

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

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

The Alliance for Transportation Electrification (“the Alliance”) appreciates the opportunity to file comments in this proceeding, and to participate in any further proceedings or workshops that the Commission may wish to initiate. The Alliance appreciates the Commission’s decision to take a deliberate and transparent approach to study these complex issues in a policy docket with a Commission Staff led working group.

The Alliance was established in November, 2017 at the time of the NARUC meeting in Baltimore, Maryland, as a non-profit mutual benefit corporation (as a 501.c.6), and is led by utilities, EV infrastructure firms, auto OEMs (original equipment manufacturers), and affiliated trade associations. We started with 20 organizations at the launch just over a year ago, and have grown rapidly to include about 45 members and affiliate organizations.

We advocate primarily before State Commissions and other state agencies, preferably prior to litigation, in which we promote policies that remove barriers to EV adoption and accelerate the deployment of EVSE (electrical vehicle supply equipment) in suitable locations in a state. We encourage a collaborative approach, not litigation at the outset in addressing these issues at Commissions through processes similar to the approach being followed in Missouri.

**COMMENTS**

The Alliance has three over-arching goals for which we advocate for better regulatory and policy measures at the state level. The first is that we have a large existing and rapidly growing infrastructure gap in all of the regulatory jurisdictions in North America. By infrastructure gap, we mean the difference between the amount of publicly available charging stations (reliably available with adequate uptime), and the projected growth in electric vehicles over the next 10 or 15 years. We believe that “hockey stick” type growth will occur in the North American EV market during this period of time, with annual growth rates accelerating rapidly in the near future. Such projections are based both on the publicly announced plans of major auto OEM’s and medium and heavy-duty manufacturers, but also on a large number of projections by reputable research groups, analysts, investment banks, and others. Moreover, it is notable as well that such annual projections of EV market growth and size have been increasing, not decreasing, over the past several years. Accordingly, we believe there is an urgency now to accelerate the pace of both planning and deployments of EV infrastructure especially with the central involvement of regulated utilities.

In this regard, given that the “infrastructure gap” is large and growing, in not just Missouri but in all Midwestern states and throughout the country, and if not resolved quickly through regulatory and

policy actions, will impose a major barrier on such growth in EVs and innovation generally. The Commission has made a good start in approving two utility proposed programs for EV infrastructure deployment, by holding a workshop to begin to address the issues, and by seeking follow-up comments to that workshop in the current Docket.

The Alliance proposes an overall transportation electrification strategy that would ensure benefits to stakeholders and the market. Hallmarks of this strategy should be:

- To provide room for flexibility and creativity as the utilities explore products and services in what is a rapidly growing and evolving industry,
- To be descriptive in goals rather than prescriptive, and
- To employ pilot programs and metrics, while recognizing that one size does not fit all, and that there may be a need for periodic recalibration but that such considerations should not cause undue delay.

Our comments below are organized according to the list of issues raised at the March 21, 2019 Commission Workshop in which we participated and which were summarized in the Request for Additional Comments that was issued on March 22, 2019.

**a. Additional thoughts stemming from common themes of the workshop discussions:**

**i. Pilot Programs**

Pilot programs are an essential tool to preparing for and assessing market acceptance of new technologies. For pilot programs to be successful, they should be dynamic and adjust to changing needs in the market. This is especially true for transportation electrification because the technology is evolving so rapidly. It is essential that any pilot program involving a utility be able to adapt to changing needs, iterate, and dynamically grow to larger scale in the near future. Pilot programs should not be done just for the sake of experimenting with a new technological concept and then abandoned. Instead, the Commission should create a process for the regulated utility to create a more dynamic and flexible program that can evolve quickly subject to reasonable oversight and reporting mechanisms by the Commission.

**ii. Data Gathering and Analysis**

Given the nascent nature of the electric transportation market and the fact that we don't know how quickly the market for EVs will develop and how quickly the charging infrastructure to support the market will be needed, data gathering and market monitoring will be essential. In the early stages of market development, many different types of technologies will be tried and different regulatory strategies adopted. Data is key to designing the distributed energy networks of the future, and therefore it would be foolish not to gather the data necessary to analyze various approaches to understand the basis for successes or failures.

We would also point out that ensuring that high-quality data is available is also a reason to ensure full utility participation particularly in the early stages of market development. Third parties, who will also be a part of market development may or may not be willing to part with data on the charging behavior of their EVSE customers, and the PSC will not know the quality of data being offered. Certainly, if ratepayer funds are to be used to finance rebates for EV charging for either SFH, commercial customers, or fleets or metro transit for medium and heavy-duty EV's, the data generated by this equipment should be made available to the utility. As penetration rates increase in certain neighborhoods and distribution feeders, the utility also needs to have situational awareness of charging behaviors so that both operational reliability will be maintained, and going forward, assessing what, if any, infrastructure upgrades will be necessary. Together with the data analysis on a granular level of how consumer behavior may change, this should provide the utility with the necessary and useful learning to advance to the next stage.

### **iii. Customer Education and Outreach**

Market surveys of consumers continue to demonstrate a very low lack of awareness among customers about basic information about EV's and charging stations, such as EV vehicle names, types of plugs, how charging is carried out and at what voltage, and so on. Even in California – the largest EV market in the U.S. - surveys have indicated that less than one-half of potential consumers can name a specific type of EV (other than Tesla). Moreover, they have little understanding of how electricity is used and consumed in a Level 2 charger at home or publicly accessible (in fact, the survey data shows that thousands of EV owners are reverting to simple “drip charging” overnight at 120 volts). They also have little understanding of how electric rates are set, how dynamic rates like TOU may work in practice, and how overall electric prices (per kWh) stack up against gasoline or diesel prices at the pump.

The Alliance believes that education and outreach is a shared responsibility among auto OEM's, auto dealers, utilities, and the organizations (NGO's) in the EV ecosystem. While no one organization can do all of the education and outreach, we believe that utilities should be allowed to spend a reasonable amount of funds on such activities. No other party has the close relationship with electric customers that can help ensure successful programs.

