review, interconnection agreement and PTO phases, the Utilities’ proposed process includes review of the customer-provided information to ensure the project meets the Utility’s technical requirements, allows for the development of interconnection agreements, facilitates field verification as may be necessary, and supports the issuance of PTO.

No cost information is required for this advice letter. This advice letter will not increase any rate or charge, cause the withdrawal of service, or conflict with any other schedule or rule.

Effective Date

The Utilities believe this submittal should be classified as Tier 1 pursuant to General Order 96-B. This Advice Letter will be effective on February 11, 2022, the date submitted.

Protest

Pursuant to General Order 96-B, General Rule 7.5.1, the Utilities request that the Commission waive the protest period for this submittal.

⁵ SCE: <https://www.sce.com/business/generating-your-own-power/Grid-Interconnections/Interconnecting-Generation-under-Rule-21>
PG&E <http://yourprojects.pge.com/>.
SDG&E <https://www.sdge.com/more-information/customer-generation/electric-rule-21>.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically to parties shown on the attached list and the parties on the service list for R.17-07-007. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter submittals can also be accessed electronically at: <http://www.pge.com/tariffs/>.

/S/

Sidney Bob Dietz II
Director, Regulatory Relations

cc: Service List R.17-07-007



ADVICE LETTER SUMMARY

ENERGY UTILITY



MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Pacific Gas and Electric Company (ID U39 E)

Utility type:

- ELC GAS WATER
 PLC HEAT

Contact Person: Kimberly Loo

Phone #: (415)973-4587

E-mail: PGETariffs@pge.com

E-mail Disposition Notice to: KELM@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
 PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 6500-E et al.

Tier Designation: 1

Subject of AL: Joint Advice Letter Proposing Interconnection Pathway for Vehicle-to-Grid Alternating Current Projects and Implementation Steps for Direct Current Electric Vehicle Supply Equipment Projects, Pursuant to Decision 20-09-035, with Modifications Pursuant to Resolution E -5165

Keywords (choose from CPUC listing): Compliance

AL Type: Monthly Quarterly Annual One-Time Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: D.20-09-025, Resolution E-5165

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? Yes No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? Yes No

Requested effective date: 2/11/22

No. of tariff sheets: 0

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: N/A

Service affected and changes proposed¹: N/A

Pending advice letters that revise the same tariff sheets: N/A

¹Discuss in AL if more space is needed.

Protests and correspondence regarding this AL are to be sent via email and are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

California Public Utilities Commission
Energy Division Tariff Unit Email:
EDTariffUnit@cpuc.ca.gov

Contact Name: Sidnev Bob Dietz II. c/o Megan Lawson
Title: Director, Regulatory Relations
Utility/Entity Name: Pacific Gas and Electric Company

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email: PGETariffs@pge.com

Contact Name:
Title:
Utility/Entity Name:

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email:

CPUC
Energy Division Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102

Clear Form

**PG&E Gas and Electric
Advice Submittal List
General Order 96-B, Section IV**

AT&T
Albion Power Company

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
Braun Blaising Smith Wynne, P.C.
California Cotton Ginners & Growers Assn
California Energy Commission

California Hub for Energy Efficiency
Financing

California Alternative Energy and
Advanced Transportation Financing
Authority
California Public Utilities Commission
Calpine

Cameron-Daniel, P.C.
Casner, Steve
Center for Biological Diversity

Chevron Pipeline and Power
City of Palo Alto

City of San Jose
Clean Power Research
Coast Economic Consulting
Commercial Energy
Crossborder Energy
Crown Road Energy, LLC
Davis Wright Tremaine LLP
Day Carter Murphy

Dept of General Services
Don Pickett & Associates, Inc.
Douglass & Liddell

East Bay Community Energy Ellison
Schneider & Harris LLP Energy
Management Service
Engineers and Scientists of California

GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz &
Ritchie

Green Power Institute
Hanna & Morton
ICF
International Power Technology

Intertie

Intestate Gas Services, Inc.
Kelly Group
Ken Bohn Consulting
Keyes & Fox LLP
Leviton Manufacturing Co., Inc.

Los Angeles County Integrated
Waste Management Task Force
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McClintock IP
McKenzie & Associates

Modesto Irrigation District
NLine Energy, Inc.
NRG Solar

OnGrid Solar
Pacific Gas and Electric Company
Peninsula Clean Energy

Pioneer Community Energy

Public Advocates Office

Redwood Coast Energy Authority
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions
San Diego Gas & Electric Company

SPURR
San Francisco Water Power and Sewer
Sempra Utilities

Sierra Telephone Company, Inc.
Southern California Edison Company
Southern California Gas Company
Spark Energy
Sun Light & Power
Sunshine Design
Tecogen, Inc.
TerraVerde Renewable Partners
Tiger Natural Gas, Inc.

TransCanada
Utility Cost Management
Utility Power Solutions
Water and Energy Consulting Wellhead
Electric Company
Western Manufactured Housing
Communities Association (WMA)
Yep Energy