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**BEFORE THE PUBLIC SERVICE COMMISSION**
**OF THE STATE OF MISSOURI**

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| In the Matter of a Working Case to Evaluate Potential Mechanisms for Facilitating Installation of Electric Vehicle Charging Stations | Case No. EW-2019-0229 |

**POST-WORKSHOP COMMENTS OF SIEMENS AND GREENLOTS**

Attached herein please find joint comments of Siemens and Greenlots (collectively, "Joint EV Technology Providers", "The Providers", "we" or "our") in the above-captioned proceeding.

Respectfully submitted this 30th day of April 2019 by:


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## POST-WORKSHOP COMMENTS OF SIEMENS AND GREENLOTS

Siemens and Green lots hereby submit comments pursuant to the Public Service Commission of the State of Missouri ("the Commission") workshop on March 21, 2019 and Order inviting Comments issued on March 22, 2019 in Case No EW-2019-0229.

### Introduction

Siemens is a global leader in eMobility® and considers eMobility to be a critical element in driving economic benefits from new investments and job opportunities, at the same time achieving the societal benefit of a cleaner environment. We sell the EV chargers, EVSE electrical components, and make-ready equipment that we assemble/manufacture in the US directly to consumers, workplaces, cities, government, utilities and other segments. Siemens Plug to Grid™ eMobility product portfolio encompasses hardware, software and services which are currently deployed in 35 countries globally. The goal of our policy efforts is to promote public policies and global best practices that animates the EV market through lowering the Total Cost of Ownership (TCO).

**Siemens operates through 10 locations in Missouri with 1100 employees generating over $184 million in in-state sales.**

Greenlots is a leading provider of EV charging software and services and a wholly owned subsidiary of Shell New Energies, committed to accelerating the transportation electrification market Missouri. The Greenlots network supports a significant percentage of the DC fast charging infrastructure in North America, and an increasing percentage of the 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 electric vehicle charging loads and respond to local and system conditions.

### Comments

The comments of the Joint EV Technology Providers here address some of the topics raised by the Commission that we consider to be critical to developing a thriving and competitive EV market – however, they are by no means all-encompassing, and we reserve the right to submit additional comments.

**Core Policy Positions of the Joint EV Technology Providers on EV Infrastructure (EVSE) Deployment**

- Supporting an open, competitive market for EV charging infrastructure that allows for a level playing field for all relevant players who have a positive role in growing the overall EV market, including the key role of the utilities and utility ratepayer investment. This creates more charging options for customers, grows the market, and enhances competition amongst market participants, without favoring any one business model or type.
- Publicly funded charging infrastructure should utilize diverse business models in deployments to maximize cost/resource efficiencies in the various vehicle and customer segments. This means not just relying on rebates and/or make ready programs, which entail inherently more costly retail-level procurement.
- Publicly funded charging infrastructure must be based on open technical standards to ensure interoperability, customer switching capability and minimum risk of stranded assets.
- Charging infrastructure at public sites such as highway corridors and government buildings must provide payment options with credit card readers as a minimum to ensure universal customer access.
- Publicly funded charging infrastructure must be "smart", i.e., networked and sub-metered, to enable EVs to be grid assets and maximize "fuel" savings benefits to users.

**# 2 (a)**

**On Pilots**

The Commission should provide guidance on two points:

**First,** learnings from the numerous pilots around the U.S. and globally should be leveraged. These insights are generally applicable in different scenarios/geographies -- repeat pilots are generally an inefficient use of ratepayer funds.

**Second,** pilots should be treated as ongoing programs rather than science experiments. The typical four-step approach to pilots (plan, receive regulatory approval, operate, evaluate/report) should be avoided, because it results in lengthy, expensive pilots, the results of which may be obsolete before the final report is produced. Such pilots typically involve protracted regulatory proceedings for approval as well; in fact, their relevancy is often dated even before installation of equipment has begun. Instead, pilots should be treated as phased programs. They should be approved in advance, planned in real time, put into operation, then either terminated for not working or modified continuously over time to improve the effectiveness of those that are working.

The Commission can allow ongoing modifications by approving program designs that incorporate flexibility. For example, the approval need not specify how program marketing is performed. A utility could conduct marketing within a certain budget (which could even be a percentage of program costs, which is how many businesses operate) but have the flexibility to determine exactly how the marketing is performed (channels, messages, campaigns, etc.).

**On Data Gathering**

Electrical Vehicle Supply Equipment (EVSE), also called a charger, has the ability for data generation, storage or communication abilities. Data related to charging activities can be collected and stored only when the EVSE is connected to an EV. To ensure effective data gathering capabilities of an EVSE, there are three requirements:

**The first** is metering or, to be specific, sub-metering. Without either a dedicated smart meter or sub-metering, it is not possible to determine the time-varying value of EVs to the grid and to wholesale markets. The metering must be at the EVSE level to accurately determine the costs and benefits of the EV acting as a Distributed Energy Resource or DER (i.e., reducing on-peak consumption or increasing consumption when renewables are abundant and wholesale prices low).

