

Exhibit No: 551
Issue: Rate Design - Clean Charge Network
Witness: Douglas Jester
Type of Exhibit: Direct Testimony
Sponsoring Party: Sierra Club
Case No. ER-2016-0285
Date testimony prepared: Dec. 14, 2016

FILED²

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

MAR 2 2017

**Missouri Public
Service Commission**

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

**DIRECT TESTIMONY OF DOUGLAS JESTER
ON BEHALF OF SIERRA CLUB**

DECEMBER 14, 2016

Sierra Club Exhibit No. 551
Date 2/23/17 Reporter MM
File No. ER-2016-0285

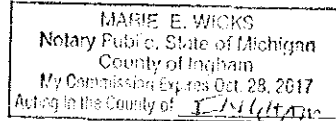
BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's)
Request for Authority to Implement a General Rate)
Increase for Electric Service)

Case No. ET-2016-0285

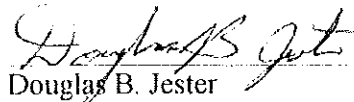
County of Ingham)

State of Michigan)



AFFIDAVIT OF DOUGLAS B. JESTER

Douglas B. Jester, of lawful age, on his oath states: that he has participated in the preparation of the following direct testimony in question and answer form, which is attached hereto and made a part hereof for all purposes, and is to be presented in the above case; that the answers in the following direct 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.


Douglas B. Jester

In witness whereof I have hereunto subscribed my name and affixed my official seal this 14TH day of December, 2016.


Marie E. Wicks

TABLE OF CONTENTS
DIRECT TESTIMONY OF DOUGLAS JESTER

QUALIFICATIONS AND PURPOSE OF TESTIMONY 1

KCP&L’S ELECTRIC VEHICLE CHARGING PROPOSAL.....5

**THE COMMISSION SHOULD USE TIME-OF-USE ENERGY CHARGES TO
BETTER INTEGRATE ELECTRIC VEHICLE CHARGING WITH THE
ELECTRIC POWER SYSTEM..... 7**

**THE COMMISSION SHOULD SEEK FAIR AND EQUITABLE RECOVERY
OF ELECTRIC VEHICLE CHARGING EQUIPMENT COSTS 12**

**THE COMMISSION SHOULD ENABLE DEVELOPMENT OF A
COMPETITIVE VEHICLE CHARGING MARKET, WHILE SUPPORTING
KCP&L’S ENGAGEMENT 15**

**THE COMMISSION SHOULD REQUIRE REGULAR REPORTING BY KCP&L
ON ITS CLEAN CHARGE NETWORK TO ENSURE THAT THE PROGRAM
RESULTS IN “LEARNING BY DOING” 17**

SUMMARY OF RECOMMENDATIONS 18

1 **QUALIFICATIONS AND PURPOSE OF TESTIMONY**

2

3 **Q. State your name, business name and address.**

4 A. My name is Douglas B. Jester. I am a principal of 5 Lakes Energy LLC, a Michigan
5 limited liability corporation, located at Suite 710, 115 W Allegan Street, Lansing,
6 Michigan 48933.

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

8 A. In its Application in this case, Kansas City Power & Light requested approval from this
9 Commission to recover its costs for the Missouri portions of its Clean Charge Network,
10 consisting of infrastructure for electric vehicle charging in its service territory and for a
11 tariff for recovery of some of those costs from those who use the Clean Charge Network.

12 I am testifying that in setting a tariff for electric vehicle charging:

- 13 • the Commission should take steps to ensure that vehicle charging will be well
14 integrated with the electric power system;
- 15 • the Commission should seek in the long-term to achieve fair and equitable
16 contribution toward recovery of electric vehicle charging equipment costs from
17 the drivers of such electric vehicles or the host sites for electric vehicle charging;
- 18 • the Commission should take steps to enable development of a competitive
19 vehicle charging market, while supporting utility engagement in this market; and
- 20 • the Commission should require regular reporting by KCP&L on its Clean Charge
21 Network to ensure that the program results in “learning by doing” for KCP&L,
22 the Commission and interested stakeholders.