While we recommend that the Commission allow robust education and outreach activities (such as improved web portals, ride and drive events, gasoline to kWh price comparisons, etc.) in regulated utility programs, we urge the Commission to defer to the evolving marketplace in the next several years as the various business models and pricing systems mature and not be overly prescriptive as to the content of these programs. We also believe that such program costs should be included in the tariffs and rates paid by all ratepayers, subject to a reasonable budget and Commission oversight.

In any case, a robust utility-led outreach and education program would greatly assist the public in learning about what is, to many, a rather complicated new world.

#### iv. Cost/Benefit Analysis

First, as a general matter and while we certainly recognize that customers' resources are finite, we believe that the benefits of electrifying transportation to society include lower rates for all customers by more efficiently utilizing existing resources, increasing sales in periods when costs are low, and better utilizing the electric distribution system. At the same time, the State will be reducing its dependence on expensive and polluting oil and reducing overall carbon emissions. These are all extremely important public policy objectives, but not always easy to quantify. In addition to these societal benefits, there are certainly benefits to the owners of electric vehicles in terms of lower overall costs of transportation services. The Alliance fully supports the presentation made by David Farnsworth of the Regulatory Assistance Project at the March 21<sup>st</sup> workshop entitled "Beneficial Electrification of Transportation" which provides an excellent overview of both the benefits of electrification and how to ensure that those benefits are realized.

For specific studies on benefits and costs, the Commission can refer to several studies that have been done in the states of Illinois and Michigan (released July, 2017), Maryland by M.J. Bradley and Associates, as well as other states. These reports are available at: [www.mjbradley.com](http://www.mjbradley.com).

In addition, the National Renewable Energy Laboratory (NREL) has developed an excellent tool (called EVI-Pro model) for estimating the size of the infrastructure gap in a state or region, and estimating the benefits and costs on an NPV basis for each type of charging infrastructure. The Commission should refer to this particular analysis and tool for modelling in the context of the needs of Missouri, and may wish to consult with NREL analysts who have most recently performed such detailed, state-specific analysis for the states of California (California Energy Commission, or CEC), or for Maryland in the context of the PC 44 Working Group process which published its final report on January 19, 2018 (for the NREL modelling tool, refer to Wood, Eric et al, National Plug-in EV Infrastructure Analysis, NREL, September, 2017; Mr. Wood also presented to the ERE Committee of NARUC at its 2018 summer meetings in Scottsdale AZ in July).

In the end however, we believe it is up to the utility filing an electric transportation funding or cost recovery proposal to make the case with the Commission that the filing is beneficial to all customers including non-participants. Regarding the specific cost-benefit test to be used in utility filings, there is insufficient space in these Comments to explore this emerging and complex topic fully. The complexities include important things to attempt to quantify, such as avoided gasoline savings (under the control of the ICE or EV driver, not the utility), the avoided GHG benefits, potential economic development benefits, benefits of grid integration through off-peak managed charging (again, under the control of the utility ratepayer and EV driver subject to rate design and utility incentives). The traditional cost-benefit tests may still be utilized by the utility, such as: ratepayer impact measure (RIM), utility cost test (UCT), total resource cost (TRC) test, or the societal cost test (SCT). The utility may wish to perform such cost-benefit tests, in any case, as it makes a specific EVSE filing or in the context of a GRC cost recovery filing, as several regulated utilities have done before the Commission. Yet it is important to recognize the significant limitations of these traditional tests, especially in the

stage of pilot programs. Cost benefit analysis should be considered an advisory tool and not the exclusive test for determining public benefit for EV infrastructure investments.

A useful starting place for the Commission to consider would be: the National Standard Practice Manual (NSPM), for assessing cost-effectiveness of energy efficiency resources, published by NESP (an Executive Summary of this May, 2017 report is available at <https://nationalefficiencyscreening.org>). Although this Manual focused on the criteria and assumptions to be used in cost-benefit tests for energy efficiency measures, the authors of the study believe that this screening tool and methodologies can be applied to distributed energy resources (DER's), including EV infrastructure.

Moreover, the authors of this Manual have recently launched a new effort to update specifically this Manual, and its screening and methodologies, for use in assessing DER's and EVSE, and the Alliance will participate in those planning committee efforts. Also, EPRI has been working for the past year, with the Brattle Group, on developing a new methodology for specifically assessing EVSE investments, which combines key elements of the TRC test along with the Societal Cost Test (SCT). This study should be made available for review and discussion in several months. Accordingly, the Commission should follow the progress of these efforts in the future for application in Missouri.

Transportation electrification is a sound investment in our future and the funding required to achieve this must come from somewhere. Even in the absence of the extremely important public policy objectives, EV charging infrastructure will provide (1) economic benefits through good work for tradespeople such as electricians and excavators as well as professionals such as architects and engineers and (2) reliability and resiliency improvements through an upgraded electrical network. Such benefits can be quantified along with costs, although there will likely be differences in how accurate the quantification can be. But overall, the Alliance believes that investments in TE infrastructure are almost certain to provide overall net benefits to the state of Missouri.

**v. Adoption Rates/Needs of Customers at Present**

The evolution of the internal combustion engine (ICE) to EV technologies is accelerating, both for light-duty and heavy-duty vehicles, and may be near the tipping point for most auto OEM's (Original Equipment Manufacturers), according to most industry analysts. For light-duty vehicles, while sales last year were still only slightly over 2 percent of total sales, they rose to about 364,000 vehicles, constituting an annualized increase of over 80 percent. Many analysts expect this "hockey-stick" type growth to continue and perhaps accelerate over the next five to ten years as the availability of vehicles expand significantly beyond Tesla, Nissan, and General Motors (the early market leaders). Just looking at the public announcements of vehicle introductions, including a significant number of larger vehicles, SUV's, and light trucks either in a full battery electric or PHEV, the Electric Power Research Institute (EPRI) estimates that consumers will have about 130 EV vehicles types to choose from by 2022 or 2023. That is just about three or four years away, which is quite short from a regulatory and utility planning standpoint to build out EVSE infrastructure. Meanwhile, the medium and heavy duty (fleet)

segment is growing even more rapidly, and all-electric bus sales came to about 10 percent of new vehicle purchases in 2018.

