

DOCKETED

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California Energy Commission

Electric Vehicle Charging Infrastructure Reliability Workshop – Oct 21, 2022



Agenda

1. Background
 - Assembly Bill 2061
 - Scope
 - Tools for Monitoring Reliability
 - Overview of the Charging Ecosystem
2. Standards for Chargers Receiving State- and Ratepayer-Funded Incentives
3. Assessment of Uptime and Reliability of Charging Infrastructure
4. Panel
5. Public Comment



Housekeeping

- Workshop is being recorded on Zoom
- Virtual Participation via Zoom or telephone during the Public Comment period
- Presentation and other related documents are available online:

[Workshop on Electric Vehicle Charging Infrastructure Reliability Standards Event Page](https://www.energy.ca.gov/event/workshop/2022-10/workshop-electric-vehicle-charging-infrastructure-reliability-standards)

<https://www.energy.ca.gov/event/workshop/2022-10/workshop-electric-vehicle-charging-infrastructure-reliability-standards>

- EV Charging Infrastructure Reliability Docket: 22-EVI-04

[Website to Submit Written Comment](https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=22-EVI-04)

<https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=22-EVI-04>



Commitment to Diversity

The CEC adopted a resolution strengthening its commitment to diversity in our funding programs. The CEC continues to encourage disadvantaged and underrepresented businesses and communities to engage in and benefit from our many programs.

To meet this commitment, CEC staff conducts outreach efforts and activities to:

- Engage with disadvantaged and underrepresented groups throughout the state;
- Notify potential new applicants about the CEC's funding opportunities;
- Assist applicants in understanding how to apply for funding from the CEC's programs;
- Survey participants to measure progress in diversity outreach efforts



Diversity Survey



Scan the code on a phone or tablet with a QR reader to access the survey.

One Minute Survey

The information supplied will be used for public reporting purposes to display anonymous overall attendance demographics

Zoom Participants, please use the link in the chat to access the survey or scan the QR code on the left of the screen with a phone or tablet to access the survey

Survey will be closed at the end of the day

Survey Link:

<https://forms.office.com/Pages/ResponsePage.aspx?id=RBI6rPQT9k6NG7qicUgZTmWqlGAqr0JNux5TMCEdoEBUOVpYNjZKMVNxODNQSU1PRFo3MVpTQjJORY4u>



