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Greenlots Comments on AB 2127 EV Charging Infrastructure Assessment

Additional submitted attachment is included below.



February 26, 2021

Docket No. 19-AB-2127

-Via e-file-

California Energy Commission
Docket Unit, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

RE: Comments of Greenlots on AB 2127 Electric Vehicle Charging Infrastructure Assessment

Dear Commissioners and Staff,

Greenlots submits these comments in regard to the California Energy Commission's ("CEC" or "the Commission") draft AB 2127 Electric Vehicle Charging Infrastructure Assessment ("the report" or "the assessment") and following the Lead Commissioner Workshop held on February 4-5, 2021 regarding the assessment, which analyzes charging needs to support zero-emission vehicles in 2030.

Greenlots is a leading provider of electric vehicle ("EV") charging software and services committed to accelerating transportation electrification in California, and a wholly owned subsidiary of Shell Renewables and Energy Solutions. The Greenlots network supports a significant percentage of the DC fast charging infrastructure in North America, and an increasing amount of Level 2 infrastructure. Greenlots' smart charging solutions are built around an open standards-based focus on future-proofing while helping site hosts, utilities, and grid operators manage dynamic EV charging loads and respond to local and system conditions.

Greenlots has consistently communicated the viewpoint that a long-range strategy is needed for California in order to reach its EV infrastructure goals, and other goals related to climate, equity, and air quality. Indeed, meeting the Governor's Executive Order N-79-20 to have 100% sales of zero-emission passenger cars and trucks by 2035 ("the Order") will require significant planning, coordination and investment. With this in mind, Greenlots strongly supported legislation including SB 350, AB 841 and AB 2127, understanding where the state is in terms of EV charging infrastructure today versus what is required to help meet these various and evolving goals.

Accordingly, Greenlots applauds the Commission and its staff's significant efforts, modeling and analysis that went into this important, seminal report. Below we provide select comments on the report's content and findings.

Greenlots agrees with the Report's findings that light-duty vehicles will need over 1.5 million shared chargers by 2030, and that continued public support for charger deployment is essential to meet state ZEV goals.

Building from CARB's analysis that that 8 million light-duty ZEVs will be needed in 2030 to meet the new Order, the report finds that over 1.5 million shared chargers for light-duty vehicles, will be needed to support these vehicle deployments by 2030. Greenlots supports this finding, noting that this represents both a realistic vision for what is needed, and a clear call for an immediate acceleration of the state's efforts and the efforts of the industry.

As the report also recognizes, however, continued and significant public support and investment will be critical to meet this need. Indeed, with articulation of the infrastructure gap, California has a sharpened responsibility to deliver a range of policy, programs, and investment to enable the market to close the part of the gap that is within its economic wherewithal. Greenlots notes the preliminary analysis relating to medium and heavy-duty charging indicates that still further investigation will be needed in those segments. Greenlots also supports the vision outlined in the report where charging solutions must be tailored to local and community needs to ensure equitable ZEV access for all Californians, and where charging is accessible, smart, widespread, and easier than a trip to the gas station. These are visions that will similarly take significant, concerted effort to realize, and the report's other inseverable and complimentary findings, discussed below, will be critical to make these visions a reality.

Greenlots supports the Report's focus on charging management strategies beyond the use of time-of-use rates, to better align with renewable energy generation and grid needs.

The report makes an appropriate and astute recognition that in order to responsibly support the significant ramp up in charging and number of chargers identified, much more will need to be done to have charging behavior align with system needs and renewable energy generation. Indeed, in order to realize the economic, air quality, and climate benefits of transportation electrification, the state must pursue greater vehicle-grid integration ("VGI"), ensuring that charging is better aligned with renewable electricity, while providing for driver optionality. The report forecasts increased electricity demand by up to 15 percent by 2030 related to transportation electrification, and it will be critical to integrate this load in a manner that ensures it is an asset to the grid and complementary to the state's abundant renewable energy resources. This will implicate increased use of technology-enabled EV charging and load management solutions, increased investment and funding for these solutions, which are as important as the infrastructure itself, and the state prioritizing and supporting charging standards and innovation, as discussed below.

There is opportunity for the assessment to better acknowledge the role of utilities, including investor-owned utilities, in advancing transportation electrification.