**The second** is communications. Data from the EVSE meter must be delivered to the cloud and/or utility using open technical standards for use in determining the value and to provide necessary control functionality. In addition, programming and control signals must be deliverable to the EV via remote communications. A local timer on board the EVSE (or the EV) could respond to simple TOU rates but is incapable of delivering the far greater value associated with hourly pricing or demand response events dispatched by the utility and/or market operator without communication abilities.

**The third** is integration with IT systems. Data for billing, signals for controlling EV charging, and other communications to or from the EVSE need to be integrated with back-office systems to create, capture, measure, and monetize – through rate design or demand response incentive payments – the DER value of EVs.

It is submitted by some parties that EVs are also capable of metering electricity consumption by utilizing the vehicle's on-board telematics. It is our experience that owing to lack of vehicle OEM standardization, it cannot be relied upon to provide data accuracy, and would be further complicated and hindered by the varying degrees of vehicle OEM implementation and compliance. In addition, the Commission has no jurisdiction over the accuracy of sub-meters on board vehicles, and there are data exchange issues between OEMs and back end systems from EV Service Providers (EVSP) and third parties.

There have been significant technical developments on the topic of sub-metering in recent months, so we encourage the Commission to incorporate sub-metering as a topic for deliberation should a rulemaking be considered on EV charging infrastructure.

**On Customer Education**

Effective consumer education is a critical component of supporting and scaling the market for EVs. However, lessons from other states show that spending significant public funds on consumer energy education via different government entities without a clear, coordinated approach is ineffective both in terms of raising awareness as well as efficiency in spending/return on investment. Electric utilities have historically played a key role in communicating with the end consumer on all matters related to electricity. Integration of communication activities across different utility programs (e.g. energy efficiency, rates, demand response, EVs etc.) to eliminate duplication and wasteful expenditures is key.

Consumers look for simple, clear and easily accessible information on all aspects of EV purchases – vehicles, charging options, public charging locations, rates, electrical installation, incentives and so on. A goal should be to create an easily accessible information resource that for instance could enable a consumer to simply enter their zip code to be able to access all relevant information. The Commission should work with other state agencies to create such a resource that can be measured to ensure that the investment is effective across all consumer categories.

**On Cost/Benefit Analysis**

A foundational policy question is whether the Commission should approve the use of ratepayer funds for investment in EV charging infrastructure. The Commission should do so is because the adoption of EVs provides significant financial benefits to all ratepayers. EV charging infrastructure is inherently part of the electrical grid and can either impose unnecessary costs (in the form of required grid upgrades to meet new peak demands) or achieve greater financial benefits (via increased throughput of kWh through the existing grid and better system utilization and efficiency). When cost-benefit analyses clearly demonstrate that the benefits to non-participating ratepayers exceed the costs over time, the Commission would be remiss in not approving cost-effective EV charging infrastructure investments by the utilities. However, this is not the only situation where such a program would be deserving of Commission approval.

Siemens has developed a model [1] to calculate an estimate of the gross financial benefit of an electric vehicle to a utility's non-participating ratepayers. The model calculates the incremental transmission and distribution revenue from recharging the batteries of an EV over a 10-year life. The value of this calculation is estimated to be similar to the direct financial benefit to non-participating ratepayers. This calculation excludes all other benefits, most importantly fuel savings to EV owners, and health and other benefits of reduced air pollution and emissions. Using average electricity rates across the U.S., the model calculates EV-related T&D revenues of $3,071 per EV for 10 years. By definition these revenues are incremental. However, how these amounts flow to ratepayers, shareholders, tax collectors, or others is a matter for regulators and policymakers to determine.

In another example, Michigan's Consumers Energy found a lifetime value of $1,900 to $2,300 per EV in its service territory.[2] Consumers Energy summarizes these benefits as follows:

> "EV benefits to customers will come in three categories: Consumers Energy customer benefits, social benefits, and individual benefits. A central hypothesis of this Program is that Consumers Energy customers will see lower rates due to the lifetime value of each EV and improved grid utilization. To realize and maximize benefits to the grid and all system users, it is important to properly manage the incremental load resulting from EV adoption to ensure increased grid utilization and avoid increasing system peak loads. The Company is uniquely positioned to provide the basis for the realization of the "lifetime value" of grid benefits for system users by investing in EV programs and facilitating benefits to all customers. The financial benefit that each incremental EV adds to the system is a resource that could benefit all Consumers Energy customers. This occurs through a combination of reinvesting benefits towards further EV infrastructure, rebates, pilots, and reducing rates across all customers, including non-EV drivers."[3]

[1] Contact Siemens for the analysis

[2] In the matter of the application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief, Case No. U-20134.