23 **Q. On whose behalf are you appearing in this case?**

1 A. I am testifying on behalf of the Sierra Club.

2 **Q. Are you the same Douglas Jester who has previously filed testimony in this**
3 **proceeding?**

4 A. Yes, I previously filed direct testimony concerning revenue requirements in this case,
5 ER-2016-0285, on 30 November 2016.

6 **Q. Summarize your experience in the field of electric utility regulation.**

7 A. I have worked for more than 20 years in regulating the electricity industry and in related
8 fields. My work experience is summarized in my resume, attached as Schedule SC-1 to
9 my revenue requirement direct testimony, filed 30 November 2016.

10 **Q. Have you testified before this Commission or as an expert in any other proceeding?**

11 A. Yes, I recently filed testimony before this Commission in case ET-2016-0246,
12 concerning Ameren Missouri's proposal to deploy electric vehicle charging stations in its
13 service territory.

14 I have testified before the Michigan Public Service Commission in

- 15 • Case U-17473 (Consumers Energy Plant Retirement Securitization)
- 16 • Case U-17096-R (Indiana Michigan 2013 PSCR Reconciliation)
- 17 • Case U-17301 (Consumers Energy Renewable Energy Plan 2013 Biennial
18 Review);
- 19 • Case U-17302 (DTE Energy Renewable Energy Plan 2013 Biennial Review);
- 20 • Case U-17317 (Consumers Energy 2014 PSCR Plan);
- 21 • Case U-17319 (DTE Electric 2014 PSCR Plan);

- 1 • Case U-17674 (WEPCO 2015 PSCR Plan);
- 2 • Case U-17679 (Indiana-Michigan 2015 PSCR Plan);
- 3 • Case U-17689 (DTE Electric Cost of Service and Rate Design);
- 4 • Case U-17688 (Consumers Energy Cost of Service and Rate Design);
- 5 • Case U-17698 (Indiana-Michigan Cost of Service and Rate Design);
- 6 • Case U-17762 (DTE Electric Energy Optimization Plan);
- 7 • Case U-17752 (Consumers Energy Community Solar);
- 8 • Case U-17735 (Consumers Energy General Rates);
- 9 • Case U-17767 (DTE General Rates);
- 10 • Case U-17792 (Consumers Energy Renewable Energy Plan Revision);
- 11 • Case U-17895 (UPPCO General Rates);
- 12 • Case U-17911 (UPPCO 2016 PSCR Plan);
- 13 • Case U-17990 (Consumers Energy General Rates); and
- 14 • Case U-18014 (DTE General Rates).

15 I have testified before the Public Utility Commission of Nevada in

- 16 • Case 16-07001 (NV Energy 2017-2036 Integrated Resource Plan).

17 In the past, I have testified as an expert witness on behalf of the State of Michigan before
18 the Federal Energy Regulatory Commission in cases relating to the relicensing of hydro-
19 electric generation. I also have been listed as a witness on behalf of the State of
20 Michigan, prepared case files and submissions, and been deposed in cases before the
21 United States District Court for the Western District of Michigan and the Ingham County

1 Circuit Court of the State of Michigan, concerning electricity generation matters in which
2 the cases were settled before trial.

3 **Q. Do you have specific qualifications in relation to electric vehicle charging**
4 **infrastructure?**

5 A. In 2010, I served as an active member of the Michigan Public Service Commission's
6 electric vehicle charging collaborative.

7 In 2012, my colleagues and I at 5 Lakes Energy, on behalf of the Pew Charitable Trusts,
8 engaged stakeholders in a number of States in roundtable discussions about the
9 development of electric vehicle infrastructure and drafted a report about best practices,
10 which informed Pew's subsequent work in this field.