Many studies have been done by associations, agencies, and research groups to project the number of EV's in the fleets over the next two decades for global, national, and regional markets (since the EV market today is truly a global marketplace with China being the leading country). There is insufficient space here to assess those market projections, other than to state our view that several studies (such as EIA, and the NREL Infrastructure study calling for 15 million EV's by 2030, Central Scenario) are too conservative, and that the updated annual projections continue to increase. We place more weight on market projections done by both BNEF and EEI, which call for higher number of vehicles on the road by 2030 (with BNEF being more aggressive than EEI). For example, in November 2018, the Edison Electric Institute and the Institute for Electric Innovation released a report that projects 18.7 million EVs on the road in 2030 that will need 9.6 million charge ports to support those vehicles.

Analytically, it is not appropriate for the Commission to take a simple numerical percentage to determine the likely market for EVs in Missouri since Missouri will not have the same adoption rates as other states. It is difficult to project EV market growth, but as pointed out at the March 21<sup>st</sup> Workshop, Kansas City in particular has become one of the national leaders in EV adoption.

Simply put, the Alliance submits that the amount of infrastructure necessary to fuel the likely increase in EV's is totally inadequate today, whether it be for the nation or for Missouri. Moreover, the planning and lead times for developing, citing, permitting, and financing this infrastructure will require time and effort to overcome multiple obstacles. The regulatory process moves slowly and requires due process, transparency, and significant advice and input from stakeholders, which the Alliance believes overall is a good and necessary attribute of the regulatory paradigm, especially given the expected scale of this transformation.

While Missouri needs to prepare for the future, Missouri citizens do have current needs and there are current barriers to EV adoption that must be addressed. These include:

- While we are approaching price parity between the ICE and EV vehicle soon, consumer awareness and knowledge of PEVs, range anxiety, and charging infrastructure investment remain primary barriers to PEV adoption. Missouri can improve customer understanding by empowering stakeholders (e.g., OEMs, utilities, and charging equipment manufacturers) to improve the customer journey - from initial consideration to ownership and operation – through education and outreach. Missouri can also address range anxiety by supporting the accelerated deployment of residential, workplace, and public charging infrastructure that provides equitable, reliable, and consistent access to electric transportation for riders and drivers.
- It is in the public interest to ensure key consumer principles like transparent pricing for PEV charging services and the use of open standards for communications and payment to ensure universal access for PEV owners to publicly available charging stations (as discussed below).

- The non-utility investment committed to deploy charging equipment and services in Missouri is not enough to close the infrastructure gap across the state (especially in underserved markets including multi-unit dwellings), so public and utility investments should be utilized to complement private funding sources to establish a foundational charging infrastructure in Missouri. In other words, utility investments in EVSE, either in a make-ready or own and operate model, can catalyze the market (also discussed in more detail below)

The actions proposed in these comments are necessary because drivers are discouraged from purchasing and fully utilizing electric vehicles when sufficient infrastructure is not present. Fast charging, in particular, is vital to EV adoption because it facilitates long distance driving and accommodates drivers who cannot charge at home (either because they live in a multifamily community or have only on-street parking). The Missouri PSC has recently made a start in this direction by approving a part of Ameren’s proposed incentives for charging infrastructure, but it is not enough.

DC fast charging (DCFC) that is easily accessible to the general public is an absolutely essential prerequisite for widespread transportation electrification for two reasons. The first is that battery capacities, though growing rapidly, continue to provide a shorter driving range than a tank of gasoline; DC fast chargers, therefore, are critical to enabling drivers to complete their journey without concern for refueling and without long trip delays. The second reason is that many vehicle owners do not own a parking space and lack reliable (if any) access to a home charger.

Without widespread access to DC fast chargers, in other words, drivers of EVs will be range-limited, while other would-be drivers will refrain from transitioning to begin with. We are already at or past the tipping point in market development, and therefore the public-facing DCFC infrastructure needs to be approved and deployed now.

**vi. Cost Recovery/Rate Design/Incentives**

The Alliance has participated in workshops and utility filings in many other jurisdictions in the country. Accordingly, we have observed different approaches toward rate design issues, and specifically the concepts of energy discounts and demand charges. In general, we encourage creative thinking and approaches in this difficult and complex area of ratemaking, and the recovery of a utility’s fixed costs, while at the same time providing incentives to accelerate EV (and E-Bus) adoption. We believe in both propositions that price signals still matter, and that cost recovery of fixed costs should be approved for the utility.

The Alliance believes, for example, that the Commission should regard early stage investments in capital and O&M for EVSE as other types of investments in the distribution grid that have been approved in recent years. Of course, the Commission should vet the proposals carefully and subject them to rigorous review in terms of engineering and budget estimates and assess how they can accelerate EVSE deployments to further the public policy goals of Missouri. But we believe that capital that is raised and allocated for these purposes should be treated in a

similar fashion as other capital – subject to the normal regulatory tests of prudence and use of a proper cost-benefit methodology.

The Public Counsel has suggested that cost recovery not be permitted by utilities unless they can demonstrate that their investments have actually led to an increased number of electric vehicles on the road. We believe it would be unfortunate to condition cost recovery on this requirement as it would dampen utility desire to make such investments and slow down the acceleration of EVSE deployments. As was pointed out at the March 21<sup>st</sup> workshop, it is almost impossible to tie overall growth in the EV market to specific investments that may be made either by utilities and third parties. Such a policy would hurt consumers and deny Missouri residents the public policy benefits that will come from increased market penetration of EVs.

**vii. Flexibility and Choice**

As we will discuss below, customers should have flexibility and choice in charging infrastructure once they have made a decision to go electric. Some customers may want to own their own charging equipment, others may buy from third parties, and others may want their local utility to be responsible for ownership and maintenance. In fact, limiting utility ownership and operation of charging infrastructure serves to limit customer choice and should be avoided. Customers, armed with the right information will choose charging service providers that make the most sense to them.

