



Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204
PortlandGeneral.com

June 27, 2017

Public Utility Commission of Oregon
Attn: Filing Center
201 High Street, S.E.
P.O. Box 1088
Salem, OR 97308-1088

RE: UM 1811 – Application for Transportation Electrification Programs

On behalf of Portland General Electric Company ("PGE"), Staff of the Public Utility Commission of Oregon, the Citizen's Utility Board of Oregon, the Industrial Customers of Northwest Utilities, Oregon Department of Energy, Tesla, Inc., Tri-County Metropolitan Transportation District of Oregon, Forth, and Greenlots, PGE is filing the following:

- **UM 1811 Stipulation**
- **Joint Testimony in Support of Stipulation (Stipulating Parties / 100)**
 - **Appendix A – qualification statement of Jeanette Shaw**
 - **Appendix B – qualification statement of Beau Whiteman**

Please direct all formal correspondence and requests to the following email address: pge.opuc.filings@pgn.com. Thank you in advance for your assistance.

Sincerely,

A handwritten signature in blue ink, appearing to read "Barbara Halle", is written over a light blue circular stamp or watermark.

Barbara Halle
Associate General Counsel

Enclosure

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UM 1811

In the Matter of

PORTLAND GENERAL ELECTRIC
COMPANY

Application for Transportation Electrification
Programs

STIPULATION

This stipulation (“Stipulation”) is between Portland General Electric Company (“PGE”), Staff of the Public Utility Commission of Oregon (“Staff”), the Citizens Utility Board of Oregon (“CUB”), the Industrial Customers of Northwest Utilities (“ICNU”), the Oregon Department of Energy (“ODOE”), Tesla, Inc. (“Tesla”), the Tri-County Metropolitan Transportation District of Oregon (“TriMet”), Forth, and Greenlots (collectively, “Stipulating Parties”). ChargePoint also participated in settlement discussions and has elected not to participate in this Stipulation.

PGE filed an Application for Transportation Electrification (“TE”) Programs on December 27, 2016, and supplemented the Application and provided supporting testimony on March 15, 2017. In the following three months, Staff, CUB, ICNU, and ChargePoint sent 86 data requests regarding PGE’s filing. On April 24, CUB, ICNU, Staff, Forth, ChargePoint, and Greenlots filed written reply testimony. Parties to this docket participated in a Settlement Conference on May 12, during which stakeholders discussed concerns and opportunities. During that discussion, PGE accepted a number of Stipulating Parties’ proposals and offered modifications regarding other proposals. The Stipulating Parties also accepted a number of PGE’s suggestions, which represented compromises that Stipulating Parties deemed reasonable for settlement purposes. Details of the settled issues are described in detail below.

TERMS OF STIPULATION

1. This Stipulation settles all issues in this docket. In its application, PGE proposed four TE programs; however, PGE has agreed to withdraw the “Residential Smart Charging” proposal, therefore, this Stipulation contains terms for PGE’s three remaining TE programs: TriMet Mass Transit; Education and Outreach; and Electric Avenue Network; as well as two future programs to be proposed by PGE.

Terms Applicable to All Three of PGE’s Programs¹

2. For the Stipulating Parties to support approval of PGE’s three Transportation Electrification programs as modified in this Stipulation, PGE agrees that the proposals are pilot programs only, meaning that the Stipulating Parties have not agreed that the TE proposals meet the six statutory criteria outlined in SB 1547, but rather, these TE programs may provide value as pilot programs. As pilots, the programs must be time-limited, cost-limited, and be designed to produce specific learnings.
3. PGE is to hold workshops with Staff and intervenors to develop cost effectiveness and attribution methodologies for TE programs. PGE is encouraged to work with Pacific Power to coordinate or co-develop these models.
4. PGE will schedule meetings, with the Stipulating Parties to this docket, to identify the specific and detailed learnings for each of the three TE pilots included in this Stipulation. Once the Stipulating Parties agree on the specific learnings to be gained from these pilots, PGE will file a written list of said learnings in this docket, and will track and report on such learnings. A draft of the type of

¹ The three programs include: TriMet Mass Transit; Education and Outreach; and Electric Avenue Network.

learnings expected from these pilots is included in Appendix 1, but is subject to revision by the Stipulating Parties.

5. When PGE proposes cost recovery for the TE programs in this Stipulation, all costs will be subject to a prudence review.
6. The Stipulating Parties agree to work toward establishing a method for cost recovery, subject to the cost caps specified herein, for invested capital that includes options other than a deferral. Further, the Stipulating Parties will determine how the cost cap is calculated, i.e., how revenues will be applied against costs over the life of the project, as well as requirements for tracking and reporting of costs and revenues.
7. Amounts in this Stipulation are net present values (NPV) in 2017 dollars of 10-years of nominal net costs (capital carrying costs, maintenance, and power costs less tax credits, user fees, and revenue from low-carbon fuel standard credits from chargers deployed as part of the TriMet and Electric Avenue pilots).
8. A summary of allowable costs are included below:

Table 1: Maximum Allowable Costs by Program, 10-year NPV (\$,000)

	Maximum Allowable Costs
Outreach and Technical Assistance	\$ 400
TriMet Pilot	\$ 800
Electric Avenue Network*	\$ 2,600
Residential Home Charger Pilot	-
Pilot Evaluation	\$ 500
Total	\$4,300

* If federal tax credits are available, allowable decrease based on federal tax credits received.

