

DOCKETED

Docket Number:	21-TRAN-03
Project Title:	Zero Emission Vehicle Infrastructure Barriers and Opportunities
TN #:	242527
Document Title:	FLO comments on CEC Reliability Workshop
Description:	N/A
Filer:	System
Organization:	FLO
Submitter Role:	Public
Submission Date:	4/1/2022 3:24:17 PM
Docketed Date:	4/1/2022

Comment Received From: Cory Bullis
Submitted On: 4/1/2022
Docket Number: 21-TRAN-03

FLO comments on CEC Reliability Workshop

Additional submitted attachment is included below.



April 1, 2022

Mr. Dustin Schell
Air Resources Engineer
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814
Docket: 21-TRAN-03

Re: FLO Comments on CEC’s Electric Vehicle Charging Infrastructure Reliability Workshop

Dear Mr. Schell,

Thank you for the opportunity to comment on the California Energy Commission’s Electric Vehicle Charging Reliability Workshop. Charging station reliability is one of the most important aspects of the driver’s charging experience – consumers want to perceive charging as convenient, reliable, and accessible, otherwise we risk diminishing their interests in electric vehicles (EVs). As one of the lead agencies on EV charging infrastructure policy in the state, we applaud the Commission’s attention to this critical issue.

FLO is a leading North American EV charging network operator and a provider of charging software and equipment. In conjunction with its parent company, AddEnergie, FLO leverages its vertical integration to offer EV drivers the best possible charging experience. Every month, the company enables more than half a million charging events, thanks to over 60,000 high-quality EV charging stations deployed at public, commercial and residential installations. FLO employees are located across North America, from the headquarters in Quebec City, to assembly plants in Shawinigan, to offices in Montreal, Vancouver and Sacramento, and we also work remotely in key US and Canadian markets.

Our comments seek to inform the technical implementation of the Commission’s reliability standard

I. It is critical for the Commission to implement a reliability standard (also known as uptime guarantees) for all publicly funded charging stations.

We strongly support the Commission requiring publicly funded charging stations (including stations funded by utilities and community choice aggregators) to adhere to a reliability standard via uptime guarantees. To encourage mass EV adoption, charging stations must be reliable. However, there are extensive examples of broken public chargers, causing consumer frustration. Plug In America, which represents EV drivers, released a survey in February that revealed 34 percent of surveyed drivers have experienced broken DC fast chargers, which was a “moderate concern” to them¹. The Air Resources Board also independently surveyed drivers about their charging experiences and found that the second most common customer complaint involved issues related to “charging station operability”². Avista, a utility in Washington State,

¹ Plug In America. *The Expanding EV Market: Observations in a year of growth*. February 2022. Page 2.

² California Air Resources Board. *Electric Vehicle Supply Equipment Standards Technology Review*. February 2022. Pages 10-11.

conducted a pilot study of 439 charging ports it owned, and concluded as late as 2019 their overall uptime was 78 percent³. These are not isolated incidents, and the lack of reliable charging stations is gaining more visibility. Ford is employing a workforce of “Charge Angels”⁴, whose sole purpose will be to track down broken public EV charging stations and service them. Broken chargers, at best, risk creating consumer frustration with the EV charging experience, or, at worst, risk stranding them.

Mainstream consumers will not have the patience to tolerate broken charging stations; if California is to fulfill its EV adoption goals, it must ensure the charging experience is convenient, accessible, and reliable for drivers.

To ensure charging stations are reliable, FLO strongly encourages the Commission to require that publicly funded charging stations must meet a minimum of a 97 percent uptime guarantee at the individual station level for a minimum of five years, consistent with its EV charging grant solicitations for multi-family housing⁵ and rural communities⁶. Uptime guarantees ensure charging stations are online and operational for drivers to use for a minimum period of time in a given year.

A 97 percent uptime guarantee or higher has already been established in other public or ratepayer funded programs across North America. These examples include:

- The Federal Highway Administration’s National Electric Vehicle Formula program requires a greater than 97 percent uptime guarantee at the individual station level⁷.
- The New York State Energy and Research Development Authority requires 97 percent uptime for its DCFC grant program⁸.
- ConEdison’s Make Ready EV Program requires 99 percent uptime for DCFC EVSE⁹.
- Louisville Gas & Electric requires 99 percent uptime for DCFC EVSE¹⁰.
- Florida Power & Light requires 98 percent uptime for both Level 2 and DCFC EVSE in an RFP¹¹.

