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**MISSOURI PUBLIC SERVICE COMMISSION**

**File No. ER-2016-0285**

# SURREBUTTAL TESTIMONY

**OF**

**NOAH GARCIA**

**ON**

**BEHALF OF**

## NATURAL RESOURCES DEFENSE COUNCIL

## Table of Contents

Introduction and Qualifications…….3

Purpose of Surrebuttal Testimony……...…….4

Clean Charge Network Considerations……..……..4

Rate Design……12

## Introduction and Qualifications

**Q. Please state your name and address.**

A. My name is Noah Garcia and my business address is 20 North Wacker Drive, Chicago, Illinois 60606.

**Q. What organization are you employed at and what is your position?**

A. I work at the Natural Resources Defense Council (NRDC) as a Schneider Fellow. NRDC is a non-profit environmental organization with more than two million members and online activists. NRDC uses law, science, and the support of its members to ensure the rights of all people to clean air, clean water, and healthy communities. One of NRDC's top priorities is to reduce transportation sector air pollutants.

**Q. Please describe your educational background and work experience.**

A. My educational experience includes a Bachelor of Arts in International Relations with a concentration in economics from Stanford University and a Master of Arts in Public Policy from Stanford University with a concentration in energy and environmental policy.

During my time at Stanford, I was a research assistant at the Steyer-Taylor Center for Energy Policy and Finance and analyzed the role of policy and market drivers behind clean energy development. At NRDC, I have advocated and provided support for state-based clean energy policies in various legislative and regulatory environments in Illinois. I have also advocated for and collaborated with partners on utility-driven transportation electrification programs in several jurisdictions in the Midwest. In Missouri, I participated in the *Working Case Regarding Electric Vehicle Charging Facilities* (File No. EW-2016-0123), providing substantive comments and materials on the necessity of charging stations to the development of the plug-in electric vehicle (PEV) market and how utilities could beneficially engage in this space. As part of the docketed proceeding, I presented at the Missouri Public Service Commission's EV workshop on May 25, 2016; along with Sierra Club and the Electric Power Research Institute, we expanded on the environmental benefits of vehicle electrification and the need for strategic deployment of

charging infrastructure to realize these benefits. I have also submitted testimony in two current rate cases before the Commission: ET-2016-0246 and ER-2016-0179.

## Purpose of Surrebuttal Testimony

**Q. What is the purpose of your surrebuttal testimony?**

A. The purpose of this surrebuttal testimony is to respond to rebuttal testimony offered by the Office of the Public Counsel (OPC), Kansas City Power & Light (KCPL), and Staff on KCPL's Clean Charge Network (CCN) and time of use (TOU) rates. I first address threshold questions regarding the CCN and later address rate design considerations associated with KCPL's proposed tariff for its CCN stations.

In short, I recommend that the Commission permit KCPL to receive cost recovery for the CCN, but reject the inclusion of the optional session charge as a part of KCPL's tariff proposal for the CCN stations. In line with Staff and other parties, I recommend the Commission begin a process to implement a TOU rate designed with PEV load profiles in mind that would help maximize the benefits of widespread PEV adoption to all utility customers.

## Clean Charge Network Considerations

**Q. What does OPC claim about the market for PEV charging services in Missouri?**

A. In his testimony, Witness Marke makes the following statement:

> *Both ratepayers and drivers are best served by a competitive market for charging services rather than a regulated monopoly…The deployment of electric vehicle ("EV") charging infrastructure should be left to the Company's non-regulated services and to free market competition.*[1]

[1] Rebuttal Testimony of Geoff Marke, File No. ER-2016-0285, Filed December 30, 2016

Throughout the section on competition in his testimony, Dr. Marke is generally of the view that PEV charging services constitute a competitive market in KCPL's service area, and that KCPL's regulated services should not be permitted to enter this market.

**Q. Does an assessment of the PEV charging services market in KCPL's service area require a more nuanced examination?**

A. Yes. Although it is true that private entities had been providing PEV charging infrastructure prior to the CCN, it was on a minimal scale. In response to Data Request 0207, KCPL provided spreadsheet data that gives a detailed account of the public charging stations located in its service area. Of those 680 charging stations, only 29 were *not* part of KCPL's CCN. Although home charging stations are important for driving PEV adoption and were not included in these data, it is unlikely that this level of public charging station deployment prior to the CCN would be able to support and sustain the acceleration of the PEV market in KCPL's service area.