[3] *Ibid.*

The Consumers Energy application for Commission approval includes the methodology for calculating the costs and benefits. The Michigan Public Service Commission relied on this and other information in approving the application.[4]

Understanding these inherent net benefits, and especially in the context of pilot programs, it is generally more appropriate, and indeed warranted, to focus on maximizing costs and minimizing benefits rather than conducting detailed cost-benefit studies or requiring a certain balance of costs and benefits as a condition of program approval. Many of the benefits associated with pilot programs, in particular the learnings they are designed to provide, are difficult to associate monetary values with. Additionally, strict numerical tests often provide an artificial level of certainty to decision making that masks inherent and oftentimes substantial uncertainty that exists in the underlying assumptions they are based upon. For these reasons, we encourage the Commission to monitor the development of these analytical tools and dimensions of analysis as they relate to transportation electrification, but not tie its decision making to such analysis at this point.

**On Adoption Rates/Needs of Customers at Present**

We believe the most important factor in EV adoption is **lowering the Total Cost of Ownership (TCO)**, in terms of both economics and consumer convenience. Two key factors inhibit the nascent but growing EV market in the US: *lack of charging infrastructure* and *lack of awareness*. Both factors are barriers to lowering the TCO of EVs and driving adoption to a cleaner, more efficient mode of transport.

In addressing these barriers, Missouri needs to *fully leverage utility assets and capabilities* to *maximize the benefits* associated with EV ownership and operation to animate the market. The charging market should be open to all relevant participants, including the utilities. Several states have reached the conclusion that utility participation in EV charging is not only beneficial but, in some cases, necessary, to achieve state policy goals for EV adoption. A major reason to allow the utility ownership option is that *such ownership is the lowest cost and most reliable means of creating end-to-end technical solutions* for electric vehicles as distributed resources to "assist in grid management, integrating generation from eligible renewable energy resources, and reducing fuel costs for vehicle drivers who charge in a manner consistent with electrical grid conditions."[5] Another reason is that many markets are not served by third parties, such as low-income, multi-unit dwellings (MUDs), school districts and transit agencies (for eBuses). Indeed, no market is currently adequately served by third parties. Making EVs grid assets (even for simple demand response) requires linking wholesale markets or grid conditions with utility software applications, which in

[4] Michigan Public Service Commission, Order in Case No. U-20134, January 9, 2019.
[5] California Pub. Util. Code §740.12(a)(1)(E)

turn manage the grid via various communications solutions, including those to EVSE. Ownership gives the utility the maximum level of control in selecting and implementing elements of the solution in order to verify functionality, performance and operability.

Contrary to arguments made by a minority of parties, we have not seen a single instance where utility participation has harmed competition in the EV charging infrastructure market *(*as per Siemens testimony in Oregon[6]).

The Providers recommend that the Commission encourage ***multiple business models*** to deploy EV infrastructure with utility roles ranging from turnkey ownership, deployment and management (for example in the residential segment as in a pilot program approved for Xcel MN) to make-ready ownership or provision of platform energy services to name a few examples. This portfolio approach can help increase customer choice in deciding the type of EVSE ownership they desire by allowing for diverse business models without relying on – for example – rebates only to drive adoption. If the customer prefers a utility turnkey model, they should have that option. The prevalent rebate-based programs have failed to animate the market[7] and have led to a cost-inefficient system for deploying public funds through the loss of scale economies in purchasing and deployment.

Providing infrastructure to enable universal access to public charging will go a long way towards a meaningful reduction in range anxiety and overcoming enduring market barriers, especially in metro areas with a prevalence of multi-unit dwellings. Given that the vast majority of charging will occur in the metro areas (along with electric vehicle prevalence) – provision of and access to public charging stations is critical.

**On Cost Recovery/Rate Design/Incentives**

The Commission should provide guidance around **cost recovery** and support options that provide appropriate incentives for utilities that reflect the risks taken in making EV charging investments. A critical component of this is offering opportunity for fair returns on these investments. Cost recovery itself can be accomplished through *three mechanisms:*

*Rate basing* is appropriate for investments that provide benefits to all or large groups of ratepayers, as is the case with rapid adoption of EVs generally, provided this is managed and done intelligently. A clear

[6] In the matter of Portland General Electric's application for Transport Electrification Programs, Docket No. UM 1811

[7] Opening Testimony of Max Baumhefner, Melissa Whited, and Chris King, Sponsored by the Natural Resources Defense Council, The Greenlining Institute, Plug In America, the Coalition of California Utility Employees, Sierra *Club, Environmental Defense Fund, the Alliance of Automobile Manufacturers, Greenlots, Siemens, and Emotorwerks on Residential Charging Infrastructure and Rates*, A.17-01-020 et al., August 7, 2017, p. 14.

situation where rate basing is appropriate is where private market players are not providing service and/or facing significant cost challenges. Rate basing is well understood and agreed upon as providing both proper cost recovery and appropriate financial incentives.