**b. Any comments on the questions Staff proffered at the March 21 workshop:**

**i. What is the “Make Ready Model” – what should be included in the “Make Ready”?**

The make ready model is simply the idea that the utility provide infrastructure when necessary to allow a customer to install a charger either at a home, business, or other site without having to do any further upgrades to the electrical infrastructure. In practice “make-ready” means everything behind the charger itself, including the junction box, pedestal/wall-mount/foundation (potentially including excavation and concrete), conduit (potentially including trenching or boring), conductor, disconnect, breaker, and potentially panel and/or transformer upgrades. It might also be considered as a “plug and play” model for charging equipment. In some cases, little or no additional infrastructure may be required to “make ready”. But in other cases, and particularly for DC fast charging stations, significant upgrades would be required. We believe that any capital equipment and costs of installation to meet these conditions should be included in the cost of make ready.

Without any action by the Commission, make ready investments would likely fall under the utility’s existing line extension policies, which in some cases require contributions on the part of the facility owner or developer, or Contribution in Aid of Construction (CIAC). However, the Commission does have within its authority the ability to waive any line extension fees for EV infrastructure or CIAC depending on the specific case. The Alliance generally supports such



waivers in the context of a well-developed and supported EVSE pilot program. The Alliance does not take a position as to whether the EV charger must be separately metered in order to receive a waiver from line extension fees and we defer to the Missouri utilities.

## ii. **Ownership Models**

The Alliance believes that a “portfolio approach” is the best way for regulated utilities to proceed with respect to improving charging infrastructure to prepare for future demands from EV growth. The idea behind the portfolio approach is that the utility will not own and operate every segment of the market and “crowd out” potential non-utility service providers. At this stage of market development, even the statement of a regulated utility having the ability to “crowd out” other players reflects a disregard for market-based realities, or a tendency by vendors and certain advocates to want to “lock in” certain business models, including proprietary systems. Yet the primary argument made by opponents of utility involvement is that competition and the development of a third party charging market will be stifled by a dominant utility presence. The Alliance disagrees with that assessment of today’s market in Missouri where many market gaps exist where a utility presence is necessary and constructive to catalyze further development

In other words, the Commission need not worry that utility-owned and operated programs in EVSE, which is properly scoped and overseen by the Commission with a viable stakeholder process, result in a zero-sum outcome. The results should be complementary and benefit all ratepayers, and participants in the EV ecosystem.

### 1. **Third Party**

We are confident that the private sector will step up to provide charging infrastructure in many instances, as it is already doing in many cases, and we wholeheartedly root for a wide range of customer options in the long run. The three largest examples of private sector activity currently are (1) a trust fund established by Volkswagen and federal and state environmental authorities (Appendix D) that, while certainly beneficial to society, and for whom we have high hopes, does not possess a long track record, (2) Tesla which has a largely proprietary network, and (3) a hardware manufacturer that offers a fine charger and network services, but is not a comprehensive network developer. While these are all important and commendable efforts, we are concerned that no market participant currently takes the holistic view that the regulated local utility must in operating in the public interest and being responsive to local and state public policy imperatives. But in the end, it will be the customer who ought to have the choice between owning their own facility, buying from a third party, or having their local utility own and operate their facility. Public charging stations will have a similar choice.

DC fast charging (DCFC) is a particularly challenging undertaking for the private sector due to high capital costs, high operating costs, generally low utilization in the early phase, and the fact that private operators have to purchase electricity at retail. That said, DC fast chargers are essential for EV drivers to be able to drive long distances, and

they are a safety net for drivers on local trips. DC fast chargers also are expected to serve as primary chargers for ridesharing services (many of whose drivers are low and moderate income) and customers who lack access to a private charger due to living in a multifamily community or do not have off-street parking. Furthermore, as autonomous vehicles take hold probably faster than we think, most analysts believe that ride-sharing EVs may become a primary means of transportation in dense urban areas, which will also create demand for both public-facing DCFC and Level 2 charging infrastructure

For the next few years, though, DC fast chargers are an absolute necessity to customers purchasing EVs who need to charge away from home and quickly even though usage is generally lower than expected. Because this “infrastructure heavy” model is relatively undesirable for most of the private sector at this early stage, the State’s commitment to air pollution reduction and transportation electrification goals are at serious risk. This scenario is a textbook example of the need for action by a regulated public utility that is well capitalized, can take a long-term and holistic view of the entire service territory, and is an expert in installing, operating, and maintaining electrical equipment.

Experience over the past few years has shown that involvement by expert and trusted utilities as a complement to the private sector is important because the electric vehicle charging landscape is complex and challenging to the vast majority of the population, and especially for a new EV owner as the market moves in to an “early majority” phase. While certain residential consumers and commercial landlords invest the time and resources to learn and execute on the options, unfortunately a more common outcome is the “do nothing” approach. One way to jump-start the market is for the utility to offer to shoulder the burden in this early phase of market development by providing, installing, operating, and maintaining infrastructure, both public and private. Utility involvement may not be as critical further down the road as the market reaches maturity, but still may be needed where the private sector does not venture, such as in multifamily communities, low and moderate income neighborhoods, and for publicly accessible DC fast charging.

And yes, both third party and utility-based models can co-exist together, and in fact, this has been the case through the history of regulating public utilities with complex and evolving networks, as cited above. Various business models are being developed in the EV infrastructure space between the regulated utilities, vendors, auto OEM’s, and others. It is simply not the case that there is always direct “competition” that has developed between the regulated utility and nonutility enterprise, whether it be on issues of location, type of service, integration of other or ancillary services, or pricing.