9. Costs for each pilot represent a total cap on customer exposure to costs from the pilot.

TriMet Pilot

10. Maximum allowable cost for the TriMet pilot, if determined to be prudent, is \$800,000 (NPV in 2017 dollars of 10-years of nominal net costs).
11. Pilot is time limited: 10 year asset life for charging stations. Contract with TriMet is 10 years.
12. PGE to report annually on program progress, program costs and costs recovered, estimates of costs to be recovered, specific learnings, and any recommended changes to methodology.
13. PGE agrees to register as a credit generator under the Clean Fuels Program and to credit any value it receives from Clean Fuels Program credits associated with the TriMet charging stations to all customers and ratepayer classes to offset the cost of these pilots.
14. PGE agrees that the TriMet pilot program is not a model to allow utility ownership of transit charging infrastructure beyond this pilot's terms and scope.
15. PGE will file a copy of the executed PGE-TriMet agreement, after it is executed, in the UM 1811 docket.
16. In the vendor contracts for the TriMet program charging station equipment, PGE agrees to use best efforts to place the costs of equipment risk or failure on the vendor/manufacturer; if equipment costs or failure risks exceed the spending cap agreed to in this Stipulation, PGE agrees that PGE customers will not be responsible for the cost overruns.

17. PGE will not undertake any future action that commits ratepayer funding for mass transit electrification projects without first participating in a discussion with the Commission. Any future proposals to use ratepayer money for mass transit electrification will be discussed with Staff and Stipulating Parties in advance of any commitments, and will be filed with the Commission for review.
18. Approving this TriMet pilot program is not intended to suggest that future investment by PGE in mass transit electrification is appropriate.
19. PGE will identify in writing the specific learnings to be gained from this pilot and provide annual reporting on the pilot—as described in paragraph 4 above.

Education and Outreach

20. Maximum allowable cost for Education and Outreach is \$400,000 over an initial three-year pilot period. Additional spending will be subject to application of the forthcoming cost effectiveness analysis and attribution methodology.
21. \$1M has been removed from the Education and Outreach proposal to be allocated for a future workplace and/or fleet charging program noted at paragraph 31.
22. The 1.0 FTE dedicated to Education and Outreach will be pulled from PGE's TE proposal and Stipulating Parties agree to support the addition of 1.0 FTE (at no more than \$183,000) for TE technical assistance in PGE's pending general rate case, UE 319.
23. \$400,000 will be allocated over 3 years to the remaining education and outreach initiatives, as displayed in Table 2.

Table 2: Outreach & Education Budget, 10-year NPV (\$,000)

	Maximum Allowable Costs
Technical Assistance	\$ 75
Builders & Facilities Outreach	\$ 125
Ride & Drives	\$ 75
Regional Market Transformation	\$ 125
Total	\$ 400

Electric Avenue Charging Stations

24. PGE is limited to investing in a maximum of six additional Electric Avenue Charging sites under this settlement.
25. Costs for additional Electric Avenue charging stations will be capped at \$2.6M, assuming no tax credits are available for this equipment. If tax credits are available for additional Electric Avenue deployments, costs will be capped at \$2.6M less the value of tax credits PGE received.
26. PGE will collect and report information and data on a yearly basis that includes, but is not limited to, load profiles, utilization, charging frequency, charging duration, voltage and power quality, kWh delivery, insights into price sensitivity of customers charging at the Electric Avenue chargers, revenue generated, types of vehicles customers drive, and any additional insights.
27. Time limited: this Pilot is limited to the 10-year asset life for charging stations.

28. PGE agrees to register as a credit generator under the Clean Fuels Program and credit any value it receives from Clean Fuels Program credits associated with the Electric Avenue charging stations to all customers and all ratepayer classes to offset the cost of these pilots.
29. As part of the reporting requirements in paragraph 6, PGE is to review its tariff charges for public charging at least annually to determine if charges or other terms need to be changed; Stipulating Parties may participate in this review.

Agreement to Future Pilot Proposals

30. PGE agrees to propose a residential home charging pilot, which includes rebates for customers installing a connected level 2 home charger and going on a time-of-use rate schedule, within one year of Commission approval of this plan.²
31. PGE agrees to propose a workplace charging and/or fleet charging program within one-year of the date of the Stipulation, conditioned on Commission approval of the Stipulation. The approximate total cost of the proposal will be \$1M. The program shall be open to both cost-of-service and direct access customers. The proposed \$1M results from a removal of \$1M from the PGE's proposed Education and Outreach budget in its application. PGE will also separately consider developing programs to increase access to electricity as a transportation fuel at multifamily dwellings.
32. Pilot Evaluation: Costs for program evaluation are capped at \$500,000.

² This future program will be proposed in lieu of the "Residential Smart Charging" program that PGE has agreed to withdraw at this time.

33. The Stipulating Parties recommend and request that the Commission approve this Stipulation as an appropriate and reasonable resolution of the issues in this docket.
34. The Stipulating Parties agree that this Stipulation represents a compromise in the positions of the Stipulating Parties. Without the written consent of all Stipulating Parties, evidence of conduct or statements, including but not limited to term sheets or other documents created solely for use in settlement conferences in this docket, and conduct or statements made at settlement conferences, are confidential and not admissible in the instant or any subsequent proceeding, unless independently discoverable or offered for other purposes allowed under ORS 40.190.
35. The Stipulating Parties have negotiated this Stipulation as an integrated document. If the Commission rejects all or any material part of this Stipulation, or adds any material condition to any final order that is not consistent with this Stipulation, each Stipulating Party reserves its right: (i) to withdraw from the Stipulation, upon written notice to the Commission and the other Stipulating Parties within five (5) business days of service of the final order that rejects this Stipulation, in whole or material part, or adds such material condition; (ii) pursuant to OAR 860-001-0350(9), to present evidence and argument on the record in support of the Stipulation, including the right to cross-examine witnesses, introduce evidence as deemed appropriate to respond fully to issues presented, and raise issues that are incorporated in the settlements embodied in this Stipulation; and (iii) pursuant to ORS 756.561 and OAR 860-001-0720, to

seek rehearing or reconsideration, or pursuant to ORS 756.610 to appeal the Commission order. Nothing in this paragraph provides any Stipulating Party the right to withdraw from this Stipulation as a result of the Commission's resolution of issues that this Stipulation does not resolve.