While the report includes a subsection describing publicly-owned utilities and their role, efforts and preparedness for transportation electrification,¹ there is opportunity to better acknowledge the important and central role of all utilities, including investor-owned utilities, both now and in the future as the market evolves. While the utility's role will evolve over time, it will continue to be at the nexus of effective EV grid integration, and for the foreseeable future will have an important role in developing and supporting the development of EV charging infrastructure, especially in more difficult to reach market segments. Greenlots encourages inclusion of a subsection that discusses this topic and these realities.

Innovative financial concepts intended to better support and leverage private sector investment, including staff's "Cost of Enabled Charging" concept, warrant more stakeholder socialization and workshoping.

Greenlots greatly appreciates Staff's initiative and innovative thinking in developing what it previously referred to as a Transportation Electrification Regulatory Policies Act (TERPA) concept, introduced at the IEPR Workshop on June 24, 2020, and later described in the Draft 2020 Integrated Energy Policy Report, Volume 1, as the "avoided cost of charging". The concept, described on page 86-88 now as the "Cost of Enabled Charging", represents a unique approach building upon historical precedent and policy successes that could have valuable applicability to challenges associated with EV charging infrastructure deployment. Greenlots appreciates the description of how this could work, and is excited by the prospect it could hold in driving interoperability and standardization in the EV charging ecosystem.

At the same time, Greenlots has concerns that this approach could inappropriately and prematurely drive the EV charging market towards commoditization. At this stage of the market, and despite understandable desires to look to future market states, EV charging and related technologies are not ready for commoditization from a value standpoint, and policies and programs that support them should not treat them as commodities. Given that there is a lot of detail and nuance to unpack in the concept, as we've encouraged previously, Greenlots suggests dedicating time to further explain, discuss and socialize the concept at a dedicated Commission workshop.

The report's focus on taking steps to prioritize charger and VGI standardization is appropriate, overdue, and needed to protect state investments and provide certainty to the market.

Over the past several years, the Commission has proposed at multiple workshops future technology requirements for the CALeVIP program, but largely has not taken action to adopt its own recommendations.² The report correctly determines that prioritizing chargers that speak

¹ At p. 69-70.

² These include past workshops on CALeVIP equipment technology requirements held on June 28, 2018, and November 18, 2019, the CALeVIP Projects Roadmap workshop held on October 4, 2018, and the CALeVIP 2021 Incentive Projects Planning workshop, held on October 23, 2019

common languages with vehicles and backend networks ensures chargers, the cloud, and vehicles can exchange the information necessary to automatically align charging with surplus renewable energy generation, enable plug-in vehicles to power homes and businesses during outages, streamline the charging experience, provide customers with hardware and software switching ability and increased choice, and provide certainty and a platform for innovation to the market. Accordingly, Greenlots supports the Commission's determination that it must seize the moment to support the technology requirements it has contemplated over the years that are needed to help move the and coalesce the market around greater adoption of standardization and driver-friendly technologies. The Commission importantly recognizes that this is not only a market need, but an opportunity to better protect against California being left behind by efforts in other geographies.

Greenlots firmly believes that the adoption of open protocols and standards is essential to support transportation electrification, grow the market for EVs, enhance the driver/customer experience, integrate with the electricity system, and lower the cost of ownership of both EVs and EV charging infrastructure. Indeed, the proliferation of open protocols and standards provides a platform and ecosystem for innovation and customer choice that is critical in guarding against stranded assets and protecting the prudence of public investments. Accordingly, the Commission should take necessary steps to support standardization in both VGI communication and hardware-software communication, as it has proposed to do at past workshops including those referenced above. By determining and setting a requirement early, and giving the market time to adapt its products to meet the requirements, the Commission can use its position to support clear state goals, improve the driver experience, and support an interoperable EV charging marketplace. As discussed further below, this includes requiring third-party OCPP certification for any Commission-funded charging infrastructure, in addition to ISO/IEC 15118, "plug and charge" functionality, and any needed hardware changes to support these capabilities that are critical for vehicle-grid integration.

For these reasons, Greenlots strongly supports the assessment's determinations that it should provide clear guidance by setting and prioritize these technology requirements in advance of the implementation of future incentive programs, so the market has time to plan around them.

