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It's Electric, Inc's Comments on Community Charging in Urban Areas solicitation

Additional submitted attachment is included below.

April 5, 2024

California Energy Commission
Re: Docket No. 20-TRAN-04
Submitted via electronic commenting system for docket 20-TRAN-04

To Whom It May Concern,

Thank you for the opportunity to submit comments on Docket No. 20-TRAN-04, Community Charging in Urban Areas. My name is Nathan King, and I'm the co-founder and CEO of It's Electric, Inc. ("It's Electric"), a curbside electric vehicle (EV) charging company headquartered in Brooklyn, New York.

It's Electric is an EV charging station owner-operator, purpose-built for cities, with a mission to unlock access to clean vehicles for all urban drivers. Launched in 2021, It's Electric was founded to solve an urgent challenge: government agencies like the California Energy Commission are leading the way in setting policy targets and offering incentives to facilitate a transition to EVs, but no scalable charging solutions exist for the 40 million drivers across the U.S. who don't have access to a private driveway or garage. If we want all Californians to have equitable access to electric mobility, we must provide them with convenient and affordable public charging options where they already park: the curb.

It's Electric is addressing this challenge by harnessing spare electrical capacity from nearby buildings to deploy low-footprint curbside Level-2 EV chargers. We create a behind-the-meter connection to property owners' electrical panels to tap this excess capacity, thereby avoiding the barrier of grid limitations and the costly and time-consuming process of creating a new utility interconnection. Because of these significant savings, we can take on the capital, installation, and ongoing operations costs ourselves, without requiring contributions from our municipal partners or our host properties. Furthermore, we can afford to deploy in areas that don't yet have high rates of EV ownership – where we know utilization will initially be low – thus breaking the chicken-or-the-egg cycle that is currently stifling EV adoption in urban areas.

In return for hosting an It's Electric charger, host properties receive 20% of the charger's topline revenue, creating a new passive income stream for them while making it easier for everyone in their community to charge an EV. Our property owner partners include cities, parking authorities, owners of 1-2 family homes, commercial and multifamily residential property owners, schools, and other public institutions. And unlike other "public" chargers – which are often located in

parking lots or garages that charge a fee to access, or that are not open to the public 24/7– we are a truly public charging option. With revenue sharing for host properties, plentiful access for (current and future) EV owners, and virtually no impact on municipal budgets: It's Electric is a win for everyone.

Solving the Challenges of Deploying EVSE in Urban Areas: Hardware Specifications

We worked with industrial design firm Billings Jackson to ensure our chargers complement and enhance the urban fabric. While most other U.S. EV charging equipment is designed for installation in garages, parking lots, or highway rest stops, It's Electric chargers are sleek, durable, and unobtrusive, with a small footprint. Not only does this make our chargers easier and cheaper to install, it also ensures that the majority of the sidewalk is clear of obstruction – a priority for all pedestrians, especially those with mobility limitations.

Equitable access to EV charging requires hardware specifically designed to function in the urban environment, and we encourage the California Energy Commission (CEC) to consider the following issues when soliciting proposals for Community Charging in Urban Areas.

Charger Type: J3400 Standard

It's Electric chargers are the first in North America to feature a bring-your-own charging cord configuration. In March 2024, we received Underwriters Laboratories (UL) certification for both UL 2594 (Electric Vehicle Supply Equipment) and UL 2231 (Electric Vehicle Circuits).[1] Detachable cords not only streamline the charger's profile; they reduce the maintenance required from damaged cords or cord management components, which are the most commonly broken element of a public charger. User-detachable cables are the predominant curbside charging hardware configuration in the EU and UK,[2] where a "universal" J3068 socket-outlet allows for complete interoperability across different curbside charging providers. This universal socket-outlet is defined in the J3400 Standard in Appendix B referencing the J3068 standard and is fully compatible with J1772 and J3400 charging inlets in use in North American EVs.[3]

We support the Federal Highway Administration's (FHWA) adoption of the SAE's J3400 standard. In particular, we support the J3400 standard because it details a "Case B" Level-2 electric vehicle supply equipment (EVSE) design in which an "EV connects to an AC EVSE via an EV cable assembly that is detachable by the driver at both ends."[4] Detachable cords enable decision-makers to avoid picking technology winners and losers when it comes to Level-2

[1] TUV Rheinland. "Certificate No. US 72404367." https://www.certipedia.com/certificates/72404367?locale=en
[2] "Community Charging: Emerging Multifamily, Curbside, and Multimodal Practices" (pp 29-33). Joint Office of Energy and Transportation. February 2024. https://driveelectric.gov/files/community-emobility-charging.pdf
[3] "A Universal EV Outlet with Portable EV Cable." Kempton, McGee, & Ejzak. Article under review, manuscript received March 10, 2024. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4767711
[4] SAE International. "Technical Information Report: NACS Electric Vehicle Coupler." December 2023. Available at https://www.sae.org/standards/content/j3400_202312/ See page 11.