36. This Stipulation will be offered into the record in this proceeding as evidence pursuant to OAR 860-001-0350(7). The Stipulating Parties agree to support this Stipulation throughout this proceeding and in any appeal, provide witnesses to support this Stipulation (if specifically required by the Commission), and recommend that the Commission issue an order adopting the settlements contained herein. By entering into this Stipulation, no Stipulating Party shall be deemed to have approved, admitted or consented to the facts, principles, methods or theories employed by any other Stipulating Party in arriving at the terms of this Stipulation. Except as provided in this Stipulation, no Stipulating Party shall be deemed to have agreed that any provision of this Stipulation is appropriate for resolving issues in any other proceeding.
37. This Stipulation may be signed in any number of counterparts, each of which will be an original for all purposes, but all of which taken together will constitute one and the same agreement.

DATED this 27th day of June, 2017.



PORTLAND GENERAL ELECTRIC
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STAFF OF THE PUBLIC UTILITY
COMMISSION OF OREGON

CITIZENS' UTILITY BOARD
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INDUSTRIAL CUSTOMERS OF
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OREGON DEPARTMENT
OF ENERGY

TESLA, INC.

TRI-COUNTY METROPOLITAN
TRANSPORTATION DISTRICT OF
OREGON

FORTH

GREENLOTS

PORTLAND GENERAL ELECTRIC
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Kaylie Klem 6/22/17

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Jeanette W. Shaw 6/22/17

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Don O. Gornall 0/6/0 Tyler C. Pepple

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Richard Wallace 6/27/17

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Michael G. Galtsoff, Attorney for
TESLA, INC. 6/27/2017

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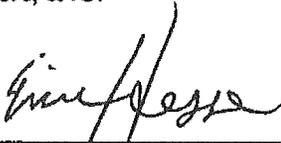
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GREENLOTS

APPENDIX 1:

UM1811 Draft Pilot Learnings by Program, Subject to Revision by Stipulating Parties to this Docket

- TriMet
 - Future Program design elements, including
 - What's pricing
 - tariff structure
 - line extension
 - Line drop
 - Suppliers
 - What distribution requirements
 - Technical assistance program elements
 - The impacts of depot chargers on PGE's distribution system and non-coincident peak loads.
 - Coincident peak demand impacts of high-powered bus charging.
 - The additional infrastructure, if any, needed to support and ensure high reliable bus charging infrastructure (and applicable costs).
 - Fleet impacts and fleet facility upgrade costs (to support technical assistance to other bus-fleet customers).
 - Charging infrastructure installation, operation, and maintenance costs.
 - Our initial deployment with TriMet will include time of use rates with demand charges (through Schedule 85-P). We intend to study the system impacts on peak days, evaluate the bus charging use case, assess the customer's needs, and develop models that we believe will be beneficial to all customers. We may include these alternative dynamic pricing elements in the future to maximize the benefit of this program to all customers.

- Outreach & Education
 - The impact of outreach efforts on awareness of electric vehicles in the service area.
 - The impact of technical assistance programs on the installation of workplace EV chargers.
 - The impact of outreach efforts on the consideration of electric vehicle for new car shoppers.
 - The impact of outreach efforts on overall sales and leases of electric vehicles in the service area.
 - The major challenges business customers face when planning for and siting electric vehicle charging infrastructure.
 - Survey customers on their awareness of electric vehicles and their exposure to our electric vehicle marketing campaigns. This approach will provide important data in case impacts are difficult to decipher from market-level sales data analysis. We will also ask customers whether marketing influenced their purchase as an indicator of effectiveness.
 - Deploy survey instruments to a variety of populations, including:
 - Recent EV purchasers

- Recent technical assistance customers
 - Recent non-EV purchasers
 - Trade allies (dealers, manufacturers)
 - Key stakeholders (Drive Oregon, transportation authorities, program staff)
 - Data collected from these populations will be critical in measuring impacts at each step of the vehicle purchasing process and on EV owners' charging behavior.
- Electric Avenue Network
 - The impact of the presence of visible, reliable, and accessible charging infrastructure on
 - Customers' willingness to purchase an EV
 - Customers' willingness to take longer trips in an EV
 - Who the predominant users of the charging infrastructure are
 - Whether there are distinct use cases with predictable load profiles
 - Whether the chargers are regularly utilized by non-PGE customers
 - Network load profiles and the impacts on PGE's distribution system and non-coincident peak loads of DC Quick Chargers, which will become increasingly important as we look at upgrading quick chargers to >100 kW units.
 - The impacts of time-variant rates on customer use of charging infrastructure.
 - The additional infrastructure, if any, needed to support and ensure high reliable public charging infrastructure (and applicable costs). What siting criteria can be utilized to limit or reduce distribution system upgrades necessary to install quick charging infrastructure.
 - Charging infrastructure installation, operation, and maintenance costs.
 - Challenges and best practices in permitting, designing, and siting DC quick charging infrastructure.
 - Revenue
 - Coincidence Factor of Charging Stations
 - Utilization
 - Load Profile
 - Load Factors
 - Accessibility
 - Other relevant data:
 - Load profile
 - Utilization
 - Duration
 - Voltage & Power quality
 - kWh delivery
 - Insight about price sensitivities
 - Insight about time-variant rates
 - How often customers charge
 - Type of vehicles customers drive

Any additional insights as a result of the pilot

**Before the Public Utility Commission
of the State of Oregon**

UM 1811
Application for Transportation Electrification
Programs

Portland General Electric Company

Joint Testimony in Support of Stipulation

June 27, 2017

1 **Q. Please state your names and positions.**

2 A. My name is Brian Spak. I am a Manager for Portland General Electric (PGE). My
3 qualifications appear in PGE/100.

4 My name is Jason R. Salmi Klotz. I am a Principal Executive Manager employed in the
5 Energy Resources and Planning Division of the Public Utility Commission of Oregon
6 (OPUC). My qualifications appear in Exhibit Staff/101.