Background



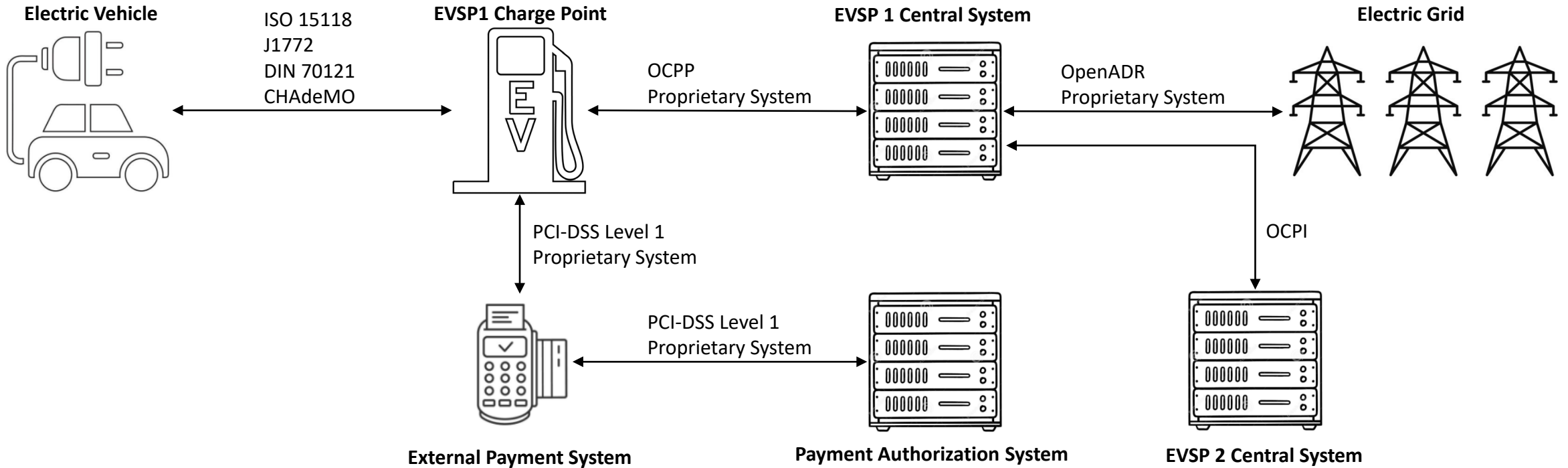
Assembly Bill 2061

Requires the CEC to:

- **Develop uptime recordkeeping and reporting standards** in coordination with the California Public Utilities Commission
 - Applicable to chargers installed on or after **Jan 1, 2024**, that 'received an incentive from a state agency or through a charge on ratepayers.'
 - Applies for a minimum of **6 years**
- **Assess** the uptime of charging station infrastructure biennially starting **Jan 1, 2025**

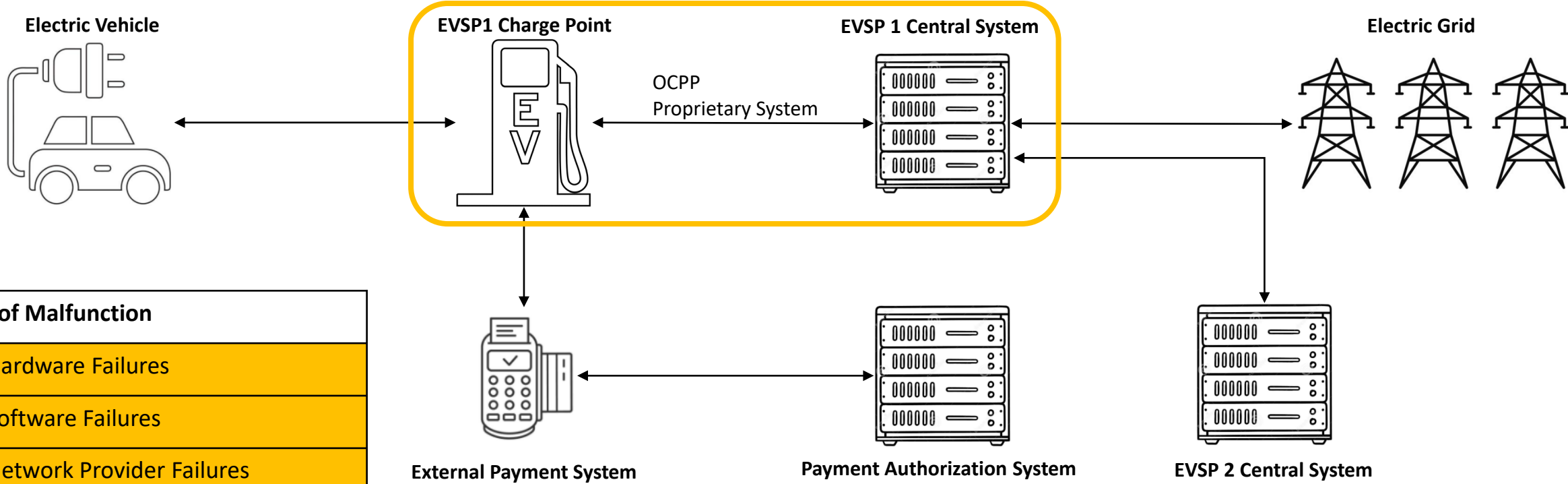


Overview of Charging Ecosystem





Charger / Network Failure

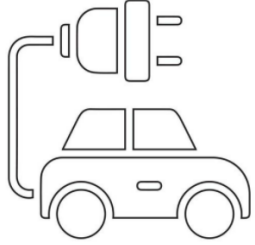


Category of Malfunction
Charger Hardware Failures
Charger Software Failures
Charger Network Provider Failures
Internal Payment System Failures
OCPI Failures
External Payment System Failures
Charge Initiation / Interoperability Failures
Unmonitored Hardware Failures