Where the benefits accrue to single ratepayers, such as a home charger, appropriate recovery can be achieved through *charging the individual ratepayer*. Fees should reflect the proper depreciation period for assets and recover ongoing maintenance and operations expenses. Note that, even in this case where EV owners are bearing the full costs, utility provision of the service promotes the overall adoption of EVs and the efficient integration of associated new load. Accordingly, this still delivers benefits to all ratepayers, not just participants.

A third option is *performance-based ratemaking*, where cost recovery is limited to recovering expenses, such as rebate payments, but can also include incentives to the utility on top of straight recovery. In these cases, it is essential to provide adequate financial incentive to utilities, because there is risk in operating any program, and simple recovery of the expenses exposes the utility to the possibility of under collection. This is because unanticipated costs may arise, especially in new program types. PBR mechanisms could include the rate at which EVs are adopted, the speed with which interconnections to private charging stations are made, or other such metrics. PBR incentives need to be attractive enough to make EV charging programs a priority for utilities. The challenge with PBR incentives is that they are evolving and, hence, uncertain. This creates additional risk and threatens to slow program growth and, therefore, EV adoption. We note that to date, in fact, PBR initiatives have largely failed to adequately incentivize utilities. A prime example is SDG&E's Residential Charging Program[8] that the California Public Utilities Commission modified into a rebate-based program with PBR-base cost recovery, which SDG&E declined to implement given the lack of reasonable financial incentives. We remind the Commission and stakeholders that the success of programs is dependent on ensuring that the utilities have an opportunity to earn a fair rate of return on investment commensurate with the risks they are undertaking in running the programs. Therefore, being over prescriptive in both design and cost parameters runs counterproductive to the overarching goal of capturing EV-related benefits for all Missourians.

**Rate design,** broadly defined to include demand response incentive payments, is one load management mechanism that allows for monetization of the value of EVs as Distributed Energy Resource (DER).

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[8] Filed in California Docket No. A1701020 on January 20, 2017.

Rates for electricity used in charging should reflect disaggregated costs of wholesale power and distribution network resources, differentiated by time of day. Time-varying tariffs should be available to EV chargers as EV-only tariffs, allowing consumers to maintain their home or business on non-time-varying rates.

The more that rate design reflects disaggregated costs of wholesale power and distribution grid investments, the more that DER can respond to price signals, provide value shifting load, and capture the value of that shifting. Where state policies call for it, rates can also include price signals reflecting environmental factors, such as the cost of carbon emissions, thus increasing the ability of EVs as DERs to respond to those signals and deliver value.

Another principal and growing load management mechanism is **Smart Charging**, which can not only complement rate design but also be a more effective tool in achieving beneficial load management outcomes, as it does not rely on uncertain customer behavioral response to fixed or even dynamic rate structures. Importantly, managed charging programs provide further benefits by acting dynamically in the same way that demand response programs do, except they are much more powerful as they can not only curtail load, but also increase load. This capability can be very impactful in helping to manage and maximize the utilization of grid assets and can be implemented more quickly and flexibly than rate design-only approaches.

**Demand charges** are a time-tested solution to recovering the cost of distribution network upgrades. EV charging is not fundamentally different from any other use of the grid, and demand charges provide an important price signal to managed load. At the same time, demand charges can be a significant business challenge in the early stages of this nascent market when utilization rates for public chargers are low. This implicates the need to utilize load management solutions first to address these costs, as this price signal is meant to clearly message to charging operators. After these solutions are fully leveraged, potential temporary mitigation but not elimination of demand charges may be appropriate in some situations. Another possibility is to consider average demand for the month and develop demand charges for that approach, as opposed to the typical approach where the demand charge is based on the highest 15 minutes of consumption in the month. The benefits include still having a price signal explicitly for demand and having a price signal that continues throughout the month (with the traditional approach, once a very high demand has been registered, there is no incentive to remain below that very high peak for the remainder of the month). A third possibility is time-differentiated demand charges, with higher charges during peak hours and lower charges off peak. What is key to any approach is maintaining the incentive to continue to manage load, which is essential to realize the benefits that EVs can provide to the grid, and appropriately leverage the capabilities and managed charging technologies that provide for this.