7 My name is Bob Jenks. I am the Executive Director of the Citizens' Utility Board of
8 Oregon (CUB). My qualifications appear in Exhibit CUB/101.

9 My name is Bradley G. Mullins. I am an independent consultant, testifying on behalf of
10 Industrial Customers of Northwest Utilities (ICNU). My qualifications appear in ICNU/100.

11 My name is Thomas Ashley. I am Senior Director of Government Affairs & Public
12 Policy for Greenlots. I have previously submitted testimony in this docket in Exhibit
13 Greenlots/100.

14 My name is Jeanette Shaw. I am Director of Government Relations for Forth. My
15 qualifications appear in Stipulating Parties/100, Appendix A.

16 My name is Beau Whiteman. I am a Senior Manager for Tesla. My qualifications
17 appear in Stipulating Parties/100, Appendix B.

18 My name is Eric Hesse. I am the Strategic Planning Coordinator for TriMet.

19 My name is Jesse D. Ratcliffe. I am the Senior Assistant Attorney General, Natural
20 Resources Section. I have previously submitted testimony in this docket in Exhibit
21 ODOE/100.

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

2 A. Our purpose is to describe the terms of the settlement (Stipulation) reached among PGE,
3 OPUC Staff (Staff); CUB; ICNU; Forth; Greenlots; TriMet; Tesla; and ODOE (“Stipulating
4 Parties”) regarding the transportation electrification (TE) program pilots and associated
5 revenue requirement filed in this docket (UM 1811). Out of the ten total parties to this
6 docket, we are aware of one party who does not support the Stipulation.

7 **Q. What is the basis for the Stipulation?**

8 A. PGE filed its proposed Transportation Electrification Programs on December 27, 2016
9 (revised March 15, 2017) in compliance with SB 1547’s December 31, 2016 deadline.
10 Parties to this docket, namely, Staff, CUB, ICNU, and ChargePoint, made 86 data requests
11 regarding PGE’s filing. On April 24, Staff, CUB, ICNU, ODOE, Forth (previously Drive
12 Oregon), ChargePoint and Greenlots filed reply testimony in this docket. All parties to this
13 docket participated in a Settlement Conference on May 12, 2017, during which the parties
14 discussed their positions, and support for, and concerns regarding, certain aspects of PGE’s
15 proposed programs. During that discussion, PGE accepted a number of the Stipulating
16 Parties’ proposals and offered modifications regarding other proposals; the Stipulating
17 Parties also accepted a number of PGE’s suggestions. Therefore, the Stipulation reached
18 between the nine Stipulating Parties represents agreement and compromises that the
19 Stipulating Parties deemed to be reasonable resolutions for all issues in this docket.

20 **Q. Please summarize the terms agreed upon in the Stipulation.**

21 A. This Stipulation settles all issues in this docket. In its application, PGE proposed four TE
22 programs and as a result of settlement discussions, has agreed to withdraw its “Residential
23 Smart Charging” proposal. Therefore, this Stipulation contains terms for PGE’s three

1 remaining TE programs: TriMet Mass Transit, Education and Outreach, and Electric Avenue
2 Network, as well as two future programs to be proposed by PGE.

3 The following terms apply to all three of PGE’s proposed programs:

- 4 1. For the Stipulating Parties to support Commission approval of the three
5 Transportation Electrification programs as modified in this Stipulation, PGE
6 agrees that the proposals are pilot programs only, meaning that the Stipulating
7 Parties have not agreed that these specific TE program proposals meet the six
8 statutory criteria outlined in SB 1547, but rather, these TE programs are intended
9 to provide value as pilot programs. As pilots, the programs are time-limited, cost-
10 limited, will be designed to produce specific learnings to inform possible future
11 activity, and structured to limit costs to ratepayers.
- 12 2. PGE is to undertake efforts to develop cost effectiveness and attribution
13 methodologies for TE programs and is encouraged to work with Pacific Power to
14 coordinate or co-develop these models. Additionally, PGE will hold workshops
15 with Stipulating Parties to advance the understanding of these methodologies and
16 give stakeholders an opportunity to inform the development of these
17 methodologies.
- 18 3. PGE will schedule meetings with the Stipulating Parties to identify the specific
19 and detailed learnings for each of the three TE pilots included in this Stipulation.
20 Once the Stipulating Parties agree on the specific learning objectives for these
21 pilots, PGE will file in this docket a written list of the agreed-upon learnings and
22 in part will track and report data associated with these learnings. A draft of the
23 type of learnings expected from these pilots is included in Appendix 1 to the

1 Stipulation; however, it is simply a draft by PGE and is subject to revision by the
2 Stipulating Parties at the scheduled meetings noted in this paragraph.

- 3 4. When PGE proposes cost recovery for the TE programs in this Stipulation, costs
4 will be subject to a prudence review.
- 5 5. The Stipulating Parties agree to work toward establishing a method for cost
6 recovery for invested capital, subject to the cost caps agreed to in the Stipulation,
7 which includes options other than a deferral. Further, the Stipulating Parties will
8 determine how the cost cap is calculated, how revenues will be applied against
9 costs over the life of the project, as well as requirements for tracking and
10 reporting of costs and revenues.
- 11 6. Amounts in this Stipulation are net present values (NPV) in 2017 dollars of 10-
12 years of nominal net costs (capital carrying costs, maintenance, and power costs
13 less tax credits, user fees, and revenue from low-carbon fuel standard credits from
14 chargers deployed as part of the TriMet and Electric Avenue pilots).
- 15 7. A summary of the maximum recoverable costs for the three pilots are in
16 Table 1 below:

17 **Table 1: Maximum Recoverable Costs by Program, 10-year NPV (\$,000)**

	Maximum Allowable Costs
Outreach and Technical Assistance	\$ 400
TriMet Pilot	\$ 800
Electric Avenue Network*	\$ 2,600
Residential Home Charger Pilot	-
Pilot Evaluation	\$ 500
Total	\$4,300

18 * If federal tax credits are available, amounts decrease based on federal tax credits received.