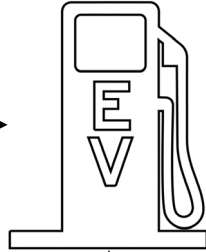


Internal Payment System Failure

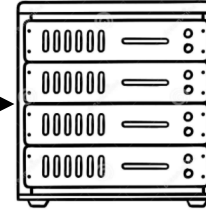
Electric Vehicle



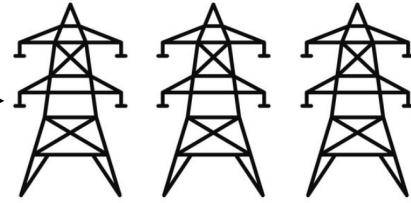
EVSP1 Charge Point



EVSP 1 Central System



Electric Grid



OCPP
Proprietary System

OCPI

EVSP 2 Central System

Category of Malfunction

Charger Hardware Failures

Charger Software Failures

Charger Network Provider Failures

Internal Payment System Failures

OCPI Failures

External Payment System Failures

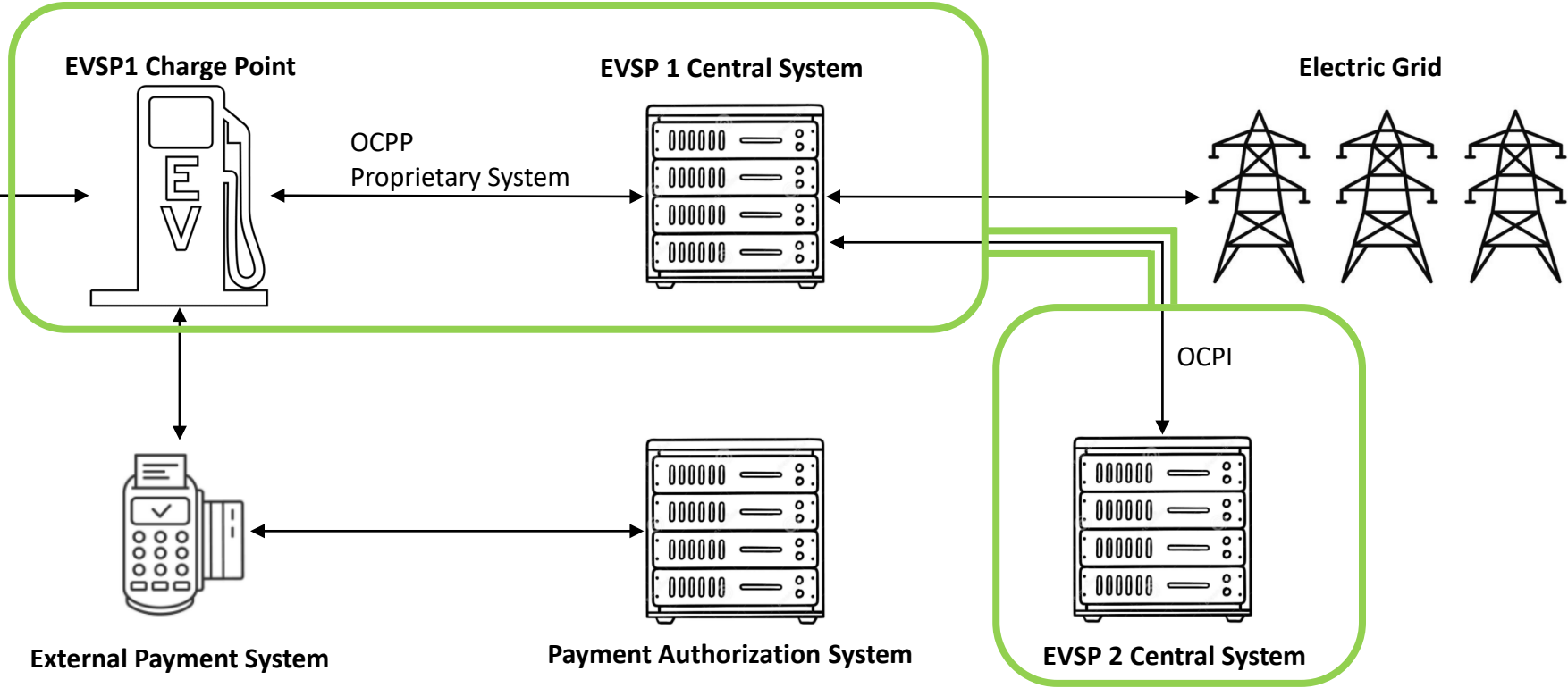
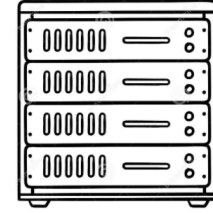
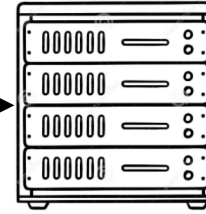
Charge Initiation / Interoperability Failures