The Commission should ignore calls to revise the report's findings that it should support and prioritize standardized charging communication protocols, and move beyond antiquated messaging and ineffective approaches related to VGI communication standardization.

Greenlots anticipates that the Commission will receive comments from a minority of stakeholders urging it to revise its findings related to charger and VGI communication protocol standardization, and continue to take a hands-off approach that "lets the market decide". These comments will likely bear a striking resemblance to messaging on this topic from over six years

ago when the original 2014 California VGI Roadmap³ was being developed. This view generally holds that before anything else, VGI value must be studied more carefully and proven more definitively before taking further actions, especially before encouraging standardization for VGI communication across certain pathways lest it result in picking winners and losers or steering the market in a certain direction. This point of view, also expressed throughout the 2017 stakeholder process that led up to the California Public Utility Commission's 2018 "Energy Division Staff Report on VGI Communication Protocol Working Group"⁴ was largely responsible for no action or recommendation being made with respect to VGI communication standardization at that time. This followed other stakeholder process on the topic where this view was prevalent, including this Commission's Vehicle-Grid Integration Communication Standards Workshop held in December 2016.

After more than six years, these talking points are badly outdated and should not be given credence, especially considering how little progress the industry has made on VGI communication standardization when heeding these short-sighted recommendations and in the absence of agency directive – as well as the growing recognition of value that may not be able to adequately be unlocked without this type of standardization.

It is appropriate, necessary, and a responsibility of the Commission to encourage and require communications standardization across pathways that transect EVSE being supported with public funds.

As the Commission's 2017 Integrated Energy Policy Report stated in its recommendations related to updating the original 2014 California VGI Roadmap, there is a need "...to use open standards, to return the value of grid integration to stakeholders, and to commercialize prior investments in research and maintain leadership in advanced technology development."⁵ Its recommendations also emphasized the need to "standardize electric vehicle charging equipment to enable resource dispatch" and "better integrate electric vehicles into the grid".⁶ These recommendations encapsulate ambitions that today – after another four years involving working groups focused on updating the VGI roadmap,⁷ addressing VGI communication protocols,⁸ further analyzing VGI use cases, value, and needed policy changes,⁹ and even passing legislation related to VGI¹⁰ – we regrettably still have little to show for in terms of demonstratable progress on these issues beyond further analysis, policy recommendations, and reiterated ambitions.

³ Available at: <https://www.caiso.com/Documents/Vehicle-GridIntegrationRoadmap.pdf>

⁴ Available at: <https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442460144>

⁵ At p. 141.

⁶ I.d.

⁷ See <https://www.energy.ca.gov/programs-and-topics/programs/california-vehicle-grid-integration-roadmap-update>

⁸ See <https://www.cpuc.ca.gov/vgi/>

⁹ See <https://gridworks.org/initiatives/vehicle-grid-integrationwg/>

¹⁰ SB 676 (Bradford), 2019

Greenlots supports efforts to study and prove out VGI value across different use cases, including those that do not relate to public EV charging infrastructure investments (e.g. those involving OEM telematics). However, these efforts should not distract from the essential, overdue deliverable of implementing actions that move the market towards greater adoption of existing and emerging open standards, with a specific focus on those that relate to the charging infrastructure being supported with public funds. The suggestion that the Commission need not worry about equipping public funds-supported EVSE with VGI capabilities because this may be addressed through some other pathway at some point in time is not aligned with the Commission's responsibility to manage risk and protect state investments.

Greenlots recognizes that this goal of coalescing around standards is not easily achieved. The process and results thus far make this very evident. It is also a result that does not naturally emanate from middle-ground compromise or consensus policy making. Stakeholders have dedicated significant and genuine collective efforts to the process. However, this has been hampered by overarching desires to maximize flexibility and the erroneous notion that supporting VGI development over one pathway inherently disadvantages another, as if it is a zero-sum game. The lack of progress we've seen is largely due to this dynamic, which is holding back the industry and the value of public investments. Rather than ensuring charging stations deployed with the support of public funds can communicate VGI signals, we are seeing results which inherently minimize the value of that public investment by potentially bypassing it altogether.