11 In 2015 and 2016, my colleagues and I at 5 Lakes Energy produced integrated resource
12 planning tools for least-cost compliance with the Clean Power Plan in ten states. These
13 tools incorporate means to model the potential effects of various levels of electric vehicle
14 market penetration on the electricity system.

15 Most recently, I testified extensively before the Michigan Public Service Commission in
16 Case U-17990, concerning an electric vehicle charging infrastructure proposal by
17 Consumers Energy.

18 **Q. What materials have you reviewed in preparation for your testimony?**

19 A. I reviewed KCP&L's application in this case and subsequent submissions to the docket. I
20 also reviewed the Staff report and comments submitted by stakeholders in EW-2016-
21 0123, the *Working Case Regarding Electric Vehicle Charging Facilities*. In addition,
22 there is a substantial literature on electric vehicles and electrical vehicle charging that I

1 have routinely read over the last several years. I also cite sources from my accumulated
2 personal library on relevant subjects.

3 **KCP&L'S ELECTRIC VEHICLE CHARGING PROPOSAL**

4 **Q. Please summarize KCP&L's proposal concerning electric vehicle charging**
5 **infrastructure?**

6 A. In this case, KCP&L presents its request and justification for electric vehicle charging
7 infrastructure primarily through the testimony of Tim M. Rush¹. Mr. Rush summarizes
8 KCP&L's proposed cost recovery of its investments and expenses for installing,
9 operating, and maintaining the Clean Charge Network, about which I previously testified,
10 and describes the proposed tariff, which I will address in this testimony.

11 As presented by Witness Rush, and embodied in the proposed tariff sheets attached to his
12 testimony as Schedule TMR-5, KCP&L proposes that the charges for use of the Clean
13 Charge Network consist of an energy charge and a session charge. The energy charge per
14 kWh for a Level 2 charger would be the average price per kWh for KCP&L's residential
15 class, including volumetric charges, customer charges, and applicable riders. The energy
16 charge per kWh for a Level 3 charger² would be the average price per kWh for KCP&L's
17 small general service class, including volumetric charges, customer charges, demand
18 charges, and applicable riders.

19 Session charges are to be determined by the host with some limitations, including that
20 they would be capped at \$6.00 per hour, which may be prorated.

¹ Direct testimony of Tim M. Rush, page 20, line 15 through page 32, line 9.
² "Level 3" is the term used by KCP&L in the proposed tariff sheets, which are attached to Tim Rush's testimony as Schedule TMR-5. This charging station technology provides higher power charging to vehicles through direct current (rather than alternating current), and is more commonly referred to as "Direct Current Fast Charging." In ET-2016-0246, the tariff case concerning Ameren Missouri's proposal to deploy charging stations along Interstate 70, fast charging stations are referred to on proposed tariff sheets as "Level 2-DC."

1 KCP&L further proposes that at the host’s option, the host may pay the energy charge
2 and the driver pay the session charge, or the driver pay both.

3 **Q. Please summarize your conclusions regarding KCP&L’s proposal?**

4 A. I recommend that the Commission should:

- 5 • use time-of-use energy charges to better integrate electric vehicle charging with the
6 electric power system consistent with the Commission Staff’s Final Report in EW-2016-
7 0123, the *Working Case Regarding Electric Vehicle Charging Facilities*;
- 8 • seek fair and equitable recovery of EV charging from drivers or site hosts by setting
9 energy charges that will recover the cost of providing and delivering power to the
10 charging station, and permitting ~~session~~ charges that will contribute toward recovery of
11 the cost of electric vehicle charging equipment for some of the market segments served
12 by the Clean Charge Network; and
- 13 • enable development of a competitive vehicle charging market, while supporting
14 KCP&L’s engagement in this market, by authorizing non-utility owners and operators of
15 EV charging stations to obtain electricity for use in vehicle charging on terms
16 competitive with the utility’s self-supply for that purpose and also by authorizing such
17 owners and operators to charge for vehicle charging on a volumetric (kWh) basis.