charging infrastructure. A charging post with a J1772-compatible "universal" J3068 socket-outlet can be used to charge any vehicle with a driver-provided cable, whether the EV has a J1772 or J3400 charging inlet.[5] This effectively future-proofs the investment states like California will be making over the next several years in building the network of publicly-available Level-2 chargers, enabling the development of a convenient, affordable, reliable, and equitable EV charging network, particularly for low-income and disadvantaged communities.

Beyond ensuring that taxpayer dollars are well spent, future-proofing EVSE infrastructure is a critical equity issue as well. Disadvantaged communities already lag behind in terms of EV adoption, with the high upfront cost of the vehicle itself and the lack of public EV charging infrastructure cited as the primary reasons.[6] The Inflation Reduction Act of 2022 created a new and used EV tax credit to help address the cost issue; while the new EV tax credit was an extension of a previous incentive, the used EV tax credit was a first-time acknowledgment that over 70% of Americans purchase used (not new) cars.[7] As EVs move along the technology adoption curve to include lower-income EV buyers, these buyers will be disproportionately likely to not have access to at-home charging because they live in multi-family homes or are renters. This means that these drivers could face a scenario of purchasing an older EV model, and then being reliant on charging stations that may or may not be compatible with their vehicle. Socket-outlet chargers, deployed on the curb, will enable these drivers to confidently make the transition to EVs, knowing that they will be able to charge their vehicles as conveniently as their neighbors who have access to at-home charging.

EVSE with user-detachable cables are also preferable from an accessibility and reliability perspective, especially when deployed in an urban context.

Accessibility. When a socket-outlet charger is not in use, the sidewalk and street are kept clear of cable. This is an important safety and accessibility feature, as dangling cable can be a hazard to those with mobility and vision impairments. The user-detachable cable model has been key to our ability to adhere to the U.S. Access Board's latest Design Recommendations for Accessible Electric Vehicle Charging Stations – which state that "Charging cables cannot block or obstruct accessible routes when stored or when connected to vehicles" – while keeping the charger footprint small.[8]

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[5] Ibid. See "Appendix B - Using SAE J3400 Coupler with Universal AC Socket-Outlet."
[6] J.D. Power. "EV Divide Grows in U.S. as More New-Vehicle Shoppers Dig in Their Heels on Internal Combustion." https://www.jdpower.com/business/resources/ev-divide-grows-us-more-new-vehicle-shoppers-dig-their-heels-internal-combustion May 1, 2023. Retrieved April 2, 2024.
[7] Carlier, Mathilde. "New and used light vehicle sales in the United States from 2010 to 2022." https://www.statista.com/statistics/183713/value-of-us-passenger-cas-sales-and-leases-since-1990/ August 29, 2023. Retrieved April 3, 2024.
[8] U.S. Access Board. "Design Recommendations for Accessible Electric Vehicle Charging Stations." https://www.access-board.gov/tad/ev/#:~:text=The%20Access%20Board%20recommends%20designing,parts%20at%20all%20EV%20chargers. See section on "charging cables."

Reliability. In our conversations with municipalities, they cite problems with an attached cable as the most common reason a charger is broken/unavailable. Cables break for a variety of reasons: users fail to properly remount the cable when they are done using it (resulting in broken pins); the cable is stolen or vandalized; or simply the cable is exposed to the elements for a longer period of time, accelerating wear and tear. When the cable breaks on chargers with an integrated cable, often the entire unit must be replaced, a costly and time-consuming process. This represents a major barrier to meeting the FHWA's 97% "uptime" requirements, a mandate that we support.

Reliability is a key issue for consumers as they weigh whether to make the switch to EVs. This is particularly true for drivers in disadvantaged or low-income communities, who most often do not have access to off-street parking and thus rely on public charging. For residents living in these communities who want to purchase an EV but who can't charge at home, reliable public charging infrastructure is an equity issue. With a detachable cable, if a particular cable breaks, the solution is much cheaper and easier – replacing that user's cable – and any delay does not impact the rest of the community.