1 8. Costs for each pilot represent a total cap on customer exposure to costs from the
2 three pilots. These stipulated recoverable costs are subject to prudence review.

3 **Q. Please summarize the terms agreed upon in the Stipulation regarding the TriMet Pilot.**

4 A. The following terms apply to PGE's proposed pilot with TriMet:

- 5 1. The maximum recoverable cost for the TriMet pilot, if determined to be prudent,
6 is \$800,000. (The \$800,000 represents the Net Present Value in 2017 dollars of
7 ten years of nominal net costs).
- 8 2. Pilot is limited to the 10 year asset life for charging stations. PGE's contract with
9 TriMet has a 10 year term.
- 10 3. PGE is to report annually on program progress, program costs and costs
11 recovered, estimates of costs to be recovered, specific learnings, and any
12 recommended changes to methodology.
- 13 4. PGE agrees to register as a credit generator under the Clean Fuels Program and to
14 credit any value it receives from Clean Fuels Program credits associated with the
15 TriMet charging stations to all customers and ratepayer classes to offset the cost
16 of these pilots.
- 17 5. PGE agrees that the TriMet pilot program is not a model to allow utility
18 ownership of transit charging infrastructure beyond this pilot's terms and scope.
- 19 6. PGE will file a copy of the executed PGE-TriMet agreement, after it is executed,
20 in the UM 1811 docket.
- 21 7. In the vendor contracts for the TriMet program charging station equipment, PGE
22 agrees to use best efforts to place the costs of equipment risk or failure on the
23 vendor/manufacturer; if equipment costs or failure risks exceed the spending cap

1 agreed to in this Stipulation, PGE agrees that PGE customers will not be
2 responsible for the cost overruns.

3 8. PGE will not undertake any future action that commits ratepayer funding without
4 first participating in a discussion with the Commission. Any future proposals to
5 use ratepayer money for mass transit transportation electrification will be
6 discussed with Staff and Stipulating Parties in advance of any commitments, and
7 will be filed with the Commission for review.

8 9. Approving this TriMet pilot program is not intended to suggest that future
9 investment by PGE in mass transit electrification is appropriate.

10 10. PGE will identify in writing the specific learnings expected to be gained from this
11 pilot, after meeting with the Stipulating Parties, as noted in paragraph 4 of the
12 Stipulation (and page 3 of this joint-testimony), and provide annual reporting on
13 the pilot.

14 **Q. Please summarize the terms agreed upon in the Stipulation regarding the Education**
15 **and Outreach Pilot.**

16 A. The following terms apply to PGE’s proposed Education and Outreach pilot:

17 1. The maximum allowable cost for Education and Outreach is \$400,000 over an
18 initial three-year pilot period. Additional spending in this area will be subject to
19 application of the forthcoming cost effectiveness analysis and attribution
20 methodology.

21 2. Stipulating Parties agree to the removal of \$1M from PGE’s filed Education and
22 Outreach proposal; Stipulating Parties agree to the reallocation of this amount for

- 1 a future workplace and/or fleet charging program to be proposed and filed by
2 PGE.
- 3 3. The costs associated with the 1.0 FTE dedicated to Education and Outreach that
4 PGE proposed has been removed from this filing; rather, the Stipulating Parties
5 agree to support the addition of 1.0 FTE (at no more than the fully loaded cost of
6 \$183,000) for TE technical assistance in PGE’s pending general rate case, UE
7 319.
- 8 4. \$400,000 will be allocated over 3 years to the remaining Education and Outreach
9 initiatives, as displayed in Table 2.

Table 2: Outreach & Education Budget, 10-year NPV (\$,000)

	Maximum Allowable Costs
Technical Assistance	\$ 75
Builders & Facilities Outreach	\$ 125
Ride & Drives	\$ 75
Regional Market Transformation	\$ 125
Total	\$ 400

- 10 **Q. Please summarize the terms agreed upon in the Stipulation regarding the Electric**
11 **Avenue Charging Stations Pilot.**
- 12 A. The following terms apply to PGE’s proposed Electric Avenue Charging pilot:
- 13 1. PGE is limited to investing in a maximum of six additional Electric Avenue
14 Charging sites under this settlement.

- 1 2. Recoverable costs for the Electric Avenue charging are capped at \$2.6M,
2 assuming no tax credits are available for this equipment. If tax credits are
3 available for additional Electric Avenue deployments, costs are capped at \$2.6M
4 less the value of tax credits PGE received.
- 5 3. PGE will collect and report information and data on a yearly basis that includes,
6 but is not limited to: load profiles, utilization, charging frequency, charging
7 duration, voltage and power quality, kWh delivery, insights into price sensitivity
8 of customers charging at the Electric Avenue chargers, revenue generated, types
9 of vehicles customers drive, and any additional insights.
- 10 4. The term of this Pilot is limited to the 10-year asset life for charging stations.
- 11 5. PGE agrees to register as a credit generator under the Clean Fuels Program and
12 credit any value it receives from Clean Fuels Program credits associated with the
13 Electric Avenue charging stations to all customers and all rate classes to offset the
14 cost of these pilots.
- 15 6. As part of the annual reporting requirements, PGE is to review its tariff prices for
16 public charging at least annually to determine if charges or other terms need to be
17 changed; Stipulating Parties may participate in this review.
- 18 7. Additionally, PGE shall assess its role in the charging market, addressing whether
19 its participation in the market is necessary as presently structured, if another
20 model or intervention strategy would be better for the market, or if PGE should
21 exit the charging market.