KCPL's CCN can be seen as a response to the market coordination issue for two-sided markets that I describe in direct testimony: would-be PEV drivers may be reluctant to purchase a PEV if the supporting charging infrastructure is not in place. Similarly, a private charging station provider or site host may be reluctant to invest in a station if there is insufficient PEV charging demand. Through investment in this infrastructure, particularly at multi-unit dwellings and workplaces, the CCN can jump start PEV adoption, potentially leading to further opportunities for private companies and other entities to invest in more charging infrastructure.

**Q. What other concerns does OPC have regarding utility deployment of electric vehicle charging stations?**

A. OPC appears to be concerned that utility engagement in the deployment of charging stations will create barriers to entry for new market participants and unjustly penalizes private players in the market. Dr. Marke also explains that the utility can subvert competition and could potentially "reduce efficiency."[2] Additionally, OPC fears that utility assets will become stranded assets that become obsolete and outdated relative to private market alternatives.

[2] See footnote 1

**Q. Within the context of KCPL's CCN, do these issues merit the Commission's concern?**

A. No. KCPL is not proposing to develop, manufacture, or deploy its own charging station products to serve this project. No other approved or pending utility charging infrastructure proposal specifies that the utility itself will be responsible for providing its own charging station hardware and software. In this instance, KCPL procured charging equipment and software from ChargePoint, a private charging station company, and Nissan, a private automaker.

OPC's argument about technological obsolesce would, if carried to its logical conclusion, preclude any investment. The promise of future technological improvement should not prevent necessary investments today. If consumers never purchased the latest smartphones out of a fear that the next generation of smartphones would be better, they would forever be without a phone. The charging connectors available today are standardized plugs that comply with standards developed by the Society of Automotive Engineers. PEV drivers need access to those plugs now.

In the future, NRDC recommends that PEV charging infrastructure investments made by KCPL with Commission approval should be subject to a utility-led competitive solicitation process to procure charging stations from qualified charging station service providers.

**Q. What does KCPL believe to be true about the provision of PEV charging services in Missouri?**

A. In his testimony, Witness Rush explains that while KCPL believes private charging station companies can play a role in the future of the PEV charging services market, they cannot today because the Company believes utilities are the only entity legally permitted to own and operate charging stations in the state.

**Q. What is your response to this claim?**

A. NRDC believes utilities have an important role to play in the provision of charging infrastructure and other programs that accelerate PEV adoption in Missouri. However, NRDC does not believe that utilities are or should be the sole provider of public PEV charging services in the state. Private, third party entities have been providing charging services in Missouri for years and should continue to be able to do so.

**Q. Generally, what impact do PEVs have on greenhouse gas emissions and what does OPC claim about these impacts?**

A. There is a public benefit associated with the reduction of greenhouse gas emissions from PEVs relative to gasoline-powered vehicles. In an attempt to refute this point, Dr. Marke carefully makes the claim that increased adoption of PEVs will not reduce KCPL's carbon emissions.

> *Q. Will increased use of EVs reduce KCPL's carbon emissions?*
> *A. No. KCPL is largely dependent on coal and natural gas/oil fossil fuel mix to supply its generation needs. This means that electric vehicles will require KCPL to continue burning carbon intense fossil fuels.*[3]