This reliability advantage is also relevant when evaluating the costs and benefits associated with the initial logistics challenge of getting EV drivers a Level-2 cable. To state the obvious, a publicly accessible charger that requires a user-provided cable is not "available" in any practical sense unless a driver has such a cable in their possession. In this regard, the E.U. and the U.K.'s experience is promising: Level-2 user-detachable cables are provided at the point of sale by auto dealers, similar to the Level 1 chargers that are provided today in the United States. Given that the market has solved the cable distribution problem elsewhere, we are confident that this hurdle will be a short-term logistical challenge for socket-outlet EVSE manufacturers like us to overcome, before a more standardized solution takes hold. Indeed, we are incentivized to do so (e.g. by providing a cable to drivers at no or little cost) to ensure a robust customer base is able to utilize our chargers.

Payment Method Requirements for Electric Vehicle Supply Equipment

In keeping with SB 123, It's Electric encourages alignment of CEC's rules with the National Electric Vehicle Infrastructure (NEVI) standards with regards to payment methods, to ensure that chargers without credit card readers can receive state-level funding to deploy in California communities.[9] Currently, CEC requires the following of Level-2 chargers:

[9] California Air Resources Board. "Electric Vehicle Supply Equipment (EVSE) Standards." https://ww2.arb.ca.gov/our-work/programs/electric-vehicle-supply-equipment-evse-standards/about

(d) All EVSE subject to this section shall have a credit card reader device physically located on either the EVSE unit or a kiosk used to service that EVSE. The credit card reader device shall comply with all of the following requirements:

(1) The credit card reader device shall accept, at a minimum, the Euro MasterCard Visa (EMV) chip and, at a minimum, one of the following credit card types: Visa, MasterCard, or American Express.

(2) The credit card reader device shall be non-locking and shall always permit customers to remove their credit card without damage to the card, including during a fault situation or power failure.

(3) The credit card reader device shall comply with PCI – DSS Level 1.[10]

We think these prescriptive rules are too narrowly tailored to reflect today's payment technology, and should be broadened in keeping with the rules finalized by the Federal Highway Administration (FHWA) in February 2023:

> This final rule establishes a requirement that charging stations must provide a contactless payment method that accepts major credit and debit cards and accept payment through either an automated toll-free phone number or a short message/messaging system (commonly abbreviated as SMS). Payment methods must be accessible to persons with disabilities, not require a membership, not affect the power flow to vehicles, and provide access for those that are limited English proficient.[11]

Later in the summary of the rules, the FHWA defines "contactless payment methods" as a "secure method for consumers to purchase services using a debit card, credit card, smartcard, mobile application, **or** another payment device by using radio frequency identification (RFID) technology and near-field communication (NFC)."[12] (Emphasis added) The use of "or" is crucial here, as it allows EVSE manufacturers to choose which payment technologies make the most sense to deliver an easy consumer experience, without locking us into a particular method.

During the NEVI rulemaking process, FHWA received comments supporting the contactless payment requirement and opposing the addition of a contact-based payment option on technology availability and accessibility, security, and charger reliability grounds. Most relevant to our discussion here is reliability: malfunctions with contact-based credit card payments are cited as being responsible for a large portion of reported downtime of existing chargers,

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[10] California Code of Regulations. "Attachment A: Final Regulation Order." https://ww2.arb.ca.gov/sites/default/files/2020-06/evse_fro_ac.pdf

[11] Federal Highway Administration. "National Electric Vehicle Infrastructure Standards and Requirements." https://www.federalregister.gov/documents/2023/02/28/2023-03500/national-electric-vehicle-infrastructure-standards-and-requirements February 28, 2023.

[12] Ibid.

potentially contributing to the failure of stations in meeting uptime requirements – and certainly adding to consumer frustration and lack of confidence in the public charging network.[13]

We believe the federal standard allows payment technology to continue to develop, while requiring that low-tech options remain available to ensure public EVSE are accessible to everyone. Furthermore, this approach is in keeping with It's Electric's design philosophy on deploying EVSE in the public right-of-way.

When designing our charger – purpose-built for deployment at the curb – we intentionally stripped our charging post down to the bare minimum, including removing the credit card swipers, screens, and touchpads. All that's left is a slim, stainless-steel encased charging bollard with a J3068 socket-outlet and an RFID card reader. We have eliminated everything that could be vandalized, damaged, or broken, to make a piece of street furniture that is as ubiquitous and long-lasting as a fire hydrant (at least for its expected useful life of 10 years).