Pitting one type of VGI against another, or one VGI pathway versus another, is self-defeating. There is no need to be picking winners and losers, and supporting VGI over a certain pathway does not pick winners and losers, as some mistakenly assert. It is an impediment to overall VGI development to subscribe to the notion that unless a specific action can be equally beneficial to all potential VGI pathways, it shouldn't be taken at all. Indeed, the desire to first identify VGI value before creating the pathways to achieve and access that value is understandable. However, this has locked VGI and the development of its value into a chicken-and-egg conundrum not dissimilar to that commonly used to describe the challenge of supporting the adoption and proliferation of EVs and EV charging infrastructure. This has inhibited market development, and if it continues could conceivably relegate VGI only to relatively low and narrow tech approaches that already exist (e.g. bill management through rate design, etc.).

California has been a leader in enacting policy and regulation that may be unpopular in some circles but is needed to move a market in a particular beneficial direction. For California to continue its leadership in advanced mobility and clean transportation through VGI, it is becoming increasingly clear that pragmatic action is required to break through the current and historic circular discourse that has produced so few useful results. There is large financial risk associated with VGI value being left on the table, including potentially stranded assets, crippled in their ability to support VGI, that will become increasingly costly for the public and inconvenient for drivers, detracting from the positive work the state is doing in so many other areas of advanced mobility.

Greenlots supports the report’s finding that the Commission prioritize EVSE equipped with ISO 15118 capabilities and the required physical layer for high-level communications when supported with public funds.

With respect to VGI communication through the EVSE, which is the relevant VGI pathway in the context of public funds-supported EVSE and supporting EVSE value and capabilities, Greenlots strongly supports the report’s findings that the Commission prioritize chargers that support this standard, and include the physical hardware transceiver chip to allow for high-level VGI communication.

Without this, the EVSE is largely sidelined in the VGI value chain as the default consequence of inaction. While there is a spectrum of stakeholder perspectives and interests associated with multiple VGI pathways, it is the Commission’s prerogative and duty to put in place requirements that avoid further lack of progress. Five years from now, the state and Commission will want to be in a position where the majority of chargers deployed throughout the state with the support of public funds have the capability to communicate with vehicles to facilitate VGI through the charger, and unlock value largely heretofore unavailable. The hardware cost of this chip is *de minimis* at reasonable scale,¹¹ and having a sufficient fleet of deployed chargers with these hardware capabilities will create value and incentives for network and software providers to integrate, innovate with, and leverage these capabilities in their offerings. Without it, this is unlikely to happen: the hardware capabilities must come first. This hardware capability does not advantages EVSE as some stakeholders continue to argue – it simply puts the EVSE on the same equal capabilities footing as telematics-based VGI communication pathways.

ISO/IEC 15118 is the protocol commonly associated with EVSE-centric VGI, which also supports “plug and charge”, future V2G capabilities and a relatively seamless EV driver charging experience, providing the greatest benefits compared to other high-level communication protocols. The standard is being deployed and supported internationally, with a number of automakers committed to equipping millions of EVs with ISO 15118 capability over the next several years. Indeed, inaction in California while much of the global automotive market coalesces around this standard for EV-EVSE communication has and will continue to prove detrimental to the growth of the EV market, and would be out of line with the State’s longstanding leadership role in clean mobility. As such, and while recognizing there are various issues still being worked out with this protocol, Greenlots strongly supports equipping public funds-supported EVSE with the ability to communicate with EVs via ISO 15118, which means that networked chargers are equipped with the requisite transceiver chip when deployed with the support of public funds.

¹¹ See Energy Commission presentation regarding future technology requirements for the CALeVIP program, November 18, 2019, Slide 52, indicating a transceiver marginal cost of about \$1.50/unit. Available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=230794&DocumentContentId=62410>

Greenlots notes that it is impractical to expect EVSE manufacturers to be able to incorporate this hardware change into their products overnight, and accordingly supports providing the signal to the marketplace quickly, and providing an adequate phase-in timeframe. This will also provide time for the industry to continue to work through Public Key Infrastructure (“PKI”) implementation challenges. This low-cost hardware requirement will support VGI value to drivers and the grid, enhance the charging experience, and avoid unnecessary stranded asset risk. Without setting a date on the near horizon for industry to plan around for incorporating physical capabilities for VGI through the EVSE, the Commission would likely be prevented from selectively requiring this, since an adequate array of hardware to choose from supporting these capabilities likely would not exist in certain market segments without an adequate market signal to manufacturers.