18
19
20
21

1 **THE COMMISSION SHOULD USE TIME-OF-USE ENERGY CHARGES TO BETTER**
2 **INTEGRATE ELECTRIC VEHICLE CHARGING WITH THE ELECTRIC POWER**
3 **SYSTEM**

4 **Q. Why should the Commission use time-of-use energy charges to better integrate**
5 **electric vehicle charging with the electric power system?**

6 A. In the near term, the key step to integrate electric vehicle charging with the electric power
7 system is to encourage charging that “fills valleys” in utility load and does not add to
8 capacity requirements. Time-of-use rates are the best means to signal to drivers the best
9 times to charge their vehicles, while still enabling drivers to obtain charging services that
10 match their vehicle operations requirements.

11 In future, electric vehicle charging may be used for other roles including demand
12 response through “smart charging” that may be used for frequency regulation, voltage
13 regulation, spinning reserve, or other ancillary services.

14 **Q. How much can “valley-filling” by electric vehicle charging reduce the average cost**
15 **of power?**

16 A. Pacific Northwest National Laboratory³ found that nationally there is sufficient
17 generation capacity to charge almost all passenger vehicles through “valley-filling”.
18 Missouri currently has total generation capacity of about 22 GW, providing
19 approximately 88 TWh per year for a load factor of about 46%. If vehicle electrification
20 added 28 TWh generation per year and this load was accommodated by “valley-filling”,
21 then this load factor would rise to 60%. A 60% load factor is somewhat high for most

³ Kintner-Meyer, M., K. Schneider, and R. Pratt, Impacts Assessment of Plug-in Hybrid Vehicles on Electric Utilities and Regional U.S. Power Grids. Pacific Northwest National Laboratory, November 2007, energyenvironment.pnnl.gov/ei/pdf/PHEV_Feasibility_Analysis_PartI.pdf.

1 utilities but not unreasonable with the load-scheduling flexibility of electric vehicles.
2 Assuming consistent with the current generation portfolio that generation capacity
3 represents an average of 35% of total utility costs and that fuel and other variable costs
4 represent an average of about 35% of total utility costs, then a revision⁴ of the calculation
5 I made above concerning the dilution of fixed costs suggests that vehicle charging would
6 increase utility sales by 33.8% but only increase utility costs by about 12% so that rates
7 would be reduced by 10.6%. In the alternative, rates could be held constant if the
8 incremental costs of transmission, distribution, and generation capacity to support electric
9 vehicle charging were less than 41% of the current costs of transmission, distribution, and
10 generation capacity.

11 In a recent report⁵, NRDC authors present the following graph illustrating a similar but
12 more detailed analysis for San Diego Gas and Electric, consistent with my results.

⁴ In this case, multiplying only the variable costs of generation by the increased load, adding the unchanged costs of distribution, transmission, and generation capacity, then dividing the result by the increased load.

⁵ NRDC, 2016. Driving Out Pollution: How Utilities Can Accelerate the Market for Electric Vehicles.

FIGURE 1: SDG&E COST OF SERVICE BEFORE AND AFTER WIDESPREAD ELECTRIC VEHICLE ADOPTION



(Adapted from Kintner-Myer et al., 2007)⁵⁴

1
2 Q. How should the Commission ensure that vehicle charging will be well integrated
3 with the electric power system?

4 A. There are two issues for the Commission to consider that relate to rate design.

5 First, as I outlined earlier, it is possible to support substantial vehicle charging load
6 without significant additional generation capacity, through load “valley-filling”. The
7 most effective way to do this is through clear price signals that are passed through as
8 actual costs to the person making charging decisions. Absent such price signals, the
9 driver of an electric vehicle will have no reason – and likely no awareness of the need-
10 to avoid charging at high load times. I therefore recommend that the Commission require
11 that all vehicle charging be done through time-of-use tariffs, preferably with critical peak
12 pricing, as was recommended by the Commission’s Staff in its Final Report in EW-2016-
13 0123, the *Working Case Regarding Electric Vehicle Charging Facilities*.