1 **Q. Please summarize the terms agreed upon in the Stipulation regarding pilot evaluation.**

2 A. PGE will complete an evaluation at the end of the 2nd and 5th pilot years, projected to be
3 2018 and 2021 (but may change based on the pilot start date). The cost for program
4 evaluation is capped at \$500,000.

5 **Q. Please summarize the terms agreed upon regarding the development of future pilot**
6 **proposals.**

- 7 1. PGE agrees to propose a residential home charging pilot, which includes rebates
8 for customers installing a connected, level 2 home charger and enrolling in a time-
9 of-use rate schedule, within one year of Commission approval of this plan.¹
- 10 2. PGE agrees to propose a workplace charging and/or fleet charging program
11 within one-year of the date of the Stipulation, conditioned on Commission
12 approval of the Stipulation. The approximate total cost of the proposal will be
13 \$1M. Given that costs will be recovered from customers including customers on
14 direct access, the program shall be open to both cost-of-service and direct access
15 customers. The proposed \$1M results from a removal of \$1M from the PGE's
16 proposed Education and Outreach budget in this application. PGE will also
17 separately consider developing programs to increase access to electricity as a
18 transportation fuel at multifamily dwellings.

19 **Q. Are there any issues in this docket that are unresolved by the Stipulation?**

20 A. No. However, ChargePoint, one of the ten parties in this docket, did not agree to the
21 Stipulation.

¹ This future program will be proposed in lieu of the "Residential Smart Charging" program that PGE has agreed to withdraw at this time.

1 *NOTE: The italicized questions and answers in this joint testimony are supported by all of*
2 *the Stipulating Parties, except for ICNU. ICNU is not participating in the italicized joint*
3 *testimony, but is a participant in the remainder of the joint testimony.*
4

5 ***Q. Do the Stipulating Parties believe that the proposed pilots will hamper the market for***
6 ***electric vehicle charging in PGE’s service territory?***

7 *A. No. As indicated in PGE/100, the proposed expansion of the Electric Avenue system is*
8 *designed as a pilot program to assist PGE in determining how customers use visible public*
9 *charging. The expansion of six new community stations is not expected to saturate the*
10 *market. After PGE’s proposal, Tesla announced plans to build three additional*
11 *supercharger stations within PGE’s service area, and plans to pursue these installations*
12 *independent of PGE’s pilot program being approved, because additional public charging –*
13 *above and beyond six additional Electric Avenues – is necessary to support projected*
14 *adoption of electric vehicles.² PGE developed Electric Avenue Network pricing to avoid*
15 *undercutting the market-based pricing offered by other providers.*

16 *Additionally, as indicated in Drive Oregon/100/Shaw/9/Attachment 3, eight companies*
17 *that produce and manage electric vehicle charging and service equipment (EV Connect,*
18 *Greenlots, ABB Inc., Schneider Electric, Eluminocity, SemaConnect, EV-Box, and*
19 *OpConnect) have voiced support for this particular pilot, stating that the pilots would “help*
20 *drive rapidly increasing EV sales in the region . . . the most important factor in our*
21 *industry’s success.” These companies also state that they “have confidence that this process*
22 *[PGE’s RFP process] will allow open competition.”*

23 ***Q. How will the Electric Avenue expansion stimulate innovation?***

² The Tesla Team, “Charging is our priority,” April 24, 2017. Available at: <https://www.tesla.com/blog/charging-our-priority>

1 As indicated in PGE’s Response to ChargePoint Data Request No. 005, we anticipate the
 2 proposed Electric Avenue expansion will stimulate innovation in electric vehicle charging
 3 and related infrastructure and services by:

- 4 • **Increasing electric vehicle adoption:** as indicated in Navigant’s report, PGE’s
 5 proposed transportation electrification portfolio is expected to increase EV
 6 adoption. More EVs on the road will increase demand for electric vehicle
 7 chargers and charging-related services. Ultimately a larger customer base will
 8 create a larger incentive for EVSPs to create innovative products and solutions
 9 for the growing market.
- 10 • **Creating a platform for innovation:** by creating public charging infrastructure,
 11 PGE will empower the private market to create innovative solutions to Oregon’s
 12 mobility and carbon challenges. An example of how Electric Avenue helped
 13 stimulate innovation is Uber Electric Portland. On April 12, Uber announced
 14 Uber Electric, a historic partnership between Uber, Drive Oregon (now called
 15 Forth), Black Parent Initiative, Cynergy E-Bikes, and the electric vehicle
 16 industry. The initiative aims to make 10% of all vehicles driven on the Uber
 17 platform in Oregon electric by 2019. The initiative will offer drivers low-cost
 18 leases of electric vehicles and perks for being trained by Forth as an “EV
 19 Ambassador”. Electric Avenue has served as a hub for the approximately 100
 20 Uber EV drivers today and inspired the development of this initiative. As
 21 indicated in Appendix 5, Uber believes “the Commission’s approval of PGE’s
 22 planned expansion of public charging stations would be essential to increasing
 23 the scale of Uber Electric.” We believe this innovative initiative is representative
 24 of the potential that can be stimulated by the deployment of Electric Avenue
 25 Network.
- 26 • **Creating a competitive RFP for charging infrastructure and network service
 27 providers:** As indicated by NRDC, “Utility-scale investment is also needed to
 28 facilitate the expansion of the nascent competitive EV charging service
 29 industry.”³ A competitive RFP inherently drives competition and supports growth
 30 of the industry. RFPs create opportunities for businesses to innovate, find ways to
 31 make products cheaper, and highlight new products/features. The EVSE industry
 32 is not limited to PGE’s service area—our RFP will be one of many; it will be in a
 33 “market” of RFPs around the country that collectively will drive the EV product
 34 and service industry to innovate and shape the EVSE market by fostering
 35 competition among manufacturers and service providers.