The Joint EVSE Providers support **vehicle incentives** at this nascent stage of the market, which can help to make EV purchase more clearly attractive compared to traditional internal combustion engine (ICE) vehicles. However, incentives should be removed in a phased manner as EV prices start reaching price parity with ICE vehicles. On **charger** incentives, we strongly recommend that incentives derived from public funds be restricted to smart chargers (networked and sub-metered) that utilize open technical standards (between the charger and the cloud). Publicly available chargers should receive incentives only if they support the universal payment option of credit card chip readers as the minimum and support standard EV plug types (CCS, CHAdeMO and J1772). **Electrical distribution equipment (makeready)** incentives should follow the open standards requirements for charger incentives.

**On Flexibility and Choice**

The Joint EVSE Providers are strong proponents of an open and competitive EV infrastructure market, both for the customers (site owners) and the drivers. The Commission should ensure that the publicly funded infrastructure (ratepayer or taxpayer funds) is based on open technical standards for the communication protocol between the charger and the cloud. Open Charge Point Protocol (OCPP) is the industry accepted communication standard protocol that helps ensure that the site or asset owner has the ability to switch their service provider while keeping their charger and without any vendor lock-in. Additionally, as mentioned earlier, such public funds should only be used to procure smart chargers that are networked and sub-metered so that the EVSEs can provide grid benefits via managed charging.

To ensure that the EV driver has universal access to public charging, public funds should be focused on those public chargers that allow multiple payment options with a credit card chip reader (at the charger or an onsite kiosk) as the minimum. The public charging payment experience should be what drivers are accustomed to at the gas station as drivers transition to electric. Customers, not service providers should be able to make the choice of payment method.

Another key area where the Commission can drive flexibility and choice is in the procurement of chargers and make-ready equipment. The Commission should be cognizant that rebate-based procurement leads to less sophisticated purchasing decisions by customers with generally inadequate technical knowledge nor any negotiating leverage, unlike a utility with deep procurement expertise and experience to drive cost efficiencies. The so-called rebate-dependent marketplace has led to overpriced purchases of infrastructure based on proprietary technologies. It has also heightened the risks of stranded assets, as well as tying customers to multi-year service agreements that can further compound vendor lock-in. When the charger to "cloud" link is proprietary, the customer is locked into a single service vendor for the life of the charger, because no other services provider's system can communicate with the charger (resulting in vendor lock-in).

Utilities can play a major role in reducing EV charging infrastructure costs by procuring larger quantities of EVSEs and standardizing make-readies (vs. customized). The program designs should encourage competitive solicitations and allow for bulk procurement, which inherently drives costs lower, balanced with seeking sustainable outcomes for market participants. We have experience in states that have implemented the inaccurate notion that competition at the retail level drives costs lower and supports innovation better than competition at the wholesale level, approving programs to procure chargers and make-readies in a rebate-based manner, either in single or small quantities instead of in bulk. The result has been *potentially meaningful cost disadvantages*. Indeed, in any industry the way to drive down unit costs is to increase purchasing volume and avoid one-off procurement. Additionally, make-readies have been procured largely via third parties, which incur cost adders. For procurement to be truly cost-efficient, utilities need to procure equipment, software and services directly and in bulk for program requirements.

## # 2 (b)

**On Make Ready Model**

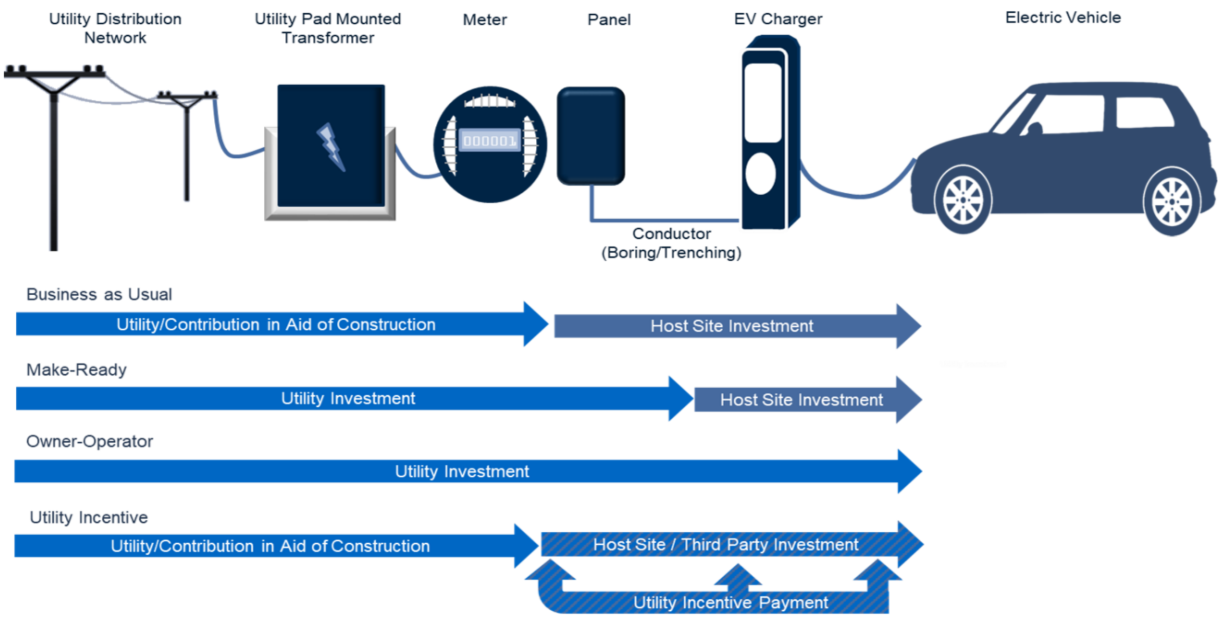
Make Ready refers to the electrical distribution equipment that connects the charger safely and reliably to the electrical grid. Among the different elements that constitute a "make ready" are panels, conduits, circuit breakers and conductors.