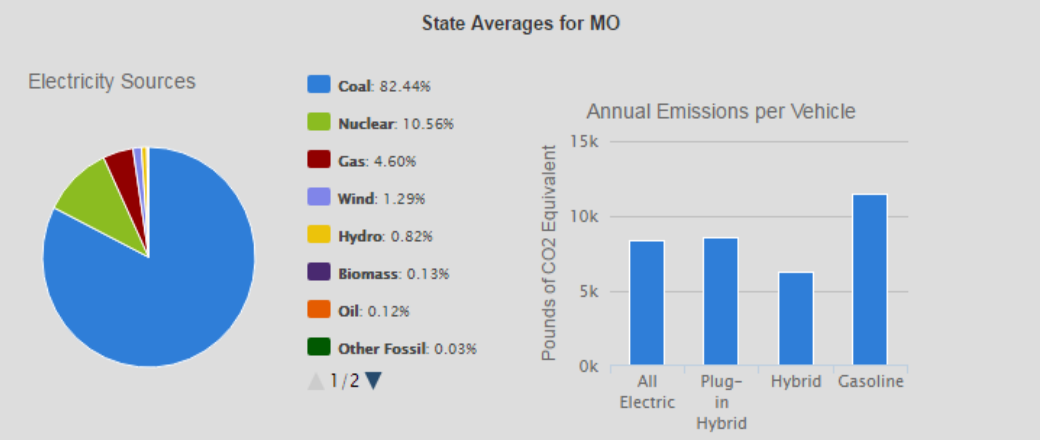
**Q. What is your response to OPC's assertion regarding the environmental impacts of PEVs in this case?**

A. Dr. Marke is only looking at one side of the emissions ledger, neglecting the significant emissions reductions that result from displacing gasoline. If one is to look narrowly at how KCPL's emissions profile changes as PEV adoption increases, then KCPL's emissions would increase as a result of increased generation from its fossil-fuel power plants. This would be the case for virtually every other vertically-integrated regulated utility in the United States. In answering the question above, OPC ignores how the total emissions from PEVs compare to gasoline-powered vehicles. If the goal is to assess the environmental impacts from PEVs, then it must be done in comparison to gasoline-powered vehicles.

Witness Marke correctly points out that Missouri still relies heavily on coal generation. Department of Energy's Alternative Fuels Data Center shows – using 2014 data from the Energy Information Administration – that coal comprised approximately 82 percent of the state's generation. This is shown in Figure 1 below.

[3] Rebuttal Testimony of Geoff Marke, File No. ER-2016-0285, Filed December 30, 2016

## Figure 1: Comparison of Annual Electric and Gasoline Vehicle Emissions with 2014 Missouri Generation Assumptions




Source: *Department of Energy Alternative Fuels Data Center*

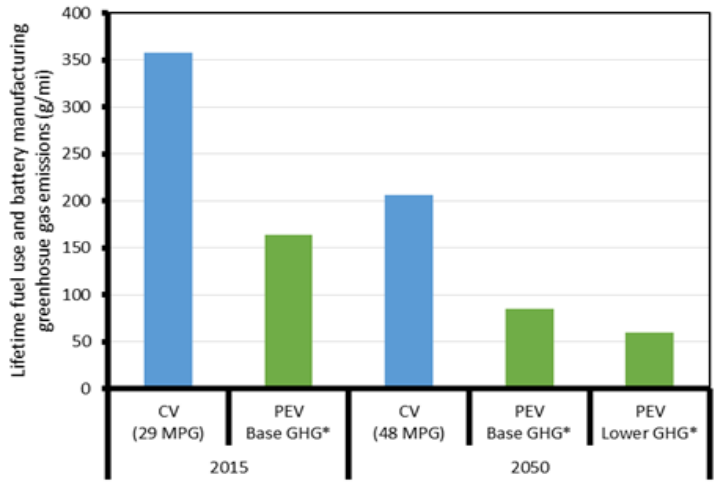
Even with Missouri's coal-heavy generation mix in 2014, PEVs still emit less $CO_2$ equivalent than gasoline-powered vehicles under equivalent driving conditions – approximately 27 percent less.[4] Furthermore, the Department of Energy's assumptions are already out of date: 2015 EIA state generation data reveals that coal's share of the generation mix dropped four percentage points from 82 percent in 2014 to 78 percent, while shares of generation from zero-emitting resources increased.[5] This suggests that under the Department of Energy's assumptions, electric vehicles in Missouri ran on cleaner fuel in 2015 than in 2014. And we expect this phenomenon to continue. As market trends and policies shift Missouri's generation mix and that of the country as a whole towards lower carbon generation sources, the clean air and carbon emissions benefits from PEVs will continue to increase. As shown in Figure 2, on today's national electricity mix, PEVs emit half as much greenhouse gas pollution per mile (even when accounting for emissions resulting from the manufacturing of batteries) than current conventional vehicles, a margin that

[4] Alternative Fuels Data Center, "Emissions from Hybrid and Plug-In Electric Vehicles," U.S. Department of Energy (accessed November 22, 2016) available at: http://www.afdc.energy.gov/vehicles/electric_emissions.php#wheel
Upon rolling over the individual results on AFDCs website, one can see a battery electric (all electric) vehicle emits 8,328 lbs of CO2 equivalent and gasoline vehicles emit 11,435 lbs of CO2 equivalent. Hence, a 27% reduction compared to gasoline powered vehicles.