## **2. IOU**

The Alliance believes it is indisputable that charging hardware is being installed too slowly in relation to the imminent introduction of a wide array of electric vehicles. While, as stated above, the private sector is an important part of the solution, utilities

are well suited to complementing the private market by addressing multiple examples of market challenges in a “portfolio approach.” Thus the Alliance fully supports the involvement of Missouri’s investor-owned utilities as well as municipal and cooperative utilities with infrastructure, including ownership, operation, leasing, maintenance and other business models, particularly where the private market is not yet ready to step in. We also emphasize to the Commission that the market will not be developed in a black and white or binary manner with utility ownership crowding out the private sector. To the contrary, utilities are likely to be a small part of the overall market, and in many cases utility involvement will mean contracting infrastructure development to third parties or providing incentives to third parties for charging station installation, often in preferred locations.

Some argue that a utility ownership and operation option is either unnecessary or premature, or may conflict with the development of a “competitive market” for EVSE. Such arguments are misplaced, and fail to comprehend both the nature of market transformation with new technologies, and the limitations that utilities typically place on their proposals. The building out and development of the EVSE infrastructure, especially the make-ready infrastructure (conduit, wiring, and such to the stub for the charging equipment), will be done for all models, namely the third party owned-model, the customer-owned and operated model as well as the utility-owned and operated options. This enhanced infrastructure benefits all in the EV ecosystem, including the non-utility service providers that wish to offer service directly to EV owners.

We also ask the Commission to consider the benefits that utilities can bring owing to quite different time horizons for capital investments in EVSE as a grid-edge asset: namely, while third parties often take a shorter term (less than five years) to achieve the return on investment demanded by their equity investors, the regulated utility takes a much longer view toward investments in utility assets in the distribution grid (often in the 10 to 40 year timeframe). And many EVSE investments – particularly DC Fast Chargers will take longer than five years to recoup costs. Although certain components of EVSE may have shorter depreciation schedules (software, communications equipment, etc.) than other utility grid infrastructure, the utility and the Commission have significant discretion under the relevant accounting rules to establish schedules that support market transformation and the public policy goals of the state of Missouri.

It is also useful to note that the California Public Utilities Commission at one time expressed concerns with utility investment and prohibited the state’s utilities from investing in EVSE. Following several years of wholly inadequate activity by the private sector, even in the country’s most successful EV market, the CPUC in 2014 reversed its position and now has approved or is reviewing more than a billion dollars in utility infrastructure investment. Experience in other states has been quite the same.

The Alliance emphasizes that there are a wide variety of ownership, or joint venture, possibilities that are currently being explored in EV infrastructure where a private EVSE

firm can bring technology, software and network management experience (such as vehicle to grid know-how) to the table, while the utility can bring its scale, engineering experience and detailed knowledge of the grid. The utility may want to put its brand on certain charging stations it rolls out, and a vendor may be fine supplying the solutions on a turnkey basis including all back-office and network management systems. The point is that a variety of business structures are possible in order to develop the EVSE market, and the particular solution will differ from state to state, utility to utility, and case to case. That is why we support the portfolio approach where all options for expanding infrastructure are examined and deployed where investment is feasible.

**a. IOU Ownership With/Without Subsidies**

As stated above, the Alliance believes that the utility has a strong and robust role to play in the development and operation of the EV infrastructure. We believe utilities can be involved in a variety of roles as part of a portfolio of varied approaches. These roles include:

- Unregulated investments in charging stations outside of utility rate base or charges;
- Regulated investment in ownership charging stations with regulated cost recovery where it can be demonstrated that all customers benefit from the utility investment and public policy objectives are satisfied;
- Contract services to owners of charging stations, including operation and maintenance;
- Make-ready investments, as discussed above; and,
- Incentives offered to third parties and/or customers for charging station installation. In many cases, such incentive payment schemes can be tied to public policy requirements, such as the ability to gather data, or a requirement that the station be ready for interoperability (see below). Incentives may take the form of direct payments, rebates, special tariffs (such as a waiver of demand charges) or other options.

All of these options are important, and none will interfere with the long-term development of a charging market with active participation of non-utility service providers. The regulatory oversight provided by the Commission over utilities can and will help ensure that the utilities' efforts will be closely monitored and that utility investments will remain in the public interest.

In summary, the Alliance believes that a robust utility involvement is essential for market development and that several key models are available to consider. The utility ownership and operation option is becoming more common in other jurisdictions as the market moves from the early adopter phase to an early majority phase. Utilities have filed for ownership and

operation options for certain EVSE segments in Oregon, Washington, Maryland, California, and other states, and Commissions have approved such programs subject to specific terms and conditions. As stated above, the Alliance believes that the overall EVSE market will continue to develop in a nuanced way, including utility ownership and operation, in States across the country in the near future, and that there is no single “magic bullet” to meet with existing market gaps. The Alliance therefore urges the Commission to support a variety of approaches, and specifically a portfolio approach.

**iii. Potential Policies for EV Charging Infrastructure Implementation That Provides the Most Benefit to the Grid**

**1. What policies will promote deployment of EV charging stations?**

The lack of reliable, affordable, and suitable public charging infrastructure is a critical barrier to electric vehicle (EV) adoption and is a challenge that electric utilities are uniquely qualified to help address. The auto industry is amid a transformative period where many types of mass market all-electric vehicles that can travel over 200 miles on a charge will be introduced by auto manufacturers (OEM’s) within the next five years. Drivers will expect robust public charging that will accommodate their transportation needs and address the sizeable “infrastructure gap” in the state. The limited number of public-facing charging stations in Minnesota were not designed for this newer vehicle technology, however, and consumers may find that the existing public charging network does not meet their expectations in the areas of reliability and speed.

The electric utility can play a strong role, either owning and operating, or facilitating the deployment of public fast charging infrastructure with host sites and vendors that is ready for the coming generation of EVs and position Missouri as a regional leader. Regarding deployment facilitation, the utility could play many roles, including reliability and situational awareness, leveraging the use of data from electric vehicle supply equipment (EVSE) to ease EV-grid integration, and aligning EVSE with other grid-edge functions like demand response. Moreover, the electrification of the transportation system offers a rare opportunity to address societal challenges while also enhancing economic development by maintaining strong auto OEM’s and robust supply chain.