The Make Ready model refers to a deployment method by which the utility can provide incentives to the site owner to deploy and maintain – or the utility can own and maintain – the make ready equipment itself. In both cases, the site owner owns and maintains the chargers. The Make Ready model is restricted to the electrical equipment only and does not include the chargers, thereby making the process more complicated for the site owner.

The Joint EVSE Providers do not support the Make Ready model as the only method for deploying charging infrastructure as it often leads to inefficiencies in equipment procurement and distorts the market. Indeed, its premise is based on the Rebate-based incentives model of EVSE deployment which supports certain proprietary business practices and forces site owners, who are often not technology specialists, to learn about chargers and how to deploy the entire EVSE chain.

For a charging station to receive a line extension incentive, beyond what is otherwise provided to sources of new load, it needs to be a) public charger, b) provide universal access for payment with a credit card chip reader as the minimum, and c) utilize an open technical standard communications protocol between the charger and the cloud. These requirements hold for both Level 2 and DC Fast chargers that provide public charging.

**Figure 1. Models of Utility Investment in Electric Vehicle Charging Infrastructure**




*Source: M.J. Bradley & Associates*

## On Ownership Models

As discussed earlier, the charging market should be open to all relevant participants, including the utilities, to ensure an open and competitive market. Several states have reached the conclusion that utility participation in EV charging is not only beneficial but, in some cases, necessary, to achieve state policy goals for EV adoption, especially for specific customer segments such as multi-unit dwellings.

The question the Commission should be deliberating is how to leverage market capabilities to accelerate widespread eMobility and not who should (or should not) own the EVSE. In our opinion, this approach to policymaking is too narrow and ties the Commission to a deliberation that is neither supportive of nor conducive at this time to the broader challenge of accelerating eMobility in the state.

The Commission should ensure that the customer has the choice to decide the type of EVSE ownership they desire by allowing for diverse business models to drive the market. If the customer prefers a utility turnkey model, they should have that option just as they should for an alternative third-party business model.

In our opinion, utility ownership of EVSEs should be encouraged, because such ownership provides compelling benefits and, *promotes innovation and competition among EVSE providers and network providers*. It also provides *customers with choice* between utility turnkey solution or private third-party solution *based on costs, ability to switch and ease of maintenance, etc.*

A major reason to allow the utility ownership option is that <u>such ownership is the lowest cost and most reliable means of creating end-to-end technical solutions</u> for electric vehicles as distributed resources to "assist in grid management, integrating generation from eligible renewable energy resources, and reducing fuel costs for vehicle drivers who charge in a manner consistent with electrical grid conditions."[9] Making these EVs grid assets requires linking wholesale markets or grid conditions with utility software applications managing the grid with communications solutions linking to the EVSE and management of the EVSE itself. Ownership gives the utility the maximum level of control in selecting and implementing elements of the solution in order to verify functionality, performance and operability.

<u>The utility ownership option reduces the risk of stranded costs</u> as well. When the utility owns the EVSE it has greater flexibility and incentive in selecting, testing and standardizing EVSEs to verify long-term reliable operation. The utility has field crews throughout its service territory that can maintain, repair, or even relocate EVSE – crews that, with certainty, will be in place for the life of the EVSE. The utility has, and will have, the expertise to select and manage EVSE. If a customer chooses an EVSE from a company that exits the market five years from now, the utility-provided funding for that EVSE could well become a stranded asset – but would not be if the utility could take over ownership. Of course, this requires that the EVSE utilize open technical standards. Similarly, if a customer sells the EV or relocates, the utility can retrieve the EVSE and reinstall it elsewhere. Finally, utilities buying EVSE are better positioned to drive standards and interoperability – both of which reduce the risk of stranded assets and costs.