Greenlots supports the report’s findings that the Commission should prioritize EVSE certified to be Open Charge Point Protocol (“OCPP”) compliant when supported with public funds.

Greenlots agrees that the Commission should require public-funds supported EVSE to be OCPP compliant. As the assessment describes,¹² OCPP is the leading and freely available universal communication protocol that enables component vendors and network operators to mix and match interoperable hardware and software. Utilizing OCPP therefore both mitigates stranded asset risk and provides site hosts and station owners with the flexibility and optionality to switch between OCPP compliant vendors of both hardware and software, providing for competition and customer choice beyond the initial point of purchase.

Due to relatively light regulatory oversight of this space to date, the application of this protocol has been inadequate to ensure full flexibility and ongoing customer choice. If regulators do not adequately address the impact of non-compliant networks, the complexity resulting from shoehorning incompatible networks into an open and interoperable system could add significant future cost and difficulty, or not be possible at all. It will also significantly limit future flexibility for switching hardware and software, and in so doing, limit the potential for ongoing competition for both software and new hardware models. As competition is often the driver of innovation, and innovation often results in increased customer choice, such a dynamic can have profoundly negative impacts on hardware and software product development and markets.

The argument for a slower, restrained approach towards requiring and adopting this protocol has largely been rooted in two contentions. First, it’s argued that using a standard protocol itself can hamper innovation by imposing a ceiling on features and functionality. Second, some contend that OCPP isn’t yet certified by a standards body or that there is no third-party certification program to ensure compliance. Neither of these contentions are well-founded. Utilizing OCPP imposes no ceiling whatsoever in adding additional functionality or features on top of it; instead it represents a floor upon which more can be built should a particular vendor choose to or market segment demand it. Moreover, while a self-certification process has been

¹² At p. 58-59.

available for quite some time, the Open Charge Alliance (OCA) – the open and transparent organization that oversees the protocol – has implemented a third-party certification program with independent testing laboratories around the world, including in the United States.¹³ Finally, the International Electrotechnical Commission (IEC) is already working with stakeholders to develop OCPP 2.0 into an IEC version (IEC 63110), which will be backwards compatible with prior OCPP versions, representing OCPP’s relatively near-term pathway to adoption by a more traditional international standards body.

The need for charger-to-network interoperability is immediate, and the public policy goals this supports are clear. The vast majority of EVSE vendors already offer EVSE that is self-certified OCPP-compliant, and Greenlots sees no justification for Californians to continue to support non-interoperable infrastructure deployment. With an independent third-party OCPP certification process, it is appropriate for this to be a requirement of EVSE supported with public funds once an adequate phase-in timeline is established for hardware and software providers to comply.

Finally, Greenlots notes that in some instances, hardware-software interoperability has been limited by vendors contractually, even when the underlying hardware may be OCPP certified/compliant. This is analogous to a cell phone that is locked to a certain network, requiring permission from that network operator to be unlocked. Accordingly, the Commission should explicitly forbid this practice, as agencies in other states have done in public charging infrastructure solicitations.¹⁴

Conclusion

Greenlots appreciates the Commission’s consideration of these comments, its ongoing efforts to support transportation electrification and advanced mobility, and looks forward to the road ahead.

Sincerely,



Erick Karlen

Sr. Advisor, Policy & Market Development

¹³ See <https://www.openchargealliance.org/certification/ocpp-16-certification/>

¹⁴ See for example Oregon’s currently open solicitation to upgrade its portion of the original West Coast Electric Highway, which states “Interoperability - Ability to change network service providers without having to replace charging equipment: All EV charging stations must be networked and compliant with Open Charge Point Protocol (OCPP) 1.6 (or newer) requirements, and must be capable of switching networks without technological, contractual, or other unreasonable restrictions. (Systems that are OCPP compliant at the network level only are not permitted).” Materials linked here: <https://www.oregon.gov/odot/Programs/Pages/Electric-Vehicles.aspx>