Unmonitored Failures

External Payment System

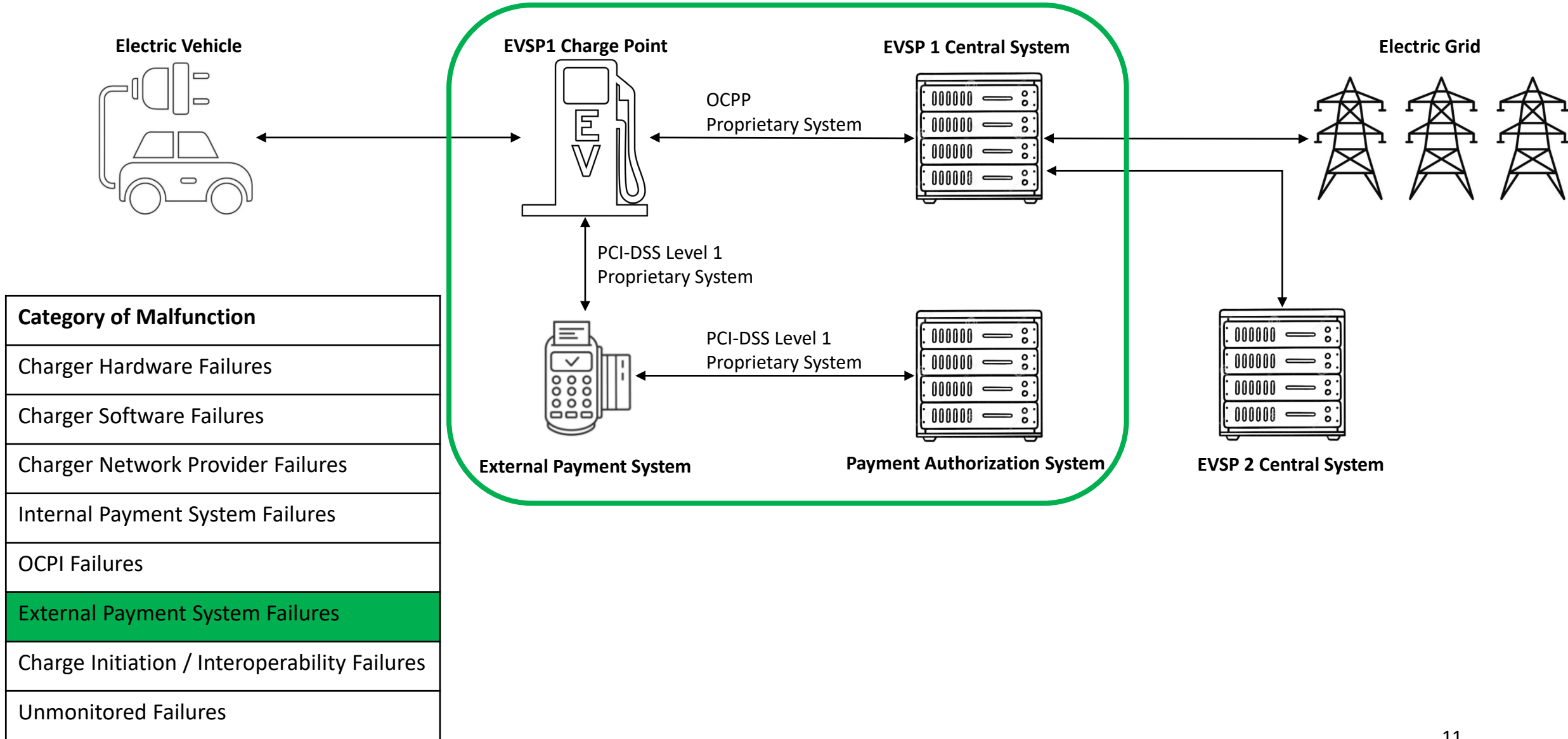


Payment Authorization System



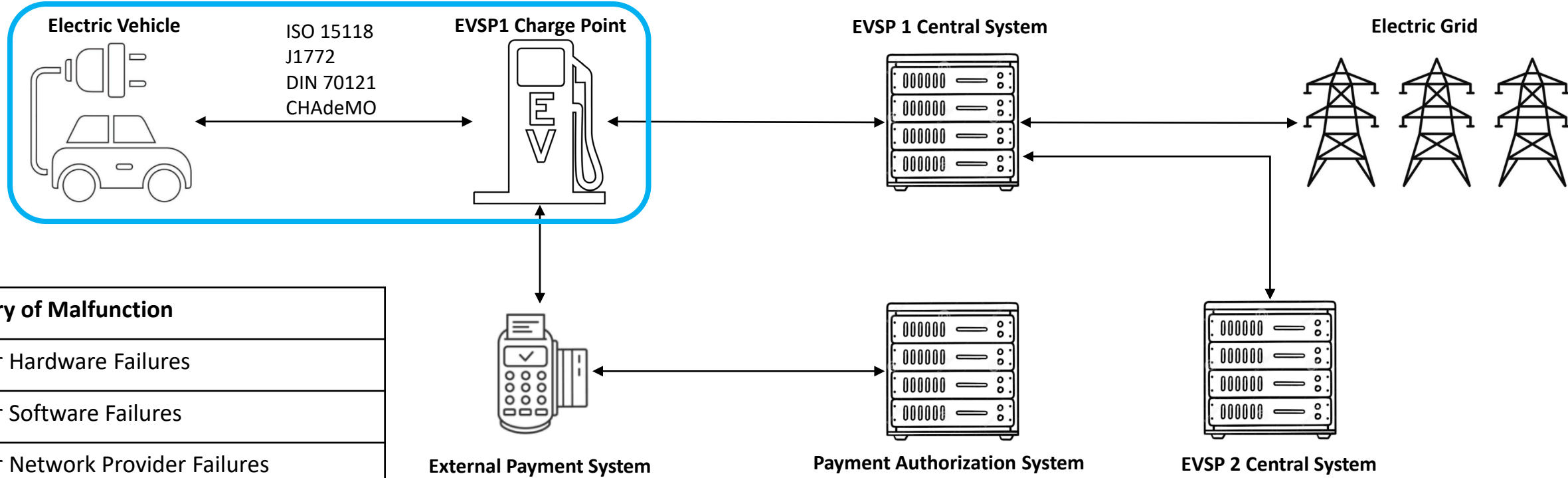


External Payment System Failure





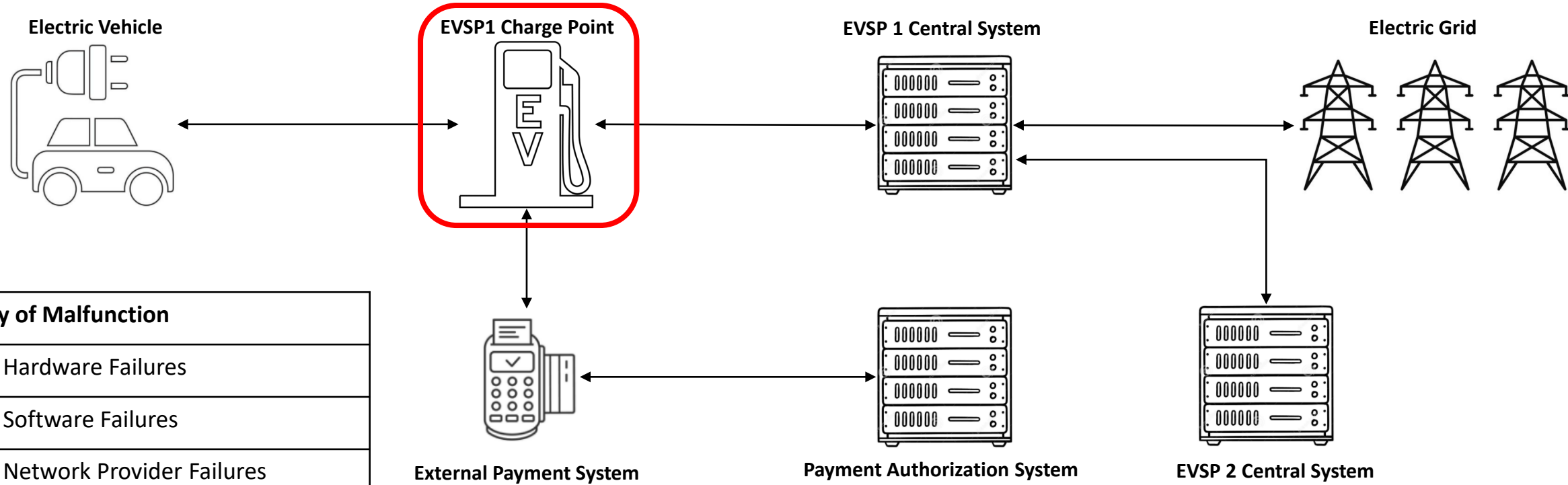
EV <--> Charger Interoperability Failure



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Unmonitored Charger Failures



Category of Malfunction
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Unmonitored Failures



Reliability Tools

1. Remote Monitoring
2. Preventive and Corrective Maintenance
3. Recordkeeping and reporting
4. Field Testing
5. Consumer surveys



Remote Monitoring

Data collected remotely through network connection to charger

Charger status and error codes collected, on a specified time interval

Total charge attempts / failed charge attempts



Maintenance

Preventative Maintenance

- Maintenance tasks that are regularly and routinely performed to reduce the chances of failure and unplanned downtime
- Identifies failures not detected through other means

Corrective maintenance

- Maintenance tasks that are performed to rectify and repair faulty systems and equipment



Recordkeeping & Reporting

Records specified to be retained for a particular duration

- Database of timestamped operative statuses
- Total attempts to charge
- Failed charge attempts
- Maintenance logs including date/time

Aggregated reports of uptime and maintenance activities provided on a quarterly basis



Field Monitoring

Systematically testing chargers operating in the public using a protocol designed to identify and categorize failures

Provides a point in time view of the overall health of the charging network from a user experience perspective



Consumer Reporting

A system that assigns a unique identifier to chargers and a means for consumers to report downed chargers / failed charging sessions.