Selecting, installing, and maintaining a smart (networked) Level 2 or DC EVSE is complicated and unfamiliar, a reason why many consumers or site-owners do not want the burden of selection on themselves, but, instead, <u>want the choice</u> of utility ownership as part of a convenient, turn-key solution.[10] An EVSE is

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[9] California Pub. Util. Code §740.12(a)(1)(E)

[10] *Opening Testimony of Max Baumhefner, Melissa Whited, and Chris King, sponsored by the Natural Resources Defense Council, the Greenlining Institute, Plug in America, the Coalition of California Utility Employees, Sierra Club, Environmental Defense*

not like a home appliance. Selecting and installing a grid-supporting smart EVSE should not be equated with selecting and installing home appliance. Many consumers want a trusted entity to provide a convenient and reliable solution; with the utility ownership option, that solution can include selecting equipment, arranging for installation, operation, maintenance, repair, customer service, removal, and warranty. This is specifically true of complex deployments in medium and heavy-duty categories such as transit bus depots or truck stops.

The utility ownership option has many benefits just as third-party ownership does in several situations – and that having an open competitive market with participation by both utilities and third parties will allow markets and customers to determine the optimum long-term ownership mix. Consumers should have choice, and the choice of utility ownership as an option should not be taken away from consumers.

**<u>On Potential Policies to ensure Grid Benefits</u>**

**Policies that will promote deployment of EV charging stations** are manifold. We list some key policies below:

- ✓ Market certainty
- ✓ Promote faster EV adoption
- ✓ Use of open technical standards
- ✓ Ensure universal payment access
- ✓ Load management policies and programs, including smart/managed charging technology implementation, and EV-specific tariffs, including dynamic pricing
- ✓ Accelerated interconnection process
- ✓ Demand charge considerations

Regarding **technology utilization,** it is our opinion that **Energy Star certification** is not required based on a cost-benefit analysis. Energy Star certification **is not relevant** to network communications for charging stations.

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*Fund, the Alliance of Automobile Manufacturers, Greenlots, Siemens, and Emotorwerks on Residential Charging Infrastructure and Rates, at 11. Application 17-01-020 of San Diego Gas & Electric Company (U 902E) for Approval of SB 350 Transportation Electrification Proposals*

**"Interoperability"** refers to the ability of hardware, software, or systems provided by one vendor or party to work with the hardware, software, or systems provided by another vendor or party. Interoperability is achieved through the implementation of open industry standards for the interfaces between the different hardware, software, or systems. The interoperability ecosystem also includes how drivers and vehicles engage charging systems, and how charging systems can communicate with and be communicated to by utilities and grid operators.

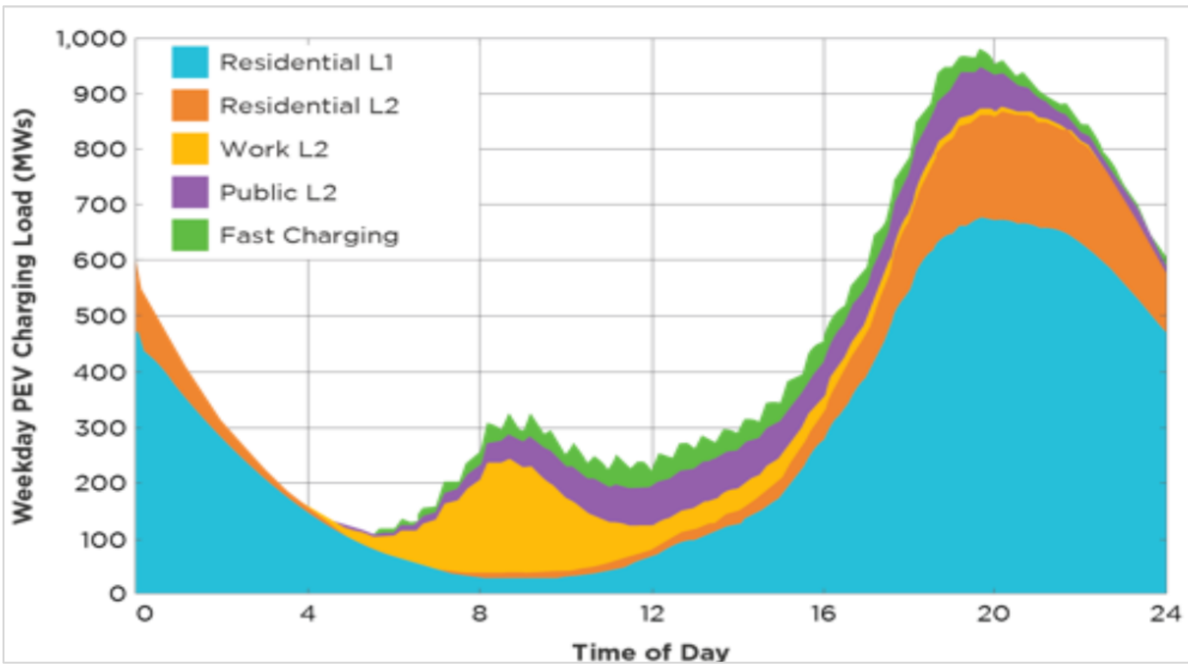
Standards are the basic requirement to ensure an open and competitive industry with inherent customer choice. Innovations and technical developments are not precluded, provided that they are in addition to standards-based solutions.