To catalyze or jump-start this nascent market of EV infrastructure, the Commission should allow for a robust and holistic approach by the electric utilities in their planning to build out such infrastructure and recover their associated costs. The Alliance believes that a portfolio approach of different charging infrastructures should be encouraged by the Commission, including Level 2 chargers, workplace charging, multi-unit dwellings (MUD), DC fast charging, and high-capacity charging for medium and heavy-duty vehicles. Such an approach has worked well to transform certain markets in the energy efficiency sector in the past decade, such as CFL’s and light-emitting diodes (LED’s), to improve lighting efficiency in homes and buildings. A similar approach can work here.

The Alliance encourages the Commission to adopt as much regulatory certainty as possible, in terms of policy guidance or a policy statement short of a rulemaking, in providing a stable regulatory environment in this nascent stage of the EVSE market. More specifically, we encourage the Commission not to try to “micro-manage” the different types of charging infrastructure by regarding one as “more subject to competition” and “one more challenging to site and develop” and apply different rates of return (ROE) or cost recovery mechanisms to specific components. The Alliance prefers a more certain and holistic approach to the various types of infrastructure and applying a common cost recovery treatment to all capital investments.

While certain states have provided an “incentive” for utilities to engage in EVSE (such as the Washington Legislature did in June, 2015, by enacting ESHB 1853 which allowed a 2 percent incentive rate of return on certain investments subject to a rate cap), the Alliance does not necessarily advocate for such mechanisms in every state. But the Alliance believes that the Commission should consider consistent treatment on recovery to be applied to all capital investments by the utilities, including considering the treatment of rebates (offered to residential and commercial customers) as a regulatory asset with a return, along with the make-ready investments on both sides of the meter, the customer side as well as the utility-facing side. By doing so, the Commission would send a positive signal to both the utilities and the EVSE vendors, as well as the auto OEM’s and medium and heavy-duty vehicle sector, that it is serious about assisting in the development of the EV market in a consistent and predictable way.

## **2. What type of technology/charging equipment needs to be utilized?**

The electric utility should not be confined by Commission rules or policy to certain types of charging infrastructure that are more difficult to site, permit, and develop as some have argued – such as the charging for MUD in denser urban areas in Missouri, or on the major intercity highway corridors. Both utilities and third parties should be allowed to facilitate the building out of such infrastructure – either through a make-ready and rebate model, or an own-and-operate model – across all infrastructure types with a portfolio approach and customers should have the flexibility to choose the most appropriate technology.

### **a. Energy Star Certified EV Charging Station Requirements**

Again, the Alliance does not oppose the Energy Star certification for certain types of EVSE, such as Level 1 and Level 2 chargers. The Alliance does not believe there is an inherent conflict between the goals of greater energy efficiency, and those of promoting greater electrification of transportation. We have not been in the lead in working with the federal EPA on the Energy Star designation issues, and several of our members have undergone the process to receive a designation for Level 2

chargers. But we are also aware that there are serious technical issues that need to be resolved as one considers Energy Star designation for DCFC (Level 3 chargers) and higher voltage levels (50 kw and above). Accordingly, we urge the Commission to exercise caution in this area while these technical issues are discussed and hopefully resolved.

### **3. What is the interoperability of the EV charging station?**

The Alliance believes strongly in building out an EV infrastructure that is interoperable and subject to open standards. Today, that is not the case. The Alliance is concerned that, without sufficient attention devoted to this by Commission and other state decision-makers, the EV ecosystem will develop on both the front end (consumer facing), and the back end (network management system to charging stations) in a manner that is detrimental to EV owners, utilities, and the general public interest.

#### **i. Network to Charger Communications; Hardware Portability**

The Alliance believes that the Open Charge Point Protocol (OCPP), which is not connected with any individual charging network, is the most appropriation protocol for the network to charger communications. As evidence of OCPP's important, all members of the Alliance have committed to using this protocol while it advances through the process for "official" designation.

We believe the industry is generally coming around to this standard, although more slowly than we would like, and that the Commission does have the authority to condition the use of ratepayer funding for EVSE to be used by the regulated utility, in an RFP or tendering process, to be compliant with OCPP, and that such EVSE be "portable," or contractually permitted to be moved between networks without onerous network management fees or payment of royalties. . The utility must ensure, through due diligence and self-certification procedures, that all of the vendors are, in fact, complying with this in practice.

#### **ii. Network to Network Communications; Customer Roaming**

Customer roaming between networks is another topic worthy of discussion. While plug shapes have not yet coalesced to a single format for DC fast charging, charger manufacturers are addressing this by equipping most units with dual ports, i.e., CHAdeMO and CCS Combo (which is basically a modified J-1772 plug used by most American and European OEMs). (Tesla

remains an independent network, though Teslas are capable of using CHAdeMO chargers with an adapter and Teslas can use the J-1772 Level 2 industry standard plug, also with an adapter.)

A more significant issue we've observed is that many customers prefer to use a single RFID card to access each of the various charging networks. This is what we mean by "roaming" or network to network communications. Currently, each network generally operates independently and requires a dedicated account. As with network to charger communications, so too is the industry gradually moving toward a means for customers to use the card for one network on another network's chargers. One of the protocols for customer roaming between networks is called Open Charge Point Interface (OCPI).

The Alliance emphasizes the importance of interoperability and open protocols and standards in this rapidly growing market. We are concerned about the proliferation of multiple network operating systems communicating with charging stations/EVSE providers (we called this the back-end of the overall system), as well as the consumer facing technical issues that have prevented easy e-roaming for EV owners and have required them to carry multiple membership cards (usually, RFID but QR codes on a smart phone and others), which we call the front end of the system. These are difficult and complex issues, and we believe they are primarily the responsibility of the various industry sectors – auto OEM's, EVSE vendors, utilities, software developers – to develop these Comments of the Alliance for Transportation Electrification Project No. 1598941 (Phase Two) 3 protocols and standards, and implement them. Meanwhile, certain systems, such as Tesla's charging network, have been built up successfully, but these chargers are not currently fully compatible with non-Teslas.