1 Second, pricing will be more effective if the vehicle and charging equipment are enabled
2 to automate demand response in the charging process. The Commission should require
3 KCP&L to evaluate and report back to the Commission as to how electric vehicle
4 charging can participate in KCP&L's demand response programs to provide various
5 ancillary services including frequency response, traditional and advanced demand
6 response -- all of which are very valuable in the grid now but will become increasingly
7 valuable with increasing renewables penetration.

8 **Q. In its Order dated 24 August 2016⁶, the Commission requested consideration of**
9 **certain issues in direct testimony, including analysis of a Plug-in Electric Vehicle**
10 **time of use electricity rate ("PEV") offered by Georgia Power; do you have**
11 **testimony on that issue?**

12 Yes, I wish to provide a brief assessment of the Georgia Power PEV Rate referenced in
13 the Commission's Order. For a few reasons, this PEV rate appears to be well designed.

14 First, the rate is relatively simple for customers to understand, with just three periods
15 during the summer on-peak months and two periods during the remainder of the year.

16 Second, the on-to-off-peak ratio is greater than 3:1 when comparing the "on-peak"
17 energy charge to both the "off-peak" and "super off peak" energy charges, and therefore
18 appears sufficiently high to incent EV charging behavior.

19 Third, the off-peak periods are generally of sufficient length to accommodate the EV
20 charging needs for many EV drivers, even at lower power levels. In all seasons, the
21 "super-off peak" period lasts for 8 hours (11:00 PM to 7:00 AM), during which most
22 vehicles would complete charging with an AC Level 2 charging station. The total off-

⁶ *Order Directing Consideration of Certain Questions in Testimony*, Case No. ER-2016-0285 (filed August 24, 2016).

1 peak period (combining the “super off-peak” and “off peak”) runs 19 hours even during
2 the summer season (7:00 PM to 2:00 PM) when the on-peak period applies, allowing for
3 nearly a complete charge with an AC Level 1 charger while energy costs are low.

4 At 5 hours, the on-peak period (2:00 PM to 7:00 PM Monday through Friday from June
5 to September) is acceptable, but could be made shorter in line with best practices for time
6 of use rate design, which call for concentrating peak-related charges into as few hours in
7 order to ease the burden on customers and produce a better response, and to actually track
8 underlying increased costs, which are themselves concentrated into relatively few hours
9 of the day and year.⁷ In addition, the rate may be further improved through “shadow
10 billing” (where the customer’s bill will provide an assessment of what the energy costs
11 would have been on a standard rate) or even a first-year price guarantee (where a
12 customer would not be required to pay more than what her bill would otherwise have
13 been on a standard residential rate, if, after the first year, the TOU rate resulted in higher
14 charges).

15 Finally, because the tariff is limited to “EV-only use” for residential customers, it is
16 likely that the installation of a second utility meter or meter upgrades may be required for
17 access, which can be a prohibitive cost for the prospective EV driver.⁸ In order to ease
18 access to future EV-only rates in Missouri, the Commission may wish consider lower-
19 cost metering options, like sub-metering or use of charging stations internal metrology.

20 The use of so-called “whole-home” time of use rates can also remove the need for
21 separate metering, but introduce uncertainty regarding net benefits. A 2015 study,

⁷ See, e.g., Regulatory Assistance Project, *Smart Rate Design for a Smart Future* (2015).

⁸ MJ Bradley & Associates (2015) *Electricity Pricing Strategies to Reduce Grid Impacts from Plug-in Electric Vehicle Charging in New York State*. Page 8.

1 evaluating EV pricing strategies to reduce grid impact for the state of New York,
2 recommended that New York’s current whole-home TOU rates should be evaluated for
3 EV owner net-benefits and, if necessary, re-tailored to consistently provide benefits. A
4 whole home TOU rate should be designed, the study concluded, to be revenue neutral for
5 the majority of customers when compared to the standard rate, but result in a lower bill
6 for the EV driver who charges during off-peak hours but does not shift any non-EV load.
7 In sum, I urge the Commission should consider both whole-home TOU tariffs and EV-
8 only rates, with a focus on cost effectiveness and ease of access for EV drivers.