Governmental entities have also recommended uptime guarantees, including:

- The Regional Electric Vehicle Plan for the West recommends a 97 percent uptime requirement for charging stations¹².
- The Northeast States for Coordinated Air Use Management recommends a 99 percent uptime requirement for DCFC EVSE¹³.

³ Avista Corp. Electric Vehicle Supply Equipment Pilot Final Report. October 2019.

⁴ [Roving bands of Ford ‘Charge Angels’ will repair EV charging stations | Engadget](#)

⁵ California Energy Commission. *EV Charging For Multi-Family Housing*. Page 16. November 2021.

⁶ California Energy Commission. *Rural Electric Vehicle Charging*. Page 16. December 2021.

⁷ Federal Highway Administration. National Electric Vehicle Infrastructure Formula Program. February 2022. Page 22.

⁸ NYSERDA PON 4509, Page 11

⁹ Consolidated Edison Company of New York, Inc. *Electric Vehicle Infrastructure Make-Ready Program Implementation Plan*. September 2020. Page 7.

¹⁰ Louisville Gas and Electric. *Direct Current Fast charger Project Requirements*. 2021. Page 5.

¹¹ Florida Power & Light. *Electric Vehicle Supple Equipment Request for Proposal: Scope of Work*. 2021. Page 5.

¹² REV West: Voluntary Minimum Standards. Page 3. [revwest_volminimumstandards.pdf \(naseo.org\)](#)

¹³ Kinsey et. Al. *Building Reliable EV Charging Networks*. Page 6. May 2019.

And finally, California’s legislature is currently considering legislation, Assembly Bill 2703 (Muratsuchi), which would call on its Energy Commission to implement a reliability standard for EV charging stations it funds¹⁴.

Uptime guarantees act as an insurance policy that minimize consumer frustration and maximize the public benefit provided to drivers from charging stations funded by ratepayer dollars. Broken chargers do not provide a public good, and each time a charger goes offline, the return on investment in the charger is diluted. Uptime guarantees protect against this outcome. Therefore, the Commission should require publicly funded chargers to meet uptime guarantees.

II. Uptime guarantees must be measured and enforced through a standardized uptime data reporting framework.

FLO strongly supports the Commission collecting and publishing reliability metrics for publicly funded charging stations by technology type, both CEC and non-CEC funded. Collecting reliability data is the only way to understand the performance of publicly funded charging stations, whether reliability is a problem, and to what extent it is a problem. FLO’s mantra with its customers has been “if you don’t measure something, you can’t improve it” and the same applies here – if the Commission does not measure reliability, it will not know whether there is an issue and, if it is, how to improve drivers’ charging experience.

There is precedent for requiring uptime reporting, including:

- The Federal Highway Administration plans to issue data reporting requirements for funding recipients of National Electric Vehicle Formula funding, in which uptime reporting is likely to be included¹⁵.
- The legislature is currently contemplating Assembly Bill 2061 (Ting & Reyes), which requires reliability data reporting at the individual station level for a minimum of five years and calls on the Commission to develop a standardized reporting formula.
- California’s Air Resources Board recommended in its EVSE technology review to develop metrics and a process for tracking charging station uptime¹⁶.
- Alaska Energy Authority’s request for qualifications on charging stations requires charging networks to “monitor station uptime” and provide this data to the agency¹⁷.

Should the Commission collect reliability data, it is critical that it require funding recipients to adhere to the following requirements to ensure accurate, consistent reporting that provides a holistic and detailed understand of station reliability:

- Require funding recipients to report this data, with the option to designate this responsibility to charging providers – this gives site hosts who do not have the ability to collect this information the option to work with the charging provider to handle this responsibility. Charging networks already seamlessly and automatically collect this data and therefore can more easily provide this data to the Commission.

¹⁴ Assemblymember Al Muratsuchi. Assembly Bill 2703. 2022. [Bill Text - AB-2703 Zero-emission fueling station reliability standards: transportation: low-income and disadvantaged community financial assistance. \(ca.gov\)](#)

¹⁵ Federal Highway Administration. National Electric Vehicle Infrastructure Formula Program. February 2022. Page 28.

¹⁶ California Air Resources Board. *Electric Vehicle Supply Equipment Standards Technology Review*. February 2022. Pages 20.

¹⁷ Alaska Energy Authority. *RFQ Section 2 EVSE Package Requirements Response Attachment A*. 2021. Pages A6-A7.