The Alliance believes that a certain amount of "chaos and complexity" is inherent in an early stage of market development, but remains concerned about the confusion and potentially unpleasant consumer experience. As utilities petition the Commission for tariffs and rate recovery especially, we believe that the Commission has adequate authority to oversee these interoperability levels to some degree, and at a minimum, require the regulated utilities to use existing open standards and protocols, such as Open Charge Point Protocol (OCPP) and Open ADR, in their requests for information (RFI) or requests for proposals (RFP) as they deploy EV infrastructure.

The Alliance also strongly urges the Commission to mitigate the risk of vendor lock of chargers (Level 2 or DC fast) paid for in whole or in part with utility funds by allowing the procurement of only hardware that is both technically and contractually capable of operating on multiple networks. The term "open standards" is most certainly an important principle, but the phrase lacks the specificity necessary to ensure that charging hardware can feasibly operate on more than one network. In this regard, the Commission may wish to look to the experiences of Missouri utilities who have selected



network-specific hardware, as well as seek to ensure that final contract language provides suitable protection.

#### **4. Energy Storage with EV charging stations for mitigation of demand charges.**

Demand charges constitute a disproportionate cost of an average month's kWh charges when loads are "peaky," or generally low or zero punctuated by relatively high and brief periods of demand. In other words, the exact use case for many DC fast chargers today which sit idle for hours at a time and then are called on to dispense 50 kWh for a few minutes before ramping down and, typically within 30 minutes, settling back to zero as shown in the following graph produced by EPRI:

The problem is that the demand charge has relatively few kWh over which it is spread, thereby causing the per kWh cost in a particular period to be substantially higher than if the same demand charge was spread over a greater number of kWh. Over time this problem will diminish for many DC fast chargers as utilization increases, but at the moment and for the next few years in most cases utilization will continue to be low.

Demand charges serve an important function in the overall ratemaking of setting just and reasonable (J&R) rates for regulated utilities, while at the same time ensuring that the prudently incurred fixed costs of utilities are recovered in a reasonable way. The Alliance believes that the Commission should continue to adhere to the principles of cost-based ratemaking, although in the early stages of market development it will have to allow a certain amount of "market-based rates" (such as the prices for public DCFC services). Accordingly, we believe there is neither a regulatory nor an economic reason to exempt certain types of loads or customers permanently from these requirements. That said, we certainly recognize the need to consider new structures, and for that reason we encourage commissions to try new solutions, perhaps via pilots at first.

Energy storage is certainly an option for dealing with demand charges, but the economics will depend on many factors and is beyond the capability to be discussed here. It should simply be an option available to charging station owners.

#### **5. What are the anticipated system impacts of EV charging on peak on the grid?**

The Alliance believes that most charging (probably over 80 percent) will occur during off-peak hours because of time of use rate incentive structures that will be in place. And even in instances where charging occurs during the day at public or workplace stations, those stations can usually be programmed to avoid system peaks. Thus we do not believe that on peak charging on the grid will be a serious problem, but only if utilities and third party providers work together to implement managed charging that works to change consumer behavior to use off-peak charging incentives. . And if it begins to become a problem, pricing structures can be altered to ensure that those causing the problem pay for any peak capacity that must be added.

## 6. What are the potential impacts on the local distribution system?

### a. Distribution System Upgrade Requirements

It is a testament to the expertise and resilience inherent in utilities across America that the grid is able to support EVs, and we are confident that utilities will continue to modernize their distribution grids and offer “safe, reliable, and affordable electricity” to all classes of customer in the future – rich and poor, rural or urban, and commercial-industrial or residential. The Alliance believes that regulated utility investments in the distribution system to support EV charging infrastructure should be regarded generally as another necessary type of grid modernization investment.

While it is true that utilities have not, to date, experienced widespread problems caused by EV charging, penetration remains too thin to rule out some combination of infrastructure upgrades and managed charging. While energy efficiency, weatherization, and demand response have certainly impacted utility load, revenues, and planning, it will be essential for the utilities to engage in the proper planning on a distribution level basis for increased loads due to EV charging in the future, and try to project their impacts by location (feeders and substations), load curves during the day, impact on coincident peaks, and other key measures that relate to reliability and cost.

This will be the case not only with consumer adoption, but also with fleets and large commercial/public installations that could require hundreds of kW or even 1 MW+ per site. To date, most upgrades are focused relatively far down in the distribution system, but that does not mean they are inexpensive. And as EV penetration continues to increase, we are likely to see the load curve continue to evolve so the ultimate response (when combined with the other variables such as intermittent resources, storage, and solar) is unpredictable.

But with proper planning and Commission guidance, we are confident that utilities can plan for and make the necessary system upgrades to keep ahead of the demand that transportation electrification will create on the system.

#### i. Smart Meter Requirements

Because it is advantageous to the utility and its customers to incentivize charging in off-peak hours, we recommend that at a minimum, time of use meters be available to EV charging adapters.

## 7. **Ratemaking Policies – What will facilitate the most benefit for the grid?**

### a. **Time of Use Rates Specific to EV Charging**

The Alliance suggests that there are many important concerns and issues surrounding pricing for publicly available infrastructure (L2 and DCFC), and overall rate design for residential and workplace consumers. We recognize that today it is difficult to develop cost-based pricing schemes that conform to the standards of J&R (just and reasonable) rates, given the newness of this market and the paucity of historical data. Accordingly, the Commission must make certain educated judgment calls on a case-specific basis based on the evidence in the record that is presented by utilities in rate cases. As experience is developed in trying different pricing approaches, more will be known about the best approaches.

Given the volume of rates across the country, not to mention the frequency with which they change, we are not in a position to cite them all. We will, however, offer general observations and best practices. We also point out that numerous reports have been published in recent years on the subject of EV charging that supplement decades of writing on time of use in general. One report that is particularly recent is “Beneficial Electrification of Transportation,” by the Vermont-based Regulatory Assistance Project that was the subject of discussion at the March 21<sup>st</sup> workshop.