[5] U.S. Energy Information Administration, "Form EIA-923 detailed data" (accessed November 22, 2016) available at: https://www.eia.gov/electricity/data/eia923/

will only increase as the US electricity mix becomes less carbon intensive.[6] By 2050, under a base case, PEVs will emit less than half as much carbon than a gasoline vehicle with a fuel economy of 48 miles-per-gallon. Under a scenario in which the transition to lower carbon generation sources occurs more quickly, PEVs emit only a quarter as much as a very efficient gasoline vehicle.[7]

**Figure 2: Conventional Vehicle and Plug-In Electric Vehicle Lifecycle Greenhouse Gas Emissions**




Source: *Electric Power Research Institute and Natural Resources Defense Council*

This concept – known as "environmentally beneficial electrification" – is becoming increasingly familiar with power sector experts.[8] All else equal, cleaner electric generation coupled with the improved efficiency of end-use technologies like PEVs and electric heat pumps *increases* electric generation while providing the opportunity to simultaneously *decrease* overall emissions relative to other non-electrified end-use technologies. In short, PEVs provide significant

[6] Marcus Alexander, Roland Hwang, and Luke Tonachel, *Environmental Assessment of a Full Electric Transportation Portfolio Volume 2: Greenhouse Gas Emissions*, Electric Power Research Institute and Natural Resources Defense Council (September 2015)
[7] *Ibid.*
[8] Keith Dennis, Ken Colburn, and Jim Lazar, "Environmentally Beneficial Electrification: The Dawn of 'Emissions Efficiency'", *The Electricity Journal* 29 (July 2016): 52-58 available at: http://ac.els-cdn.com/S1040619016301075/1-s2.0-S1040619016301075-main.pdf?_tid=c0ef3efe-ad0e-11e6-908a-00000aacb35d&acdnat=1479419136_7977bb870b5feb0cd2198d0783d05673

environmental benefits today and those benefits will only increase as the electric grid becomes cleaner.

**Q. What else does OPC claim about PEVs generally?**

A. OPC believes there is an equity concern regarding the acceleration of the PEV market because low-income customers in KCPL's territory may not have sufficient tax liability to take full advantage of federal tax credits that are available for PEV drivers with sufficient tax liability.

**Q. What is your response to this assertion?**

A. First, as I have already illustrated in direct testimony, increased PEV adoption can benefit all utility customers – regardless of income. By spreading transmission and distribution costs over a greater number of kilowatt-hour (kWh) sales, greater PEV load can exert downward pressure on rates for all customers. Other broad, utility customer benefits include, but are not limited to: reduction in greenhouse gas emissions, improved integration of renewable generation, and decreased dependence on expensive, imported oil. Because the CCN allows the body of utility customers to realize these benefits, KCPL should be permitted to reasonably recover the cost of the program through rates.

While it is true that not all consumers have sufficient federal income tax liability to be able to take full advantage of the federal tax credits in a purchase acquisition, OPC ignores the fact that the majority of PEVs are acquired via leases, allowing the consumer to realize the benefit of the federal tax credits in the form of monthly lease payments that are significantly lower than those of comparable gasoline vehicles (made lower by virtue of the fact the lender is able to claim the tax credits). Moreover, it is not uncommon to see low-mileage, used PEVs such as the Nissan Leaf or Chevy Volt for under $15,000.