- Require uptime data to be reported at the individual station level (as opposed to site or network level) – if not done this way, higher performing chargers could mask lower performing chargers, skewing the Commission’s understanding of drivers’ charging experiences and creating risks that some areas or populations may be under-served.
- Require uptime data to be reported across a 12-month period for a minimum of five years – reliability calculations across a 12-month period provide a more averaged understanding of charger performance. Furthermore, requiring a minimum of five years of reporting (well into each station’s useful life) will allow the Commission to obtain a longer-term understanding on how chargers perform. Requiring uptime data reporting only for the first year or two could give the Commission skewed results, as there is a risk that some stations may work best during the first couple years of operation, but as time goes on, may begin to wear down from use, abuse, and exposure to the elements, especially if improperly maintained. Finally, we encourage the Commission to provide flexibility to charging networks on how they provide this data – through API or another format – so that they can use tools and processes that are best for or most familiar to them without unduly restricting business models.
- Require funding recipients to use a standardized reporting formula developed by the Commission to calculate uptime – if the Commission doesn’t, it will have limited ability to know how funding recipients are calculating uptime, potentially undermining accuracy and consistency of information. FLO has developed the following formula¹⁸ and encourages the Commission to consider it:

$$\frac{[(\text{Number of minutes in the period}) - (\text{stall outage time minutes} - \text{excluded minutes})]}{(\text{Number of minutes in the period})}$$

- Limit exclusions to funding recipient’s calculation of station uptime to the following occurrences:
 - Upstream infrastructure failures (grid, cellular and internet providers)
 - Vandalism and abuse
 - Force majeure, defined as catastrophic unforeseen weather events
 - Site access restrictions permitted under the terms of the incentive agreement (e.g. closing a parking garage 12-6 am)
- We do not believe the following occurrences should be eligible as an exclusion to calculating uptime:
 - *Direct or company-specific cyberattacks as “force majeure”* – while generalized attacks that impact upstream infrastructure likely should be included, company-specific attacks should not be included. These are within the responsibility of a company to protect against.
 - *Vehicle interoperability issues* – it is extremely difficult to determine if a charger fails to dispense electricity due to a communication issue with a vehicle as opposed to a failure in the charger’s software or hardware. If vehicle interoperability issues are an allowable exclusion, it may increase the risk of

¹⁸ [Reliability Blog Series #3: Calculating Standardized Charger Uptime \(flo.com\)](#)

misreporting by the funding recipient when an uptime failure is due to the station's software or hardware, not the vehicle.

- *Supply chain and shipping delays* – while we understand there are supply chain issues impacting a multitude of industries right now, these should not impact uptime over the long term. Furthermore, companies can mitigate the impacts of delays and shortages with appropriate stockpiling and supply chain management processes.
- *Lack of workforce* – companies have several options to enlist technicians to repair stations, either in-house, through a 3rd party entity (e.g., ChargerHelp!) or if the site host has their own workforce. Creating an exclusion for insufficient supply of technicians would be hard to implement and account for accurately, potentially leading companies to misreport and potentially skew the data provided to the Commission.
- Require companies to separately report length and frequency of “excluded time” occurrences – while exclusions are necessary to measure a charging network's compliance fairly and accurately with a reliability standard, we believe charging networks should still report the frequency and length of excluded time separately to give the Commission the truest understanding of a station's reliability and how it may impact EV adoption.

Finally, it is critical to publish any reliability analysis via its AB 2127 and SB 1000 reports by technology type externally so stakeholders can review and assess the extent of the problem. Stakeholders have been effective at shaping and informing EV charging policy discussions and can be a useful resource to further support the Commission's work on reliability.

III. Definition for EV charging station reliability (slide 9)

Slide 9 of the Commission's workshop offers two definitions to measure reliability. We offer comments on the accuracy and applicability on each in turn:

- (1) *EV charging infrastructure reliability (charger reliability) refers to any element that must be operational to successfully charge an EV at a publicly available EV charging station. This includes hardware and software, but does not include infrastructure upstream from the charger (e.g. the electricity grid, cellular and internet providers).*

FLO supports definition (1) with the indicated minor modifications as technically accurate and the most precise definition to effectively measure charging station reliability from both a technical perspective and from the view of the charging network. Should the Commission institute a reliability standard via uptime guarantees and uptime reporting requirements, we believe this is the appropriate definition to measure a charging station's reliability.