9

10 **THE COMMISSION SHOULD SEEK FAIR AND EQUITABLE RECOVERY OF**
11 **ELECTRIC VEHICLE CHARGING EQUIPMENT COSTS**

12 **Q. Please describe some of the ways in which the costs of electric vehicle charging**
13 **equipment may be recovered.**

14 A. There are several approaches available, each of which can be compatible with both
15 development of a competitive market and with utility engagement in this market.

16 The first alternative is to charge the electric vehicle driver in addition to the delivered
17 energy costs. However, during market development, when vehicle charging infrastructure
18 is leading vehicle sales, this approach may not be able to recover sufficient revenue at
19 reasonable prices. In addition, during market development most charging stations will be
20 local monopolies in which unregulated pricing could be excessive, risking electricity
21 prices that eliminate fuel cost savings and may likely exceed gasoline prices. Therefore,
22 the Commission should ensure that pricing is appropriate for use of charging stations in

1 which its regulated utilities invest, regardless of whether those stations are owned and
2 operated by the utility or a third party.

3 The second alternative is to allow a station host to contribute toward equipment costs,
4 either upfront or in “rental” rate via monthly charges that include maintenance and
5 operations as well as recovery of and on capital.

6 Finally, during the market development period when charging infrastructure leads electric
7 vehicle ownership, there is room for Company or ratepayer contribution toward recovery
8 of charging equipment. This approach is especially appropriate for deployment in critical
9 market segments in which unique barriers limit deployment of infrastructure, as well as
10 for well-defined pilot programs of a fixed term that are designed to accelerate the market.

11 **Q. How should the Commission seek fair and equitable recovery of electric vehicle**
12 **charging costs from drivers or site hosts?**

13 A. KCP&L’s proposal to use an energy charge ~~and a session charge~~ is an appropriate
14 strategy for fair and equitable recovery of electric vehicle charging costs for public
15 charging stations at this stage in market development.

16 The energy charge approximately reflects the average cost of energy generation and
17 delivery for electric vehicle charging, using the Commission’s cost-of-service practices.

18 This can be refined in future when experience will enable direct estimation of cost of
19 service using actual vehicle charging data in context of a tariff in which drivers or hosts
20 are paying for energy usage. However, it does not incorporate time-of-use rates to
21 encourage drivers to charge at times when vehicle charging will be complementary to
22 conditions on the power system.

1 A session charge can be an appropriate way to recover costs of public electric vehicle
2 charging equipment, though during this period of market development the Commission
3 and KCP&L should expect and accept that session revenues may not fully cover
4 annualized costs of charging equipment⁹. In addition, recent work on electric vehicle
5 charging pricing policy clearly demonstrates that non-residential Level 2 charging
6 equipment is more efficiently utilized where charging is not made available for free and
7 further where charges may be applied beyond energy charges¹⁰.

8 **Q. How does your recommendation differ from KCP&L's proposal?**

9 A. First, I am recommending that energy charges be based on time of use.

10 Second, I am recommending that the Commission establish an expectation that when the
11 electric vehicle market matures, session charges will be used to recover costs of public-
12 use electric vehicle charging equipment. Charging stations that are functionally not
13 public, such as stations associated with multi-family dwellings will need to be handled
14 differently as these policies evolve. The Commission should not be concerned to
15 precisely recover costs of the Clean Charge Network through the tariff adopted in this
16 case, as the number of electric vehicles is dynamic and neither KCP&L nor the
17 Commission have data about charging behavior in context of a pricing policy on which to
18 base the tariff. Rather, the Commission should establish the principle that, in the long run,
19 KCP&L's vehicle charging tariff should be calibrated for cost recovery with the energy
20 charge recovering the cost of energy generation and delivery and the session charge
21 recovering the cost of charging station investment and operations. It can do so by

⁹ See ER-2016-0285 Direct Revenue Requirements Testimony of Douglas Jester, filed in this docket.