In sum, increased PEV adoption can benefit all utility customers. With regard to upfront costs, PEVs are also accessible to a wide array of prospective consumers, even if they cannot take advantage of the federal tax credits for PEVs directly. These vehicles generally already out-compete their gasoline counterparts on fuel and maintenance costs, and as battery technologies

improve, PEVs will soon become competitive with gasoline vehicles on an upfront cost basis.[9] The release of the Chevy Bolt and upcoming Tesla Model 3 represent a new generation of mass market, long-range battery electric vehicles (BEVs) and we expect additional offerings from more automakers as the PEV market accelerates. However, widespread and sustained vehicle electrification cannot take place if the necessary charging infrastructure is not in place to support it.

**Q. Does OPC have additional concerns about PEVs?**

A. Yes. OPC appears to be concerned that PEV drivers do not adequately contribute to the maintenance of roads because they do not pay gasoline tax as a result of fueling their vehicles with electricity instead of gasoline.

**Q. Does OPC's claim merit the Commission's concern?**

A. No. The limited deployment of PEVs to date in Missouri has had a negligible impact on tax revenues collected for road maintenance. Moreover, PEV drivers in Missouri are required to pay an additional $75 for an annual Alternative Fuel Vehicle Decal, which exceeds what drivers of similarly sized efficient conventional vehicles could pay on an annual basis in gasoline taxes.[10]

If the State of Missouri was interested in resolving its revenue shortfall for road maintenance, it could pursue the following strategies:

1) Index motor-fuel taxes to inflation;
2) Index motor-fuel taxes to the overall efficiency of the vehicle fleet to prevent erosion of transportation funding as the state reduces its dependence on fossil fuels; and
3) Extend motor-fuel taxes on an energy-equivalent basis to all transportation fuels to ensure that all users pay their fair share while retaining the incentive for consumers to buy more efficient vehicles of various types and to drive them efficiently.

[9] M. Davis, "Total Cost of Ownership Model for Current Plug-In Electric Vehicles: Update to 2013 and 2014 Model Year Vehicles", Electric Power Research Institute (May 2014) available at: http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?productId=000000003002004054

[10] Consider an efficient gasoline vehicle that gets 40 mpg and averages 10,000 miles travelled annually. With a 17 cent state gas tax, that vehicle driver would be contributing $42.50 in gas tax revenue which is still approximately $30 less than what PEV drivers pay for a special decal on an annual basis.

NRDC realizes this issue is beyond the purview of the Commission. However, it is erroneous to conclude that PEVs have caused or will cause any meaningful road maintenance revenue shortfall in the near future in Missouri or that they are not already paying their fair share.

## Rate Design

**Q. What is your response to KCPL's rebuttal testimony on the inclusion of a session charge in the setting of tariffs for its CCN stations?**

A. Although Witness Rush gives a description and brief rationale for a session charge, he neither includes any additional justification for the session charge nor responds to the concerns I raise in direct testimony regarding session charges.

KCPL has repeatedly stated that a session charge can incentivize vehicle turnover and influence PEV driver charging behavior. NRDC understands that this may potentially become an issue when PEV adoption reaches significantly higher levels. But session charges represent an attempt to solve a problem that has not been shown to exist in KCPL's service area: KCPL has not provided any evidence that critical charging opportunities for PEV drivers in its network have been prevented or impeded by lack of vehicle turnover at stations.

I have already demonstrated in direct testimony that the single most important factor behind purchases of PEVs is the ability to realize fuel cost savings relative to gasoline. A session charge is a fee borne by PEV drivers that has a very tenuous connection to cost causation. With this in mind, NRDC finds the energy charges that KCPL proposes to be reasonable and reflective of cost causation principles. But placing unjustified session charges on PEV drivers would likely dampen PEV sales and undermine the goal of the CCN.

Consider a scenario in which a Level 2 station charges for energy only. Assuming a vehicle with a 3.3 kW onboard charger charges for three hours at a Level 2 station with KCP&L's proposed Level 2 tariff without a session charge, the cost of the charging event is 3.3kW for 3 hours at

$.124/kWh = **$1.23**. Now consider a scenario in which a Level 2 station charges for energy only for the first two hours of charging and begins charging a $6.00 session charge per hour along with energy charges starting in the third hour. Now, the cost to that same PEV driver becomes $1.23 + $6.00 = **$7.23**, nearly a six-fold increase in the price of the charging session. These punitive charges eliminate the fuel cost savings that PEV drivers may realize from charging at CCN stations, leading to confusion and dissatisfaction with the CCN among KCPL's growing number of customers who drive PEVs.