36 Further, our proposal estimates \$500,000 - \$1,000,000 of annual investment that
 37 will be awarded to charging equipment and service providers—this investment

³ Baumhefner, Hwang, Bull. NRDC. Driving Out Pollution: How Utilities Can Accelerate the Market for Electric Vehicles (2016).

1 *will contribute to the growth and health of a the EVSE industry, which inherently*
2 *will help fund research and innovation.*

- 3 • ***Sharing results of the Electric Avenue Model:*** *As a pilot, we hope the co-located*
4 *chargers demonstrates a model that can be successful in our service area but also*
5 *in other markets as well. The Electric Avenue model of co-locating several*
6 *DCQCs each capable of providing a charge to nearly all EVs has not been*
7 *broadly deployed, despite being the same basic approach as gasoline filling*
8 *stations. This approach is and of itself is innovative (already deployed by Tesla),*
9 *and we believe it has the potential to demonstrate greater results than other*
10 *approaches to public charging have yet to show. As active participants in*
11 *regional and national transportation electrification groups and conferences (i.e.*
12 *Edison Electrical Institute, EV Roadmap, ROEV Association, etc.), PGE intends*
13 *to share learnings (best practices, lessons learned, etc.) with other industry*
14 *stakeholders in hopes to spur innovative ideas and further investment in EV*
15 *charging infrastructure.*

16 ***Q. Have any companies that produce or manage electric vehicle charging and service***
17 ***equipment expressed concerns about the impact that the pilots would have on the private***
18 ***market?***

19 ***A. Other than ChargePoint, no.***

20 *As indicated by Thomas Ashley in UM1811/Greenlots/100: the proposed pilots will help*
21 *lead to greater opportunity for all market participants: from prospective private*
22 *owner/operators to service providers, installers, O&M providers, etc. Intrinsicly, greater*
23 *market opportunity will lead to increased competition for owning and operating charging*
24 *infrastructure, as well as between software providers, hardware manufacturers, installers,*
25 *etc.*

1 **Q. What do the Stipulating Parties recommend to the Commission regarding their**
2 **adjustments and modifications to PGE’s filed TE Programs?**

3 A. The Stipulating Parties recommend and request that the Commission approve PGE’s
4 proposed TE programs, subject to the adjustments and revisions indicated in the Stipulation
5 and supporting testimony. Based on careful review of PGE’s inaugural TE filing,
6 consideration of PGE’s responses to 86 data requests, and thorough analysis of the issues
7 during the settlement conference, we believe the adjustments made at the request of the
8 Stipulating Parties represent appropriate and reasonable resolutions of the issues in this
9 docket. Further, rates reflecting these adjustments will be fair, just, and reasonable.

10 **Q. Why does PGE support the Stipulation?**

11 A. PGE supports the Stipulation as it provides an opportunity to accelerate transportation
12 electrification in Oregon while meeting PGE’s two program goals, as outlined in our filed
13 Application for Transportation Electrification Programs:

- 14 1. Increase customer acquisition of electric vehicles and other electric
15 transportation options in our service area; and
- 16 2. Begin efficiently integrating electric vehicles into our system.

17 The ability for PGE to measure the impact of discrete, time and cost limited pilots on the
18 adoption of EVs, coupled with the data and learnings collected through the pilot programs
19 agreed to in the Stipulation, will greatly benefit the electric transportation market in the
20 state. Additionally, the collaborative nature from which the planned learnings were drafted
21 (and will be refined in subsequent meetings with the Stipulating Parties) provides an
22 opportunity for wider education regarding the adoption of electricity as a transportation fuel,
23 and the benefits that this increased adoption can deliver to the electricity grid.

1 **Q. Why does Staff support the Stipulation?**

2 A. Staff is supportive of the Stipulation as it represents the best efforts to address and resolve
3 almost all of the parties' issues while protecting ratepayers, limiting the cost of the pilot
4 programs and activities in manner that allows PGE to study this new market, and collect
5 data that will support and improve subsequent transportation electrification programs.

6 Further, the Stipulation provides coordination for the development of necessary
7 evaluative tools. In accordance with the Stipulation, PGE will continue its work to develop
8 a cost effectiveness and attribution methodology, which Staff feels is an essential step
9 required for the TE process. The development of these tools will assist all parties and the
10 Commission when evaluating PGE's current pilots and provide the quantitative metrics
11 necessary to assess the cost and benefits, and attribution (whether the programs is in fact
12 accelerating transportation electrification), of future proposed TE programs.

13 Staff is comfortable recommending approval of the three TE programs agreed to in the
14 Stipulation because they will provide value as *pilot* programs. As pilots, ratepayers are
15 protected because the three programs will be time-limited, will be designed to produce
16 specific learnings, and limit cost exposure to customers to the caps agreed to by the
17 Stipulating Parties. The TE programs stipulated to in this inaugural filing are expected to
18 accelerate transportation electrification, in addition to PGE's understanding of how to
19 accelerate transportation electrification through installation of charging infrastructure,
20 deployment of technical support, and appropriately-limited education and outreach
21 initiatives. PGE's initial three programs will likely provide necessary learnings and data to
22 help guide the utilities, Staff, stakeholders and the Commission on the development of the
23 EV market in substantive dimensions. Therefore, Staff supports the Stipulation reached by
24 nine of the ten parties to this docket.

1 **Q. Why does CUB support the Stipulation?**

2 A. CUB supports the stipulation as a reasonable compromise of Stipulating Parties' positions in
3 an effort to accelerate transportation electrification in PGE's service territory. While some
4 components of the Company's program application are not cost effective, CUB believes that
5 the proposals made are reasonable in that they are pilot programs and can offer specific
6 knowledge for parties to gain and take away from these programs. CUB is especially
7 supportive of the residential home charger pilot. CUB continues to have concerns with how
8 new EVs will impact PGE's system, and expects that this pilot will help the Company better
9 understand the needs of its residential EV consumers. CUB believes the Stipulation in its
10 entirety is reasonable and in the public interest.