J3400 and J3068 Signaling as an Alternative to ISO-15118 for Level-2 AC Chargers

As you are aware, the FHWA recently solicited input on the SAE J3400 standard, commonly known as the Tesla/NACS connector.[14] We submitted comments in support of that transition, including the adoption of LIN CP signaling as a performance-based alternative to ISO-15188 for Level 2 AC chargers. The J3400 standard includes provisions for LIN CP using J3068 signaling for AC power transfer.[15] LIN CP signaling allows for a more robust communication protocol between the EVSE and EV, while still being backwards compliant with the current PWM-CP signaling protocol defined in the J1772 standards. LIN CP utilizes readily available components that utilize significantly less power than ISO-15118 hardware, reducing the cost to build and operate chargers. LIN CP J3068 signaling will allow the North American Level-2 AC charging industry to more quickly integrate features such as plug and charge and bi-directional charging.[16] Further, when LIN CP is combined with a user-detachable cable, there is a potential for a chip embedded in the cable to allow plug and charge compatibility for vehicles that currently do not support plug and charge systems. This capacity for user-detachable cables to become "plug and charge" translators greatly expands the convenience and security to drivers with legacy vehicles.

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[13] Thomas, Zoe. "The Problem with EV Chargers." *Tech News Briefing.* https://www.wsj.com/podcasts/tech-news-briefing/the-problem-with-ev-chargers/05b1af19-9fb0-4b44-98f8-15a836fdc283 November 16, 2023. Retrieved April 5, 2024.

[14] Federal Register. https://www.federalregister.gov/documents/2024/03/06/2024-04750/request-for-information-on-the-j3400-connector-and-potential-options-for-performance-based-charging

[15] Also defined in International Electrotechnical Commission Standard 61851-1 Annex D.

[16] "A Universal EV Outlet with Portable EV Cable." Kempton, McGee, & Ejzak. Article under review, manuscript received March 10, 2024. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4767711

Charger Output

It's Electric's business model is based on the premise that Level-2 is the only feasible option for curbside charging, and is the best choice for widespread deployment in low-income and disadvantaged communities that face grid limitations. Level-2 chargers that meet the FHWA's NEVI requirements can fully charge any light-duty EV in 6-8 hours, allowing drivers to charge their vehicles overnight or during their work shift. For these drivers, the time spent charging is limited to plugging in the EV and activating the charger. The power required for a Level-2 charger – no more than a residential electric clothes dryer – is readily available in most buildings.

DC Fast chargers, while able to charge most light-duty EVs in under an hour, are orders of magnitude more complicated and expensive to deploy. Equipment and installation costs are typically 5x-25x higher than a Level-2 charger, excluding engineering, interconnection, and permitting costs.[17] DC Fast chargers take up significantly more space than Level-2 chargers, and have accessory transformers, meter stands, and equipment cabinets that must be co-located by the unit. Moreover, because of the intense electrical demands DC Fast chargers require, finding suitable locations for these chargers from a grid capacity perspective is extremely challenging. Finally, because most drivers utilize DC Fast chargers during daytime hours – when they are awake and can move their car after the charging session is complete, rather than leaving their vehicle to charge overnight – the capacity of the utility's electrical distribution will quickly reach a limit on DC Fast charging. This is a major reason why the National Renewable Energy Laboratory (NREL) estimates that 80% of public charging in cities needs to be Level-2.[18] For these reasons, DC Fast charger deployments should be concentrated off-street on public lots and garages, ideally adjacent to highway exits and commercial centers, serving drivers making intercity trips or topping off while shopping.

It's Electric's chargers connect to a 40 Amp, 208V -240V AC circuit, and deliver 6.6 kW at 208V or 7.7 kW at 240V. This power level means that an average EV with 80 kWh capacity will require 6-7 hours to recharge from 20% to 80% battery levels. This is in keeping with the FHWA's rule that "Each AC Level 2 charging port must have a continuous power delivery rating of at least 6 kW and the charging station must be capable of providing at least 6 kW per port simultaneously across all AC ports."[19]

As explained previously, It's Electric powers our chargers through a behind-the-meter connection to nearby buildings, utilizing their spare capacity to bypass the need for a new utility interconnection. Because of the varying power levels available at buildings throughout the state

[17] Energy5. "DC Fast Charging Stations Cost - A Comprehensive Guide." https://energy5.com/dc-fast-charging-stations-cost---a-comprehensive-guide September 2023.
[18] Squires, Anna. "Building the 2030 National Charging Network." https://www.nrel.gov/news/program/2023/building-the-2030-national-charging-network.html June 2023.
[19] Federal Highway Administration, U.S. Department of Transportation. See Footnote 8.

of California, we anticipate that some chargers will be able to deliver 6.6 kW of power and others will be able to deliver 7.7 kW of power. Thus, we support the CEC's output minimum of 6.2 kW of power for Level-2 chargers.

Thank you again for the opportunity to submit comments in advance of the Community Charging in Urban Areas solicitation. We welcome the opportunity to meet with you and your staff to provide any additional information or clarification on our recommendations.

Sincerely,

Nathan King, AIA
Co-Founder & CEO
It's Electric, Inc.