Provides consumer perspective on the health of the charging network. Serves as a form of physical inspection that can help detect failures not captured through remote means.



Standards for Chargers Receiving State- and Ratepayer Funded Incentives



Assembly Bill 2061

Requires the CEC to:

- **Develop uptime recordkeeping and reporting standards** in coordination with the California Public Utilities Commission
 - Applicable to chargers installed on or after **Jan 1, 2024**, that 'received an incentive from a state agency or through a charge on ratepayers.'
 - Applies for a minimum of **6 years**
- **Assess the uptime of charging station infrastructure biennially starting Jan 1, 2025**

Staff anticipates to initiate a **rulemaking Q1 2023**. This will provide more detail and opportunity for public comment



Recent and future CEC funding opportunities (light-duty)

- **Recent Funding Opportunities:**
 - Charging Access for Reliable On-Demand Transportation Services (CARTS)
 - Reliable, Equitable, and Accessible, Charging for multi-family Housing (REACH)
 - Rural Electric Vehicle (REV) Charging
- **Future Solicitations:**
 - National Electric Vehicle Infrastructure (NEVI) Program Funding
 - California Electric Vehicle Infrastructure Project (CALeVIP) 2.0
 - Convenient, High-Visibility, Low-Cost Level-2 Charging (CHILL-2)



Reliability Requirements for REACH and REV

Standards:

- Equipment to be operational at least **97 percent** of the standard operating hours
- Set expectation for most repairs to be made “within 48 hours of the initial notice” with exception for “significant or complex issues”

Requirements

- Remote monitoring for networked chargers
- Recordkeeping and reporting
- Operations and maintenance plans



Federal NEVI Requirements (Proposed)

The Notice of Proposed Rulemaking proposes the following requirements for chargers funded through NEVI:

- Each port must have an average annual uptime of greater than 97% (23 CFR §680.116 (b))
- “A charging port is considered "up" when its hardware and software are both online and available for use, or in use, and the charging port successfully dispenses electricity as expected.” (23 CFR §680.116 (b)(1))
- Conform with ISO 15118 (23 CFR §680.108)
- Capable of using the Open Charge Point Protocol (OCPP) (23 CFR §680.114(a)(5))



Proposed CEC Reliability Requirements (NEVI, CALeVIP 2.0, CHILL-2)

Recordkeeping:

- Charger port operative status and error codes on 15-minute interval (StatusNotification.req)
- Total number of attempts to initiate charge
- Failed attempts to initiate charge by category:
 - Charger / network outage
 - Payment system failures by category
 - Internal Network Error
 - Roaming / OCPI communication failure
 - External (e.g. Credit Card)
 - Interoperability failures, including vehicle make and model when known
- Maintenance events (including type, date/time, duration)
- Records made available to CEC within 10 days of request



Proposed CEC Reliability Requirements (NEVI, CALeVIP 2.0, CHILL-2)

Quarterly Reporting:

- Annual average charger port uptime.
 - Uptime is defined as Operative Status and Error Codes indicate that charger was operative for the 15-minute interval.
- Total number of attempts to initiate charge
- Total number of failed attempts to initiate charge by category
- Maintenance Logs:
 - Including total number of dispatch events
 - Description of significant maintenance challenges



CEC Reliability Requirements (NEVI, CALeVIP 2.0, CHILL-2)

Maintenance Requirements:

- Annual preventative maintenance
- Corrective maintenance completed within 5 business days
- All maintenance conducted by technician(s) certified by manufacturer

Required Participation Consumer Reporting Survey

- All chargers must bear sticker with unique identifier and link to survey

Equipment Requirements:

- All chargers ISO 15118 ready
- All Chargers OCPP ready



CEC Reliability Requirements (NEVI, CALeVIP 2.0, CHILL-2)

Performance Standards:

- Minimum Uptime: **97%**
- Minimum Payment Success Rate: **97%**



Assessment of Uptime and Reliability of Charging Infrastructure



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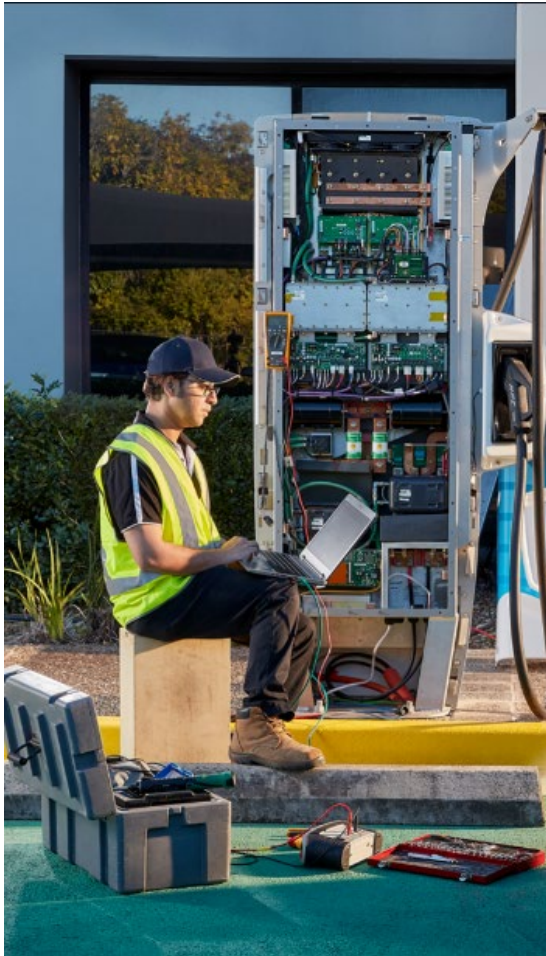
Reliability Assessment of Charging Infrastructure

We are considering the following tools:

- Field Monitoring
- Consumer surveys
- Monitoring Data:
 - Publicly available data
 - Commercially available data
 - Voluntary data requests
 - Mandatory data collection



Field Monitoring



CEC Staff are considering developing a program to evaluate the usability and reliability of chargers deployed throughout California

The program envisions testing samples of different populations of publicly available DC fast chargers and Level 2 chargers.

Populations:

Rural, DAC/LIC

Rural, Non-DAC/LIC

Urban, DAC/LIC

Urban, Non-DAC/LIC

**DAC/LIC is an abbreviation for disadvantaged and low-income communities*



Consumer Survey

The CEC is considering developing a program that:

- CEC funded chargers required to bear a sticker/sign with unique identifier and survey link to report down chargers and cause of outage.
- Using data for visibility on issues not automatically captured such as physical issues with chargers.
- Directing research and standards development to misunderstood or emerging issues.

REPORT A CHARGER ISSUE


CHARGER# A120-B

Maintenance of this charger is the responsibility of _____. Please contact (XXX) XXX-XXXX to report charger issues.

If you would like to additionally report the issue to the California Energy Commission as part of an effort to assess the health of the charging network in the state, please take a short survey at the link below.

Type this address into your browser:
[Hyperlink here]

Or scan the QR code below:



Sample Sticker/Sign



Reliability Panel





Public Comment

Zoom Participants

- Use “raise hand” feature to make verbal comments
- Use the “Q&A” feature to type your questions
- The chat feature has been disabled

Telephone Participants

- Dial *9 to raise your hand
- Dial *6 to mute / unmute you phone line

Written Comments – Due Nov 11, 2022

- Docket: 22-EVI-04
- [E-Comment Submission](https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=22-EVI-04)
<https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=22-EVI-04>