11 **Q. Why does ICNU support the Stipulation?**

12 A. ICNU supports the Stipulation primarily because it represents an appropriate compromise of
13 the Stipulating Parties' positions and because it more appropriately matches costs and
14 benefits from PGE's TE programs than as the Company originally proposed. Under the
15 statute that authorizes these programs, nonresidential customers are required to share in the
16 cost of the proposed programs. As originally proposed by PGE, it was not clear that these
17 customers would receive any benefit from the TE programs. The Stipulation addresses this
18 shortcoming by requiring PGE to allocate approximately \$1 million to a workplace and/or
19 fleet charging program within one year of the Stipulation. This will provide direct benefits
20 to the Company's non-residential customers and has the potential to further accelerate the
21 adoption of electric vehicles in the state by providing additional incentives for employees of
22 these nonresidential customers to purchase an EV.

1 **Q. Why does Greenlots support the Stipulation?**

2 A. Portland General Electric has designed a pilot that seeks to grow electric vehicle charging
3 and access to clean transportation in the Portland Metro, including support for the further
4 adoption and deployment of electric vehicles by and with private individuals/vehicles, fleets,
5 car sharing and ride sharing companies, and transit buses. PGE has gone through a robust
6 stakeholder process and gained input from many stakeholders who will benefit directly or
7 indirectly from the expansion of the electric vehicle charging infrastructure in and around
8 the city. PGE seems well aware of the lack of infrastructure and the role of that lack in
9 electric vehicle adoption not growing more readily. The DC fast charging backbone
10 infrastructure will significantly change the real and perceived ability of drivers to drive
11 electric vehicles and charge them in Portland.

12 With a commitment to open communications and interoperability, PGE has taken a
13 strong step to future-proofing the investments flowing from this program, as well as
14 increasing competition amongst suppliers and service providers. The innovative program
15 with TriMet will ensure that Portland is able to take a strong step forward in further
16 electrifying its transit options, with benefits to be enjoyed across a broad spectrum of the
17 Portland region. These programs come at a critical time for EV adoption, and will help
18 enable further investment in infrastructure, helping scale a nascent market.

19 **Q. Why does Forth support the Stipulation?**

20 A. Forth supports the Stipulation because, among other reasons, it will help increase the
21 awareness of electric vehicles (EV) and charging infrastructure in Oregon. Outreach and
22 education is one of the most impactful and cost-effective strategies to accelerate
23 transportation electrification. Forth notes that the Legislative Assembly found, among other
24 things, that transportation electrification is “...necessary” and “...requires that electric

1 companies increase access to the use of electricity as a transportation fuel.” The fundamental
2 purpose of these plans should be to accelerate transportation electrification and Forth
3 believes the agreed upon programs do so modestly -- the original proposed funding amounts
4 would have more adequately addressed the outreach and educational needs of the nascent
5 Oregon EV marketplace. Forth is pleased to see the inclusion of approximately \$1 million to
6 a workplace and/or fleet charging program within one year of the Stipulation. Lastly, Forth
7 understands the concerns that have been raised about utility ownership of charging
8 infrastructure but supports PGE’s ownership and operation proposal within the context of
9 this proposal. Creating a highly visible backbone of fast charging will help drive and support
10 increased electric vehicle sales.

11 **Q. Why does Tesla support the Stipulation?**

12 A. Transportation electrification proposals have the potential to reduce or eliminate commercial
13 barriers to the adoption of electric vehicles by lowering the upfront costs of charging
14 infrastructure, expanding the charging network accessibility across the state, and piloting
15 innovative approaches to grid management goals. Tesla, Inc., intervened in this matter to
16 support those positions and our interests have been sufficiently addressed in the negotiated
17 stipulation.

18 **Q. Why does TriMet support the Stipulation?**

19 A. TriMet intervened to represent our business interests in relation to our proposal to partner
20 with PGE under their proposed mass transit electrification program on the implementation
21 of a fully electric five bus pilot project to enable TriMet to develop firsthand experience
22 with fully electric buses to inform TriMet’s bus electrification strategy. As the stipulation
23 supports this effort by enabling PGE to participate in functionally and financially sufficient
24 ways to undertake all of the elements TriMet sought under the proposed partnership,

1 including purchase, ownership and maintenance of the charging infrastructure in a pilot
2 context, TriMet’s interests have been met. We therefore support the terms of the stipulation.

3 **Q. Does this complete your joint-testimony?**

4 A. Yes.

Q. Ms. Shaw, please state your educational background and experience

A. I received a Bachelor of Science in Political Science and Public Service from the University of California at Santa Barbara and an Executive MBA from Stanford University. I am Director of Government Relations at Forth, which is recognized as a global leader on electric mobility issues; has designed and implemented several leading demonstration and pilot projects; has been the nation's leading recruiter of workplace charging partners through the USDOE Workplace Charging Challenge for three years running; and organizes the nation's leading annual conference on the subject, the EV Roadmap Conference. Prior to my current role, I spent over 25 years in the high-tech arena as a Vice President of Government Affairs for a fortune 500 company and a consultant focusing on transportation, environmental health, safety and sustainability and disruptive technologies such as transportation network companies (TNCs), electric vehicles, autonomous vehicles, high-speed rail, solar, LED technologies and defense transportation systems internationally, federally, and at the state and local levels.

Q. Mr. Whiteman, please state your educational background and experience

A. I received a Bachelor of Arts degree in Political Science from Allegheny College and a Master of Public Administration degree from The George Washington University. I accepted my current role at Tesla earlier this year, having been with the company since 2011. Previously, I spent three years actively deploying DC fast charging infrastructure for Tesla.