¹⁰ Winn, R. 2016. Electric Vehicle Charging at Work: Understanding Workplace PEV Charging Behavior to Inform Pricing Policy and Investment Decisions. Luskin Center for Innovation, University of California Los Angeles. Available from <http://innovation.luskin.ucla.edu/sites/default/files/Full%20Report.pdf>.

1 accepting KCP&L's proposed basis for an energy charge ~~and a session charge~~ in this case
2 but directing that KCP&L present the appropriate data and analysis for revision of these
3 charges in its next general rate case.

4 In the context of my other recommendations, I recommend that the Commission should
5 allow the site host to choose to pay ~~either the session charge or the energy charge, or~~
6 ~~both~~, on behalf of the driver to reflect the host's interests in driver visits to and behavior
7 at the site.

8

9 **THE COMMISSION SHOULD ENABLE DEVELOPMENT OF A COMPETITIVE**
10 **VEHICLE CHARGING MARKET, WHILE SUPPORTING KCP&L's ENGAGEMENT**

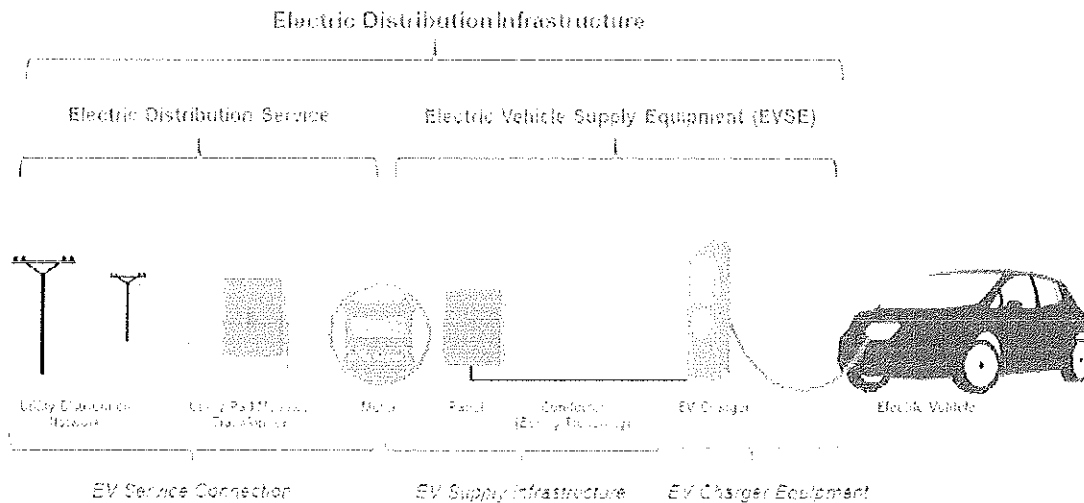
11 **Q. Why should the Commission promote development of a competitive electric vehicle**
12 **charging market?**

13 A. First, it is a well-established conclusion of economics that in the long-run effective
14 competition produces better prices and greater supply of services. Secondly, this is a
15 period of rapid innovation in the electric vehicle and vehicle charging markets and the
16 Commission should avoid locking-in a particular business model or set of technologies
17 for vehicle charging infrastructure.

18 **Q. How should the Commission promote development of a competitive electric vehicle**
19 **charging market, while supporting utility engagement?**

20 A. It is important to understand in some detail the structure of costs and scope of potential
21 competition for vehicle charging. The following diagram represents the approach Pacific

1 Gas & Electric (PG&E) has taken to vehicle charging infrastructure and is a useful
2 reference for examining this question.



3

4 PEV infrastructure costs consist of three groups: the “EV Service Connection”; the “EV
5 Supply Infrastructure”; and the “EV Charger Equipment.” The EV Service Connection
6 refers to the utility distribution infrastructure, including transformers, utility services, and
7 meters. The EV Supply Infrastructure is comprised of the electricity panels, conduit and
8 wiring.