Home charging, in general, is suited for EV-specific time-of-use rates because vehicle charging typically does not need to occur at a particular moment. Unlike most other uses for electricity, when energy must be supplied at the precise instant that it is demanded, electric batteries consume energy at times other than when they are needed to power vehicles. This flexibility offers great opportunity to improve utilization of generation, transmission, and distribution resources. That said, customers historically have resisted time of use rates; moreover, for EV-specific rates in particular, the added monthly cost and installation costs of a second utility meter (i.e., the work to install the meter, which can be extensive) could, although not necessarily, make time of use rates impractical, uneconomical, or both for a great many customers.

In addition, several utilities have proposed (and Commissions have approved) whole-house TOU rates. However, the experiences of utilities to date have demonstrated there is considerable resistance from ratepayers to whole-house TOU rates due to the fear of “paying more” for overall electricity consumption. One example of an effort to overcome this opposition was by ConEdison, in New York, which offers a one-year price guarantee for EV owners who elect the company’s residential TOU rate. Under this program, the company will compare what the customer paid under time-of-use rates with what would have been paid under the standard residential rate; if the customer paid more under the TOU rate, the company will credit the customer’s account for the difference.

Furthermore, the Alliance is encouraged by technology developments that will enable customers to set certain parameters around charging linked to driving patterns, vehicle state of charge, and energy price signals. Ideally, technology will handle this for customers through some type of default mechanism that does not require active operation by the user. This overall architecture and system, however, has not matured sufficiently in the marketplace yet.

One time-of-use variable we have witnessed is a rather significant disparity in the delta between peak and non-peak rates. The reasons are many and ultimately go to the core of ratemaking, involving (in no particular order) a multitude of system costs, corporate and regulatory philosophy, political influences, wholesale market prices, intermittent resources, industrial loads, legacy costs, fuel mixes, long-term contracts, and more. Some utilities offer massive discounts for “super off-peak” charging, while others offer only modest discounts. An example of a substantial discount is Georgia Power’s TOU-PEV-6 rate (Rev. Original, Page No. 30), which charges \$0.2317/kWh during peak hours and only \$0.014164/kWh during super off-peak.

In contrast to home charging, where TOU rates are typically encouraged by utilities to better utilize grid resources, public charging tends to be less responsive to price signals. One reason for this is that there are many different business models for public charging, with some service providers taking the position that simplicity and consistency is more important than managing demand. This does not necessarily mean that the charging provider cannot be charged variable pricing, only that they provider may choose not to pass that along to customers. To the extent grid conditions (i.e., where real-time price signals are available) warrant demand response, the Alliance suggests that decision-makers take a ranked-order approach to deploying demand resources just as they do supply resources, so that chargers that are particularly important are dispatched after other resources that may be more flexible.

Certain service providers, meanwhile, do offer the ability to change price based on factors such as wholesale or distribution system conditions (in addition to other conditions unrelated to energy prices such as lunch hour, busy shopping times, etc.). One concern about this variability is the notice given to customers about the price changes that could happen in the middle of a charging session. The National Institute of Standards and Technology (NIST) is addressing this issue in Section 3.40 of Handbook 44. The section, which is not yet finalized, is titled “EV Fueling Systems,” and provides in relevant part that “Except when the conditions for variable price structure have been approved by the customer prior to the sale, a system shall not permit a change to the unit price during delivery of electrical energy.”<sup>1</sup>

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<sup>1</sup> NIST Handbook 44, available at <https://www.nist.gov/document/3-40-19-hb44-finalpdf> (last visited March 1, 2019).

- c. **The need for a rulemaking to address electric vehicle charging and the infrastructure to support it. Stakeholders may also submit exemplar rules from other jurisdictions.**

Regarding the appropriate process by which the Staff should proceed, the Alliance encourages the Commission to keep this Docket open for the foreseeable future, to continue the stakeholder process, through additional workshops, and perhaps to recommend to the Commission a rulemaking process setting out the general parameters, guidelines and requirements under which utilities would then file proposals for EVSE investments. The technology of EV's and EVSE is changing rapidly, as well as the markets in the United States and internationally, and other States are taking actions in this area. Accordingly, we believe it is sensible and timely to keep this policy-oriented Docket with a working group open for the foreseeable future.

We believe it is critical that the Commission as a whole (both Commissioners and staff), along with other state agencies, continue to stay abreast of the technology and market trends in the EVSE ecosystem, which includes industry sectors that are not normally within the realm of regulatory oversight in electric power (industries such as auto OEM's, bus manufacturers, EV infrastructure firms, demand response (DR), and IT firms working on software and autonomous vehicles). Accordingly, the Alliance encourages the Commission to recognize its important role in continuing oversight and maintaining a certain level of knowledge and capabilities to oversee and assess these trends. We recognize that the utilities (not the Commission or any other state agency) will continue to bear the burden of developing forward-looking and well-balanced programs and providing the necessary information and analysis to the Commission for these broader technology trends.

The balance between the principles and learnings developed from a policy-oriented Docket such as this one, and the detailed evidence introduced in a specific filing by a regulated utility is important to keep in mind. Of course, at the end of the day, the Commission must rule on the evidence, case-specific, that is introduced in a filing. Yet the Alliance believes that the foundational knowledge and learnings developed through this policy Docket will prove to be invaluable to Commissioners, staff, and stakeholders and result in good decisions that are well supported and should withstand potential further judicial review.

## **CONCLUSIONS**

In conclusion, we urge the Commission to:

- Act quickly and decisively;
- Provide flexibility to utilities to be innovative;
- Approve, without unnecessary conditions, a wide range of ongoing initiatives at a scale that is meaningful, rather than pilots, so that we can learn best practices;
- Provide a streamlined and simple review structure that allows for meaningful participation by stakeholders who may have limited regulatory resources but whose perspectives are important; and

- To not pull back from the bold progress you have already made so that others around the country can look to you to pave the way forward.

Respectfully submitted,

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