Witness Rush briefly mentions that the maximum session charge allowed, $6.00 per hour, represents the revenue that *would have been* collected had a Level 3 station been utilized for that hour. While NRDC understands and appreciates the idea behind charging the opportunity cost of lost charging revenue, that concept is not applicable for the CCN's Level 2 or Level 3 stations because it assumes extremely high station utilization rates. To put it simply, it is a stretch to assume that a station would have been charging another vehicle had the offending vehicle been unplugged from the station. KCPL has not demonstrated this to be the case. In order to help ensure the success of the CCN and prevent PEV drivers from incurring undue fueling costs at the discretion of site hosts, the Commission should reject KCPL's proposal to include an optional session charge in its tariff.

**Q. What is Staff's position regarding the development of a TOU rate for residential KCPL customers who are PEV drivers?**

A. In his testimony, Witness Murray recommends that a PEV-TOU rate schedule be proposed in KCPL's next rate case.

**Q. What is your response to Staff's position?**

A. NRDC strongly supports Staff's recommendation on the development of a PEV-TOU rate. Although I know of no study that assesses the grid impacts of PEVs in KCPL's territory specifically, I have presented in direct testimony in ER-2016-0179 reports and data from multiple jurisdictions showing that PEV TOU rates are effective in moving PEV load to off-peak

hours, minimizing strain on the electric grid and maximizing consumer cost savings.[11] There is no reason to expect that PEV drivers in KCPL's service area differ in any meaningful way from PEV drivers in these other jurisdictions. Thanks to timers that are already embedded in PEVs and many charging stations, drivers can simply program their cars or their stations to begin charging during the off-peak period of the TOU rate and wake up to a charged electric vehicle in the morning. For these reasons, a TOU rate is a compelling, appropriate, and feasible rate for PEV drivers to adopt in KCPL's territory to ensure the grid and utility customer benefits of vehicle electrification.

Despite the benefits these rate structures confer on PEV drivers and non-PEV drivers alike, simply ordering TOU rates on an opt-in basis will not be sufficient to achieve widespread TOU enrollment among PEV drivers – or other utility customers for that matter. However, in the realm of tariff design, nudges can be a powerful tool to increase enrollment. For this reason, NRDC recommends that the Commission begin to take the steps necessary to implement PEV-TOU rates for KCPL and other regulated utilities in the state on an opt-out basis. That is, utility customers that are known to drive PEVs are defaulted onto the PEV-TOU rate and may switch to KCPL's other tariff offerings at any time if they wish.

**Q. In conclusion, what do you recommend regarding the CCN?**

A. In summary, I recommend that the Commission permit KCPL to receive cost recovery for the CCN, but reject the inclusion of the optional session charge as a part of KCPL's tariff proposal for the CCN stations. In line with Staff and other parties, I recommend the Commission begin a process to implement a PEV-TOU rate that would help maximize the benefits of widespread PEV adoption to all utility customers.

With performance improvements to existing PEV models and the advent of a new, affordable, and long-range generation of PEVs on the horizon, it is imperative that a robust charging

[11] Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, *Joint IOU Electric Vehicle Load Research Report 4th Report*, Filed on December 24, 2015.

network and practical, beneficial rate structures are in place to sustain the growth of this market in a manner that benefits all utility customers.

**Q. Does this conclude your testimony?**

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

| | | |
|---|---|---|
| In the Matter of | ) | |
| Kansas City Power & Light Company's | ) | File No. ER-2016-0285 |
| Request for Authority to Implement | ) | |
| A General Rate Increase for Electric Service | ) | |

County of Cook )
State of Illinois )

AFFIDAVIT OF NOAH GARCIA

Noah Garcia, of lawful age, on his oath states: that he has participated in the preparation of the following surrebuttal testimony in question and answer form, consisting of ____ pages to be presented in the above case; that the answers in the following surrebuttal testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such answers are true to the best of his knowledge and belief.

Noah Garcia

27 In witness whereof I have hereunto subscribed my name and affixed my official seal this 27 day of January, 2017.

OFFICIAL SEAL
JENNIFER R DALY
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:05/28/17

1