9 The EV Charger Equipment to the right in this diagram is analogous to other end-use
10 equipment that is normally supplied by competitive markets; there are currently a number
11 of competitors in the marketplace for manufacturing, installing, and servicing such
12 equipment. This is also the locus of innovation activity in vehicle charging technology
13 and business models and should therefore be the focus of any effort by the Commission
14 to promote development of a competitive market for vehicle charging.

15 With this background, the Commission should take two steps in the present case to
16 promote development of a competitive electric vehicle charging market in KCP&L’s

1 service territory. First, it should authorize any party to obtain power from KCP&L for the
2 purpose of providing electric vehicle charging services either under the tariff that applies
3 to that party's site generally or at the energy charge authorized by the Commission under
4 a tariff for electric vehicle charging in KCP&L's Clean Charging Network, at the
5 customer's option. This will ensure that a charging station that is not owned by KCP&L
6 can obtain power for the purpose of vehicle charging on a non-discriminatory basis.
7 Second, the Commission should authorize volumetric (kWh) charges by non-utilities for
8 electric vehicle charging services, either without limitation or at the rates established in
9 the KCP&L Clean Charge Network tariff.

10 Under such a tariff, the Commission should not limit a non-utility provider of electric
11 vehicle charging services from also applying a session charge for the recovery of
12 additional costs of electric vehicle charging services.

13
14 **THE COMMISSION SHOULD REQUIRE REGULAR REPORTING BY KCP&L ON**
15 **ITS CLEAN CHARGE NETWORK TO ENSURE THAT THE PROGRAM RESULTS IN**
16 **"LEARNING BY DOING"**

17
18 **Q. Do you have any other recommendations with respect to electric vehicle charging?**

19 **A.** Yes. Leading the market requires learning by doing. The Commission should actively
20 engage in such learning both to ensure that KCP&L is actively learning but also for the
21 benefit of the Commission and other stakeholders. To that end, I recommend that the
22 Commission require regular reporting by KCP&L to the Commission and interested

1 stakeholders in order to provide for continuous monitoring and review of the Clean
2 Charge Network. This should include but not be limited to stations planned and
3 implemented; station usage and load patterns; distribution system impacts; host and
4 customer satisfaction and issues; electric vehicle sales and electric vehicle miles traveled
5 in Missouri; implications of ubiquitous vehicle charging on KCP&L's future distribution
6 system architecture; and the effects of KCP&L's programs on development of a
7 competitive market for vehicle charging equipment and services.

8 **SUMMARY OF RECOMMENDATIONS**

9 **Q. Please summarize your recommendations to the Commission regarding KCP&L's**
10 **proposed tariff.**

11 A. I recommend that in setting a tariff for KCP&L's Clean Charge Network:

- 12 • the Commission adopt a time of use rate, potentially along the lines of that used
13 by Georgia Power;
- 14 • authorize the use of ^{energy}~~session~~ charges as requested by KCP&L but establish an
15 expectation that these will be adjusted over time, as the market matures, to
16 provide a reasonable contribution to recovery of the costs of electric vehicle
17 charging equipment
- 18 • authorize any party to obtain power from KCP&L for the purpose of providing
19 electric vehicle charging services either under the tariff that applies to that party's
20 site generally or at the energy charge authorized by the Commission under a tariff
21 for electric vehicle charging in KCP&L's Clean Charging Network, at the
22 customer's option;

- 1 • authorize volumetric (kWh) charges by non-utilities for electric vehicle charging
2 services, either without limitation or at the rates established in the KCP&L Clean
3 Charge Network tariff; and
4 • require regular reporting by KCP&L on its Clean Charge Network to ensure that
5 the program results in “learning by doing” for KCP&L, the Commission and
6 interested stakeholders.

7 **Q. Does that complete your testimony regarding KCP&L’s electric vehicle charging**
8 **tariff?**

9 **A. Yes.**