**Technical Standardization** is a critical way of reducing costs of EVSE deployment and ensuring a competitive product market. This includes open standards-based chargers including "smart chargers" with communications and submetering capability to provide grid benefits and fuel savings benefits to the EV user. Ratepayer-supported chargers – whether utility-purchased, supported by rebates, or supported indirectly via utility make ready investments – *should natively communicate to the "cloud" using transparent and open standards widely adopted in the industry*. This is also a critical and common-sense measure to protect against stranded asset risks. It also directly supports ongoing competition beyond the initial purchase decision, as the hardware, the software or the network services can be swapped out for another. These standard features allow for **interoperability** and reduces the risk of obsolescence and/or stranded assets. *Regulators should not require specific technical standards but instead require this consideration in utility program design and find that such standards are essential to both short- and long-term cost reductions as well as ratepayer protection from obsolescence of deployed technologies.*

The common existing site-host driven marketplace is not based on open technical standards, which prevents the site host from being able to switch between EV service providers, whether that be for cost or any other reason. This prevents the marketplace from being able to continuously compete for a given operator or site host's business, instead confining competition to just the upfront purchase decision. To drive down cost and best serve the marketplace, competition and innovation for hardware, software and services must be based on product features, price, service, etc., and not just at the initial purchase decision, but also the ongoing costs. The Commission should ensure that the charging market that it supports is protected by mandates for open technical standards to prevent **vendor lock-in**.

**For EVSEs to operate as a source of grid services and provide system value**, they need to be "smart" i.e., networked and sub-metered, which include capabilities for remote communications and internal metering of interval consumption to support billing of time-varying pricing. The metering (sub-metering to be precise) must be at the EVSE level to accurately determine the costs and benefits of the EV acting as a Distributed Energy Resource. As discussed earlier, managed charging programs provide further benefits by acting dynamically, a capability that can be very impactful in helping to manage and maximize the utilization of grid assets and going beyond the capabilities of a rate design-only approach

The below graphic illustrates the need for **managed charging via smart chargers for grid stability** – unmanaged charging has a severe negative impact on the grid especially during system peak. The impact on the distribution grid will vary by nodal locations but will be adverse if charging is not managed.




**Unmanaged PEV Charging, California, 2025**

*Source: California Energy Commission November 2017*

**Smart meters** are not mandatory to drive grid benefits from EV charging infrastructure; however, they are required to enable dynamic rates as well as support demand management. The alternative to smart meters is submetering which takes advantage of the same functionality built into a charger.

**Rates for electricity used for charging** should reflect disaggregated costs of wholesale power and distribution network resources, differentiated by time of day. Time-varying tariffs should be available to EV chargers as EV-only tariffs, allowing consumers to maintain their home or business on non-time-varying rates. We recommend demand charges be largely targeted towards business customers who are already familiar with them and reference our discussion of demand charge considerations above.

Time-varying rates should be optional, especially in the absence of EV-only tariffs. Most EV drivers prefer time-varying rates, and the savings they offer, for their EVs, especially when the rates are available on an EV only basis. Time-varying rates save money for EV drivers as well as ratepayers, by reducing system costs. EVSE providers, such as the Joint EVSE Providers prefer them, because they reduce the TCO of EVs (thus promoting market adoption), as well as enable savings options beneficial to EV owners using smart or non-smart charging EVSE. As discussed above, smart/managed charging should be seen and considered not only as a compliment to rate design, but also as an alternative that can be more appropriate, efficient and effective in many situations.

In our opinion, the Commission should use **the rulemaking process** to address the EV infrastructure market in Missouri. We encourage the Commission to make the process both time and resources efficient so that interested stakeholders can participate effectively

The Joint EV Technology Providers thank the Commission for seeking feedback on the deliberation process and appreciate this opportunity to provide comments.

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