From a technical perspective, “reliability” typically refers to whether software and hardware, including any related components, are operational and working properly to dispense electricity for a charging session. These are elements that electric vehicle service providers have control over because they design, manufacture, and maintain these components. In most cases, meeting an uptime guarantee and providing uptime data should be the responsibility of the charging network, because they are not only typically responsible for the software and hardware they provide (via operations and maintenance agreements), but they also are more familiar with and

technically capable of repairing and servicing the software and hardware they provide to consumers. Given this, we strongly encourage the Commission to use this definition as it relates to any reliability requirements it holds charging networks accountable for. As discussed above, we believe the additional clarification that this definition does not include infrastructure upstream from the charger is critical because charging networks cannot fix any failures related to these elements.

(2) User Experience is the overall experience of drivers that use public charging infrastructure to charge their electric vehicle (EV).

FLO recognizes that beyond the charging station being operational and working properly to dispense electricity, there are still other occurrences that may interfere with their ability to initiate a charging session. These could include, but are not limited to:

- The charging spot has been “ICEd”.
- The site host closes access to the station (typically in the late evening / early morning).
- An EV that is not charging parks in the space.
- Site construction blocks access.
- Customer does not know how to initiate a charging session.
- Customer cannot locate a charging station due to lack of signage.

We support the Commission evaluating the user experience holistically and investigating how to resolve the issues listed above. However, most if not all these issues cannot be controlled, tracked or fixed by the electric vehicle service provider. Therefore, this definition is not appropriate for measuring and evaluating an electric vehicle service provider’s compliance with a reliability standard – both uptime guarantees and uptime data reporting. However, we do think the Commission should spend more time investigating how to resolve these issues, and even potentially develop an independent metric on how well the state is resolving these issues.

IV. Should there be different reliability standards / metrics / reporting requirements for Level 2 stations and DC fast chargers? (slide 16)

Currently, FLO does not see a need for different reliability standards, metrics, and reporting requirements between networked Level 2 stations and DC fast chargers. Drivers need a consistent experience across charging networks and charging levels; therefore, we encourage the Commission to strive for consistent standards to the extent feasible, otherwise it risks creating an inconsistent charging experience for consumers, potentially dampening their interest in EVs.

V. Qualitative metrics are not a substitute for uptime as a quantitative metric.

FLO recognizes there may be additional metrics to measure overall reliability beyond uptime, both qualitative and quantitative – these could include but are not limited to: the number of hours the site is available to the public, the number of payment method options integrated with the charger, whether the charger has a failsafe mechanism to initiate a charging session in the event of a weak cellular connection, whether charging companies have 24/7 customer support, how robust charging companies’ maintenance plans are, and the types of service level agreements charging companies have with site hosts. Depending on how these features are implemented and maintained, they can increase drivers’ access to stations and their ability to successfully initiate a charging session. FLO supports the Commission additionally assessing these metrics if it believes they are important to more broadly understand charging station

reliability, however, we do not think any of these factors should substitute tracking and measuring station uptime.

Uptime measures charging station reliability more definitively than any other metric because it is closely correlated with monitoring the station's software and hardware. No other metric can measure these elements as closely or transparently, and no other metric is as closely aligned with the practical question of whether a charging station is working when it is needed. FLO encourages the Commission, if it wants to track other metrics, to make these additive to an uptime metric as opposed to implementing them as an alternative.

VI. A reliability standard should include a complementary operations and maintenance standard.

Funding recipients should also be required to submit robust operations and maintenance plans for review and evaluation, which should be provided to them by electric vehicle service providers. Key features of a well-developed, comprehensive operations and maintenance model can include:

- Scheduled preventative maintenance
- 24/7/365 customer call center to receive service calls
- 24/7/365 connectivity and monitoring of the operations of each charger
- Service ticketing and procedures to ensure service and operational issues are addressed in a reasonable timeframe
- Service level agreements backed by charging manufacturers
- Sufficient technicians trained to work on the make and model of each charger they operate in each region that they operate
- Detailed documentation and procedures to troubleshoot and repair chargers
- Sufficient local inventory of spare parts and logistics infrastructure

These additional qualitative features can strengthen and support charging companies' efforts to comply with uptime guarantees.

VII. In Conclusion

To protect drivers, ensure strong accountability of public funds, and help grow the EV charging market, it's critical the Commission develops a robust EV charging reliability standard. The Commission cannot measure compliance with uptime guarantees without uptime data; providing a well-defined, granular uptime data reporting framework to charging networks is critical to ensuring the Commission receives consistent and accurate data showing a station's "true" uptime. Otherwise, the Commission risks receiving skewed or incomplete data that undermines the accuracy of any charging station reliability analysis.

Thank you for your consideration,

[electronically submitted]

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FLO